

THE RANCH PLAN PLANNED COMMUNITY  
PLANNING AREAS 3 AND 4 RUNOFF MANAGEMENT PLAN

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INTERNATIONAL

**TECHNICAL APPENDIX D.1**

**Rational Method Expected Value  
(2-, 5-, 10-, 25-, 50- and 100-year)**



ELEVATION DATA: UPSTREAM(FEET) = 3090.55 DOWNSTREAM(FEET) = 3022.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 920.65 CHANNEL SLOPE = 0.0740  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.725

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.45  
AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 4.45  
Tc(MIN.) = 24.43  
SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 2.42  
EFFECTIVE AREA(ACRES) = 44.29 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 44.3 PEAK FLOW RATE(CFS) = 4.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 3.27  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 2797.11 FEET.

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FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3022.44 DOWNSTREAM(FEET) = 2962.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.87 CHANNEL SLOPE = 0.0612  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.639

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	126.78	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.38  
AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 4.82  
Tc(MIN.) = 29.25  
SUBAREA AREA(ACRES) = 126.78 SUBAREA RUNOFF(CFS) = 4.52  
EFFECTIVE AREA(ACRES) = 171.07 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 171.1 PEAK FLOW RATE(CFS) = 6.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 3.21  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 3774.98 FEET.

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FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2962.57 DOWNSTREAM(FEET) = 2917.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.94 CHANNEL SLOPE = 0.0240  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.526

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.68	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.26  
AVERAGE FLOW DEPTH(FEET) = 0.95 TRAVEL TIME(MIN.) = 13.77  
Tc(MIN.) = 43.02

SUBAREA AREA(ACRES) = 112.68 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 283.75 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 283.8 PEAK FLOW RATE(CFS) = 6.10

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 2.26  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 5639.92 FEET.

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FLOW PROCESS FROM NODE 10105.00 TO NODE 10105.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2917.85 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1406.97 CHANNEL SLOPE = 0.0269  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.478

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	183.39	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.36  
AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 9.93  
Tc(MIN.) = 52.95

SUBAREA AREA(ACRES) = 183.39 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 467.14 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 467.1 PEAK FLOW RATE (CFS) = 6.10  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.93 FLOW VELOCITY (FEET/SEC.) = 2.36  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.50 = 7046.89 FEET.

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FLOW PROCESS FROM NODE 10105.50 TO NODE 10106.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2880.00 DOWNSTREAM (FEET) = 2868.10  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1701.11 CHANNEL SLOPE = 0.0070  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.434  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.63	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 1.42  
AVERAGE FLOW DEPTH (FEET) = 1.19 TRAVEL TIME (MIN.) = 19.92  
Tc (MIN.) = 72.87

SUBAREA AREA (ACRES) = 60.63 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 527.77 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 527.8 PEAK FLOW RATE (CFS) = 6.10

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.19 FLOW VELOCITY (FEET/SEC.) = 1.42  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 8748.00 FEET.

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FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2868.10 DOWNSTREAM (FEET) = 2781.28  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2951.00 CHANNEL SLOPE = 0.0294  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.398  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.11	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.44  
AVERAGE FLOW DEPTH (FEET) = 0.91 TRAVEL TIME (MIN.) = 20.15  
Tc (MIN.) = 93.02

SUBAREA AREA (ACRES) = 123.11 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 650.88 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 650.9 PEAK FLOW RATE (CFS) = 6.10

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.91 FLOW VELOCITY (FEET/SEC.) = 2.44  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 11699.00 FEET.

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FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 2781.28 DOWNSTREAM (FEET) = 2725.20  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2630.56 CHANNEL SLOPE = 0.0213  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.368  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	186.62	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.15  
AVERAGE FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 20.37  
Tc (MIN.) = 113.39

SUBAREA AREA (ACRES) = 186.62 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 837.50 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 837.5 PEAK FLOW RATE (CFS) = 6.10

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.97 FLOW VELOCITY (FEET/SEC.) = 2.15  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 14329.56 FEET.

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FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 2725.20 DOWNSTREAM(FEET) = 2581.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 2890.52 CHANNEL SLOPE = 0.0496
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.351
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       112.07   0.60    1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.96
AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 16.28
Tc(MIN.) = 129.67
SUBAREA AREA(ACRES) = 112.07 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 949.57 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 949.6 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 2.96
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 17220.08 FEET.

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FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2581.72 DOWNSTREAM(FEET) = 2367.59
CHANNEL LENGTH THRU SUBAREA(FEET) = 2877.15 CHANNEL SLOPE = 0.0744
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.339
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       145.21   0.60    1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.45
AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 13.90
Tc(MIN.) = 143.57
SUBAREA AREA(ACRES) = 145.21 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1094.78 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

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* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1094.8 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.77 FLOW VELOCITY(FEET/SEC.) = 3.45
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 20097.23 FEET.

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FLOW PROCESS FROM NODE 10110.00 TO NODE 10111.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2367.59 DOWNSTREAM(FEET) = 2075.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 2802.04 CHANNEL SLOPE = 0.1041
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.329
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -       339.01   0.60    1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.90
AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 11.97
Tc(MIN.) = 155.54
SUBAREA AREA(ACRES) = 339.01 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1433.79 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1433.8 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.72 FLOW VELOCITY(FEET/SEC.) = 3.90
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10111.00 = 22899.27 FEET.

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FLOW PROCESS FROM NODE 10111.00 TO NODE 10112.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2075.82 DOWNSTREAM(FEET) = 2004.03
CHANNEL LENGTH THRU SUBAREA(FEET) = 3782.59 CHANNEL SLOPE = 0.0190
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.306
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE            GROUP   (ACRES) (INCH/HR) (DECIMAL) CN

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USER-DEFINED          -      265.32      0.60      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =          6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.05
AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 30.69
Tc(MIN.) = 186.23
SUBAREA AREA(ACRES) = 265.32 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1699.11 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1699.1 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.99 FLOW VELOCITY(FEET/SEC.) = 2.05
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.00 = 26681.86 FEET.

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FLOW PROCESS FROM NODE 10112.00 TO NODE 10112.50 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2004.03 DOWNSTREAM(FEET) = 1982.04
CHANNEL LENGTH THRU SUBAREA(FEET) = 1479.53 CHANNEL SLOPE = 0.0149
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.301
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 307.63 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.88
AVERAGE FLOW DEPTH(FEET) = 1.04 TRAVEL TIME(MIN.) = 13.13
Tc(MIN.) = 199.36
SUBAREA AREA(ACRES) = 307.63 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 2006.74 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 2006.7 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.04 FLOW VELOCITY(FEET/SEC.) = 1.88
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.50 = 28161.39 FEET.

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*****
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1982.04 DOWNSTREAM(FEET) = 1925.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 3416.13 CHANNEL SLOPE = 0.0165
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.289
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 127.40 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.96
AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 29.11
Tc(MIN.) = 228.47
SUBAREA AREA(ACRES) = 127.40 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 2134.14 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 2134.1 PEAK FLOW RATE(CFS) = 6.10
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.02 FLOW VELOCITY(FEET/SEC.) = 1.96
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 2134.1 TC(MIN.) = 228.47
EFFECTIVE AREA(ACRES) = 2134.14 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 6.10

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END OF RATIONAL METHOD ANALYSIS

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ELEVATION DATA: UPSTREAM(FEET) = 2903.38 DOWNSTREAM(FEET) = 2639.65  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1124.98 CHANNEL SLOPE = 0.2344  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.070  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.13	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.18  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 3.03  
 Tc(MIN.) = 14.90  
 SUBAREA AREA(ACRES) = 36.13 SUBAREA RUNOFF(CFS) = 15.30  
 EFFECTIVE AREA(ACRES) = 41.28 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 41.3 PEAK FLOW RATE(CFS) = 17.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.92 FLOW VELOCITY(FEET/SEC.) = 6.91  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10203.00 = 1964.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10203.00 TO NODE 10204.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2639.65 DOWNSTREAM(FEET) = 2444.90  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.75 CHANNEL SLOPE = 0.1026  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.825  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.14	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.46  
 AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 5.80  
 Tc(MIN.) = 20.70  
 SUBAREA AREA(ACRES) = 56.14 SUBAREA RUNOFF(CFS) = 11.35  
 EFFECTIVE AREA(ACRES) = 97.42 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 19.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 5.19  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10204.00 = 3862.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10204.00 TO NODE 10205.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2444.90 DOWNSTREAM(FEET) = 2245.64  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1973.02 CHANNEL SLOPE = 0.1010  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.688  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	264.47	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.29  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.81  
 AVERAGE FLOW DEPTH(FEET) = 1.34 TRAVEL TIME(MIN.) = 5.66  
 Tc(MIN.) = 26.36  
 SUBAREA AREA(ACRES) = 264.47 SUBAREA RUNOFF(CFS) = 21.08  
 EFFECTIVE AREA(ACRES) = 361.89 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 361.9 PEAK FLOW RATE(CFS) = 28.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 5.69  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10205.00 = 5835.44 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10205.00 TO NODE 10206.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2245.64 DOWNSTREAM(FEET) = 2157.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1870.92 CHANNEL SLOPE = 0.0469  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.597  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	255.55	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.27  
 AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 7.30  
 Tc(MIN.) = 33.66  
 SUBAREA AREA(ACRES) = 255.55 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 617.44 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 617.4 PEAK FLOW RATE(CFS) = 28.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:



DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 4.27  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.00 = 7706.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10206.00 TO NODE 10206.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2157.91 DOWNSTREAM(FEET) = 2119.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1453.59 CHANNEL SLOPE = 0.0266  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.540  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.47	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.46  
AVERAGE FLOW DEPTH(FEET) = 1.67 TRAVEL TIME(MIN.) = 7.01  
Tc(MIN.) = 40.68

SUBAREA AREA(ACRES) = 141.47 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 758.91 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 758.9 PEAK FLOW RATE(CFS) = 28.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.67 FLOW VELOCITY(FEET/SEC.) = 3.46  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.50 = 9159.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2119.30 DOWNSTREAM(FEET) = 2093.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2020.48 CHANNEL SLOPE = 0.0129  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.478  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.39	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.63  
AVERAGE FLOW DEPTH(FEET) = 1.91 TRAVEL TIME(MIN.) = 12.78

Tc(MIN.) = 53.46  
SUBAREA AREA(ACRES) = 105.39 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 864.30 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 864.3 PEAK FLOW RATE(CFS) = 28.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.91 FLOW VELOCITY(FEET/SEC.) = 2.63  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10220.00 = 11180.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 53.46  
RAINFALL INTENSITY(INCH/HR) = 0.48

AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 864.30

TOTAL STREAM AREA(ACRES) = 864.30  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 28.84

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10210.00 TO NODE 10211.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 890.82  
ELEVATION DATA: UPSTREAM(FEET) = 2966.08 DOWNSTREAM(FEET) = 2867.74

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.601

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.993

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	7.25	0.60	1.000	0	16.60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.56  
TOTAL AREA(ACRES) = 7.25 PEAK FLOW RATE(CFS) = 2.56

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10211.00 TO NODE 10212.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2867.74 DOWNSTREAM(FEET) = 2763.75
CHANNEL LENGTH THRU SUBAREA(FEET) = 1682.06 CHANNEL SLOPE = 0.0618
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.693
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 33.02 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.34
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.96
AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 9.46
Tc(MIN.) = 26.06
SUBAREA AREA(ACRES) = 33.02 SUBAREA RUNOFF(CFS) = 2.78
EFFECTIVE AREA(ACRES) = 40.27 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 40.3 PEAK FLOW RATE(CFS) = 3.39

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 2.78
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10212.00 = 2572.88 FEET.

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*****
FLOW PROCESS FROM NODE 10212.00 TO NODE 10213.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2763.75 DOWNSTREAM(FEET) = 2662.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 1206.59 CHANNEL SLOPE = 0.0842
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.609
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 71.89 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.87
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.25
AVERAGE FLOW DEPTH(FEET) = 0.63 TRAVEL TIME(MIN.) = 6.19
Tc(MIN.) = 32.25
SUBAREA AREA(ACRES) = 71.89 SUBAREA RUNOFF(CFS) = 0.60
EFFECTIVE AREA(ACRES) = 112.16 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 112.2 PEAK FLOW RATE(CFS) = 3.39
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 3.14
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10213.00 = 3779.47 FEET.

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*****
FLOW PROCESS FROM NODE 10213.00 TO NODE 10214.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2662.20 DOWNSTREAM(FEET) = 2520.73
CHANNEL LENGTH THRU SUBAREA(FEET) = 1783.17 CHANNEL SLOPE = 0.0793
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.533
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 182.61 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.06
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 9.71
Tc(MIN.) = 41.96
SUBAREA AREA(ACRES) = 182.61 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 294.77 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 294.8 PEAK FLOW RATE(CFS) = 3.39
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 3.06
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10214.00 = 5562.64 FEET.

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*****
FLOW PROCESS FROM NODE 10214.00 TO NODE 10215.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 2520.73 DOWNSTREAM(FEET) = 2270.71
CHANNEL LENGTH THRU SUBAREA(FEET) = 2774.20 CHANNEL SLOPE = 0.0901
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.470
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 156.94 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.22
AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 14.35
Tc(MIN.) = 56.31
SUBAREA AREA(ACRES) = 156.94 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 451.71 AREA-AVERAGED Fm(INCH/HR) = 0.60

```

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 451.7 PEAK FLOW RATE(CFS) = 3.39  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 3.22  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10215.00 = 8336.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10215.00 TO NODE 10216.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2270.71 DOWNSTREAM(FEET) = 2151.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.75 CHANNEL SLOPE = 0.0592  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.443

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	130.62	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.73  
AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 12.35  
Tc(MIN.) = 68.66  
SUBAREA AREA(ACRES) = 130.62 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 582.33 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 582.3 PEAK FLOW RATE(CFS) = 3.39  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 2.73  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.00 = 10356.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10216.00 TO NODE 10216.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2151.20 DOWNSTREAM(FEET) = 2120.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1242.42 CHANNEL SLOPE = 0.0246  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.423

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 51.25 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.97  
AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 10.53  
Tc(MIN.) = 79.19

SUBAREA AREA(ACRES) = 51.25 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 633.58 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 633.6 PEAK FLOW RATE(CFS) = 3.39  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 1.97  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.50 = 11599.01 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2120.63 DOWNSTREAM(FEET) = 2093.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1301.06 CHANNEL SLOPE = 0.0210  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.401

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	26.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.85  
AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 11.71  
Tc(MIN.) = 90.90  
SUBAREA AREA(ACRES) = 26.16 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 659.74 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 659.7 PEAK FLOW RATE(CFS) = 3.39  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 1.85  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 90.90
RAINFALL INTENSITY(INCH/HR) = 0.40
AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 659.74
TOTAL STREAM AREA(ACRES) = 659.74
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.39

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31.22 Tc(MIN.) = 53.46
EFFECTIVE AREA(ACRES) = 1252.29 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1524.0
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10220.00 TO NODE 10221.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2093.25 DOWNSTREAM(FEET) = 1965.76
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.11 CHANNEL SLOPE = 0.0430
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.449

Table with 6 columns: DEVELOPMENT TYPE/, SCS SOIL AREA, Fp, Ap, SCS. Rows for USER-DEFINED and LAND USE.

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.23
AVERAGE FLOW DEPTH(FEET) = 1.57 TRAVEL TIME(MIN.) = 11.69
Tc(MIN.) = 65.15
SUBAREA AREA(ACRES) = 104.45 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1356.74 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1628.5 PEAK FLOW RATE(CFS) = 31.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.57 FLOW VELOCITY(FEET/SEC.) = 4.23
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.00 = 15866.18 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10221.00 TO NODE 10221.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1965.76 DOWNSTREAM(FEET) = 1950.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1346.48 CHANNEL SLOPE = 0.0117
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.433

Table with 6 columns: DEVELOPMENT TYPE/, SCS SOIL AREA, Fp, Ap, SCS. Rows for USER-DEFINED and LAND USE.

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.22
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.59
AVERAGE FLOW DEPTH(FEET) = 2.00 TRAVEL TIME(MIN.) = 8.66
Tc(MIN.) = 73.81

SUBAREA AREA(ACRES) = 169.50 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1526.24 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1798.0 PEAK FLOW RATE(CFS) = 31.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.00 FLOW VELOCITY(FEET/SEC.) = 2.59
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.50 = 17212.66 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1950.00 DOWNSTREAM(FEET) = 1925.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 1849.80 CHANNEL SLOPE = 0.0131

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.411  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 43.12 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 31.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.70  
 AVERAGE FLOW DEPTH (FEET) = 1.96 TRAVEL TIME (MIN.) = 11.42  
 Tc (MIN.) = 85.23  
 SUBAREA AREA (ACRES) = 43.12 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 1569.36 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1841.1 PEAK FLOW RATE (CFS) = 31.22  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 2.70  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 1841.1 TC (MIN.) = 85.23  
 EFFECTIVE AREA (ACRES) = 1569.36 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 31.22

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.22	85.23	0.411	0.60 (0.60)	1.00	1569.4	10200.00
2	27.57	123.69	0.357	0.60 (0.60)	1.00	1841.1	10210.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S3.DAT  
TIME/DATE OF STUDY: 10:39 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.168
- 2) 10.00; 1.446
- 3) 15.00; 1.065
- 4) 20.00; 0.844
- 5) 25.00; 0.712
- 6) 30.00; 0.628
- 7) 40.00; 0.544
- 8) 50.00; 0.488
- 9) 60.00; 0.460
- 10) 90.00; 0.403
- 11) 120.00; 0.361
- 12) 180.00; 0.310
- 13) 360.00; 0.241
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10300.00 TO NODE 10301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 310.52  
ELEVATION DATA: UPSTREAM(FEET) = 4227.21 DOWNSTREAM(FEET) = 4064.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.977  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.738

SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	1.00	0.60	1.000	0	7.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 1.02  
TOTAL AREA(ACRES) = 1.00 PEAK FLOW RATE(CFS) = 1.02

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10301.00 TO NODE 10302.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 4064.64 DOWNSTREAM(FEET) = 3797.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 631.34 CHANNEL SLOPE = 0.4235  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.471

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.23	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.51  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.70  
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 1.85  
Tc(MIN.) = 9.82

SUBAREA AREA(ACRES) = 6.23 SUBAREA RUNOFF(CFS) = 4.89  
EFFECTIVE AREA(ACRES) = 7.23 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 5.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 6.51  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10302.00 = 941.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10302.00 TO NODE 10303.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3797.25 DOWNSTREAM(FEET) = 3447.07  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1908.89 CHANNEL SLOPE = 0.1834  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.051  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.83	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.80  
 AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 5.49  
 Tc(MIN.) = 15.31  
 SUBAREA AREA(ACRES) = 32.83 SUBAREA RUNOFF(CFS) = 13.34  
 EFFECTIVE AREA(ACRES) = 40.06 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 16.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.94 FLOW VELOCITY(FEET/SEC.) = 6.20  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10303.00 = 2850.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10303.00 TO NODE 10304.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3447.07 DOWNSTREAM(FEET) = 3228.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.05 CHANNEL SLOPE = 0.1140  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.817  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.51	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.61  
 AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 5.70  
 Tc(MIN.) = 21.01  
 SUBAREA AREA(ACRES) = 60.51 SUBAREA RUNOFF(CFS) = 11.84  
 EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 19.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 5.41  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10304.00 = 4768.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10304.00 TO NODE 10305.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3228.48 DOWNSTREAM(FEET) = 3118.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1679.40 CHANNEL SLOPE = 0.0656  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.678  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.56	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63  
 AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 6.04  
 Tc(MIN.) = 27.05  
 SUBAREA AREA(ACRES) = 116.56 SUBAREA RUNOFF(CFS) = 8.15  
 EFFECTIVE AREA(ACRES) = 217.13 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 217.1 PEAK FLOW RATE(CFS) = 19.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 4.42  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10305.00 = 6448.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10305.00 TO NODE 10306.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3118.37 DOWNSTREAM(FEET) = 2807.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2853.67 CHANNEL SLOPE = 0.1088  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.578  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	189.23	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.33  
 AVERAGE FLOW DEPTH(FEET) = 1.11 TRAVEL TIME(MIN.) = 8.92  
 Tc(MIN.) = 35.97  
 SUBAREA AREA(ACRES) = 189.23 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 406.36 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 406.4 PEAK FLOW RATE(CFS) = 19.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.11 FLOW VELOCITY(FEET/SEC.) = 5.33  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10306.00 = 9301.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10306.00 TO NODE 10307.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2807.99 DOWNSTREAM(FEET) = 2591.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2848.03 CHANNEL SLOPE = 0.0759  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.509

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	416.51	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.65

AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 10.20

Tc(MIN.) = 46.17

SUBAREA AREA(ACRES) = 416.51 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 822.87 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 822.9 PEAK FLOW RATE(CFS) = 19.69

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 4.65

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10307.00 = 12149.90 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10307.00 TO NODE 10308.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2591.87 DOWNSTREAM(FEET) = 2516.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.06 CHANNEL SLOPE = 0.0263  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.458

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	320.49	0.60	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.61  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.16  
AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 15.11  
Tc(MIN.) = 61.28  
SUBAREA AREA(ACRES) = 320.49 SUBAREA RUNOFF(CFS) = 1.85  
EFFECTIVE AREA(ACRES) = 1143.36 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1143.4 PEAK FLOW RATE(CFS) = 19.69  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.45 FLOW VELOCITY(FEET/SEC.) = 3.14

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.00 = 15011.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10308.00 TO NODE 10308.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2516.62 DOWNSTREAM(FEET) = 2462.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.32 CHANNEL SLOPE = 0.0288  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.439

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	191.88	0.60	0.966	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.966

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.28

AVERAGE FLOW DEPTH(FEET) = 1.46 TRAVEL TIME(MIN.) = 9.60

Tc(MIN.) = 70.88

SUBAREA AREA(ACRES) = 191.88 SUBAREA RUNOFF(CFS) = 2.58

EFFECTIVE AREA(ACRES) = 1335.24 AREA-AVERAGED Fm(INCH/HR) = 0.59

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1335.2 PEAK FLOW RATE(CFS) = 19.69

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.42 FLOW VELOCITY(FEET/SEC.) = 3.24

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.50 = 16901.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10308.50 TO NODE 10309.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2462.25 DOWNSTREAM(FEET) = 2409.87



CHANNEL LENGTH THRU SUBAREA (FEET) = 1874.33 CHANNEL SLOPE = 0.0279  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.421  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.14	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 19.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.20  
 AVERAGE FLOW DEPTH (FEET) = 1.43 TRAVEL TIME (MIN.) = 9.76  
 Tc (MIN.) = 80.64  
 SUBAREA AREA (ACRES) = 90.14 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 1425.38 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1425.4 PEAK FLOW RATE (CFS) = 19.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.43 FLOW VELOCITY (FEET/SEC.) = 3.20  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10309.00 = 18775.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 51  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----  
 ELEVATION DATA: UPSTREAM (FEET) = 2409.87 DOWNSTREAM (FEET) = 2330.13  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2576.20 CHANNEL SLOPE = 0.0310  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.398  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.83	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 19.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.32  
 AVERAGE FLOW DEPTH (FEET) = 1.41 TRAVEL TIME (MIN.) = 12.95  
 Tc (MIN.) = 93.58  
 SUBAREA AREA (ACRES) = 83.83 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 1509.21 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1509.2 PEAK FLOW RATE (CFS) = 19.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.41 FLOW VELOCITY (FEET/SEC.) = 3.32  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 1  
 -----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 -----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 93.58  
 RAINFALL INTENSITY (INCH/HR) = 0.40  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA (ACRES) = 1509.21  
 TOTAL STREAM AREA (ACRES) = 1509.21  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 19.69

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10320.00 TO NODE 10321.00 IS CODE = 21  
 -----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 -----  
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 290.56  
 ELEVATION DATA: UPSTREAM (FEET) = 3374.80 DOWNSTREAM (FEET) = 3300.24

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.959  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.596  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	2.24	0.60	1.000	0	8.96

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 2.01  
 TOTAL AREA (ACRES) = 2.24 PEAK FLOW RATE (CFS) = 2.01

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10321.00 TO NODE 10322.00 IS CODE = 51  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----  
 ELEVATION DATA: UPSTREAM (FEET) = 3300.24 DOWNSTREAM (FEET) = 3187.21  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 581.07 CHANNEL SLOPE = 0.1945  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.358  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.01	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.40  
AVERAGE FLOW DEPTH(FEET) = 0.53 TRAVEL TIME(MIN.) = 2.20  
Tc(MIN.) = 11.16  
SUBAREA AREA(ACRES) = 5.01 SUBAREA RUNOFF(CFS) = 3.42  
EFFECTIVE AREA(ACRES) = 7.25 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 4.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 4.70  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10322.00 = 871.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10322.00 TO NODE 10323.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3187.21 DOWNSTREAM(FEET) = 3108.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.98 CHANNEL SLOPE = 0.0801  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.062

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.37	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.49  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.17  
AVERAGE FLOW DEPTH(FEET) = 0.96 TRAVEL TIME(MIN.) = 3.91  
Tc(MIN.) = 15.07  
SUBAREA AREA(ACRES) = 30.37 SUBAREA RUNOFF(CFS) = 12.63  
EFFECTIVE AREA(ACRES) = 37.62 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 15.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 4.48  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10323.00 = 1849.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10323.00 TO NODE 10324.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3108.86 DOWNSTREAM(FEET) = 2923.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.11 CHANNEL SLOPE = 0.0966  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.814

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.37	0.60	1.000	-

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 68.88 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.28  
AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 6.08  
Tc(MIN.) = 21.15  
SUBAREA AREA(ACRES) = 68.88 SUBAREA RUNOFF(CFS) = 13.26  
EFFECTIVE AREA(ACRES) = 106.50 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 106.5 PEAK FLOW RATE(CFS) = 20.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 5.12  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10324.00 = 3773.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10324.00 TO NODE 10325.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2923.03 DOWNSTREAM(FEET) = 2675.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2788.58 CHANNEL SLOPE = 0.0889  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	146.19	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.14  
AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 9.04  
Tc(MIN.) = 30.18  
SUBAREA AREA(ACRES) = 146.19 SUBAREA RUNOFF(CFS) = 3.50  
EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 20.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 4.99  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10325.00 = 6562.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10325.00 TO NODE 10326.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2675.11 DOWNSTREAM(FEET) = 2541.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.28 CHANNEL SLOPE = 0.0465  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.531  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 321.78 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.91  
 AVERAGE FLOW DEPTH (FEET) = 1.32 TRAVEL TIME (MIN.) = 12.22  
 Tc (MIN.) = 42.40  
 SUBAREA AREA (ACRES) = 321.78 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 574.47 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 574.5 PEAK FLOW RATE (CFS) = 20.50  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.32 FLOW VELOCITY (FEET/SEC.) = 3.91  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.00 = 9424.58 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10326.00 TO NODE 10326.50 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 2541.92 DOWNSTREAM (FEET) = 2438.80  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2617.40 CHANNEL SLOPE = 0.0394  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.476  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	187.06	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.68  
 AVERAGE FLOW DEPTH (FEET) = 1.36 TRAVEL TIME (MIN.) = 11.86  
 Tc (MIN.) = 54.26  
 SUBAREA AREA (ACRES) = 187.06 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 761.53 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 761.5 PEAK FLOW RATE (CFS) = 20.50  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 3.68

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.50 = 12041.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10326.50 TO NODE 10327.00 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 2438.80 DOWNSTREAM (FEET) = 2414.64  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1181.79 CHANNEL SLOPE = 0.0204  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.458  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.27	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.87  
 AVERAGE FLOW DEPTH (FEET) = 1.54 TRAVEL TIME (MIN.) = 6.87  
 Tc (MIN.) = 61.13  
 SUBAREA AREA (ACRES) = 82.27 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 843.80 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) = 20.50  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.54 FLOW VELOCITY (FEET/SEC.) = 2.87  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.00 = 13223.77 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10327.00 TO NODE 10327.50 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 2414.64 DOWNSTREAM (FEET) = 2389.73  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2431.92 CHANNEL SLOPE = 0.0102  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.423  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	243.69	0.60	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.22

AVERAGE FLOW DEPTH (FEET) = 1.76 TRAVEL TIME (MIN.) = 18.24  
Tc (MIN.) = 79.37  
SUBAREA AREA (ACRES) = 243.69 SUBAREA RUNOFF (CFS) = 0.28  
EFFECTIVE AREA (ACRES) = 1087.49 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 1087.5 PEAK FLOW RATE (CFS) = 20.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.76 FLOW VELOCITY (FEET/SEC.) = 2.21  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.50 = 15655.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2389.73 DOWNSTREAM (FEET) = 2330.13  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1944.59 CHANNEL SLOPE = 0.0306  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.405

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.36	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.34  
AVERAGE FLOW DEPTH (FEET) = 1.43 TRAVEL TIME (MIN.) = 9.69  
Tc (MIN.) = 89.06  
SUBAREA AREA (ACRES) = 69.36 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 1156.85 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 1156.8 PEAK FLOW RATE (CFS) = 20.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.43 FLOW VELOCITY (FEET/SEC.) = 3.34  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10330.00 = 17600.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 89.06

RAINFALL INTENSITY (INCH/HR) = 0.40  
AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 1156.85  
TOTAL STREAM AREA (ACRES) = 1156.85  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 20.50

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.69	93.58	0.398	0.60 ( 0.60)	0.99	1509.2	10300.00
2	20.50	89.06	0.405	0.60 ( 0.60)	1.00	1156.8	10320.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	39.55	89.06	0.405	0.60 ( 0.60)	1.00	2593.2	10320.00
2	39.84	93.58	0.398	0.60 ( 0.60)	1.00	2666.1	10300.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 39.84 Tc (MIN.) = 93.58  
EFFECTIVE AREA (ACRES) = 2666.06 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 2666.1  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10330.00 TO NODE 10331.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2330.13 DOWNSTREAM (FEET) = 2041.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3034.53 CHANNEL SLOPE = 0.0951  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.386

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	70.23	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 39.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.04  
AVERAGE FLOW DEPTH (FEET) = 1.48 TRAVEL TIME (MIN.) = 8.38  
Tc (MIN.) = 101.96  
SUBAREA AREA (ACRES) = 70.23 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 2736.29 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 2736.3 PEAK FLOW RATE (CFS) = 39.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.48 FLOW VELOCITY (FEET/SEC.) = 6.04  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10331.00 = 24386.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 51  
-----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2041.66 DOWNSTREAM (FEET) = 1739.96  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3264.87 CHANNEL SLOPE = 0.0924  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.374

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 104.94 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 39.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.98  
AVERAGE FLOW DEPTH (FEET) = 1.49 TRAVEL TIME (MIN.) = 9.10  
Tc (MIN.) = 111.06  
SUBAREA AREA (ACRES) = 104.94 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 2841.23 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 2841.2 PEAK FLOW RATE (CFS) = 39.84  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.49 FLOW VELOCITY (FEET/SEC.) = 5.98  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 10  
-----

>>>> MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 15.1  
-----

>>>> DEFINE MEMORY BANK # 2 <<<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: S1.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.10	228.47	0.60 (0.60)	1.00	2134.1	10100.00

TOTAL AREA (ACRES) = 2134.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 15.1  
-----

>>>> DEFINE MEMORY BANK # 3 <<<<<

-----  
PEAK FLOWRATE TABLE FILE NAME: S2.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.22	85.23	0.60 (0.60)	1.00	1569.4	10200.00
2	27.57	123.69	0.60 (0.60)	1.00	1841.1	10210.00
TOTAL AREA (ACRES) =						1841.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 14.0  
-----

>>>> MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY <<<<<

-----  
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.22	85.23	0.60 (0.60)	1.00	1569.4	10200.00
2	27.57	123.69	0.60 (0.60)	1.00	1841.1	10210.00
TOTAL AREA (ACRES) =						1841.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY <<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.22	85.23	0.412	0.60 (0.60)	1.00	1569.4	10200.00
2	27.57	123.69	0.358	0.60 (0.60)	1.00	1841.1	10210.00
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 =						19062.46 FEET.	

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.10	228.47	0.291	0.60 (0.60)	1.00	2134.1	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 =						31577.52 FEET.	

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	34.43	85.23	0.412	0.60 (0.60)	1.00	2365.5	10200.00
2	31.62	123.69	0.358	0.60 (0.60)	1.00	2996.5	10210.00
3	28.55	228.47	0.291	0.60 (0.60)	1.00	3975.2	10100.00
TOTAL AREA (ACRES) =						3975.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 34.43 Tc (MIN.) = 85.234  
EFFECTIVE AREA (ACRES) = 2365.52 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3975.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10222.00 TO NODE 10332.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1925.82 DOWNSTREAM (FEET) = 1739.96  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1475.92 CHANNEL SLOPE = 0.1259  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.405

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.92	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 34.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.47

AVERAGE FLOW DEPTH (FEET) = 1.33 TRAVEL TIME (MIN.) = 3.80

Tc (MIN.) = 89.04

SUBAREA AREA (ACRES) = 19.92 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 2385.44 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 3995.2 PEAK FLOW RATE (CFS) = 34.43

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.33 FLOW VELOCITY (FEET/SEC.) = 6.47

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	34.43	89.04	0.405	0.60 ( 0.60)	1.00	2385.4	10200.00
2	31.62	127.58	0.355	0.60 ( 0.60)	1.00	3016.4	10210.00
3	28.55	232.45	0.290	0.60 ( 0.60)	1.00	3995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	39.55	106.53	0.380	0.60 ( 0.60)	1.00	2768.3	10320.00
2	39.84	111.06	0.374	0.60 ( 0.60)	1.00	2841.2	10300.00

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.66	89.04	0.405	0.60 ( 0.60)	1.00	4699.1	10200.00
2	72.71	106.53	0.380	0.60 ( 0.60)	1.00	5440.2	10320.00
3	72.67	111.06	0.374	0.60 ( 0.60)	1.00	5587.2	10300.00
4	69.44	127.58	0.355	0.60 ( 0.60)	1.00	5857.6	10210.00
5	59.47	232.45	0.290	0.60 ( 0.60)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =							6836.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 72.71 Tc (MIN.) = 106.535

EFFECTIVE AREA (ACRES) = 5440.17 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 6836.4

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 6836.4 TC (MIN.) = 106.53

EFFECTIVE AREA (ACRES) = 5440.17 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.998

PEAK FLOW RATE (CFS) = 72.71

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.66	89.04	0.405	0.60 ( 0.60)	1.00	4699.1	10200.00
2	72.71	106.53	0.380	0.60 ( 0.60)	1.00	5440.2	10320.00
3	72.67	111.06	0.374	0.60 ( 0.60)	1.00	5587.2	10300.00
4	69.44	127.58	0.355	0.60 ( 0.60)	1.00	5857.6	10210.00
5	59.47	232.45	0.290	0.60 ( 0.60)	1.00	6836.4	10100.00

END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 2504.36 DOWNSTREAM(FEET) = 2462.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.55 CHANNEL SLOPE = 0.0439  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.624

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 56.74 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.52  
AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 6.30  
Tc(MIN.) = 30.25  
SUBAREA AREA(ACRES) = 56.74 SUBAREA RUNOFF(CFS) = 1.23  
EFFECTIVE AREA(ACRES) = 80.20 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 80.2 PEAK FLOW RATE(CFS) = 2.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 2.36  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.50 = 2836.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.50 TO NODE 10403.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2462.54 DOWNSTREAM(FEET) = 2433.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 967.41 CHANNEL SLOPE = 0.0299  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.557

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 68.01 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.02  
AVERAGE FLOW DEPTH(FEET) = 0.69 TRAVEL TIME(MIN.) = 7.98  
Tc(MIN.) = 38.23  
SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 148.21 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 148.2 PEAK FLOW RATE(CFS) = 2.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 2.02

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10403.00 = 3803.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10403.00 TO NODE 10404.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2433.59 DOWNSTREAM(FEET) = 2239.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.12 CHANNEL SLOPE = 0.0662  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.468

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 301.25 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.74  
AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 17.86  
Tc(MIN.) = 56.09  
SUBAREA AREA(ACRES) = 301.25 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 449.46 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 449.5 PEAK FLOW RATE(CFS) = 2.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 2.74  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10404.00 = 6737.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10404.00 TO NODE 10405.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2239.33 DOWNSTREAM(FEET) = 2128.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.32 CHANNEL SLOPE = 0.0386  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.424

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 152.68 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.25



AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 21.20  
Tc(MIN.) = 77.30  
SUBAREA AREA(ACRES) = 152.68 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 602.14 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 602.1 PEAK FLOW RATE(CFS) = 2.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 2.25  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10405.00 = 9599.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	2128.80	DOWNSTREAM(FEET) =	1759.52
CHANNEL LENGTH THRU SUBAREA(FEET) =	1966.12	CHANNEL SLOPE =	0.1878
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.409

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	139.70	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.08  
AVERAGE FLOW DEPTH(FEET) = 0.49 TRAVEL TIME(MIN.) = 8.04  
Tc(MIN.) = 85.34  
SUBAREA AREA(ACRES) = 139.70 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 741.84 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 741.8 PEAK FLOW RATE(CFS) = 2.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.49 FLOW VELOCITY(FEET/SEC.) = 4.08  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10420.00 = 11566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 85.34  
RAINFALL INTENSITY(INCH/HR) = 0.41

AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 741.84  
TOTAL STREAM AREA(ACRES) = 741.84  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.88

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10410.00 TO NODE 10411.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 413.10  
ELEVATION DATA: UPSTREAM(FEET) = 3217.26 DOWNSTREAM(FEET) = 3058.86

Tc = K\*(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.517  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.501  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	3.06	0.60	1.000	0	9.52

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.48  
TOTAL AREA(ACRES) = 3.06 PEAK FLOW RATE(CFS) = 2.48

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10411.00 TO NODE 10412.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	3058.86	DOWNSTREAM(FEET) =	2879.84
CHANNEL LENGTH THRU SUBAREA(FEET) =	512.18	CHANNEL SLOPE =	0.3495
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.353

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.24	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.55  
AVERAGE FLOW DEPTH(FEET) = 0.49 TRAVEL TIME(MIN.) = 1.54  
Tc(MIN.) = 11.06  
SUBAREA AREA(ACRES) = 4.24 SUBAREA RUNOFF(CFS) = 2.87  
EFFECTIVE AREA(ACRES) = 7.30 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.3 PEAK FLOW RATE(CFS) = 4.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.53 FLOW VELOCITY(FEET/SEC.) = 5.84  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10412.00 = 925.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10412.00 TO NODE 10413.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2879.84 DOWNSTREAM(FEET) = 2644.97
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.24 CHANNEL SLOPE = 0.1208
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.946
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 47.95 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.12
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.00
AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 6.48
Tc(MIN.) = 17.54
SUBAREA AREA(ACRES) = 47.95 SUBAREA RUNOFF(CFS) = 14.95
EFFECTIVE AREA(ACRES) = 55.25 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 55.2 PEAK FLOW RATE(CFS) = 17.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 5.36
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10413.00 = 2869.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10413.00 TO NODE 10414.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2644.97 DOWNSTREAM(FEET) = 2550.42
CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.61 CHANNEL SLOPE = 0.0468
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.697
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 151.60 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.05
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.12
AVERAGE FLOW DEPTH(FEET) = 1.42 TRAVEL TIME(MIN.) = 8.17
Tc(MIN.) = 25.71
SUBAREA AREA(ACRES) = 151.60 SUBAREA RUNOFF(CFS) = 13.28
EFFECTIVE AREA(ACRES) = 206.85 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 206.9 PEAK FLOW RATE(CFS) = 18.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 3.79
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10414.00 = 4889.13 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10414.00 TO NODE 10415.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2550.42 DOWNSTREAM(FEET) = 2391.31
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.76 CHANNEL SLOPE = 0.0830
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.606
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 206.03 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.11
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78
AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 6.69
Tc(MIN.) = 32.40
SUBAREA AREA(ACRES) = 206.03 SUBAREA RUNOFF(CFS) = 1.11
EFFECTIVE AREA(ACRES) = 412.88 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 412.9 PEAK FLOW RATE(CFS) = 18.12
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.13 FLOW VELOCITY(FEET/SEC.) = 4.71
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10415.00 = 6805.89 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10415.00 TO NODE 10416.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2391.31 DOWNSTREAM(FEET) = 2092.16
CHANNEL LENGTH THRU SUBAREA(FEET) = 2843.10 CHANNEL SLOPE = 0.1052
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.533
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 122.38 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.12
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.17
AVERAGE FLOW DEPTH(FEET) = 1.08 TRAVEL TIME(MIN.) = 9.16
Tc(MIN.) = 41.56
SUBAREA AREA(ACRES) = 122.38 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 535.26 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 535.3 PEAK FLOW RATE(CFS) = 18.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 5.17  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10416.00 = 9648.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2092.16 DOWNSTREAM(FEET) = 1759.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2151.95 CHANNEL SLOPE = 0.1546  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.499

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.94	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.92

AVERAGE FLOW DEPTH(FEET) = 1.01 TRAVEL TIME(MIN.) = 6.06  
Tc(MIN.) = 47.62

SUBAREA AREA(ACRES) = 59.94 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 595.20 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 595.2 PEAK FLOW RATE(CFS) = 18.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.01 FLOW VELOCITY(FEET/SEC.) = 5.92  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 47.62  
RAINFALL INTENSITY(INCH/HR) = 0.50  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 595.20  
TOTAL STREAM AREA(ACRES) = 595.20  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 18.12

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.88	85.34	0.409	0.60( 0.60)	1.00	741.8	10400.00
2	18.12	47.62	0.499	0.60( 0.60)	1.00	595.2	10410.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.08	47.62	0.499	0.60( 0.60)	1.00	1009.2	10410.00
2	17.71	85.34	0.409	0.60( 0.60)	1.00	1337.0	10400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 20.08 Tc(MIN.) = 47.62  
EFFECTIVE AREA(ACRES) = 1009.17 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1337.0

LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1759.52 DOWNSTREAM(FEET) = 1688.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2477.21 CHANNEL SLOPE = 0.0287  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.455

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.64	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.08  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.24

AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 12.74  
Tc(MIN.) = 60.36

SUBAREA AREA(ACRES) = 72.64 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1081.81 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1409.7 PEAK FLOW RATE(CFS) = 20.08  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.44 FLOW VELOCITY(FEET/SEC.) = 3.24  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S3.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.66	89.04	0.60 ( 0.60)	1.00	4699.1	10200.00
2	72.71	106.53	0.60 ( 0.60)	1.00	5440.2	10320.00
3	72.67	111.06	0.60 ( 0.60)	1.00	5587.2	10300.00
4	69.44	127.58	0.60 ( 0.60)	1.00	5857.6	10210.00
5	59.47	232.45	0.60 ( 0.60)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.66	89.04	0.60 ( 0.60)	1.00	4699.1	10200.00
2	72.71	106.53	0.60 ( 0.60)	1.00	5440.2	10320.00
3	72.67	111.06	0.60 ( 0.60)	1.00	5587.2	10300.00
4	69.44	127.58	0.60 ( 0.60)	1.00	5857.6	10210.00
5	59.47	232.45	0.60 ( 0.60)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =						6836.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10507.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1739.96 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2238.93 CHANNEL SLOPE = 0.0231  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.363

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.71  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.13  
 AVERAGE FLOW DEPTH(FEET) = 2.42 TRAVEL TIME (MIN.) = 9.04  
 Tc (MIN.) = 115.58  
 SUBAREA AREA (ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 5502.10 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 6898.3 PEAK FLOW RATE (CFS) = 72.71  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.42 FLOW VELOCITY(FEET/SEC.) = 4.13  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.66	98.18	0.388	0.60 ( 0.60)	1.00	4761.1	10200.00
2	72.71	115.58	0.363	0.60 ( 0.60)	1.00	5502.1	10320.00
3	72.67	120.11	0.357	0.60 ( 0.60)	1.00	5649.1	10300.00
4	69.44	136.74	0.343	0.60 ( 0.60)	1.00	5919.5	10210.00
5	59.47	241.96	0.283	0.60 ( 0.60)	1.00	6898.3	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.08	60.36	0.455	0.60 ( 0.60)	1.00	1081.8	10410.00
2	17.71	98.44	0.388	0.60 ( 0.60)	1.00	1409.7	10400.00
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.31	60.36	0.455	0.60 ( 0.60)	1.00	4008.9	10410.00
2	87.39	98.18	0.388	0.60 ( 0.60)	1.00	6168.5	10200.00
3	87.42	98.44	0.388	0.60 ( 0.60)	1.00	6181.6	10400.00
4	89.30	115.58	0.363	0.60 ( 0.60)	1.00	6911.8	10320.00
5	88.96	120.11	0.357	0.60 ( 0.60)	1.00	7058.8	10300.00
6	85.09	136.74	0.343	0.60 ( 0.60)	1.00	7329.2	10210.00
7	72.37	241.96	0.283	0.60 ( 0.60)	1.00	8308.0	10100.00
TOTAL AREA (ACRES) =						8308.0	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 89.30 Tc (MIN.) = 115.576  
 EFFECTIVE AREA (ACRES) = 6911.78 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 8308.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 115.58  
EFFECTIVE AREA(ACRES) = 6911.78 AREA-AVERAGED Fm(INCH/HR)= 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.998  
PEAK FLOW RATE(CFS) = 89.30

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.31	60.36	0.455	0.60( 0.60)	1.00	4008.9	10410.00
2	87.39	98.18	0.388	0.60( 0.60)	1.00	6168.5	10200.00
3	87.42	98.44	0.388	0.60( 0.60)	1.00	6181.6	10400.00
4	89.30	115.58	0.363	0.60( 0.60)	1.00	6911.8	10320.00
5	88.96	120.11	0.357	0.60( 0.60)	1.00	7058.8	10300.00
6	85.09	136.74	0.343	0.60( 0.60)	1.00	7329.2	10210.00
7	72.37	241.96	0.283	0.60( 0.60)	1.00	8308.0	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S5.DAT  
TIME/DATE OF STUDY: 10:39 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.148
- 2) 10.00; 1.432
- 3) 15.00; 1.057
- 4) 20.00; 0.839
- 5) 25.00; 0.709
- 6) 30.00; 0.626
- 7) 40.00; 0.542
- 8) 50.00; 0.486
- 9) 60.00; 0.456
- 10) 90.00; 0.400
- 11) 120.00; 0.357
- 12) 180.00; 0.306
- 13) 360.00; 0.238
- 14) 1440.00; 0.108

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10500.00 TO NODE 10501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.64  
ELEVATION DATA: UPSTREAM(FEET) = 3108.31 DOWNSTREAM(FEET) = 3060.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.565  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.924  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "1 DWELLING/ACRE"	-	1.54	0.60	0.910	0	6.57

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910  
SUBAREA RUNOFF(CFS) = 1.91  
TOTAL AREA(ACRES) = 1.54 PEAK FLOW RATE(CFS) = 1.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10501.00 TO NODE 10502.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3060.24 DOWNSTREAM(FEET) = 2942.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 690.48 CHANNEL SLOPE = 0.1703  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.565  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.27	0.60	0.943	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.943  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.60  
AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 2.50  
Tc(MIN.) = 9.07  
SUBAREA AREA(ACRES) = 8.27 SUBAREA RUNOFF(CFS) = 7.44  
EFFECTIVE AREA(ACRES) = 9.81 AREA-AVERAGED Fm(INCH/HR) = 0.56  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 9.8 PEAK FLOW RATE(CFS) = 8.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 5.13  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10502.00 = 986.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10502.00 TO NODE 10503.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2942.64 DOWNSTREAM(FEET) = 2815.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 957.31 CHANNEL SLOPE = 0.1331  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.278  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.91	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.34  
 AVERAGE FLOW DEPTH(FEET) = 0.96 TRAVEL TIME(MIN.) = 2.99  
 Tc(MIN.) = 12.06  
 SUBAREA AREA(ACRES) = 18.91 SUBAREA RUNOFF(CFS) = 11.53  
 EFFECTIVE AREA(ACRES) = 28.72 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 28.7 PEAK FLOW RATE(CFS) = 17.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 5.58  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10503.00 = 1943.43 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10503.00 TO NODE 10504.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2815.24 DOWNSTREAM(FEET) = 2202.44  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2096.20 CHANNEL SLOPE = 0.2923  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.010  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.49	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.71  
 AVERAGE FLOW DEPTH(FEET) = 1.11 TRAVEL TIME(MIN.) = 4.01  
 Tc(MIN.) = 16.07  
 SUBAREA AREA(ACRES) = 75.49 SUBAREA RUNOFF(CFS) = 27.89  
 EFFECTIVE AREA(ACRES) = 104.21 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 38.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 9.18  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10504.00 = 4039.63 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10504.00 TO NODE 10505.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2202.44 DOWNSTREAM(FEET) = 1969.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.32 CHANNEL SLOPE = 0.0834  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.21	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.37  
 AVERAGE FLOW DEPTH(FEET) = 1.77 TRAVEL TIME(MIN.) = 7.33  
 Tc(MIN.) = 23.40  
 SUBAREA AREA(ACRES) = 278.21 SUBAREA RUNOFF(CFS) = 37.73  
 EFFECTIVE AREA(ACRES) = 382.42 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 382.4 PEAK FLOW RATE(CFS) = 52.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 6.15  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10505.00 = 6839.95 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10505.00 TO NODE 10506.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1969.00 DOWNSTREAM(FEET) = 1759.23  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2892.99 CHANNEL SLOPE = 0.0725  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.613  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	323.47	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.91  
 AVERAGE FLOW DEPTH(FEET) = 1.76 TRAVEL TIME(MIN.) = 8.15  
 Tc(MIN.) = 31.55  
 SUBAREA AREA(ACRES) = 323.47 SUBAREA RUNOFF(CFS) = 3.81  
 EFFECTIVE AREA(ACRES) = 705.89 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 705.9 PEAK FLOW RATE(CFS) = 52.20  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.73 FLOW VELOCITY(FEET/SEC.) = 5.83  
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10506.00 = 9732.94 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1759.23 DOWNSTREAM(FEET) = 1688.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2597.28 CHANNEL SLOPE = 0.0273  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.529

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.34	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.05

AVERAGE FLOW DEPTH(FEET) = 2.07 TRAVEL TIME(MIN.) = 10.68

Tc(MIN.) = 42.24

SUBAREA AREA(ACRES) = 212.34 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 918.2 PEAK FLOW RATE(CFS) = 52.20

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.07 FLOW VELOCITY(FEET/SEC.) = 4.05

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 918.2 TC(MIN.) = 42.24

EFFECTIVE AREA(ACRES) = 918.23 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999

PEAK FLOW RATE(CFS) = 52.20  
=====

=====  
END OF RATIONAL METHOD ANALYSIS





ELEVATION DATA: UPSTREAM(FEET) = 2951.30 DOWNSTREAM(FEET) = 2641.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1930.18 CHANNEL SLOPE = 0.1606  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.019  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.78	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.06  
 AVERAGE FLOW DEPTH(FEET) = 1.01 TRAVEL TIME(MIN.) = 5.31  
 Tc(MIN.) = 15.70  
 SUBAREA AREA(ACRES) = 60.78 SUBAREA RUNOFF(CFS) = 22.93  
 EFFECTIVE AREA(ACRES) = 69.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.8 PEAK FLOW RATE(CFS) = 26.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 6.65  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10603.00 = 2862.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10603.00 TO NODE 10604.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2641.28 DOWNSTREAM(FEET) = 2318.61  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.90 CHANNEL SLOPE = 0.1640  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.826  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.78	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.10  
 AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 4.62  
 Tc(MIN.) = 20.32  
 SUBAREA AREA(ACRES) = 68.78 SUBAREA RUNOFF(CFS) = 13.99  
 EFFECTIVE AREA(ACRES) = 138.61 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 138.6 PEAK FLOW RATE(CFS) = 28.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.18 FLOW VELOCITY(FEET/SEC.) = 6.78  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10604.00 = 4829.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10604.00 TO NODE 10605.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2318.61 DOWNSTREAM(FEET) = 1983.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2601.81 CHANNEL SLOPE = 0.1286  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.674  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	178.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.72  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.54  
 AVERAGE FLOW DEPTH(FEET) = 1.33 TRAVEL TIME(MIN.) = 6.63  
 Tc(MIN.) = 26.95  
 SUBAREA AREA(ACRES) = 178.16 SUBAREA RUNOFF(CFS) = 11.83  
 EFFECTIVE AREA(ACRES) = 316.77 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 316.8 PEAK FLOW RATE(CFS) = 28.20  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 6.20  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10605.00 = 7431.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1983.94 DOWNSTREAM(FEET) = 1655.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2439.06 CHANNEL SLOPE = 0.1348  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.595  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.31	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.34  
 AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 6.41  
 Tc(MIN.) = 33.36  
 SUBAREA AREA(ACRES) = 61.31 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 378.08 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 378.1 PEAK FLOW RATE(CFS) = 28.20  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 6.34  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S4.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.31	60.36	0.60 ( 0.60)	1.00	4008.9	10410.00
2	87.39	98.18	0.60 ( 0.60)	1.00	6168.5	10200.00
3	87.42	98.44	0.60 ( 0.60)	1.00	6181.6	10400.00
4	89.30	115.58	0.60 ( 0.60)	1.00	6911.8	10320.00
5	88.96	120.11	0.60 ( 0.60)	1.00	7058.8	10300.00
6	85.09	136.74	0.60 ( 0.60)	1.00	7329.2	10210.00
7	72.37	241.96	0.60 ( 0.60)	1.00	8308.0	10100.00
TOTAL AREA (ACRES) =						8308.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S5.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.20	42.24	0.60 ( 0.60)	1.00	918.2	10500.00
TOTAL AREA (ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.20	42.24	0.60 ( 0.60)	1.00	918.2	10500.00
TOTAL AREA (ACRES) =						918.2

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.20	42.24	0.527	0.60 ( 0.60)	1.00	918.2	10500.00
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.31	60.36	0.452	0.60 ( 0.60)	1.00	4008.9	10410.00
2	87.39	98.18	0.384	0.60 ( 0.60)	1.00	6168.5	10200.00
3	87.42	98.44	0.384	0.60 ( 0.60)	1.00	6181.6	10400.00
4	89.30	115.58	0.359	0.60 ( 0.60)	1.00	6911.8	10320.00
5	88.96	120.11	0.353	0.60 ( 0.60)	1.00	7058.8	10300.00
6	85.09	136.74	0.339	0.60 ( 0.60)	1.00	7329.2	10210.00
7	72.37	241.96	0.279	0.60 ( 0.60)	1.00	8308.0	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	109.54	42.24	0.527	0.60 ( 0.60)	1.00	3723.4	10500.00
2	115.09	60.36	0.452	0.60 ( 0.60)	1.00	4927.2	10410.00
3	125.43	98.18	0.384	0.60 ( 0.60)	1.00	7086.8	10200.00
4	125.43	98.44	0.384	0.60 ( 0.60)	1.00	7099.9	10400.00
5	124.87	115.58	0.359	0.60 ( 0.60)	1.00	7830.0	10320.00
6	123.90	120.11	0.353	0.60 ( 0.60)	1.00	7977.0	10300.00
7	118.63	136.74	0.339	0.60 ( 0.60)	1.00	8247.4	10210.00
8	99.95	241.96	0.279	0.60 ( 0.60)	1.00	9226.2	10100.00
TOTAL AREA (ACRES) =						9226.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 125.43 Tc (MIN.) = 98.180  
 EFFECTIVE AREA (ACRES) = 7086.76 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 9226.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10507.00 TO NODE 10620.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1688.35 DOWNSTREAM (FEET) = 1655.24  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2570.61 CHANNEL SLOPE = 0.0129  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.368  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 83.74 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 125.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.80  
 AVERAGE FLOW DEPTH (FEET) = 3.32 TRAVEL TIME (MIN.) = 11.27  
 Tc (MIN.) = 109.45  
 SUBAREA AREA (ACRES) = 83.74 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 7170.50 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 9310.0 PEAK FLOW RATE (CFS) = 125.43  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.32 FLOW VELOCITY (FEET/SEC.) = 3.80  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 11  
 -----  
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	109.54	53.91	0.471	0.60 (0.60)	1.00	3807.2	10500.00
2	115.09	71.86	0.430	0.60 (0.60)	1.00	5010.9	10410.00
3	125.43	109.45	0.368	0.60 (0.60)	1.00	7170.5	10200.00
4	125.43	109.70	0.368	0.60 (0.60)	1.00	7183.6	10400.00
5	124.87	126.84	0.347	0.60 (0.60)	1.00	7913.7	10320.00
6	123.90	131.41	0.343	0.60 (0.60)	1.00	8060.8	10300.00
7	118.63	148.17	0.329	0.60 (0.60)	1.00	8331.2	10210.00
8	99.95	253.90	0.274	0.60 (0.60)	1.00	9310.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28.20	33.36	0.595	0.60 (0.60)	1.00	378.1	10600.00

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.80	33.36	0.595	0.60 (0.60)	1.00	2734.2	10600.00
2	131.88	53.91	0.471	0.60 (0.60)	1.00	4185.3	10500.00
3	135.48	71.86	0.430	0.60 (0.60)	1.00	5389.0	10410.00
4	142.88	109.45	0.368	0.60 (0.60)	1.00	7548.6	10200.00
5	142.85	109.70	0.368	0.60 (0.60)	1.00	7561.7	10400.00
6	141.32	126.84	0.347	0.60 (0.60)	1.00	8291.8	10320.00
7	140.17	131.41	0.343	0.60 (0.60)	1.00	8438.9	10300.00
8	134.22	148.17	0.329	0.60 (0.60)	1.00	8709.3	10210.00
9	112.94	253.90	0.274	0.60 (0.60)	1.00	9688.1	10100.00

TOTAL AREA (ACRES) = 9688.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 142.88 Tc (MIN.) = 109.447  
 EFFECTIVE AREA (ACRES) = 7548.58 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 9688.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10620.00 TO NODE 10621.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1655.24 DOWNSTREAM (FEET) = 1584.84  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2294.47 CHANNEL SLOPE = 0.0307  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.358

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	342.43	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 142.88  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.45  
 AVERAGE FLOW DEPTH (FEET) = 2.96 TRAVEL TIME (MIN.) = 7.02  
 Tc (MIN.) = 116.47  
 SUBAREA AREA (ACRES) = 342.43 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 7891.01 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 10030.5 PEAK FLOW RATE (CFS) = 142.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.96 FLOW VELOCITY (FEET/SEC.) = 5.45  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10621.00 = 40157.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1584.84 DOWNSTREAM (FEET) = 1443.87  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2923.79 CHANNEL SLOPE = 0.0482  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.350

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	160.90	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 142.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.44  
 AVERAGE FLOW DEPTH (FEET) = 2.72 TRAVEL TIME (MIN.) = 7.56  
 Tc (MIN.) = 124.03  
 SUBAREA AREA (ACRES) = 160.90 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 8051.91 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 10191.4 PEAK FLOW RATE (CFS) = 142.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.72 FLOW VELOCITY (FEET/SEC.) = 6.44  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 124.03  
 RAINFALL INTENSITY (INCH/HR) = 0.35  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 8051.91  
 TOTAL STREAM AREA (ACRES) = 10191.39  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 142.88

\*\*\*\*\*

FLOW PROCESS FROM NODE 10630.00 TO NODE 10631.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 298.79  
 ELEVATION DATA: UPSTREAM (FEET) = 3257.00 DOWNSTREAM (FEET) = 3147.13

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.430  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.640  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	1.25	0.60	1.000	0	8.43

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 1.17  
 TOTAL AREA (ACRES) = 1.25 PEAK FLOW RATE (CFS) = 1.17

\*\*\*\*\*

FLOW PROCESS FROM NODE 10631.00 TO NODE 10632.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3147.13 DOWNSTREAM (FEET) = 2774.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 640.96 CHANNEL SLOPE = 0.5817  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.408

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.75	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.25  
 AVERAGE FLOW DEPTH (FEET) = 0.39 TRAVEL TIME (MIN.) = 1.71  
 Tc (MIN.) = 10.14  
 SUBAREA AREA (ACRES) = 4.75 SUBAREA RUNOFF (CFS) = 3.45  
 EFFECTIVE AREA (ACRES) = 6.00 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 6.0 PEAK FLOW RATE (CFS) = 4.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.46 FLOW VELOCITY (FEET/SEC.) = 6.85  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10632.00 = 939.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10632.00 TO NODE 10633.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 2774.29 DOWNSTREAM (FEET) = 2004.58  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1905.65 CHANNEL SLOPE = 0.4039  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.153  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.75	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 24.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.21  
 AVERAGE FLOW DEPTH (FEET) = 0.95 TRAVEL TIME (MIN.) = 3.45  
 Tc (MIN.) = 13.59  
 SUBAREA AREA (ACRES) = 79.75 SUBAREA RUNOFF (CFS) = 39.72  
 EFFECTIVE AREA (ACRES) = 85.75 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 85.8 PEAK FLOW RATE (CFS) = 42.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.16 FLOW VELOCITY (FEET/SEC.) = 10.53  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10633.00 = 2845.40 FEET.

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FLOW PROCESS FROM NODE 10633.00 TO NODE 10634.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2004.58 DOWNSTREAM(FEET) = 1714.99
CHANNEL LENGTH THRU SUBAREA(FEET) = 1868.05 CHANNEL SLOPE = 0.1550
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.945
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 124.45 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.13
AVERAGE FLOW DEPTH(FEET) = 1.60 TRAVEL TIME(MIN.) = 3.83
Tc(MIN.) = 17.42
SUBAREA AREA(ACRES) = 124.45 SUBAREA RUNOFF(CFS) = 38.67
EFFECTIVE AREA(ACRES) = 210.20 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 210.2 PEAK FLOW RATE(CFS) = 65.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.63 FLOW VELOCITY(FEET/SEC.) = 8.22
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10634.00 = 4713.45 FEET.

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FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1714.99 DOWNSTREAM(FEET) = 1443.87
CHANNEL LENGTH THRU SUBAREA(FEET) = 1685.34 CHANNEL SLOPE = 0.1609
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.815
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 42.00 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.47
AVERAGE FLOW DEPTH(FEET) = 1.65 TRAVEL TIME(MIN.) = 3.32
Tc(MIN.) = 20.73
SUBAREA AREA(ACRES) = 42.00 SUBAREA RUNOFF(CFS) = 8.14
EFFECTIVE AREA(ACRES) = 252.20 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 252.2 PEAK FLOW RATE(CFS) = 65.32
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 8.35
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10640.00 = 6398.79 FEET.

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*****
FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 20.73
RAINFALL INTENSITY(INCH/HR) = 0.82
AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 252.20
TOTAL STREAM AREA(ACRES) = 252.20
PEAK FLOW RATE(CFS) AT CONFLUENCE = 65.32

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\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.80	48.83	0.490	0.60( 0.60)	1.00	3237.5	10600.00
1	131.88	68.79	0.436	0.60( 0.60)	1.00	4688.6	10500.00
1	135.48	86.66	0.402	0.60( 0.60)	1.00	5892.3	10410.00
1	142.88	124.03	0.350	0.60( 0.60)	1.00	8051.9	10200.00
1	142.85	124.29	0.349	0.60( 0.60)	1.00	8065.0	10400.00
1	141.32	141.47	0.335	0.60( 0.60)	1.00	8795.2	10320.00
1	140.17	146.08	0.331	0.60( 0.60)	1.00	8942.2	10300.00
1	134.22	162.99	0.316	0.60( 0.60)	1.00	9212.6	10210.00
1	112.94	269.40	0.268	0.60( 0.60)	1.00	10191.4	10100.00
2	65.32	20.73	0.815	0.60( 0.60)	1.00	252.2	10630.00

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RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.76	20.73	0.815	0.60( 0.60)	1.00	1626.9	10630.00
2	113.80	48.83	0.490	0.60( 0.60)	1.00	3489.7	10600.00
3	131.87	68.79	0.436	0.60( 0.60)	1.00	4940.8	10500.00
4	135.48	86.66	0.402	0.60( 0.60)	1.00	6144.5	10410.00
5	142.88	124.03	0.350	0.60( 0.60)	1.00	8304.1	10200.00
6	142.85	124.29	0.349	0.60( 0.60)	1.00	8317.2	10400.00
7	141.32	141.47	0.335	0.60( 0.60)	1.00	9047.4	10320.00
8	140.17	146.08	0.331	0.60( 0.60)	1.00	9194.4	10300.00
9	134.22	162.99	0.316	0.60( 0.60)	1.00	9464.8	10210.00
10	112.94	269.40	0.268	0.60( 0.60)	1.00	10443.6	10100.00

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 145.76 Tc(MIN.) = 20.73
EFFECTIVE AREA(ACRES) = 1626.86 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10443.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

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FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1443.87 DOWNSTREAM(FEET) = 1320.32
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.45 CHANNEL SLOPE = 0.0548
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.686
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 94.37 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84
AVERAGE FLOW DEPTH(FEET) = 2.70 TRAVEL TIME(MIN.) = 5.49
Tc(MIN.) = 26.22
SUBAREA AREA(ACRES) = 94.37 SUBAREA RUNOFF(CFS) = 7.29
EFFECTIVE AREA(ACRES) = 1721.23 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10538.0 PEAK FLOW RATE(CFS) = 145.76
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.68 FLOW VELOCITY(FEET/SEC.) = 6.79
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.
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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 10538.0 TC(MIN.) = 26.22
EFFECTIVE AREA(ACRES) = 1721.23 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 145.76

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.76	26.22	0.686	0.60( 0.60)	1.00	1721.2	10630.00
2	113.80	54.71	0.469	0.60( 0.60)	1.00	3584.1	10600.00
3	131.87	74.46	0.426	0.60( 0.60)	1.00	5035.2	10500.00
4	135.48	92.30	0.393	0.60( 0.60)	1.00	6238.9	10410.00
5	142.88	129.58	0.345	0.60( 0.60)	1.00	8398.5	10200.00
6	142.85	129.84	0.345	0.60( 0.60)	1.00	8411.6	10400.00
7	141.32	147.04	0.330	0.60( 0.60)	1.00	9141.7	10320.00
8	140.17	151.66	0.326	0.60( 0.60)	1.00	9288.8	10300.00
9	134.22	168.63	0.312	0.60( 0.60)	1.00	9559.2	10210.00
10	112.94	275.29	0.266	0.60( 0.60)	1.00	10538.0	10100.00

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END OF RATIONAL METHOD ANALYSIS

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ELEVATION DATA: UPSTREAM(FEET) = 3246.68 DOWNSTREAM(FEET) = 3075.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1893.56 CHANNEL SLOPE = 0.0906  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.880

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.98	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.14

AVERAGE FLOW DEPTH(FEET) = 0.88 TRAVEL TIME(MIN.) = 7.61

Tc(MIN.) = 18.93

SUBAREA AREA(ACRES) = 31.98 SUBAREA RUNOFF(CFS) = 8.07

EFFECTIVE AREA(ACRES) = 39.77 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 39.8 PEAK FLOW RATE(CFS) = 10.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.89 FLOW VELOCITY(FEET/SEC.) = 4.22

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.00 = 2874.79 FEET.

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FLOW PROCESS FROM NODE 10703.00 TO NODE 10703.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3075.14 DOWNSTREAM(FEET) = 2952.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2060.61 CHANNEL SLOPE = 0.0597  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.655

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.58	0.60	0.872	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.76

AVERAGE FLOW DEPTH(FEET) = 1.04 TRAVEL TIME(MIN.) = 9.15

Tc(MIN.) = 28.07

SUBAREA AREA(ACRES) = 34.58 SUBAREA RUNOFF(CFS) = 4.11

EFFECTIVE AREA(ACRES) = 74.35 AREA-AVERAGED Fm(INCH/HR) = 0.56

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 74.4 PEAK FLOW RATE(CFS) = 10.03

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 3.60

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.50 = 4935.40 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10703.50 TO NODE 10704.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2952.03 DOWNSTREAM(FEET) = 2895.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 930.70 CHANNEL SLOPE = 0.0606  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.604

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.69	0.60	0.951	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.951

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.51

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.65

AVERAGE FLOW DEPTH(FEET) = 0.98 TRAVEL TIME(MIN.) = 4.25

Tc(MIN.) = 32.32

SUBAREA AREA(ACRES) = 30.69 SUBAREA RUNOFF(CFS) = 0.92

EFFECTIVE AREA(ACRES) = 105.04 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 105.0 PEAK FLOW RATE(CFS) = 10.03

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 3.60

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10704.00 = 5866.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2895.59 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2585.44 CHANNEL SLOPE = 0.1217  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.533

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.40	0.60	0.977	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.79

AVERAGE FLOW DEPTH(FEET) = 0.88 TRAVEL TIME(MIN.) = 8.99

Tc(MIN.) = 41.31

SUBAREA AREA(ACRES) = 199.40 SUBAREA RUNOFF(CFS) = 2.20

EFFECTIVE AREA(ACRES) = 304.44 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 304.4 PEAK FLOW RATE(CFS) = 10.03

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.84 FLOW VELOCITY (FEET/SEC.) = 4.69  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 41.31  
RAINFALL INTENSITY (INCH/HR) = 0.53  
AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA (ACRES) = 304.44  
TOTAL STREAM AREA (ACRES) = 304.44  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 10.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 10710.00 TO NODE 10711.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 943.64  
ELEVATION DATA: UPSTREAM (FEET) = 3389.13 DOWNSTREAM (FEET) = 3276.30

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 11.438  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.312  
SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
PUBLIC PARK	-	7.76	0.60	0.981	0	11.44

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.981  
SUBAREA RUNOFF (CFS) = 5.05  
TOTAL AREA (ACRES) = 7.76 PEAK FLOW RATE (CFS) = 5.05

\*\*\*\*\*

FLOW PROCESS FROM NODE 10711.00 TO NODE 10712.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3276.30 DOWNSTREAM (FEET) = 3152.26  
CHANNEL LENGTH THRU SUBAREA (FEET) = 950.69 CHANNEL SLOPE = 0.1305  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.070  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	22.39	0.60	0.988	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.988  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.84  
AVERAGE FLOW DEPTH (FEET) = 0.83 TRAVEL TIME (MIN.) = 3.28  
Tc (MIN.) = 14.71  
SUBAREA AREA (ACRES) = 22.39 SUBAREA RUNOFF (CFS) = 9.62  
EFFECTIVE AREA (ACRES) = 30.15 AREA-AVERAGED Fm (INCH/HR) = 0.59  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 30.1 PEAK FLOW RATE (CFS) = 12.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.92 FLOW VELOCITY (FEET/SEC.) = 5.13  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10712.00 = 1894.33 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10712.00 TO NODE 10713.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3152.26 DOWNSTREAM (FEET) = 2879.03  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1909.77 CHANNEL SLOPE = 0.1431  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.827  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	42.59	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.72  
AVERAGE FLOW DEPTH (FEET) = 1.01 TRAVEL TIME (MIN.) = 5.56  
Tc (MIN.) = 20.28  
SUBAREA AREA (ACRES) = 42.59 SUBAREA RUNOFF (CFS) = 8.70  
EFFECTIVE AREA (ACRES) = 72.74 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 72.7 PEAK FLOW RATE (CFS) = 15.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.96 FLOW VELOCITY (FEET/SEC.) = 5.50  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10713.00 = 3804.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2879.03 DOWNSTREAM (FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2621.96 CHANNEL SLOPE = 0.1136  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.651  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	22.39	0.60	0.988	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

USER-DEFINED - 156.72 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 19.71  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.42  
 AVERAGE FLOW DEPTH (FEET) = 1.10 TRAVEL TIME (MIN.) = 8.07  
 Tc (MIN.) = 28.34  
 SUBAREA AREA (ACRES) = 156.72 SUBAREA RUNOFF (CFS) = 7.14  
 EFFECTIVE AREA (ACRES) = 229.46 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 229.5 PEAK FLOW RATE (CFS) = 15.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.00 FLOW VELOCITY (FEET/SEC.) = 5.07  
 LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10720.00 = 6426.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 28.34  
 RAINFALL INTENSITY (INCH/HR) = 0.65  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 229.46  
 TOTAL STREAM AREA (ACRES) = 229.46  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 15.09

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.03	41.31	0.533	0.60 ( 0.58)	0.97	304.4	10700.00
2	15.09	28.34	0.651	0.60 ( 0.60)	1.00	229.5	10710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.12	28.34	0.651	0.60 ( 0.59)	0.98	438.4	10710.00
2	10.31	41.31	0.533	0.60 ( 0.59)	0.98	533.9	10700.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 25.12 Tc (MIN.) = 28.34  
 EFFECTIVE AREA (ACRES) = 438.35 AREA-AVERAGED Fm (INCH/HR) = 0.59  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 533.9  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10720.00 TO NODE 10720.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2581.07 DOWNSTREAM (FEET) = 2523.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1699.13 CHANNEL SLOPE = 0.0339  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.572

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.31	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.66  
 AVERAGE FLOW DEPTH (FEET) = 1.51 TRAVEL TIME (MIN.) = 7.75  
 Tc (MIN.) = 36.09

SUBAREA AREA (ACRES) = 116.31 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 554.66 AREA-AVERAGED Fm (INCH/HR) = 0.59  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 650.2 PEAK FLOW RATE (CFS) = 25.12  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.51 FLOW VELOCITY (FEET/SEC.) = 3.66  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.50 = 10150.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10720.50 TO NODE 10721.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2523.48 DOWNSTREAM (FEET) = 2488.66  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1575.08 CHANNEL SLOPE = 0.0221  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.514

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.28	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.12  
 AVERAGE FLOW DEPTH (FEET) = 1.64 TRAVEL TIME (MIN.) = 8.40  
 Tc (MIN.) = 44.49

SUBAREA AREA (ACRES) = 82.28 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 636.94 AREA-AVERAGED Fm (INCH/HR) = 0.59

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 732.5 PEAK FLOW RATE(CFS) = 25.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.64 FLOW VELOCITY(FEET/SEC.) = 3.12  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.00 = 11725.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.00 TO NODE 10721.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2488.66 DOWNSTREAM(FEET) = 2453.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2032.11 CHANNEL SLOPE = 0.0174  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.464  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	259.52	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.85  
AVERAGE FLOW DEPTH(FEET) = 1.71 TRAVEL TIME(MIN.) = 11.88  
Tc(MIN.) = 56.37  
SUBAREA AREA(ACRES) = 259.52 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 896.46 AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 992.0 PEAK FLOW RATE(CFS) = 25.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 2.85  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.50 = 13757.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10721.50 TO NODE 10722.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2453.35 DOWNSTREAM(FEET) = 2384.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1842.37 CHANNEL SLOPE = 0.0374  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.445  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	308.58	0.60	1.000	-

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 229.78 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.80  
AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 8.08  
Tc(MIN.) = 64.46

SUBAREA AREA(ACRES) = 229.78 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1126.24 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1221.8 PEAK FLOW RATE(CFS) = 25.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 3.80  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10722.00 = 15600.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10722.00 TO NODE 10723.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2384.52 DOWNSTREAM(FEET) = 1925.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3780.37 CHANNEL SLOPE = 0.1214  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.424  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	308.58	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.88  
AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 10.71  
Tc(MIN.) = 75.16  
SUBAREA AREA(ACRES) = 308.58 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1434.82 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1530.4 PEAK FLOW RATE(CFS) = 25.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 5.88  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10723.00 = 19380.60 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1925.64 DOWNSTREAM(FEET) = 1320.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3826.73 CHANNEL SLOPE = 0.1582  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.406

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.11	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.51

AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 9.79

Tc(MIN.) = 84.96

SUBAREA AREA(ACRES) = 434.11 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 1868.93 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1964.5 PEAK FLOW RATE(CFS) = 25.12

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.13 FLOW VELOCITY(FEET/SEC.) = 6.51

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1964.5 TC(MIN.) = 84.96

EFFECTIVE AREA(ACRES) = 1868.93 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.996

PEAK FLOW RATE(CFS) = 25.12

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.12	84.96	0.406	0.60( 0.60)	1.00	1868.9	10710.00
2	10.31	112.06	0.364	0.60( 0.60)	0.99	1964.5	10700.00

=====  
END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 2237.54 DOWNSTREAM(FEET) = 1920.11  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 954.74 CHANNEL SLOPE = 0.3325  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.25	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.82  
 AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.33  
 Tc(MIN.) = 11.98  
 SUBAREA AREA(ACRES) = 18.25 SUBAREA RUNOFF(CFS) = 10.58  
 EFFECTIVE AREA(ACRES) = 24.38 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 14.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 7.43  
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10803.00 = 1880.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1920.11 DOWNSTREAM(FEET) = 1289.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2201.18 CHANNEL SLOPE = 0.2865  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.972

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.99	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.32  
 AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 4.41  
 Tc(MIN.) = 16.39  
 SUBAREA AREA(ACRES) = 78.99 SUBAREA RUNOFF(CFS) = 26.45  
 EFFECTIVE AREA(ACRES) = 103.37 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 103.4 PEAK FLOW RATE(CFS) = 34.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.14 FLOW VELOCITY(FEET/SEC.) = 8.85  
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S6.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.76	26.22	0.60( 0.60)	1.00	1721.2	10630.00
2	113.80	54.71	0.60( 0.60)	1.00	3584.1	10600.00
3	131.87	74.46	0.60( 0.60)	1.00	5035.2	10500.00
4	135.48	92.30	0.60( 0.60)	1.00	6238.9	10410.00
5	142.88	129.58	0.60( 0.60)	1.00	8398.5	10200.00
6	142.85	129.84	0.60( 0.60)	1.00	8411.6	10400.00
7	141.32	147.04	0.60( 0.60)	1.00	9141.7	10320.00
8	140.17	151.66	0.60( 0.60)	1.00	9288.8	10300.00
9	134.22	168.63	0.60( 0.60)	1.00	9559.2	10210.00
10	112.94	275.29	0.60( 0.60)	1.00	10538.0	10100.00
TOTAL AREA(ACRES) =						10538.0

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S7.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.12	84.96	0.60( 0.60)	1.00	1868.9	10710.00
2	10.31	112.06	0.60( 0.60)	0.99	1964.5	10700.00
TOTAL AREA(ACRES) =						1964.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.12	84.96	0.60( 0.60)	1.00	1868.9	10710.00
2	10.31	112.06	0.60( 0.60)	0.99	1964.5	10700.00
TOTAL AREA(ACRES) =						1964.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 25.12 84.96 0.397 0.60( 0.60) 1.00 1868.9 10710.00  
 2 10.31 112.06 0.355 0.60( 0.60) 0.99 1964.5 10700.00  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	145.76	26.22	0.678	0.60( 0.60)	1.00	1721.2	10630.00
2	113.80	54.71	0.462	0.60( 0.60)	1.00	3584.1	10600.00
3	131.87	74.46	0.417	0.60( 0.60)	1.00	5035.2	10500.00
4	135.48	92.30	0.384	0.60( 0.60)	1.00	6238.9	10410.00
5	142.88	129.58	0.336	0.60( 0.60)	1.00	8398.5	10200.00
6	142.85	129.84	0.336	0.60( 0.60)	1.00	8411.6	10400.00
7	141.32	147.04	0.321	0.60( 0.60)	1.00	9141.7	10320.00
8	140.17	151.66	0.317	0.60( 0.60)	1.00	9288.8	10300.00
9	134.22	168.63	0.303	0.60( 0.60)	1.00	9559.2	10210.00
10	112.94	275.29	0.257	0.60( 0.60)	1.00	10538.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	159.02	26.22	0.678	0.60( 0.60)	1.00	2298.1	10630.00
2	132.66	54.71	0.462	0.60( 0.60)	1.00	4787.6	10600.00
3	155.02	74.46	0.417	0.60( 0.60)	1.00	6673.2	10500.00
4	159.12	84.96	0.397	0.60( 0.60)	1.00	7612.1	10710.00
5	156.59	92.30	0.384	0.60( 0.60)	1.00	8133.7	10410.00
6	149.71	112.06	0.355	0.60( 0.60)	1.00	9348.0	10700.00
7	152.62	129.58	0.336	0.60( 0.60)	1.00	10363.0	10200.00
8	152.59	129.84	0.336	0.60( 0.60)	1.00	10376.1	10400.00
9	150.64	147.04	0.321	0.60( 0.60)	1.00	11106.2	10320.00
10	149.37	151.66	0.317	0.60( 0.60)	1.00	11253.2	10300.00
11	143.00	168.63	0.303	0.60( 0.60)	1.00	11523.6	10210.00
12	120.40	275.29	0.257	0.60( 0.60)	1.00	12502.4	10100.00

TOTAL AREA(ACRES) = 12502.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 159.12 Tc(MIN.) = 84.957  
 EFFECTIVE AREA(ACRES) = 7612.15 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12502.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10724.00 TO NODE 10820.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1320.32 DOWNSTREAM(FEET) = 1289.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1341.06 CHANNEL SLOPE = 0.0231  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.388

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.66	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 159.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.01  
 AVERAGE FLOW DEPTH(FEET) = 3.25 TRAVEL TIME(MIN.) = 4.46  
 Tc(MIN.) = 89.42  
 SUBAREA AREA(ACRES) = 47.66 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 7659.81 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 12550.1 PEAK FLOW RATE(CFS) = 159.12  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.25 FLOW VELOCITY(FEET/SEC.) = 5.01  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	159.02	30.68	0.611	0.60( 0.60)	1.00	2345.8	10630.00
2	132.66	59.36	0.447	0.60( 0.60)	1.00	4835.3	10600.00
3	155.02	78.94	0.408	0.60( 0.60)	1.00	6720.9	10500.00
4	159.12	89.42	0.388	0.60( 0.60)	1.00	7659.8	10710.00
5	156.59	96.77	0.377	0.60( 0.60)	1.00	8181.4	10410.00
6	149.71	116.58	0.349	0.60( 0.60)	1.00	9395.6	10700.00
7	152.62	134.08	0.332	0.60( 0.60)	1.00	10410.6	10200.00
8	152.59	134.34	0.332	0.60( 0.60)	1.00	10423.7	10400.00
9	150.64	151.55	0.317	0.60( 0.60)	1.00	11153.9	10320.00
10	149.37	156.19	0.313	0.60( 0.60)	1.00	11300.9	10300.00
11	143.00	173.20	0.299	0.60( 0.60)	1.00	11571.3	10210.00
12	120.40	280.06	0.255	0.60( 0.60)	1.00	12550.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	34.61	16.39	0.972	0.60( 0.60)	1.00	103.4	10800.00

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	193.63	16.39	0.972	0.60( 0.60)	1.00	1356.3	10800.00
2	160.09	30.68	0.611	0.60( 0.60)	1.00	2449.2	10630.00
3	132.66	59.36	0.447	0.60( 0.60)	1.00	4938.7	10600.00
4	155.02	78.94	0.408	0.60( 0.60)	1.00	6824.2	10500.00
5	159.12	89.42	0.388	0.60( 0.60)	1.00	7763.2	10710.00
6	156.59	96.77	0.377	0.60( 0.60)	1.00	8284.8	10410.00



7	149.71	116.58	0.349	0.60	( 0.60)	1.00	9499.0	10700.00
8	152.62	134.08	0.332	0.60	( 0.60)	1.00	10514.0	10200.00
9	152.59	134.34	0.332	0.60	( 0.60)	1.00	10527.1	10400.00
10	150.64	151.55	0.317	0.60	( 0.60)	1.00	11257.2	10320.00
11	149.37	156.19	0.313	0.60	( 0.60)	1.00	11404.3	10300.00
12	143.00	173.20	0.299	0.60	( 0.60)	1.00	11674.7	10210.00
13	120.40	280.06	0.255	0.60	( 0.60)	1.00	12653.5	10100.00

TOTAL AREA(ACRES) = 12653.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 193.63 Tc(MIN.) = 16.386  
EFFECTIVE AREA(ACRES) = 1356.28 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12653.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1289.38 DOWNSTREAM(FEET) = 1208.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2450.84 CHANNEL SLOPE = 0.0332  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.746

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	147.19	0.60	1.000	-	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 203.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.12  
AVERAGE FLOW DEPTH(FEET) = 3.33 TRAVEL TIME(MIN.) = 6.68  
Tc(MIN.) = 23.06  
SUBAREA AREA(ACRES) = 147.19 SUBAREA RUNOFF(CFS) = 19.41  
EFFECTIVE AREA(ACRES) = 1503.47 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12800.7 PEAK FLOW RATE(CFS) = 199.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.31 FLOW VELOCITY(FEET/SEC.) = 6.08  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 23.06  
RAINFALL INTENSITY(INCH/HR) = 0.75  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1503.47  
TOTAL STREAM AREA(ACRES) = 12800.66  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 199.28

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10830.00 TO NODE 10831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.89  
ELEVATION DATA: UPSTREAM(FEET) = 3249.56 DOWNSTREAM(FEET) = 3166.67

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.939  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	0.88	0.60	1.000	0	8.94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 0.74  
TOTAL AREA(ACRES) = 0.88 PEAK FLOW RATE(CFS) = 0.74

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10831.00 TO NODE 10832.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3166.67 DOWNSTREAM(FEET) = 2954.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.65 CHANNEL SLOPE = 0.3126  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.270

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	2.82	0.60	1.000	-	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.22  
AVERAGE FLOW DEPTH(FEET) = 0.36 TRAVEL TIME(MIN.) = 2.68  
Tc(MIN.) = 11.62  
SUBAREA AREA(ACRES) = 2.82 SUBAREA RUNOFF(CFS) = 1.70  
EFFECTIVE AREA(ACRES) = 3.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 2.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.40 FLOW VELOCITY(FEET/SEC.) = 4.61  
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10832.00 = 977.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10832.00 TO NODE 10833.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	2954.84	DOWNSTREAM(FEET) =	2765.08
CHANNEL LENGTH THRU SUBAREA(FEET) =	951.35	CHANNEL SLOPE =	0.1995
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	1.062		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	29.25	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.48  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.42  
AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 2.92  
Tc(MIN.) = 14.54  
SUBAREA AREA(ACRES) = 29.25 SUBAREA RUNOFF(CFS) = 12.16  
EFFECTIVE AREA(ACRES) = 32.95 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.0 PEAK FLOW RATE(CFS) = 13.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 6.10  
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10833.00 = 1928.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10833.00 TO NODE 10834.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	2765.08	DOWNSTREAM(FEET) =	2446.09
CHANNEL LENGTH THRU SUBAREA(FEET) =	1959.29	CHANNEL SLOPE =	0.1628
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.840		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.66	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.45  
AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 5.06  
Tc(MIN.) = 19.60  
SUBAREA AREA(ACRES) = 80.66 SUBAREA RUNOFF(CFS) = 17.40  
EFFECTIVE AREA(ACRES) = 113.61 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 113.6 PEAK FLOW RATE(CFS) = 24.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 6.55  
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10834.00 = 3888.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10834.00 TO NODE 10835.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	2446.09	DOWNSTREAM(FEET) =	1797.70
CHANNEL LENGTH THRU SUBAREA(FEET) =	2083.04	CHANNEL SLOPE =	0.3113
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.740		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	196.68	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.29  
AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 3.74  
Tc(MIN.) = 23.33  
SUBAREA AREA(ACRES) = 196.68 SUBAREA RUNOFF(CFS) = 24.74  
EFFECTIVE AREA(ACRES) = 310.29 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 310.3 PEAK FLOW RATE(CFS) = 39.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.18 FLOW VELOCITY(FEET/SEC.) = 9.38  
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10835.00 = 5971.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	1797.70	DOWNSTREAM(FEET) =	1208.07
CHANNEL LENGTH THRU SUBAREA(FEET) =	3213.25	CHANNEL SLOPE =	0.1835
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.615		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	218.82	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.81  
AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 6.86  
Tc(MIN.) = 30.20  
SUBAREA AREA(ACRES) = 218.82 SUBAREA RUNOFF(CFS) = 3.06  
EFFECTIVE AREA(ACRES) = 529.11 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 529.1 PEAK FLOW RATE(CFS) = 39.03

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 7.68  
 LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10840.00 = 9184.47 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 30.20  
 RAINFALL INTENSITY (INCH/HR) = 0.62  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 529.11  
 TOTAL STREAM AREA (ACRES) = 529.11  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 39.03

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	199.28	23.06	0.746	0.60 ( 0.60)	1.00	1503.5	10800.00
1	160.09	37.76	0.553	0.60 ( 0.60)	1.00	2596.3	10630.00
1	132.66	66.79	0.432	0.60 ( 0.60)	1.00	5085.8	10600.00
1	155.02	86.09	0.395	0.60 ( 0.60)	1.00	6971.4	10500.00
1	159.12	96.50	0.378	0.60 ( 0.60)	1.00	7910.4	10710.00
1	156.59	103.90	0.367	0.60 ( 0.60)	1.00	8431.9	10410.00
1	149.71	123.78	0.341	0.60 ( 0.60)	1.00	9646.2	10700.00
1	152.62	141.25	0.326	0.60 ( 0.60)	1.00	10661.2	10200.00
1	152.59	141.51	0.326	0.60 ( 0.60)	1.00	10674.3	10400.00
1	150.64	158.74	0.311	0.60 ( 0.60)	1.00	11404.4	10320.00
1	149.37	163.41	0.307	0.60 ( 0.60)	1.00	11551.5	10300.00
1	143.00	180.50	0.293	0.60 ( 0.60)	1.00	11821.9	10210.00
1	120.40	287.67	0.252	0.60 ( 0.60)	1.00	12800.7	10100.00
2	39.03	30.20	0.615	0.60 ( 0.60)	1.00	529.1	10830.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	238.32	23.06	0.746	0.60 ( 0.60)	1.00	1907.6	10800.00
2	219.30	30.20	0.615	0.60 ( 0.60)	1.00	2562.9	10830.00
3	160.09	37.76	0.553	0.60 ( 0.60)	1.00	3125.5	10630.00
4	132.66	66.79	0.432	0.60 ( 0.60)	1.00	5615.0	10600.00
5	155.02	86.09	0.395	0.60 ( 0.60)	1.00	7500.5	10500.00
6	159.12	96.50	0.378	0.60 ( 0.60)	1.00	8439.5	10710.00
7	156.59	103.90	0.367	0.60 ( 0.60)	1.00	8961.1	10410.00
8	149.71	123.78	0.341	0.60 ( 0.60)	1.00	10175.3	10700.00
9	152.62	141.25	0.326	0.60 ( 0.60)	1.00	11190.3	10200.00
10	152.59	141.51	0.326	0.60 ( 0.60)	1.00	11203.4	10400.00
11	150.64	158.74	0.311	0.60 ( 0.60)	1.00	11933.5	10320.00
12	149.36	163.41	0.307	0.60 ( 0.60)	1.00	12080.6	10300.00
13	143.00	180.50	0.293	0.60 ( 0.60)	1.00	12351.0	10210.00
14	120.39	287.67	0.252	0.60 ( 0.60)	1.00	13329.8	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 238.32 Tc (MIN.) = 23.06  
 EFFECTIVE AREA (ACRES) = 1907.63 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 13329.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10840.00 TO NODE 10841.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1208.07 DOWNSTREAM (FEET) = 1119.03  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3050.12 CHANNEL SLOPE = 0.0292  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.605  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	222.84	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 238.93  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.07  
 AVERAGE FLOW DEPTH (FEET) = 3.62 TRAVEL TIME (MIN.) = 8.37  
 Tc (MIN.) = 31.43  
 SUBAREA AREA (ACRES) = 222.84 SUBAREA RUNOFF (CFS) = 1.05  
 EFFECTIVE AREA (ACRES) = 2130.47 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 13552.6 PEAK FLOW RATE (CFS) = 238.32  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.62 FLOW VELOCITY (FEET/SEC.) = 6.06  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10841.00 = 52177.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1119.03 DOWNSTREAM (FEET) = 1087.70  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1318.14 CHANNEL SLOPE = 0.0238  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.573  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	265.26	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 238.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.62  
 AVERAGE FLOW DEPTH(FEET) = 3.76 TRAVEL TIME(MIN.) = 3.91  
 Tc(MIN.) = 35.34  
 SUBAREA AREA(ACRES) = 265.26 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 2395.73 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 13817.9 PEAK FLOW RATE(CFS) = 238.32  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.76 FLOW VELOCITY(FEET/SEC.) = 5.62  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 35.34  
 RAINFALL INTENSITY(INCH/HR) = 0.57  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 2395.73  
 TOTAL STREAM AREA(ACRES) = 13817.87  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 238.32

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10850.00 TO NODE 10851.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 311.88  
 ELEVATION DATA: UPSTREAM(FEET) = 3029.66 DOWNSTREAM(FEET) = 2922.38

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.691  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.566

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 2.73 0.60 1.000 0 8.69  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 2.37  
 TOTAL AREA(ACRES) = 2.73 PEAK FLOW RATE(CFS) = 2.37

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10851.00 TO NODE 10852.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2922.38 DOWNSTREAM(FEET) = 2684.61  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 687.05 CHANNEL SLOPE = 0.3461  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.332

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 5.11 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.07  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.58  
 AVERAGE FLOW DEPTH(FEET) = 0.49 TRAVEL TIME(MIN.) = 2.05  
 Tc(MIN.) = 10.74  
 SUBAREA AREA(ACRES) = 5.11 SUBAREA RUNOFF(CFS) = 3.37  
 EFFECTIVE AREA(ACRES) = 7.84 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 5.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 5.93  
 LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10852.00 = 998.93 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10852.00 TO NODE 10853.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2684.61 DOWNSTREAM(FEET) = 2306.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.58 CHANNEL SLOPE = 0.1966  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.997

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 60.02 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.36  
 AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 5.04  
 Tc(MIN.) = 15.79  
 SUBAREA AREA(ACRES) = 60.02 SUBAREA RUNOFF(CFS) = 21.43  
 EFFECTIVE AREA(ACRES) = 67.86 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 67.9 PEAK FLOW RATE(CFS) = 24.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.07 FLOW VELOCITY(FEET/SEC.) = 7.02  
 LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10853.00 = 2923.51 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10853.00 TO NODE 10854.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2306.25 DOWNSTREAM(FEET) = 1555.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3225.53 CHANNEL SLOPE = 0.2329  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.774  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 235.82 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 44.26  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.71  
AVERAGE FLOW DEPTH(FEET) = 1.30 TRAVEL TIME(MIN.) = 6.17  
Tc(MIN.) = 21.96  
SUBAREA AREA(ACRES) = 235.82 SUBAREA RUNOFF(CFS) = 36.94  
EFFECTIVE AREA(ACRES) = 303.68 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 303.7 PEAK FLOW RATE(CFS) = 47.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 8.83  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10854.00 = 6149.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1555.12 DOWNSTREAM(FEET) = 1087.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3294.22 CHANNEL SLOPE = 0.1419  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.628  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 247.64 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.48  
AVERAGE FLOW DEPTH(FEET) = 1.52 TRAVEL TIME(MIN.) = 7.34  
Tc(MIN.) = 29.30  
SUBAREA AREA(ACRES) = 247.64 SUBAREA RUNOFF(CFS) = 6.34  
EFFECTIVE AREA(ACRES) = 551.32 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 551.3 PEAK FLOW RATE(CFS) = 47.57  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.47 FLOW VELOCITY(FEET/SEC.) = 7.34  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10860.00 = 9443.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 29.30  
RAINFALL INTENSITY(INCH/HR) = 0.63  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 551.32  
TOTAL STREAM AREA(ACRES) = 551.32  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 47.57

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	238.32	35.34	0.573	0.60( 0.60)	1.00	2395.7	10800.00
1	219.30	42.74	0.519	0.60( 0.60)	1.00	3051.0	10830.00
1	160.09	51.34	0.474	0.60( 0.60)	1.00	3613.6	10630.00
1	132.66	81.01	0.404	0.60( 0.60)	1.00	6103.1	10600.00
1	155.02	99.78	0.373	0.60( 0.60)	1.00	7988.6	10500.00
1	159.12	110.10	0.358	0.60( 0.60)	1.00	8927.6	10710.00
1	156.59	117.57	0.347	0.60( 0.60)	1.00	9449.2	10410.00
1	149.71	137.59	0.329	0.60( 0.60)	1.00	10663.4	10700.00
1	152.62	155.00	0.314	0.60( 0.60)	1.00	11678.4	10200.00
1	152.59	155.26	0.314	0.60( 0.60)	1.00	11691.5	10400.00
1	150.64	172.53	0.299	0.60( 0.60)	1.00	12421.6	10320.00
1	149.36	177.23	0.295	0.60( 0.60)	1.00	12568.7	10300.00
1	143.00	194.47	0.288	0.60( 0.60)	1.00	12839.1	10210.00
1	120.39	302.27	0.247	0.60( 0.60)	1.00	13817.9	10100.00
2	47.57	29.30	0.628	0.60( 0.60)	1.00	551.3	10850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	264.36	29.30	0.628	0.60( 0.60)	1.00	2537.6	10850.00
2	238.31	35.34	0.573	0.60( 0.60)	1.00	2947.0	10800.00
3	219.30	42.74	0.519	0.60( 0.60)	1.00	3602.3	10830.00
4	160.08	51.34	0.474	0.60( 0.60)	1.00	4164.9	10630.00
5	132.65	81.01	0.404	0.60( 0.60)	1.00	6654.4	10600.00
6	155.01	99.78	0.373	0.60( 0.60)	1.00	8540.0	10500.00
7	159.11	110.10	0.358	0.60( 0.60)	1.00	9478.9	10710.00
8	156.59	117.57	0.347	0.60( 0.60)	1.00	10000.5	10410.00
9	149.71	137.59	0.329	0.60( 0.60)	1.00	11214.7	10700.00
10	152.62	155.00	0.314	0.60( 0.60)	1.00	12229.7	10200.00
11	152.59	155.26	0.314	0.60( 0.60)	1.00	12242.8	10400.00
12	150.64	172.53	0.299	0.60( 0.60)	1.00	12973.0	10320.00
13	149.36	177.23	0.295	0.60( 0.60)	1.00	13120.0	10300.00
14	143.00	194.47	0.288	0.60( 0.60)	1.00	13390.4	10210.00
15	120.39	302.27	0.247	0.60( 0.60)	1.00	14369.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 264.36 Tc(MIN.) = 29.30  
 EFFECTIVE AREA(ACRES) = 2537.59 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 14369.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1087.70 DOWNSTREAM(FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 4791.22 CHANNEL SLOPE = 0.0264  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.519

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	402.51	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 264.36

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.00

AVERAGE FLOW DEPTH(FEET) = 3.83 TRAVEL TIME(MIN.) = 13.31

Tc(MIN.) = 42.61

SUBAREA AREA(ACRES) = 402.51 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 2940.10 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 14771.7 PEAK FLOW RATE(CFS) = 264.36

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.83 FLOW VELOCITY(FEET/SEC.) = 6.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 14771.7 TC(MIN.) = 42.61  
 EFFECTIVE AREA(ACRES) = 2940.10 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999  
 PEAK FLOW RATE(CFS) = 264.36

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	264.36	42.61	0.519	0.60( 0.60)	1.00	2940.1	10850.00
2	238.31	49.01	0.484	0.60( 0.60)	1.00	3349.6	10800.00
3	219.30	56.69	0.456	0.60( 0.60)	1.00	4004.9	10830.00
4	160.08	66.44	0.433	0.60( 0.60)	1.00	4567.4	10630.00
5	132.65	96.80	0.377	0.60( 0.60)	1.00	7056.9	10600.00
6	155.01	115.00	0.351	0.60( 0.60)	1.00	8942.5	10500.00

7	159.11	125.22	0.340	0.60( 0.60)	1.00	9881.4	10710.00
8	156.59	132.73	0.333	0.60( 0.60)	1.00	10403.0	10410.00
9	149.71	152.91	0.316	0.60( 0.60)	1.00	11617.2	10700.00
10	152.62	170.25	0.301	0.60( 0.60)	1.00	12632.2	10200.00
11	152.59	170.52	0.301	0.60( 0.60)	1.00	12645.3	10400.00
12	150.64	187.84	0.290	0.60( 0.60)	1.00	13375.5	10320.00
13	149.36	192.59	0.288	0.60( 0.60)	1.00	13522.5	10300.00
14	143.00	209.97	0.282	0.60( 0.60)	1.00	13792.9	10210.00
15	120.39	318.50	0.241	0.60( 0.60)	1.00	14771.7	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S9.DAT  
TIME/DATE OF STUDY: 10:40 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.077
- 2) 10.00; 1.385
- 3) 15.00; 1.029
- 4) 20.00; 0.823
- 5) 25.00; 0.698
- 6) 30.00; 0.617
- 7) 40.00; 0.534
- 8) 50.00; 0.478
- 9) 60.00; 0.445
- 10) 90.00; 0.387
- 11) 120.00; 0.344
- 12) 180.00; 0.293
- 13) 360.00; 0.225
- 14) 1440.00; 0.102

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETFLOW FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10900.00 TO NODE 10901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 305.17  
ELEVATION DATA: UPSTREAM(FEET) = 3291.76 DOWNSTREAM(FEET) = 3104.08

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.671  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.707  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.19 0.60 1.000 0 7.67  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.19  
TOTAL AREA(ACRES) = 1.19 PEAK FLOW RATE(CFS) = 1.19

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10901.00 TO NODE 10902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3104.08 DOWNSTREAM(FEET) = 2877.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 666.71 CHANNEL SLOPE = 0.3398  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.381  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 2.53 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.66  
AVERAGE FLOW DEPTH(FEET) = 0.39 TRAVEL TIME(MIN.) = 2.38  
Tc(MIN.) = 10.05  
SUBAREA AREA(ACRES) = 2.53 SUBAREA RUNOFF(CFS) = 1.78  
EFFECTIVE AREA(ACRES) = 3.72 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 2.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.42 FLOW VELOCITY(FEET/SEC.) = 4.89  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10902.00 = 971.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10902.00 TO NODE 10903.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2877.50 DOWNSTREAM(FEET) = 2643.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.39 CHANNEL SLOPE = 0.1219  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.944  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 36.43 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.56  
AVERAGE FLOW DEPTH(FEET) = 0.81 TRAVEL TIME(MIN.) = 7.00  
Tc(MIN.) = 17.05  
SUBAREA AREA(ACRES) = 36.43 SUBAREA RUNOFF(CFS) = 11.30  
EFFECTIVE AREA(ACRES) = 40.15 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 40.2 PEAK FLOW RATE(CFS) = 12.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 4.98  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10903.00 = 2888.27 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10903.00 TO NODE 10904.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2643.95 DOWNSTREAM(FEET) = 2373.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.90 CHANNEL SLOPE = 0.1400  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.764  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 129.07 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.05  
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 5.32  
Tc(MIN.) = 22.37  
SUBAREA AREA(ACRES) = 129.07 SUBAREA RUNOFF(CFS) = 19.03  
EFFECTIVE AREA(ACRES) = 169.22 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 169.2 PEAK FLOW RATE(CFS) = 24.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.16 FLOW VELOCITY(FEET/SEC.) = 6.21  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10904.00 = 4820.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10904.00 TO NODE 10905.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2373.49 DOWNSTREAM(FEET) = 1817.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2764.66 CHANNEL SLOPE = 0.2010  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.638  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 117.70 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.25  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.28  
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 6.33  
Tc(MIN.) = 28.70  
SUBAREA AREA(ACRES) = 117.70 SUBAREA RUNOFF(CFS) = 4.05  
EFFECTIVE AREA(ACRES) = 286.92 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 286.9 PEAK FLOW RATE(CFS) = 24.95  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 7.12  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10905.00 = 7584.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10905.00 TO NODE 10906.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 1817.76 DOWNSTREAM(FEET) = 1387.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2799.36 CHANNEL SLOPE = 0.1536  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.567  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 363.93 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.40  
AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 7.29  
Tc(MIN.) = 35.99  
SUBAREA AREA(ACRES) = 363.93 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 650.85 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 650.8 PEAK FLOW RATE(CFS) = 24.95  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE



END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.14 FLOW VELOCITY(FEET/SEC.) = 6.40  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10906.00 = 10384.19 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1387.73 DOWNSTREAM(FEET) = 1113.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2484.63 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.516

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 56.85 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.68  
AVERAGE FLOW DEPTH(FEET) = 1.21 TRAVEL TIME (MIN.) = 7.29  
Tc(MIN.) = 43.28  
SUBAREA AREA(ACRES) = 56.85 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 707.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 707.7 PEAK FLOW RATE(CFS) = 24.95  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.21 FLOW VELOCITY(FEET/SEC.) = 5.68  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10920.00 = 12868.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 43.28  
RAINFALL INTENSITY (INCH/HR) = 0.52  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 707.70  
TOTAL STREAM AREA(ACRES) = 707.70  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 24.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10910.00 TO NODE 10911.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 287.29  
ELEVATION DATA: UPSTREAM(FEET) = 3119.43 DOWNSTREAM(FEET) = 3044.59

Tc = K\*[LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.891  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.538  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.91 0.60 1.000 0 8.89  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.61  
TOTAL AREA(ACRES) = 1.91 PEAK FLOW RATE(CFS) = 1.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10911.00 TO NODE 10912.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3044.59 DOWNSTREAM(FEET) = 2980.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 627.50 CHANNEL SLOPE = 0.1015  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.228

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 4.16 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.16  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME (MIN.) = 3.31  
Tc(MIN.) = 12.20  
SUBAREA AREA(ACRES) = 4.16 SUBAREA RUNOFF(CFS) = 2.35  
EFFECTIVE AREA(ACRES) = 6.07 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 3.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 3.35  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10912.00 = 914.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10912.00 TO NODE 10913.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2980.93 DOWNSTREAM(FEET) = 2876.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 984.99 CHANNEL SLOPE = 0.1065  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.981  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 22.86 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.14  
 AVERAGE FLOW DEPTH (FEET) = 0.78 TRAVEL TIME (MIN.) = 3.96  
 Tc (MIN.) = 16.16  
 SUBAREA AREA (ACRES) = 22.86 SUBAREA RUNOFF (CFS) = 7.84  
 EFFECTIVE AREA (ACRES) = 28.93 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 28.9 PEAK FLOW RATE (CFS) = 9.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.86 FLOW VELOCITY (FEET/SEC.) = 4.48  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10913.00 = 1899.78 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10913.00 TO NODE 10914.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 2876.01 DOWNSTREAM (FEET) = 2832.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 939.99 CHANNEL SLOPE = 0.0465  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.811  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 53.02 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.63  
 AVERAGE FLOW DEPTH (FEET) = 1.18 TRAVEL TIME (MIN.) = 4.32  
 Tc (MIN.) = 20.48  
 SUBAREA AREA (ACRES) = 53.02 SUBAREA RUNOFF (CFS) = 10.08  
 EFFECTIVE AREA (ACRES) = 81.95 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 81.9 PEAK FLOW RATE (CFS) = 15.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.19 FLOW VELOCITY (FEET/SEC.) = 3.65  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10914.00 = 2839.77 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10914.00 TO NODE 10915.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 2832.29 DOWNSTREAM (FEET) = 2769.58

CHANNEL LENGTH THRU SUBAREA (FEET) = 1006.52 CHANNEL SLOPE = 0.0623  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.715  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 90.80 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.37  
 AVERAGE FLOW DEPTH (FEET) = 1.25 TRAVEL TIME (MIN.) = 3.84  
 Tc (MIN.) = 24.32  
 SUBAREA AREA (ACRES) = 90.80 SUBAREA RUNOFF (CFS) = 9.41  
 EFFECTIVE AREA (ACRES) = 172.75 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 172.8 PEAK FLOW RATE (CFS) = 17.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.19 FLOW VELOCITY (FEET/SEC.) = 4.23  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10915.00 = 3846.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10915.00 TO NODE 10916.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 2769.58 DOWNSTREAM (FEET) = 2453.21  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3003.36 CHANNEL SLOPE = 0.1053  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.583  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 311.96 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.13  
 AVERAGE FLOW DEPTH (FEET) = 1.08 TRAVEL TIME (MIN.) = 9.76  
 Tc (MIN.) = 34.07  
 SUBAREA AREA (ACRES) = 311.96 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 484.71 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 484.7 PEAK FLOW RATE (CFS) = 17.91  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.08 FLOW VELOCITY (FEET/SEC.) = 5.13  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10916.00 = 6849.65 FEET.

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*****
FLOW PROCESS FROM NODE 10916.00 TO NODE 10917.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2453.21 DOWNSTREAM(FEET) = 1787.18
CHANNEL LENGTH THRU SUBAREA(FEET) = 2846.14 CHANNEL SLOPE = 0.2340
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.529
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 238.62 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.91
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.93
AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 6.84
Tc(MIN.) = 40.92
SUBAREA AREA(ACRES) = 238.62 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 723.33 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 723.3 PEAK FLOW RATE(CFS) = 17.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.93 FLOW VELOCITY(FEET/SEC.) = 6.93
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10917.00 = 9695.79 FEET.

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*****
FLOW PROCESS FROM NODE 10917.00 TO NODE 10918.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1787.18 DOWNSTREAM(FEET) = 1279.22
CHANNEL LENGTH THRU SUBAREA(FEET) = 2918.23 CHANNEL SLOPE = 0.1741
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.485
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 150.63 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.91
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.20
AVERAGE FLOW DEPTH(FEET) = 0.98 TRAVEL TIME(MIN.) = 7.85
Tc(MIN.) = 48.76

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SUBAREA AREA(ACRES) = 150.63 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 873.96 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 874.0 PEAK FLOW RATE(CFS) = 17.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.98 FLOW VELOCITY(FEET/SEC.) = 6.20
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10918.00 = 12614.02 FEET.

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FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1279.22 DOWNSTREAM(FEET) = 1113.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1664.50 CHANNEL SLOPE = 0.0995
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.464
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 60.16 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.91
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.04
AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 5.50
Tc(MIN.) = 54.27
SUBAREA AREA(ACRES) = 60.16 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 934.12 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 934.1 PEAK FLOW RATE(CFS) = 17.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.09 FLOW VELOCITY(FEET/SEC.) = 5.04
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

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*****
FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 54.27
RAINFALL INTENSITY(INCH/HR) = 0.46
AREA-AVERAGED Fm(INCH/HR) = 0.60

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AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 934.12  
 TOTAL STREAM AREA (ACRES) = 934.12  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 17.91

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.95	43.28	0.516	0.60 (0.60)	1.00	707.7	10900.00
2	17.91	54.27	0.464	0.60 (0.60)	1.00	934.1	10910.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	40.82	43.28	0.516	0.60 (0.60)	1.00	1452.7	10900.00
2	40.35	54.27	0.464	0.60 (0.60)	1.00	1641.8	10910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 40.82 Tc (MIN.) = 43.28  
 EFFECTIVE AREA (ACRES) = 1452.73 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1641.8  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1113.60 DOWNSTREAM (FEET) = 961.06  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2282.16 CHANNEL SLOPE = 0.0668  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.477

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	185.67	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 40.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.32

AVERAGE FLOW DEPTH (FEET) = 1.60 TRAVEL TIME (MIN.) = 7.15

Tc (MIN.) = 50.43

SUBAREA AREA (ACRES) = 185.67 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 1638.40 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 1827.5 PEAK FLOW RATE (CFS) = 40.82

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.60 FLOW VELOCITY (FEET/SEC.) = 5.32

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1827.5 TC (MIN.) = 50.43

EFFECTIVE AREA (ACRES) = 1638.40 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 40.82

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	40.82	50.43	0.477	0.60 (0.60)	1.00	1638.4	10900.00
2	40.35	61.43	0.442	0.60 (0.60)	1.00	1827.5	10910.00

=====

END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 2005.09 DOWNSTREAM(FEET) = 1450.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.43 CHANNEL SLOPE = 0.5763  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.192

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.53	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.90  
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 2.03  
Tc(MIN.) = 12.42  
SUBAREA AREA(ACRES) = 16.53 SUBAREA RUNOFF(CFS) = 8.80  
EFFECTIVE AREA(ACRES) = 21.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) = 11.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 8.67  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11003.00 = 1900.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1450.44 DOWNSTREAM(FEET) = 939.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1351.71 CHANNEL SLOPE = 0.3779  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.008

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.99	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24  
AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 2.73  
Tc(MIN.) = 15.15  
SUBAREA AREA(ACRES) = 30.99 SUBAREA RUNOFF(CFS) = 11.38  
EFFECTIVE AREA(ACRES) = 52.69 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 52.7 PEAK FLOW RATE(CFS) = 19.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 8.47  
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S8.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	264.36	42.61	0.60( 0.60)	1.00	2940.1	10850.00
2	238.31	49.01	0.60( 0.60)	1.00	3349.6	10800.00
3	219.30	56.69	0.60( 0.60)	1.00	4004.9	10830.00
4	160.08	66.44	0.60( 0.60)	1.00	4567.4	10630.00
5	132.65	96.80	0.60( 0.60)	1.00	7056.9	10600.00
6	155.01	115.00	0.60( 0.60)	1.00	8942.5	10500.00
7	159.11	125.22	0.60( 0.60)	1.00	9881.4	10710.00
8	156.59	132.73	0.60( 0.60)	1.00	10403.0	10410.00
9	149.71	152.91	0.60( 0.60)	1.00	11617.2	10700.00
10	152.62	170.25	0.60( 0.60)	1.00	12632.2	10200.00
11	152.59	170.52	0.60( 0.60)	1.00	12645.3	10400.00
12	150.64	187.84	0.60( 0.60)	1.00	13375.5	10320.00
13	149.36	192.59	0.60( 0.60)	1.00	13522.5	10300.00
14	143.00	209.97	0.60( 0.60)	1.00	13792.9	10210.00
15	120.39	318.50	0.60( 0.60)	1.00	14771.7	10100.00

TOTAL AREA(ACRES) = 14771.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: S9.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	40.82	50.43	0.60( 0.60)	1.00	1638.4	10900.00
2	40.35	61.43	0.60( 0.60)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	40.82	50.43	0.60( 0.60)	1.00	1638.4	10900.00
2	40.35	61.43	0.60( 0.60)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\*\*\*\*  
 \*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	40.82	50.43	0.472	0.60 ( 0.60)	1.00	1638.4	10900.00
2	40.35	61.43	0.436	0.60 ( 0.60)	1.00	1827.5	10910.00

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	264.36	42.61	0.515	0.60 ( 0.60)	1.00	2940.1	10850.00
2	238.31	49.01	0.479	0.60 ( 0.60)	1.00	3349.6	10800.00
3	219.30	56.69	0.450	0.60 ( 0.60)	1.00	4004.9	10830.00
4	160.08	66.44	0.426	0.60 ( 0.60)	1.00	4567.4	10630.00
5	132.65	96.80	0.370	0.60 ( 0.60)	1.00	7056.9	10600.00
6	155.01	115.00	0.344	0.60 ( 0.60)	1.00	8942.5	10500.00
7	159.11	125.22	0.333	0.60 ( 0.60)	1.00	9881.4	10710.00
8	156.59	132.73	0.326	0.60 ( 0.60)	1.00	10403.0	10410.00
9	149.71	152.91	0.309	0.60 ( 0.60)	1.00	11617.2	10700.00
10	152.62	170.25	0.294	0.60 ( 0.60)	1.00	12632.2	10200.00
11	152.59	170.52	0.294	0.60 ( 0.60)	1.00	12645.3	10400.00
12	150.64	187.84	0.283	0.60 ( 0.60)	1.00	13375.5	10320.00
13	149.36	192.59	0.281	0.60 ( 0.60)	1.00	13522.5	10300.00
14	143.00	209.97	0.275	0.60 ( 0.60)	1.00	13792.9	10210.00
15	120.39	318.50	0.234	0.60 ( 0.60)	1.00	14771.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	302.04	42.61	0.515	0.60 ( 0.60)	1.00	4324.5	10850.00
2	278.58	49.01	0.479	0.60 ( 0.60)	1.00	4941.9	10800.00
3	275.62	50.43	0.472	0.60 ( 0.60)	1.00	5109.1	10900.00
4	259.85	56.69	0.450	0.60 ( 0.60)	1.00	5750.8	10830.00
5	230.85	61.43	0.436	0.60 ( 0.60)	1.00	6105.9	10910.00
6	199.52	66.44	0.426	0.60 ( 0.60)	1.00	6394.9	10630.00
7	166.91	96.80	0.370	0.60 ( 0.60)	1.00	8884.4	10600.00
8	186.85	115.00	0.344	0.60 ( 0.60)	1.00	10770.0	10500.00
9	189.88	125.22	0.333	0.60 ( 0.60)	1.00	11708.9	10710.00
10	186.76	132.73	0.326	0.60 ( 0.60)	1.00	12230.5	10410.00
11	178.30	152.91	0.309	0.60 ( 0.60)	1.00	13444.7	10700.00
12	179.84	170.25	0.294	0.60 ( 0.60)	1.00	14459.7	10200.00
13	179.79	170.52	0.294	0.60 ( 0.60)	1.00	14472.8	10400.00
14	176.82	187.84	0.283	0.60 ( 0.60)	1.00	15203.0	10320.00
15	175.38	192.59	0.281	0.60 ( 0.60)	1.00	15350.0	10300.00
16	168.41	209.97	0.275	0.60 ( 0.60)	1.00	15620.4	10210.00
17	142.01	318.50	0.234	0.60 ( 0.60)	1.00	16599.2	10100.00

TOTAL AREA (ACRES) = 16599.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 302.04 Tc (MIN.) = 42.613  
 EFFECTIVE AREA (ACRES) = 4324.50 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 16599.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 961.06 DOWNSTREAM (FEET) = 939.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 601.65 CHANNEL SLOPE = 0.0356  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.508

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.29 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 302.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.95  
 AVERAGE FLOW DEPTH (FEET) = 3.56 TRAVEL TIME (MIN.) = 1.26  
 Tc (MIN.) = 43.87  
 SUBAREA AREA (ACRES) = 18.29 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 4342.79 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 16617.5 PEAK FLOW RATE (CFS) = 302.04  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.56 FLOW VELOCITY (FEET/SEC.) = 7.95  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	302.04	43.87	0.508	0.60 ( 0.60)	1.00	4342.8	10850.00
2	278.58	50.30	0.472	0.60 ( 0.60)	1.00	4960.1	10800.00
3	275.62	51.72	0.467	0.60 ( 0.60)	1.00	5127.4	10900.00
4	259.85	58.00	0.446	0.60 ( 0.60)	1.00	5769.1	10830.00
5	230.85	62.78	0.434	0.60 ( 0.60)	1.00	6124.2	10910.00
6	199.52	67.84	0.424	0.60 ( 0.60)	1.00	6413.2	10630.00
7	166.91	98.26	0.368	0.60 ( 0.60)	1.00	8902.7	10600.00
8	186.85	116.43	0.342	0.60 ( 0.60)	1.00	10788.2	10500.00
9	189.88	126.63	0.331	0.60 ( 0.60)	1.00	11727.2	10710.00
10	186.76	134.15	0.325	0.60 ( 0.60)	1.00	12248.8	10410.00
11	178.30	154.35	0.308	0.60 ( 0.60)	1.00	13463.0	10700.00
12	179.84	171.69	0.293	0.60 ( 0.60)	1.00	14478.0	10200.00
13	179.79	171.96	0.293	0.60 ( 0.60)	1.00	14491.1	10400.00
14	176.82	189.28	0.282	0.60 ( 0.60)	1.00	15221.2	10320.00

15 175.38 194.04 0.281 0.60( 0.60) 1.00 15368.3 10300.00  
 16 168.41 211.42 0.274 0.60( 0.60) 1.00 15638.7 10210.00  
 17 142.01 320.02 0.233 0.60( 0.60) 1.00 16617.5 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.35	15.15	1.008	0.60( 0.60)	1.00	52.7	11000.00

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	226.34	15.15	1.008	0.60( 0.60)	1.00	1552.4	11000.00
2	302.04	43.87	0.508	0.60( 0.60)	1.00	4395.5	10850.00
3	278.58	50.30	0.472	0.60( 0.60)	1.00	5012.8	10800.00
4	275.62	51.72	0.467	0.60( 0.60)	1.00	5180.1	10900.00
5	259.85	58.00	0.446	0.60( 0.60)	1.00	5821.8	10830.00
6	230.85	62.78	0.434	0.60( 0.60)	1.00	6176.9	10910.00
7	199.52	67.84	0.424	0.60( 0.60)	1.00	6465.9	10630.00
8	166.91	98.26	0.368	0.60( 0.60)	1.00	8955.4	10600.00
9	186.85	116.43	0.342	0.60( 0.60)	1.00	10840.9	10500.00
10	189.88	126.63	0.331	0.60( 0.60)	1.00	11779.9	10710.00
11	186.76	134.15	0.325	0.60( 0.60)	1.00	12301.5	10410.00
12	178.30	154.35	0.308	0.60( 0.60)	1.00	13515.7	10700.00
13	179.84	171.69	0.293	0.60( 0.60)	1.00	14530.7	10200.00
14	179.79	171.96	0.293	0.60( 0.60)	1.00	14543.8	10400.00
15	176.82	189.28	0.282	0.60( 0.60)	1.00	15273.9	10320.00
16	175.38	194.04	0.281	0.60( 0.60)	1.00	15421.0	10300.00
17	168.41	211.42	0.274	0.60( 0.60)	1.00	15691.4	10210.00
18	142.01	320.02	0.233	0.60( 0.60)	1.00	16670.2	10100.00

TOTAL AREA(ACRES) = 16670.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 302.04 Tc(MIN.) = 43.874  
 EFFECTIVE AREA(ACRES) = 4395.48 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 16670.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11020.00 TO NODE 11021.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 939.63 DOWNSTREAM(FEET) = 865.22  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2876.19 CHANNEL SLOPE = 0.0259  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.471  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	191.02	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 302.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.05  
 AVERAGE FLOW DEPTH(FEET) = 3.78 TRAVEL TIME(MIN.) = 6.80  
 Tc(MIN.) = 50.68  
 SUBAREA AREA(ACRES) = 191.02 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 4586.50 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 16861.2 PEAK FLOW RATE(CFS) = 302.04  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.78 FLOW VELOCITY(FEET/SEC.) = 7.05  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11021.00 = 61764.91 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11021.00 TO NODE 11022.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 865.22 DOWNSTREAM(FEET) = 752.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2892.47 CHANNEL SLOPE = 0.0389  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.451

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	320.06	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 302.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.22  
 AVERAGE FLOW DEPTH(FEET) = 3.50 TRAVEL TIME(MIN.) = 5.86  
 Tc(MIN.) = 56.54  
 SUBAREA AREA(ACRES) = 320.06 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 4906.56 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 17181.2 PEAK FLOW RATE(CFS) = 302.04  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.50 FLOW VELOCITY(FEET/SEC.) = 8.22  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11022.00 = 64657.38 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11022.00 TO NODE 11023.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<



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ELEVATION DATA: UPSTREAM(FEET) = 752.60 DOWNSTREAM(FEET) = 737.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.15 CHANNEL SLOPE = 0.0081
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.432
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 226.98 0.60 0.986 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 302.66
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.56
AVERAGE FLOW DEPTH(FEET) = 4.70 TRAVEL TIME(MIN.) = 6.81
Tc(MIN.) = 63.35
SUBAREA AREA(ACRES) = 226.98 SUBAREA RUNOFF(CFS) = 1.24
EFFECTIVE AREA(ACRES) = 5133.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 17408.2 PEAK FLOW RATE(CFS) = 302.04
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.70 FLOW VELOCITY(FEET/SEC.) = 4.56
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11023.00 = 66521.52 FEET.

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FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 737.50 DOWNSTREAM(FEET) = 678.93
CHANNEL LENGTH THRU SUBAREA(FEET) = 2632.50 CHANNEL SLOPE = 0.0222
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.419
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 124.84 0.60 0.992 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 302.23
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.66
AVERAGE FLOW DEPTH(FEET) = 3.89 TRAVEL TIME(MIN.) = 6.58
Tc(MIN.) = 69.93
SUBAREA AREA(ACRES) = 124.84 SUBAREA RUNOFF(CFS) = 0.38
EFFECTIVE AREA(ACRES) = 5258.38 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

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TOTAL AREA(ACRES) = 17533.1 PEAK FLOW RATE(CFS) = 302.04
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.89 FLOW VELOCITY(FEET/SEC.) = 6.67
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

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END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 17533.1 TC(MIN.) = 69.93
EFFECTIVE AREA(ACRES) = 5258.38 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999
PEAK FLOW RATE(CFS) = 302.04

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.84	42.56	0.515	0.60( 0.60)	1.00	2415.3	11000.00
2	302.04	69.93	0.419	0.60( 0.60)	1.00	5258.4	10850.00
3	278.58	76.86	0.406	0.60( 0.60)	1.00	5875.7	10800.00
4	275.62	78.38	0.403	0.60( 0.60)	1.00	6043.0	10900.00
5	259.85	85.05	0.390	0.60( 0.60)	1.00	6684.7	10830.00
6	230.85	90.63	0.379	0.60( 0.60)	1.00	7039.8	10910.00
7	199.52	96.73	0.370	0.60( 0.60)	1.00	7328.8	10630.00
8	166.91	128.46	0.330	0.60( 0.60)	1.00	9818.3	10600.00
9	186.85	145.80	0.315	0.60( 0.60)	1.00	11703.8	10500.00
10	189.88	155.90	0.306	0.60( 0.60)	1.00	12642.8	10710.00
11	186.76	163.55	0.300	0.60( 0.60)	1.00	13164.4	10410.00
12	178.30	184.07	0.284	0.60( 0.60)	1.00	14378.6	10700.00
13	179.84	201.34	0.278	0.60( 0.60)	1.00	15393.6	10200.00
14	179.79	201.61	0.278	0.60( 0.60)	1.00	15406.7	10400.00
15	176.82	219.07	0.271	0.60( 0.60)	1.00	16136.8	10320.00
16	175.38	223.88	0.269	0.60( 0.60)	1.00	16283.9	10300.00
17	168.41	241.55	0.263	0.60( 0.60)	1.00	16554.3	10210.00
18	142.01	351.47	0.221	0.60( 0.60)	1.00	17533.1	10100.00

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END OF RATIONAL METHOD ANALYSIS

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ELEVATION DATA: UPSTREAM(FEET) = 3876.52 DOWNSTREAM(FEET) = 3625.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1902.80 CHANNEL SLOPE = 0.1317  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.767

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.64	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.73

AVERAGE FLOW DEPTH(FEET) = 1.07 TRAVEL TIME(MIN.) = 5.53

Tc(MIN.) = 21.94

SUBAREA AREA(ACRES) = 75.64 SUBAREA RUNOFF(CFS) = 11.38

EFFECTIVE AREA(ACRES) = 118.28 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 118.3 PEAK FLOW RATE(CFS) = 17.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 5.56

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11104.00 = 3782.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11104.00 TO NODE 11105.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3625.86 DOWNSTREAM(FEET) = 3222.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2898.91 CHANNEL SLOPE = 0.1391  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.610

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	167.73	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.48

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.83

AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 8.29

Tc(MIN.) = 30.23

SUBAREA AREA(ACRES) = 167.73 SUBAREA RUNOFF(CFS) = 1.54

EFFECTIVE AREA(ACRES) = 286.01 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 286.0 PEAK FLOW RATE(CFS) = 17.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.02 FLOW VELOCITY(FEET/SEC.) = 5.71

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11105.00 = 6681.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3222.66 DOWNSTREAM(FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2480.35 CHANNEL SLOPE = 0.1089  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.545

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	252.33	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.17

AVERAGE FLOW DEPTH(FEET) = 1.07 TRAVEL TIME(MIN.) = 7.99

Tc(MIN.) = 38.23

SUBAREA AREA(ACRES) = 252.33 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 538.34 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 538.3 PEAK FLOW RATE(CFS) = 17.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.07 FLOW VELOCITY(FEET/SEC.) = 5.17

LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11121.00 = 9162.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 38.23

RAINFALL INTENSITY(INCH/HR) = 0.54

AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 538.34

TOTAL STREAM AREA(ACRES) = 538.34

PEAK FLOW RATE(CFS) AT CONFLUENCE = 17.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11111.00 TO NODE 11112.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 329.73

ELEVATION DATA: UPSTREAM(FEET) = 4094.14 DOWNSTREAM(FEET) = 3956.68

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.552  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.554  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 1.49 0.60 1.000 0 8.55  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 1.28  
 TOTAL AREA(ACRES) = 1.49 PEAK FLOW RATE(CFS) = 1.28

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11112.00 TO NODE 11113.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3956.68 DOWNSTREAM(FEET) = 3752.68  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 665.35 CHANNEL SLOPE = 0.3066  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.316  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 9.55 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.38  
 AVERAGE FLOW DEPTH(FEET) = 0.52 TRAVEL TIME(MIN.) = 2.06  
 Tc(MIN.) = 10.61  
 SUBAREA AREA(ACRES) = 9.55 SUBAREA RUNOFF(CFS) = 6.15  
 EFFECTIVE AREA(ACRES) = 11.04 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 11.0 PEAK FLOW RATE(CFS) = 7.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 6.11  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11113.00 = 995.08 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11113.00 TO NODE 11114.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3752.68 DOWNSTREAM(FEET) = 3541.57  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 955.83 CHANNEL SLOPE = 0.2209  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.143  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 26.09 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.34  
 AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 2.51  
 Tc(MIN.) = 13.13  
 SUBAREA AREA(ACRES) = 26.09 SUBAREA RUNOFF(CFS) = 12.75  
 EFFECTIVE AREA(ACRES) = 37.13 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.1 PEAK FLOW RATE(CFS) = 18.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.94 FLOW VELOCITY(FEET/SEC.) = 6.80  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11114.00 = 1950.91 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11114.00 TO NODE 11115.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3541.57 DOWNSTREAM(FEET) = 3320.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.90 CHANNEL SLOPE = 0.1172  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.871  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.13 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.77  
 AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 5.45  
 Tc(MIN.) = 18.58  
 SUBAREA AREA(ACRES) = 51.13 SUBAREA RUNOFF(CFS) = 12.46  
 EFFECTIVE AREA(ACRES) = 88.26 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 88.3 PEAK FLOW RATE(CFS) = 21.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.13 FLOW VELOCITY(FEET/SEC.) = 5.60  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11115.00 = 3840.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11115.00 TO NODE 11116.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3320.00 DOWNSTREAM(FEET) = 3162.36  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.45 CHANNEL SLOPE = 0.0837  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.709  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 193.52 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 32.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.45  
 AVERAGE FLOW DEPTH (FEET) = 1.40 TRAVEL TIME (MIN.) = 5.76  
 Tc (MIN.) = 24.34  
 SUBAREA AREA (ACRES) = 193.52 SUBAREA RUNOFF (CFS) = 19.00  
 EFFECTIVE AREA (ACRES) = 281.78 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 281.8 PEAK FLOW RATE (CFS) = 27.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.32 FLOW VELOCITY (FEET/SEC.) = 5.25  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11116.00 = 5724.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11116.00 TO NODE 11117.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3162.36 DOWNSTREAM (FEET) = 3062.66  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1903.90 CHANNEL SLOPE = 0.0524  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.600

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.47	0.60	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.42  
 AVERAGE FLOW DEPTH (FEET) = 1.45 TRAVEL TIME (MIN.) = 7.17  
 Tc (MIN.) = 31.51  
 SUBAREA AREA (ACRES) = 112.47 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 394.25 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 394.2 PEAK FLOW RATE (CFS) = 27.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.45 FLOW VELOCITY (FEET/SEC.) = 4.41  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11117.00 = 7628.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3062.66 DOWNSTREAM (FEET) = 2952.48

CHANNEL LENGTH THRU SUBAREA (FEET) = 1878.40 CHANNEL SLOPE = 0.0587  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.544

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.63	0.60	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.60  
 AVERAGE FLOW DEPTH (FEET) = 1.42 TRAVEL TIME (MIN.) = 6.81  
 Tc (MIN.) = 38.32

SUBAREA AREA (ACRES) = 51.63 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 445.88 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 445.9 PEAK FLOW RATE (CFS) = 27.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.42 FLOW VELOCITY (FEET/SEC.) = 4.60  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 38.32  
 RAINFALL INTENSITY (INCH/HR) = 0.54  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 445.88  
 TOTAL STREAM AREA (ACRES) = 445.88  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 27.66

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.79	38.23	0.545	0.60 (0.60)	1.00	538.3	11101.00
2	27.66	38.32	0.544	0.60 (0.60)	1.00	445.9	11111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.43	38.23	0.545	0.60 (0.60)	1.00	983.1	11101.00

2 45.43 38.32 0.544 0.60( 0.60) 1.00 984.2 11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 45.43 Tc(MIN.) = 38.32
EFFECTIVE AREA(ACRES) = 984.22 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 984.2
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11121.00 TO NODE 11122.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2952.48 DOWNSTREAM(FEET) = 2639.37
CHANNEL LENGTH THRU SUBAREA(FEET) = 2687.92 CHANNEL SLOPE = 0.1165
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.502

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 170.98 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.73

AVERAGE FLOW DEPTH(FEET) = 1.50 TRAVEL TIME(MIN.) = 6.66

Tc(MIN.) = 44.98

SUBAREA AREA(ACRES) = 170.98 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 1155.20 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1155.2 PEAK FLOW RATE(CFS) = 45.43

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 6.73

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11122.00 = 12194.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2639.37 DOWNSTREAM(FEET) = 1954.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 3696.53 CHANNEL SLOPE = 0.1854
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.464

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 114.61 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.00

AVERAGE FLOW DEPTH(FEET) = 1.38 TRAVEL TIME(MIN.) = 7.70

Tc(MIN.) = 52.69

SUBAREA AREA(ACRES) = 114.61 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 1269.81 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1269.8 PEAK FLOW RATE(CFS) = 45.43

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 8.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 52.69

RAINFALL INTENSITY(INCH/HR) = 0.46

AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1269.81

TOTAL STREAM AREA(ACRES) = 1269.81

PEAK FLOW RATE(CFS) AT CONFLUENCE = 45.43

\*\*\*\*\*

FLOW PROCESS FROM NODE 11130.00 TO NODE 11131.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 259.85

ELEVATION DATA: UPSTREAM(FEET) = 3923.93 DOWNSTREAM(FEET) = 3765.35

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.204

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.737

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)

NATURAL FAIR COVER

"CHAPARRAL,NARROWLEAF" - 1.27 0.60 1.000 0 7.20

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 1.30

TOTAL AREA(ACRES) = 1.27 PEAK FLOW RATE(CFS) = 1.30

\*\*\*\*\*

FLOW PROCESS FROM NODE 11131.00 TO NODE 11132.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3765.35 DOWNSTREAM(FEET) = 3414.86
CHANNEL LENGTH THRU SUBAREA(FEET) = 674.05 CHANNEL SLOPE = 0.5200
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.500
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 6.52 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.96
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.43
AVERAGE FLOW DEPTH(FEET) = 0.45 TRAVEL TIME(MIN.) = 1.75
Tc(MIN.) = 8.95
SUBAREA AREA(ACRES) = 6.52 SUBAREA RUNOFF(CFS) = 5.28
EFFECTIVE AREA(ACRES) = 7.79 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 6.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 7.25
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11132.00 = 933.90 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11132.00 TO NODE 11133.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3414.86 DOWNSTREAM(FEET) = 2699.51
CHANNEL LENGTH THRU SUBAREA(FEET) = 1813.44 CHANNEL SLOPE = 0.3945
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.183
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 41.63 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.55
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.40
AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 3.60
Tc(MIN.) = 12.55
SUBAREA AREA(ACRES) = 41.63 SUBAREA RUNOFF(CFS) = 21.83
EFFECTIVE AREA(ACRES) = 49.42 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 49.4 PEAK FLOW RATE(CFS) = 25.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 9.26
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11133.00 = 2747.34 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11133.00 TO NODE 11134.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2699.51 DOWNSTREAM(FEET) = 2464.06
CHANNEL LENGTH THRU SUBAREA(FEET) = 1053.33 CHANNEL SLOPE = 0.2235
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.049
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 142.85 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55.05
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.05
AVERAGE FLOW DEPTH(FEET) = 1.42 TRAVEL TIME(MIN.) = 1.94
Tc(MIN.) = 14.49
SUBAREA AREA(ACRES) = 142.85 SUBAREA RUNOFF(CFS) = 57.77
EFFECTIVE AREA(ACRES) = 192.27 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 192.3 PEAK FLOW RATE(CFS) = 77.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.62 FLOW VELOCITY(FEET/SEC.) = 9.85
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11134.00 = 3800.67 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2464.06 DOWNSTREAM(FEET) = 1954.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 1291.98 CHANNEL SLOPE = 0.3946
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.965
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 24.58 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.79
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.37
AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 1.74
Tc(MIN.) = 16.23
SUBAREA AREA(ACRES) = 24.58 SUBAREA RUNOFF(CFS) = 8.07
EFFECTIVE AREA(ACRES) = 216.85 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 216.9 PEAK FLOW RATE(CFS) = 77.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.46 FLOW VELOCITY(FEET/SEC.) = 12.16  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11141.00 = 5092.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 16.23  
RAINFALL INTENSITY(INCH/HR) = 0.96  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 216.85  
TOTAL STREAM AREA(ACRES) = 216.85  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 77.75

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.43	52.59	0.464	0.60( 0.60)	1.00	1268.7	11101.00
1	45.43	52.69	0.464	0.60( 0.60)	1.00	1269.8	11111.00
2	77.75	16.23	0.965	0.60( 0.60)	1.00	216.9	11130.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.89	16.23	0.965	0.60( 0.60)	1.00	608.4	11130.00
2	45.43	52.59	0.464	0.60( 0.60)	1.00	1485.6	11101.00
3	45.43	52.69	0.464	0.60( 0.60)	1.00	1486.7	11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 106.89 Tc(MIN.) = 16.23  
EFFECTIVE AREA(ACRES) = 608.38 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1486.7  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1486.7 TC(MIN.) = 16.23  
EFFECTIVE AREA(ACRES) = 608.38 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 106.89

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.89	16.23	0.965	0.60( 0.60)	1.00	608.4	11130.00
2	45.43	52.59	0.464	0.60( 0.60)	1.00	1485.6	11101.00

3 45.43 52.69 0.464 0.60( 0.60) 1.00 1486.7 11111.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S12.DAT  
TIME/DATE OF STUDY: 10:40 04/01/2013  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.036
- 2) 10.00; 1.358
- 3) 15.00; 1.014
- 4) 20.00; 0.814
- 5) 25.00; 0.693
- 6) 30.00; 0.612
- 7) 40.00; 0.530
- 8) 50.00; 0.473
- 9) 60.00; 0.439
- 10) 90.00; 0.380
- 11) 120.00; 0.337
- 12) 180.00; 0.286
- 13) 360.00; 0.218
- 14) 1440.00; 0.098

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	PARK- HEIGHT (FT)	CURB WIDTH (FT)	GUTTER-GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018	0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 11220.00 TO NODE 11221.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 762.39  
ELEVATION DATA: UPSTREAM(FEET) = 3797.72 DOWNSTREAM(FEET) = 3296.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.919  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.295

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.02	0.60	1.000	0	10.92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.14  
TOTAL AREA(ACRES) = 5.02 PEAK FLOW RATE(CFS) = 3.14

\*\*\*\*\*

FLOW PROCESS FROM NODE 11221.00 TO NODE 11223.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3296.86 DOWNSTREAM(FEET) = 2738.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 912.82 CHANNEL SLOPE = 0.6112  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.173

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.44	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.60  
AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 1.77  
Tc(MIN.) = 12.69  
SUBAREA AREA(ACRES) = 26.44 SUBAREA RUNOFF(CFS) = 13.64  
EFFECTIVE AREA(ACRES) = 31.46 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31.5 PEAK FLOW RATE(CFS) = 16.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 9.75  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11223.00 = 1675.21 FEET.

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FLOW PROCESS FROM NODE 11223.00 TO NODE 11224.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2738.96 DOWNSTREAM(FEET) = 2370.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.79 CHANNEL SLOPE = 0.3843  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.060

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.44	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.71  
AVERAGE FLOW DEPTH(FEET) = 1.07 TRAVEL TIME(MIN.) = 1.65  
Tc(MIN.) = 14.33  
SUBAREA AREA(ACRES) = 82.44 SUBAREA RUNOFF(CFS) = 34.13  
EFFECTIVE AREA(ACRES) = 113.90 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 113.9 PEAK FLOW RATE(CFS) = 47.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 10.63  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11224.00 = 2635.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2370.12 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.40 CHANNEL SLOPE = 0.2591  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.885

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55.20  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.50  
AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 3.90  
Tc(MIN.) = 18.23  
SUBAREA AREA(ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 15.88  
EFFECTIVE AREA(ACRES) = 175.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 175.8 PEAK FLOW RATE(CFS) = 47.15  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.31 FLOW VELOCITY(FEET/SEC.) = 9.17  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S11.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.89	16.23	0.60( 0.60)	1.00	608.4	11130.00
2	45.43	52.59	0.60( 0.60)	1.00	1485.6	11101.00
3	45.43	52.69	0.60( 0.60)	1.00	1486.7	11111.00
TOTAL AREA(ACRES) =						1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	106.89	16.23	0.60( 0.60)	1.00	608.4	11130.00
2	45.43	52.59	0.60( 0.60)	1.00	1485.6	11101.00
3	45.43	52.69	0.60( 0.60)	1.00	1486.7	11111.00
TOTAL AREA(ACRES) =						1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11231.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1954.20 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1435.64 CHANNEL SLOPE = 0.1116  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.851

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	89.78	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.39  
AVERAGE FLOW DEPTH(FEET) = 2.16 TRAVEL TIME(MIN.) = 2.85  
Tc(MIN.) = 19.08  
SUBAREA AREA(ACRES) = 89.78 SUBAREA RUNOFF(CFS) = 20.27  
EFFECTIVE AREA(ACRES) = 698.16 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1576.4 PEAK FLOW RATE(CFS) = 157.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.41 FLOW VELOCITY(FEET/SEC.) = 9.06  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	157.61	19.08	0.851	0.60( 0.60)	1.00	698.2	11130.00
2	45.43	56.21	0.452	0.60( 0.60)	1.00	1575.3	11101.00
3	45.43	56.31	0.452	0.60( 0.60)	1.00	1576.4	11111.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	47.15	18.23	0.885	0.60( 0.60)	1.00	175.8	11220.00

LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	204.77	18.23	0.885	0.60( 0.60)	1.00	842.9	11220.00
2	199.14	19.08	0.851	0.60( 0.60)	1.00	874.0	11130.00
3	45.43	56.21	0.452	0.60( 0.60)	1.00	1751.2	11101.00
4	45.43	56.31	0.452	0.60( 0.60)	1.00	1752.3	11111.00

TOTAL AREA (ACRES) = 1752.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 204.77 Tc(MIN.) = 18.232  
EFFECTIVE AREA(ACRES) = 842.88 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1752.3  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1794.01 DOWNSTREAM(FEET) = 1680.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1933.84 CHANNEL SLOPE = 0.0585  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.754  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 59.78 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 208.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.62

AVERAGE FLOW DEPTH(FEET) = 3.02 TRAVEL TIME(MIN.) = 4.23

Tc(MIN.) = 22.46  
SUBAREA AREA(ACRES) = 59.78 SUBAREA RUNOFF(CFS) = 8.31  
EFFECTIVE AREA(ACRES) = 902.66 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1812.1 PEAK FLOW RATE(CFS) = 204.77  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.00 FLOW VELOCITY(FEET/SEC.) = 7.58  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 22.46  
RAINFALL INTENSITY(INCH/HR) = 0.75  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 902.66  
TOTAL STREAM AREA(ACRES) = 1812.05  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 204.77

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11201.00 TO NODE 11202.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 986.34  
ELEVATION DATA: UPSTREAM(FEET) = 3383.22 DOWNSTREAM(FEET) = 3248.87

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.343  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
PUBLIC PARK - 8.54 0.60 1.000 0 11.34  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 5.12  
TOTAL AREA(ACRES) = 8.54 PEAK FLOW RATE(CFS) = 5.12

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11202.00 TO NODE 11203.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3248.87 DOWNSTREAM(FEET) = 3198.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 922.69 CHANNEL SLOPE = 0.0550  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.981  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 24.42 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.44  
 AVERAGE FLOW DEPTH (FEET) = 0.96 TRAVEL TIME (MIN.) = 4.48  
 Tc (MIN.) = 15.82  
 SUBAREA AREA (ACRES) = 24.42 SUBAREA RUNOFF (CFS) = 8.38  
 EFFECTIVE AREA (ACRES) = 32.96 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 33.0 PEAK FLOW RATE (CFS) = 11.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.03 FLOW VELOCITY (FEET/SEC.) = 3.59  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11203.00 = 1909.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11203.00 TO NODE 11204.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 3198.08 DOWNSTREAM (FEET) = 3062.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1941.08 CHANNEL SLOPE = 0.0699  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.725  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.67 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 13.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.12  
 AVERAGE FLOW DEPTH (FEET) = 1.05 TRAVEL TIME (MIN.) = 7.85  
 Tc (MIN.) = 23.67  
 SUBAREA AREA (ACRES) = 37.67 SUBAREA RUNOFF (CFS) = 4.25  
 EFFECTIVE AREA (ACRES) = 70.63 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 70.6 PEAK FLOW RATE (CFS) = 11.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.98 FLOW VELOCITY (FEET/SEC.) = 3.93  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11204.00 = 3850.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 3062.48 DOWNSTREAM (FEET) = 2940.56  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1916.73 CHANNEL SLOPE = 0.0636  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.595  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 34.87 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 11.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.80  
 AVERAGE FLOW DEPTH (FEET) = 1.00 TRAVEL TIME (MIN.) = 8.41  
 Tc (MIN.) = 32.08  
 SUBAREA AREA (ACRES) = 34.87 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 105.50 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 105.5 PEAK FLOW RATE (CFS) = 11.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.00 FLOW VELOCITY (FEET/SEC.) = 3.80  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11205.00 = 5766.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11205.00 TO NODE 11206.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2940.56 DOWNSTREAM (FEET) = 2581.93  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2865.58 CHANNEL SLOPE = 0.1252  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.519  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 56.17 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 11.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.87  
 AVERAGE FLOW DEPTH (FEET) = 0.88 TRAVEL TIME (MIN.) = 9.81  
 Tc (MIN.) = 41.89  
 SUBAREA AREA (ACRES) = 56.17 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 161.67 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 161.7 PEAK FLOW RATE (CFS) = 11.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.98 FLOW VELOCITY (FEET/SEC.) = 3.93  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11204.00 = 3850.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 4.87  
LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11206.00 = 8632.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11206.00 TO NODE 11207.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.93 DOWNSTREAM(FEET) = 2317.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1985.44 CHANNEL SLOPE = 0.1333  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.482  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	546.87	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.02  
AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 6.59  
Tc(MIN.) = 48.49  
SUBAREA AREA(ACRES) = 546.87 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 708.54 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 708.5 PEAK FLOW RATE(CFS) = 11.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 5.02  
LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11207.00 = 10617.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2317.20 DOWNSTREAM(FEET) = 1680.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4085.95 CHANNEL SLOPE = 0.1557  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.436  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.75	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.29  
AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 12.86  
Tc(MIN.) = 61.35

SUBAREA AREA(ACRES) = 389.75 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1098.29 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1098.3 PEAK FLOW RATE(CFS) = 11.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 FLOW VELOCITY(FEET/SEC.) = 5.29  
LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11241.00 = 14703.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 61.35  
RAINFALL INTENSITY(INCH/HR) = 0.44  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 1098.29  
TOTAL STREAM AREA(ACRES) = 1098.29  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.31

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	204.77	22.46	0.754	0.60( 0.60)	1.00	902.7	11220.00
1	199.14	23.34	0.733	0.60( 0.60)	1.00	933.8	11130.00
1	45.43	62.41	0.434	0.60( 0.60)	1.00	1811.0	11101.00
1	45.43	62.50	0.434	0.60( 0.60)	1.00	1812.1	11111.00
2	11.31	61.35	0.436	0.60( 0.60)	1.00	1098.3	11201.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	211.93	22.46	0.754	0.60( 0.60)	1.00	1304.8	11220.00
2	206.37	23.34	0.733	0.60( 0.60)	1.00	1351.6	11130.00
3	60.90	61.35	0.436	0.60( 0.60)	1.00	2885.5	11201.00
4	56.69	62.41	0.434	0.60( 0.60)	1.00	2909.2	11101.00
5	56.68	62.50	0.434	0.60( 0.60)	1.00	2910.3	11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 211.93 Tc(MIN.) = 22.46

EFFECTIVE AREA(ACRES) = 1304.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2910.3  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11241.00 TO NODE 11242.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1680.94 DOWNSTREAM(FEET) = 1521.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1795.61 CHANNEL SLOPE = 0.0890  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.680

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	198.62	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 219.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.04  
AVERAGE FLOW DEPTH(FEET) = 2.84 TRAVEL TIME(MIN.) = 3.31  
Tc(MIN.) = 25.78

SUBAREA AREA(ACRES) = 198.62 SUBAREA RUNOFF(CFS) = 14.40  
EFFECTIVE AREA(ACRES) = 1503.45 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3109.0 PEAK FLOW RATE(CFS) = 211.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.81 FLOW VELOCITY(FEET/SEC.) = 8.94  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11242.00 = 21056.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1521.21 DOWNSTREAM(FEET) = 1343.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.33 CHANNEL SLOPE = 0.0797  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.611

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	95.39	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.59  
AVERAGE FLOW DEPTH(FEET) = 2.87 TRAVEL TIME(MIN.) = 4.32  
Tc(MIN.) = 30.09  
SUBAREA AREA(ACRES) = 95.39 SUBAREA RUNOFF(CFS) = 0.98

EFFECTIVE AREA(ACRES) = 1598.84 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3204.3 PEAK FLOW RATE(CFS) = 211.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.87 FLOW VELOCITY(FEET/SEC.) = 8.60  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 30.09  
RAINFALL INTENSITY(INCH/HR) = 0.61  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 1598.84  
TOTAL STREAM AREA(ACRES) = 3204.35  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 211.93

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11250.00 TO NODE 11251.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 982.50  
ELEVATION DATA: UPSTREAM(FEET) = 3806.44 DOWNSTREAM(FEET) = 3168.25

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.112  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.213  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	5.91	0.60	1.000	0	12.11

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.26  
TOTAL AREA(ACRES) = 5.91 PEAK FLOW RATE(CFS) = 3.26

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11251.00 TO NODE 11252.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3168.25 DOWNSTREAM(FEET) = 2683.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 925.62 CHANNEL SLOPE = 0.5240  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.064

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.73	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.13  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 2.16  
Tc(MIN.) = 14.28  
SUBAREA AREA(ACRES) = 13.73 SUBAREA RUNOFF(CFS) = 5.73  
EFFECTIVE AREA(ACRES) = 19.64 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 19.6 PEAK FLOW RATE(CFS) = 8.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 7.65  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11252.00 = 1908.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11252.00 TO NODE 11253.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2683.24 DOWNSTREAM(FEET) = 2334.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 944.66 CHANNEL SLOPE = 0.3694  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.966

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	55.67	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.16  
AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 1.93  
Tc(MIN.) = 16.20  
SUBAREA AREA(ACRES) = 55.67 SUBAREA RUNOFF(CFS) = 18.33  
EFFECTIVE AREA(ACRES) = 75.31 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 75.3 PEAK FLOW RATE(CFS) = 24.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 8.89  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11253.00 = 2852.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11253.00 TO NODE 11254.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2334.26 DOWNSTREAM(FEET) = 1768.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2293.59 CHANNEL SLOPE = 0.2468  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.799

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.43	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.69  
AVERAGE FLOW DEPTH(FEET) = 1.24 TRAVEL TIME(MIN.) = 4.40  
Tc(MIN.) = 20.60  
SUBAREA AREA(ACRES) = 165.43 SUBAREA RUNOFF(CFS) = 29.70  
EFFECTIVE AREA(ACRES) = 240.74 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 240.7 PEAK FLOW RATE(CFS) = 43.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.28 FLOW VELOCITY(FEET/SEC.) = 8.81  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11254.00 = 5146.37 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11254.00 TO NODE 11255.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1768.11 DOWNSTREAM(FEET) = 1506.97  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.59 CHANNEL SLOPE = 0.1376  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.696

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	194.55	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42  
AVERAGE FLOW DEPTH(FEET) = 1.53 TRAVEL TIME(MIN.) = 4.26  
Tc(MIN.) = 24.87  
SUBAREA AREA(ACRES) = 194.55 SUBAREA RUNOFF(CFS) = 16.86  
EFFECTIVE AREA(ACRES) = 435.29 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 435.3 PEAK FLOW RATE(CFS) = 43.23  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.42 FLOW VELOCITY(FEET/SEC.) = 7.11  
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11255.00 = 7043.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1506.97 DOWNSTREAM(FEET) = 1343.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 882.10 CHANNEL SLOPE = 0.1848  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.666

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	137.86	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.06

AVERAGE FLOW DEPTH(FEET) = 1.40 TRAVEL TIME(MIN.) = 1.82

Tc(MIN.) = 26.69

SUBAREA AREA(ACRES) = 137.86 SUBAREA RUNOFF(CFS) = 8.15

EFFECTIVE AREA(ACRES) = 573.15 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 573.1 PEAK FLOW RATE(CFS) = 43.23

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 7.93

LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11261.00 = 7926.06 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 26.69

RAINFALL INTENSITY(INCH/HR) = 0.67

AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 573.15

TOTAL STREAM AREA(ACRES) = 573.15

PEAK FLOW RATE(CFS) AT CONFLUENCE = 43.23

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	211.93	30.09	0.611	0.60( 0.60)	1.00	1598.8	11220.00
1	206.37	31.03	0.604	0.60( 0.60)	1.00	1645.6	11130.00
1	60.90	71.81	0.416	0.60( 0.60)	1.00	3179.5	11201.00
1	56.69	73.07	0.413	0.60( 0.60)	1.00	3203.3	11101.00
1	56.68	73.16	0.413	0.60( 0.60)	1.00	3204.3	11111.00
2	43.23	26.69	0.666	0.60( 0.60)	1.00	573.1	11250.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	211.93	30.09	0.611	0.60( 0.60)	1.00	1598.8	11220.00
2	43.23	26.69	0.666	0.60( 0.60)	1.00	573.1	11250.00

1	255.15	26.69	0.666	0.60( 0.60)	1.00	1991.5	11250.00
2	219.42	30.09	0.611	0.60( 0.60)	1.00	2172.0	11220.00
3	208.80	31.03	0.604	0.60( 0.60)	1.00	2218.8	11130.00
4	60.90	71.81	0.416	0.60( 0.60)	1.00	3752.6	11201.00
5	56.68	73.07	0.413	0.60( 0.60)	1.00	3776.4	11101.00
6	56.68	73.16	0.413	0.60( 0.60)	1.00	3777.5	11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 255.15 Tc(MIN.) = 26.69

EFFECTIVE AREA(ACRES) = 1991.45 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3777.5

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1343.95 DOWNSTREAM(FEET) = 1299.17

CHANNEL LENGTH THRU SUBAREA(FEET) = 889.38 CHANNEL SLOPE = 0.0503

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.634

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.65	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 256.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.57

AVERAGE FLOW DEPTH(FEET) = 3.36 TRAVEL TIME(MIN.) = 1.96

Tc(MIN.) = 28.65

SUBAREA AREA(ACRES) = 79.65 SUBAREA RUNOFF(CFS) = 2.44

EFFECTIVE AREA(ACRES) = 2071.10 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3857.1 PEAK FLOW RATE(CFS) = 255.15

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.35 FLOW VELOCITY(FEET/SEC.) = 7.57

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11310.00 = 24168.81 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3857.1 TC(MIN.) = 28.65

EFFECTIVE AREA(ACRES) = 2071.10 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 255.15

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	255.15	28.65	0.634	0.60( 0.60)	1.00	2071.1	11250.00
2	219.42	32.13	0.595	0.60( 0.60)	1.00	2251.6	11220.00
3	208.80	33.09	0.587	0.60( 0.60)	1.00	2298.4	11130.00
4	60.90	74.61	0.410	0.60( 0.60)	1.00	3832.3	11201.00







ELEVATION DATA: UPSTREAM(FEET) = 3150.57 DOWNSTREAM(FEET) = 2840.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 982.20 CHANNEL SLOPE = 0.3162  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.056  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.59	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.59  
 AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.49  
 Tc(MIN.) = 14.38  
 SUBAREA AREA(ACRES) = 9.59 SUBAREA RUNOFF(CFS) = 3.94  
 EFFECTIVE AREA(ACRES) = 23.07 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 23.1 PEAK FLOW RATE(CFS) = 9.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 6.61  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11302.00 = 1906.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11302.00 TO NODE 11303.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2840.04 DOWNSTREAM(FEET) = 2177.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.03 CHANNEL SLOPE = 0.3460  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.885  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.31	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.31  
 AVERAGE FLOW DEPTH(FEET) = 0.91 TRAVEL TIME(MIN.) = 3.84  
 Tc(MIN.) = 18.23  
 SUBAREA AREA(ACRES) = 84.31 SUBAREA RUNOFF(CFS) = 21.63  
 EFFECTIVE AREA(ACRES) = 107.38 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 107.4 PEAK FLOW RATE(CFS) = 27.55

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.01 FLOW VELOCITY(FEET/SEC.) = 8.97  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11303.00 = 3822.82 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11303.00 TO NODE 11304.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2177.16 DOWNSTREAM(FEET) = 1612.27  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2472.34 CHANNEL SLOPE = 0.2285  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.734  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	99.61	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.09  
 AVERAGE FLOW DEPTH(FEET) = 1.18 TRAVEL TIME(MIN.) = 5.10  
 Tc(MIN.) = 23.32  
 SUBAREA AREA(ACRES) = 99.61 SUBAREA RUNOFF(CFS) = 11.99  
 EFFECTIVE AREA(ACRES) = 206.99 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 207.0 PEAK FLOW RATE(CFS) = 27.55  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 7.65  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11304.00 = 6295.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1612.27 DOWNSTREAM(FEET) = 1222.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2432.96 CHANNEL SLOPE = 0.1604  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.623  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.86	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.75  
 AVERAGE FLOW DEPTH(FEET) = 1.18 TRAVEL TIME(MIN.) = 6.01  
 Tc(MIN.) = 29.33  
 SUBAREA AREA(ACRES) = 53.86 SUBAREA RUNOFF(CFS) = 1.11  
 EFFECTIVE AREA(ACRES) = 260.85 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 260.8 PEAK FLOW RATE(CFS) = 27.55  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 6.71  
 LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

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*****
FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 10
-----
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
=====
*****
FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 2 <<<<<
=====
PEAK FLOWRATE TABLE FILE NAME: S12.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:
  STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS) (MIN.) (INCH/HR)      (ACRES)      NODE
  1      255.15  28.65  0.60( 0.60)  1.00  2071.1  11250.00
  2      219.42  32.13  0.60( 0.60)  1.00  2251.6  11220.00
  3      208.80  33.09  0.60( 0.60)  1.00  2298.4  11130.00
  4      60.90   74.61  0.60( 0.60)  1.00  3832.3  11201.00
  5      56.68   75.91  0.60( 0.60)  1.00  3856.1  11101.00
  6      56.68   76.00  0.60( 0.60)  1.00  3857.1  11111.00
  TOTAL AREA (ACRES) =      3857.1

*****
FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 14.0
-----
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
=====
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS) (MIN.) (INCH/HR)      (ACRES)      NODE
  1      255.15  28.65  0.60( 0.60)  1.00  2071.1  11250.00
  2      219.42  32.13  0.60( 0.60)  1.00  2251.6  11220.00
  3      208.80  33.09  0.60( 0.60)  1.00  2298.4  11130.00
  4      60.90   74.61  0.60( 0.60)  1.00  3832.3  11201.00
  5      56.68   75.91  0.60( 0.60)  1.00  3856.1  11101.00
  6      56.68   76.00  0.60( 0.60)  1.00  3857.1  11111.00
  TOTAL AREA (ACRES) =      3857.1

*****
FLOW PROCESS FROM NODE 11310.00 TO NODE 11320.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1299.17  DOWNSTREAM(FEET) = 1222.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 1694.05  CHANNEL SLOPE = 0.0455
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.591
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
  LAND USE      GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
  USER-DEFINED      -      83.22      0.60  1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

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* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 255.15
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29
AVERAGE FLOW DEPTH(FEET) = 3.42  TRAVEL TIME(MIN.) = 3.87
Tc(MIN.) = 32.52
SUBAREA AREA (ACRES) = 83.22  SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 2154.32  AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60  AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 3940.4  PEAK FLOW RATE(CFS) = 255.15
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.42  FLOW VELOCITY(FEET/SEC.) = 7.29
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

*****
FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
  STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
  1      255.15  32.52  0.591  0.60( 0.60)  1.00  2154.3  11250.00
  2      219.42  36.15  0.562  0.60( 0.60)  1.00  2334.9  11220.00
  3      208.80  37.16  0.553  0.60( 0.60)  1.00  2381.6  11130.00
  4      60.90   80.15  0.399  0.60( 0.60)  1.00  3915.5  11201.00
  5      56.68   81.55  0.397  0.60( 0.60)  1.00  3939.3  11101.00
  6      56.68   81.64  0.396  0.60( 0.60)  1.00  3940.4  11111.00
  LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
  1      27.55  29.33  0.623  0.60( 0.60)  1.00  260.8  11300.00
  LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

** PEAK FLOW RATE TABLE **
  STREAM      Q      Tc  Intensity  Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
  1      269.94  29.33  0.623  0.60( 0.60)  1.00  2204.0  11300.00
  2      255.15  32.52  0.591  0.60( 0.60)  1.00  2415.2  11250.00
  3      219.42  36.15  0.562  0.60( 0.60)  1.00  2595.7  11220.00
  4      208.80  37.16  0.553  0.60( 0.60)  1.00  2642.5  11130.00
  5      60.90   80.15  0.399  0.60( 0.60)  1.00  4176.4  11201.00
  6      56.68   81.55  0.397  0.60( 0.60)  1.00  4200.1  11101.00
  7      56.68   81.64  0.396  0.60( 0.60)  1.00  4201.2  11111.00
  TOTAL AREA(ACRES) = 4201.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 269.94  Tc(MIN.) = 29.334
EFFECTIVE AREA(ACRES) = 2203.99  AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4201.2
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

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\*\*\*\*\*  
FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1222.10 DOWNSTREAM(FEET) = 1092.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3157.19 CHANNEL SLOPE = 0.0410  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.557  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.55	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 269.94  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.11  
AVERAGE FLOW DEPTH(FEET) = 3.56 TRAVEL TIME(MIN.) = 7.40  
Tc(MIN.) = 36.74  
SUBAREA AREA(ACRES) = 328.55 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 2532.54 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 4529.8 PEAK FLOW RATE(CFS) = 269.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.56 FLOW VELOCITY(FEET/SEC.) = 7.11  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 36.74  
RAINFALL INTENSITY(INCH/HR) = 0.56  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 2532.54  
TOTAL STREAM AREA(ACRES) = 4529.77  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 269.94

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11330.00 TO NODE 11331.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.83  
ELEVATION DATA: UPSTREAM(FEET) = 3270.16 DOWNSTREAM(FEET) = 3123.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.975  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.633  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	-	1.69	0.60	1.000	0	7.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.57  
TOTAL AREA(ACRES) = 1.69 PEAK FLOW RATE(CFS) = 1.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11331.00 TO NODE 11332.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3123.64 DOWNSTREAM(FEET) = 2903.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 710.41 CHANNEL SLOPE = 0.3104  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.339  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.82	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.53  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.15  
AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 2.30  
Tc(MIN.) = 10.28  
SUBAREA AREA(ACRES) = 5.82 SUBAREA RUNOFF(CFS) = 3.87  
EFFECTIVE AREA(ACRES) = 7.51 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.5 PEAK FLOW RATE(CFS) = 5.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 5.62  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11332.00 = 1010.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11332.00 TO NODE 11333.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2903.10 DOWNSTREAM(FEET) = 2718.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 843.93 CHANNEL SLOPE = 0.2183  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.161  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.66	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.46					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.44					
AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 2.59					
Tc(MIN.) = 12.86					
SUBAREA AREA(ACRES) = 9.66		SUBAREA RUNOFF(CFS) = 4.88			
EFFECTIVE AREA(ACRES) = 17.17		AREA-AVERAGED Fm(INCH/HR) = 0.60			
AREA-AVERAGED Fp(INCH/HR) = 0.60		AREA-AVERAGED Ap = 1.00			
TOTAL AREA(ACRES) = 17.2		PEAK FLOW RATE(CFS) = 8.67			

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 5.67  
 LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11333.00 = 1854.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11333.00 TO NODE 11334.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2718.89 DOWNSTREAM(FEET) = 2364.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1084.60 CHANNEL SLOPE = 0.3264  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.995  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.67	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.76					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.92					
AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 2.61					
Tc(MIN.) = 15.48					
SUBAREA AREA(ACRES) = 11.67		SUBAREA RUNOFF(CFS) = 4.15			
EFFECTIVE AREA(ACRES) = 28.84		AREA-AVERAGED Fm(INCH/HR) = 0.60			
AREA-AVERAGED Fp(INCH/HR) = 0.60		AREA-AVERAGED Ap = 1.00			
TOTAL AREA(ACRES) = 28.8		PEAK FLOW RATE(CFS) = 10.26			

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 6.85  
 LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11334.00 = 2938.77 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11334.00 TO NODE 11335.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2364.84 DOWNSTREAM(FEET) = 1729.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.08 CHANNEL SLOPE = 0.3237  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	102.74	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.63					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24					
AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 3.97					
Tc(MIN.) = 19.45					
SUBAREA AREA(ACRES) = 102.74		SUBAREA RUNOFF(CFS) = 21.84			
EFFECTIVE AREA(ACRES) = 131.58		AREA-AVERAGED Fm(INCH/HR) = 0.60			
AREA-AVERAGED Fp(INCH/HR) = 0.60		AREA-AVERAGED Ap = 1.00			
TOTAL AREA(ACRES) = 131.6		PEAK FLOW RATE(CFS) = 27.98			

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 8.74  
 LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11335.00 = 4901.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1729.46 DOWNSTREAM(FEET) = 1092.58  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2702.07 CHANNEL SLOPE = 0.2357  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.692  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.38	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.93					
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.06					
AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 5.59					
Tc(MIN.) = 25.03					
SUBAREA AREA(ACRES) = 90.38		SUBAREA RUNOFF(CFS) = 7.53			
EFFECTIVE AREA(ACRES) = 221.96		AREA-AVERAGED Fm(INCH/HR) = 0.60			
AREA-AVERAGED Fp(INCH/HR) = 0.60		AREA-AVERAGED Ap = 1.00			
TOTAL AREA(ACRES) = 222.0		PEAK FLOW RATE(CFS) = 27.98			

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 7.77  
 LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11340.00 = 7603.92 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 25.03  
 RAINFALL INTENSITY(INCH/HR) = 0.69  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 221.96  
 TOTAL STREAM AREA(ACRES) = 221.96  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 27.98

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	269.94	36.74	0.557	0.60( 0.60)	1.00	2532.5	11300.00
1	255.15	40.03	0.530	0.60( 0.60)	1.00	2743.7	11250.00
1	219.42	43.95	0.508	0.60( 0.60)	1.00	2924.3	11220.00
1	208.80	45.05	0.501	0.60( 0.60)	1.00	2971.0	11130.00
1	60.90	90.88	0.379	0.60( 0.60)	1.00	4504.9	11201.00
1	56.68	92.48	0.376	0.60( 0.60)	1.00	4528.7	11101.00
1	56.68	92.57	0.376	0.60( 0.60)	1.00	4529.8	11111.00
2	27.98	25.03	0.692	0.60( 0.60)	1.00	222.0	11330.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	256.75	25.03	0.692	0.60( 0.60)	1.00	1947.7	11330.00
2	269.94	36.74	0.557	0.60( 0.60)	1.00	2754.5	11300.00
3	255.15	40.03	0.530	0.60( 0.60)	1.00	2965.7	11250.00
4	219.42	43.95	0.508	0.60( 0.60)	1.00	3146.2	11220.00
5	208.80	45.05	0.501	0.60( 0.60)	1.00	3193.0	11130.00
6	60.90	90.88	0.379	0.60( 0.60)	1.00	4726.9	11201.00
7	56.68	92.48	0.376	0.60( 0.60)	1.00	4750.6	11101.00
8	56.68	92.57	0.376	0.60( 0.60)	1.00	4751.7	11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 269.94 Tc(MIN.) = 36.74  
 EFFECTIVE AREA(ACRES) = 2754.50 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4751.7  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11340.00 TO NODE 11341.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1092.58 DOWNSTREAM(FEET) = 1055.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.69 CHANNEL SLOPE = 0.0259  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.526  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 54.55 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 269.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.98  
 AVERAGE FLOW DEPTH(FEET) = 3.88 TRAVEL TIME(MIN.) = 3.99  
 Tc(MIN.) = 40.73  
 SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 2809.05 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 4806.3 PEAK FLOW RATE(CFS) = 269.94  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.88 FLOW VELOCITY(FEET/SEC.) = 5.98  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11341.00 = 30452.74 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11341.00 TO NODE 11342.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1055.49 DOWNSTREAM(FEET) = 1017.16  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 943.89 CHANNEL SLOPE = 0.0406  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.513  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 119.96 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 269.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.08  
 AVERAGE FLOW DEPTH(FEET) = 3.57 TRAVEL TIME(MIN.) = 2.22  
 Tc(MIN.) = 42.95  
 SUBAREA AREA(ACRES) = 119.96 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 2929.01 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 4926.2 PEAK FLOW RATE(CFS) = 269.94  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.57 FLOW VELOCITY(FEET/SEC.) = 7.08  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11342.00 = 31396.63 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1017.16 DOWNSTREAM(FEET) = 957.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1557.63 CHANNEL SLOPE = 0.0383  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.492

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 85.25 0.60 0.990 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.990  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 270.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.93  
AVERAGE FLOW DEPTH(FEET) = 3.60 TRAVEL TIME(MIN.) = 3.74  
Tc(MIN.) = 46.70

SUBAREA AREA(ACRES) = 85.25 SUBAREA RUNOFF(CFS) = 0.38  
EFFECTIVE AREA(ACRES) = 3014.26 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 5011.5 PEAK FLOW RATE(CFS) = 269.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.60 FLOW VELOCITY(FEET/SEC.) = 6.93  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 46.70  
RAINFALL INTENSITY(INCH/HR) = 0.49  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 3014.26  
TOTAL STREAM AREA(ACRES) = 5011.49  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 269.94

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11350.00 TO NODE 11351.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 950.54  
ELEVATION DATA: UPSTREAM(FEET) = 2805.98 DOWNSTREAM(FEET) = 2583.16

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.655  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.038  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 5.40 0.60 1.000 0 14.66  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.13  
TOTAL AREA(ACRES) = 5.40 PEAK FLOW RATE(CFS) = 2.13

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11351.00 TO NODE 11352.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2583.16 DOWNSTREAM(FEET) = 2403.73  
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.57 CHANNEL SLOPE = 0.1876  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.884

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 15.56 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.44  
AVERAGE FLOW DEPTH(FEET) = 0.56 TRAVEL TIME(MIN.) = 3.59  
Tc(MIN.) = 18.25

SUBAREA AREA(ACRES) = 15.56 SUBAREA RUNOFF(CFS) = 3.98  
EFFECTIVE AREA(ACRES) = 20.96 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 21.0 PEAK FLOW RATE(CFS) = 5.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 4.72  
LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11352.00 = 1907.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11352.00 TO NODE 11353.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2403.73 DOWNSTREAM(FEET) = 1786.74  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1933.85 CHANNEL SLOPE = 0.3190  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.742

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 74.05 0.60 1.000 -



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.82  
 AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 4.73  
 Tc(MIN.) = 22.98  
 SUBAREA AREA(ACRES) = 74.05 SUBAREA RUNOFF(CFS) = 9.47  
 EFFECTIVE AREA(ACRES) = 95.01 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 95.0 PEAK FLOW RATE(CFS) = 12.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 7.05  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11353.00 = 3840.96 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11353.00 TO NODE 11354.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1786.74 DOWNSTREAM(FEET) = 1308.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2073.35 CHANNEL SLOPE = 0.2307  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.638

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	41.22	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.38  
 AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 5.41  
 Tc(MIN.) = 28.39  
 SUBAREA AREA(ACRES) = 41.22 SUBAREA RUNOFF(CFS) = 1.42  
 EFFECTIVE AREA(ACRES) = 136.23 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 136.2 PEAK FLOW RATE(CFS) = 12.15  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 6.27  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11354.00 = 5914.31 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1308.39 DOWNSTREAM(FEET) = 957.53  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2455.49 CHANNEL SLOPE = 0.1429  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.561  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/  
LAND USE

SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.53	0.60	1.000

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.23  
 AVERAGE FLOW DEPTH(FEET) = 0.88 TRAVEL TIME(MIN.) = 7.83  
 Tc(MIN.) = 36.22

SUBAREA AREA(ACRES) = 201.53 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 337.76 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 337.8 PEAK FLOW RATE(CFS) = 12.15  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 5.23  
 LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11360.00 = 8369.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 36.22  
 RAINFALL INTENSITY(INCH/HR) = 0.56  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 337.76  
 TOTAL STREAM AREA(ACRES) = 337.76  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.15

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	256.75	35.12	0.570	0.60( 0.60)	1.00	2207.5	11330.00
1	269.94	46.70	0.492	0.60( 0.60)	1.00	3014.3	11300.00
1	255.15	50.13	0.473	0.60( 0.60)	1.00	3225.4	11250.00
1	219.42	54.44	0.458	0.60( 0.60)	1.00	3406.0	11220.00
1	208.80	55.68	0.454	0.60( 0.60)	1.00	3452.8	11130.00
1	60.90	105.31	0.358	0.60( 0.60)	1.00	4986.6	11201.00
1	56.68	107.20	0.355	0.60( 0.60)	1.00	5010.4	11101.00
1	56.68	107.30	0.355	0.60( 0.60)	1.00	5011.5	11111.00
2	12.15	36.22	0.561	0.60( 0.60)	1.00	337.8	11350.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	268.72	35.12	0.570	0.60( 0.60)	1.00	2534.9 11330.00
2	270.16	36.22	0.561	0.60( 0.60)	1.00	2622.2 11350.00
3	280.59	46.70	0.492	0.60( 0.60)	1.00	3352.0 11300.00
4	265.39	50.13	0.473	0.60( 0.60)	1.00	3563.2 11250.00
5	229.34	54.44	0.458	0.60( 0.60)	1.00	3743.7 11220.00
6	218.62	55.68	0.454	0.60( 0.60)	1.00	3790.5 11130.00
7	68.66	105.31	0.358	0.60( 0.60)	1.00	5324.4 11201.00
8	64.38	107.20	0.355	0.60( 0.60)	1.00	5348.1 11101.00
9	64.37	107.30	0.355	0.60( 0.60)	1.00	5349.2 11111.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 280.59 Tc(MIN.) = 46.70  
EFFECTIVE AREA(ACRES) = 3352.02 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5349.2  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11360.00 TO NODE 11361.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 957.53 DOWNSTREAM(FEET) = 847.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2937.03 CHANNEL SLOPE = 0.0374  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.460

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 176.74 0.60 0.977 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 281.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.95  
AVERAGE FLOW DEPTH(FEET) = 3.67 TRAVEL TIME(MIN.) = 7.05  
Tc(MIN.) = 53.74  
SUBAREA AREA(ACRES) = 176.74 SUBAREA RUNOFF(CFS) = 1.68  
EFFECTIVE AREA(ACRES) = 3528.76 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 5526.0 PEAK FLOW RATE(CFS) = 280.59  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.67 FLOW VELOCITY(FEET/SEC.) = 6.93  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11361.00 = 35891.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11361.00 TO NODE 11362.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 847.62 DOWNSTREAM(FEET) = 738.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3869.90 CHANNEL SLOPE = 0.0283  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.431  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 429.50 0.60 0.995 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 281.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.24  
AVERAGE FLOW DEPTH(FEET) = 3.87 TRAVEL TIME(MIN.) = 10.33  
Tc(MIN.) = 64.07  
SUBAREA AREA(ACRES) = 429.50 SUBAREA RUNOFF(CFS) = 0.83  
EFFECTIVE AREA(ACRES) = 3958.26 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 5955.5 PEAK FLOW RATE(CFS) = 280.59  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.87 FLOW VELOCITY(FEET/SEC.) = 6.24  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11362.00 = 39761.19 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 738.28 DOWNSTREAM(FEET) = 678.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2987.23 CHANNEL SLOPE = 0.0199  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.413

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 125.97 0.60 0.991 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.991  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 280.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.47  
AVERAGE FLOW DEPTH(FEET) = 4.14 TRAVEL TIME(MIN.) = 9.11  
Tc(MIN.) = 73.18  
SUBAREA AREA(ACRES) = 125.97 SUBAREA RUNOFF(CFS) = 0.42  
EFFECTIVE AREA(ACRES) = 4084.23 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 6081.5 PEAK FLOW RATE (CFS) = 280.59

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.13 FLOW VELOCITY (FEET/SEC.) = 5.48

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 6081.5 TC (MIN.) = 73.18

EFFECTIVE AREA (ACRES) = 4084.23 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.998

PEAK FLOW RATE (CFS) = 280.59

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	268.72	61.89	0.435	0.60 ( 0.60)	1.00	3267.2	11330.00
2	270.16	62.97	0.433	0.60 ( 0.60)	1.00	3354.4	11350.00
3	280.59	73.18	0.413	0.60 ( 0.60)	1.00	4084.2	11300.00
4	265.39	76.97	0.406	0.60 ( 0.60)	1.00	4295.4	11250.00
5	229.34	82.28	0.395	0.60 ( 0.60)	1.00	4475.9	11220.00
6	218.62	83.85	0.392	0.60 ( 0.60)	1.00	4522.7	11130.00
7	68.66	142.88	0.318	0.60 ( 0.60)	1.00	6056.6	11201.00
8	64.38	145.45	0.315	0.60 ( 0.60)	1.00	6080.4	11101.00
9	64.37	145.54	0.315	0.60 ( 0.60)	1.00	6081.5	11111.00

=====  
END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 3001.05 DOWNSTREAM(FEET) = 2787.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.99 CHANNEL SLOPE = 0.2213  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.196

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.43	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.66

AVERAGE FLOW DEPTH(FEET) = 0.91 TRAVEL TIME(MIN.) = 2.41

Tc(MIN.) = 12.20

SUBAREA AREA(ACRES) = 26.43 SUBAREA RUNOFF(CFS) = 14.18

EFFECTIVE AREA(ACRES) = 40.07 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 21.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.00 FLOW VELOCITY(FEET/SEC.) = 7.11

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11403.00 = 1897.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11403.00 TO NODE 11404.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2787.96 DOWNSTREAM(FEET) = 2518.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1956.80 CHANNEL SLOPE = 0.1376  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.921

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	67.85	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.54

AVERAGE FLOW DEPTH(FEET) = 1.27 TRAVEL TIME(MIN.) = 4.98

Tc(MIN.) = 17.19

SUBAREA AREA(ACRES) = 67.85 SUBAREA RUNOFF(CFS) = 19.60

EFFECTIVE AREA(ACRES) = 107.92 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.9 PEAK FLOW RATE(CFS) = 31.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 6.53

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11404.00 = 3853.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11404.00 TO NODE 11405.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2518.71 DOWNSTREAM(FEET) = 2304.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.99 CHANNEL SLOPE = 0.1101  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.753

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.61	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.91

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.27

AVERAGE FLOW DEPTH(FEET) = 1.40 TRAVEL TIME(MIN.) = 5.17

Tc(MIN.) = 22.36

SUBAREA AREA(ACRES) = 80.61 SUBAREA RUNOFF(CFS) = 11.14

EFFECTIVE AREA(ACRES) = 188.53 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 188.5 PEAK FLOW RATE(CFS) = 31.18

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 6.01

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11405.00 = 5798.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11405.00 TO NODE 11406.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2304.57 DOWNSTREAM(FEET) = 1888.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3280.59 CHANNEL SLOPE = 0.1270  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.602

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	111.04	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.51

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.35

AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 8.62

Tc(MIN.) = 30.97

SUBAREA AREA(ACRES) = 111.04 SUBAREA RUNOFF(CFS) = 0.21

EFFECTIVE AREA(ACRES) = 299.57 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 299.6 PEAK FLOW RATE(CFS) = 31.18

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.28 FLOW VELOCITY(FEET/SEC.) = 6.35

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11406.00 = 9079.53 FEET.

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FLOW PROCESS FROM NODE 11406.00 TO NODE 11407.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1888.00 DOWNSTREAM(FEET) = 1539.46
CHANNEL LENGTH THRU SUBAREA(FEET) = 2842.33 CHANNEL SLOPE = 0.1226
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.539
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      141.19   0.60     1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.22
AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 7.61
Tc(MIN.) = 38.58
SUBAREA AREA(ACRES) = 141.19 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 440.76 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 440.8 PEAK FLOW RATE(CFS) = 31.18
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.29 FLOW VELOCITY(FEET/SEC.) = 6.22
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11407.00 = 11921.86 FEET.

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FLOW PROCESS FROM NODE 11407.00 TO NODE 11408.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1539.46 DOWNSTREAM(FEET) = 1268.36
CHANNEL LENGTH THRU SUBAREA(FEET) = 2859.01 CHANNEL SLOPE = 0.0948
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.488
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      158.63   0.60     1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.68
AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 8.40
Tc(MIN.) = 46.98

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SUBAREA AREA(ACRES) = 158.63 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 599.39 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 599.4 PEAK FLOW RATE(CFS) = 31.18
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 5.68
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11408.00 = 14780.87 FEET.

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FLOW PROCESS FROM NODE 11408.00 TO NODE 11409.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1268.36 DOWNSTREAM(FEET) = 1109.80
CHANNEL LENGTH THRU SUBAREA(FEET) = 2883.36 CHANNEL SLOPE = 0.0550
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.445
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap    SCS
  LAND USE          GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED        -      208.66   0.60     1.000   -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63
AVERAGE FLOW DEPTH(FEET) = 1.50 TRAVEL TIME(MIN.) = 10.38
Tc(MIN.) = 57.36
SUBAREA AREA(ACRES) = 208.66 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 808.05 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 808.1 PEAK FLOW RATE(CFS) = 31.18
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 4.63
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.00 = 17664.23 FEET.

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*****
FLOW PROCESS FROM NODE 11409.00 TO NODE 11409.50 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1109.80 DOWNSTREAM(FEET) = 953.45
CHANNEL LENGTH THRU SUBAREA(FEET) = 2734.25 CHANNEL SLOPE = 0.0572
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.422

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SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	97.66	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.68  
AVERAGE FLOW DEPTH(FEET) = 1.49 TRAVEL TIME(MIN.) = 9.74  
Tc(MIN.) = 67.10  
SUBAREA AREA(ACRES) = 97.66 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 905.71 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 905.7 PEAK FLOW RATE(CFS) = 31.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.49 FLOW VELOCITY(FEET/SEC.) = 4.68  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.50 = 20398.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11409.50 TO NODE 11410.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 953.45 DOWNSTREAM(FEET) = 914.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1100.66 CHANNEL SLOPE = 0.0357  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.412  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	130.64	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.92  
AVERAGE FLOW DEPTH(FEET) = 1.63 TRAVEL TIME(MIN.) = 4.68  
Tc(MIN.) = 71.78  
SUBAREA AREA(ACRES) = 130.64 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1036.35 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1036.4 PEAK FLOW RATE(CFS) = 31.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.63 FLOW VELOCITY(FEET/SEC.) = 3.92  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11410.00 = 21499.14 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11410.00 TO NODE 11411.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 914.20 DOWNSTREAM(FEET) = 740.43  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3015.96 CHANNEL SLOPE = 0.0576  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.391  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	299.66	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.71  
AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 10.66  
Tc(MIN.) = 82.44  
SUBAREA AREA(ACRES) = 299.66 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1336.01 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1336.0 PEAK FLOW RATE(CFS) = 31.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 4.71  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11411.00 = 24515.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 740.43 DOWNSTREAM(FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1605.97 CHANNEL SLOPE = 0.0553  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.380  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	70.41	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63  
AVERAGE FLOW DEPTH(FEET) = 1.50 TRAVEL TIME(MIN.) = 5.78

Tc(MIN.) = 88.22  
 SUBAREA AREA(ACRES) = 70.41 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1406.42 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 1406.4 PEAK FLOW RATE(CFS) = 31.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 4.63  
 LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S10.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.84	42.56	0.60 ( 0.60)	1.00	2415.3	11000.00
2	302.04	69.93	0.60 ( 0.60)	1.00	5258.4	10850.00
3	278.58	76.86	0.60 ( 0.60)	1.00	5875.7	10800.00
4	275.62	78.38	0.60 ( 0.60)	1.00	6043.0	10900.00
5	259.85	85.05	0.60 ( 0.60)	1.00	6684.7	10830.00
6	230.85	90.63	0.60 ( 0.60)	1.00	7039.8	10910.00
7	199.52	96.73	0.60 ( 0.60)	1.00	7328.8	10630.00
8	166.91	128.46	0.60 ( 0.60)	1.00	9818.3	10600.00
9	186.85	145.80	0.60 ( 0.60)	1.00	11703.8	10500.00
10	189.88	155.90	0.60 ( 0.60)	1.00	12642.8	10710.00
11	186.76	163.55	0.60 ( 0.60)	1.00	13164.4	10410.00
12	178.30	184.07	0.60 ( 0.60)	1.00	14378.6	10700.00
13	179.84	201.34	0.60 ( 0.60)	1.00	15393.6	10200.00
14	179.79	201.61	0.60 ( 0.60)	1.00	15406.7	10400.00
15	176.82	219.07	0.60 ( 0.60)	1.00	16136.8	10320.00
16	175.38	223.88	0.60 ( 0.60)	1.00	16283.9	10300.00
17	168.41	241.55	0.60 ( 0.60)	1.00	16554.3	10210.00
18	142.01	351.47	0.60 ( 0.60)	1.00	17533.1	10100.00
TOTAL AREA(ACRES) =						17533.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S13.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	268.72	61.89	0.60 ( 0.60)	1.00	3267.2	11330.00

2	270.16	62.97	0.60 ( 0.60)	1.00	3354.4	11350.00
3	280.59	73.18	0.60 ( 0.60)	1.00	4084.2	11300.00
4	265.39	76.97	0.60 ( 0.60)	1.00	4295.4	11250.00
5	229.34	82.28	0.60 ( 0.60)	1.00	4475.9	11220.00
6	218.62	83.85	0.60 ( 0.60)	1.00	4522.7	11130.00
7	68.66	142.88	0.60 ( 0.60)	1.00	6056.6	11201.00
8	64.38	145.45	0.60 ( 0.60)	1.00	6080.4	11101.00
9	64.37	145.54	0.60 ( 0.60)	1.00	6081.5	11111.00
TOTAL AREA(ACRES) =						6081.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	268.72	61.89	0.60 ( 0.60)	1.00	3267.2	11330.00
2	270.16	62.97	0.60 ( 0.60)	1.00	3354.4	11350.00
3	280.59	73.18	0.60 ( 0.60)	1.00	4084.2	11300.00
4	265.39	76.97	0.60 ( 0.60)	1.00	4295.4	11250.00
5	229.34	82.28	0.60 ( 0.60)	1.00	4475.9	11220.00
6	218.62	83.85	0.60 ( 0.60)	1.00	4522.7	11130.00
7	68.66	142.88	0.60 ( 0.60)	1.00	6056.6	11201.00
8	64.38	145.45	0.60 ( 0.60)	1.00	6080.4	11101.00
9	64.37	145.54	0.60 ( 0.60)	1.00	6081.5	11111.00
TOTAL AREA(ACRES) =						6081.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	268.72	61.89	0.432	0.60 ( 0.60)	1.00	3267.2	11330.00
2	270.16	62.97	0.430	0.60 ( 0.60)	1.00	3354.4	11350.00
3	280.59	73.18	0.410	0.60 ( 0.60)	1.00	4084.2	11300.00
4	265.39	76.97	0.402	0.60 ( 0.60)	1.00	4295.4	11250.00
5	229.34	82.28	0.391	0.60 ( 0.60)	1.00	4475.9	11220.00
6	218.62	83.85	0.388	0.60 ( 0.60)	1.00	4522.7	11130.00
7	68.66	142.88	0.314	0.60 ( 0.60)	1.00	6056.6	11201.00
8	64.38	145.45	0.312	0.60 ( 0.60)	1.00	6080.4	11101.00
9	64.37	145.54	0.312	0.60 ( 0.60)	1.00	6081.5	11111.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	246.84	42.56	0.513	0.60 ( 0.60)	1.00	2415.3	11000.00
2	302.04	69.93	0.416	0.60 ( 0.60)	1.00	5258.4	10850.00
3	278.58	76.86	0.402	0.60 ( 0.60)	1.00	5875.7	10800.00
4	275.62	78.38	0.399	0.60 ( 0.60)	1.00	6043.0	10900.00
5	259.85	85.05	0.386	0.60 ( 0.60)	1.00	6684.7	10830.00



6	230.85	90.63	0.375	0.60	( 0.60)	1.00	7039.8	10910.00
7	199.52	96.73	0.366	0.60	( 0.60)	1.00	7328.8	10630.00
8	166.91	128.46	0.326	0.60	( 0.60)	1.00	9818.3	10600.00
9	186.85	145.80	0.311	0.60	( 0.60)	1.00	11703.8	10500.00
10	189.88	155.90	0.303	0.60	( 0.60)	1.00	12642.8	10710.00
11	186.76	163.55	0.297	0.60	( 0.60)	1.00	13164.4	10410.00
12	178.30	184.07	0.281	0.60	( 0.60)	1.00	14378.6	10700.00
13	179.84	201.34	0.275	0.60	( 0.60)	1.00	15393.6	10200.00
14	179.79	201.61	0.275	0.60	( 0.60)	1.00	15406.7	10400.00
15	176.82	219.07	0.268	0.60	( 0.60)	1.00	16136.8	10320.00
16	175.38	223.88	0.266	0.60	( 0.60)	1.00	16283.9	10300.00
17	168.41	241.55	0.260	0.60	( 0.60)	1.00	16554.3	10210.00
18	142.01	351.47	0.218	0.60	( 0.60)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	466.03	42.56	0.513	0.60	( 0.60)	1.00	4662.1 11000.00
2	554.55	61.89	0.432	0.60	( 0.60)	1.00	7690.2 11330.00
3	558.16	62.97	0.430	0.60	( 0.60)	1.00	7889.5 11350.00
4	579.31	69.93	0.416	0.60	( 0.60)	1.00	9110.5 10850.00
5	571.64	73.18	0.410	0.60	( 0.60)	1.00	9631.8 11300.00
6	544.40	76.86	0.402	0.60	( 0.60)	1.00	10165.2 10800.00
7	543.76	76.97	0.402	0.60	( 0.60)	1.00	10183.0 11250.00
8	531.43	78.38	0.399	0.60	( 0.60)	1.00	10386.4 10900.00
9	495.75	82.28	0.391	0.60	( 0.60)	1.00	10893.5 11220.00
10	481.33	83.85	0.388	0.60	( 0.60)	1.00	11091.2 11130.00
11	475.40	85.05	0.386	0.60	( 0.60)	1.00	11238.8 10830.00
12	432.23	90.63	0.375	0.60	( 0.60)	1.00	11738.9 10910.00
13	385.42	96.73	0.366	0.60	( 0.60)	1.00	12186.2 10630.00
14	272.18	128.46	0.326	0.60	( 0.60)	1.00	15500.3 10600.00
15	252.14	142.88	0.314	0.60	( 0.60)	1.00	17442.0 11201.00
16	250.82	145.45	0.312	0.60	( 0.60)	1.00	17745.3 11101.00
17	250.93	145.54	0.312	0.60	( 0.60)	1.00	17756.9 11111.00
18	251.18	145.80	0.311	0.60	( 0.60)	1.00	17785.3 10500.00
19	252.47	155.90	0.303	0.60	( 0.60)	1.00	18724.2 10710.00
20	248.04	163.55	0.297	0.60	( 0.60)	1.00	19245.8 10410.00
21	236.42	184.07	0.281	0.60	( 0.60)	1.00	20460.0 10700.00
22	236.62	201.34	0.275	0.60	( 0.60)	1.00	21475.0 10200.00
23	236.55	201.61	0.275	0.60	( 0.60)	1.00	21488.2 10400.00
24	232.22	219.07	0.268	0.60	( 0.60)	1.00	22218.3 10320.00
25	230.40	223.88	0.266	0.60	( 0.60)	1.00	22365.3 10300.00
26	222.05	241.55	0.260	0.60	( 0.60)	1.00	22635.7 10210.00
27	187.08	351.47	0.218	0.60	( 0.60)	1.00	23614.5 10100.00

TOTAL AREA (ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 579.31 Tc (MIN.) = 69.932  
EFFECTIVE AREA (ACRES) = 9110.49 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 23614.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 51  
-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 678.93 DOWNSTREAM (FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2069.94 CHANNEL SLOPE = 0.0132  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.405  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 165.16 0.60 0.997 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 579.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.44  
AVERAGE FLOW DEPTH (FEET) = 5.48 TRAVEL TIME (MIN.) = 5.35  
Tc (MIN.) = 75.29  
SUBAREA AREA (ACRES) = 165.16 SUBAREA RUNOFF (CFS) = 0.18  
EFFECTIVE AREA (ACRES) = 9275.65 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 23779.7 PEAK FLOW RATE (CFS) = 579.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 5.48 FLOW VELOCITY (FEET/SEC.) = 6.44  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	466.03	48.22	0.481	0.60	( 0.60)	1.00	4827.2 11000.00
2	554.55	67.31	0.421	0.60	( 0.60)	1.00	7855.4 11330.00
3	558.16	68.37	0.419	0.60	( 0.60)	1.00	8054.6 11350.00
4	579.31	75.29	0.405	0.60	( 0.60)	1.00	9275.6 10850.00
5	571.64	78.56	0.399	0.60	( 0.60)	1.00	9797.0 11300.00
6	544.40	82.31	0.391	0.60	( 0.60)	1.00	10330.3 10800.00
7	543.76	82.41	0.391	0.60	( 0.60)	1.00	10348.2 11250.00
8	531.43	83.85	0.388	0.60	( 0.60)	1.00	10551.5 10900.00
9	495.75	87.85	0.380	0.60	( 0.60)	1.00	11058.7 11220.00
10	481.33	89.46	0.377	0.60	( 0.60)	1.00	11256.4 11130.00
11	475.40	90.68	0.375	0.60	( 0.60)	1.00	11404.0 10830.00
12	432.23	96.40	0.367	0.60	( 0.60)	1.00	11904.1 10910.00
13	385.42	102.67	0.358	0.60	( 0.60)	1.00	12351.4 10630.00
14	272.18	134.93	0.321	0.60	( 0.60)	1.00	15665.5 10600.00
15	252.14	149.47	0.308	0.60	( 0.60)	1.00	17607.1 11201.00
16	250.82	152.05	0.306	0.60	( 0.60)	1.00	17910.5 11101.00
17	250.93	152.14	0.306	0.60	( 0.60)	1.00	17922.0 11111.00
18	251.18	152.40	0.306	0.60	( 0.60)	1.00	17950.4 10500.00

19	252.47	162.49	0.298	0.60	( 0.60)	1.00	18889.4	10710.00
20	248.04	170.17	0.291	0.60	( 0.60)	1.00	19411.0	10410.00
21	236.42	190.76	0.279	0.60	( 0.60)	1.00	20625.2	10700.00
22	236.62	208.05	0.272	0.60	( 0.60)	1.00	21640.2	10200.00
23	236.55	208.30	0.272	0.60	( 0.60)	1.00	21653.3	10400.00
24	232.22	225.80	0.266	0.60	( 0.60)	1.00	22383.5	10320.00
25	230.40	230.61	0.264	0.60	( 0.60)	1.00	22530.5	10300.00
26	222.05	248.35	0.257	0.60	( 0.60)	1.00	22800.9	10210.00
27	187.08	358.57	0.216	0.60	( 0.60)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.18	88.22	0.380	0.60	( 0.60)	1.00	1406.4 11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.481	0.60	( 0.60)	1.00	5595.9 11000.00
2	580.96	67.31	0.421	0.60	( 0.60)	1.00	8928.4 11330.00
3	584.85	68.37	0.419	0.60	( 0.60)	1.00	9144.6 11350.00
4	607.73	75.29	0.405	0.60	( 0.60)	1.00	10475.9 10850.00
5	600.82	78.56	0.399	0.60	( 0.60)	1.00	11049.3 11300.00
6	574.40	82.31	0.391	0.60	( 0.60)	1.00	11642.5 10800.00
7	573.78	82.41	0.391	0.60	( 0.60)	1.00	11661.9 11250.00
8	561.75	83.85	0.388	0.60	( 0.60)	1.00	11888.3 10900.00
9	526.86	87.85	0.380	0.60	( 0.60)	1.00	12459.2 11220.00
10	523.61	88.22	0.380	0.60	( 0.60)	1.00	12510.6 11401.00
11	512.31	89.46	0.377	0.60	( 0.60)	1.00	12662.8 11130.00
12	506.21	90.68	0.375	0.60	( 0.60)	1.00	12810.4 10830.00
13	462.36	96.40	0.367	0.60	( 0.60)	1.00	13310.5 10910.00
14	414.81	102.67	0.358	0.60	( 0.60)	1.00	13757.8 10630.00
15	298.52	134.93	0.321	0.60	( 0.60)	1.00	17071.9 10600.00
16	277.48	149.47	0.308	0.60	( 0.60)	1.00	19013.5 11201.00
17	275.98	152.05	0.306	0.60	( 0.60)	1.00	19316.9 11101.00
18	276.08	152.14	0.306	0.60	( 0.60)	1.00	19328.4 11111.00
19	276.32	152.40	0.306	0.60	( 0.60)	1.00	19356.9 10500.00
20	276.92	162.49	0.298	0.60	( 0.60)	1.00	20295.8 10710.00
21	271.96	170.17	0.291	0.60	( 0.60)	1.00	20817.4 10410.00
22	259.34	190.76	0.279	0.60	( 0.60)	1.00	22031.6 10700.00
23	259.00	208.05	0.272	0.60	( 0.60)	1.00	23046.6 10200.00
24	258.92	208.30	0.272	0.60	( 0.60)	1.00	23059.7 10400.00
25	254.04	225.80	0.266	0.60	( 0.60)	1.00	23789.9 10320.00
26	252.08	230.61	0.264	0.60	( 0.60)	1.00	23936.9 10300.00
27	243.18	248.35	0.257	0.60	( 0.60)	1.00	24207.3 10210.00
28	204.78	358.57	0.216	0.60	( 0.60)	1.00	25186.1 10100.00

TOTAL AREA (ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 607.73 Tc(MIN.) = 75.286  
EFFECTIVE AREA(ACRES) = 10475.87 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 25186.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 25186.1 TC(MIN.) = 75.29  
EFFECTIVE AREA(ACRES) = 10475.87 AREA-AVERAGED Fm(INCH/HR)= 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.999  
PEAK FLOW RATE(CFS) = 607.73

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.481	0.60	( 0.60)	1.00	5595.9 11000.00
2	580.96	67.31	0.421	0.60	( 0.60)	1.00	8928.4 11330.00
3	584.85	68.37	0.419	0.60	( 0.60)	1.00	9144.6 11350.00
4	607.73	75.29	0.405	0.60	( 0.60)	1.00	10475.9 10850.00
5	600.82	78.56	0.399	0.60	( 0.60)	1.00	11049.3 11300.00
6	574.40	82.31	0.391	0.60	( 0.60)	1.00	11642.5 10800.00
7	573.78	82.41	0.391	0.60	( 0.60)	1.00	11661.9 11250.00
8	561.75	83.85	0.388	0.60	( 0.60)	1.00	11888.3 10900.00
9	526.86	87.85	0.380	0.60	( 0.60)	1.00	12459.2 11220.00
10	523.61	88.22	0.380	0.60	( 0.60)	1.00	12510.6 11401.00
11	512.31	89.46	0.377	0.60	( 0.60)	1.00	12662.8 11130.00
12	506.21	90.68	0.375	0.60	( 0.60)	1.00	12810.4 10830.00
13	462.36	96.40	0.367	0.60	( 0.60)	1.00	13310.5 10910.00
14	414.81	102.67	0.358	0.60	( 0.60)	1.00	13757.8 10630.00
15	298.52	134.93	0.321	0.60	( 0.60)	1.00	17071.9 10600.00
16	277.48	149.47	0.308	0.60	( 0.60)	1.00	19013.5 11201.00
17	275.98	152.05	0.306	0.60	( 0.60)	1.00	19316.9 11101.00
18	276.08	152.14	0.306	0.60	( 0.60)	1.00	19328.4 11111.00
19	276.32	152.40	0.306	0.60	( 0.60)	1.00	19356.9 10500.00
20	276.92	162.49	0.298	0.60	( 0.60)	1.00	20295.8 10710.00
21	271.96	170.17	0.291	0.60	( 0.60)	1.00	20817.4 10410.00
22	259.34	190.76	0.279	0.60	( 0.60)	1.00	22031.6 10700.00
23	259.00	208.05	0.272	0.60	( 0.60)	1.00	23046.6 10200.00
24	258.92	208.30	0.272	0.60	( 0.60)	1.00	23059.7 10400.00
25	254.04	225.80	0.266	0.60	( 0.60)	1.00	23789.9 10320.00
26	252.08	230.61	0.264	0.60	( 0.60)	1.00	23936.9 10300.00
27	243.18	248.35	0.257	0.60	( 0.60)	1.00	24207.3 10210.00
28	204.78	358.57	0.216	0.60	( 0.60)	1.00	25186.1 10100.00

=====  
END OF RATIONAL METHOD ANALYSIS  
=====



ELEVATION DATA: UPSTREAM(FEET) = 1423.64 DOWNSTREAM(FEET) = 1258.86  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 937.16 CHANNEL SLOPE = 0.1758  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.133  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.16	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.67  
 AVERAGE FLOW DEPTH(FEET) = 0.85 TRAVEL TIME(MIN.) = 2.76  
 Tc(MIN.) = 12.69  
 SUBAREA AREA(ACRES) = 28.16 SUBAREA RUNOFF(CFS) = 13.52  
 EFFECTIVE AREA(ACRES) = 36.58 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 17.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 6.20  
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11503.00 = 1917.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11503.00 TO NODE 11504.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1258.86 DOWNSTREAM(FEET) = 1009.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.29 CHANNEL SLOPE = 0.1298  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.875  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.67	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.56  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.14  
 AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 5.22  
 Tc(MIN.) = 17.91  
 SUBAREA AREA(ACRES) = 69.67 SUBAREA RUNOFF(CFS) = 17.26  
 EFFECTIVE AREA(ACRES) = 106.25 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 106.2 PEAK FLOW RATE(CFS) = 26.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 6.15  
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11504.00 = 3841.97 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 1009.04 DOWNSTREAM(FEET) = 593.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2817.91 CHANNEL SLOPE = 0.1475  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.681  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	65.12	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.58  
 AVERAGE FLOW DEPTH(FEET) = 1.21 TRAVEL TIME(MIN.) = 7.14  
 Tc(MIN.) = 25.05  
 SUBAREA AREA(ACRES) = 65.12 SUBAREA RUNOFF(CFS) = 4.77  
 EFFECTIVE AREA(ACRES) = 171.37 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 171.4 PEAK FLOW RATE(CFS) = 26.33  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 6.41  
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S14.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.60( 0.60)	1.00	5595.9	11000.00
2	584.85	68.37	0.60( 0.60)	1.00	9144.6	11350.00
3	607.73	75.29	0.60( 0.60)	1.00	10475.9	10850.00
4	600.82	78.56	0.60( 0.60)	1.00	11049.3	11300.00
5	574.40	82.31	0.60( 0.60)	1.00	11642.5	10800.00
6	526.86	87.85	0.60( 0.60)	1.00	12459.2	11220.00
7	512.31	89.46	0.60( 0.60)	1.00	12662.8	11130.00
8	462.36	96.40	0.60( 0.60)	1.00	13310.5	10910.00
9	414.81	102.67	0.60( 0.60)	1.00	13757.8	10630.00
10	298.52	134.93	0.60( 0.60)	1.00	17071.9	10600.00
11	277.48	149.47	0.60( 0.60)	1.00	19013.5	11201.00
12	276.32	152.40	0.60( 0.60)	1.00	19356.9	10500.00
13	276.92	162.49	0.60( 0.60)	1.00	20295.8	10710.00
14	271.96	170.17	0.60( 0.60)	1.00	20817.4	10410.00
15	259.34	190.76	0.60( 0.60)	1.00	22031.6	10700.00
16	259.00	208.05	0.60( 0.60)	1.00	23046.6	10200.00

17 254.04 225.80 0.60 ( 0.60) 1.00 23789.9 10320.00  
 18 252.08 230.61 0.60 ( 0.60) 1.00 23936.9 10300.00  
 19 243.18 248.35 0.60 ( 0.60) 1.00 24207.3 10210.00  
 20 204.78 358.57 0.60 ( 0.60) 1.00 25186.1 10100.00  
 TOTAL AREA (ACRES) = 25186.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	48.22	0.60 ( 0.60)	1.00	5595.9	11000.00
2	584.85	68.37	0.60 ( 0.60)	1.00	9144.6	11350.00
3	607.73	75.29	0.60 ( 0.60)	1.00	10475.9	10850.00
4	600.82	78.56	0.60 ( 0.60)	1.00	11049.3	11300.00
5	574.40	82.31	0.60 ( 0.60)	1.00	11642.5	10800.00
6	526.86	87.85	0.60 ( 0.60)	1.00	12459.2	11220.00
7	512.31	89.46	0.60 ( 0.60)	1.00	12662.8	11130.00
8	462.36	96.40	0.60 ( 0.60)	1.00	13310.5	10910.00
9	414.81	102.67	0.60 ( 0.60)	1.00	13757.8	10630.00
10	298.52	134.93	0.60 ( 0.60)	1.00	17071.9	10600.00
11	277.48	149.47	0.60 ( 0.60)	1.00	19013.5	11201.00
12	276.32	152.40	0.60 ( 0.60)	1.00	19356.9	10500.00
13	276.92	162.49	0.60 ( 0.60)	1.00	20295.8	10710.00
14	271.96	170.17	0.60 ( 0.60)	1.00	20817.4	10410.00
15	259.34	190.76	0.60 ( 0.60)	1.00	22031.6	10700.00
16	259.00	208.05	0.60 ( 0.60)	1.00	23046.6	10200.00
17	254.04	225.80	0.60 ( 0.60)	1.00	23789.9	10320.00
18	252.08	230.61	0.60 ( 0.60)	1.00	23936.9	10300.00
19	243.18	248.35	0.60 ( 0.60)	1.00	24207.3	10210.00
20	204.78	358.57	0.60 ( 0.60)	1.00	25186.1	10100.00
TOTAL AREA (ACRES) = 25186.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11431.00 TO NODE 11520.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 651.70 DOWNSTREAM(FEET) = 593.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2004.08 CHANNEL SLOPE = 0.0291  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.388  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 54.88 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 607.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.78

AVERAGE FLOW DEPTH(FEET) = 4.80 TRAVEL TIME(MIN.) = 3.80  
 Tc(MIN.) = 79.09  
 SUBAREA AREA(ACRES) = 54.88 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 10530.75 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 25241.0 PEAK FLOW RATE(CFS) = 607.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.80 FLOW VELOCITY(FEET/SEC.) = 8.78  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.63	52.24	0.456	0.60 ( 0.60)	1.00	5650.8	11000.00
2	584.85	72.21	0.402	0.60 ( 0.60)	1.00	9199.5	11350.00
3	607.73	79.09	0.388	0.60 ( 0.60)	1.00	10530.7	10850.00
4	600.82	82.37	0.382	0.60 ( 0.60)	1.00	11104.2	11300.00
5	574.40	86.16	0.374	0.60 ( 0.60)	1.00	11697.3	10800.00
6	526.86	91.79	0.363	0.60 ( 0.60)	1.00	12514.1	11220.00
7	512.31	93.43	0.361	0.60 ( 0.60)	1.00	12717.7	11130.00
8	462.36	100.48	0.351	0.60 ( 0.60)	1.00	13365.4	10910.00
9	414.81	106.85	0.342	0.60 ( 0.60)	1.00	13812.7	10630.00
10	298.52	139.47	0.307	0.60 ( 0.60)	1.00	17126.8	10600.00
11	277.48	154.10	0.295	0.60 ( 0.60)	1.00	19068.4	11201.00
12	276.32	157.03	0.292	0.60 ( 0.60)	1.00	19411.8	10500.00
13	276.92	167.11	0.284	0.60 ( 0.60)	1.00	20350.7	10710.00
14	271.96	174.82	0.277	0.60 ( 0.60)	1.00	20872.3	10410.00
15	259.34	195.47	0.267	0.60 ( 0.60)	1.00	22086.5	10700.00
16	259.00	212.76	0.261	0.60 ( 0.60)	1.00	23101.5	10200.00
17	254.04	230.53	0.254	0.60 ( 0.60)	1.00	23844.8	10320.00
18	252.08	235.35	0.252	0.60 ( 0.60)	1.00	23991.8	10300.00
19	243.18	253.13	0.245	0.60 ( 0.60)	1.00	24262.2	10210.00
20	204.78	363.57	0.205	0.60 ( 0.60)	1.00	25241.0	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26.33	25.05	0.681	0.60 ( 0.60)	1.00	171.4	11500.00
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	375.87	25.05	0.681	0.60 ( 0.60)	1.00	2881.1	11500.00
2	487.63	52.24	0.456	0.60 ( 0.60)	1.00	5822.2	11000.00
3	584.85	72.21	0.402	0.60 ( 0.60)	1.00	9370.8	11350.00
4	607.73	79.09	0.388	0.60 ( 0.60)	1.00	10702.1	10850.00

5	600.82	82.37	0.382	0.60	( 0.60)	1.00	11275.6	11300.00
6	574.40	86.16	0.374	0.60	( 0.60)	1.00	11868.7	10800.00
7	526.86	91.79	0.363	0.60	( 0.60)	1.00	12685.5	11220.00
8	512.31	93.43	0.361	0.60	( 0.60)	1.00	12889.0	11130.00
9	462.36	100.48	0.351	0.60	( 0.60)	1.00	13536.7	10910.00
10	414.81	106.85	0.342	0.60	( 0.60)	1.00	13984.1	10630.00
11	298.52	139.47	0.307	0.60	( 0.60)	1.00	17298.1	10600.00
12	277.48	154.10	0.295	0.60	( 0.60)	1.00	19239.8	11201.00
13	276.32	157.03	0.292	0.60	( 0.60)	1.00	19583.1	10500.00
14	276.92	167.11	0.284	0.60	( 0.60)	1.00	20522.1	10710.00
15	271.96	174.82	0.277	0.60	( 0.60)	1.00	21043.6	10410.00
16	259.34	195.47	0.267	0.60	( 0.60)	1.00	22257.9	10700.00
17	259.00	212.76	0.261	0.60	( 0.60)	1.00	23272.9	10200.00
18	254.04	230.53	0.254	0.60	( 0.60)	1.00	24016.1	10320.00
19	252.08	235.35	0.252	0.60	( 0.60)	1.00	24163.2	10300.00
20	243.18	253.13	0.245	0.60	( 0.60)	1.00	24433.6	10210.00
21	204.78	363.57	0.205	0.60	( 0.60)	1.00	25412.4	10100.00

TOTAL AREA (ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 607.73 Tc (MIN.) = 79.091  
EFFECTIVE AREA (ACRES) = 10702.12 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25412.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 593.37 DOWNSTREAM (FEET) = 577.77  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1515.75 CHANNEL SLOPE = 0.0103  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.381  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 607.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.03  
AVERAGE FLOW DEPTH (FEET) = 5.37 TRAVEL TIME (MIN.) = 3.59  
Tc (MIN.) = 82.68  
SUBAREA AREA (ACRES) = 100.60 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 10802.72 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 25513.0 PEAK FLOW RATE (CFS) = 607.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.37 FLOW VELOCITY (FEET/SEC.) = 7.03  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1

>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 82.68  
RAINFALL INTENSITY (INCH/HR) = 0.38  
AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 10802.72  
TOTAL STREAM AREA (ACRES) = 25512.96  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 607.73

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21

>>>> RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>> USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 278.68  
ELEVATION DATA: UPSTREAM (FEET) = 1593.31 DOWNSTREAM (FEET) = 1523.14

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.844  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.458  
SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	1.18	0.60	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 0.91  
TOTAL AREA (ACRES) = 1.18 PEAK FLOW RATE (CFS) = 0.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1523.14 DOWNSTREAM (FEET) = 1297.56  
CHANNEL LENGTH THRU SUBAREA (FEET) = 698.37 CHANNEL SLOPE = 0.3230  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.236  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.32	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.16  
AVERAGE FLOW DEPTH(FEET) = 0.46 TRAVEL TIME(MIN.) = 2.25  
Tc(MIN.) = 11.10  
SUBAREA AREA(ACRES) = 8.32 SUBAREA RUNOFF(CFS) = 4.76  
EFFECTIVE AREA(ACRES) = 9.50 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.5 PEAK FLOW RATE(CFS) = 5.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.56 FLOW VELOCITY(FEET/SEC.) = 5.79  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11532.00 = 977.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11532.00 TO NODE 11533.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	1297.56	DOWNSTREAM(FEET) =	1134.68
CHANNEL LENGTH THRU SUBAREA(FEET) =	962.17	CHANNEL SLOPE =	0.1693
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	1.037		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.50	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.20  
AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 3.09  
Tc(MIN.) = 14.18  
SUBAREA AREA(ACRES) = 18.50 SUBAREA RUNOFF(CFS) = 7.27  
EFFECTIVE AREA(ACRES) = 28.00 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 28.0 PEAK FLOW RATE(CFS) = 11.01

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.82 FLOW VELOCITY(FEET/SEC.) = 5.44  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11533.00 = 1939.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11533.00 TO NODE 11534.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	1134.68	DOWNSTREAM(FEET) =	1002.72
CHANNEL LENGTH THRU SUBAREA(FEET) =	956.78	CHANNEL SLOPE =	0.1379
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.919		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.44	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.31  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.22  
AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 2.56  
Tc(MIN.) = 16.75  
SUBAREA AREA(ACRES) = 98.44 SUBAREA RUNOFF(CFS) = 28.24  
EFFECTIVE AREA(ACRES) = 126.44 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 126.4 PEAK FLOW RATE(CFS) = 36.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.33 FLOW VELOCITY(FEET/SEC.) = 6.81  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11534.00 = 2896.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11534.00 TO NODE 11535.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	1002.72	DOWNSTREAM(FEET) =	816.20
CHANNEL LENGTH THRU SUBAREA(FEET) =	2160.78	CHANNEL SLOPE =	0.0863
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.734		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.87	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 44.83  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.01  
AVERAGE FLOW DEPTH(FEET) = 1.58 TRAVEL TIME(MIN.) = 5.99  
Tc(MIN.) = 22.74  
SUBAREA AREA(ACRES) = 134.87 SUBAREA RUNOFF(CFS) = 16.29  
EFFECTIVE AREA(ACRES) = 261.31 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 261.3 PEAK FLOW RATE(CFS) = 36.27  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.46 FLOW VELOCITY(FEET/SEC.) = 5.67  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11535.00 = 5056.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	816.20	DOWNSTREAM(FEET) =	577.77
CHANNEL LENGTH THRU SUBAREA(FEET) =	3109.20	CHANNEL SLOPE =	0.0767
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.584		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.24 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.27  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.44  
 AVERAGE FLOW DEPTH(FEET) = 1.49 TRAVEL TIME(MIN.) = 9.52  
 Tc(MIN.) = 32.26  
 SUBAREA AREA(ACRES) = 78.24 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 339.55 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 339.5 PEAK FLOW RATE(CFS) = 36.27  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.49 FLOW VELOCITY(FEET/SEC.) = 5.44  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11540.00 = 8165.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 -----

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 32.26  
 RAINFALL INTENSITY(INCH/HR) = 0.58  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 339.55  
 TOTAL STREAM AREA(ACRES) = 339.55  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 36.27

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	375.87	29.10	0.617	0.60( 0.60)	1.00	2981.7	11500.00
1	487.63	56.03	0.442	0.60( 0.60)	1.00	5922.8	11000.00
1	584.85	75.84	0.395	0.60( 0.60)	1.00	9471.4	11350.00
1	607.73	82.68	0.381	0.60( 0.60)	1.00	10802.7	10850.00
1	600.82	85.97	0.374	0.60( 0.60)	1.00	11376.2	11300.00
1	574.40	89.81	0.366	0.60( 0.60)	1.00	11969.3	10800.00
1	526.86	95.51	0.358	0.60( 0.60)	1.00	12786.1	11220.00
1	512.31	97.18	0.356	0.60( 0.60)	1.00	12989.6	11130.00
1	462.36	104.33	0.345	0.60( 0.60)	1.00	13637.3	10910.00
1	414.81	110.80	0.336	0.60( 0.60)	1.00	14084.7	10630.00
1	298.52	143.77	0.303	0.60( 0.60)	1.00	17398.7	10600.00
1	277.48	158.47	0.291	0.60( 0.60)	1.00	19340.4	11201.00
1	276.32	161.41	0.288	0.60( 0.60)	1.00	19683.7	10500.00
1	276.92	171.50	0.280	0.60( 0.60)	1.00	20622.7	10710.00
1	271.96	179.22	0.274	0.60( 0.60)	1.00	21144.2	10410.00

1	259.34	199.92	0.265	0.60( 0.60)	1.00	22358.5	10700.00
1	259.00	217.21	0.259	0.60( 0.60)	1.00	23373.5	10200.00
1	254.04	235.00	0.252	0.60( 0.60)	1.00	24116.7	10320.00
1	252.08	239.83	0.250	0.60( 0.60)	1.00	24263.8	10300.00
1	243.18	257.66	0.244	0.60( 0.60)	1.00	24534.2	10210.00
1	204.78	368.28	0.204	0.60( 0.60)	1.00	25513.0	10100.00
2	36.27	32.26	0.584	0.60( 0.60)	1.00	339.5	11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	410.42	29.10	0.617	0.60( 0.60)	1.00	3288.1	11500.00
2	425.24	32.26	0.584	0.60( 0.60)	1.00	3665.9	11530.00
3	515.04	56.03	0.442	0.60( 0.60)	1.00	6262.3	11000.00
4	609.35	75.84	0.395	0.60( 0.60)	1.00	9811.0	11350.00
5	631.37	82.68	0.381	0.60( 0.60)	1.00	11142.3	10850.00
6	624.04	85.97	0.374	0.60( 0.60)	1.00	11715.7	11300.00
7	597.13	89.81	0.366	0.60( 0.60)	1.00	12308.9	10800.00
8	549.09	95.51	0.358	0.60( 0.60)	1.00	13125.6	11220.00
9	534.38	97.18	0.356	0.60( 0.60)	1.00	13329.2	11130.00
10	483.80	104.33	0.345	0.60( 0.60)	1.00	13976.9	10910.00
11	435.68	110.80	0.336	0.60( 0.60)	1.00	14424.2	10630.00
12	317.33	143.77	0.303	0.60( 0.60)	1.00	17738.3	10600.00
13	295.53	158.47	0.291	0.60( 0.60)	1.00	19679.9	11201.00
14	294.22	161.41	0.288	0.60( 0.60)	1.00	20023.3	10500.00
15	294.30	171.50	0.280	0.60( 0.60)	1.00	20962.2	10710.00
16	288.94	179.22	0.274	0.60( 0.60)	1.00	21483.8	10410.00
17	275.81	199.92	0.265	0.60( 0.60)	1.00	22698.0	10700.00
18	275.07	217.21	0.259	0.60( 0.60)	1.00	23713.0	10200.00
19	269.70	235.00	0.252	0.60( 0.60)	1.00	24456.3	10320.00
20	267.62	239.83	0.250	0.60( 0.60)	1.00	24603.3	10300.00
21	258.30	257.66	0.244	0.60( 0.60)	1.00	24873.7	10210.00
22	217.45	368.28	0.204	0.60( 0.60)	1.00	25852.5	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 631.37 Tc(MIN.) = 82.68  
 EFFECTIVE AREA(ACRES) = 11142.27 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 25852.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11540.00 TO NODE 11541.00 IS CODE = 51

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 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 577.77 DOWNSTREAM(FEET) = 556.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.36 CHANNEL SLOPE = 0.0104  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.371  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN



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USER-DEFINED          -      389.46      0.60      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      631.37
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =      7.12
AVERAGE FLOW DEPTH(FEET) = 5.43 TRAVEL TIME(MIN.) = 4.80
Tc(MIN.) = 87.49
SUBAREA AREA(ACRES) = 389.46 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 11531.73 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 26242.0 PEAK FLOW RATE(CFS) = 631.37
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.43 FLOW VELOCITY(FEET/SEC.) = 7.12
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11541.00 = 76797.15 FEET.

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FLOW PROCESS FROM NODE 11541.00 TO NODE 11542.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 556.39 DOWNSTREAM(FEET) = 523.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3267.94 CHANNEL SLOPE = 0.0101
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.359
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 330.30 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 631.37
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.06
AVERAGE FLOW DEPTH(FEET) = 5.46 TRAVEL TIME(MIN.) = 7.71
Tc(MIN.) = 95.20
SUBAREA AREA(ACRES) = 330.30 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 11862.03 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 26572.3 PEAK FLOW RATE(CFS) = 631.37
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.46 FLOW VELOCITY(FEET/SEC.) = 7.06
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11542.00 = 80065.09 FEET.

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FLOW PROCESS FROM NODE 11542.00 TO NODE 11543.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 523.29 DOWNSTREAM(FEET) = 493.61
CHANNEL LENGTH THRU SUBAREA(FEET) = 2857.94 CHANNEL SLOPE = 0.0104
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.349
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 285.11 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 631.37
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.12
AVERAGE FLOW DEPTH(FEET) = 5.44 TRAVEL TIME(MIN.) = 6.69
Tc(MIN.) = 101.89
SUBAREA AREA(ACRES) = 285.11 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 12147.14 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 26857.4 PEAK FLOW RATE(CFS) = 631.37
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.44 FLOW VELOCITY(FEET/SEC.) = 7.12
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11543.00 = 82923.02 FEET.

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FLOW PROCESS FROM NODE 11543.00 TO NODE 11544.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 493.61 DOWNSTREAM(FEET) = 480.21
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.01 CHANNEL SLOPE = 0.0068
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.341
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 303.63 0.60 0.987 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 631.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.08
AVERAGE FLOW DEPTH(FEET) = 5.89 TRAVEL TIME(MIN.) = 5.38
Tc(MIN.) = 107.27
SUBAREA AREA(ACRES) = 303.63 SUBAREA RUNOFF(CFS) = 1.21
EFFECTIVE AREA(ACRES) = 12450.77 AREA-AVERAGED Fm(INCH/HR) = 0.60

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AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 27161.0 PEAK FLOW RATE(CFS) = 631.37  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.88 FLOW VELOCITY(FEET/SEC.) = 6.09  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11544.00 = 84886.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11544.00 TO NODE 11545.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 480.21 DOWNSTREAM(FEET) = 456.90  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1914.49 CHANNEL SLOPE = 0.0122  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.335

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	184.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 631.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.56  
 AVERAGE FLOW DEPTH(FEET) = 5.28 TRAVEL TIME(MIN.) = 4.22  
 Tc(MIN.) = 111.49  
 SUBAREA AREA(ACRES) = 184.16 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 12634.93 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 27345.2 PEAK FLOW RATE(CFS) = 631.37  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.28 FLOW VELOCITY(FEET/SEC.) = 7.56  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11545.00 = 86800.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 456.90 DOWNSTREAM(FEET) = 436.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2322.79 CHANNEL SLOPE = 0.0089  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.327

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	184.16	0.60	1.000	-

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 151.95 0.60 0.844 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.844  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 634.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.74  
 AVERAGE FLOW DEPTH(FEET) = 5.60 TRAVEL TIME(MIN.) = 5.75  
 Tc(MIN.) = 117.24

SUBAREA AREA(ACRES) = 151.95 SUBAREA RUNOFF(CFS) = 6.98  
 EFFECTIVE AREA(ACRES) = 12786.88 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 27497.1 PEAK FLOW RATE(CFS) = 631.37  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.60 FLOW VELOCITY(FEET/SEC.) = 6.72  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 27497.1 TC(MIN.) = 117.24  
 EFFECTIVE AREA(ACRES) = 12786.88 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.997  
 PEAK FLOW RATE(CFS) = 631.37

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	410.42	67.60	0.412	0.60( 0.60)	0.99	4932.7	11500.00
2	425.24	70.41	0.406	0.60( 0.60)	0.99	5310.6	11530.00
3	515.04	92.40	0.363	0.60( 0.60)	1.00	7906.9	11000.00
4	609.35	110.72	0.336	0.60( 0.60)	1.00	11455.6	11350.00
5	631.37	117.24	0.327	0.60( 0.60)	1.00	12786.9	10850.00
6	624.04	120.63	0.322	0.60( 0.60)	1.00	13360.4	11300.00
7	597.13	124.86	0.319	0.60( 0.60)	1.00	13953.5	10800.00
8	549.09	131.30	0.314	0.60( 0.60)	1.00	14770.2	11220.00
9	534.38	133.22	0.312	0.60( 0.60)	1.00	14973.8	11130.00
10	483.80	141.26	0.305	0.60( 0.60)	1.00	15621.5	10910.00
11	435.68	148.71	0.299	0.60( 0.60)	1.00	16068.8	10630.00
12	317.33	184.82	0.271	0.60( 0.60)	1.00	19382.9	10600.00
13	295.53	200.26	0.265	0.60( 0.60)	1.00	21324.6	11201.00
14	294.22	203.23	0.264	0.60( 0.60)	1.00	21667.9	10500.00
15	294.30	213.31	0.260	0.60( 0.60)	1.00	22606.8	10710.00
16	288.94	221.25	0.257	0.60( 0.60)	1.00	23128.4	10410.00
17	275.81	242.43	0.249	0.60( 0.60)	1.00	24342.6	10700.00
18	275.07	259.73	0.243	0.60( 0.60)	1.00	25357.6	10200.00
19	269.70	277.71	0.236	0.60( 0.60)	1.00	26100.9	10320.00
20	267.62	282.66	0.234	0.60( 0.60)	1.00	26247.9	10300.00
21	258.30	300.87	0.227	0.60( 0.60)	1.00	26518.3	10210.00
22	217.45	413.40	0.199	0.60( 0.60)	1.00	27497.1	10100.00

=====

END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 2839.39 DOWNSTREAM(FEET) = 2697.55  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 976.87 CHANNEL SLOPE = 0.1452  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.957  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.42	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.81  
 AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 3.39  
 Tc(MIN.) = 15.73  
 SUBAREA AREA(ACRES) = 31.42 SUBAREA RUNOFF(CFS) = 10.09  
 EFFECTIVE AREA(ACRES) = 38.09 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 38.1 PEAK FLOW RATE(CFS) = 12.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 5.26  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11603.00 = 1915.41 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11603.00 TO NODE 11604.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2697.55 DOWNSTREAM(FEET) = 2598.90  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1887.15 CHANNEL SLOPE = 0.0523  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.708  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.03	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.86  
 AVERAGE FLOW DEPTH(FEET) = 1.19 TRAVEL TIME(MIN.) = 8.15  
 Tc(MIN.) = 23.89  
 SUBAREA AREA(ACRES) = 72.03 SUBAREA RUNOFF(CFS) = 6.98  
 EFFECTIVE AREA(ACRES) = 110.12 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 12.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.07 FLOW VELOCITY(FEET/SEC.) = 3.59  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11604.00 = 3802.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11604.00 TO NODE 11605.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2598.90 DOWNSTREAM(FEET) = 2464.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2488.89 CHANNEL SLOPE = 0.0541  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.560  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.28	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.64  
 AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 11.38  
 Tc(MIN.) = 35.27  
 SUBAREA AREA(ACRES) = 96.28 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 206.40 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 206.4 PEAK FLOW RATE(CFS) = 12.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 3.64  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11605.00 = 6291.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11605.00 TO NODE 11606.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2464.25 DOWNSTREAM(FEET) = 2359.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1936.71 CHANNEL SLOPE = 0.0538  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.497  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	266.26	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.64  
 AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 8.86  
 Tc(MIN.) = 44.13  
 SUBAREA AREA(ACRES) = 266.26 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 472.66 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 472.7 PEAK FLOW RATE (CFS) = 12.23  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.06 FLOW VELOCITY (FEET/SEC.) = 3.64  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11606.00 = 8228.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11606.00 TO NODE 11607.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2359.99 DOWNSTREAM (FEET) = 1905.15  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3829.49 CHANNEL SLOPE = 0.1188  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.437

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	132.44	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 12.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.89  
AVERAGE FLOW DEPTH (FEET) = 0.91 TRAVEL TIME (MIN.) = 13.04  
Tc (MIN.) = 57.17  
SUBAREA AREA (ACRES) = 132.44 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 605.10 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 605.1 PEAK FLOW RATE (CFS) = 12.23  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.91 FLOW VELOCITY (FEET/SEC.) = 4.89  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11607.00 = 12057.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11607.00 TO NODE 11608.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 1905.15 DOWNSTREAM (FEET) = 1717.92  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1095.02 CHANNEL SLOPE = 0.1710  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.426

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	132.44	0.60	1.000	-

USER-DEFINED - 76.91 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 12.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.62  
AVERAGE FLOW DEPTH (FEET) = 0.85 TRAVEL TIME (MIN.) = 3.25  
Tc (MIN.) = 60.42  
SUBAREA AREA (ACRES) = 76.91 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 682.01 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 682.0 PEAK FLOW RATE (CFS) = 12.23  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.85 FLOW VELOCITY (FEET/SEC.) = 5.62  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11608.00 = 13152.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11608.00 TO NODE 11609.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1717.92 DOWNSTREAM (FEET) = 1516.24  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1480.24 CHANNEL SLOPE = 0.1362  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.416

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	328.91	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 12.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.15  
AVERAGE FLOW DEPTH (FEET) = 0.89 TRAVEL TIME (MIN.) = 4.79  
Tc (MIN.) = 65.21  
SUBAREA AREA (ACRES) = 328.91 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 1010.92 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 1010.9 PEAK FLOW RATE (CFS) = 12.23  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.89 FLOW VELOCITY (FEET/SEC.) = 5.15  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11609.00 = 14632.91 FEET.

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FLOW PROCESS FROM NODE 11609.00 TO NODE 11610.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1516.24 DOWNSTREAM(FEET) = 1332.01
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.38 CHANNEL SLOPE = 0.0957
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.402
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 355.16 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.51
AVERAGE FLOW DEPTH(FEET) = 0.95 TRAVEL TIME(MIN.) = 7.12
Tc(MIN.) = 72.33
SUBAREA AREA(ACRES) = 355.16 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1366.08 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1366.1 PEAK FLOW RATE(CFS) = 12.23
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 4.51
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11610.00 = 16558.29 FEET.

*****
FLOW PROCESS FROM NODE 11610.00 TO NODE 11611.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1332.01 DOWNSTREAM(FEET) = 1105.34
CHANNEL LENGTH THRU SUBAREA(FEET) = 2901.03 CHANNEL SLOPE = 0.0781
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.378
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 234.59 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.18
AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 11.56
Tc(MIN.) = 83.88
SUBAREA AREA(ACRES) = 234.59 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1600.67 AREA-AVERAGED Fm(INCH/HR) = 0.60

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AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1600.7 PEAK FLOW RATE(CFS) = 12.23
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.99 FLOW VELOCITY(FEET/SEC.) = 4.18
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11611.00 = 19459.32 FEET.

*****
FLOW PROCESS FROM NODE 11611.00 TO NODE 11612.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1105.34 DOWNSTREAM(FEET) = 1030.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 1982.46 CHANNEL SLOPE = 0.0378
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.360
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 212.67 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.18
AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 10.39
Tc(MIN.) = 94.27
SUBAREA AREA(ACRES) = 212.67 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1813.34 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1813.3 PEAK FLOW RATE(CFS) = 12.23
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.13 FLOW VELOCITY(FEET/SEC.) = 3.18
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11612.00 = 21441.78 FEET.

*****
FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1030.47 DOWNSTREAM(FEET) = 870.22
CHANNEL LENGTH THRU SUBAREA(FEET) = 3051.86 CHANNEL SLOPE = 0.0525
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.340
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 465.36 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.59  
 AVERAGE FLOW DEPTH(FEET) = 1.07 TRAVEL TIME(MIN.) = 14.16  
 Tc(MIN.) = 108.43  
 SUBAREA AREA(ACRES) = 465.36 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 2278.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 2278.7 PEAK FLOW RATE(CFS) = 12.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.07 FLOW VELOCITY(FEET/SEC.) = 3.59  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 108.43  
 RAINFALL INTENSITY(INCH/HR) = 0.34  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 2278.70  
 TOTAL STREAM AREA(ACRES) = 2278.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 12.23

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11620.00 TO NODE 11621.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 266.64  
 ELEVATION DATA: UPSTREAM(FEET) = 2567.03 DOWNSTREAM(FEET) = 2486.90

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.387  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.518  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	0.69	0.60	1.000	0	8.39

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 0.57

TOTAL AREA(ACRES) = 0.69 PEAK FLOW RATE(CFS) = 0.57

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11621.00 TO NODE 11622.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2486.90 DOWNSTREAM(FEET) = 2424.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 712.48 CHANNEL SLOPE = 0.0870  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.114  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.63	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.58  
 AVERAGE FLOW DEPTH(FEET) = 0.43 TRAVEL TIME(MIN.) = 4.61  
 Tc(MIN.) = 12.99  
 SUBAREA AREA(ACRES) = 3.63 SUBAREA RUNOFF(CFS) = 1.68  
 EFFECTIVE AREA(ACRES) = 4.32 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4.3 PEAK FLOW RATE(CFS) = 2.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.49 FLOW VELOCITY(FEET/SEC.) = 2.76  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11622.00 = 979.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11622.00 TO NODE 11623.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2424.91 DOWNSTREAM(FEET) = 2351.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 977.46 CHANNEL SLOPE = 0.0751  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.857  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.42	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.02  
 AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 5.39  
 Tc(MIN.) = 18.39  
 SUBAREA AREA(ACRES) = 13.42 SUBAREA RUNOFF(CFS) = 3.11  
 EFFECTIVE AREA(ACRES) = 17.74 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 17.7 PEAK FLOW RATE(CFS) = 4.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 3.14  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11623.00 = 1956.58 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11623.00 TO NODE 11624.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2351.48 DOWNSTREAM(FEET) = 2317.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 947.96 CHANNEL SLOPE = 0.0355  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.686

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.02	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.46  
AVERAGE FLOW DEPTH(FEET) = 0.81 TRAVEL TIME(MIN.) = 6.42  
Tc(MIN.) = 24.81  
SUBAREA AREA(ACRES) = 16.02 SUBAREA RUNOFF(CFS) = 1.25  
EFFECTIVE AREA(ACRES) = 33.76 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.8 PEAK FLOW RATE(CFS) = 4.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 2.37  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.00 = 2904.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11624.00 TO NODE 11624.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2317.87 DOWNSTREAM(FEET) = 2292.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 758.23 CHANNEL SLOPE = 0.0337  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.601

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.93	0.60	0.984	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.34  
AVERAGE FLOW DEPTH(FEET) = 0.79 TRAVEL TIME(MIN.) = 5.40  
Tc(MIN.) = 30.21  
SUBAREA AREA(ACRES) = 32.93 SUBAREA RUNOFF(CFS) = 0.33  
EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 4.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.77 FLOW VELOCITY(FEET/SEC.) = 2.32  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.50 = 3662.77 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11624.50 TO NODE 11625.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2292.33 DOWNSTREAM(FEET) = 2256.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1098.98 CHANNEL SLOPE = 0.0325  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.536

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	48.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.11  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.29  
AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 8.00  
Tc(MIN.) = 38.21  
SUBAREA AREA(ACRES) = 48.16 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 114.85 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 114.9 PEAK FLOW RATE(CFS) = 4.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.77 FLOW VELOCITY(FEET/SEC.) = 2.29  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11625.00 = 4761.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11625.00 TO NODE 11626.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2256.59 DOWNSTREAM(FEET) = 2104.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.93 CHANNEL SLOPE = 0.0739  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.475

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.15	0.60	0.950	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.950



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.950  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.47  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 9.87  
 Tc(MIN.) = 48.08  
 SUBAREA AREA(ACRES) = 212.15 SUBAREA RUNOFF(CFS) = 4.53  
 EFFECTIVE AREA(ACRES) = 327.00 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 327.0 PEAK FLOW RATE(CFS) = 4.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.70 FLOW VELOCITY(FEET/SEC.) = 3.25  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11626.00 = 6818.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11626.00 TO NODE 11627.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2104.66 DOWNSTREAM(FEET) = 1837.03  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2716.08 CHANNEL SLOPE = 0.0985  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.425  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	147.74	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.57  
 AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 12.68  
 Tc(MIN.) = 60.76  
 SUBAREA AREA(ACRES) = 147.74 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 474.74 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 474.7 PEAK FLOW RATE(CFS) = 4.76  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 3.57  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11627.00 = 9534.76 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11627.00 TO NODE 11628.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1837.03 DOWNSTREAM(FEET) = 1393.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2077.86 CHANNEL SLOPE = 0.2132  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.411  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	202.44	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.80  
 AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 7.22  
 Tc(MIN.) = 67.98

SUBAREA AREA(ACRES) = 202.44 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 677.18 AREA-AVERAGED Fm(INCH/HR) = 0.59

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 677.2 PEAK FLOW RATE(CFS) = 4.76  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 4.80  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11628.00 = 11612.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11628.00 TO NODE 11629.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1393.93 DOWNSTREAM(FEET) = 1201.61  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2844.34 CHANNEL SLOPE = 0.0676  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.380  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.55	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.13  
 AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 15.17  
 Tc(MIN.) = 83.14

SUBAREA AREA(ACRES) = 141.55 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 818.73 AREA-AVERAGED Fm(INCH/HR) = 0.59

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 818.7 PEAK FLOW RATE (CFS) = 4.76  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.71 FLOW VELOCITY (FEET/SEC.) = 3.13  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11629.00 = 14456.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1201.61 DOWNSTREAM (FEET) = 870.22  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3807.89 CHANNEL SLOPE = 0.0870  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.349

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	106.41	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.41

AVERAGE FLOW DEPTH (FEET) = 0.68 TRAVEL TIME (MIN.) = 18.60

Tc (MIN.) = 101.74

SUBAREA AREA (ACRES) = 106.41 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 925.14 AREA-AVERAGED Fm (INCH/HR) = 0.59

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 925.1 PEAK FLOW RATE (CFS) = 4.76

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.68 FLOW VELOCITY (FEET/SEC.) = 3.41

LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11630.00 = 18264.85 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 101.74

RAINFALL INTENSITY (INCH/HR) = 0.35

AREA-AVERAGED Fm (INCH/HR) = 0.59

AREA-AVERAGED Fp (INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.99

EFFECTIVE STREAM AREA (ACRES) = 925.14

TOTAL STREAM AREA (ACRES) = 925.14

PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.76

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.23	108.43	0.340	0.60 ( 0.60)	1.00	2278.7	11600.00
2	4.76	101.74	0.349	0.60 ( 0.59)	0.99	925.1	11620.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.56	101.74	0.349	0.60 ( 0.60)	1.00	3063.3	11620.00
2	16.86	108.43	0.340	0.60 ( 0.60)	1.00	3203.8	11600.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 16.86 Tc (MIN.) = 108.43

EFFECTIVE AREA (ACRES) = 3203.84 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 3203.8

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 3203.8 TC (MIN.) = 108.43

EFFECTIVE AREA (ACRES) = 3203.84 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.997

PEAK FLOW RATE (CFS) = 16.86

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.56	101.74	0.349	0.60 ( 0.60)	1.00	3063.3	11620.00
2	16.86	108.43	0.340	0.60 ( 0.60)	1.00	3203.8	11600.00

=====

END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 1254.33 DOWNSTREAM(FEET) = 1143.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.91 CHANNEL SLOPE = 0.1076  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.060

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.57

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.73

AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 3.62

Tc(MIN.) = 13.83

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 8.91

EFFECTIVE AREA(ACRES) = 34.36 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 34.4 PEAK FLOW RATE(CFS) = 14.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.99 FLOW VELOCITY(FEET/SEC.) = 4.87

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11704.00 = 1881.24 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11704.00 TO NODE 11705.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1143.91 DOWNSTREAM(FEET) = 804.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1952.20 CHANNEL SLOPE = 0.1737  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.836

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.19	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.35

AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 5.12

Tc(MIN.) = 18.95

SUBAREA AREA(ACRES) = 50.19 SUBAREA RUNOFF(CFS) = 10.68

EFFECTIVE AREA(ACRES) = 84.55 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 84.6 PEAK FLOW RATE(CFS) = 18.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.98 FLOW VELOCITY(FEET/SEC.) = 6.23

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11705.00 = 3833.44 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 804.90 DOWNSTREAM(FEET) = 725.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1056.71 CHANNEL SLOPE = 0.0753  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.733

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.89	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.60

AVERAGE FLOW DEPTH(FEET) = 1.17 TRAVEL TIME(MIN.) = 3.83

Tc(MIN.) = 22.77

SUBAREA AREA(ACRES) = 15.89 SUBAREA RUNOFF(CFS) = 1.91

EFFECTIVE AREA(ACRES) = 100.44 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.4 PEAK FLOW RATE(CFS) = 18.00

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.15 FLOW VELOCITY(FEET/SEC.) = 4.54

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S16.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.56	101.74	0.60( 0.60)	1.00	3063.3	11620.00
2	16.86	108.43	0.60( 0.60)	1.00	3203.8	11600.00
TOTAL AREA(ACRES) =						3203.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.56	101.74	0.60( 0.60)	1.00	3063.3	11620.00
2	16.86	108.43	0.60( 0.60)	1.00	3203.8	11600.00
TOTAL AREA(ACRES) =						3203.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11630.00 TO NODE 11721.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 870.22 DOWNSTREAM(FEET) = 725.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3507.54 CHANNEL SLOPE = 0.0413  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.319  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	213.50	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.86  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.56  
AVERAGE FLOW DEPTH(FEET) = 1.26 TRAVEL TIME(MIN.) = 16.41  
Tc(MIN.) = 124.84

SUBAREA AREA(ACRES) = 213.50 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 3417.34 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 3417.3 PEAK FLOW RATE(CFS) = 16.86  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 3.56  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	16.56	118.20	0.326	0.60( 0.60)	1.00	3276.8	11620.00
2	16.86	124.84	0.319	0.60( 0.60)	1.00	3417.3	11600.00

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18.00	22.77	0.733	0.60( 0.60)	1.00	100.4	11701.00

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	25.18	22.77	0.733	0.60( 0.60)	1.00	731.8	11701.00
2	16.56	118.20	0.326	0.60( 0.60)	1.00	3377.2	11620.00
3	16.86	124.84	0.319	0.60( 0.60)	1.00	3517.8	11600.00

TOTAL AREA(ACRES) = 3517.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 25.18 Tc(MIN.) = 22.775  
EFFECTIVE AREA(ACRES) = 731.82 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3517.8  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11721.00 TO NODE 11722.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 725.34 DOWNSTREAM(FEET) = 657.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1845.27 CHANNEL SLOPE = 0.0367  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.595  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	185.10	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.77  
AVERAGE FLOW DEPTH(FEET) = 1.49 TRAVEL TIME(MIN.) = 8.16  
Tc(MIN.) = 30.94

SUBAREA AREA(ACRES) = 185.10 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 916.92 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 3702.9 PEAK FLOW RATE(CFS) = 25.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.49 FLOW VELOCITY(FEET/SEC.) = 3.77  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11722.00 = 29846.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11722.00 TO NODE 11723.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.70 DOWNSTREAM(FEET) = 609.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1967.44 CHANNEL SLOPE = 0.0245  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.515

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	273.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.23  
AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 10.16  
Tc(MIN.) = 41.10  
SUBAREA AREA(ACRES) = 273.16 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1190.08 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 3976.0 PEAK FLOW RATE(CFS) = 25.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 3.23  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11723.00 = 31813.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11723.00 TO NODE 11724.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 609.57 DOWNSTREAM(FEET) = 546.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2808.53 CHANNEL SLOPE = 0.0224  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.442  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	159.72	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.13  
AVERAGE FLOW DEPTH(FEET) = 1.64 TRAVEL TIME(MIN.) = 14.95  
Tc(MIN.) = 56.05  
SUBAREA AREA(ACRES) = 159.72 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1349.80 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 4135.8 PEAK FLOW RATE(CFS) = 25.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.64 FLOW VELOCITY(FEET/SEC.) = 3.13  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11724.00 = 34622.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11724.00 TO NODE 11725.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 546.77 DOWNSTREAM(FEET) = 483.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.33 CHANNEL SLOPE = 0.0216  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.404  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.67	0.60	0.917	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.21  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.15  
AVERAGE FLOW DEPTH(FEET) = 1.70 TRAVEL TIME(MIN.) = 15.45  
Tc(MIN.) = 71.50  
SUBAREA AREA(ACRES) = 134.67 SUBAREA RUNOFF(CFS) = 4.06  
EFFECTIVE AREA(ACRES) = 1484.47 AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 4270.4 PEAK FLOW RATE(CFS) = 25.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.65 FLOW VELOCITY(FEET/SEC.) = 3.08  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11725.00 = 37543.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 483.75 DOWNSTREAM(FEET) = 436.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2685.66 CHANNEL SLOPE = 0.0177  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.372  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.44	0.60	0.986	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.87  
AVERAGE FLOW DEPTH(FEET) = 1.72 TRAVEL TIME(MIN.) = 15.59

Tc(MIN.) = 87.09  
 SUBAREA AREA(ACRES) = 121.44 SUBAREA RUNOFF(CFS) = 0.57  
 EFFECTIVE AREA(ACRES) = 1605.91 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 4391.9 PEAK FLOW RATE(CFS) = 25.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 2.86  
 LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 4391.9 TC(MIN.) = 87.09  
 EFFECTIVE AREA(ACRES) = 1605.91 AREA-AVERAGED Fm(INCH/HR)= 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.991  
 PEAK FLOW RATE(CFS) = 25.18

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.18	87.09	0.372	0.60 ( 0.59)	0.99	1605.9	11701.00
2	16.56	189.59	0.269	0.60 ( 0.60)	0.99	4251.3	11620.00
3	16.86	195.86	0.267	0.60 ( 0.60)	0.99	4391.9	11600.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
 RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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 Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
 FILE NAME: S18.DAT  
 TIME/DATE OF STUDY: 14:36 04/03/2013  
 =====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
 NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.948
- 2) 10.00; 1.299
- 3) 15.00; 0.980
- 4) 20.00; 0.794
- 5) 25.00; 0.680
- 6) 30.00; 0.602
- 7) 40.00; 0.520
- 8) 50.00; 0.463
- 9) 60.00; 0.426
- 10) 90.00; 0.364
- 11) 120.00; 0.321
- 12) 180.00; 0.271
- 13) 360.00; 0.203
- 14) 1440.00; 0.091

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11801.00 TO NODE 11802.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 970.31  
 ELEVATION DATA: UPSTREAM(FEET) = 834.89 DOWNSTREAM(FEET) = 727.50

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.170  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.899

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 7.24 0.60 1.000 0 17.17  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 1.95  
 TOTAL AREA(ACRES) = 7.24 PEAK FLOW RATE(CFS) = 1.95

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11802.00 TO NODE 11803.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 727.50 DOWNSTREAM(FEET) = 674.12  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 968.10 CHANNEL SLOPE = 0.0551  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.719

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 22.08 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.27  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.63  
 AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 6.14  
 Tc(MIN.) = 23.31

SUBAREA AREA(ACRES) = 22.08 SUBAREA RUNOFF(CFS) = 2.36  
 EFFECTIVE AREA(ACRES) = 29.32 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 3.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.63 FLOW VELOCITY(FEET/SEC.) = 2.63  
 LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11803.00 = 1938.41 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11803.00 TO NODE 11804.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====



ELEVATION DATA: UPSTREAM(FEET) = 674.12 DOWNSTREAM(FEET) = 554.40  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.27 CHANNEL SLOPE = 0.0642  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.565

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.55	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.76

AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 11.26

Tc(MIN.) = 34.57

SUBAREA AREA(ACRES) = 35.55 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 64.87 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 64.9 PEAK FLOW RATE(CFS) = 3.13

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 2.76

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11804.00 = 3802.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 554.40 DOWNSTREAM(FEET) = 423.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1767.25 CHANNEL SLOPE = 0.0738  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.493

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.70	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.90

AVERAGE FLOW DEPTH(FEET) = 0.60 TRAVEL TIME(MIN.) = 10.15

Tc(MIN.) = 44.72

SUBAREA AREA(ACRES) = 36.70 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 101.57 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 101.6 PEAK FLOW RATE(CFS) = 3.13

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 2.90

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S15.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	425.24	70.41	0.60( 0.60)	0.99	5310.6	11530.00
2	515.04	92.40	0.60( 0.60)	1.00	7906.9	11000.00
3	609.35	110.72	0.60( 0.60)	1.00	11455.6	11350.00
4	631.37	117.24	0.60( 0.60)	1.00	12786.9	10850.00
5	624.04	120.63	0.60( 0.60)	1.00	13360.4	11300.00
6	597.13	124.86	0.60( 0.60)	1.00	13953.5	10800.00
7	549.09	131.30	0.60( 0.60)	1.00	14770.2	11220.00
8	483.80	141.26	0.60( 0.60)	1.00	15621.5	10910.00
9	435.68	148.71	0.60( 0.60)	1.00	16068.8	10630.00
10	317.33	184.82	0.60( 0.60)	1.00	19382.9	10600.00
11	295.53	200.26	0.60( 0.60)	1.00	21324.6	11201.00
12	294.22	203.23	0.60( 0.60)	1.00	21667.9	10500.00
13	294.30	213.31	0.60( 0.60)	1.00	22606.8	10710.00
14	288.94	221.25	0.60( 0.60)	1.00	23128.4	10410.00
15	275.81	242.43	0.60( 0.60)	1.00	24342.6	10700.00
16	275.07	259.73	0.60( 0.60)	1.00	25357.6	10200.00
17	269.70	277.71	0.60( 0.60)	1.00	26100.9	10320.00
18	267.62	282.66	0.60( 0.60)	1.00	26247.9	10300.00
19	258.30	300.87	0.60( 0.60)	1.00	26518.3	10210.00
20	217.45	413.40	0.60( 0.60)	1.00	27497.1	10100.00
TOTAL AREA(ACRES) =						27497.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S17.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.18	87.09	0.60( 0.59)	0.99	1605.9	11701.00
2	16.56	189.59	0.60( 0.60)	0.99	4251.3	11620.00
3	16.86	195.86	0.60( 0.60)	0.99	4391.9	11600.00
TOTAL AREA(ACRES) =						4391.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.18	87.09	0.60 ( 0.59)	0.99	1605.9	11701.00
2	16.56	189.59	0.60 ( 0.60)	0.99	4251.3	11620.00
3	16.86	195.86	0.60 ( 0.60)	0.99	4391.9	11600.00
TOTAL AREA (ACRES) =						4391.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.18	87.09	0.370	0.60 ( 0.59)	0.99	1605.9	11701.00
2	16.56	189.59	0.267	0.60 ( 0.60)	0.99	4251.3	11620.00
3	16.86	195.86	0.265	0.60 ( 0.60)	0.99	4391.9	11600.00

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	425.24	70.41	0.404	0.60 ( 0.60)	0.99	5310.6	11530.00
2	515.04	92.40	0.361	0.60 ( 0.60)	1.00	7906.9	11000.00
3	609.35	110.72	0.334	0.60 ( 0.60)	1.00	11455.6	11350.00
4	631.37	117.24	0.325	0.60 ( 0.60)	1.00	12786.9	10850.00
5	624.04	120.63	0.320	0.60 ( 0.60)	1.00	13360.4	11300.00
6	597.13	124.86	0.317	0.60 ( 0.60)	1.00	13953.5	10800.00
7	549.09	131.30	0.312	0.60 ( 0.60)	1.00	14770.2	11220.00
8	483.80	141.26	0.303	0.60 ( 0.60)	1.00	15621.5	10910.00
9	435.68	148.71	0.297	0.60 ( 0.60)	1.00	16068.8	10630.00
10	317.33	184.82	0.269	0.60 ( 0.60)	1.00	19382.9	10600.00
11	295.53	200.26	0.263	0.60 ( 0.60)	1.00	21324.6	11201.00
12	294.22	203.23	0.262	0.60 ( 0.60)	1.00	21667.9	10500.00
13	294.30	213.31	0.258	0.60 ( 0.60)	1.00	22606.8	10710.00
14	288.94	221.25	0.255	0.60 ( 0.60)	1.00	23128.4	10410.00
15	275.81	242.43	0.247	0.60 ( 0.60)	1.00	24342.6	10700.00
16	275.07	259.73	0.241	0.60 ( 0.60)	1.00	25357.6	10200.00
17	269.70	277.71	0.234	0.60 ( 0.60)	1.00	26100.9	10320.00
18	267.62	282.66	0.232	0.60 ( 0.60)	1.00	26247.9	10300.00
19	258.30	300.87	0.225	0.60 ( 0.60)	1.00	26518.3	10210.00
20	217.45	413.40	0.197	0.60 ( 0.60)	1.00	27497.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	447.49	70.41	0.404	0.60 ( 0.60)	0.99	6608.9	11530.00
2	518.54	87.09	0.370	0.60 ( 0.60)	0.99	8886.0	11701.00
3	539.78	92.40	0.361	0.60 ( 0.60)	0.99	9649.9	11000.00

4	632.55	110.72	0.334	0.60 ( 0.60)	1.00	13671.4	11350.00
5	654.02	117.24	0.325	0.60 ( 0.60)	1.00	15171.0	10850.00
6	646.40	120.63	0.320	0.60 ( 0.60)	1.00	15832.0	11300.00
7	619.14	124.86	0.317	0.60 ( 0.60)	1.00	16534.1	10800.00
8	570.55	131.30	0.312	0.60 ( 0.60)	1.00	17517.0	11220.00
9	504.43	141.26	0.303	0.60 ( 0.60)	1.00	18625.4	10910.00
10	455.67	148.71	0.297	0.60 ( 0.60)	1.00	19265.2	10630.00
11	334.29	184.82	0.269	0.60 ( 0.60)	1.00	23511.0	10600.00
12	327.15	189.59	0.267	0.60 ( 0.60)	1.00	24234.8	11620.00
13	318.60	195.86	0.265	0.60 ( 0.60)	1.00	25163.6	11600.00
14	312.29	200.26	0.263	0.60 ( 0.60)	1.00	25716.4	11201.00
15	310.90	203.23	0.262	0.60 ( 0.60)	1.00	26059.8	10500.00
16	310.74	213.31	0.258	0.60 ( 0.60)	1.00	26998.7	10710.00
17	305.19	221.25	0.255	0.60 ( 0.60)	1.00	27520.3	10410.00
18	291.55	242.43	0.247	0.60 ( 0.60)	1.00	28734.5	10700.00
19	290.39	259.73	0.241	0.60 ( 0.60)	1.00	29749.5	10200.00
20	284.59	277.71	0.234	0.60 ( 0.60)	1.00	30492.8	10320.00
21	282.39	282.66	0.232	0.60 ( 0.60)	1.00	30639.8	10300.00
22	272.63	300.87	0.225	0.60 ( 0.60)	1.00	30910.2	10210.00
23	230.01	413.40	0.197	0.60 ( 0.60)	1.00	31889.0	10100.00

TOTAL AREA (ACRES) = 31889.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 654.02 Tc (MIN.) = 117.240

EFFECTIVE AREA (ACRES) = 15170.95 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 31889.0

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11726.00 TO NODE 11821.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 436.21 DOWNSTREAM (FEET) = 423.93

CHANNEL LENGTH THRU SUBAREA (FEET) = 1621.39 CHANNEL SLOPE = 0.0076

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.320

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.69	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 654.02

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.38

AVERAGE FLOW DEPTH (FEET) = 5.85 TRAVEL TIME (MIN.) = 4.24

Tc (MIN.) = 121.48

SUBAREA AREA (ACRES) = 59.69 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 15230.64 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 31948.7 PEAK FLOW RATE (CFS) = 654.02

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.85 FLOW VELOCITY(FEET/SEC.) = 6.38

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	447.49	75.07	0.395	0.60( 0.60)	0.99	6668.6	11530.00
2	518.54	91.58	0.362	0.60( 0.60)	0.99	8945.7	11701.00
3	539.78	96.83	0.354	0.60( 0.60)	0.99	9709.5	11000.00
4	632.55	114.99	0.328	0.60( 0.60)	1.00	13731.1	11350.00
5	654.02	121.48	0.320	0.60( 0.60)	1.00	15230.6	10850.00
6	646.40	124.88	0.317	0.60( 0.60)	1.00	15891.7	11300.00
7	619.14	129.15	0.313	0.60( 0.60)	1.00	16593.8	10800.00
8	570.55	135.68	0.308	0.60( 0.60)	1.00	17576.7	11220.00
9	504.43	145.78	0.300	0.60( 0.60)	1.00	18685.1	10910.00
10	455.67	153.36	0.293	0.60( 0.60)	1.00	19324.9	10630.00
11	334.29	189.83	0.267	0.60( 0.60)	1.00	23570.7	10600.00
12	327.15	194.63	0.265	0.60( 0.60)	1.00	24294.5	11620.00
13	318.60	200.94	0.263	0.60( 0.60)	1.00	25223.3	11600.00
14	312.29	205.35	0.261	0.60( 0.60)	1.00	25776.1	11201.00
15	310.90	208.33	0.260	0.60( 0.60)	1.00	26119.4	10500.00
16	310.74	218.41	0.256	0.60( 0.60)	1.00	27058.4	10710.00
17	305.19	226.38	0.253	0.60( 0.60)	1.00	27580.0	10410.00
18	291.55	247.61	0.245	0.60( 0.60)	1.00	28794.2	10700.00
19	290.39	264.93	0.239	0.60( 0.60)	1.00	29809.2	10200.00
20	284.59	282.92	0.232	0.60( 0.60)	1.00	30552.4	10320.00
21	282.39	287.89	0.230	0.60( 0.60)	1.00	30699.5	10300.00
22	272.63	306.14	0.223	0.60( 0.60)	1.00	30969.9	10210.00
23	230.01	418.89	0.197	0.60( 0.60)	1.00	31948.7	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 654.02 Tc(MIN.) = 121.48

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 15230.64

\*\*\*\*\*

FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	447.49	75.07	0.395	0.60( 0.60)	0.99	6668.6	11530.00
2	518.54	91.58	0.362	0.60( 0.60)	0.99	8945.7	11701.00
3	539.78	96.83	0.354	0.60( 0.60)	0.99	9709.5	11000.00
4	632.55	114.99	0.328	0.60( 0.60)	1.00	13731.1	11350.00
5	654.02	121.48	0.320	0.60( 0.60)	1.00	15230.6	10850.00
6	646.40	124.88	0.317	0.60( 0.60)	1.00	15891.7	11300.00
7	619.14	129.15	0.313	0.60( 0.60)	1.00	16593.8	10800.00
8	570.55	135.68	0.308	0.60( 0.60)	1.00	17576.7	11220.00
9	504.43	145.78	0.300	0.60( 0.60)	1.00	18685.1	10910.00
10	455.67	153.36	0.293	0.60( 0.60)	1.00	19324.9	10630.00
11	334.29	189.83	0.267	0.60( 0.60)	1.00	23570.7	10600.00
12	327.15	194.63	0.265	0.60( 0.60)	1.00	24294.5	11620.00

13	318.60	200.94	0.263	0.60( 0.60)	1.00	25223.3	11600.00
14	312.29	205.35	0.261	0.60( 0.60)	1.00	25776.1	11201.00
15	310.90	208.33	0.260	0.60( 0.60)	1.00	26119.4	10500.00
16	310.74	218.41	0.256	0.60( 0.60)	1.00	27058.4	10710.00
17	305.19	226.38	0.253	0.60( 0.60)	1.00	27580.0	10410.00
18	291.55	247.61	0.245	0.60( 0.60)	1.00	28794.2	10700.00
19	290.39	264.93	0.239	0.60( 0.60)	1.00	29809.2	10200.00
20	284.59	282.92	0.232	0.60( 0.60)	1.00	30552.4	10320.00
21	282.39	287.89	0.230	0.60( 0.60)	1.00	30699.5	10300.00
22	272.63	306.14	0.223	0.60( 0.60)	1.00	30969.9	10210.00
23	230.01	418.89	0.197	0.60( 0.60)	1.00	31948.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.13	44.72	0.493	0.60( 0.60)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.04	44.72	0.493	0.60( 0.60)	0.99	4074.3	11801.00
2	450.00	75.07	0.395	0.60( 0.60)	0.99	6770.2	11530.00
3	520.84	91.58	0.362	0.60( 0.60)	0.99	9047.2	11701.00
4	542.03	96.83	0.354	0.60( 0.60)	0.99	9811.1	11000.00
5	634.63	114.99	0.328	0.60( 0.60)	1.00	13832.6	11350.00
6	656.05	121.48	0.320	0.60( 0.60)	1.00	15332.2	10850.00
7	648.41	124.88	0.317	0.60( 0.60)	1.00	15993.3	11300.00
8	621.13	129.15	0.313	0.60( 0.60)	1.00	16695.4	10800.00
9	572.50	135.68	0.308	0.60( 0.60)	1.00	17678.3	11220.00
10	506.33	145.78	0.300	0.60( 0.60)	1.00	18786.6	10910.00
11	457.54	153.36	0.293	0.60( 0.60)	1.00	19426.4	10630.00
12	335.99	189.83	0.267	0.60( 0.60)	1.00	23672.3	10600.00
13	328.83	194.63	0.265	0.60( 0.60)	1.00	24396.1	11620.00
14	320.27	200.94	0.263	0.60( 0.60)	1.00	25324.9	11600.00
15	313.95	205.35	0.261	0.60( 0.60)	1.00	25877.7	11201.00
16	312.56	208.33	0.260	0.60( 0.60)	1.00	26221.0	10500.00
17	312.37	218.41	0.256	0.60( 0.60)	1.00	27160.0	10710.00
18	306.80	226.38	0.253	0.60( 0.60)	1.00	27681.5	10410.00
19	293.11	247.61	0.245	0.60( 0.60)	1.00	28895.8	10700.00
20	291.91	264.93	0.239	0.60( 0.60)	1.00	29910.8	10200.00
21	286.06	282.92	0.232	0.60( 0.60)	1.00	30654.0	10320.00
22	283.85	287.89	0.230	0.60( 0.60)	1.00	30801.1	10300.00
23	274.05	306.14	0.223	0.60( 0.60)	1.00	31071.5	10210.00
24	231.26	418.89	0.197	0.60( 0.60)	1.00	32050.3	10100.00

TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 656.05 Tc(MIN.) = 121.478

EFFECTIVE AREA(ACRES) = 15332.21 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 32050.3

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

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FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.316  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 656.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42

AVERAGE FLOW DEPTH(FEET) = 5.43 TRAVEL TIME(MIN.) = 4.30

Tc(MIN.) = 125.78

SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 15534.12 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 656.05

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.43 FLOW VELOCITY(FEET/SEC.) = 7.42

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11822.00 = 92657.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.04	49.81	0.464	0.60( 0.60)	0.99	4276.2	11801.00
2	450.00	79.80	0.385	0.60( 0.60)	0.99	6972.1	11530.00
3	520.84	96.13	0.355	0.60( 0.60)	0.99	9249.1	11701.00
4	542.03	101.34	0.348	0.60( 0.60)	0.99	10013.0	11000.00
5	634.63	119.33	0.322	0.60( 0.60)	1.00	14034.6	11350.00
6	656.05	125.78	0.316	0.60( 0.60)	1.00	15534.1	10850.00
7	648.41	129.19	0.313	0.60( 0.60)	1.00	16195.2	11300.00
8	621.13	133.51	0.310	0.60( 0.60)	1.00	16897.3	10800.00
9	572.50	140.13	0.304	0.60( 0.60)	1.00	17880.2	11220.00
10	506.33	150.37	0.296	0.60( 0.60)	1.00	18988.5	10910.00
11	457.54	158.06	0.289	0.60( 0.60)	1.00	19628.3	10630.00
12	335.99	194.91	0.265	0.60( 0.60)	1.00	23874.2	10600.00
13	328.83	199.74	0.264	0.60( 0.60)	1.00	24598.0	11620.00
14	320.27	206.09	0.261	0.60( 0.60)	1.00	25526.8	11600.00
15	313.95	210.53	0.259	0.60( 0.60)	1.00	26079.6	11201.00
16	312.56	213.51	0.258	0.60( 0.60)	1.00	26422.9	10500.00
17	312.37	223.60	0.255	0.60( 0.60)	1.00	27361.9	10710.00
18	306.80	231.58	0.252	0.60( 0.60)	1.00	27883.4	10410.00
19	293.11	252.87	0.243	0.60( 0.60)	1.00	29097.7	10700.00
20	291.91	270.20	0.237	0.60( 0.60)	1.00	30112.7	10200.00
21	286.06	288.22	0.230	0.60( 0.60)	1.00	30855.9	10320.00
22	283.85	293.20	0.228	0.60( 0.60)	1.00	31003.0	10300.00
23	274.05	311.49	0.221	0.60( 0.60)	1.00	31273.4	10210.00

24 231.26 424.48 0.196 0.60( 0.60) 1.00 32252.2 10100.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 656.05 Tc(MIN.) = 125.78  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 15534.12

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 402.38 DOWNSTREAM(FEET) = 380.74  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2380.10 CHANNEL SLOPE = 0.0091  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.311

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.13	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 656.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84

AVERAGE FLOW DEPTH(FEET) = 5.66 TRAVEL TIME(MIN.) = 5.80

Tc(MIN.) = 131.58

SUBAREA AREA(ACRES) = 116.13 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 15650.25 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 32368.3 PEAK FLOW RATE(CFS) = 656.05

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.66 FLOW VELOCITY(FEET/SEC.) = 6.84

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.04	56.67	0.438	0.60( 0.60)	0.99	4392.4	11801.00
2	450.00	86.17	0.372	0.60( 0.60)	0.99	7088.2	11530.00
3	520.84	102.27	0.346	0.60( 0.60)	0.99	9365.3	11701.00
4	542.03	107.42	0.339	0.60( 0.60)	0.99	10129.2	11000.00
5	634.63	125.18	0.317	0.60( 0.60)	1.00	14150.7	11350.00
6	656.05	131.58	0.311	0.60( 0.60)	1.00	15650.3	10850.00
7	648.41	135.00	0.308	0.60( 0.60)	1.00	16311.3	11300.00
8	621.13	139.40	0.305	0.60( 0.60)	1.00	17013.4	10800.00
9	572.50	146.13	0.299	0.60( 0.60)	1.00	17996.3	11220.00
10	506.33	156.56	0.291	0.60( 0.60)	1.00	19104.7	10910.00
11	457.54	164.40	0.284	0.60( 0.60)	1.00	19744.5	10630.00
12	335.99	201.76	0.263	0.60( 0.60)	1.00	23990.3	10600.00
13	328.83	206.64	0.261	0.60( 0.60)	1.00	24714.1	11620.00
14	320.27	213.03	0.259	0.60( 0.60)	1.00	25642.9	11600.00

15	313.95	217.51	0.257	0.60	( 0.60)	1.00	26195.7	11201.00
16	312.56	220.50	0.256	0.60	( 0.60)	1.00	26539.1	10500.00
17	312.37	230.58	0.252	0.60	( 0.60)	1.00	27478.0	10710.00
18	306.80	238.59	0.249	0.60	( 0.60)	1.00	27999.6	10410.00
19	293.11	259.96	0.241	0.60	( 0.60)	1.00	29213.8	10700.00
20	291.91	277.31	0.234	0.60	( 0.60)	1.00	30228.8	10200.00
21	286.06	295.35	0.227	0.60	( 0.60)	1.00	30972.1	10320.00
22	283.85	300.35	0.226	0.60	( 0.60)	1.00	31119.1	10300.00
23	274.05	318.71	0.219	0.60	( 0.60)	1.00	31389.5	10210.00
24	231.26	432.01	0.196	0.60	( 0.60)	1.00	32368.3	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 656.05 Tc(MIN.) = 131.58  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 15650.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 131.58  
RAINFALL INTENSITY(INCH/HR) = 0.31  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 15650.25  
TOTAL STREAM AREA(ACRES) = 32368.29  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 656.05

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11831.00 TO NODE 11832.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.20  
ELEVATION DATA: UPSTREAM(FEET) = 1353.30 DOWNSTREAM(FEET) = 1280.02

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.179  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.535  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.76	0.60	1.000	0	8.18

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 0.64  
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 0.64

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11832.00 TO NODE 11833.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1280.02 DOWNSTREAM(FEET) = 1070.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 686.67 CHANNEL SLOPE = 0.3057  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.258

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.95	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.66  
AVERAGE FLOW DEPTH(FEET) = 0.42 TRAVEL TIME(MIN.) = 2.46  
Tc(MIN.) = 10.64  
SUBAREA AREA(ACRES) = 5.95 SUBAREA RUNOFF(CFS) = 3.53  
EFFECTIVE AREA(ACRES) = 6.71 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 3.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.50 FLOW VELOCITY(FEET/SEC.) = 5.29  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11833.00 = 934.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11833.00 TO NODE 11834.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1070.08 DOWNSTREAM(FEET) = 913.56  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.36 CHANNEL SLOPE = 0.1601  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.051

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.21	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.00  
AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 3.25  
Tc(MIN.) = 13.89  
SUBAREA AREA(ACRES) = 23.21 SUBAREA RUNOFF(CFS) = 9.42  
EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.9 PEAK FLOW RATE(CFS) = 12.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 5.48  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11834.00 = 1912.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11834.00 TO NODE 11835.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 913.56 DOWNSTREAM(FEET) = 727.99
CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.63 CHANNEL SLOPE = 0.0989
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.794
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 73.73 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.22
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.12
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 6.11
Tc(MIN.) = 20.00
SUBAREA AREA(ACRES) = 73.73 SUBAREA RUNOFF(CFS) = 12.89
EFFECTIVE AREA(ACRES) = 103.65 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 103.7 PEAK FLOW RATE(CFS) = 18.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 5.03
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11835.00 = 3787.86 FEET.

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*****
FLOW PROCESS FROM NODE 11835.00 TO NODE 11836.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 727.99 DOWNSTREAM(FEET) = 611.39
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.64 CHANNEL SLOPE = 0.0615
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.644
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 93.31 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.29
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.34
AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 7.28
Tc(MIN.) = 27.28
SUBAREA AREA(ACRES) = 93.31 SUBAREA RUNOFF(CFS) = 3.75
EFFECTIVE AREA(ACRES) = 196.96 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 197.0 PEAK FLOW RATE(CFS) = 18.13
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 4.23
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11836.00 = 5684.50 FEET.

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*****
FLOW PROCESS FROM NODE 11836.00 TO NODE 11837.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 611.39 DOWNSTREAM(FEET) = 508.59
CHANNEL LENGTH THRU SUBAREA(FEET) = 2178.15 CHANNEL SLOPE = 0.0472
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.547
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 98.92 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.83
AVERAGE FLOW DEPTH(FEET) = 1.26 TRAVEL TIME(MIN.) = 9.48
Tc(MIN.) = 36.76
SUBAREA AREA(ACRES) = 98.92 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 295.88 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 295.9 PEAK FLOW RATE(CFS) = 18.13
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 3.83
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11837.00 = 7862.65 FEET.

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FLOW PROCESS FROM NODE 11837.00 TO NODE 11838.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 508.59 DOWNSTREAM(FEET) = 448.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 1942.91 CHANNEL SLOPE = 0.0309
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.482
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 79.71 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.25
AVERAGE FLOW DEPTH(FEET) = 1.36 TRAVEL TIME(MIN.) = 9.95
Tc(MIN.) = 46.71

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SUBAREA AREA (ACRES) = 79.71 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 375.59 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 375.6 PEAK FLOW RATE (CFS) = 18.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 3.25  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.00 = 9805.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.00 TO NODE 11838.50 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 448.50 DOWNSTREAM (FEET) = 420.79  
CHANNEL LENGTH THRU SUBAREA (FEET) = 917.65 CHANNEL SLOPE = 0.0302  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.458

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.57	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 18.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.23  
AVERAGE FLOW DEPTH (FEET) = 1.37 TRAVEL TIME (MIN.) = 4.74  
Tc (MIN.) = 51.45  
SUBAREA AREA (ACRES) = 34.57 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 410.16 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 410.2 PEAK FLOW RATE (CFS) = 18.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.37 FLOW VELOCITY (FEET/SEC.) = 3.23  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.50 = 10723.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 420.79 DOWNSTREAM (FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1615.83 CHANNEL SLOPE = 0.0248  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.425

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.54	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 18.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.99  
AVERAGE FLOW DEPTH (FEET) = 1.42 TRAVEL TIME (MIN.) = 9.01  
Tc (MIN.) = 60.46

SUBAREA AREA (ACRES) = 21.54 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 431.70 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 431.7 PEAK FLOW RATE (CFS) = 18.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.42 FLOW VELOCITY (FEET/SEC.) = 2.99  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11841.00 = 12339.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 60.46  
RAINFALL INTENSITY (INCH/HR) = 0.43  
AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 431.70  
TOTAL STREAM AREA (ACRES) = 431.70  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 18.13

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	336.04	56.67	0.438	0.60 ( 0.60)	0.99	4392.4	11801.00
1	450.00	86.17	0.372	0.60 ( 0.60)	0.99	7088.2	11530.00
1	520.84	102.27	0.346	0.60 ( 0.60)	0.99	9365.3	11701.00
1	542.03	107.42	0.339	0.60 ( 0.60)	0.99	10129.2	11000.00
1	634.63	125.18	0.317	0.60 ( 0.60)	1.00	14150.7	11350.00
1	656.05	131.58	0.311	0.60 ( 0.60)	1.00	15650.3	10850.00
1	648.41	135.00	0.308	0.60 ( 0.60)	1.00	16311.3	11300.00
1	621.13	139.40	0.305	0.60 ( 0.60)	1.00	17013.4	10800.00
1	572.50	146.13	0.299	0.60 ( 0.60)	1.00	17996.3	11220.00
1	506.33	156.56	0.291	0.60 ( 0.60)	1.00	19104.7	10910.00
1	457.54	164.40	0.284	0.60 ( 0.60)	1.00	19744.5	10630.00
1	335.99	201.76	0.263	0.60 ( 0.60)	1.00	23990.3	10600.00
1	328.83	206.64	0.261	0.60 ( 0.60)	1.00	24714.1	11620.00
1	320.27	213.03	0.259	0.60 ( 0.60)	1.00	25642.9	11600.00

1	313.95	217.51	0.257	0.60	( 0.60)	1.00	26195.7	11201.00
1	312.56	220.50	0.256	0.60	( 0.60)	1.00	26539.1	10500.00
1	312.37	230.58	0.252	0.60	( 0.60)	1.00	27478.0	10710.00
1	306.80	238.59	0.249	0.60	( 0.60)	1.00	27999.6	10410.00
1	293.11	259.96	0.241	0.60	( 0.60)	1.00	29213.8	10700.00
1	291.91	277.31	0.234	0.60	( 0.60)	1.00	30228.8	10200.00
1	286.06	295.35	0.227	0.60	( 0.60)	1.00	30972.1	10320.00
1	283.85	300.35	0.226	0.60	( 0.60)	1.00	31119.1	10300.00
1	274.05	318.71	0.219	0.60	( 0.60)	1.00	31389.5	10210.00
1	231.26	432.01	0.196	0.60	( 0.60)	1.00	32368.3	10100.00
2	18.13	60.46	0.425	0.60	( 0.60)	1.00	431.7	11831.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	353.56	56.67	0.438	0.60	( 0.60)	0.99	4797.0 11801.00
2	368.84	60.46	0.425	0.60	( 0.60)	0.99	5171.0 11831.00
3	465.86	86.17	0.372	0.60	( 0.60)	0.99	7519.9 11530.00
4	535.61	102.27	0.346	0.60	( 0.60)	0.99	9797.0 11701.00
5	556.49	107.42	0.339	0.60	( 0.60)	0.99	10560.9 11000.00
6	648.13	125.18	0.317	0.60	( 0.60)	1.00	14582.4 11350.00
7	669.33	131.58	0.311	0.60	( 0.60)	1.00	16082.0 10850.00
8	661.57	135.00	0.308	0.60	( 0.60)	1.00	16743.0 11300.00
9	634.13	139.40	0.305	0.60	( 0.60)	1.00	17445.1 10800.00
10	585.26	146.13	0.299	0.60	( 0.60)	1.00	18428.0 11220.00
11	518.72	156.56	0.291	0.60	( 0.60)	1.00	19536.4 10910.00
12	469.65	164.40	0.284	0.60	( 0.60)	1.00	20176.2 10630.00
13	347.20	201.76	0.263	0.60	( 0.60)	1.00	24422.0 10600.00
14	339.96	206.64	0.261	0.60	( 0.60)	1.00	25145.8 11620.00
15	331.29	213.03	0.259	0.60	( 0.60)	1.00	26074.6 11600.00
16	324.90	217.51	0.257	0.60	( 0.60)	1.00	26627.4 11201.00
17	323.46	220.50	0.256	0.60	( 0.60)	1.00	26970.8 10500.00
18	323.11	230.58	0.252	0.60	( 0.60)	1.00	27909.7 10710.00
19	317.41	238.59	0.249	0.60	( 0.60)	1.00	28431.3 10410.00
20	303.38	259.96	0.241	0.60	( 0.60)	1.00	29645.5 10700.00
21	301.90	277.31	0.234	0.60	( 0.60)	1.00	30660.5 10200.00
22	295.76	295.35	0.227	0.60	( 0.60)	1.00	31403.8 10320.00
23	293.47	300.35	0.226	0.60	( 0.60)	1.00	31550.8 10300.00
24	283.38	318.71	0.219	0.60	( 0.60)	1.00	31821.2 10210.00
25	239.60	432.01	0.196	0.60	( 0.60)	1.00	32800.0 10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 669.33 Tc(MIN.) = 131.58  
EFFECTIVE AREA(ACRES) = 16081.95 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 32800.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

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FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 380.74 DOWNSTREAM(FEET) = 347.47

CHANNEL LENGTH THRU SUBAREA(FEET) = 2830.43 CHANNEL SLOPE = 0.0118  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.306  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 116.59 0.60 0.997 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 669.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.57  
AVERAGE FLOW DEPTH(FEET) = 5.43 TRAVEL TIME(MIN.) = 6.23  
Tc(MIN.) = 137.81

SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 0.10  
EFFECTIVE AREA(ACRES) = 16198.54 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 32916.6 PEAK FLOW RATE(CFS) = 669.33  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.43 FLOW VELOCITY(FEET/SEC.) = 7.57  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	353.56	63.98	0.418	0.60	( 0.60)	0.99	4913.5 11801.00
2	368.84	67.70	0.410	0.60	( 0.60)	0.99	5287.6 11831.00
3	465.86	93.00	0.360	0.60	( 0.60)	0.99	7636.5 11530.00
4	535.61	108.86	0.337	0.60	( 0.60)	0.99	9913.6 11701.00
5	556.49	113.96	0.330	0.60	( 0.60)	0.99	10677.4 11000.00
6	648.13	131.47	0.311	0.60	( 0.60)	1.00	14699.0 11350.00
7	669.33	137.81	0.306	0.60	( 0.60)	1.00	16198.5 10850.00
8	661.57	141.26	0.303	0.60	( 0.60)	1.00	16859.6 11300.00
9	634.13	145.71	0.300	0.60	( 0.60)	1.00	17561.7 10800.00
10	585.26	152.57	0.294	0.60	( 0.60)	1.00	18544.6 11220.00
11	518.72	163.20	0.285	0.60	( 0.60)	1.00	19653.0 10910.00
12	469.65	171.22	0.278	0.60	( 0.60)	1.00	20292.8 10630.00
13	347.20	209.11	0.260	0.60	( 0.60)	1.00	24538.6 10600.00
14	339.96	214.03	0.258	0.60	( 0.60)	1.00	25262.4 11620.00
15	331.29	220.46	0.256	0.60	( 0.60)	1.00	26191.2 11600.00
16	324.90	224.97	0.254	0.60	( 0.60)	1.00	26744.0 11201.00
17	323.46	227.97	0.253	0.60	( 0.60)	1.00	27087.3 10500.00
18	323.11	238.06	0.249	0.60	( 0.60)	1.00	28026.3 10710.00
19	317.41	246.11	0.246	0.60	( 0.60)	1.00	28547.9 10410.00
20	303.38	267.54	0.238	0.60	( 0.60)	1.00	29762.1 10700.00
21	301.90	284.90	0.231	0.60	( 0.60)	1.00	30777.1 10200.00
22	295.76	302.98	0.225	0.60	( 0.60)	1.00	31520.3 10320.00
23	293.47	308.01	0.223	0.60	( 0.60)	1.00	31667.4 10300.00
24	283.38	326.44	0.216	0.60	( 0.60)	1.00	31937.8 10210.00
25	239.60	440.07	0.195	0.60	( 0.60)	1.00	32916.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 669.33 Tc(MIN.) = 137.81



AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 16198.54

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 137.81  
EFFECTIVE AREA(ACRES) = 16198.54 AREA-AVERAGED Fm(INCH/HR)= 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.996  
PEAK FLOW RATE(CFS) = 669.33

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	353.56	63.98	0.418	0.60( 0.60)	0.99	4913.5	11801.00
2	368.84	67.70	0.410	0.60( 0.60)	0.99	5287.6	11831.00
3	465.86	93.00	0.360	0.60( 0.60)	0.99	7636.5	11530.00
4	535.61	108.86	0.337	0.60( 0.60)	0.99	9913.6	11701.00
5	556.49	113.96	0.330	0.60( 0.60)	0.99	10677.4	11000.00
6	648.13	131.47	0.311	0.60( 0.60)	1.00	14699.0	11350.00
7	669.33	137.81	0.306	0.60( 0.60)	1.00	16198.5	10850.00
8	661.57	141.26	0.303	0.60( 0.60)	1.00	16859.6	11300.00
9	634.13	145.71	0.300	0.60( 0.60)	1.00	17561.7	10800.00
10	585.26	152.57	0.294	0.60( 0.60)	1.00	18544.6	11220.00
11	518.72	163.20	0.285	0.60( 0.60)	1.00	19653.0	10910.00
12	469.65	171.22	0.278	0.60( 0.60)	1.00	20292.8	10630.00
13	347.20	209.11	0.260	0.60( 0.60)	1.00	24538.6	10600.00
14	339.96	214.03	0.258	0.60( 0.60)	1.00	25262.4	11620.00
15	331.29	220.46	0.256	0.60( 0.60)	1.00	26191.2	11600.00
16	324.90	224.97	0.254	0.60( 0.60)	1.00	26744.0	11201.00
17	323.46	227.97	0.253	0.60( 0.60)	1.00	27087.3	10500.00
18	323.11	238.06	0.249	0.60( 0.60)	1.00	28026.3	10710.00
19	317.41	246.11	0.246	0.60( 0.60)	1.00	28547.9	10410.00
20	303.38	267.54	0.238	0.60( 0.60)	1.00	29762.1	10700.00
21	301.90	284.90	0.231	0.60( 0.60)	1.00	30777.1	10200.00
22	295.76	302.98	0.225	0.60( 0.60)	1.00	31520.3	10320.00
23	293.47	308.01	0.223	0.60( 0.60)	1.00	31667.4	10300.00
24	283.38	326.44	0.216	0.60( 0.60)	1.00	31937.8	10210.00
25	239.60	440.07	0.195	0.60( 0.60)	1.00	32916.6	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*  
\* \* \* \* \*  
\*\*\*\*\*

FILE NAME: S19.DAT  
TIME/DATE OF STUDY: 07:44 07/16/2018

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.878
- 2) 10.00; 1.253
- 3) 15.00; 0.953
- 4) 20.00; 0.778
- 5) 25.00; 0.670
- 6) 30.00; 0.594
- 7) 40.00; 0.512
- 8) 50.00; 0.455
- 9) 60.00; 0.399
- 10) 90.00; 0.345
- 11) 120.00; 0.286
- 12) 180.00; 0.229
- 13) 360.00; 0.175
- 14) 1200.00; 0.084

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	MANNING LIP (FT)	HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)  
\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11900.00 TO NODE 11901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.79  
ELEVATION DATA: UPSTREAM(FEET) = 2369.48 DOWNSTREAM(FEET) = 2332.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.203  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.603  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL ".4 DWELLING/ACRE"	-	1.62	0.60	0.999	0	7.20

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
SUBAREA RUNOFF(CFS) = 1.46  
TOTAL AREA(ACRES) = 1.62 PEAK FLOW RATE(CFS) = 1.46

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11901.00 TO NODE 11902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2332.92 DOWNSTREAM(FEET) = 2297.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 664.26 CHANNEL SLOPE = 0.0530  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.177  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.35	0.60	0.906	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.906  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.72  
AVERAGE FLOW DEPTH(FEET) = 0.69 TRAVEL TIME(MIN.) = 4.07  
Tc(MIN.) = 11.27  
SUBAREA AREA(ACRES) = 8.35 SUBAREA RUNOFF(CFS) = 4.76  
EFFECTIVE AREA(ACRES) = 9.97 AREA-AVERAGED Fm(INCH/HR) = 0.55  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.92  
TOTAL AREA(ACRES) = 10.0 PEAK FLOW RATE(CFS) = 5.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.79 FLOW VELOCITY(FEET/SEC.) = 2.99  
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.00 = 960.05 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11902.00 TO NODE 11902.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2297.70 DOWNSTREAM(FEET) = 2263.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 928.77 CHANNEL SLOPE = 0.0369
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.909
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.48 0.60 0.904 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.11
AVERAGE FLOW DEPTH(FEET) = 1.11 TRAVEL TIME(MIN.) = 4.98
Tc(MIN.) = 16.25
SUBAREA AREA(ACRES) = 34.48 SUBAREA RUNOFF(CFS) = 11.39
EFFECTIVE AREA(ACRES) = 44.45 AREA-AVERAGED Fm(INCH/HR) = 0.54
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.91
TOTAL AREA(ACRES) = 44.5 PEAK FLOW RATE(CFS) = 14.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 3.29
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.50 = 1888.82 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11902.50 TO NODE 11903.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2263.40 DOWNSTREAM(FEET) = 2252.14
CHANNEL LENGTH THRU SUBAREA(FEET) = 895.50 CHANNEL SLOPE = 0.0126
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.716
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 23.65 0.60 0.958 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.14
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.26
AVERAGE FLOW DEPTH(FEET) = 1.54 TRAVEL TIME(MIN.) = 6.61
Tc(MIN.) = 22.86
SUBAREA AREA(ACRES) = 23.65 SUBAREA RUNOFF(CFS) = 3.01
EFFECTIVE AREA(ACRES) = 68.10 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93
TOTAL AREA(ACRES) = 68.1 PEAK FLOW RATE(CFS) = 14.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 2.21

LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11903.00 = 2784.32 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11903.00 TO NODE 11904.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
ELEVATION DATA: UPSTREAM(FEET) = 2252.14 DOWNSTREAM(FEET) = 2186.04
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.35 CHANNEL SLOPE = 0.0343
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.571
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 68.53 0.60 0.961 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.961
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.28
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.24
AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 9.90
Tc(MIN.) = 32.77
SUBAREA AREA(ACRES) = 68.53 SUBAREA RUNOFF(CFS) = 1.37
EFFECTIVE AREA(ACRES) = 136.63 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 136.6 PEAK FLOW RATE(CFS) = 14.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 3.21
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11904.00 = 4708.67 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 11904.00 TO NODE 11905.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2186.04 DOWNSTREAM(FEET) = 1957.34
CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.87 CHANNEL SLOPE = 0.1187
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.520
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 63.15 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.59
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.13

AVERAGE FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 6.26  
 Tc (MIN.) = 39.03  
 SUBAREA AREA (ACRES) = 63.15 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 199.78 AREA-AVERAGED Fm (INCH/HR) = 0.58  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 199.8 PEAK FLOW RATE (CFS) = 14.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.97 FLOW VELOCITY (FEET/SEC.) = 5.13  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11905.00 = 6635.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11905.00 TO NODE 11906.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1957.34 DOWNSTREAM (FEET) = 1244.16  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2498.96 CHANNEL SLOPE = 0.2854  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.484

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.87	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 14.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.08  
 AVERAGE FLOW DEPTH (FEET) = 0.83 TRAVEL TIME (MIN.) = 5.88  
 Tc (MIN.) = 44.91  
 SUBAREA AREA (ACRES) = 84.87 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 284.65 AREA-AVERAGED Fm (INCH/HR) = 0.58  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 284.6 PEAK FLOW RATE (CFS) = 14.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.83 FLOW VELOCITY (FEET/SEC.) = 7.08  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11906.00 = 9134.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1244.16 DOWNSTREAM (FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3370.75 CHANNEL SLOPE = 0.1098  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.420  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.43	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 14.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.97  
 AVERAGE FLOW DEPTH (FEET) = 0.99 TRAVEL TIME (MIN.) = 11.30  
 Tc (MIN.) = 56.21

SUBAREA AREA (ACRES) = 199.43 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 484.08 AREA-AVERAGED Fm (INCH/HR) = 0.59  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 484.1 PEAK FLOW RATE (CFS) = 14.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.99 FLOW VELOCITY (FEET/SEC.) = 4.97  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11920.00 = 12505.25 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 56.21  
 RAINFALL INTENSITY (INCH/HR) = 0.42  
 AREA-AVERAGED Fm (INCH/HR) = 0.59  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.98  
 EFFECTIVE STREAM AREA (ACRES) = 484.08  
 TOTAL STREAM AREA (ACRES) = 484.08  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 14.59

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11910.00 TO NODE 11911.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 517.62  
 ELEVATION DATA: UPSTREAM (FEET) = 2531.88 DOWNSTREAM (FEET) = 2441.33

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.185  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.122  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						

"CHAPARRAL,BROADLEAF" - 3.46 0.60 1.000 0 12.19  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.63  
TOTAL AREA(ACRES) = 3.46 PEAK FLOW RATE(CFS) = 1.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11911.00 TO NODE 11912.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2441.33 DOWNSTREAM(FEET) = 2382.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 397.30 CHANNEL SLOPE = 0.1488  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.012  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.79	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.63  
AVERAGE FLOW DEPTH(FEET) = 0.50 TRAVEL TIME(MIN.) = 1.82  
Tc(MIN.) = 14.01  
SUBAREA AREA(ACRES) = 5.79 SUBAREA RUNOFF(CFS) = 2.15  
EFFECTIVE AREA(ACRES) = 9.25 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.2 PEAK FLOW RATE(CFS) = 3.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 3.86  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11912.00 = 914.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11912.00 TO NODE 11913.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2382.20 DOWNSTREAM(FEET) = 2263.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1891.47 CHANNEL SLOPE = 0.0626  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.702  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.30	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.71  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.32  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 9.50  
Tc(MIN.) = 23.51  
SUBAREA AREA(ACRES) = 54.30 SUBAREA RUNOFF(CFS) = 5.00

EFFECTIVE AREA(ACRES) = 63.55 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 63.5 PEAK FLOW RATE(CFS) = 5.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 3.20  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11913.00 = 2806.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11913.00 TO NODE 11914.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.77 DOWNSTREAM(FEET) = 1845.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1957.31 CHANNEL SLOPE = 0.2138  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.595  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	65.14	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.07  
AVERAGE FLOW DEPTH(FEET) = 0.63 TRAVEL TIME(MIN.) = 6.43  
Tc(MIN.) = 29.94  
SUBAREA AREA(ACRES) = 65.14 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 128.69 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 128.7 PEAK FLOW RATE(CFS) = 5.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 5.06  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11914.00 = 4763.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11914.00 TO NODE 11915.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1845.23 DOWNSTREAM(FEET) = 1557.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1686.78 CHANNEL SLOPE = 0.1708  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.545  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.52	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.68  
AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 6.01  
Tc(MIN.) = 35.95  
SUBAREA AREA(ACRES) = 78.52 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 207.21 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 207.2 PEAK FLOW RATE(CFS) = 5.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 4.68  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11915.00 = 6450.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11915.00 TO NODE 11916.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1557.21 DOWNSTREAM(FEET) = 1403.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.39 CHANNEL SLOPE = 0.0806  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.484  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 70.48 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.52  
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 9.05  
Tc(MIN.) = 44.99  
SUBAREA AREA(ACRES) = 70.48 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 277.69 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 277.7 PEAK FLOW RATE(CFS) = 5.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 3.52  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11916.00 = 8359.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11916.00 TO NODE 11917.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1403.38 DOWNSTREAM(FEET) = 1079.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1945.82 CHANNEL SLOPE = 0.1662  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.444  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 232.20 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.60  
AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 7.05  
Tc(MIN.) = 52.04  
SUBAREA AREA(ACRES) = 232.20 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 509.89 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 509.9 PEAK FLOW RATE(CFS) = 5.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 4.60  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11917.00 = 10305.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1079.99 DOWNSTREAM(FEET) = 873.95  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2563.91 CHANNEL SLOPE = 0.0804  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.391  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 110.82 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.85  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.52  
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 12.15  
Tc(MIN.) = 64.19  
SUBAREA AREA(ACRES) = 110.82 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 620.71 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 620.7 PEAK FLOW RATE (CFS) = 5.85  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.74 FLOW VELOCITY (FEET/SEC.) = 3.52  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 64.19  
 RAINFALL INTENSITY (INCH/HR) = 0.39  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 620.71  
 TOTAL STREAM AREA (ACRES) = 620.71  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 5.85

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.59	56.21	0.420	0.60 ( 0.59)	0.98	484.1	11900.00
2	5.85	64.19	0.391	0.60 ( 0.60)	1.00	620.7	11910.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.09	56.21	0.420	0.60 ( 0.60)	0.99	1027.6	11900.00
2	19.44	64.19	0.391	0.60 ( 0.60)	0.99	1104.8	11910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 20.09 Tc (MIN.) = 56.21  
 EFFECTIVE AREA (ACRES) = 1027.64 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1104.8  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11920.00 TO NODE 11921.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 873.95 DOWNSTREAM (FEET) = 827.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1417.25 CHANNEL SLOPE = 0.0325  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.393  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 107.47 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.41  
 AVERAGE FLOW DEPTH (FEET) = 1.40 TRAVEL TIME (MIN.) = 6.92  
 Tc (MIN.) = 63.14  
 SUBAREA AREA (ACRES) = 107.47 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 1135.11 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1212.3 PEAK FLOW RATE (CFS) = 20.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.40 FLOW VELOCITY (FEET/SEC.) = 3.41  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11921.00 = 14286.85 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11921.00 TO NODE 11922.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 827.94 DOWNSTREAM (FEET) = 753.55  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1886.43 CHANNEL SLOPE = 0.0394  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.378

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 344.27 0.60 1.000 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.66  
 AVERAGE FLOW DEPTH (FEET) = 1.35 TRAVEL TIME (MIN.) = 8.60  
 Tc (MIN.) = 71.74  
 SUBAREA AREA (ACRES) = 344.27 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 1479.38 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1556.5 PEAK FLOW RATE (CFS) = 20.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.35 FLOW VELOCITY (FEET/SEC.) = 3.66

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11922.00 = 16173.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11922.00 TO NODE 11923.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 753.55 DOWNSTREAM(FEET) = 641.58
CHANNEL LENGTH THRU SUBAREA(FEET) = 2860.88 CHANNEL SLOPE = 0.0391
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.354

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 165.18 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.65

AVERAGE FLOW DEPTH(FEET) = 1.36 TRAVEL TIME(MIN.) = 13.08

Tc(MIN.) = 84.81

SUBAREA AREA(ACRES) = 165.18 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 1644.56 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1721.7 PEAK FLOW RATE(CFS) = 20.09

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.36 FLOW VELOCITY(FEET/SEC.) = 3.65

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11923.00 = 19034.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11923.00 TO NODE 11924.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 641.58 DOWNSTREAM(FEET) = 579.89
CHANNEL LENGTH THRU SUBAREA(FEET) = 1844.02 CHANNEL SLOPE = 0.0335
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.338

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 433.73 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.45

AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 8.91

Tc(MIN.) = 93.72

SUBAREA AREA(ACRES) = 433.73 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 2078.29 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 2155.4 PEAK FLOW RATE(CFS) = 20.09

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.39 FLOW VELOCITY(FEET/SEC.) = 3.45

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11924.00 = 20878.18 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11924.00 TO NODE 11925.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 579.89 DOWNSTREAM(FEET) = 494.12
CHANNEL LENGTH THRU SUBAREA(FEET) = 2756.15 CHANNEL SLOPE = 0.0311
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.311

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 265.42 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.09

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.35

AVERAGE FLOW DEPTH(FEET) = 1.41 TRAVEL TIME(MIN.) = 13.72

Tc(MIN.) = 107.44

SUBAREA AREA(ACRES) = 265.42 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 2343.71 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 2420.9 PEAK FLOW RATE(CFS) = 20.09

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 3.35

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11925.00 = 23634.33 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11925.00 TO NODE 11926.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 494.12 DOWNSTREAM(FEET) = 458.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 1922.70 CHANNEL SLOPE = 0.0186
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000



MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.288  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 97.46 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.75  
 AVERAGE FLOW DEPTH (FEET) = 1.56 TRAVEL TIME (MIN.) = 11.63  
 Tc (MIN.) = 119.08  
 SUBAREA AREA (ACRES) = 97.46 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 2441.17 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 2518.3 PEAK FLOW RATE (CFS) = 20.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.56 FLOW VELOCITY (FEET/SEC.) = 2.75  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11926.00 = 25557.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11926.00 TO NODE 11927.00 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 458.40 DOWNSTREAM (FEET) = 399.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2170.13 CHANNEL SLOPE = 0.0274  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.276  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 53.83 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.09  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.20  
 AVERAGE FLOW DEPTH (FEET) = 1.45 TRAVEL TIME (MIN.) = 11.30  
 Tc (MIN.) = 130.38  
 SUBAREA AREA (ACRES) = 53.83 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 2495.00 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 2572.1 PEAK FLOW RATE (CFS) = 20.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.45 FLOW VELOCITY (FEET/SEC.) = 3.20  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 15.1  
 -----

>>>> DEFINE MEMORY BANK # 1 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610401T.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	48.82	37.99	0.60 ( 0.60)	1.00	610.3	40120.00
2	48.79	41.62	0.60 ( 0.60)	1.00	652.1	40100.00
TOTAL AREA (ACRES) =						652.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 11  
 -----

>>>> CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY <<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	20.09	130.38	0.276	0.60 ( 0.60)	1.00	2495.0	11900.00
2	19.44	139.06	0.268	0.60 ( 0.60)	1.00	2572.1	11910.00
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	48.82	37.99	0.529	0.60 ( 0.60)	1.00	610.3	40120.00
2	48.79	41.62	0.503	0.60 ( 0.60)	1.00	652.1	40100.00
LONGEST FLOWPATH FROM NODE 40100.00 TO NODE 11927.00 = 10245.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	60.02	37.99	0.529	0.60 ( 0.60)	1.00	1337.2	40120.00
2	60.46	41.62	0.503	0.60 ( 0.60)	1.00	1448.4	40100.00
3	46.88	130.38	0.276	0.60 ( 0.60)	1.00	3147.1	11900.00
4	45.44	139.06	0.268	0.60 ( 0.60)	1.00	3224.2	11910.00
TOTAL AREA (ACRES) =						3224.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 60.46 Tc (MIN.) = 41.615  
 EFFECTIVE AREA (ACRES) = 1448.42 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3224.2  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.50 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 399.00 DOWNSTREAM(FEET) = 384.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 986.26 CHANNEL SLOPE = 0.0152  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 60.46  
 FLOW VELOCITY(FEET/SEC.) = 3.37 FLOW DEPTH(FEET) = 2.44  
 TRAVEL TIME(MIN.) = 4.87 Tc(MIN.) = 46.49  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610402T.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.62	15.91	0.60( 0.60)	1.00	33.3	40200.00
TOTAL AREA(ACRES) =			33.3			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	60.02	42.87	0.496	0.60( 0.60)	1.00	1337.2	40120.00
2	60.46	46.49	0.475	0.60( 0.60)	1.00	1448.4	40100.00
3	46.88	135.58	0.271	0.60( 0.60)	1.00	3147.1	11900.00
4	45.44	144.29	0.263	0.60( 0.60)	1.00	3224.2	11910.00
LONGEST FLOWPATH FROM NODE			11910.00 TO NODE 11927.50 = 28713.42 FEET.				

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.62	15.91	0.921	0.60( 0.60)	1.00	33.3	40200.00
LONGEST FLOWPATH FROM NODE			40200.00 TO NODE 11927.50 = 1999.00 FEET.				

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	51.02	15.91	0.921	0.60( 0.60)	1.00	529.6	40200.00
2	60.02	42.87	0.496	0.60( 0.60)	1.00	1370.5	40120.00
3	60.46	46.49	0.475	0.60( 0.60)	1.00	1481.7	40100.00
4	46.88	135.58	0.271	0.60( 0.60)	1.00	3180.4	11900.00
5	45.44	144.29	0.263	0.60( 0.60)	1.00	3257.5	11910.00
TOTAL AREA(ACRES) =			3257.5				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 60.46 Tc(MIN.) = 46.488  
 EFFECTIVE AREA(ACRES) = 1481.73 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3257.5  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11927.50 TO NODE 11928.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 384.00 DOWNSTREAM(FEET) = 359.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 647.19 CHANNEL SLOPE = 0.0386  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.462  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.01	0.50	0.984	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =			0.50		
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =			0.984		

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.72  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78  
 AVERAGE FLOW DEPTH(FEET) = 2.06 TRAVEL TIME(MIN.) = 2.26  
 Tc(MIN.) = 48.74

SUBAREA AREA(ACRES) = 78.01 SUBAREA RUNOFF(CFS) = 0.52  
 EFFECTIVE AREA(ACRES) = 1559.74 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.59 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 3335.5 PEAK FLOW RATE(CFS) = 60.46  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.06 FLOW VELOCITY(FEET/SEC.) = 4.77  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11928.00 = 29360.61 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	140.99	18.14	0.843	0.59( 0.59)	1.00	607.7	40200.00
2	60.02	45.13	0.483	0.59( 0.59)	1.00	1448.5	40120.00
3	60.46	48.74	0.462	0.59( 0.59)	1.00	1559.7	40100.00
4	46.88	137.98	0.269	0.60( 0.60)	1.00	3258.4	11900.00
5	45.44	146.72	0.261	0.60( 0.60)	1.00	3335.5	11910.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 140.99 Tc(MIN.) = 18.14  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.59  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 607.65

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 359.00 DOWNSTREAM(FEET) = 341.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1322.66 CHANNEL SLOPE = 0.0131  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.697  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.18 0.60 0.890 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 141.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.94  
AVERAGE FLOW DEPTH(FEET) = 3.46 TRAVEL TIME(MIN.) = 5.59  
Tc(MIN.) = 23.73  
SUBAREA AREA(ACRES) = 8.18 SUBAREA RUNOFF(CFS) = 1.20  
EFFECTIVE AREA(ACRES) = 615.83 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.59 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3343.7 PEAK FLOW RATE(CFS) = 140.99  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.45 FLOW VELOCITY(FEET/SEC.) = 3.95  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	140.99	23.73	0.697	0.59(0.58)	1.00	615.8	40200.00
2	60.02	52.03	0.444	0.59(0.59)	1.00	1456.7	40120.00
3	60.46	55.64	0.423	0.59(0.59)	1.00	1567.9	40100.00
4	46.88	145.33	0.262	0.60(0.60)	1.00	3266.6	11900.00
5	45.44	154.14	0.254	0.60(0.60)	1.00	3343.7	11910.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 140.99 Tc(MIN.) = 23.73  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.59  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 615.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1<<<<<

PEAK FLOWRATE TABLE FILE NAME: S18.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	368.84	67.70	0.60(0.60)	0.99	5287.6	11831.00
2	465.86	93.00	0.60(0.60)	0.99	7636.5	11530.00
3	535.61	108.86	0.60(0.60)	0.99	9913.6	11701.00
4	556.49	113.96	0.60(0.60)	0.99	10677.4	11000.00
5	648.13	131.47	0.60(0.60)	1.00	14699.0	11350.00
6	669.33	137.81	0.60(0.60)	1.00	16198.5	10850.00
7	634.13	145.71	0.60(0.60)	1.00	17561.7	10800.00
8	585.26	152.57	0.60(0.60)	1.00	18544.6	11220.00
9	518.72	163.20	0.60(0.60)	1.00	19653.0	10910.00
10	469.65	171.22	0.60(0.60)	1.00	20292.8	10630.00
11	347.20	209.11	0.60(0.60)	1.00	24538.6	10600.00
12	331.29	220.46	0.60(0.60)	1.00	26191.2	11600.00
13	323.11	238.06	0.60(0.60)	1.00	28026.3	10710.00
14	317.41	246.11	0.60(0.60)	1.00	28547.9	10410.00
15	303.38	267.54	0.60(0.60)	1.00	29762.1	10700.00
16	301.90	284.90	0.60(0.60)	1.00	30777.1	10200.00
17	295.76	302.98	0.60(0.60)	1.00	31520.3	10320.00
18	293.47	308.01	0.60(0.60)	1.00	31667.4	10300.00
19	283.38	326.44	0.60(0.60)	1.00	31937.8	10210.00
20	239.60	440.07	0.60(0.60)	1.00	32916.6	10100.00

TOTAL AREA(ACRES) = 32916.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2<<<<<

\*\*\*\*\*  
MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2<<<<<

PEAK FLOWRATE TABLE FILE NAME: S25.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	141.11	0.60(0.59)	0.99	4845.7	12500.00
2	161.52	169.33	0.60(0.59)	0.99	6553.7	12300.00
3	161.17	174.49	0.60(0.59)	0.99	6933.7	12330.00
4	157.95	201.22	0.60(0.59)	0.98	8764.7	12410.00
5	155.98	214.55	0.60(0.59)	0.98	9660.0	12400.00
6	155.19	218.06	0.60(0.59)	0.98	9842.0	12211.00
7	166.94	226.09	0.60(0.59)	0.98	10505.5	12201.00
8	174.98	233.46	0.60(0.58)	0.97	10951.7	12261.00
9	174.75	235.04	0.60(0.58)	0.98	11005.8	12111.00
10	174.24	239.60	0.60(0.59)	0.98	11200.8	12231.00
11	171.86	258.05	0.60(0.59)	0.98	11864.6	12101.10
12	151.86	297.99	0.60(0.59)	0.98	13091.2	12010.00
13	99.78	374.08	0.60(0.59)	0.98	13237.1	12000.00

TOTAL AREA(ACRES) = 13237.1

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FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	141.11	0.60 ( 0.59)	0.99	4845.7	12500.00
2	161.52	169.33	0.60 ( 0.59)	0.99	6553.7	12300.00
3	161.17	174.49	0.60 ( 0.59)	0.99	6933.7	12330.00
4	157.95	201.22	0.60 ( 0.59)	0.98	8764.7	12410.00
5	155.98	214.55	0.60 ( 0.59)	0.98	9660.0	12400.00
6	155.19	218.06	0.60 ( 0.59)	0.98	9842.0	12211.00
7	166.94	226.09	0.60 ( 0.59)	0.98	10505.5	12201.00
8	174.98	233.46	0.60 ( 0.58)	0.97	10951.7	12261.00
9	174.75	235.04	0.60 ( 0.58)	0.98	11005.8	12111.00
10	174.24	239.60	0.60 ( 0.59)	0.98	11200.8	12231.00
11	171.86	258.05	0.60 ( 0.59)	0.98	11864.6	12101.10
12	151.86	297.99	0.60 ( 0.59)	0.98	13091.2	12010.00
13	99.78	374.08	0.60 ( 0.59)	0.98	13237.1	12000.00
TOTAL AREA (ACRES) =						13237.1

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FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	141.11	0.266	0.60 ( 0.59)	0.99	4845.7	12500.00
2	161.52	169.33	0.239	0.60 ( 0.59)	0.99	6553.7	12300.00
3	161.17	174.49	0.234	0.60 ( 0.59)	0.99	6933.7	12330.00
4	157.95	201.22	0.223	0.60 ( 0.59)	0.98	8764.7	12410.00
5	155.98	214.55	0.219	0.60 ( 0.59)	0.98	9660.0	12400.00
6	155.19	218.06	0.218	0.60 ( 0.59)	0.98	9842.0	12211.00
7	166.94	226.09	0.215	0.60 ( 0.59)	0.98	10505.5	12201.00
8	174.98	233.46	0.213	0.60 ( 0.58)	0.97	10951.7	12261.00
9	174.75	235.04	0.212	0.60 ( 0.58)	0.98	11005.8	12111.00
10	174.24	239.60	0.211	0.60 ( 0.59)	0.98	11200.8	12231.00
11	171.86	258.05	0.206	0.60 ( 0.59)	0.98	11864.6	12101.10
12	151.86	297.99	0.194	0.60 ( 0.59)	0.98	13091.2	12010.00
13	99.78	374.08	0.173	0.60 ( 0.59)	0.98	13237.1	12000.00
LONGEST FLOWPATH FROM NODE							12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	368.84	67.70	0.385	0.60 ( 0.60)	0.99	5287.6	11831.00
2	465.86	93.00	0.339	0.60 ( 0.60)	0.99	7636.5	11530.00
3	535.61	108.86	0.308	0.60 ( 0.60)	0.99	9913.6	11701.00
4	556.49	113.96	0.298	0.60 ( 0.60)	0.99	10677.4	11000.00
5	648.13	131.47	0.275	0.60 ( 0.60)	1.00	14699.0	11350.00
6	669.33	137.81	0.269	0.60 ( 0.60)	1.00	16198.5	10850.00
7	634.13	145.71	0.262	0.60 ( 0.60)	1.00	17561.7	10800.00
8	585.26	152.57	0.255	0.60 ( 0.60)	1.00	18544.6	11220.00

9	518.72	163.20	0.245	0.60 ( 0.60)	1.00	19653.0	10910.00
10	469.65	171.22	0.237	0.60 ( 0.60)	1.00	20292.8	10630.00
11	347.20	209.11	0.220	0.60 ( 0.60)	1.00	24538.6	10600.00
12	331.29	220.46	0.217	0.60 ( 0.60)	1.00	26191.2	11600.00
13	323.11	238.06	0.212	0.60 ( 0.60)	1.00	28026.3	10710.00
14	317.41	246.11	0.209	0.60 ( 0.60)	1.00	28547.9	10410.00
15	303.38	267.54	0.203	0.60 ( 0.60)	1.00	29762.1	10700.00
16	301.90	284.90	0.198	0.60 ( 0.60)	1.00	30777.1	10200.00
17	295.76	302.98	0.192	0.60 ( 0.60)	1.00	31520.3	10320.00
18	293.47	308.01	0.191	0.60 ( 0.60)	1.00	31667.4	10300.00
19	283.38	326.44	0.185	0.60 ( 0.60)	1.00	31937.8	10210.00
20	239.60	440.07	0.166	0.60 ( 0.60)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	455.85	67.70	0.385	0.60 ( 0.60)	0.99	7612.4	11831.00
2	571.10	93.00	0.339	0.60 ( 0.60)	0.99	10829.9	11530.00
3	647.47	108.86	0.308	0.60 ( 0.60)	0.99	13651.8	11701.00
4	669.77	113.96	0.298	0.60 ( 0.60)	0.99	14590.6	11000.00
5	768.84	131.47	0.275	0.60 ( 0.60)	0.99	19213.6	11350.00
6	793.08	137.81	0.269	0.60 ( 0.60)	0.99	20930.8	10850.00
7	779.85	141.11	0.266	0.60 ( 0.60)	0.99	21614.0	12500.00
8	765.28	145.71	0.262	0.60 ( 0.60)	0.99	22685.9	10800.00
9	725.24	152.57	0.255	0.60 ( 0.60)	0.99	24084.1	11220.00
10	672.36	163.20	0.245	0.60 ( 0.60)	0.99	25835.9	10910.00
11	642.74	169.33	0.239	0.60 ( 0.60)	0.99	26695.6	12300.00
12	631.04	171.22	0.237	0.60 ( 0.60)	0.99	26985.6	10630.00
13	620.25	174.49	0.234	0.60 ( 0.60)	0.99	27593.1	12330.00
14	530.62	201.22	0.223	0.60 ( 0.60)	0.99	32419.9	12410.00
15	503.98	209.11	0.220	0.60 ( 0.60)	0.99	33832.7	10600.00
16	495.54	214.55	0.219	0.60 ( 0.60)	0.99	34991.8	12400.00
17	489.83	218.06	0.218	0.60 ( 0.59)	0.99	35684.9	12211.00
18	489.98	220.46	0.217	0.60 ( 0.59)	0.99	36230.8	11600.00
19	495.62	226.09	0.215	0.60 ( 0.59)	0.99	37284.2	12201.00
20	500.23	233.46	0.213	0.60 ( 0.59)	0.99	38498.2	12261.00
21	499.27	235.04	0.212	0.60 ( 0.59)	0.99	38717.5	12111.00
22	497.52	238.06	0.212	0.60 ( 0.59)	0.99	39161.2	10710.00
23	496.26	239.60	0.211	0.60 ( 0.59)	0.99	39327.0	12231.00
24	490.81	246.11	0.209	0.60 ( 0.59)	0.99	39982.9	10410.00
25	481.45	258.05	0.206	0.60 ( 0.59)	0.99	41088.7	12101.10
26	470.48	267.54	0.203	0.60 ( 0.59)	0.99	41918.3	10700.00
27	460.31	284.90	0.198	0.60 ( 0.59)	0.99	43466.5	10200.00
28	449.32	297.99	0.194	0.60 ( 0.59)	0.99	44406.1	12010.00
29	444.20	302.98	0.192	0.60 ( 0.59)	0.99	44621.2	10320.00
30	438.47	308.01	0.191	0.60 ( 0.59)	0.99	44777.8	10300.00
31	415.77	326.44	0.185	0.60 ( 0.60)	0.99	45083.6	10210.00
32	364.80	374.08	0.173	0.60 ( 0.60)	0.99	45585.3	12000.00
33	335.27	440.07	0.166	0.60 ( 0.60)	0.99	46153.7	10100.00
TOTAL AREA (ACRES) =							46153.7

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 793.08 Tc (MIN.) = 137.811

EFFECTIVE AREA (ACRES) = 20930.83 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

TOTAL AREA (ACRES) = 46153.7

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

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FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.268
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 14.37 0.60 0.987 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 793.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.69
AVERAGE FLOW DEPTH(FEET) = 5.86 TRAVEL TIME(MIN.) = 1.15
Tc(MIN.) = 138.96

SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 0.05
EFFECTIVE AREA(ACRES) = 20945.20 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 793.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.86 FLOW VELOCITY(FEET/SEC.) = 7.69
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-19.

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 20-33.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 793.08 Tc(MIN.) = 138.96
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 20945.20

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FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-30.

31 415.77 327.79 0.185 0.60 ( 0.60) 0.99 45097.9 10210.00  
 32 364.80 375.48 0.173 0.60 ( 0.60) 0.99 45599.6 12000.00  
 33 335.27 441.50 0.166 0.60 ( 0.60) 0.99 46168.0 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	140.99	23.73	0.697	0.59 ( 0.58)	1.00	615.8	40200.00
2	60.02	52.03	0.444	0.59 ( 0.59)	1.00	1456.7	40120.00
3	60.46	55.64	0.423	0.59 ( 0.59)	1.00	1567.9	40100.00
4	46.88	145.33	0.262	0.60 ( 0.60)	1.00	3266.6	11900.00
5	45.44	154.14	0.254	0.60 ( 0.60)	1.00	3343.7	11910.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.697	0.60 ( 0.59)	0.99	3237.9	40200.00
2	458.29	52.03	0.444	0.60 ( 0.59)	0.99	7205.6	40120.00
3	466.95	55.64	0.423	0.60 ( 0.60)	0.99	7715.8	40100.00
4	514.29	69.03	0.383	0.60 ( 0.60)	0.99	9448.2	11831.00
5	625.72	94.25	0.337	0.60 ( 0.60)	0.99	13143.3	11530.00
6	699.69	110.08	0.306	0.60 ( 0.60)	0.99	16265.0	11701.00
7	721.22	115.16	0.296	0.60 ( 0.60)	0.99	17300.1	11000.00
8	817.64	132.63	0.274	0.60 ( 0.60)	0.99	22254.0	11350.00
9	840.92	138.96	0.268	0.60 ( 0.60)	0.99	24091.2	10850.00
10	827.20	142.27	0.265	0.60 ( 0.60)	0.99	24837.0	12500.00
11	817.06	145.33	0.262	0.60 ( 0.60)	0.99	25606.9	11900.00
12	811.91	146.88	0.260	0.60 ( 0.60)	0.99	25980.4	10800.00
13	770.74	153.75	0.254	0.60 ( 0.60)	0.99	27438.8	11220.00
14	768.74	154.14	0.254	0.60 ( 0.60)	0.99	27506.3	11910.00
15	716.05	164.41	0.244	0.60 ( 0.60)	0.99	29194.0	10910.00
16	685.39	170.54	0.238	0.60 ( 0.60)	0.99	30053.6	12300.00
17	673.36	172.44	0.236	0.60 ( 0.60)	0.99	30343.7	10630.00
18	662.01	175.72	0.233	0.60 ( 0.60)	0.99	30951.2	12330.00
19	570.45	202.50	0.222	0.60 ( 0.60)	0.99	35778.0	12410.00
20	543.38	210.40	0.220	0.60 ( 0.60)	0.99	37190.8	10600.00
21	534.65	215.85	0.218	0.60 ( 0.60)	0.99	38349.9	12400.00
22	528.75	219.36	0.217	0.60 ( 0.60)	0.99	39043.0	12211.00
23	528.77	221.76	0.216	0.60 ( 0.59)	0.99	39588.9	11600.00
24	534.10	227.39	0.215	0.60 ( 0.59)	0.99	40642.3	12201.00
25	538.32	234.75	0.213	0.60 ( 0.59)	0.99	41856.3	12261.00
26	537.27	236.34	0.212	0.60 ( 0.59)	0.99	42075.6	12111.00
27	535.37	239.36	0.211	0.60 ( 0.59)	0.99	42519.3	10710.00
28	534.02	240.90	0.211	0.60 ( 0.59)	0.99	42685.1	10710.00
29	528.22	247.41	0.209	0.60 ( 0.59)	0.99	43341.0	10410.00
30	518.22	259.36	0.205	0.60 ( 0.59)	0.99	44446.8	12101.10
31	506.74	268.86	0.202	0.60 ( 0.59)	0.99	45276.4	10700.00
32	495.63	286.22	0.197	0.60 ( 0.59)	0.99	46824.6	10200.00
33	483.94	299.31	0.193	0.60 ( 0.60)	0.99	47764.2	12010.00
34	478.55	304.32	0.192	0.60 ( 0.60)	0.99	47979.3	10320.00
35	472.55	309.35	0.190	0.60 ( 0.60)	0.99	48135.9	10300.00
36	448.86	327.79	0.185	0.60 ( 0.60)	0.99	48441.6	10210.00
37	395.86	375.48	0.173	0.60 ( 0.60)	0.99	48943.4	12000.00
38	365.05	441.50	0.166	0.60 ( 0.60)	0.99	49511.8	10100.00

TOTAL AREA (ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 840.92 Tc (MIN.) = 138.964  
 EFFECTIVE AREA (ACRES) = 24091.17 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 49511.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 49511.8 TC (MIN.) = 138.96  
 EFFECTIVE AREA (ACRES) = 24091.17 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.995  
 PEAK FLOW RATE (CFS) = 840.92

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.697	0.60 ( 0.59)	0.99	3237.9	40200.00
2	458.29	52.03	0.444	0.60 ( 0.59)	0.99	7205.6	40120.00
3	466.95	55.64	0.423	0.60 ( 0.60)	0.99	7715.8	40100.00
4	514.29	69.03	0.383	0.60 ( 0.60)	0.99	9448.2	11831.00
5	625.72	94.25	0.337	0.60 ( 0.60)	0.99	13143.3	11530.00
6	699.69	110.08	0.306	0.60 ( 0.60)	0.99	16265.0	11701.00
7	721.22	115.16	0.296	0.60 ( 0.60)	0.99	17300.1	11000.00
8	817.64	132.63	0.274	0.60 ( 0.60)	0.99	22254.0	11350.00
9	840.92	138.96	0.268	0.60 ( 0.60)	0.99	24091.2	10850.00
10	827.20	142.27	0.265	0.60 ( 0.60)	0.99	24837.0	12500.00
11	817.06	145.33	0.262	0.60 ( 0.60)	0.99	25606.9	11900.00
12	811.91	146.88	0.260	0.60 ( 0.60)	0.99	25980.4	10800.00
13	770.74	153.75	0.254	0.60 ( 0.60)	0.99	27438.8	11220.00
14	768.74	154.14	0.254	0.60 ( 0.60)	0.99	27506.3	11910.00
15	716.05	164.41	0.244	0.60 ( 0.60)	0.99	29194.0	10910.00
16	685.39	170.54	0.238	0.60 ( 0.60)	0.99	30053.6	12300.00
17	673.36	172.44	0.236	0.60 ( 0.60)	0.99	30343.7	10630.00
18	662.01	175.72	0.233	0.60 ( 0.60)	0.99	30951.2	12330.00
19	570.45	202.50	0.222	0.60 ( 0.60)	0.99	35778.0	12410.00
20	543.38	210.40	0.220	0.60 ( 0.60)	0.99	37190.8	10600.00
21	534.65	215.85	0.218	0.60 ( 0.60)	0.99	38349.9	12400.00
22	528.75	219.36	0.217	0.60 ( 0.60)	0.99	39043.0	12211.00
23	528.77	221.76	0.216	0.60 ( 0.59)	0.99	39588.9	11600.00
24	534.10	227.39	0.215	0.60 ( 0.59)	0.99	40642.3	12201.00
25	538.32	234.75	0.213	0.60 ( 0.59)	0.99	41856.3	12261.00
26	537.27	236.34	0.212	0.60 ( 0.59)	0.99	42075.6	12111.00
27	535.37	239.36	0.211	0.60 ( 0.59)	0.99	42519.3	10710.00
28	534.02	240.90	0.211	0.60 ( 0.59)	0.99	42685.1	10710.00
29	528.22	247.41	0.209	0.60 ( 0.59)	0.99	43341.0	10410.00
30	518.22	259.36	0.205	0.60 ( 0.59)	0.99	44446.8	12101.10
31	506.74	268.86	0.202	0.60 ( 0.59)	0.99	45276.4	10700.00
32	495.63	286.22	0.197	0.60 ( 0.59)	0.99	46824.6	10200.00
33	483.94	299.31	0.193	0.60 ( 0.60)	0.99	47764.2	12010.00
34	478.55	304.32	0.192	0.60 ( 0.60)	0.99	47979.3	10320.00
35	472.55	309.35	0.190	0.60 ( 0.60)	0.99	48135.9	10300.00
36	448.86	327.79	0.185	0.60 ( 0.60)	0.99	48441.6	10210.00
37	395.86	375.48	0.173	0.60 ( 0.60)	0.99	48943.4	12000.00
38	365.05	441.50	0.166	0.60 ( 0.60)	0.99	49511.8	10100.00

END OF RATIONAL METHOD ANALYSIS



ELEVATION DATA: UPSTREAM(FEET) = 3849.51 DOWNSTREAM(FEET) = 3265.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1892.03 CHANNEL SLOPE = 0.3086  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.729

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.96	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.76  
AVERAGE FLOW DEPTH(FEET) = 0.73 TRAVEL TIME(MIN.) = 4.66  
Tc(MIN.) = 21.13  
SUBAREA AREA(ACRES) = 68.96 SUBAREA RUNOFF(CFS) = 7.99  
EFFECTIVE AREA(ACRES) = 96.81 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 96.8 PEAK FLOW RATE(CFS) = 11.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 6.88  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12003.00 = 3833.64 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3265.69 DOWNSTREAM(FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3118.62 CHANNEL SLOPE = 0.2688  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.597

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.28	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 7.60  
Tc(MIN.) = 28.74  
SUBAREA AREA(ACRES) = 328.28 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 425.09 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 425.1 PEAK FLOW RATE(CFS) = 11.22

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.76 FLOW VELOCITY(FEET/SEC.) = 6.50  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 28.74  
RAINFALL INTENSITY(INCH/HR) = 0.60  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 425.09  
TOTAL STREAM AREA(ACRES) = 425.09  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 11.22

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12010.00 TO NODE 12011.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 264.80  
ELEVATION DATA: UPSTREAM(FEET) = 4208.12 DOWNSTREAM(FEET) = 4068.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.470  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.467  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	2.06	0.60	1.000	0	7.47

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.61  
TOTAL AREA(ACRES) = 2.06 PEAK FLOW RATE(CFS) = 1.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12011.00 TO NODE 12012.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 4068.13 DOWNSTREAM(FEET) = 3694.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.45 CHANNEL SLOPE = 0.5703  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.257

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.98	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.07



AVERAGE FLOW DEPTH (FEET) = 0.39 TRAVEL TIME (MIN.) = 1.80  
Tc (MIN.) = 9.27  
SUBAREA AREA (ACRES) = 3.98 SUBAREA RUNOFF (CFS) = 2.35  
EFFECTIVE AREA (ACRES) = 6.04 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 6.0 PEAK FLOW RATE (CFS) = 3.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.43 FLOW VELOCITY (FEET/SEC.) = 6.43  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12012.00 = 919.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12012.00 TO NODE 12013.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 3694.92 DOWNSTREAM (FEET) = 3415.55  
CHANNEL LENGTH THRU SUBAREA (FEET) = 981.94 CHANNEL SLOPE = 0.2845  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.080

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 35.56 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 11.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.68  
AVERAGE FLOW DEPTH (FEET) = 0.75 TRAVEL TIME (MIN.) = 2.45  
Tc (MIN.) = 11.72  
SUBAREA AREA (ACRES) = 35.56 SUBAREA RUNOFF (CFS) = 15.35  
EFFECTIVE AREA (ACRES) = 41.60 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 41.6 PEAK FLOW RATE (CFS) = 17.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.90 FLOW VELOCITY (FEET/SEC.) = 7.47  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12013.00 = 1901.19 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12013.00 TO NODE 12014.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 3415.55 DOWNSTREAM (FEET) = 2756.62  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1926.68 CHANNEL SLOPE = 0.3420  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.895

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 72.40 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.93  
AVERAGE FLOW DEPTH (FEET) = 1.02 TRAVEL TIME (MIN.) = 3.59  
Tc (MIN.) = 15.31  
SUBAREA AREA (ACRES) = 72.40 SUBAREA RUNOFF (CFS) = 19.26  
EFFECTIVE AREA (ACRES) = 114.00 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 114.0 PEAK FLOW RATE (CFS) = 30.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.06 FLOW VELOCITY (FEET/SEC.) = 9.07  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12014.00 = 3827.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2756.62 DOWNSTREAM (FEET) = 2427.28  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1697.28 CHANNEL SLOPE = 0.1940  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.786

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 121.96 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 40.70  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.94  
AVERAGE FLOW DEPTH (FEET) = 1.31 TRAVEL TIME (MIN.) = 3.56  
Tc (MIN.) = 18.88  
SUBAREA AREA (ACRES) = 121.96 SUBAREA RUNOFF (CFS) = 20.39  
EFFECTIVE AREA (ACRES) = 235.96 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 236.0 PEAK FLOW RATE (CFS) = 39.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.29 FLOW VELOCITY (FEET/SEC.) = 7.87  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12020.00 = 5525.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 1

-----  
>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>> AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 18.88  
RAINFALL INTENSITY (INCH/HR) = 0.79  
AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 235.96  
TOTAL STREAM AREA (ACRES) = 235.96

PEAK FLOW RATE(CFS) AT CONFLUENCE = 39.44

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11.22	28.74	0.597	0.60( 0.60)	1.00	425.1	12000.00
2	39.44	18.88	0.786	0.60( 0.60)	1.00	236.0	12010.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	18.88	0.786	0.60( 0.60)	1.00	515.2	12010.00
2	11.22	28.74	0.597	0.60( 0.60)	1.00	661.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 18.88  
 EFFECTIVE AREA(ACRES) = 515.20 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 661.0  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12020.00 TO NODE 12021.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2427.28 DOWNSTREAM(FEET) = 2056.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2698.04 CHANNEL SLOPE = 0.1375  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.657

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	376.13	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.67  
 AVERAGE FLOW DEPTH(FEET) = 1.61 TRAVEL TIME(MIN.) = 5.86

Tc(MIN.) = 24.74  
 SUBAREA AREA(ACRES) = 376.13 SUBAREA RUNOFF(CFS) = 19.39  
 EFFECTIVE AREA(ACRES) = 891.33 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1037.2 PEAK FLOW RATE(CFS) = 49.13

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.50 FLOW VELOCITY(FEET/SEC.) = 7.30  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12021.00 = 9650.30 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	49.13	24.74	0.657	0.60( 0.60)	1.00	891.3	12010.00
2	11.22	37.62	0.517	0.60( 0.60)	1.00	1037.2	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 24.74  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 891.33

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12021.00 TO NODE 12022.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2056.25 DOWNSTREAM(FEET) = 1864.68  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2552.86 CHANNEL SLOPE = 0.0750  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.563

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	347.45	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.13  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.83  
 AVERAGE FLOW DEPTH(FEET) = 1.68 TRAVEL TIME(MIN.) = 7.29  
 Tc(MIN.) = 32.03

SUBAREA AREA(ACRES) = 347.45 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1238.78 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1384.6 PEAK FLOW RATE(CFS) = 49.13  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.68 FLOW VELOCITY(FEET/SEC.) = 5.83  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12022.00 = 12203.16 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	32.03	0.563	0.60( 0.60)	1.00	1238.8	12010.00
2	11.22	48.20	0.451	0.60( 0.60)	1.00	1384.6	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 32.03  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1238.78

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12022.00 TO NODE 12023.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1864.68 DOWNSTREAM(FEET) = 1710.75  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.57 CHANNEL SLOPE = 0.0816  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.520

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 280.70 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.13  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.01  
 AVERAGE FLOW DEPTH(FEET) = 1.65 TRAVEL TIME(MIN.) = 5.23  
 Tc(MIN.) = 37.27

SUBAREA AREA(ACRES) = 280.70 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1519.48 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 1665.3 PEAK FLOW RATE(CFS) = 49.13  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.65 FLOW VELOCITY(FEET/SEC.) = 6.01  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12023.00 = 14089.73 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	37.27	0.520	0.60( 0.60)	1.00	1519.5	12010.00
2	11.22	55.77	0.415	0.60( 0.60)	1.00	1665.3	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 37.27  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1519.48

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1710.75 DOWNSTREAM(FEET) = 1672.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.87 CHANNEL SLOPE = 0.0196  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.461

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 248.35 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.13  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.52  
 AVERAGE FLOW DEPTH(FEET) = 2.16 TRAVEL TIME(MIN.) = 9.20  
 Tc(MIN.) = 46.47

SUBAREA AREA(ACRES) = 248.35 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1767.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 1913.7 PEAK FLOW RATE(CFS) = 49.13  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.16 FLOW VELOCITY(FEET/SEC.) = 3.52  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12024.00 = 16034.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	46.47	0.461	0.60( 0.60)	1.00	1767.8	12010.00
2	11.22	69.08	0.376	0.60( 0.60)	1.00	1913.7	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 46.47  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1767.83

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 1913.7 TC(MIN.) = 46.47  
 EFFECTIVE AREA(ACRES) = 1767.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE(CFS) = 49.13

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	46.47	0.461	0.60( 0.60)	1.00	1767.8	12010.00
2	11.22	69.08	0.376	0.60( 0.60)	1.00	1913.7	12000.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S21.DAT  
TIME/DATE OF STUDY: 14:36 04/03/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.756
- 2) 10.00; 1.171
- 3) 15.00; 0.905
- 4) 20.00; 0.751
- 5) 25.00; 0.652
- 6) 30.00; 0.579
- 7) 40.00; 0.498
- 8) 50.00; 0.441
- 9) 60.00; 0.396
- 10) 90.00; 0.330
- 11) 120.00; 0.285
- 12) 180.00; 0.236
- 13) 360.00; 0.170
- 14) 1440.00; 0.074

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GUTTER GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313 0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S20.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	46.47	0.60 ( 0.60)	1.00	1767.8	12010.00
2	11.22	69.08	0.60 ( 0.60)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =			1913.7			

-----  
FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	46.47	0.60 ( 0.60)	1.00	1767.8	12010.00
2	11.22	69.08	0.60 ( 0.60)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =			1913.7			

-----  
FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1672.60 DOWNSTREAM(FEET) = 1636.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 780.49 CHANNEL SLOPE = 0.0458  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.446  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	93.19	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.83  
AVERAGE FLOW DEPTH(FEET) = 1.84 TRAVEL TIME(MIN.) = 2.69  
Tc(MIN.) = 49.16  
SUBAREA AREA(ACRES) = 93.19 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE Fm(ACRES) = 1861.02 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 2006.9 PEAK FLOW RATE(CFS) = 49.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.84 FLOW VELOCITY(FEET/SEC.) = 4.83  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	49.16	0.446	0.60( 0.60)	1.00	1861.0	12010.00
2	11.22	72.97	0.367	0.60( 0.60)	1.00	2006.9	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 49.13 Tc(MIN.) = 49.16  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1861.02

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 49.16  
RAINFALL INTENSITY(INCH/HR) = 0.45  
AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 1861.02  
TOTAL STREAM AREA(ACRES) = 2006.87  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 49.13

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12101.10 TO NODE 12101.20 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 847.57  
ELEVATION DATA: UPSTREAM(FEET) = 3435.00 DOWNSTREAM(FEET) = 2774.23

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.008  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.117  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	6.56	0.60	1.000	0	11.01

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.06  
TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 3.06

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12101.20 TO NODE 12101.30 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2774.23 DOWNSTREAM(FEET) = 2097.09

CHANNEL LENGTH THRU SUBAREA(FEET) = 1205.19 CHANNEL SLOPE = 0.5619  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.987

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.88	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.22  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.18  
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 2.46  
Tc(MIN.) = 13.46  
SUBAREA AREA(ACRES) = 34.88 SUBAREA RUNOFF(CFS) = 12.14  
EFFECTIVE AREA(ACRES) = 41.44 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.4 PEAK FLOW RATE(CFS) = 14.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.73 FLOW VELOCITY(FEET/SEC.) = 9.08  
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12101.30 = 2052.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2097.09 DOWNSTREAM(FEET) = 1636.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1553.74 CHANNEL SLOPE = 0.2962  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.851

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.40	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.86  
AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 3.29  
Tc(MIN.) = 16.76  
SUBAREA AREA(ACRES) = 56.40 SUBAREA RUNOFF(CFS) = 12.74  
EFFECTIVE AREA(ACRES) = 97.84 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 97.8 PEAK FLOW RATE(CFS) = 22.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 8.02  
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12102.00 = 3606.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 16.76  
 RAINFALL INTENSITY(INCH/HR) = 0.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 97.84  
 TOTAL STREAM AREA(ACRES) = 97.84  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 22.10

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.13	49.16	0.446	0.60( 0.60)	1.00	1861.0	12010.00
1	11.22	72.97	0.367	0.60( 0.60)	1.00	2006.9	12000.00
2	22.10	16.76	0.851	0.60( 0.60)	1.00	97.8	12101.10

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.06	16.76	0.851	0.60( 0.60)	1.00	732.2	12101.10
2	49.13	49.16	0.446	0.60( 0.60)	1.00	1958.9	12010.00
3	11.22	72.97	0.367	0.60( 0.60)	1.00	2104.7	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 54.06 Tc(MIN.) = 16.76  
 EFFECTIVE AREA(ACRES) = 732.21 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2104.7  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12102.00 TO NODE 12103.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1636.82 DOWNSTREAM(FEET) = 1558.46  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2049.75 CHANNEL SLOPE = 0.0382  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.671  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.59	0.60	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.70  
 AVERAGE FLOW DEPTH(FEET) = 2.02 TRAVEL TIME(MIN.) = 7.27  
 Tc(MIN.) = 24.02  
 SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 7.50

EFFECTIVE AREA(ACRES) = 848.80 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2221.3 PEAK FLOW RATE(CFS) = 54.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.98 FLOW VELOCITY(FEET/SEC.) = 4.65  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12103.00 = 18864.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	24.02	0.671	0.60( 0.60)	1.00	848.8	12101.10
2	49.13	56.72	0.411	0.60( 0.60)	1.00	2075.5	12010.00
3	11.22	83.91	0.343	0.60( 0.60)	1.00	2221.3	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 54.59 Tc(MIN.) = 24.02  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 848.80

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12103.00 TO NODE 12104.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1558.46 DOWNSTREAM(FEET) = 1453.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1971.34 CHANNEL SLOPE = 0.0531  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.577

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	355.30	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.23  
 AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 6.28  
 Tc(MIN.) = 30.30

SUBAREA AREA(ACRES) = 355.30 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1204.10 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 2576.6 PEAK FLOW RATE(CFS) = 54.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.86 FLOW VELOCITY(FEET/SEC.) = 5.23  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12104.00 = 20836.18 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	30.30	0.577	0.60( 0.60)	1.00	1204.1	12101.10

2 49.13 63.14 0.389 0.60( 0.60) 1.00 2430.8 12010.00  
 3 11.22 93.18 0.325 0.60( 0.60) 1.00 2576.6 12000.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 54.59 Tc(MIN.) = 30.30  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1204.10

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12104.00 TO NODE 12105.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1453.87 DOWNSTREAM(FEET) = 1369.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1885.63 CHANNEL SLOPE = 0.0446  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.525

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 200.37 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.91  
 AVERAGE FLOW DEPTH(FEET) = 1.93 TRAVEL TIME(MIN.) = 6.40  
 Tc(MIN.) = 36.70

SUBAREA AREA(ACRES) = 200.37 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1404.47 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 2777.0 PEAK FLOW RATE(CFS) = 54.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 4.91  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12105.00 = 22721.81 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	36.70	0.525	0.60( 0.60)	1.00	1404.5	12101.10
2	49.13	69.71	0.375	0.60( 0.60)	1.00	2631.1	12010.00
3	11.22	102.68	0.311	0.60( 0.60)	1.00	2777.0	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 54.59 Tc(MIN.) = 36.70  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1404.47

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12105.00 TO NODE 12106.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1369.72 DOWNSTREAM(FEET) = 1298.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1910.12 CHANNEL SLOPE = 0.0374  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.477

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 339.52 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.60  
 AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 6.92  
 Tc(MIN.) = 43.62

SUBAREA AREA(ACRES) = 339.52 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1743.99 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 3116.5 PEAK FLOW RATE(CFS) = 54.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.99 FLOW VELOCITY(FEET/SEC.) = 4.60  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12106.00 = 24631.93 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	43.62	0.477	0.60( 0.60)	1.00	1744.0	12101.10
2	49.13	76.80	0.359	0.60( 0.60)	1.00	2970.6	12010.00
3	11.22	112.91	0.296	0.60( 0.60)	1.00	3116.5	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 54.59 Tc(MIN.) = 43.62  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1743.99

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1298.29 DOWNSTREAM(FEET) = 1215.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2982.44 CHANNEL SLOPE = 0.0277  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.415

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 164.97 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 4.12  
 AVERAGE FLOW DEPTH( FEET) = 2.10 TRAVEL TIME( MIN.) = 12.08  
 Tc( MIN.) = 55.70  
 SUBAREA AREA( ACRES) = 164.97 SUBAREA RUNOFF( CFS) = 0.00  
 EFFECTIVE AREA( ACRES) = 1908.96 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA( ACRES) = 3281.5 PEAK FLOW RATE( CFS) = 54.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.10 FLOW VELOCITY( FEET/SEC.) = 4.12  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	55.70	0.415	0.60( 0.60)	1.00	1909.0	12101.10
2	49.13	89.17	0.332	0.60( 0.60)	1.00	3135.6	12010.00
3	11.22	130.88	0.276	0.60( 0.60)	1.00	3281.5	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE( CFS) = 54.59 Tc( MIN.) = 55.70  
 AREA-AVERAGED Fm( INCH/HR) = 0.60 AREA-AVERAGED Fp( INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA( ACRES) = 1908.96

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION( MIN.) = 55.70  
 RAINFALL INTENSITY( INCH/HR) = 0.42  
 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA( ACRES) = 1908.96  
 TOTAL STREAM AREA( ACRES) = 3281.46  
 PEAK FLOW RATE( CFS) AT CONFLUENCE = 54.59

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12111.00 TO NODE 12112.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH( FEET) = 939.51  
 ELEVATION DATA: UPSTREAM( FEET) = 3108.05 DOWNSTREAM( FEET) = 2753.95

Tc = K\*[( LENGTH\*\* 3.00)/( ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc( MIN.) = 13.265  
 \* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.997  
 SUBAREA Tc AND LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA ( ACRES)	Fp ( INCH/HR)	Ap ( DECIMAL)	SCS CN	Tc ( MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	8.25	0.60	1.000	0	13.27

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp( INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF( CFS) = 2.95  
 TOTAL AREA( ACRES) = 8.25 PEAK FLOW RATE( CFS) = 2.95

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12112.00 TO NODE 12113.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA ( EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM( FEET) = 2753.95 DOWNSTREAM( FEET) = 2458.45  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 945.14 CHANNEL SLOPE = 0.3127  
 CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH( FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.872

SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA ( ACRES)	Fp ( INCH/HR)	Ap ( DECIMAL)	SCS CN
USER-DEFINED	-	16.51	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp( INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 5.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 5.63  
 AVERAGE FLOW DEPTH( FEET) = 0.54 TRAVEL TIME( MIN.) = 2.80  
 Tc( MIN.) = 16.07  
 SUBAREA AREA( ACRES) = 16.51 SUBAREA RUNOFF( CFS) = 4.05  
 EFFECTIVE AREA( ACRES) = 24.76 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES) = 24.8 PEAK FLOW RATE( CFS) = 6.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 0.58 FLOW VELOCITY( FEET/SEC.) = 5.92  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12113.00 = 1884.65 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12113.00 TO NODE 12114.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA ( EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM( FEET) = 2458.45 DOWNSTREAM( FEET) = 1823.37  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1903.76 CHANNEL SLOPE = 0.3336  
 CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH( FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.737

SUBAREA LOSS RATE DATA( AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA ( ACRES)	Fp ( INCH/HR)	Ap ( DECIMAL)	SCS CN
USER-DEFINED	-	57.98	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp( INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS) = 9.81  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 6.84



AVERAGE FLOW DEPTH (FEET) = 0.69 TRAVEL TIME (MIN.) = 4.64  
 Tc (MIN.) = 20.70  
 SUBAREA AREA (ACRES) = 57.98 SUBAREA RUNOFF (CFS) = 7.16  
 EFFECTIVE AREA (ACRES) = 82.74 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 82.7 PEAK FLOW RATE (CFS) = 10.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.70 FLOW VELOCITY (FEET/SEC.) = 6.86  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12114.00 = 3788.41 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12114.00 TO NODE 12115.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1823.37 DOWNSTREAM (FEET) = 1500.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1685.04 CHANNEL SLOPE = 0.1916  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.646

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.07	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 13.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.92  
 AVERAGE FLOW DEPTH (FEET) = 0.86 TRAVEL TIME (MIN.) = 4.74  
 Tc (MIN.) = 25.44  
 SUBAREA AREA (ACRES) = 124.07 SUBAREA RUNOFF (CFS) = 5.10  
 EFFECTIVE AREA (ACRES) = 206.81 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 10.22  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.78 FLOW VELOCITY (FEET/SEC.) = 5.58  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12115.00 = 5473.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1500.53 DOWNSTREAM (FEET) = 1215.72  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1875.45 CHANNEL SLOPE = 0.1519  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.567

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.55	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 10.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.15  
 AVERAGE FLOW DEPTH (FEET) = 0.81 TRAVEL TIME (MIN.) = 6.07  
 Tc (MIN.) = 31.52  
 SUBAREA AREA (ACRES) = 62.55 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 269.36 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 269.4 PEAK FLOW RATE (CFS) = 10.22  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.81 FLOW VELOCITY (FEET/SEC.) = 5.15  
 LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12121.00 = 7348.90 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 1

>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>> AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 31.52  
 RAINFALL INTENSITY (INCH/HR) = 0.57  
 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 269.36  
 TOTAL STREAM AREA (ACRES) = 269.36  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 10.22

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.59	55.70	0.415	0.60 ( 0.60)	1.00	1909.0	12101.10
1	49.13	89.17	0.332	0.60 ( 0.60)	1.00	3135.6	12010.00
1	11.22	130.88	0.276	0.60 ( 0.60)	1.00	3281.5	12000.00
2	10.22	31.52	0.567	0.60 ( 0.60)	1.00	269.4	12111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	31.52	0.567	0.60 ( 0.60)	1.00	1349.6	12111.00
2	62.08	55.70	0.415	0.60 ( 0.60)	1.00	2178.3	12101.10
3	55.11	89.17	0.332	0.60 ( 0.60)	1.00	3405.0	12010.00
4	16.19	130.88	0.276	0.60 ( 0.60)	1.00	3550.8	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 62.08 Tc (MIN.) = 55.70  
 EFFECTIVE AREA (ACRES) = 2178.32 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3550.8  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12121.00 TO NODE 12241.00 IS CODE = 51

=====  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====  
 ELEVATION DATA: UPSTREAM(FEET) = 1215.72 DOWNSTREAM(FEET) = 1122.29  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3397.13 CHANNEL SLOPE = 0.0275  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.376

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	136.41	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.24

AVERAGE FLOW DEPTH (FEET) = 2.21 TRAVEL TIME (MIN.) = 13.36

Tc (MIN.) = 69.06

SUBAREA AREA (ACRES) = 136.41 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 2314.73 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 3687.2 PEAK FLOW RATE (CFS) = 62.08

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.21 FLOW VELOCITY (FEET/SEC.) = 4.24

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	45.45	0.467	0.60 ( 0.60)	1.00	1486.0	12111.00
2	62.08	69.06	0.376	0.60 ( 0.60)	1.00	2314.7	12101.10
3	55.11	102.90	0.311	0.60 ( 0.60)	1.00	3541.4	12010.00
4	16.19	149.50	0.261	0.60 ( 0.60)	1.00	3687.2	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 62.08 Tc (MIN.) = 69.06

AREA-AVERAGED Fm (INCH/HR) = 0.60 AREA-AVERAGED Fp (INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 2314.73

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 3687.2 TC (MIN.) = 69.06

EFFECTIVE AREA (ACRES) = 2314.73 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE (CFS) = 62.08

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	45.45	0.467	0.60 ( 0.60)	1.00	1486.0	12111.00
2	62.08	69.06	0.376	0.60 ( 0.60)	1.00	2314.7	12101.10
3	55.11	102.90	0.311	0.60 ( 0.60)	1.00	3541.4	12010.00
4	16.19	149.50	0.261	0.60 ( 0.60)	1.00	3687.2	12000.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S22.DAT  
TIME/DATE OF STUDY: 14:36 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.756
- 2) 10.00; 1.171
- 3) 15.00; 0.905
- 4) 20.00; 0.751
- 5) 25.00; 0.652
- 6) 30.00; 0.579
- 7) 40.00; 0.498
- 8) 50.00; 0.441
- 9) 60.00; 0.396
- 10) 90.00; 0.330
- 11) 120.00; 0.285
- 12) 180.00; 0.236
- 13) 360.00; 0.170
- 14) 1440.00; 0.074

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12201.00 TO NODE 12202.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 926.94  
ELEVATION DATA: UPSTREAM(FEET) = 3077.00 DOWNSTREAM(FEET) = 2740.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.295  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.996  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	5.74	0.60	1.000	0	13.29

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.05  
TOTAL AREA(ACRES) = 5.74 PEAK FLOW RATE(CFS) = 2.05

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12202.00 TO NODE 12203.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2740.64 DOWNSTREAM(FEET) = 2551.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 832.53 CHANNEL SLOPE = 0.2271  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.868  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.85	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.77  
AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 2.91  
Tc(MIN.) = 16.21  
SUBAREA AREA(ACRES) = 18.85 SUBAREA RUNOFF(CFS) = 4.55  
EFFECTIVE AREA(ACRES) = 24.59 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 24.6 PEAK FLOW RATE(CFS) = 5.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 5.22  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12203.00 = 1759.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12203.00 TO NODE 12204.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2551.60 DOWNSTREAM(FEET) = 2151.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.86 CHANNEL SLOPE = 0.1944  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.706

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.93	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.66  
AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 6.05  
Tc(MIN.) = 22.26  
SUBAREA AREA(ACRES) = 83.93 SUBAREA RUNOFF(CFS) = 8.04  
EFFECTIVE AREA(ACRES) = 108.52 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 108.5 PEAK FLOW RATE(CFS) = 10.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 5.65  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12204.00 = 3816.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12204.00 TO NODE 12205.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2151.76 DOWNSTREAM(FEET) = 1788.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2363.99 CHANNEL SLOPE = 0.1538  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.581

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	182.26	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.16  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 7.63  
Tc(MIN.) = 29.89  
SUBAREA AREA(ACRES) = 182.26 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 290.78 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 290.8 PEAK FLOW RATE(CFS) = 10.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.82 FLOW VELOCITY(FEET/SEC.) = 5.16  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12205.00 = 6180.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12205.00 TO NODE 12206.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1788.16 DOWNSTREAM(FEET) = 1385.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2825.33 CHANNEL SLOPE = 0.1424  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.504

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	153.05	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.05  
AVERAGE FLOW DEPTH(FEET) = 0.83 TRAVEL TIME(MIN.) = 9.33  
Tc(MIN.) = 39.22  
SUBAREA AREA(ACRES) = 153.05 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 443.83 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 443.8 PEAK FLOW RATE(CFS) = 10.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 5.05  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12206.00 = 9005.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1385.78 DOWNSTREAM(FEET) = 1006.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3579.23 CHANNEL SLOPE = 0.1061  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.429

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	132.52	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.40  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.47  
AVERAGE FLOW DEPTH(FEET) = 0.88 TRAVEL TIME(MIN.) = 13.34

Tc(MIN.) = 52.56  
SUBAREA AREA(ACRES) = 132.52 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 576.35 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 576.4 PEAK FLOW RATE(CFS) = 10.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 4.47  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
-----

=====

TOTAL NUMBER OF STREAMS =	2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:	
TIME OF CONCENTRATION(MIN.) =	52.56
RAINFALL INTENSITY(INCH/HR) =	0.43
AREA-AVERAGED Fm(INCH/HR) =	0.60
AREA-AVERAGED Fp(INCH/HR) =	0.60
AREA-AVERAGED Ap =	1.00
EFFECTIVE STREAM AREA(ACRES) =	576.35
TOTAL STREAM AREA(ACRES) =	576.35
PEAK FLOW RATE(CFS) AT CONFLUENCE =	10.40

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12211.00 TO NODE 12212.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) =	733.41
ELEVATION DATA: UPSTREAM(FEET) =	1669.93
DOWNSTREAM(FEET) =	1536.26

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)]**0.20						
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =	13.893					
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.964					
SUBAREA Tc AND LOSS RATE DATA(AMC II):						
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
NATURAL FAIR COVER						
"GRASS"	-	8.90	0.60	1.000	0	13.89
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =	0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =	1.000					
SUBAREA RUNOFF(CFS) =	2.92					
TOTAL AREA(ACRES) =	8.90					
PEAK FLOW RATE(CFS) =	2.92					

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12212.00 TO NODE 12213.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

=====

ELEVATION DATA: UPSTREAM(FEET) =	1536.26
DOWNSTREAM(FEET) =	1416.02

CHANNEL LENGTH THRU SUBAREA(FEET) = 1253.05 CHANNEL SLOPE = 0.0960  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.755

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	17.91	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =	0.60				
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =	1.000				
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =	4.27				
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =	3.50				
AVERAGE FLOW DEPTH(FEET) =	0.64				
TRAVEL TIME(MIN.) =	5.97				
Tc(MIN.) =	19.86				
SUBAREA AREA(ACRES) =	17.91				
SUBAREA RUNOFF(CFS) =	2.50				
EFFECTIVE AREA(ACRES) =	26.81				
AREA-AVERAGED Fm(INCH/HR) =	0.60				
AREA-AVERAGED Fp(INCH/HR) =	0.60				
AREA-AVERAGED Ap =	1.00				
TOTAL AREA(ACRES) =	26.8				
PEAK FLOW RATE(CFS) =	3.75				

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 3.39  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12213.00 = 1986.46 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12213.00 TO NODE 12214.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

=====

ELEVATION DATA: UPSTREAM(FEET) =	1416.02				
DOWNSTREAM(FEET) =	1234.66				
CHANNEL LENGTH THRU SUBAREA(FEET) =	1877.62				
CHANNEL SLOPE =	0.0966				
CHANNEL BASE(FEET) =	0.00				
"Z" FACTOR =	3.000				
MANNING'S FACTOR =	0.060				
MAXIMUM DEPTH(FEET) =	20.00				
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.602				
SUBAREA LOSS RATE DATA(AMC II):					
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	125.19	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =	0.60				
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =	1.000				
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =	5.26				
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =	3.67				
AVERAGE FLOW DEPTH(FEET) =	0.69				
TRAVEL TIME(MIN.) =	8.54				
Tc(MIN.) =	28.40				
SUBAREA AREA(ACRES) =	125.19				
SUBAREA RUNOFF(CFS) =	0.28				
EFFECTIVE AREA(ACRES) =	152.00				
AREA-AVERAGED Fm(INCH/HR) =	0.60				
AREA-AVERAGED Fp(INCH/HR) =	0.60				
AREA-AVERAGED Ap =	1.00				
TOTAL AREA(ACRES) =	152.0				
PEAK FLOW RATE(CFS) =	3.75				
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE					

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 3.39  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12214.00 = 3864.08 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
-----

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1234.66 DOWNSTREAM(FEET) = 1006.12
CHANNEL LENGTH THRU SUBAREA(FEET) = 2510.91 CHANNEL SLOPE = 0.0910
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.492

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 339.35 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.30

AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 12.68

Tc(MIN.) = 41.08

SUBAREA AREA(ACRES) = 339.35 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 491.35 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 491.4 PEAK FLOW RATE(CFS) = 3.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.62 FLOW VELOCITY(FEET/SEC.) = 3.30

LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12221.00 = 6374.99 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 41.08

RAINFALL INTENSITY(INCH/HR) = 0.49

AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 491.35

TOTAL STREAM AREA(ACRES) = 491.35

PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.75

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13.67 Tc(MIN.) = 52.56

EFFECTIVE AREA(ACRES) = 1067.70 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1067.7

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1006.12 DOWNSTREAM(FEET) = 897.69

CHANNEL LENGTH THRU SUBAREA(FEET) = 2362.84 CHANNEL SLOPE = 0.0459

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.388

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 127.60 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.51

AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 11.23

Tc(MIN.) = 63.79

SUBAREA AREA(ACRES) = 127.60 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 1195.30 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1195.3 PEAK FLOW RATE(CFS) = 13.67

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.14 FLOW VELOCITY(FEET/SEC.) = 3.51

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1 and 2.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 13.67 Tc(MIN.) = 63.79

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1195.30

\*\*\*\*\*

FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12231.00 TO NODE 12231.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 553.71
ELEVATION DATA: UPSTREAM(FEET) = 2687.04 DOWNSTREAM(FEET) = 2470.68

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.660
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.136
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" - 3.48 0.60 1.000 0 10.66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.68
TOTAL AREA(ACRES) = 3.48 PEAK FLOW RATE(CFS) = 1.68

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FLOW PROCESS FROM NODE 12231.50 TO NODE 12232.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2470.68 DOWNSTREAM(FEET) = 2375.54
CHANNEL LENGTH THRU SUBAREA(FEET) = 410.38 CHANNEL SLOPE = 0.2318
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.060
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 12.43 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.79
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 1.43
Tc(MIN.) = 12.09
SUBAREA AREA(ACRES) = 12.43 SUBAREA RUNOFF(CFS) = 5.15
EFFECTIVE AREA(ACRES) = 15.91 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 15.9 PEAK FLOW RATE(CFS) = 6.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 5.40
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12232.00 = 964.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12232.00 TO NODE 12233.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2375.54 DOWNSTREAM(FEET) = 2252.99
CHANNEL LENGTH THRU SUBAREA(FEET) = 939.16 CHANNEL SLOPE = 0.1305
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.892
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 17.65 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.93
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.67
AVERAGE FLOW DEPTH(FEET) = 0.80 TRAVEL TIME(MIN.) = 3.35
Tc(MIN.) = 15.44
SUBAREA AREA(ACRES) = 17.65 SUBAREA RUNOFF(CFS) = 4.63
EFFECTIVE AREA(ACRES) = 33.56 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 33.6 PEAK FLOW RATE(CFS) = 8.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 4.63
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12233.00 = 1903.25 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12233.00 TO NODE 12234.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2252.99 DOWNSTREAM(FEET) = 2163.07
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.53 CHANNEL SLOPE = 0.0921
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.775
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 19.54 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.36
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.29
AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 3.79
Tc(MIN.) = 19.23
SUBAREA AREA(ACRES) = 19.54 SUBAREA RUNOFF(CFS) = 3.07
EFFECTIVE AREA(ACRES) = 53.10 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 53.1 PEAK FLOW RATE(CFS) = 8.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.85 FLOW VELOCITY(FEET/SEC.) = 4.07

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12234.00 = 2879.78 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12234.00 TO NODE 12235.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2163.07 DOWNSTREAM(FEET) = 2018.08  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.65 CHANNEL SLOPE = 0.0759  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.617

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.14	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.40

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.89

AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 8.18

Tc(MIN.) = 27.41

SUBAREA AREA(ACRES) = 51.14 SUBAREA RUNOFF(CFS) = 0.78

EFFECTIVE AREA(ACRES) = 104.24 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 8.81

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 3.79

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12235.00 = 4789.43 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12235.00 TO NODE 12236.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2018.08 DOWNSTREAM(FEET) = 1607.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.94 CHANNEL SLOPE = 0.2162  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.555

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.44	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.63

AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 5.61

Tc(MIN.) = 33.02

SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 151.68 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 8.81

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.72 FLOW VELOCITY(FEET/SEC.) = 5.63

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12236.00 = 6686.37 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12236.00 TO NODE 12237.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1607.89 DOWNSTREAM(FEET) = 1326.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2213.20 CHANNEL SLOPE = 0.1273  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.492

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	87.00	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.63

AVERAGE FLOW DEPTH(FEET) = 0.80 TRAVEL TIME(MIN.) = 7.96

Tc(MIN.) = 40.98

SUBAREA AREA(ACRES) = 87.00 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 238.68 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 238.7 PEAK FLOW RATE(CFS) = 8.81

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 4.63

LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12237.00 = 8899.57 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1326.23 DOWNSTREAM(FEET) = 1122.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2236.51 CHANNEL SLOPE = 0.0912  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.440

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.44	0.60	1.000	-



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LAND USE      GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED  -      81.83    0.60      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.81
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 4.07
AVERAGE FLOW DEPTH( FEET) = 0.85 TRAVEL TIME(MIN.) = 9.16
Tc(MIN.) = 50.15
SUBAREA AREA(ACRES) = 81.83 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 320.51 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 320.5 PEAK FLOW RATE(CFS) = 8.81
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH( FEET) = 0.85 FLOW VELOCITY( FEET/SEC.) = 4.07
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

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FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 10

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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<

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*****
FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 3 <<<<

```

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PEAK FLOWRATE TABLE FILE NAME: S21.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	45.45	0.60( 0.60)	1.00	1486.0	12111.00
2	62.08	69.06	0.60( 0.60)	1.00	2314.7	12101.10
3	55.11	102.90	0.60( 0.60)	1.00	3541.4	12010.00
4	16.19	149.50	0.60( 0.60)	1.00	3687.2	12000.00
TOTAL AREA(ACRES) =						3687.2

```

*****
FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 14.0

```

```

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	45.45	0.60( 0.60)	1.00	1486.0	12111.00
2	62.08	69.06	0.60( 0.60)	1.00	2314.7	12101.10
3	55.11	102.90	0.60( 0.60)	1.00	3541.4	12010.00
4	16.19	149.50	0.60( 0.60)	1.00	3687.2	12000.00
TOTAL AREA(ACRES) =						3687.2

```

*****
FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 11

```

```

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

```

```

** MAIN STREAM CONFLUENCE DATA **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.37	45.45	0.467	0.60( 0.60)	1.00	1486.0	12111.00
2	62.08	69.06	0.376	0.60( 0.60)	1.00	2314.7	12101.10
3	55.11	102.90	0.311	0.60( 0.60)	1.00	3541.4	12010.00
4	16.19	149.50	0.261	0.60( 0.60)	1.00	3687.2	12000.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 =							31011.50 FEET.

```

** MEMORY BANK # 2 CONFLUENCE DATA **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.81	50.15	0.440	0.60( 0.60)	1.00	320.5	12231.00
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 =							11136.08 FEET.

```

** PEAK FLOW RATE TABLE **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	60.83	45.45	0.467	0.60( 0.60)	1.00	1776.5	12111.00
2	63.11	50.15	0.440	0.60( 0.60)	1.00	1971.5	12231.00
3	69.61	69.06	0.376	0.60( 0.60)	1.00	2635.2	12101.10
4	61.33	102.90	0.311	0.60( 0.60)	1.00	3861.9	12010.00
5	21.41	149.50	0.261	0.60( 0.60)	1.00	4007.7	12000.00
TOTAL AREA(ACRES) =						4007.7	

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```

```

PEAK FLOW RATE(CFS) = 69.61 Tc(MIN.) = 69.058
EFFECTIVE AREA(ACRES) = 2635.24 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4007.7
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

```

```

*****
FLOW PROCESS FROM NODE 12241.00 TO NODE 12242.00 IS CODE = 51

```

```

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

```

```

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

```

```

ELEVATION DATA: UPSTREAM( FEET) = 1122.29 DOWNSTREAM( FEET) = 1062.50
CHANNEL LENGTH THRU SUBAREA( FEET) = 2053.03 CHANNEL SLOPE = 0.0291
CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH( FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.359

```

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SUBAREA LOSS RATE DATA(AMC II):

```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	219.09	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;					
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.					
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =					69.60

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.45  
 AVERAGE FLOW DEPTH (FEET) = 2.28 TRAVEL TIME (MIN.) = 7.69  
 Tc (MIN.) = 76.75  
 SUBAREA AREA (ACRES) = 219.09 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 2854.33 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 4226.8 PEAK FLOW RATE (CFS) = 69.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.28 FLOW VELOCITY (FEET/SEC.) = 4.45  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12242.00 = 33064.53 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	60.83	53.39	0.426	0.60 (0.60)	1.00	1995.5	12111.00
2	63.11	58.02	0.405	0.60 (0.60)	1.00	2190.6	12231.00
3	69.61	76.75	0.359	0.60 (0.60)	1.00	2854.3	12101.10
4	61.33	110.84	0.299	0.60 (0.60)	1.00	4081.0	12010.00
5	21.41	159.82	0.252	0.60 (0.60)	1.00	4226.8	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 69.61 Tc (MIN.) = 76.75  
 AREA-AVERAGED Fm (INCH/HR) = 0.60 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 2854.33

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12242.00 TO NODE 12243.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM (FEET) = 1062.50 DOWNSTREAM (FEET) = 998.53  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1931.30 CHANNEL SLOPE = 0.0331  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.344  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	249.96	0.60	0.995	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.995  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 69.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.68  
 AVERAGE FLOW DEPTH (FEET) = 2.23 TRAVEL TIME (MIN.) = 6.88  
 Tc (MIN.) = 83.64  
 SUBAREA AREA (ACRES) = 249.96 SUBAREA RUNOFF (CFS) = 0.39  
 EFFECTIVE AREA (ACRES) = 3104.29 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 4476.8 PEAK FLOW RATE (CFS) = 69.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.22 FLOW VELOCITY (FEET/SEC.) = 4.69  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12243.00 = 34995.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	60.83	60.49	0.395	0.60 (0.60)	1.00	2245.5	12111.00
2	63.11	65.06	0.385	0.60 (0.60)	1.00	2440.5	12231.00
3	69.61	83.64	0.344	0.60 (0.60)	1.00	3104.3	12101.10
4	61.33	117.93	0.288	0.60 (0.60)	1.00	4330.9	12010.00
5	21.41	169.08	0.245	0.60 (0.60)	1.00	4476.8	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 69.61 Tc (MIN.) = 83.64  
 AREA-AVERAGED Fm (INCH/HR) = 0.60 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA (ACRES) = 3104.29

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12243.00 TO NODE 12244.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM (FEET) = 998.53 DOWNSTREAM (FEET) = 926.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1863.28 CHANNEL SLOPE = 0.0389  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.330  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	166.97	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 69.61  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.96  
 AVERAGE FLOW DEPTH (FEET) = 2.16 TRAVEL TIME (MIN.) = 6.26  
 Tc (MIN.) = 89.89  
 SUBAREA AREA (ACRES) = 166.97 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 3271.26 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 4643.8 PEAK FLOW RATE (CFS) = 69.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.16 FLOW VELOCITY (FEET/SEC.) = 4.96  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12244.00 = 36859.11 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	60.83	66.96	0.381	0.60 (0.60)	1.00	2412.5	12111.00
2	63.11	71.48	0.371	0.60 (0.60)	1.00	2607.5	12231.00

3 69.61 89.89 0.330 0.60( 0.60) 1.00 3271.3 12101.10  
4 61.33 124.40 0.281 0.60( 0.60) 1.00 4497.9 12010.00  
5 21.41 177.50 0.238 0.60( 0.60) 1.00 4643.8 12000.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 69.61 Tc(MIN.) = 89.89  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3271.26

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12244.00 TO NODE 12251.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 926.00 DOWNSTREAM(FEET) = 897.69  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1665.37 CHANNEL SLOPE = 0.0170  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.319

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 83.41 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.61  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.65  
AVERAGE FLOW DEPTH(FEET) = 2.52 TRAVEL TIME(MIN.) = 7.61  
Tc(MIN.) = 97.50

SUBAREA AREA(ACRES) = 83.41 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 3354.67 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 4727.2 PEAK FLOW RATE(CFS) = 69.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.52 FLOW VELOCITY(FEET/SEC.) = 3.65  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 60.83 74.84 0.363 0.60( 0.60) 1.00 2495.9 12111.00  
2 63.11 79.28 0.354 0.60( 0.60) 1.00 2690.9 12231.00  
3 69.61 97.50 0.319 0.60( 0.60) 1.00 3354.7 12101.10  
4 61.33 132.27 0.275 0.60( 0.60) 1.00 4581.3 12010.00  
5 21.41 187.73 0.233 0.60( 0.60) 1.00 4727.2 12000.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 69.61 Tc(MIN.) = 97.50  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 3354.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 11

-----  
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
-----

\*\* MAIN STREAM CONFLUENCE DATA \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 60.83 74.84 0.363 0.60( 0.60) 1.00 2495.9 12111.00  
2 63.11 79.28 0.354 0.60( 0.60) 1.00 2690.9 12231.00  
3 69.61 97.50 0.319 0.60( 0.60) 1.00 3354.7 12101.10  
4 61.33 132.27 0.275 0.60( 0.60) 1.00 4581.3 12010.00  
5 21.41 187.73 0.233 0.60( 0.60) 1.00 4727.2 12000.00  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 13.05 52.41 0.430 0.60( 0.60) 1.00 1069.4 12211.00  
2 13.67 63.79 0.388 0.60( 0.60) 1.00 1195.3 12201.00  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 63.48 52.41 0.430 0.60( 0.60) 1.00 2817.0 12211.00  
2 68.99 63.79 0.388 0.60( 0.60) 1.00 3322.5 12201.00  
3 73.64 74.84 0.363 0.60( 0.60) 1.00 3691.2 12111.00  
4 75.58 79.28 0.354 0.60( 0.60) 1.00 3886.2 12231.00  
5 80.84 97.50 0.319 0.60( 0.60) 1.00 4550.0 12101.10  
6 71.02 132.27 0.275 0.60( 0.60) 1.00 5776.6 12010.00  
7 29.63 187.73 0.233 0.60( 0.60) 1.00 5922.5 12000.00  
TOTAL AREA(ACRES) = 5922.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 80.84 Tc(MIN.) = 97.504  
EFFECTIVE AREA(ACRES) = 4549.97 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5922.5  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 897.69 DOWNSTREAM(FEET) = 846.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2133.08 CHANNEL SLOPE = 0.0238  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.306

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 85.79 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 80.84  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.29  
 AVERAGE FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 8.29  
 Tc(MIN.) = 105.80  
 SUBAREA AREA(ACRES) = 85.79 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 4635.76 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 6008.3 PEAK FLOW RATE(CFS) = 80.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.51 FLOW VELOCITY(FEET/SEC.) = 4.29  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.48	61.23	0.393	0.60( 0.60)	1.00	2902.8	12211.00
2	68.99	72.41	0.369	0.60( 0.60)	1.00	3408.3	12201.00
3	73.64	83.33	0.345	0.60( 0.60)	1.00	3777.0	12111.00
4	75.58	87.71	0.335	0.60( 0.60)	1.00	3972.0	12231.00
5	80.84	105.80	0.306	0.60( 0.60)	1.00	4635.8	12101.10
6	71.02	140.81	0.268	0.60( 0.60)	1.00	5862.4	12010.00
7	29.63	198.40	0.229	0.60( 0.60)	1.00	6008.3	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 80.84 Tc(MIN.) = 105.80  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 4635.76

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 105.80  
 RAINFALL INTENSITY(INCH/HR) = 0.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 4635.76  
 TOTAL STREAM AREA(ACRES) = 6008.26  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 80.84

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12261.00 TO NODE 12261.50 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 378.71  
 ELEVATION DATA: UPSTREAM(FEET) = 2264.27 DOWNSTREAM(FEET) = 2072.51

$Tc = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.694  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.324  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 2.96 0.60 1.000 0 8.69  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 1.93  
 TOTAL AREA(ACRES) = 2.96 PEAK FLOW RATE(CFS) = 1.93

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12261.50 TO NODE 12262.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 2072.51 DOWNSTREAM(FEET) = 1875.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 609.41 CHANNEL SLOPE = 0.3233  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.142

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 9.89 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.36  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.50  
 AVERAGE FLOW DEPTH(FEET) = 0.51 TRAVEL TIME(MIN.) = 1.85  
 Tc(MIN.) = 10.54  
 SUBAREA AREA(ACRES) = 9.89 SUBAREA RUNOFF(CFS) = 4.83  
 EFFECTIVE AREA(ACRES) = 12.85 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12.9 PEAK FLOW RATE(CFS) = 6.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 6.00  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12262.00 = 988.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12262.00 TO NODE 12263.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1875.51 DOWNSTREAM(FEET) = 1686.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 967.89 CHANNEL SLOPE = 0.1957  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.990

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 22.00 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.64  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 2.86  
 Tc(MIN.) = 13.40  
 SUBAREA AREA(ACRES) = 22.00 SUBAREA RUNOFF(CFS) = 7.73  
 EFFECTIVE AREA(ACRES) = 34.85 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 34.8 PEAK FLOW RATE(CFS) = 12.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.83 FLOW VELOCITY(FEET/SEC.) = 5.86  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12263.00 = 1956.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12263.00 TO NODE 12264.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1686.10 DOWNSTREAM(FEET) = 1572.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 944.28 CHANNEL SLOPE = 0.1198  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.863  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	35.72	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.50  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.29  
 AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 2.97  
 Tc(MIN.) = 16.37  
 SUBAREA AREA(ACRES) = 35.72 SUBAREA RUNOFF(CFS) = 8.45  
 EFFECTIVE AREA(ACRES) = 70.57 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 70.6 PEAK FLOW RATE(CFS) = 16.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 5.29  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12264.00 = 2900.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12264.00 TO NODE 12265.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1572.93 DOWNSTREAM(FEET) = 1506.41  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 569.03 CHANNEL SLOPE = 0.1169  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.811  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN

USER-DEFINED - 43.21 0.60 0.886 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.886  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.66  
 AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 1.68  
 Tc(MIN.) = 18.05  
 SUBAREA AREA(ACRES) = 43.21 SUBAREA RUNOFF(CFS) = 10.87  
 EFFECTIVE AREA(ACRES) = 113.78 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 113.8 PEAK FLOW RATE(CFS) = 24.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 5.76  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12265.00 = 3469.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12265.00 TO NODE 12266.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1506.41 DOWNSTREAM(FEET) = 1311.17  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2121.93 CHANNEL SLOPE = 0.0920  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.667  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	84.55	0.60	0.710	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.47  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.70  
 AVERAGE FLOW DEPTH(FEET) = 1.40 TRAVEL TIME(MIN.) = 6.20  
 Tc(MIN.) = 24.25  
 SUBAREA AREA(ACRES) = 84.55 SUBAREA RUNOFF(CFS) = 18.33  
 EFFECTIVE AREA(ACRES) = 198.33 AREA-AVERAGED Fm(INCH/HR) = 0.51  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 198.3 PEAK FLOW RATE(CFS) = 27.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.30 FLOW VELOCITY(FEET/SEC.) = 5.48  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12266.00 = 5591.25 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12266.00 TO NODE 12267.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1311.17 DOWNSTREAM(FEET) = 1232.47  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1555.18 CHANNEL SLOPE = 0.0506  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.585  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 160.37 0.60 0.633 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.87  
 AVERAGE FLOW DEPTH (FEET) = 1.72 TRAVEL TIME (MIN.) = 5.32  
 Tc (MIN.) = 29.58  
 SUBAREA AREA (ACRES) = 160.37 SUBAREA RUNOFF (CFS) = 31.00  
 EFFECTIVE AREA (ACRES) = 358.70 AREA-AVERAGED Fm (INCH/HR) = 0.45  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.75  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 358.7 PEAK FLOW RATE (CFS) = 46.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.77 FLOW VELOCITY (FEET/SEC.) = 4.96  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12267.00 = 7146.43 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12267.00 TO NODE 12268.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 1232.47 DOWNSTREAM (FEET) = 1141.79  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2111.19 CHANNEL SLOPE = 0.0430  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.522  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.65	0.60	0.970	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.970  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 47.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.68  
 AVERAGE FLOW DEPTH (FEET) = 1.83 TRAVEL TIME (MIN.) = 7.52  
 Tc (MIN.) = 37.10  
 SUBAREA AREA (ACRES) = 100.65 SUBAREA RUNOFF (CFS) = 1.42  
 EFFECTIVE AREA (ACRES) = 459.35 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 459.4 PEAK FLOW RATE (CFS) = 46.50

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.83 FLOW VELOCITY (FEET/SEC.) = 4.65  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12268.00 = 9257.62 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12268.00 TO NODE 12269.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 1141.79 DOWNSTREAM (FEET) = 1115.83  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1295.17 CHANNEL SLOPE = 0.0200  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.480  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	103.26	0.60	0.838	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 50.12  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.57  
 AVERAGE FLOW DEPTH (FEET) = 2.16 TRAVEL TIME (MIN.) = 6.05  
 Tc (MIN.) = 43.15  
 SUBAREA AREA (ACRES) = 103.26 SUBAREA RUNOFF (CFS) = 7.23  
 EFFECTIVE AREA (ACRES) = 562.61 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 562.6 PEAK FLOW RATE (CFS) = 46.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.11 FLOW VELOCITY (FEET/SEC.) = 3.50  
 LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.00 = 10552.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12269.00 TO NODE 12269.50 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 1115.83 DOWNSTREAM (FEET) = 1100.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1137.63 CHANNEL SLOPE = 0.0139  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.445  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.20	0.60	0.708	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 49.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.10  
 AVERAGE FLOW DEPTH (FEET) = 2.31 TRAVEL TIME (MIN.) = 6.11  
 Tc (MIN.) = 49.26  
 SUBAREA AREA (ACRES) = 50.20 SUBAREA RUNOFF (CFS) = 5.87  
 EFFECTIVE AREA (ACRES) = 612.81 AREA-AVERAGED Fm (INCH/HR) = 0.48

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 612.8 PEAK FLOW RATE(CFS) = 49.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.30 FLOW VELOCITY(FEET/SEC.) = 3.09  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.50 = 11690.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12269.50 TO NODE 12270.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1100.00 DOWNSTREAM(FEET) = 1091.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1219.38 CHANNEL SLOPE = 0.0073  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.408

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.30	0.60	0.583	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.52  
AVERAGE FLOW DEPTH(FEET) = 2.74 TRAVEL TIME(MIN.) = 8.05  
Tc(MIN.) = 57.31  
SUBAREA AREA(ACRES) = 98.30 SUBAREA RUNOFF(CFS) = 15.06  
EFFECTIVE AREA(ACRES) = 711.11 AREA-AVERAGED Fm(INCH/HR) = 0.46  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.77  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 711.1 PEAK FLOW RATE(CFS) = 60.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.80 FLOW VELOCITY(FEET/SEC.) = 2.56  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12270.00 = 12909.80 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12270.00 TO NODE 12271.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1091.06 DOWNSTREAM(FEET) = 962.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1995.19 CHANNEL SLOPE = 0.0646  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.390

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.93	0.60	0.746	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.746  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 68.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.98  
AVERAGE FLOW DEPTH(FEET) = 1.95 TRAVEL TIME(MIN.) = 5.56  
Tc(MIN.) = 62.87  
SUBAREA AREA(ACRES) = 181.93 SUBAREA RUNOFF(CFS) = 16.21  
EFFECTIVE AREA(ACRES) = 893.04 AREA-AVERAGED Fm(INCH/HR) = 0.46  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.76  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 893.0 PEAK FLOW RATE(CFS) = 73.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.01 FLOW VELOCITY(FEET/SEC.) = 6.08  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12271.00 = 14904.99 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12271.00 TO NODE 12272.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 962.23 DOWNSTREAM(FEET) = 917.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1613.85 CHANNEL SLOPE = 0.0278  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.376

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	181.79	0.60	0.910	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.48  
AVERAGE FLOW DEPTH(FEET) = 2.38 TRAVEL TIME(MIN.) = 6.00  
Tc(MIN.) = 68.87  
SUBAREA AREA(ACRES) = 181.79 SUBAREA RUNOFF(CFS) = 5.54  
EFFECTIVE AREA(ACRES) = 1074.83 AREA-AVERAGED Fm(INCH/HR) = 0.47  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.79  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1074.8 PEAK FLOW RATE(CFS) = 76.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.39 FLOW VELOCITY(FEET/SEC.) = 4.49  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12272.00 = 16518.84 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 917.38 DOWNSTREAM(FEET) = 846.91
CHANNEL LENGTH THRU SUBAREA(FEET) = 3182.34 CHANNEL SLOPE = 0.0221
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.348
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 79.99 0.60 0.948 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.948
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.32
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.13
AVERAGE FLOW DEPTH(FEET) = 2.50 TRAVEL TIME(MIN.) = 12.86
Tc(MIN.) = 81.73
SUBAREA AREA(ACRES) = 79.99 SUBAREA RUNOFF(CFS) = 1.30
EFFECTIVE AREA(ACRES) = 1154.82 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1154.8 PEAK FLOW RATE(CFS) = 76.67
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.49 FLOW VELOCITY(FEET/SEC.) = 4.12
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12281.00 = 19701.18 FEET.

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*****
FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

```

```

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 81.73
RAINFALL INTENSITY(INCH/HR) = 0.35
AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 76.67

```

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.48	61.23	0.393	0.60( 0.60)	1.00	2902.8	12211.00
1	68.99	72.41	0.369	0.60( 0.60)	1.00	3408.3	12201.00
1	73.64	83.33	0.345	0.60( 0.60)	1.00	3777.0	12111.00
1	75.58	87.71	0.335	0.60( 0.60)	1.00	3972.0	12231.00
1	80.84	105.80	0.306	0.60( 0.60)	1.00	4635.8	12101.10
1	71.02	140.81	0.268	0.60( 0.60)	1.00	5862.4	12010.00
1	29.63	198.40	0.229	0.60( 0.60)	1.00	6008.3	12000.00
2	76.67	81.73	0.348	0.60( 0.48)	0.80	1154.8	12261.00

```

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

```

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	61.23	0.393	0.60( 0.57)	0.95	3768.0	12211.00
2	140.91	72.41	0.369	0.60( 0.57)	0.95	4431.4	12201.00
3	149.63	81.73	0.348	0.60( 0.57)	0.95	4877.7	12261.00
4	149.53	83.33	0.345	0.60( 0.57)	0.95	4931.8	12111.00
5	149.35	87.71	0.335	0.60( 0.57)	0.95	5126.8	12231.00
6	148.29	105.80	0.306	0.60( 0.58)	0.96	5790.6	12101.10
7	130.03	140.81	0.268	0.60( 0.58)	0.97	7017.2	12010.00
8	80.11	198.40	0.229	0.60( 0.58)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```

PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 81.73
EFFECTIVE AREA(ACRES) = 4877.65 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 7163.1
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

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*****
FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 51

```

```

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

```

```

=====
ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.330
SUBAREA LOSS RATE DATA(AMC II):

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```

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 267.56 0.60 0.867 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.867
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 154.92
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.23
AVERAGE FLOW DEPTH(FEET) = 4.00 TRAVEL TIME(MIN.) = 8.06
Tc(MIN.) = 89.79
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 10.58
EFFECTIVE AREA(ACRES) = 5145.21 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 149.63
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.95 FLOW VELOCITY(FEET/SEC.) = 3.20
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.

```



\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.375	0.60 ( 0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.351	0.60 ( 0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.330	0.60 ( 0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.328	0.60 ( 0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.321	0.60 ( 0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.294	0.60 ( 0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.261	0.60 ( 0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.226	0.60 ( 0.58)	0.96	7430.6	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 89.79  
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 5145.21

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 89.79  
 EFFECTIVE AREA(ACRES) = 5145.21 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.948  
 PEAK FLOW RATE(CFS) = 149.63

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.375	0.60 ( 0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.351	0.60 ( 0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.330	0.60 ( 0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.328	0.60 ( 0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.321	0.60 ( 0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.294	0.60 ( 0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.261	0.60 ( 0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.226	0.60 ( 0.58)	0.96	7430.6	12000.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
 RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
 (c) Copyright 1983-2010 Advanced Engineering Software (aes)  
 Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
 FILE NAME: S23.DAT  
 TIME/DATE OF STUDY: 14:37 04/03/2013  
 =====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
 \*USER-DEFINED TABLED RAINFALL USED\*  
 NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	1.756
2)	10.00;	1.171
3)	15.00;	0.905
4)	20.00;	0.751
5)	25.00;	0.652
6)	30.00;	0.579
7)	40.00;	0.498
8)	50.00;	0.441
9)	60.00;	0.396
10)	90.00;	0.330
11)	120.00;	0.285
12)	180.00;	0.236
13)	360.00;	0.170
14)	1440.00;	0.074

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12300.00 TO NODE 12301.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 924.36  
 ELEVATION DATA: UPSTREAM(FEET) = 1712.53 DOWNSTREAM(FEET) = 1490.12

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.417  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"GRASS"	-	6.66	0.60	1.000	0	14.42

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 2.01  
 TOTAL AREA (ACRES) = 6.66 PEAK FLOW RATE (CFS) = 2.01

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12301.00 TO NODE 12302.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1490.12 DOWNSTREAM(FEET) = 1117.78  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1564.45 CHANNEL SLOPE = 0.2380  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.768  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.97	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.18  
 AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 5.03  
 Tc(MIN.) = 19.45  
 SUBAREA AREA(ACRES) = 39.97 SUBAREA RUNOFF(CFS) = 6.05  
 EFFECTIVE AREA(ACRES) = 46.63 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 46.6 PEAK FLOW RATE(CFS) = 7.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.65 FLOW VELOCITY(FEET/SEC.) = 5.54  
 LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12302.00 = 2488.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1117.78 DOWNSTREAM(FEET) = 780.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2216.41 CHANNEL SLOPE = 0.1520  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.620  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.51 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.75  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78  
 AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 7.73  
 Tc(MIN.) = 27.18  
 SUBAREA AREA(ACRES) = 51.51 SUBAREA RUNOFF(CFS) = 0.94  
 EFFECTIVE AREA(ACRES) = 98.14 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 98.1 PEAK FLOW RATE(CFS) = 7.05  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 4.71  
 LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S22.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	69.57	0.60 ( 0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.60 ( 0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.60 ( 0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.60 ( 0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.60 ( 0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.60 ( 0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.60 ( 0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.60 ( 0.58)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =						7430.6

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM	Q	Tc	Fp (Fm)	Ap	Ae	HEADWATER
--------	---	----	---------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(ACRES)	NODE	
1	128.36	69.57	0.60 ( 0.57)	0.95	4035.5	12211.00
2	140.91	80.59	0.60 ( 0.57)	0.95	4699.0	12201.00
3	149.63	89.79	0.60 ( 0.57)	0.95	5145.2	12261.00
4	149.53	91.38	0.60 ( 0.57)	0.95	5199.4	12111.00
5	149.35	95.77	0.60 ( 0.57)	0.95	5394.4	12231.00
6	148.29	113.88	0.60 ( 0.57)	0.96	6058.1	12101.10
7	130.03	149.16	0.60 ( 0.58)	0.96	7284.8	12010.00
8	80.11	207.80	0.60 ( 0.58)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =					7430.6	

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12320.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 835.60 DOWNSTREAM(FEET) = 780.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1568.10 CHANNEL SLOPE = 0.0349  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.324  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.15	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.77

AVERAGE FLOW DEPTH(FEET) = 2.94 TRAVEL TIME(MIN.) = 4.53

Tc(MIN.) = 94.32

SUBAREA AREA(ACRES) = 51.15 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 5196.36 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 7481.8 PEAK FLOW RATE(CFS) = 149.63

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.94 FLOW VELOCITY(FEET/SEC.) = 5.77

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	74.27	0.365	0.60 ( 0.57)	0.95	4086.7	12211.00
2	140.91	85.18	0.341	0.60 ( 0.57)	0.95	4750.2	12201.00
3	149.63	94.32	0.324	0.60 ( 0.57)	0.95	5196.4	12261.00
4	149.53	95.91	0.321	0.60 ( 0.57)	0.95	5250.5	12111.00
5	149.35	100.30	0.315	0.60 ( 0.57)	0.95	5445.5	12231.00
6	148.29	118.41	0.287	0.60 ( 0.57)	0.96	6109.3	12101.10
7	130.03	153.85	0.257	0.60 ( 0.58)	0.96	7335.9	12010.00
8	80.11	213.09	0.224	0.60 ( 0.58)	0.96	7481.8	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 94.32  
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 5196.36

\*\*\*\*\*

FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.36	74.27	0.365	0.60( 0.57)	0.95	4086.7	12211.00
2	140.91	85.18	0.341	0.60( 0.57)	0.95	4750.2	12201.00
3	149.63	94.32	0.324	0.60( 0.57)	0.95	5196.4	12261.00
4	149.53	95.91	0.321	0.60( 0.57)	0.95	5250.5	12111.00
5	149.35	100.30	0.315	0.60( 0.57)	0.95	5445.5	12231.00
6	148.29	118.41	0.287	0.60( 0.57)	0.96	6109.3	12101.10
7	130.03	153.85	0.257	0.60( 0.58)	0.96	7335.9	12010.00
8	80.11	213.09	0.224	0.60( 0.58)	0.96	7481.8	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.05	27.18	0.620	0.60( 0.60)	1.00	98.1	12300.00

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.36	27.18	0.620	0.60( 0.57)	0.95	1593.9	12300.00
2	128.36	74.27	0.365	0.60( 0.57)	0.95	4184.8	12211.00
3	140.91	85.18	0.341	0.60( 0.57)	0.95	4848.3	12201.00
4	149.63	94.32	0.324	0.60( 0.57)	0.95	5294.5	12261.00
5	149.53	95.91	0.321	0.60( 0.57)	0.95	5348.6	12111.00
6	149.35	100.30	0.315	0.60( 0.57)	0.95	5543.7	12231.00
7	148.29	118.41	0.287	0.60( 0.57)	0.96	6207.4	12101.10
8	130.03	153.85	0.257	0.60( 0.58)	0.96	7434.1	12010.00
9	80.11	213.09	0.224	0.60( 0.58)	0.96	7579.9	12000.00

TOTAL AREA(ACRES) = 7579.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 94.324  
 EFFECTIVE AREA(ACRES) = 5294.50 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 7579.9  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 780.80 DOWNSTREAM(FEET) = 761.66  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2102.41 CHANNEL SLOPE = 0.0091

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.308

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.82	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.49

AVERAGE FLOW DEPTH(FEET) = 3.78 TRAVEL TIME(MIN.) = 10.05

Tc(MIN.) = 104.37

SUBAREA AREA(ACRES) = 180.82 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 5475.32 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 7760.8 PEAK FLOW RATE(CFS) = 149.63

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.78 FLOW VELOCITY(FEET/SEC.) = 3.49

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12321.00 = 45889.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.36	37.49	0.518	0.60( 0.57)	0.96	1774.8	12300.00
2	128.36	84.69	0.342	0.60( 0.57)	0.95	4365.6	12211.00
3	140.91	95.38	0.322	0.60( 0.57)	0.95	5029.1	12201.00
4	149.63	104.37	0.308	0.60( 0.57)	0.95	5475.3	12261.00
5	149.53	105.96	0.306	0.60( 0.57)	0.95	5529.5	12111.00
6	149.35	110.35	0.299	0.60( 0.57)	0.95	5724.5	12231.00
7	148.29	128.46	0.278	0.60( 0.57)	0.96	6388.3	12101.10
8	130.03	164.26	0.249	0.60( 0.58)	0.96	7614.9	12010.00
9	80.11	224.85	0.220	0.60( 0.58)	0.97	7760.8	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 149.63 Tc(MIN.) = 104.37

AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 5475.32

\*\*\*\*\*

FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 761.66 DOWNSTREAM(FEET) = 710.30

CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.13 CHANNEL SLOPE = 0.0268

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.299

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED - 217.17 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 149.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.23  
 AVERAGE FLOW DEPTH (FEET) = 3.09 TRAVEL TIME (MIN.) = 6.10  
 Tc (MIN.) = 110.47  
 SUBAREA AREA (ACRES) = 217.17 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 5692.49 AREA-AVERAGED Fm (INCH/HR) = 0.57  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 7977.9 PEAK FLOW RATE (CFS) = 149.63  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.09 FLOW VELOCITY (FEET/SEC.) = 5.23  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12322.00 = 47805.20 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.36	43.74	0.477	0.60 (0.58)	0.96	1991.9	12300.00
2	128.36	91.05	0.328	0.60 (0.57)	0.95	4582.8	12211.00
3	140.91	101.57	0.313	0.60 (0.57)	0.95	5246.3	12201.00
4	149.63	110.47	0.299	0.60 (0.57)	0.95	5692.5	12261.00
5	149.53	112.06	0.297	0.60 (0.57)	0.95	5746.6	12111.00
6	149.35	116.46	0.290	0.60 (0.57)	0.96	5941.7	12231.00
7	148.29	134.58	0.273	0.60 (0.58)	0.96	6605.4	12101.10
8	130.03	170.59	0.244	0.60 (0.58)	0.97	7832.1	12010.00
9	80.11	231.99	0.217	0.60 (0.58)	0.97	7977.9	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 149.63 Tc (MIN.) = 110.47  
 AREA-AVERAGED Fm (INCH/HR) = 0.57 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 5692.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 710.30 DOWNSTREAM (FEET) = 678.19  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1977.07 CHANNEL SLOPE = 0.0162  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.288  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 194.67 0.60 0.999 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 149.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.34  
 AVERAGE FLOW DEPTH (FEET) = 3.39 TRAVEL TIME (MIN.) = 7.60  
 Tc (MIN.) = 118.07  
 SUBAREA AREA (ACRES) = 194.67 SUBAREA RUNOFF (CFS) = 0.05  
 EFFECTIVE AREA (ACRES) = 5887.16 AREA-AVERAGED Fm (INCH/HR) = 0.57  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 8172.6 PEAK FLOW RATE (CFS) = 149.63  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.39 FLOW VELOCITY (FEET/SEC.) = 4.33  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	135.36	51.54	0.434	0.60 (0.58)	0.96	2186.6	12300.00
2	128.36	98.94	0.317	0.60 (0.57)	0.96	4777.5	12211.00
3	140.91	109.28	0.301	0.60 (0.57)	0.96	5441.0	12201.00
4	149.63	118.07	0.288	0.60 (0.57)	0.95	5887.2	12261.00
5	149.53	119.67	0.285	0.60 (0.57)	0.95	5941.3	12111.00
6	149.35	124.06	0.282	0.60 (0.57)	0.96	6136.3	12231.00
7	148.29	142.21	0.267	0.60 (0.58)	0.96	6800.1	12101.10
8	130.03	178.46	0.237	0.60 (0.58)	0.97	8026.7	12010.00
9	80.11	240.87	0.214	0.60 (0.58)	0.97	8172.6	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 149.63 Tc (MIN.) = 118.07  
 AREA-AVERAGED Fm (INCH/HR) = 0.57 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 5887.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 1  
 -----

>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 118.07  
 RAINFALL INTENSITY (INCH/HR) = 0.29  
 AREA-AVERAGED Fm (INCH/HR) = 0.57  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95  
 EFFECTIVE STREAM AREA (ACRES) = 5887.16  
 TOTAL STREAM AREA (ACRES) = 8172.59  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 149.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12330.00 TO NODE 12331.00 IS CODE = 21  
 -----

>>>> RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >> USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 994.42  
 ELEVATION DATA: UPSTREAM (FEET) = 1754.00 DOWNSTREAM (FEET) = 1530.30

$Tc = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.046  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.904  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "GRASS" - 3.33 0.60 1.000 0 15.05  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 0.91  
 TOTAL AREA(ACRES) = 3.33 PEAK FLOW RATE(CFS) = 0.91

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12331.00 TO NODE 12332.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1530.30 DOWNSTREAM(FEET) = 1412.81  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 946.66 CHANNEL SLOPE = 0.1241  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.767  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 28.08 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.18  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.55  
 AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 4.45  
 Tc(MIN.) = 19.49  
 SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 4.21  
 EFFECTIVE AREA(ACRES) = 31.41 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 31.4 PEAK FLOW RATE(CFS) = 4.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 3.88  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12332.00 = 1941.08 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12332.00 TO NODE 12333.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1412.81 DOWNSTREAM(FEET) = 1235.19  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.37 CHANNEL SLOPE = 0.0907  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.598  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 44.96 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.55  
 AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 9.19  
 Tc(MIN.) = 28.68  
 SUBAREA AREA(ACRES) = 44.96 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 76.37 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 76.4 PEAK FLOW RATE(CFS) = 4.71  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 3.46  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12333.00 = 3900.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12333.00 TO NODE 12334.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1235.19 DOWNSTREAM(FEET) = 1013.96  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1921.81 CHANNEL SLOPE = 0.1151  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.521  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 30.50 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.71  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.79  
 AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 8.45  
 Tc(MIN.) = 37.13  
 SUBAREA AREA(ACRES) = 30.50 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 106.87 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 106.9 PEAK FLOW RATE(CFS) = 4.71  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 3.79  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12334.00 = 5822.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12334.00 TO NODE 12335.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1013.96 DOWNSTREAM(FEET) = 809.84
CHANNEL LENGTH THRU SUBAREA(FEET) = 2029.80 CHANNEL SLOPE = 0.1006
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.461
SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Row 1: USER-DEFINED, -, 145.82, 0.60, 1.000, -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.62
AVERAGE FLOW DEPTH(FEET) = 0.66 TRAVEL TIME(MIN.) = 9.35
Tc(MIN.) = 46.48

SUBAREA AREA(ACRES) = 145.82 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 4.71
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 3.62
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12335.00 = 7852.06 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 809.84 DOWNSTREAM(FEET) = 678.19
CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.44 CHANNEL SLOPE = 0.0691
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.411
SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Row 1: USER-DEFINED, -, 50.71, 0.60, 1.000, -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.71
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.15
AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 10.09
Tc(MIN.) = 56.57

SUBAREA AREA(ACRES) = 50.71 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 303.40 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 303.4 PEAK FLOW RATE(CFS) = 4.71
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 3.15
LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12340.00 = 9757.50 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 56.57
RAINFALL INTENSITY(INCH/HR) = 0.41
AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 303.40
TOTAL STREAM AREA(ACRES) = 303.40
PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.71

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 16 rows of data for 2 streams.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 10 rows of data for 10 stream segments.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 152.92 Tc(MIN.) = 118.07

EFFECTIVE AREA(ACRES) = 6190.56 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 8476.0  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12340.00 TO NODE 12341.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 678.19 DOWNSTREAM(FEET) = 630.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2827.23 CHANNEL SLOPE = 0.0170  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.278

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 317.33 0.60 0.999 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 152.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.43  
 AVERAGE FLOW DEPTH(FEET) = 3.39 TRAVEL TIME(MIN.) = 10.63  
 Tc(MIN.) = 128.71

SUBAREA AREA(ACRES) = 317.33 SUBAREA RUNOFF(CFS) = 0.08  
 EFFECTIVE AREA(ACRES) = 6507.89 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 8793.3 PEAK FLOW RATE(CFS) = 152.92  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.39 FLOW VELOCITY(FEET/SEC.) = 4.43  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12341.00 = 52609.50 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	62.43	0.391	0.60( 0.58)	0.97	2780.3	12300.00
2	139.33	67.46	0.380	0.60( 0.58)	0.97	3082.6	12330.00
3	131.98	109.96	0.300	0.60( 0.58)	0.96	5398.2	12211.00
4	144.36	120.09	0.285	0.60( 0.58)	0.96	6061.7	12201.00
5	152.92	128.71	0.278	0.60( 0.58)	0.96	6507.9	12261.00
6	152.80	130.31	0.277	0.60( 0.58)	0.96	6562.0	12111.00
7	152.57	134.71	0.273	0.60( 0.58)	0.96	6757.1	12231.00
8	151.34	152.86	0.258	0.60( 0.58)	0.96	7420.8	12101.10
9	132.75	189.48	0.233	0.60( 0.58)	0.97	8647.5	12010.00
10	82.56	253.26	0.209	0.60( 0.58)	0.97	8793.3	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 152.92 Tc(MIN.) = 128.71  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 6507.89

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12341.00 TO NODE 12342.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 630.21 DOWNSTREAM(FEET) = 601.66  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2006.47 CHANNEL SLOPE = 0.0142  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.271

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 124.13 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 152.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.15  
 AVERAGE FLOW DEPTH(FEET) = 3.51 TRAVEL TIME(MIN.) = 8.07  
 Tc(MIN.) = 136.77

SUBAREA AREA(ACRES) = 124.13 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 6632.02 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 8917.5 PEAK FLOW RATE(CFS) = 152.92  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.51 FLOW VELOCITY(FEET/SEC.) = 4.15  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12342.00 = 54615.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	70.67	0.373	0.60( 0.58)	0.97	2904.4	12300.00
2	139.33	75.71	0.361	0.60( 0.58)	0.97	3206.7	12330.00
3	131.98	118.32	0.288	0.60( 0.58)	0.96	5522.3	12211.00
4	144.36	128.26	0.278	0.60( 0.58)	0.96	6185.8	12201.00
5	152.92	136.77	0.271	0.60( 0.58)	0.96	6632.0	12261.00
6	152.80	138.37	0.270	0.60( 0.58)	0.96	6686.2	12111.00
7	152.57	142.79	0.266	0.60( 0.58)	0.96	6881.2	12231.00
8	151.34	160.94	0.252	0.60( 0.58)	0.96	7545.0	12101.10
9	132.75	197.82	0.229	0.60( 0.58)	0.97	8771.6	12010.00
10	82.56	262.66	0.206	0.60( 0.58)	0.97	8917.5	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 152.92 Tc(MIN.) = 136.77  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 6632.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<



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=====
ELEVATION DATA: UPSTREAM(FEET) = 601.66 DOWNSTREAM(FEET) = 572.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.49 CHANNEL SLOPE = 0.0156
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.265
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 96.92 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 152.92
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.29
AVERAGE FLOW DEPTH(FEET) = 3.45 TRAVEL TIME(MIN.) = 7.32
Tc(MIN.) = 144.09
SUBAREA AREA(ACRES) = 96.92 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 6728.94 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 9014.4 PEAK FLOW RATE(CFS) = 152.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.45 FLOW VELOCITY(FEET/SEC.) = 4.29
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

```

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	78.15	0.356	0.60 ( 0.58)	0.97	3001.4	12300.00
2	139.33	83.20	0.345	0.60 ( 0.58)	0.97	3303.6	12330.00
3	131.98	125.91	0.280	0.60 ( 0.58)	0.96	5619.2	12211.00
4	144.36	135.70	0.272	0.60 ( 0.58)	0.96	6282.7	12201.00
5	152.92	144.09	0.265	0.60 ( 0.58)	0.96	6728.9	12261.00
6	152.80	145.70	0.264	0.60 ( 0.58)	0.96	6783.1	12111.00
7	152.57	150.11	0.260	0.60 ( 0.58)	0.96	6978.1	12231.00
8	151.34	168.29	0.246	0.60 ( 0.58)	0.96	7641.9	12101.10
9	132.75	205.40	0.227	0.60 ( 0.58)	0.97	8868.5	12010.00
10	82.56	271.21	0.203	0.60 ( 0.58)	0.97	9014.4	12000.00

NEW PEAK FLOW DATA ARE:

```

PEAK FLOW RATE(CFS) = 152.92 Tc(MIN.) = 144.09
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 6728.94

```

END OF STUDY SUMMARY:

```

TOTAL AREA(ACRES) = 9014.4 TC(MIN.) = 144.09
EFFECTIVE AREA(ACRES) = 6728.94 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.960
PEAK FLOW RATE(CFS) = 152.92

```

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	78.15	0.356	0.60 ( 0.58)	0.97	3001.4	12300.00

2	139.33	83.20	0.345	0.60 ( 0.58)	0.97	3303.6	12330.00
3	131.98	125.91	0.280	0.60 ( 0.58)	0.96	5619.2	12211.00
4	144.36	135.70	0.272	0.60 ( 0.58)	0.96	6282.7	12201.00
5	152.92	144.09	0.265	0.60 ( 0.58)	0.96	6728.9	12261.00
6	152.80	145.70	0.264	0.60 ( 0.58)	0.96	6783.1	12111.00
7	152.57	150.11	0.260	0.60 ( 0.58)	0.96	6978.1	12231.00
8	151.34	168.29	0.246	0.60 ( 0.58)	0.96	7641.9	12101.10
9	132.75	205.40	0.227	0.60 ( 0.58)	0.97	8868.5	12010.00
10	82.56	271.21	0.203	0.60 ( 0.58)	0.97	9014.4	12000.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S24.DAT  
TIME/DATE OF STUDY: 14:37 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.756
- 2) 10.00; 1.171
- 3) 15.00; 0.905
- 4) 20.00; 0.751
- 5) 25.00; 0.652
- 6) 30.00; 0.579
- 7) 40.00; 0.498
- 8) 50.00; 0.441
- 9) 60.00; 0.396
- 10) 90.00; 0.330
- 11) 120.00; 0.285
- 12) 180.00; 0.236
- 13) 360.00; 0.170
- 14) 1440.00; 0.074

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12400.00 TO NODE 12401.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 981.52  
ELEVATION DATA: UPSTREAM(FEET) = 2579.17 DOWNSTREAM(FEET) = 2249.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.811  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.968  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	8.82	0.60	1.000	0	13.81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.92  
TOTAL AREA(ACRES) = 8.82 PEAK FLOW RATE(CFS) = 2.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12401.00 TO NODE 12402.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2249.14 DOWNSTREAM(FEET) = 2103.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 975.11 CHANNEL SLOPE = 0.1490  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.838  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.29	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.82  
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 3.37  
Tc(MIN.) = 17.19  
SUBAREA AREA(ACRES) = 46.29 SUBAREA RUNOFF(CFS) = 9.91  
EFFECTIVE AREA(ACRES) = 55.11 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 55.1 PEAK FLOW RATE(CFS) = 11.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 5.26  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12402.00 = 1956.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12402.00 TO NODE 12403.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2103.89 DOWNSTREAM(FEET) = 1771.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.50 CHANNEL SLOPE = 0.1768  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.702

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 54.97 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.90  
AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 5.31  
Tc(MIN.) = 22.50  
SUBAREA AREA(ACRES) = 54.97 SUBAREA RUNOFF(CFS) = 5.03  
EFFECTIVE AREA(ACRES) = 110.08 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 11.80  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.84 FLOW VELOCITY(FEET/SEC.) = 5.62  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12403.00 = 3837.13 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12403.00 TO NODE 12404.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1771.34 DOWNSTREAM(FEET) = 1462.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2888.53 CHANNEL SLOPE = 0.1070  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.556

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 123.02 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.66  
AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 10.33  
Tc(MIN.) = 32.82  
SUBAREA AREA(ACRES) = 123.02 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 233.10 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 233.1 PEAK FLOW RATE(CFS) = 11.80  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.92 FLOW VELOCITY(FEET/SEC.) = 4.66

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12404.00 = 6725.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12404.00 TO NODE 12405.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1462.30 DOWNSTREAM(FEET) = 1308.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.25 CHANNEL SLOPE = 0.0800  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.495

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 241.71 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.16  
AVERAGE FLOW DEPTH(FEET) = 0.97 TRAVEL TIME(MIN.) = 7.71  
Tc(MIN.) = 40.53  
SUBAREA AREA(ACRES) = 241.71 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 474.81 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 474.8 PEAK FLOW RATE(CFS) = 11.80  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 4.16  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12405.00 = 8650.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12405.00 TO NODE 12406.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1308.28 DOWNSTREAM(FEET) = 1154.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1923.41 CHANNEL SLOPE = 0.0802  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.451

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 238.96 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.16

AVERAGE FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 7.70  
 Tc (MIN.) = 48.23  
 SUBAREA AREA (ACRES) = 238.96 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 713.77 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 713.8 PEAK FLOW RATE (CFS) = 11.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.97 FLOW VELOCITY (FEET/SEC.) = 4.16  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12406.00 = 10574.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1154.02 DOWNSTREAM (FEET) = 1073.11  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1607.69 CHANNEL SLOPE = 0.0503  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.415

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.02	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 11.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.52  
 AVERAGE FLOW DEPTH (FEET) = 1.06 TRAVEL TIME (MIN.) = 7.62  
 Tc (MIN.) = 55.85  
 SUBAREA AREA (ACRES) = 58.02 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 771.79 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 771.8 PEAK FLOW RATE (CFS) = 11.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.06 FLOW VELOCITY (FEET/SEC.) = 3.52  
 LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 1

>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 55.85  
 RAINFALL INTENSITY (INCH/HR) = 0.41

AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 771.79  
 TOTAL STREAM AREA (ACRES) = 771.79  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 11.80

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12410.00 TO NODE 12411.00 IS CODE = 21

>>>> RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >> USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

\*\*\*\*\*  
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 966.15  
 ELEVATION DATA: UPSTREAM (FEET) = 2215.42 DOWNSTREAM (FEET) = 1909.05

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 13.886  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.964  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	8.99	0.60	1.000	0	13.89

 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF (CFS) = 2.95  
 TOTAL AREA (ACRES) = 8.99 PEAK FLOW RATE (CFS) = 2.95

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12411.00 TO NODE 12412.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1909.05 DOWNSTREAM (FEET) = 1794.38  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 943.59 CHANNEL SLOPE = 0.1215  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.816

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.56	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.93  
 AVERAGE FLOW DEPTH (FEET) = 0.64 TRAVEL TIME (MIN.) = 4.00  
 Tc (MIN.) = 17.89  
 SUBAREA AREA (ACRES) = 18.56 SUBAREA RUNOFF (CFS) = 3.61  
 EFFECTIVE AREA (ACRES) = 27.55 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 27.5 PEAK FLOW RATE (CFS) = 5.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.67 FLOW VELOCITY (FEET/SEC.) = 4.02  
 LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12412.00 = 1909.74 FEET.

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*****
FLOW PROCESS FROM NODE 12412.00 TO NODE 12413.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1794.38 DOWNSTREAM(FEET) = 1649.76
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.82 CHANNEL SLOPE = 0.1560
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.726
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 16.09 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.29
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.59
AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 3.37
Tc(MIN.) = 21.26
SUBAREA AREA(ACRES) = 16.09 SUBAREA RUNOFF(CFS) = 1.83
EFFECTIVE AREA(ACRES) = 43.64 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 43.6 PEAK FLOW RATE(CFS) = 5.36
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 4.42
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12413.00 = 2836.56 FEET.

*****
FLOW PROCESS FROM NODE 12413.00 TO NODE 12414.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1649.76 DOWNSTREAM(FEET) = 1365.78
CHANNEL LENGTH THRU SUBAREA(FEET) = 1906.16 CHANNEL SLOPE = 0.1490
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.601
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 75.14 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.86
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.40
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 7.22
Tc(MIN.) = 28.48
SUBAREA AREA(ACRES) = 75.14 SUBAREA RUNOFF(CFS) = 0.09
EFFECTIVE AREA(ACRES) = 118.78 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 118.8 PEAK FLOW RATE(CFS) = 5.36
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 4.31
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12414.00 = 4742.72 FEET.

*****
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1365.78 DOWNSTREAM(FEET) = 1073.11
CHANNEL LENGTH THRU SUBAREA(FEET) = 3038.90 CHANNEL SLOPE = 0.0963
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.485
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 151.43 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.36
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.68
AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 13.78
Tc(MIN.) = 42.26
SUBAREA AREA(ACRES) = 151.43 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 270.21 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 270.2 PEAK FLOW RATE(CFS) = 5.36
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.70 FLOW VELOCITY(FEET/SEC.) = 3.68
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12420.00 = 7781.62 FEET.

*****
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 42.26
RAINFALL INTENSITY(INCH/HR) = 0.49
AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 270.21
TOTAL STREAM AREA(ACRES) = 270.21
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.36

** CONFLUENCE DATA **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11.80	55.85	0.415	0.60 ( 0.60)	1.00	771.8	12400.00
2	5.36	42.26	0.485	0.60 ( 0.60)	1.00	270.2	12410.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	42.26	0.485	0.60 ( 0.60)	1.00	854.1	12410.00
2	16.38	55.85	0.415	0.60 ( 0.60)	1.00	1042.0	12400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 55.85  
EFFECTIVE AREA(ACRES) = 1042.00 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1042.0  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12420.00 TO NODE 12421.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1073.11 DOWNSTREAM(FEET) = 1005.32  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2235.12 CHANNEL SLOPE = 0.0303  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.379  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 218.57 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.15  
AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 11.84  
Tc(MIN.) = 67.69

SUBAREA AREA(ACRES) = 218.57 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1260.57 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1260.6 PEAK FLOW RATE(CFS) = 16.38  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 3.15  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12421.00 = 14417.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	15.80	54.21	0.422	0.60 ( 0.60)	1.00	1072.7 12410.00
2	16.38	67.69	0.379	0.60 ( 0.60)	1.00	1260.6 12400.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 67.69  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1260.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12421.00 TO NODE 12422.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1005.32 DOWNSTREAM(FEET) = 879.13  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.31 CHANNEL SLOPE = 0.0451  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.351  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 241.55 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.65  
AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 12.80  
Tc(MIN.) = 80.49

SUBAREA AREA(ACRES) = 241.55 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1502.12 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1502.1 PEAK FLOW RATE(CFS) = 16.38  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 3.65  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12422.00 = 17217.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	67.14	0.380	0.60 ( 0.60)	1.00	1314.2	12410.00
2	16.38	80.49	0.351	0.60 ( 0.60)	1.00	1502.1	12400.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 80.49  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1502.12

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12422.00 TO NODE 12423.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 879.13 DOWNSTREAM(FEET) = 815.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.90 CHANNEL SLOPE = 0.0333
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.330
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 151.63 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.26
AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 9.81
Tc(MIN.) = 90.30
SUBAREA AREA(ACRES) = 151.63 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1653.75 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1653.8 PEAK FLOW RATE(CFS) = 16.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.29 FLOW VELOCITY(FEET/SEC.) = 3.26
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12423.00 = 19136.34 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 15.80 77.04 0.359 0.60( 0.60) 1.00 1465.9 12410.00
2 16.38 90.30 0.330 0.60( 0.60) 1.00 1653.8 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 90.30
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1653.75

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FLOW PROCESS FROM NODE 12423.00 TO NODE 12424.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 815.17 DOWNSTREAM(FEET) = 696.54
CHANNEL LENGTH THRU SUBAREA(FEET) = 2870.82 CHANNEL SLOPE = 0.0413
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.309
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 122.40 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

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* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.55
AVERAGE FLOW DEPTH(FEET) = 1.24 TRAVEL TIME(MIN.) = 13.49
Tc(MIN.) = 103.79
SUBAREA AREA(ACRES) = 122.40 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1776.15 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1776.2 PEAK FLOW RATE(CFS) = 16.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.24 FLOW VELOCITY(FEET/SEC.) = 3.55
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12424.00 = 22007.16 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 15.80 90.69 0.329 0.60( 0.60) 1.00 1588.3 12410.00
2 16.38 103.79 0.309 0.60( 0.60) 1.00 1776.2 12400.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 103.79
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1776.15

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FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 696.54 DOWNSTREAM(FEET) = 572.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 3680.45 CHANNEL SLOPE = 0.0338
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.283
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 96.54 0.60 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.27
AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 18.76
Tc(MIN.) = 122.56
SUBAREA AREA(ACRES) = 96.54 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 1872.69 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 1872.7 PEAK FLOW RATE(CFS) = 16.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.29 FLOW VELOCITY(FEET/SEC.) = 3.27

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	109.51	0.301	0.60( 0.60)	1.00	1684.8	12410.00
2	16.38	122.56	0.283	0.60( 0.60)	1.00	1872.7	12400.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 16.38 Tc(MIN.) = 122.56

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1872.69

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 122.56

EFFECTIVE AREA(ACRES) = 1872.69 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 16.38

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	109.51	0.301	0.60( 0.60)	1.00	1684.8	12410.00
2	16.38	122.56	0.283	0.60( 0.60)	1.00	1872.7	12400.00

=====  
END OF RATIONAL METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S25.DAT  
TIME/DATE OF STUDY: 14:37 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.882
- 2) 10.00; 1.255
- 3) 15.00; 0.954
- 4) 20.00; 0.779
- 5) 25.00; 0.670
- 6) 30.00; 0.594
- 7) 40.00; 0.512
- 8) 50.00; 0.455
- 9) 60.00; 0.415
- 10) 90.00; 0.352
- 11) 120.00; 0.308
- 12) 180.00; 0.259
- 13) 360.00; 0.192
- 14) 1440.00; 0.085

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12500.00 TO NODE 12501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 927.04  
ELEVATION DATA: UPSTREAM(FEET) = 1638.22 DOWNSTREAM(FEET) = 1356.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.770  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.028  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	8.89	0.60	1.000	0	13.77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.43  
TOTAL AREA(ACRES) = 8.89 PEAK FLOW RATE(CFS) = 3.43

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12501.00 TO NODE 12502.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1356.00 DOWNSTREAM(FEET) = 1203.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1004.73 CHANNEL SLOPE = 0.1519  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.870  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	24.30	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.59  
AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 3.65  
Tc(MIN.) = 17.42  
SUBAREA AREA(ACRES) = 24.30 SUBAREA RUNOFF(CFS) = 5.90  
EFFECTIVE AREA(ACRES) = 33.19 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.2 PEAK FLOW RATE(CFS) = 8.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 4.84  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12502.00 = 1931.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12502.00 TO NODE 12503.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1203.37 DOWNSTREAM(FEET) = 987.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.62 CHANNEL SLOPE = 0.1147  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.694

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.42 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.85  
AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 6.48  
Tc(MIN.) = 23.90  
SUBAREA AREA(ACRES) = 90.42 SUBAREA RUNOFF(CFS) = 7.70  
EFFECTIVE AREA(ACRES) = 123.61 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 123.6 PEAK FLOW RATE(CFS) = 10.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 4.67  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12503.00 = 3816.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12503.00 TO NODE 12504.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 987.23 DOWNSTREAM(FEET) = 870.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1478.57 CHANNEL SLOPE = 0.0792  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.594

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 84.07 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.04  
AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 6.11  
Tc(MIN.) = 30.00  
SUBAREA AREA(ACRES) = 84.07 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 207.68 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 207.7 PEAK FLOW RATE(CFS) = 10.52  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.93 FLOW VELOCITY(FEET/SEC.) = 4.02  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12504.00 = 5294.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12504.00 TO NODE 12505.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 870.07 DOWNSTREAM(FEET) = 729.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1915.52 CHANNEL SLOPE = 0.0736  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.528

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 79.84 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.94  
AVERAGE FLOW DEPTH(FEET) = 0.94 TRAVEL TIME(MIN.) = 8.10  
Tc(MIN.) = 38.10  
SUBAREA AREA(ACRES) = 79.84 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 287.52 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 287.5 PEAK FLOW RATE(CFS) = 10.52  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.94 FLOW VELOCITY(FEET/SEC.) = 3.94  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12505.00 = 7210.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 729.02 DOWNSTREAM(FEET) = 549.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2961.35 CHANNEL SLOPE = 0.0605  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.449

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 78.77 0.60 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.66  
AVERAGE FLOW DEPTH(FEET) = 0.98 TRAVEL TIME(MIN.) = 13.50

Tc(MIN.) = 51.60  
 SUBAREA AREA(ACRES) = 78.77 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 366.29 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 366.3 PEAK FLOW RATE(CFS) = 10.52  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.98 FLOW VELOCITY(FEET/SEC.) = 3.66  
 LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S23.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	78.15	0.60( 0.58)	0.97	3001.4	12300.00
2	139.33	83.20	0.60( 0.58)	0.97	3303.6	12330.00
3	131.98	125.91	0.60( 0.58)	0.96	5619.2	12211.00
4	144.36	135.70	0.60( 0.58)	0.96	6282.7	12201.00
5	152.92	144.09	0.60( 0.58)	0.96	6728.9	12261.00
6	152.80	145.70	0.60( 0.58)	0.96	6783.1	12111.00
7	152.57	150.11	0.60( 0.58)	0.96	6978.1	12231.00
8	151.34	168.29	0.60( 0.58)	0.96	7641.9	12101.10
9	132.75	205.40	0.60( 0.58)	0.97	8868.5	12010.00
10	82.56	271.21	0.60( 0.58)	0.97	9014.4	12000.00

TOTAL AREA(ACRES) = 9014.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S24.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	109.51	0.60( 0.60)	1.00	1684.8	12410.00
2	16.38	122.56	0.60( 0.60)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	109.51	0.60( 0.60)	1.00	1684.8	12410.00
2	16.38	122.56	0.60( 0.60)	1.00	1872.7	12400.00

TOTAL AREA(ACRES) = 1872.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.80	109.51	0.324	0.60( 0.60)	1.00	1684.8	12410.00
2	16.38	122.56	0.306	0.60( 0.60)	1.00	1872.7	12400.00

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.89	78.15	0.377	0.60( 0.58)	0.97	3001.4	12300.00
2	139.33	83.20	0.367	0.60( 0.58)	0.97	3303.6	12330.00
3	131.98	125.91	0.304	0.60( 0.58)	0.96	5619.2	12211.00
4	144.36	135.70	0.295	0.60( 0.58)	0.96	6282.7	12201.00
5	152.92	144.09	0.289	0.60( 0.58)	0.96	6728.9	12261.00
6	152.80	145.70	0.287	0.60( 0.58)	0.96	6783.1	12111.00
7	152.57	150.11	0.284	0.60( 0.58)	0.96	6978.1	12231.00
8	151.34	168.29	0.268	0.60( 0.58)	0.96	7641.9	12101.10
9	132.75	205.40	0.249	0.60( 0.58)	0.97	8868.5	12010.00
10	82.56	271.21	0.225	0.60( 0.58)	0.97	9014.4	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	153.03	78.15	0.377	0.60( 0.59)	0.98	4203.7	12300.00
2	152.93	83.20	0.367	0.60( 0.59)	0.98	4583.7	12330.00
3	150.61	109.51	0.324	0.60( 0.59)	0.98	6414.7	12410.00
4	148.94	122.56	0.306	0.60( 0.58)	0.97	7309.9	12400.00
5	148.21	125.91	0.304	0.60( 0.58)	0.97	7491.9	12211.00
6	160.16	135.70	0.295	0.60( 0.58)	0.97	8155.4	12201.00
7	168.35	144.09	0.289	0.60( 0.58)	0.97	8601.6	12261.00
8	168.16	145.70	0.287	0.60( 0.58)	0.97	8655.8	12111.00
9	167.73	150.11	0.284	0.60( 0.58)	0.97	8850.8	12231.00
10	165.70	168.29	0.268	0.60( 0.58)	0.97	9514.6	12101.10
11	146.08	205.40	0.249	0.60( 0.58)	0.98	10741.2	12010.00
12	94.58	271.21	0.225	0.60( 0.59)	0.98	10887.1	12000.00

TOTAL AREA(ACRES) = 10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 168.35 Tc(MIN.) = 144.089  
 EFFECTIVE AREA(ACRES) = 8601.63 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 10887.1

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 572.29 DOWNSTREAM(FEET) = 549.92

CHANNEL LENGTH THRU SUBAREA(FEET) = 1724.25 CHANNEL SLOPE = 0.0130

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.283

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 117.96 0.60 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 168.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.10

AVERAGE FLOW DEPTH(FEET) = 3.70 TRAVEL TIME(MIN.) = 7.00

Tc(MIN.) = 151.09

SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 8719.59 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 168.35

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.70 FLOW VELOCITY(FEET/SEC.) = 4.10

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	153.03	85.32	0.362	0.60( 0.59)	0.98	4321.6	12300.00
2	152.93	90.38	0.352	0.60( 0.59)	0.98	4701.7	12330.00
3	150.61	116.70	0.313	0.60( 0.59)	0.98	6532.6	12410.00
4	148.94	129.77	0.300	0.60( 0.58)	0.97	7427.9	12400.00
5	148.21	133.15	0.298	0.60( 0.58)	0.97	7609.9	12211.00
6	160.16	142.79	0.290	0.60( 0.58)	0.97	8273.4	12201.00
7	168.35	151.09	0.283	0.60( 0.58)	0.97	8719.6	12261.00
8	168.16	152.70	0.281	0.60( 0.58)	0.97	8773.7	12111.00
9	167.73	157.13	0.278	0.60( 0.58)	0.97	8968.8	12231.00
10	165.70	175.31	0.263	0.60( 0.58)	0.97	9632.5	12101.10
11	146.08	212.66	0.247	0.60( 0.59)	0.98	10859.2	12010.00
12	94.58	279.29	0.222	0.60( 0.59)	0.98	11005.0	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 168.35 Tc(MIN.) = 151.09

AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 8719.59

\*\*\*\*\*

FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	153.03	85.32	0.362	0.60( 0.59)	0.98	4321.6	12300.00
2	152.93	90.38	0.352	0.60( 0.59)	0.98	4701.7	12330.00
3	150.61	116.70	0.313	0.60( 0.59)	0.98	6532.6	12410.00
4	148.94	129.77	0.300	0.60( 0.58)	0.97	7427.9	12400.00
5	148.21	133.15	0.298	0.60( 0.58)	0.97	7609.9	12211.00
6	160.16	142.79	0.290	0.60( 0.58)	0.97	8273.4	12201.00
7	168.35	151.09	0.283	0.60( 0.58)	0.97	8719.6	12261.00
8	168.16	152.70	0.281	0.60( 0.58)	0.97	8773.7	12111.00
9	167.73	157.13	0.278	0.60( 0.58)	0.97	8968.8	12231.00
10	165.70	175.31	0.263	0.60( 0.58)	0.97	9632.5	12101.10
11	146.08	212.66	0.247	0.60( 0.59)	0.98	10859.2	12010.00
12	94.58	279.29	0.222	0.60( 0.59)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.52	51.60	0.449	0.60( 0.60)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	51.60	0.449	0.60( 0.59)	0.98	2979.9	12500.00
2	161.52	85.32	0.362	0.60( 0.59)	0.98	4687.9	12300.00
3	161.17	90.38	0.352	0.60( 0.59)	0.98	5067.9	12330.00
4	157.95	116.70	0.313	0.60( 0.59)	0.98	6898.9	12410.00
5	155.98	129.77	0.300	0.60( 0.58)	0.97	7794.2	12400.00
6	155.19	133.15	0.298	0.60( 0.58)	0.97	7976.2	12211.00
7	166.94	142.79	0.290	0.60( 0.58)	0.97	8639.7	12201.00
8	174.98	151.09	0.283	0.60( 0.58)	0.97	9085.9	12261.00
9	174.75	152.70	0.281	0.60( 0.58)	0.97	9140.0	12111.00
10	174.24	157.13	0.278	0.60( 0.58)	0.97	9335.1	12231.00
11	171.86	175.31	0.263	0.60( 0.58)	0.97	9998.8	12101.10
12	151.86	212.66	0.247	0.60( 0.59)	0.98	11225.5	12010.00
13	99.78	279.29	0.222	0.60( 0.59)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 151.090

EFFECTIVE AREA(ACRES) = 9085.88 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 11371.3

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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FLOW PROCESS FROM NODE 12520.00 TO NODE 12521.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 549.92 DOWNSTREAM(FEET) = 525.43
CHANNEL LENGTH THRU SUBAREA(FEET) = 1934.41 CHANNEL SLOPE = 0.0127
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.276
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 85.91 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.10
AVERAGE FLOW DEPTH(FEET) = 3.77 TRAVEL TIME(MIN.) = 7.86
Tc(MIN.) = 158.95
SUBAREA AREA(ACRES) = 85.91 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 9171.79 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 11457.2 PEAK FLOW RATE(CFS) = 174.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.77 FLOW VELOCITY(FEET/SEC.) = 4.10
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12521.00 = 60159.12 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	60.13	0.415	0.60( 0.59)	0.98	3065.9	12500.00
2	161.52	93.33	0.348	0.60( 0.59)	0.98	4773.8	12300.00
3	161.17	98.40	0.340	0.60( 0.59)	0.98	5153.9	12330.00
4	157.95	124.76	0.304	0.60( 0.59)	0.98	6984.8	12410.00
5	155.98	137.85	0.294	0.60( 0.58)	0.97	7880.1	12400.00
6	155.19	141.25	0.291	0.60( 0.58)	0.97	8062.1	12211.00
7	166.94	150.73	0.283	0.60( 0.58)	0.97	8725.6	12201.00
8	174.98	158.95	0.276	0.60( 0.58)	0.97	9171.8	12261.00
9	174.75	160.55	0.275	0.60( 0.58)	0.97	9225.9	12111.00
10	174.24	164.99	0.271	0.60( 0.58)	0.97	9421.0	12231.00
11	171.86	183.20	0.258	0.60( 0.58)	0.97	10084.7	12101.10
12	151.86	220.79	0.244	0.60( 0.59)	0.98	11311.4	12010.00
13	99.78	288.34	0.218	0.60( 0.59)	0.98	11457.2	12000.00

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NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 158.95
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 9171.79

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FLOW PROCESS FROM NODE 12521.00 TO NODE 12522.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 525.43 DOWNSTREAM(FEET) = 490.87

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CHANNEL LENGTH THRU SUBAREA(FEET) = 3335.01 CHANNEL SLOPE = 0.0104
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.264
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 539.82 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.81
AVERAGE FLOW DEPTH(FEET) = 3.91 TRAVEL TIME(MIN.) = 14.58
Tc(MIN.) = 173.53
SUBAREA AREA(ACRES) = 539.82 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 9711.61 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 11997.0 PEAK FLOW RATE(CFS) = 174.98
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.91 FLOW VELOCITY(FEET/SEC.) = 3.81
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12522.00 = 63494.13 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	75.99	0.382	0.60( 0.59)	0.99	3605.7	12500.00
2	161.52	108.21	0.326	0.60( 0.59)	0.99	5313.6	12300.00
3	161.17	113.30	0.318	0.60( 0.59)	0.98	5693.7	12330.00
4	157.95	139.73	0.292	0.60( 0.59)	0.98	7524.7	12410.00
5	155.98	152.88	0.281	0.60( 0.59)	0.98	8419.9	12400.00
6	155.19	156.29	0.278	0.60( 0.59)	0.98	8601.9	12211.00
7	166.94	165.48	0.271	0.60( 0.58)	0.97	9265.4	12201.00
8	174.98	173.53	0.264	0.60( 0.58)	0.97	9711.6	12261.00
9	174.75	175.15	0.263	0.60( 0.58)	0.97	9765.8	12111.00
10	174.24	179.62	0.259	0.60( 0.58)	0.97	9960.8	12231.00
11	171.86	197.87	0.252	0.60( 0.58)	0.97	10624.5	12101.10
12	151.86	235.91	0.238	0.60( 0.59)	0.98	11851.2	12010.00
13	99.78	305.14	0.212	0.60( 0.59)	0.98	11997.0	12000.00

```

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 173.53
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 9711.61

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*****
FLOW PROCESS FROM NODE 12522.00 TO NODE 12523.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 490.87 DOWNSTREAM(FEET) = 467.63
CHANNEL LENGTH THRU SUBAREA(FEET) = 1961.26 CHANNEL SLOPE = 0.0118
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

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MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.258  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 321.58 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 174.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.00  
 AVERAGE FLOW DEPTH (FEET) = 3.82 TRAVEL TIME (MIN.) = 8.17  
 Tc (MIN.) = 181.70  
 SUBAREA AREA (ACRES) = 321.58 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 10033.19 AREA-AVERAGED Fm (INCH/HR) = 0.58  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 12318.6 PEAK FLOW RATE (CFS) = 174.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.82 FLOW VELOCITY (FEET/SEC.) = 4.00  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12523.00 = 65455.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	84.87	0.363	0.60 ( 0.59)	0.99	3927.3	12500.00
2	161.52	116.53	0.314	0.60 ( 0.59)	0.99	5635.2	12300.00
3	161.17	121.65	0.307	0.60 ( 0.59)	0.99	6015.3	12330.00
4	157.95	148.10	0.285	0.60 ( 0.59)	0.98	7846.2	12410.00
5	155.98	161.29	0.274	0.60 ( 0.59)	0.98	8741.5	12400.00
6	155.19	164.70	0.271	0.60 ( 0.59)	0.98	8923.5	12211.00
7	166.94	173.73	0.264	0.60 ( 0.58)	0.97	9587.0	12201.00
8	174.98	181.70	0.258	0.60 ( 0.58)	0.97	10033.2	12261.00
9	174.75	183.30	0.258	0.60 ( 0.58)	0.97	10087.3	12111.00
10	174.24	187.79	0.256	0.60 ( 0.58)	0.97	10282.4	12231.00
11	171.86	206.06	0.249	0.60 ( 0.59)	0.98	10946.1	12101.10
12	151.86	244.37	0.235	0.60 ( 0.59)	0.98	12172.8	12010.00
13	99.78	314.54	0.209	0.60 ( 0.59)	0.98	12318.6	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 174.98 Tc (MIN.) = 181.70  
 AREA-AVERAGED Fm (INCH/HR) = 0.58 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 10033.19

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12523.00 TO NODE 12524.00 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 467.63 DOWNSTREAM (FEET) = 436.35  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2841.85 CHANNEL SLOPE = 0.0110  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.254

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 298.62 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 174.98  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.89  
 AVERAGE FLOW DEPTH (FEET) = 3.87 TRAVEL TIME (MIN.) = 12.17  
 Tc (MIN.) = 193.87  
 SUBAREA AREA (ACRES) = 298.62 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 10331.81 AREA-AVERAGED Fm (INCH/HR) = 0.58  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 12617.2 PEAK FLOW RATE (CFS) = 174.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.87 FLOW VELOCITY (FEET/SEC.) = 3.89  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12524.00 = 68297.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	98.09	0.341	0.60 ( 0.59)	0.99	4225.9	12500.00
2	161.52	128.95	0.301	0.60 ( 0.59)	0.99	5933.8	12300.00
3	161.17	134.05	0.297	0.60 ( 0.59)	0.99	6313.9	12330.00
4	157.95	160.59	0.275	0.60 ( 0.59)	0.98	8144.9	12410.00
5	155.98	173.79	0.264	0.60 ( 0.59)	0.98	9040.1	12400.00
6	155.19	177.22	0.261	0.60 ( 0.59)	0.98	9222.1	12211.00
7	166.94	186.04	0.257	0.60 ( 0.59)	0.98	9885.6	12201.00
8	174.98	193.87	0.254	0.60 ( 0.58)	0.97	10331.8	12261.00
9	174.75	195.45	0.253	0.60 ( 0.58)	0.97	10386.0	12111.00
10	174.24	199.96	0.251	0.60 ( 0.58)	0.97	10581.0	12231.00
11	171.86	218.26	0.245	0.60 ( 0.59)	0.98	11244.7	12101.10
12	151.86	256.95	0.230	0.60 ( 0.59)	0.98	12471.4	12010.00
13	99.78	328.52	0.203	0.60 ( 0.59)	0.98	12617.2	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 174.98 Tc (MIN.) = 193.87  
 AREA-AVERAGED Fm (INCH/HR) = 0.58 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 10331.81

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12524.00 TO NODE 12525.00 IS CODE = 51  
 -----

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 436.35 DOWNSTREAM (FEET) = 415.23  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2812.14 CHANNEL SLOPE = 0.0075  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.248  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 251.20 0.60 0.997 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 175.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.38  
 AVERAGE FLOW DEPTH(FEET) = 4.16 TRAVEL TIME(MIN.) = 13.87  
 Tc(MIN.) = 207.73  
 SUBAREA AREA(ACRES) = 251.20 SUBAREA RUNOFF(CFS) = 0.17  
 EFFECTIVE AREA(ACRES) = 10583.01 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 12868.4 PEAK FLOW RATE(CFS) = 174.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.16 FLOW VELOCITY(FEET/SEC.) = 3.38  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	113.17	0.318	0.60 ( 0.59)	0.99	4477.1	12500.00
2	161.52	143.10	0.289	0.60 ( 0.59)	0.99	6185.0	12300.00
3	161.17	148.22	0.285	0.60 ( 0.59)	0.99	6565.1	12330.00
4	157.95	174.83	0.263	0.60 ( 0.59)	0.98	8396.1	12410.00
5	155.98	188.06	0.256	0.60 ( 0.59)	0.98	9291.3	12400.00
6	155.19	191.55	0.255	0.60 ( 0.59)	0.98	9473.3	12211.00
7	166.94	200.08	0.251	0.60 ( 0.59)	0.98	10136.8	12201.00
8	174.98	207.73	0.248	0.60 ( 0.58)	0.97	10583.0	12261.00
9	174.75	209.34	0.248	0.60 ( 0.58)	0.97	10637.2	12111.00
10	174.24	213.87	0.246	0.60 ( 0.58)	0.98	10832.2	12231.00
11	171.86	232.22	0.239	0.60 ( 0.59)	0.98	11495.9	12101.10
12	151.86	271.33	0.225	0.60 ( 0.59)	0.98	12722.6	12010.00
13	99.78	344.49	0.198	0.60 ( 0.59)	0.98	12868.4	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 207.73  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 10583.01

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 415.23 DOWNSTREAM(FEET) = 380.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.09 CHANNEL SLOPE = 0.0119  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	247.71	0.60	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 175.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.01  
 AVERAGE FLOW DEPTH(FEET) = 3.82 TRAVEL TIME(MIN.) = 12.19  
 Tc(MIN.) = 219.93  
 SUBAREA AREA(ACRES) = 247.71 SUBAREA RUNOFF(CFS) = 0.71  
 EFFECTIVE AREA(ACRES) = 10830.72 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 13116.2 PEAK FLOW RATE(CFS) = 174.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.81 FLOW VELOCITY(FEET/SEC.) = 4.01  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	126.40	0.303	0.60 ( 0.59)	0.99	4724.8	12500.00
2	161.52	155.52	0.279	0.60 ( 0.59)	0.99	6432.8	12300.00
3	161.17	160.67	0.275	0.60 ( 0.59)	0.99	6812.8	12330.00
4	157.95	187.33	0.256	0.60 ( 0.59)	0.98	8643.8	12410.00
5	155.98	200.61	0.251	0.60 ( 0.59)	0.98	9539.0	12400.00
6	155.19	204.11	0.250	0.60 ( 0.59)	0.98	9721.0	12211.00
7	166.94	212.41	0.247	0.60 ( 0.59)	0.98	10384.5	12201.00
8	174.98	219.93	0.244	0.60 ( 0.58)	0.97	10830.7	12261.00
9	174.75	221.51	0.243	0.60 ( 0.58)	0.98	10884.9	12111.00
10	174.24	226.07	0.242	0.60 ( 0.59)	0.98	11079.9	12231.00
11	171.86	244.45	0.235	0.60 ( 0.59)	0.98	11743.7	12101.10
12	151.86	283.96	0.220	0.60 ( 0.59)	0.98	12970.3	12010.00
13	99.78	358.51	0.192	0.60 ( 0.59)	0.98	13116.2	12000.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 219.93  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 10830.72

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 380.28 DOWNSTREAM(FEET) = 347.47  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3113.51 CHANNEL SLOPE = 0.0105  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.239

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	120.94	0.60	0.974	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 175.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 3.84  
 AVERAGE FLOW DEPTH( FEET) = 3.90 TRAVEL TIME(MIN.) = 13.53  
 Tc(MIN.) = 233.46  
 SUBAREA AREA(ACRES) = 120.94 SUBAREA RUNOFF(CFS) = 0.68  
 EFFECTIVE AREA(ACRES) = 10951.67 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 13237.1 PEAK FLOW RATE(CFS) = 174.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 3.90 FLOW VELOCITY( FEET/SEC.) = 3.83  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	141.11	0.291	0.60( 0.59)	0.99	4845.7	12500.00
2	161.52	169.33	0.268	0.60( 0.59)	0.99	6553.7	12300.00
3	161.17	174.49	0.263	0.60( 0.59)	0.99	6933.7	12330.00
4	157.95	201.22	0.251	0.60( 0.59)	0.98	8764.7	12410.00
5	155.98	214.55	0.246	0.60( 0.59)	0.98	9660.0	12400.00
6	155.19	218.06	0.245	0.60( 0.59)	0.98	9842.0	12211.00
7	166.94	226.09	0.242	0.60( 0.59)	0.98	10505.5	12201.00
8	174.98	233.46	0.239	0.60( 0.58)	0.97	10951.7	12261.00
9	174.75	235.04	0.238	0.60( 0.58)	0.98	11005.8	12111.00
10	174.24	239.60	0.237	0.60( 0.59)	0.98	11200.8	12231.00
11	171.86	258.05	0.230	0.60( 0.59)	0.98	11864.6	12101.10
12	151.86	297.99	0.215	0.60( 0.59)	0.98	13091.2	12010.00
13	99.78	374.08	0.190	0.60( 0.59)	0.98	13237.1	12000.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 174.98 Tc(MIN.) = 233.46  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 10951.67

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 13237.1 TC(MIN.) = 233.46  
 EFFECTIVE AREA(ACRES) = 10951.67 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.975  
 PEAK FLOW RATE(CFS) = 174.98

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	125.24	141.11	0.291	0.60( 0.59)	0.99	4845.7	12500.00
2	161.52	169.33	0.268	0.60( 0.59)	0.99	6553.7	12300.00
3	161.17	174.49	0.263	0.60( 0.59)	0.99	6933.7	12330.00
4	157.95	201.22	0.251	0.60( 0.59)	0.98	8764.7	12410.00
5	155.98	214.55	0.246	0.60( 0.59)	0.98	9660.0	12400.00
6	155.19	218.06	0.245	0.60( 0.59)	0.98	9842.0	12211.00
7	166.94	226.09	0.242	0.60( 0.59)	0.98	10505.5	12201.00
8	174.98	233.46	0.239	0.60( 0.58)	0.97	10951.7	12261.00
9	174.75	235.04	0.238	0.60( 0.58)	0.98	11005.8	12111.00
10	174.24	239.60	0.237	0.60( 0.59)	0.98	11200.8	12231.00

11	171.86	258.05	0.230	0.60( 0.59)	0.98	11864.6	12101.10
12	151.86	297.99	0.215	0.60( 0.59)	0.98	13091.2	12010.00
13	99.78	374.08	0.190	0.60( 0.59)	0.98	13237.1	12000.00

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 =====

END OF RATIONAL METHOD ANALYSIS



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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Santa Ana, CA  
92707

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FILE NAME: S26.DAT  
TIME/DATE OF STUDY: 07:46 07/16/2018  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.873
- 2) 10.00; 1.249
- 3) 15.00; 0.951
- 4) 20.00; 0.777
- 5) 25.00; 0.669
- 6) 30.00; 0.593
- 7) 40.00; 0.511
- 8) 50.00; 0.454
- 9) 60.00; 0.399
- 10) 90.00; 0.345
- 11) 120.00; 0.287
- 12) 180.00; 0.228
- 13) 360.00; 0.167
- 14) 1200.00; 0.084

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / WAY	PARK- HEIGHT (FT)	STREET-CROSSFALL (FT)	CURB WIDTH (FT)	GUTTER-GEOMETRIES (FT)	STREET-SECTIONS (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S19.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.60 ( 0.59)	0.99	3237.9	40200.00
2	466.95	55.64	0.60 ( 0.60)	0.99	7715.8	40100.00
3	514.29	69.03	0.60 ( 0.60)	0.99	9448.2	11831.00
4	625.72	94.25	0.60 ( 0.60)	0.99	13143.3	11530.00
5	721.22	115.16	0.60 ( 0.60)	0.99	17300.1	11000.00
6	840.92	138.96	0.60 ( 0.60)	0.99	24091.2	10850.00
7	770.74	153.75	0.60 ( 0.60)	0.99	27438.8	11220.00
8	716.05	164.41	0.60 ( 0.60)	0.99	29194.0	10910.00
9	570.45	202.50	0.60 ( 0.60)	0.99	35778.0	12410.00
10	543.38	210.40	0.60 ( 0.60)	0.99	37190.8	10600.00
11	538.32	234.75	0.60 ( 0.59)	0.99	41856.3	12261.00
12	528.22	247.41	0.60 ( 0.59)	0.99	43341.0	10410.00
13	518.22	259.36	0.60 ( 0.59)	0.99	44446.8	12101.10
14	506.74	268.86	0.60 ( 0.59)	0.99	45276.4	10700.00
15	495.63	286.22	0.60 ( 0.59)	0.99	46824.6	10200.00
16	483.94	299.31	0.60 ( 0.60)	0.99	47764.2	12010.00
17	472.55	309.35	0.60 ( 0.60)	0.99	48135.9	10300.00
18	448.86	327.79	0.60 ( 0.60)	0.99	48441.6	10210.00
19	395.86	375.48	0.60 ( 0.60)	0.99	48943.4	12000.00
20	365.05	441.50	0.60 ( 0.60)	0.99	49511.8	10100.00

TOTAL AREA(ACRES) = 49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	23.73	0.60 ( 0.59)	0.99	3237.9	40200.00
2	466.95	55.64	0.60 ( 0.60)	0.99	7715.8	40100.00
3	514.29	69.03	0.60 ( 0.60)	0.99	9448.2	11831.00
4	625.72	94.25	0.60 ( 0.60)	0.99	13143.3	11530.00
5	721.22	115.16	0.60 ( 0.60)	0.99	17300.1	11000.00
6	840.92	138.96	0.60 ( 0.60)	0.99	24091.2	10850.00
7	770.74	153.75	0.60 ( 0.60)	0.99	27438.8	11220.00
8	716.05	164.41	0.60 ( 0.60)	0.99	29194.0	10910.00
9	570.45	202.50	0.60 ( 0.60)	0.99	35778.0	12410.00
10	543.38	210.40	0.60 ( 0.60)	0.99	37190.8	10600.00
11	538.32	234.75	0.60 ( 0.59)	0.99	41856.3	12261.00
12	528.22	247.41	0.60 ( 0.59)	0.99	43341.0	10410.00
13	518.22	259.36	0.60 ( 0.59)	0.99	44446.8	12101.10
14	506.74	268.86	0.60 ( 0.59)	0.99	45276.4	10700.00
15	495.63	286.22	0.60 ( 0.59)	0.99	46824.6	10200.00
16	483.94	299.31	0.60 ( 0.60)	0.99	47764.2	12010.00
17	472.55	309.35	0.60 ( 0.60)	0.99	48135.9	10300.00
18	448.86	327.79	0.60 ( 0.60)	0.99	48441.6	10210.00

19 395.86 375.48 0.60( 0.60) 0.99 48943.4 12000.00  
 20 365.05 441.50 0.60( 0.60) 0.99 49511.8 10100.00  
 TOTAL AREA(ACRES) = 49511.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 11929.00 TO NODE 12601.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 341.63 DOWNSTREAM(FEET) = 325.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1467.93 CHANNEL SLOPE = 0.0113  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.266

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.11	0.60	0.992	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 840.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.81

AVERAGE FLOW DEPTH(FEET) = 5.35 TRAVEL TIME(MIN.) = 2.49

Tc(MIN.) = 141.46

SUBAREA AREA(ACRES) = 14.11 SUBAREA RUNOFF(CFS) = 0.03

EFFECTIVE AREA(ACRES) = 24105.28 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 49525.9 PEAK FLOW RATE(CFS) = 840.92

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.35 FLOW VELOCITY(FEET/SEC.) = 9.81

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	26.69	0.643	0.60( 0.59)	0.99	3252.0	40200.00
2	466.95	58.53	0.407	0.60( 0.60)	0.99	7729.9	40100.00
3	514.29	71.85	0.378	0.60( 0.60)	0.99	9462.3	11831.00
4	625.72	96.94	0.332	0.60( 0.60)	0.99	13157.5	11530.00
5	721.22	117.75	0.291	0.60( 0.60)	0.99	17314.2	11000.00
6	840.92	141.46	0.266	0.60( 0.60)	0.99	24105.3	10850.00
7	770.74	156.30	0.251	0.60( 0.60)	0.99	27452.9	11220.00
8	716.05	167.00	0.241	0.60( 0.60)	0.99	29208.1	10910.00
9	570.45	205.24	0.219	0.60( 0.60)	0.99	35792.1	12410.00
10	543.38	213.18	0.217	0.60( 0.60)	0.99	37204.9	10600.00
11	538.32	237.54	0.209	0.60( 0.59)	0.99	41870.4	12261.00
12	528.22	250.21	0.204	0.60( 0.59)	0.99	43355.1	10410.00
13	518.22	262.17	0.200	0.60( 0.59)	0.99	44460.9	12101.10
14	506.74	271.69	0.197	0.60( 0.59)	0.99	45290.5	10700.00
15	495.63	289.07	0.191	0.60( 0.59)	0.99	46838.7	10200.00
16	483.94	302.18	0.187	0.60( 0.60)	0.99	47778.3	12010.00

17 472.55 312.23 0.183 0.60( 0.60) 0.99 48150.0 10300.00  
 18 448.86 330.71 0.177 0.60( 0.60) 0.99 48455.8 10210.00  
 19 395.86 378.50 0.165 0.60( 0.60) 0.99 48957.5 12000.00  
 20 365.05 444.58 0.159 0.60( 0.60) 0.99 49525.9 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 141.46

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24105.28

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610318T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.14	21.87	0.60( 0.60)	1.00	107.7	31800.00
2	12.05	27.12	0.60( 0.60)	1.00	119.0	31810.00
TOTAL AREA(ACRES) = 119.0						

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	426.54	26.69	0.643	0.60( 0.59)	0.99	3252.0	40200.00
2	466.95	58.53	0.407	0.60( 0.60)	0.99	7729.9	40100.00
3	514.29	71.85	0.378	0.60( 0.60)	0.99	9462.3	11831.00
4	625.72	96.94	0.332	0.60( 0.60)	0.99	13157.5	11530.00
5	721.22	117.75	0.291	0.60( 0.60)	0.99	17314.2	11000.00
6	840.92	141.46	0.266	0.60( 0.60)	0.99	24105.3	10850.00
7	770.74	156.30	0.251	0.60( 0.60)	0.99	27452.9	11220.00
8	716.05	167.00	0.241	0.60( 0.60)	0.99	29208.1	10910.00
9	570.45	205.24	0.219	0.60( 0.60)	0.99	35792.1	12410.00
10	543.38	213.18	0.217	0.60( 0.60)	0.99	37204.9	10600.00
11	538.32	237.54	0.209	0.60( 0.59)	0.99	41870.4	12261.00
12	528.22	250.21	0.204	0.60( 0.59)	0.99	43355.1	10410.00
13	518.22	262.17	0.200	0.60( 0.59)	0.99	44460.9	12101.10
14	506.74	271.69	0.197	0.60( 0.59)	0.99	45290.5	10700.00
15	495.63	289.07	0.191	0.60( 0.59)	0.99	46838.7	10200.00
16	483.94	302.18	0.187	0.60( 0.60)	0.99	47778.3	12010.00
17	472.55	312.23	0.183	0.60( 0.60)	0.99	48150.0	10300.00
18	448.86	330.71	0.177	0.60( 0.60)	0.99	48455.8	10210.00
19	395.86	378.50	0.165	0.60( 0.60)	0.99	48957.5	12000.00
20	365.05	444.58	0.159	0.60( 0.60)	0.99	49525.9	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.14	21.87	0.737	0.60( 0.60)	1.00	107.7	31800.00
2	12.05	27.12	0.637	0.60( 0.60)	1.00	119.0	31810.00

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	21.87	0.737	0.60 ( 0.59)	0.99	2773.0	31800.00
2	439.02	26.69	0.643	0.60 ( 0.59)	0.99	3370.0	40200.00
3	439.15	27.12	0.637	0.60 ( 0.59)	0.99	3432.4	31810.00
4	466.95	58.53	0.407	0.60 ( 0.60)	0.99	7848.9	40100.00
5	514.29	71.85	0.378	0.60 ( 0.60)	0.99	9581.4	11831.00
6	625.72	96.94	0.332	0.60 ( 0.60)	0.99	13276.5	11530.00
7	721.22	117.75	0.291	0.60 ( 0.60)	0.99	17433.2	11000.00
8	840.92	141.46	0.266	0.60 ( 0.60)	0.99	24224.3	10850.00
9	770.74	156.30	0.251	0.60 ( 0.60)	0.99	27571.9	11220.00
10	716.05	167.00	0.241	0.60 ( 0.60)	0.99	29327.2	10910.00
11	570.45	205.24	0.219	0.60 ( 0.60)	0.99	35911.1	12410.00
12	543.38	213.18	0.217	0.60 ( 0.60)	0.99	37323.9	10600.00
13	538.32	237.54	0.209	0.60 ( 0.59)	0.99	41989.4	12261.00
14	528.22	250.21	0.204	0.60 ( 0.59)	0.99	43474.1	10410.00
15	518.22	262.17	0.200	0.60 ( 0.59)	0.99	44579.9	12101.10
16	506.74	271.69	0.197	0.60 ( 0.59)	0.99	45409.6	10700.00
17	495.63	289.07	0.191	0.60 ( 0.59)	0.99	46957.7	10200.00
18	483.94	302.18	0.187	0.60 ( 0.60)	0.99	47897.4	12010.00
19	472.55	312.23	0.183	0.60 ( 0.60)	0.99	48269.1	10300.00
20	448.86	330.71	0.177	0.60 ( 0.60)	0.99	48574.8	10210.00
21	395.86	378.50	0.165	0.60 ( 0.60)	0.99	49076.5	12000.00
22	365.05	444.58	0.159	0.60 ( 0.60)	0.99	49644.9	10100.00

TOTAL AREA (ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 840.92 Tc (MIN.) = 141.458  
EFFECTIVE AREA (ACRES) = 24224.30 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49644.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 325.00 DOWNSTREAM (FEET) = 313.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1377.46 CHANNEL SLOPE = 0.0087  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 840.92  
FLOW VELOCITY (FEET/SEC.) = 8.88 FLOW DEPTH (FEET) = 5.62  
TRAVEL TIME (MIN.) = 2.59 Tc (MIN.) = 144.04  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	24.90	0.671	0.60 ( 0.59)	0.99	2773.0	31800.00
2	439.02	29.72	0.597	0.60 ( 0.59)	0.99	3370.0	40200.00
3	439.15	30.17	0.592	0.60 ( 0.59)	0.99	3432.4	31810.00
4	466.95	61.53	0.396	0.60 ( 0.60)	0.99	7848.9	40100.00

5	514.29	74.77	0.372	0.60 ( 0.60)	0.99	9581.4	11831.00
6	625.72	99.71	0.326	0.60 ( 0.60)	0.99	13276.5	11530.00
7	721.22	120.43	0.287	0.60 ( 0.60)	0.99	17433.2	11000.00
8	840.92	144.04	0.263	0.60 ( 0.60)	0.99	24224.3	10850.00
9	770.74	158.94	0.249	0.60 ( 0.60)	0.99	27571.9	11220.00
10	716.05	169.69	0.238	0.60 ( 0.60)	0.99	29327.2	10910.00
11	570.45	208.09	0.218	0.60 ( 0.60)	0.99	35911.1	12410.00
12	543.38	216.06	0.216	0.60 ( 0.60)	0.99	37323.9	10600.00
13	538.32	240.43	0.208	0.60 ( 0.59)	0.99	41989.4	12261.00
14	528.22	253.12	0.203	0.60 ( 0.59)	0.99	43474.1	10410.00
15	518.22	265.08	0.199	0.60 ( 0.59)	0.99	44579.9	12101.10
16	506.74	274.62	0.196	0.60 ( 0.59)	0.99	45409.6	10700.00
17	495.63	292.02	0.190	0.60 ( 0.59)	0.99	46957.7	10200.00
18	483.94	305.15	0.186	0.60 ( 0.60)	0.99	47897.4	12010.00
19	472.55	315.22	0.182	0.60 ( 0.60)	0.99	48269.1	10300.00
20	448.86	333.73	0.176	0.60 ( 0.60)	0.99	48574.8	10210.00
21	395.86	381.61	0.165	0.60 ( 0.60)	0.99	49076.5	12000.00
22	365.05	447.76	0.158	0.60 ( 0.60)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 840.92 Tc (MIN.) = 144.04  
AREA-AVERAGED Fm (INCH/HR) = 0.60 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 24224.30

\*\*\*\*\*

FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 313.00 DOWNSTREAM (FEET) = 310.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 312.40 CHANNEL SLOPE = 0.0096  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 840.92  
FLOW VELOCITY (FEET/SEC.) = 9.22 FLOW DEPTH (FEET) = 5.51  
TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 144.61  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	25.57	0.660	0.60 ( 0.59)	0.99	2773.0	31800.00
2	439.02	30.39	0.590	0.60 ( 0.59)	0.99	3370.0	40200.00
3	439.15	30.83	0.586	0.60 ( 0.59)	0.99	3432.4	31810.00
4	466.95	62.18	0.395	0.60 ( 0.60)	0.99	7848.9	40100.00
5	514.29	75.41	0.371	0.60 ( 0.60)	0.99	9581.4	11831.00
6	625.72	100.32	0.325	0.60 ( 0.60)	0.99	13276.5	11530.00
7	721.22	121.02	0.286	0.60 ( 0.60)	0.99	17433.2	11000.00
8	840.92	144.61	0.263	0.60 ( 0.60)	0.99	24224.3	10850.00
9	770.74	159.52	0.248	0.60 ( 0.60)	0.99	27571.9	11220.00
10	716.05	170.28	0.238	0.60 ( 0.60)	0.99	29327.2	10910.00
11	570.45	208.71	0.218	0.60 ( 0.60)	0.99	35911.1	12410.00
12	543.38	216.69	0.216	0.60 ( 0.60)	0.99	37323.9	10600.00
13	538.32	241.06	0.207	0.60 ( 0.59)	0.99	41989.4	12261.00
14	528.22	253.75	0.203	0.60 ( 0.59)	0.99	43474.1	10410.00
15	518.22	265.72	0.199	0.60 ( 0.59)	0.99	44579.9	12101.10
16	506.74	275.26	0.196	0.60 ( 0.59)	0.99	45409.6	10700.00
17	495.63	292.66	0.190	0.60 ( 0.59)	0.99	46957.7	10200.00

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18 483.94 305.79 0.185 0.60( 0.60) 0.99 47897.4 12010.00
19 472.55 315.87 0.182 0.60( 0.60) 0.99 48269.1 10300.00
20 448.86 334.39 0.176 0.60( 0.60) 0.99 48574.8 10210.00
21 395.86 382.29 0.165 0.60( 0.60) 0.99 49076.5 12000.00
22 365.05 448.46 0.158 0.60( 0.60) 0.99 49644.9 10100.00

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NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 144.61  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24224.30

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610317T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.43	19.96	0.60( 0.60)	1.00	59.8	31700.00
2	6.16	26.59	0.60( 0.60)	1.00	71.3	31710.00
TOTAL AREA(ACRES) =						71.3

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	443.69	25.57	0.660	0.60( 0.59)	0.99	2773.0	31800.00
2	439.02	30.39	0.590	0.60( 0.59)	0.99	3370.0	40200.00
3	439.15	30.83	0.586	0.60( 0.59)	0.99	3432.4	31810.00
4	466.95	62.18	0.395	0.60( 0.60)	0.99	7848.9	40100.00
5	514.29	75.41	0.371	0.60( 0.60)	0.99	9581.4	11831.00
6	625.72	100.32	0.325	0.60( 0.60)	0.99	13276.5	11530.00
7	721.22	121.02	0.286	0.60( 0.60)	0.99	17433.2	11000.00
8	840.92	144.61	0.263	0.60( 0.60)	0.99	24224.3	10850.00
9	770.74	159.52	0.248	0.60( 0.60)	0.99	27571.9	11220.00
10	716.05	170.28	0.238	0.60( 0.60)	0.99	29327.2	10910.00
11	570.45	208.71	0.218	0.60( 0.60)	0.99	35911.1	12410.00
12	543.38	216.69	0.216	0.60( 0.60)	0.99	37323.9	10600.00
13	538.32	241.06	0.207	0.60( 0.59)	0.99	41989.4	12261.00
14	528.22	253.75	0.203	0.60( 0.59)	0.99	43474.1	10410.00
15	518.22	265.72	0.199	0.60( 0.59)	0.99	44579.9	12101.10
16	506.74	275.26	0.196	0.60( 0.59)	0.99	45409.6	10700.00
17	495.63	292.66	0.190	0.60( 0.59)	0.99	46957.7	10200.00
18	483.94	305.79	0.185	0.60( 0.60)	0.99	47897.4	12010.00
19	472.55	315.87	0.182	0.60( 0.60)	0.99	48269.1	10300.00
20	448.86	334.39	0.176	0.60( 0.60)	0.99	48574.8	10210.00

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21 395.86 382.29 0.165 0.60( 0.60) 0.99 49076.5 12000.00
22 365.05 448.46 0.158 0.60( 0.60) 0.99 49644.9 10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

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\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.43	19.96	0.778	0.60( 0.60)	1.00	59.8	31700.00
2	6.16	26.59	0.645	0.60( 0.60)	1.00	71.3	31710.00
LONGEST FLOWPATH FROM NODE 31710.00 TO NODE 12603.00 = 3633.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	453.12	19.96	0.778	0.60( 0.59)	0.99	2224.7	31700.00
2	450.35	25.57	0.660	0.60( 0.59)	0.99	2842.5	31800.00
3	448.85	26.59	0.645	0.60( 0.59)	0.99	2971.3	31710.00
4	439.02	30.39	0.590	0.60( 0.59)	0.99	3441.3	40200.00
5	439.15	30.83	0.586	0.60( 0.59)	0.99	3503.6	31810.00
6	466.95	62.18	0.395	0.60( 0.60)	0.99	7920.2	40100.00
7	514.29	75.41	0.371	0.60( 0.60)	0.99	9652.6	11831.00
8	625.72	100.32	0.325	0.60( 0.60)	0.99	13347.8	11530.00
9	721.22	121.02	0.286	0.60( 0.60)	0.99	17504.5	11000.00
10	840.92	144.61	0.263	0.60( 0.60)	0.99	24295.6	10850.00
11	770.74	159.52	0.248	0.60( 0.60)	0.99	27643.2	11220.00
12	716.05	170.28	0.238	0.60( 0.60)	0.99	29398.4	10910.00
13	570.45	208.71	0.218	0.60( 0.60)	0.99	35982.4	12410.00
14	543.38	216.69	0.216	0.60( 0.60)	0.99	37395.2	10600.00
15	538.32	241.06	0.207	0.60( 0.59)	0.99	42060.7	12261.00
16	528.22	253.75	0.203	0.60( 0.59)	0.99	43545.4	10410.00
17	518.22	265.72	0.199	0.60( 0.59)	0.99	44651.2	12101.10
18	506.74	275.26	0.196	0.60( 0.59)	0.99	45480.8	10700.00
19	495.63	292.66	0.190	0.60( 0.59)	0.99	47029.0	10200.00
20	483.94	305.79	0.185	0.60( 0.60)	0.99	47968.6	12010.00
21	472.55	315.87	0.182	0.60( 0.60)	0.99	48340.3	10300.00
22	448.86	334.39	0.176	0.60( 0.60)	0.99	48646.1	10210.00
23	395.86	382.29	0.165	0.60( 0.60)	0.99	49147.8	12000.00
24	365.05	448.46	0.158	0.60( 0.60)	0.99	49716.2	10100.00
TOTAL AREA(ACRES) =						49716.2	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 840.92 Tc(MIN.) = 144.607  
 EFFECTIVE AREA(ACRES) = 24295.57 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49716.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610403T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.58	25.67	0.60( 0.58)	0.97	175.0	40300.00
TOTAL AREA (ACRES) =						175.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	453.12	19.96	0.778	0.60( 0.59)	0.99	2224.7	31700.00
2	450.35	25.57	0.660	0.60( 0.59)	0.99	2842.5	31800.00
3	448.85	26.59	0.645	0.60( 0.59)	0.99	2971.3	31710.00
4	439.02	30.39	0.590	0.60( 0.59)	0.99	3441.3	40200.00
5	439.15	30.83	0.586	0.60( 0.59)	0.99	3503.6	31810.00
6	466.95	62.18	0.395	0.60( 0.60)	0.99	7920.2	40100.00
7	514.29	75.41	0.371	0.60( 0.60)	0.99	9652.6	11831.00
8	625.72	100.32	0.325	0.60( 0.60)	0.99	13347.8	11530.00
9	721.22	121.02	0.286	0.60( 0.60)	0.99	17504.5	11000.00
10	840.92	144.61	0.263	0.60( 0.60)	0.99	24295.6	10850.00
11	770.74	159.52	0.248	0.60( 0.60)	0.99	27643.2	11220.00
12	716.05	170.28	0.238	0.60( 0.60)	0.99	29398.4	10910.00
13	570.45	208.71	0.218	0.60( 0.60)	0.99	35982.4	12410.00
14	543.38	216.69	0.216	0.60( 0.60)	0.99	37395.2	10600.00
15	538.32	241.06	0.207	0.60( 0.59)	0.99	42060.7	12261.00
16	528.22	253.75	0.203	0.60( 0.59)	0.99	43545.4	10410.00
17	518.22	265.72	0.199	0.60( 0.59)	0.99	44651.2	12101.10
18	506.74	275.26	0.196	0.60( 0.59)	0.99	45480.8	10700.00
19	495.63	292.66	0.190	0.60( 0.59)	0.99	47029.0	10200.00
20	483.94	305.79	0.185	0.60( 0.60)	0.99	47968.6	12010.00
21	472.55	315.87	0.182	0.60( 0.60)	0.99	48340.3	10300.00
22	448.86	334.39	0.176	0.60( 0.60)	0.99	48646.1	10210.00
23	395.86	382.29	0.165	0.60( 0.60)	0.99	49147.8	12000.00
24	365.05	448.46	0.158	0.60( 0.60)	0.99	49716.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.58	25.67	0.659	0.60( 0.58)	0.97	175.0	40300.00

LONGEST FLOWPATH FROM NODE 40300.00 TO NODE 12603.00 = 5256.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	19.96	0.778	0.60( 0.59)	0.99	2360.8	31700.00
2	462.93	25.57	0.660	0.60( 0.59)	0.99	3016.8	31800.00
3	462.78	25.67	0.659	0.60( 0.59)	0.99	3030.6	40300.00
4	459.23	26.59	0.645	0.60( 0.59)	0.99	3146.3	31710.00
5	442.26	30.39	0.590	0.60( 0.59)	0.99	3616.4	40200.00
6	442.37	30.83	0.586	0.60( 0.59)	0.99	3678.7	31810.00
7	469.11	62.18	0.395	0.60( 0.59)	0.99	8095.2	40100.00

8	516.32	75.41	0.371	0.60( 0.59)	0.99	9827.7	11831.00
9	627.50	100.32	0.325	0.60( 0.60)	0.99	13522.8	11530.00
10	722.79	121.02	0.286	0.60( 0.60)	0.99	17679.5	11000.00
11	842.37	144.61	0.263	0.60( 0.60)	0.99	24470.6	10850.00
12	772.10	159.52	0.248	0.60( 0.60)	0.99	27818.3	11220.00
13	717.36	170.28	0.238	0.60( 0.60)	0.99	29573.5	10910.00
14	571.65	208.71	0.218	0.60( 0.60)	0.99	36157.4	12410.00
15	544.56	216.69	0.216	0.60( 0.60)	0.99	37570.2	10600.00
16	539.45	241.06	0.207	0.60( 0.59)	0.99	42235.7	12261.00
17	529.33	253.75	0.203	0.60( 0.59)	0.99	43720.5	10410.00
18	519.31	265.72	0.199	0.60( 0.59)	0.99	44826.2	12101.10
19	507.81	275.26	0.196	0.60( 0.59)	0.99	45655.9	10700.00
20	496.67	292.66	0.190	0.60( 0.59)	0.99	47204.0	10200.00
21	484.95	305.79	0.185	0.60( 0.59)	0.99	48143.7	12010.00
22	473.55	315.87	0.182	0.60( 0.60)	0.99	48515.4	10300.00
23	449.82	334.39	0.176	0.60( 0.60)	0.99	48821.1	10210.00
24	396.76	382.29	0.165	0.60( 0.60)	0.99	49322.8	12000.00
25	365.91	448.46	0.158	0.60( 0.60)	0.99	49891.2	10100.00

TOTAL AREA (ACRES) = 49891.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 144.607

EFFECTIVE AREA(ACRES) = 24470.62 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

TOTAL AREA (ACRES) = 49891.2

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 310.00 DOWNSTREAM(FEET) = 307.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 459.69 CHANNEL SLOPE = 0.0065

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

CHANNEL FLOW THRU SUBAREA(CFS) = 842.37

FLOW VELOCITY(FEET/SEC.) = 7.98 FLOW DEPTH(FEET) = 5.93

TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 145.57

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12604.00 = 102017.99 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	21.07	0.754	0.60( 0.59)	0.99	2360.8	31700.00
2	462.93	26.68	0.643	0.60( 0.59)	0.99	3016.8	31800.00
3	462.78	26.79	0.642	0.60( 0.59)	0.99	3030.6	40300.00
4	459.23	27.71	0.628	0.60( 0.59)	0.99	3146.3	31710.00
5	442.26	31.52	0.581	0.60( 0.59)	0.99	3616.4	40200.00
6	442.37	31.96	0.577	0.60( 0.59)	0.99	3678.7	31810.00
7	469.11	63.29	0.393	0.60( 0.59)	0.99	8095.2	40100.00
8	516.32	76.50	0.369	0.60( 0.59)	0.99	9827.7	11831.00
9	627.50	101.36	0.323	0.60( 0.60)	0.99	13522.8	11530.00
10	722.79	122.02	0.285	0.60( 0.60)	0.99	17679.5	11000.00
11	842.37	145.57	0.262	0.60( 0.60)	0.99	24470.6	10850.00
12	772.10	160.50	0.247	0.60( 0.60)	0.99	27818.3	11220.00
13	717.36	171.28	0.237	0.60( 0.60)	0.99	29573.5	10910.00

14	571.65	209.77	0.218	0.60	( 0.60)	0.99	36157.4	12410.00
15	544.56	217.76	0.215	0.60	( 0.60)	0.99	37570.2	10600.00
16	539.45	242.13	0.207	0.60	( 0.59)	0.99	42235.7	12261.00
17	529.33	254.83	0.203	0.60	( 0.59)	0.99	43720.5	10410.00
18	519.31	266.80	0.199	0.60	( 0.59)	0.99	44826.2	12101.10
19	507.81	276.35	0.195	0.60	( 0.59)	0.99	45655.9	10700.00
20	496.67	293.76	0.189	0.60	( 0.59)	0.99	47204.0	10200.00
21	484.95	306.90	0.185	0.60	( 0.59)	0.99	48143.7	12010.00
22	473.55	316.98	0.182	0.60	( 0.60)	0.99	48515.4	10300.00
23	449.82	335.52	0.175	0.60	( 0.60)	0.99	48821.1	10210.00
24	396.76	383.45	0.165	0.60	( 0.60)	0.99	49322.8	12000.00
25	365.91	449.64	0.158	0.60	( 0.60)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 145.57  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24470.62

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 842.37  
 FLOW VELOCITY(FEET/SEC.) = 7.04 FLOW DEPTH(FEET) = 6.31  
 TRAVEL TIME(MIN.) = 1.01 Tc(MIN.) = 146.58  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	22.25	0.728	0.60( 0.59)	0.99	2360.8	31700.00
2	462.93	27.86	0.626	0.60( 0.59)	0.99	3016.8	31800.00
3	462.78	27.96	0.624	0.60( 0.59)	0.99	3030.6	40300.00
4	459.23	28.89	0.610	0.60( 0.59)	0.99	3146.3	31710.00
5	442.26	32.71	0.571	0.60( 0.59)	0.99	3616.4	40200.00
6	442.37	33.15	0.567	0.60( 0.59)	0.99	3678.7	31810.00
7	469.11	64.46	0.391	0.60( 0.59)	0.99	8095.2	40100.00
8	516.32	77.64	0.367	0.60( 0.59)	0.99	9827.7	11831.00
9	627.50	102.45	0.321	0.60( 0.60)	0.99	13522.8	11530.00
10	722.79	123.07	0.284	0.60( 0.60)	0.99	17679.5	11000.00
11	842.37	146.58	0.261	0.60( 0.60)	0.99	24470.6	10850.00
12	772.10	161.54	0.246	0.60( 0.60)	0.99	27818.3	11220.00
13	717.36	172.34	0.236	0.60( 0.60)	0.99	29573.5	10910.00
14	571.65	210.88	0.218	0.60( 0.60)	0.99	36157.4	12410.00
15	544.56	218.89	0.215	0.60( 0.60)	0.99	37570.2	10600.00
16	539.45	243.26	0.207	0.60( 0.59)	0.99	42235.7	12261.00
17	529.33	255.97	0.202	0.60( 0.59)	0.99	43720.5	10410.00

18	519.31	267.95	0.198	0.60	( 0.59)	0.99	44826.2	12101.10
19	507.81	277.50	0.195	0.60	( 0.59)	0.99	45655.9	10700.00
20	496.67	294.91	0.189	0.60	( 0.59)	0.99	47204.0	10200.00
21	484.95	308.06	0.185	0.60	( 0.59)	0.99	48143.7	12010.00
22	473.55	318.15	0.181	0.60	( 0.60)	0.99	48515.4	10300.00
23	449.82	336.70	0.175	0.60	( 0.60)	0.99	48821.1	10210.00
24	396.76	384.67	0.165	0.60	( 0.60)	0.99	49322.8	12000.00
25	365.91	450.89	0.158	0.60	( 0.60)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 146.58  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24470.62

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FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

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FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 842.37  
 FLOW VELOCITY(FEET/SEC.) = 10.57 FLOW DEPTH(FEET) = 5.15  
 TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 146.92  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	22.65	0.720	0.60( 0.59)	0.99	2360.8	31700.00
2	462.93	28.26	0.620	0.60( 0.59)	0.99	3016.8	31800.00
3	462.78	28.36	0.618	0.60( 0.59)	0.99	3030.6	40300.00
4	459.23	29.29	0.604	0.60( 0.59)	0.99	3146.3	31710.00
5	442.26	33.11	0.568	0.60( 0.59)	0.99	3616.4	40200.00
6	442.37	33.55	0.564	0.60( 0.59)	0.99	3678.7	31810.00
7	469.11	64.86	0.390	0.60( 0.59)	0.99	8095.2	40100.00
8	516.32	78.03	0.367	0.60( 0.59)	0.99	9827.7	11831.00
9	627.50	102.82	0.320	0.60( 0.60)	0.99	13522.8	11530.00
10	722.79	123.43	0.284	0.60( 0.60)	0.99	17679.5	11000.00
11	842.37	146.92	0.261	0.60( 0.60)	0.99	24470.6	10850.00
12	772.10	161.89	0.246	0.60( 0.60)	0.99	27818.3	11220.00
13	717.36	172.69	0.235	0.60( 0.60)	0.99	29573.5	10910.00
14	571.65	211.26	0.217	0.60( 0.60)	0.99	36157.4	12410.00
15	544.56	219.27	0.215	0.60( 0.60)	0.99	37570.2	10600.00
16	539.45	243.65	0.206	0.60( 0.59)	0.99	42235.7	12261.00
17	529.33	256.35	0.202	0.60( 0.59)	0.99	43720.5	10410.00
18	519.31	268.33	0.198	0.60( 0.59)	0.99	44826.2	12101.10
19	507.81	277.89	0.195	0.60( 0.59)	0.99	45655.9	10700.00
20	496.67	295.30	0.189	0.60( 0.59)	0.99	47204.0	10200.00

21	484.95	308.45	0.184	0.60	( 0.59)	0.99	48143.7	12010.00
22	473.55	318.54	0.181	0.60	( 0.60)	0.99	48515.4	10300.00
23	449.82	337.10	0.175	0.60	( 0.60)	0.99	48821.1	10210.00
24	396.76	385.09	0.165	0.60	( 0.60)	0.99	49322.8	12000.00
25	365.91	451.31	0.158	0.60	( 0.60)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 842.37 Tc(MIN.) = 146.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24470.62

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

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 >>>>CLEAR MEMORY BANK # 3 <<<<<  
 =====  
 \*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

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 >>>>DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610404T.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	62.15	24.51	0.60 ( 0.59)	0.99	393.3	40430.00
2	59.42	25.09	0.60 ( 0.59)	0.99	396.7	40440.00
3	46.67	27.60	0.60 ( 0.59)	0.99	409.2	40420.00
4	45.68	27.81	0.60 ( 0.59)	0.99	409.9	40400.00
5	44.28	28.05	0.60 ( 0.59)	0.99	410.5	40410.00
TOTAL AREA(ACRES) =						410.5

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 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	465.69	22.65	0.720	0.60 ( 0.59)	0.99	2360.8	31700.00
2	462.93	28.26	0.620	0.60 ( 0.59)	0.99	3016.8	31800.00
3	462.78	28.36	0.618	0.60 ( 0.59)	0.99	3030.6	40300.00
4	459.23	29.29	0.604	0.60 ( 0.59)	0.99	3146.3	31710.00
5	442.26	33.11	0.568	0.60 ( 0.59)	0.99	3616.4	40200.00
6	442.37	33.55	0.564	0.60 ( 0.59)	0.99	3678.7	31810.00
7	469.11	64.86	0.390	0.60 ( 0.59)	0.99	8095.2	40100.00
8	516.32	78.03	0.367	0.60 ( 0.59)	0.99	9827.7	11831.00
9	627.50	102.82	0.320	0.60 ( 0.60)	0.99	13522.8	11530.00
10	722.79	123.43	0.284	0.60 ( 0.60)	0.99	17679.5	11000.00
11	842.37	146.92	0.261	0.60 ( 0.60)	0.99	24470.6	10850.00
12	772.10	161.89	0.246	0.60 ( 0.60)	0.99	27818.3	11220.00
13	717.36	172.69	0.235	0.60 ( 0.60)	0.99	29573.5	10910.00
14	571.65	211.26	0.217	0.60 ( 0.60)	0.99	36157.4	12410.00
15	544.56	219.27	0.215	0.60 ( 0.60)	0.99	37570.2	10600.00
16	539.45	243.65	0.206	0.60 ( 0.59)	0.99	42235.7	12261.00

17	529.33	256.35	0.202	0.60	( 0.59)	0.99	43720.5	10410.00
18	519.31	268.33	0.198	0.60	( 0.59)	0.99	44826.2	12101.10
19	507.81	277.89	0.195	0.60	( 0.59)	0.99	45655.9	10700.00
20	496.67	295.30	0.189	0.60	( 0.59)	0.99	47204.0	10200.00
21	484.95	308.45	0.184	0.60	( 0.59)	0.99	48143.7	12010.00
22	473.55	318.54	0.181	0.60	( 0.60)	0.99	48515.4	10300.00
23	449.82	337.10	0.175	0.60	( 0.60)	0.99	48821.1	10210.00
24	396.76	385.09	0.165	0.60	( 0.60)	0.99	49322.8	12000.00
25	365.91	451.31	0.158	0.60	( 0.60)	0.99	49891.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	62.15	24.51	0.680	0.60 ( 0.59)	0.99	393.3	40430.00
2	59.42	25.09	0.668	0.60 ( 0.59)	0.99	396.7	40440.00
3	46.67	27.60	0.629	0.60 ( 0.59)	0.99	409.2	40420.00
4	45.68	27.81	0.626	0.60 ( 0.59)	0.99	409.9	40400.00
5	44.28	28.05	0.623	0.60 ( 0.59)	0.99	410.5	40410.00

LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 = 7428.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.85	22.65	0.720	0.60 ( 0.59)	0.99	2724.2	31700.00
2	526.93	24.51	0.680	0.60 ( 0.59)	0.99	2972.1	40430.00
3	523.92	25.09	0.668	0.60 ( 0.59)	0.99	3042.8	40440.00
4	509.93	27.60	0.629	0.60 ( 0.59)	0.99	3349.8	40420.00
5	508.83	27.81	0.626	0.60 ( 0.59)	0.99	3374.3	40400.00
6	507.31	28.05	0.623	0.60 ( 0.59)	0.99	3403.7	40410.00
7	502.36	28.26	0.620	0.60 ( 0.59)	0.99	3427.3	31800.00
8	499.68	28.36	0.618	0.60 ( 0.59)	0.99	3441.1	40300.00
9	473.86	29.29	0.604	0.60 ( 0.59)	0.99	3556.8	31710.00
10	450.15	33.11	0.568	0.60 ( 0.59)	0.99	4026.8	40200.00
11	450.21	33.55	0.564	0.60 ( 0.59)	0.99	4089.1	31810.00
12	474.54	64.86	0.390	0.60 ( 0.59)	0.99	8505.7	40100.00
13	521.42	78.03	0.367	0.60 ( 0.59)	0.99	10238.1	11831.00
14	631.96	102.82	0.320	0.60 ( 0.60)	0.99	13933.3	11530.00
15	726.73	123.43	0.284	0.60 ( 0.60)	0.99	18090.0	11000.00
16	845.99	146.92	0.261	0.60 ( 0.60)	0.99	24881.1	10850.00
17	775.52	161.89	0.246	0.60 ( 0.60)	0.99	28228.7	11220.00
18	720.63	172.69	0.235	0.60 ( 0.60)	0.99	29983.9	10910.00
19	574.67	211.26	0.217	0.60 ( 0.60)	0.99	36567.9	12410.00
20	547.55	219.27	0.215	0.60 ( 0.60)	0.99	37980.7	10600.00
21	542.33	243.65	0.206	0.60 ( 0.59)	0.99	42646.2	12261.00
22	532.14	256.35	0.202	0.60 ( 0.59)	0.99	44130.9	10410.00
23	522.07	268.33	0.198	0.60 ( 0.59)	0.99	45236.7	12101.10
24	510.52	277.89	0.195	0.60 ( 0.59)	0.99	46066.3	10700.00
25	499.30	295.30	0.189	0.60 ( 0.59)	0.99	47614.5	10200.00
26	487.52	308.45	0.184	0.60 ( 0.59)	0.99	48554.2	12010.00
27	476.07	318.54	0.181	0.60 ( 0.60)	0.99	48925.8	10300.00
28	452.25	337.10	0.175	0.60 ( 0.60)	0.99	49231.6	10210.00
29	399.05	385.09	0.165	0.60 ( 0.60)	0.99	49733.3	12000.00
30	368.11	451.31	0.158	0.60 ( 0.60)	0.99	50301.7	10100.00
TOTAL AREA(ACRES) =						50301.7	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 845.99 Tc(MIN.) = 146.922

EFFECTIVE AREA(ACRES) = 24881.09 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 50301.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

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 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.60 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 302.00 DOWNSTREAM(FEET) = 295.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 738.76 CHANNEL SLOPE = 0.0095  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 845.99  
 FLOW VELOCITY(FEET/SEC.) = 9.18 FLOW DEPTH(FEET) = 5.54  
 TRAVEL TIME(MIN.) = 1.34 Tc(MIN.) = 148.26  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.85	24.15	0.687	0.60( 0.59)	0.99	2724.2	31700.00
2	526.93	26.02	0.654	0.60( 0.59)	0.99	2972.1	40430.00
3	523.92	26.60	0.645	0.60( 0.59)	0.99	3042.8	40440.00
4	509.93	29.12	0.606	0.60( 0.59)	0.99	3349.8	40420.00
5	508.83	29.33	0.603	0.60( 0.59)	0.99	3374.3	40400.00
6	507.31	29.58	0.599	0.60( 0.59)	0.99	3403.7	40410.00
7	502.36	29.78	0.596	0.60( 0.59)	0.99	3427.3	31800.00
8	499.68	29.89	0.595	0.60( 0.59)	0.99	3441.1	40300.00
9	473.86	30.84	0.586	0.60( 0.59)	0.99	3556.8	31710.00
10	450.15	34.68	0.555	0.60( 0.59)	0.99	4026.8	40200.00
11	450.21	35.12	0.551	0.60( 0.59)	0.99	4089.1	31810.00
12	474.54	66.41	0.387	0.60( 0.59)	0.99	8505.7	40100.00
13	521.42	79.54	0.364	0.60( 0.59)	0.99	10238.1	11831.00
14	631.96	104.26	0.317	0.60( 0.60)	0.99	13933.3	11530.00
15	726.73	124.82	0.282	0.60( 0.60)	0.99	18090.0	11000.00
16	845.99	148.26	0.259	0.60( 0.60)	0.99	24881.1	10850.00
17	775.52	163.26	0.244	0.60( 0.60)	0.99	28228.7	11220.00
18	720.63	174.09	0.234	0.60( 0.60)	0.99	29983.9	10910.00
19	574.67	212.74	0.217	0.60( 0.60)	0.99	36567.9	12410.00
20	547.55	220.76	0.214	0.60( 0.60)	0.99	37980.7	10600.00
21	542.33	245.14	0.206	0.60( 0.59)	0.99	42646.2	12261.00
22	532.14	257.86	0.202	0.60( 0.59)	0.99	44130.9	10410.00
23	522.07	269.85	0.198	0.60( 0.59)	0.99	45236.7	12101.10
24	510.52	279.41	0.194	0.60( 0.59)	0.99	46066.3	10700.00
25	499.30	296.83	0.188	0.60( 0.59)	0.99	47614.5	10200.00
26	487.52	309.99	0.184	0.60( 0.59)	0.99	48554.2	12010.00
27	476.07	320.09	0.181	0.60( 0.60)	0.99	48925.8	10300.00
28	452.25	338.67	0.174	0.60( 0.60)	0.99	49231.6	10210.00
29	399.05	386.70	0.164	0.60( 0.60)	0.99	49733.3	12000.00
30	368.11	452.96	0.158	0.60( 0.60)	0.99	50301.7	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 845.99 Tc(MIN.) = 148.26  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24881.09

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610405T.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.10	16.84	0.60( 0.60)	1.00	75.7	40510.00
2	18.91	19.22	0.60( 0.60)	1.00	81.4	40500.00
TOTAL AREA(ACRES) =			81.4			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	527.85	24.15	0.687	0.60( 0.59)	0.99	2724.2	31700.00
2	526.93	26.02	0.654	0.60( 0.59)	0.99	2972.1	40430.00
3	523.92	26.60	0.645	0.60( 0.59)	0.99	3042.8	40440.00
4	509.93	29.12	0.606	0.60( 0.59)	0.99	3349.8	40420.00
5	508.83	29.33	0.603	0.60( 0.59)	0.99	3374.3	40400.00
6	507.31	29.58	0.599	0.60( 0.59)	0.99	3403.7	40410.00
7	502.36	29.78	0.596	0.60( 0.59)	0.99	3427.3	31800.00
8	499.68	29.89	0.595	0.60( 0.59)	0.99	3441.1	40300.00
9	473.86	30.84	0.586	0.60( 0.59)	0.99	3556.8	31710.00
10	450.15	34.68	0.555	0.60( 0.59)	0.99	4026.8	40200.00
11	450.21	35.12	0.551	0.60( 0.59)	0.99	4089.1	31810.00
12	474.54	66.41	0.387	0.60( 0.59)	0.99	8505.7	40100.00
13	521.42	79.54	0.364	0.60( 0.59)	0.99	10238.1	11831.00
14	631.96	104.26	0.317	0.60( 0.60)	0.99	13933.3	11530.00
15	726.73	124.82	0.282	0.60( 0.60)	0.99	18090.0	11000.00
16	845.99	148.26	0.259	0.60( 0.60)	0.99	24881.1	10850.00
17	775.52	163.26	0.244	0.60( 0.60)	0.99	28228.7	11220.00
18	720.63	174.09	0.234	0.60( 0.60)	0.99	29983.9	10910.00
19	574.67	212.74	0.217	0.60( 0.60)	0.99	36567.9	12410.00
20	547.55	220.76	0.214	0.60( 0.60)	0.99	37980.7	10600.00
21	542.33	245.14	0.206	0.60( 0.59)	0.99	42646.2	12261.00
22	532.14	257.86	0.202	0.60( 0.59)	0.99	44130.9	10410.00
23	522.07	269.85	0.198	0.60( 0.59)	0.99	45236.7	12101.10
24	510.52	279.41	0.194	0.60( 0.59)	0.99	46066.3	10700.00
25	499.30	296.83	0.188	0.60( 0.59)	0.99	47614.5	10200.00
26	487.52	309.99	0.184	0.60( 0.59)	0.99	48554.2	12010.00
27	476.07	320.09	0.181	0.60( 0.60)	0.99	48925.8	10300.00
28	452.25	338.67	0.174	0.60( 0.60)	0.99	49231.6	10210.00
29	399.05	386.70	0.164	0.60( 0.60)	0.99	49733.3	12000.00
30	368.11	452.96	0.158	0.60( 0.60)	0.99	50301.7	10100.00



LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.10	16.84	0.887	0.60 ( 0.60)	1.00	75.7	40510.00
2	18.91	19.22	0.804	0.60 ( 0.60)	1.00	81.4	40500.00

LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	548.94	16.84	0.887	0.60 ( 0.59)	0.99	1975.4	40510.00
2	546.76	19.22	0.804	0.60 ( 0.59)	0.99	2249.3	40500.00
3	536.01	24.15	0.687	0.60 ( 0.59)	0.99	2805.5	31700.00
4	531.98	26.02	0.654	0.60 ( 0.59)	0.99	3053.4	40430.00
5	528.16	26.60	0.645	0.60 ( 0.59)	0.99	3124.2	40440.00
6	510.63	29.12	0.606	0.60 ( 0.59)	0.99	3431.1	40420.00
7	509.25	29.33	0.603	0.60 ( 0.59)	0.99	3455.7	40400.00
8	507.43	29.58	0.599	0.60 ( 0.59)	0.99	3485.1	40410.00
9	502.48	29.78	0.596	0.60 ( 0.59)	0.99	3508.7	31800.00
10	499.79	29.89	0.595	0.60 ( 0.59)	0.99	3522.5	40300.00
11	473.97	30.84	0.586	0.60 ( 0.59)	0.99	3638.2	31710.00
12	450.26	34.68	0.555	0.60 ( 0.59)	0.99	4108.2	40200.00
13	450.32	35.12	0.551	0.60 ( 0.59)	0.99	4170.5	31810.00
14	474.62	66.41	0.387	0.60 ( 0.59)	0.99	8587.0	40100.00
15	521.49	79.54	0.364	0.60 ( 0.59)	0.99	10319.5	11831.00
16	632.02	104.26	0.317	0.60 ( 0.60)	0.99	14014.6	11530.00
17	726.79	124.82	0.282	0.60 ( 0.60)	0.99	18171.4	11000.00
18	846.04	148.26	0.259	0.60 ( 0.60)	0.99	24962.5	10850.00
19	775.57	163.26	0.244	0.60 ( 0.60)	0.99	28310.1	11220.00
20	720.67	174.09	0.234	0.60 ( 0.60)	0.99	30065.3	10910.00
21	574.71	212.74	0.217	0.60 ( 0.60)	0.99	36649.3	12410.00
22	547.59	220.76	0.214	0.60 ( 0.60)	0.99	38062.1	10600.00
23	542.36	245.14	0.206	0.60 ( 0.59)	0.99	42727.6	12261.00
24	532.18	257.86	0.202	0.60 ( 0.59)	0.99	44212.3	10410.00
25	522.10	269.85	0.198	0.60 ( 0.59)	0.99	45318.1	12101.10
26	510.56	279.41	0.194	0.60 ( 0.59)	0.99	46147.7	10700.00
27	499.34	296.83	0.188	0.60 ( 0.59)	0.99	47695.9	10200.00
28	487.56	309.99	0.184	0.60 ( 0.59)	0.99	48635.5	12010.00
29	476.10	320.09	0.181	0.60 ( 0.60)	0.99	49007.2	10300.00
30	452.28	338.67	0.174	0.60 ( 0.60)	0.99	49312.9	10210.00
31	399.08	386.70	0.164	0.60 ( 0.60)	0.99	49814.7	12000.00
32	368.14	452.96	0.158	0.60 ( 0.60)	0.99	50383.1	10100.00

TOTAL AREA (ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 846.04 Tc(MIN.) = 148.263  
EFFECTIVE AREA(ACRES) = 24962.46 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50383.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 295.00 DOWNSTREAM(FEET) = 286.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1203.43 CHANNEL SLOPE = 0.0075  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 846.04  
FLOW VELOCITY(FEET/SEC.) = 8.40 FLOW DEPTH(FEET) = 5.79  
TRAVEL TIME(MIN.) = 2.39 Tc(MIN.) = 150.65  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	548.94	19.50	0.794	0.60 ( 0.59)	0.99	1975.4	40510.00
2	546.76	21.88	0.736	0.60 ( 0.59)	0.99	2249.3	40500.00
3	536.01	26.83	0.641	0.60 ( 0.59)	0.99	2805.5	31700.00
4	531.98	28.70	0.613	0.60 ( 0.59)	0.99	3053.4	40430.00
5	528.16	29.28	0.604	0.60 ( 0.59)	0.99	3124.2	40440.00
6	510.63	31.83	0.578	0.60 ( 0.59)	0.99	3431.1	40420.00
7	509.25	32.04	0.576	0.60 ( 0.59)	0.99	3455.7	40400.00
8	507.43	32.29	0.574	0.60 ( 0.59)	0.99	3485.1	40410.00
9	502.48	32.50	0.572	0.60 ( 0.59)	0.99	3508.7	31800.00
10	499.79	32.62	0.572	0.60 ( 0.59)	0.99	3522.5	40300.00
11	473.97	33.60	0.563	0.60 ( 0.59)	0.99	3638.2	31710.00
12	450.26	37.47	0.532	0.60 ( 0.59)	0.99	4108.2	40200.00
13	450.32	37.91	0.528	0.60 ( 0.59)	0.99	4170.5	31810.00
14	474.62	69.17	0.382	0.60 ( 0.59)	0.99	8587.0	40100.00
15	521.49	82.23	0.359	0.60 ( 0.59)	0.99	10319.5	11831.00
16	632.02	106.83	0.312	0.60 ( 0.60)	0.99	14014.6	11530.00
17	726.79	127.30	0.280	0.60 ( 0.60)	0.99	18171.4	11000.00
18	846.04	150.65	0.257	0.60 ( 0.60)	0.99	24962.5	10850.00
19	775.57	165.70	0.242	0.60 ( 0.60)	0.99	28310.1	11220.00
20	720.67	176.57	0.231	0.60 ( 0.60)	0.99	30065.3	10910.00
21	574.71	215.37	0.216	0.60 ( 0.60)	0.99	36649.3	12410.00
22	547.59	223.42	0.213	0.60 ( 0.60)	0.99	38062.1	10600.00
23	542.36	247.81	0.205	0.60 ( 0.59)	0.99	42727.6	12261.00
24	532.18	260.54	0.201	0.60 ( 0.59)	0.99	44212.3	10410.00
25	522.10	272.54	0.197	0.60 ( 0.59)	0.99	45318.1	12101.10
26	510.56	282.12	0.193	0.60 ( 0.59)	0.99	46147.7	10700.00
27	499.34	299.56	0.187	0.60 ( 0.59)	0.99	47695.9	10200.00
28	487.56	312.73	0.183	0.60 ( 0.59)	0.99	48635.5	12010.00
29	476.10	322.85	0.180	0.60 ( 0.60)	0.99	49007.2	10300.00
30	452.28	341.46	0.173	0.60 ( 0.60)	0.99	49312.9	10210.00
31	399.08	389.58	0.164	0.60 ( 0.60)	0.99	49814.7	12000.00
32	368.14	455.90	0.158	0.60 ( 0.60)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 846.04 Tc(MIN.) = 150.65  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 24962.46

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1  
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=====  
>>>>DEFINE MEMORY BANK # 1 <<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610406T.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.78	28.95	0.609	0.60 (0.60)	0.99	135.0	40600.00
TOTAL AREA(ACRES) =							135.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	548.94	19.50	0.794	0.60 (0.59)	0.99	1975.4	40510.00
2	546.76	21.88	0.736	0.60 (0.59)	0.99	2249.3	40500.00
3	536.01	26.83	0.641	0.60 (0.59)	0.99	2805.5	31700.00
4	531.98	28.70	0.613	0.60 (0.59)	0.99	3053.4	40430.00
5	528.16	29.28	0.604	0.60 (0.59)	0.99	3124.2	40440.00
6	510.63	31.83	0.578	0.60 (0.59)	0.99	3431.1	40420.00
7	509.25	32.04	0.576	0.60 (0.59)	0.99	3455.7	40400.00
8	507.43	32.29	0.574	0.60 (0.59)	0.99	3485.1	40410.00
9	502.48	32.50	0.572	0.60 (0.59)	0.99	3508.7	31800.00
10	499.79	32.62	0.572	0.60 (0.59)	0.99	3522.5	40300.00
11	473.97	33.60	0.563	0.60 (0.59)	0.99	3638.2	31710.00
12	450.26	37.47	0.532	0.60 (0.59)	0.99	4108.2	40200.00
13	450.32	37.91	0.528	0.60 (0.59)	0.99	4170.5	31810.00
14	474.62	69.17	0.382	0.60 (0.59)	0.99	8587.0	40100.00
15	521.49	82.23	0.359	0.60 (0.59)	0.99	10319.5	11831.00
16	632.02	106.83	0.312	0.60 (0.60)	0.99	14014.6	11530.00
17	726.79	127.30	0.280	0.60 (0.60)	0.99	18171.4	11000.00
18	846.04	150.65	0.257	0.60 (0.60)	0.99	24962.5	10850.00
19	775.57	165.70	0.242	0.60 (0.60)	0.99	28310.1	11220.00
20	720.67	176.57	0.231	0.60 (0.60)	0.99	30065.3	10910.00
21	574.71	215.37	0.216	0.60 (0.60)	0.99	36649.3	12410.00
22	547.59	223.42	0.213	0.60 (0.60)	0.99	38062.1	10600.00
23	542.36	247.81	0.205	0.60 (0.59)	0.99	42727.6	12261.00
24	532.18	260.54	0.201	0.60 (0.59)	0.99	44212.3	10410.00
25	522.10	272.54	0.197	0.60 (0.59)	0.99	45318.1	12101.10
26	510.56	282.12	0.193	0.60 (0.59)	0.99	46147.7	10700.00
27	499.34	299.56	0.187	0.60 (0.59)	0.99	47695.9	10200.00
28	487.56	312.73	0.183	0.60 (0.59)	0.99	48635.5	12010.00
29	476.10	322.85	0.180	0.60 (0.60)	0.99	49007.2	10300.00
30	452.28	341.46	0.173	0.60 (0.60)	0.99	49312.9	10210.00
31	399.08	389.58	0.164	0.60 (0.60)	0.99	49814.7	12000.00
32	368.14	455.90	0.158	0.60 (0.60)	0.99	50383.1	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 =							104605.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.78	28.95	0.609	0.60 (0.60)	0.99	135.0	40600.00
LONGEST FLOWPATH FROM NODE 40600.00 TO NODE 12606.00 =							6107.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	19.50	0.794	0.60 (0.59)	0.99	2066.3	40510.00
2	557.54	21.88	0.736	0.60 (0.59)	0.99	2351.3	40500.00
3	546.79	26.83	0.641	0.60 (0.59)	0.99	2930.6	31700.00
4	542.76	28.70	0.613	0.60 (0.59)	0.99	3187.2	40430.00
5	541.11	28.95	0.609	0.60 (0.59)	0.99	3219.0	40600.00
6	534.52	29.28	0.604	0.60 (0.59)	0.99	3259.1	40440.00
7	513.28	31.83	0.578	0.60 (0.59)	0.99	3566.1	40420.00
8	511.89	32.04	0.576	0.60 (0.59)	0.99	3590.7	40400.00
9	510.06	32.29	0.574	0.60 (0.59)	0.99	3620.1	40410.00
10	505.10	32.50	0.572	0.60 (0.59)	0.99	3643.6	31800.00
11	502.41	32.62	0.572	0.60 (0.59)	0.99	3657.5	40300.00
12	476.55	33.60	0.563	0.60 (0.59)	0.99	3773.1	31710.00
13	452.70	37.47	0.532	0.60 (0.59)	0.99	4243.2	40200.00
14	452.74	37.91	0.528	0.60 (0.59)	0.99	4305.5	31810.00
15	476.37	69.17	0.382	0.60 (0.59)	0.99	8722.0	40100.00
16	523.14	82.23	0.359	0.60 (0.59)	0.99	10454.5	11831.00
17	633.45	106.83	0.312	0.60 (0.60)	0.99	14149.6	11530.00
18	728.07	127.30	0.280	0.60 (0.60)	0.99	18306.4	11000.00
19	847.22	150.65	0.257	0.60 (0.60)	0.99	25097.4	10850.00
20	776.68	165.70	0.242	0.60 (0.60)	0.99	28445.1	11220.00
21	721.73	176.57	0.231	0.60 (0.60)	0.99	30200.3	10910.00
22	575.70	215.37	0.216	0.60 (0.60)	0.99	36784.2	12410.00
23	548.57	223.42	0.213	0.60 (0.60)	0.99	38197.1	10600.00
24	543.30	247.81	0.205	0.60 (0.59)	0.99	42862.5	12261.00
25	533.10	260.54	0.201	0.60 (0.59)	0.99	44347.3	10410.00
26	523.01	272.54	0.197	0.60 (0.59)	0.99	45453.1	12101.10
27	511.45	282.12	0.193	0.60 (0.59)	0.99	46282.7	10700.00
28	500.20	299.56	0.187	0.60 (0.59)	0.99	47830.8	10200.00
29	488.39	312.73	0.183	0.60 (0.59)	0.99	48770.5	12010.00
30	476.93	322.85	0.180	0.60 (0.60)	0.99	49142.2	10300.00
31	453.08	341.46	0.173	0.60 (0.60)	0.99	49447.9	10210.00
32	399.84	389.58	0.164	0.60 (0.60)	0.99	49949.6	12000.00
33	368.86	455.90	0.158	0.60 (0.60)	0.99	50518.0	10100.00
TOTAL AREA(ACRES) =							50518.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 847.22 Tc(MIN.) = 150.650  
EFFECTIVE AREA(ACRES) = 25097.44 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50518.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 50518.0 TC(MIN.) = 150.65  
EFFECTIVE AREA(ACRES) = 25097.44 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.995  
PEAK FLOW RATE(CFS) = 847.22

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	19.50	0.794	0.60 (0.59)	0.99	2066.3	40510.00
2	557.54	21.88	0.736	0.60 (0.59)	0.99	2351.3	40500.00
3	546.79	26.83	0.641	0.60 (0.59)	0.99	2930.6	31700.00

4	542.76	28.70	0.613	0.60	( 0.59)	0.99	3187.2	40430.00
5	541.11	28.95	0.609	0.60	( 0.59)	0.99	3219.0	40600.00
6	534.52	29.28	0.604	0.60	( 0.59)	0.99	3259.1	40440.00
7	513.28	31.83	0.578	0.60	( 0.59)	0.99	3566.1	40420.00
8	511.89	32.04	0.576	0.60	( 0.59)	0.99	3590.7	40400.00
9	510.06	32.29	0.574	0.60	( 0.59)	0.99	3620.1	40410.00
10	505.10	32.50	0.572	0.60	( 0.59)	0.99	3643.6	31800.00
11	502.41	32.62	0.572	0.60	( 0.59)	0.99	3657.5	40300.00
12	476.55	33.60	0.563	0.60	( 0.59)	0.99	3773.1	31710.00
13	452.70	37.47	0.532	0.60	( 0.59)	0.99	4243.2	40200.00
14	452.74	37.91	0.528	0.60	( 0.59)	0.99	4305.5	31810.00
15	476.37	69.17	0.382	0.60	( 0.59)	0.99	8722.0	40100.00
16	523.14	82.23	0.359	0.60	( 0.59)	0.99	10454.5	11831.00
17	633.45	106.83	0.312	0.60	( 0.60)	0.99	14149.6	11530.00
18	728.07	127.30	0.280	0.60	( 0.60)	0.99	18306.4	11000.00
19	847.22	150.65	0.257	0.60	( 0.60)	0.99	25097.4	10850.00
20	776.68	165.70	0.242	0.60	( 0.60)	0.99	28445.1	11220.00
21	721.73	176.57	0.231	0.60	( 0.60)	0.99	30200.3	10910.00
22	575.70	215.37	0.216	0.60	( 0.60)	0.99	36784.2	12410.00
23	548.57	223.42	0.213	0.60	( 0.60)	0.99	38197.1	10600.00
24	543.30	247.81	0.205	0.60	( 0.59)	0.99	42862.5	12261.00
25	533.10	260.54	0.201	0.60	( 0.59)	0.99	44347.3	10410.00
26	523.01	272.54	0.197	0.60	( 0.59)	0.99	45453.1	12101.10
27	511.45	282.12	0.193	0.60	( 0.59)	0.99	46282.7	10700.00
28	500.20	299.56	0.187	0.60	( 0.59)	0.99	47830.8	10200.00
29	488.39	312.73	0.183	0.60	( 0.59)	0.99	48770.5	12010.00
30	476.93	322.85	0.180	0.60	( 0.60)	0.99	49142.2	10300.00
31	453.08	341.46	0.173	0.60	( 0.60)	0.99	49447.9	10210.00
32	399.84	389.58	0.164	0.60	( 0.60)	0.99	49949.6	12000.00
33	368.86	455.90	0.158	0.60	( 0.60)	0.99	50518.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S27.DAT  
TIME/DATE OF STUDY: 07:51 07/16/2018  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.859
- 2) 10.00; 1.240
- 3) 15.00; 0.945
- 4) 20.00; 0.774
- 5) 25.00; 0.667
- 6) 30.00; 0.591
- 7) 40.00; 0.510
- 8) 50.00; 0.453
- 9) 60.00; 0.397
- 10) 90.00; 0.337
- 11) 120.00; 0.277
- 12) 180.00; 0.217
- 13) 360.00; 0.157
- 14) 1200.00; 0.083

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GUTTER LIP (FT)	GUTTER GEOMETRIES (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S26.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	19.50	0.60 ( 0.59)	0.99	2066.3	40510.00
2	452.74	37.91	0.60 ( 0.59)	0.99	4305.5	31810.00
3	476.37	69.17	0.60 ( 0.59)	0.99	8722.0	40100.00
4	523.14	82.23	0.60 ( 0.59)	0.99	10454.5	11831.00
5	633.45	106.83	0.60 ( 0.60)	0.99	14149.6	11530.00
6	728.07	127.30	0.60 ( 0.60)	0.99	18306.4	11000.00
7	847.22	150.65	0.60 ( 0.60)	0.99	25097.4	10850.00
8	776.68	165.70	0.60 ( 0.60)	0.99	28445.1	11220.00
9	721.73	176.57	0.60 ( 0.60)	0.99	30200.3	10910.00
10	575.70	215.37	0.60 ( 0.60)	0.99	36784.2	12410.00
11	543.30	247.81	0.60 ( 0.59)	0.99	42862.5	12261.00
12	533.10	260.54	0.60 ( 0.59)	0.99	44347.3	10410.00
13	523.01	272.54	0.60 ( 0.59)	0.99	45453.1	12101.10
14	511.45	282.12	0.60 ( 0.59)	0.99	46282.7	10700.00
15	500.20	299.56	0.60 ( 0.59)	0.99	47830.8	10200.00
16	488.39	312.73	0.60 ( 0.59)	0.99	48770.5	12010.00
17	476.93	322.85	0.60 ( 0.60)	0.99	49142.2	10300.00
18	453.08	341.46	0.60 ( 0.60)	0.99	49447.9	10210.00
19	399.84	389.58	0.60 ( 0.60)	0.99	49949.6	12000.00
20	368.86	455.90	0.60 ( 0.60)	0.99	50518.0	10100.00

TOTAL AREA(ACRES) = 50518.0

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	19.50	0.60 ( 0.59)	0.99	2066.3	40510.00
2	452.74	37.91	0.60 ( 0.59)	0.99	4305.5	31810.00
3	476.37	69.17	0.60 ( 0.59)	0.99	8722.0	40100.00
4	523.14	82.23	0.60 ( 0.59)	0.99	10454.5	11831.00
5	633.45	106.83	0.60 ( 0.60)	0.99	14149.6	11530.00
6	728.07	127.30	0.60 ( 0.60)	0.99	18306.4	11000.00
7	847.22	150.65	0.60 ( 0.60)	0.99	25097.4	10850.00
8	776.68	165.70	0.60 ( 0.60)	0.99	28445.1	11220.00
9	721.73	176.57	0.60 ( 0.60)	0.99	30200.3	10910.00
10	575.70	215.37	0.60 ( 0.60)	0.99	36784.2	12410.00
11	543.30	247.81	0.60 ( 0.59)	0.99	42862.5	12261.00
12	533.10	260.54	0.60 ( 0.59)	0.99	44347.3	10410.00
13	523.01	272.54	0.60 ( 0.59)	0.99	45453.1	12101.10
14	511.45	282.12	0.60 ( 0.59)	0.99	46282.7	10700.00
15	500.20	299.56	0.60 ( 0.59)	0.99	47830.8	10200.00
16	488.39	312.73	0.60 ( 0.59)	0.99	48770.5	12010.00
17	476.93	322.85	0.60 ( 0.60)	0.99	49142.2	10300.00
18	453.08	341.46	0.60 ( 0.60)	0.99	49447.9	10210.00

19 399.84 389.58 0.60( 0.60) 0.99 49949.6 12000.00  
 20 368.86 455.90 0.60( 0.60) 0.99 50518.0 10100.00  
 TOTAL AREA(ACRES) = 50518.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12701.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 286.00 DOWNSTREAM(FEET) = 276.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.19 CHANNEL SLOPE = 0.0079  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.55	0.60	0.889	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 847.31

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.59

AVERAGE FLOW DEPTH(FEET) = 5.73 TRAVEL TIME(MIN.) = 2.44

Tc(MIN.) = 153.09

SUBAREA AREA(ACRES) = 7.55 SUBAREA RUNOFF(CFS) = 0.18

EFFECTIVE AREA(ACRES) = 25104.99 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 50525.6 PEAK FLOW RATE(CFS) = 847.22

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.73 FLOW VELOCITY(FEET/SEC.) = 8.59

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12701.00 = 105865.19 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	22.21	0.727	0.60( 0.59)	0.99	2073.9	40510.00
2	452.74	40.78	0.506	0.60( 0.59)	0.99	4313.0	31810.00
3	476.37	71.99	0.373	0.60( 0.59)	0.99	8729.6	40100.00
4	523.14	84.99	0.347	0.60( 0.59)	0.99	10462.0	11831.00
5	633.45	109.45	0.298	0.60( 0.60)	0.99	14157.2	11530.00
6	728.07	129.84	0.267	0.60( 0.60)	0.99	18313.9	11000.00
7	847.22	153.09	0.244	0.60( 0.60)	0.99	25105.0	10850.00
8	776.68	168.20	0.229	0.60( 0.60)	0.99	28452.6	11220.00
9	721.73	179.11	0.218	0.60( 0.60)	0.99	30207.8	10910.00
10	575.70	218.05	0.204	0.60( 0.60)	0.99	36791.8	12410.00
11	543.30	250.54	0.193	0.60( 0.59)	0.99	42870.1	12261.00
12	533.10	263.28	0.189	0.60( 0.59)	0.99	44354.8	10410.00
13	523.01	275.30	0.185	0.60( 0.59)	0.99	45460.6	12101.10
14	511.45	284.89	0.182	0.60( 0.59)	0.99	46290.2	10700.00
15	500.20	302.35	0.176	0.60( 0.59)	0.99	47838.4	10200.00
16	488.39	315.54	0.172	0.60( 0.59)	0.99	48778.1	12010.00

17 476.93 325.67 0.168 0.60( 0.60) 0.99 49149.7 10300.00  
 18 453.08 344.32 0.162 0.60( 0.60) 0.99 49455.5 10210.00  
 19 399.84 392.53 0.154 0.60( 0.60) 0.99 49957.2 12000.00  
 20 368.86 458.91 0.148 0.60( 0.60) 0.99 50525.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 847.22 Tc(MIN.) = 153.09

AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 25104.99

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 276.00 DOWNSTREAM(FEET) = 275.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 147.65 CHANNEL SLOPE = 0.0068  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.49	0.60	0.972	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.972

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 847.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.11

AVERAGE FLOW DEPTH(FEET) = 5.90 TRAVEL TIME(MIN.) = 0.30

Tc(MIN.) = 153.40

SUBAREA AREA(ACRES) = 1.49 SUBAREA RUNOFF(CFS) = 0.01

EFFECTIVE AREA(ACRES) = 25106.48 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 50527.1 PEAK FLOW RATE(CFS) = 847.22

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.90 FLOW VELOCITY(FEET/SEC.) = 8.11

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	22.55	0.719	0.60( 0.59)	0.99	2075.4	40510.00
2	452.74	41.13	0.504	0.60( 0.59)	0.99	4314.5	31810.00
3	476.37	72.34	0.372	0.60( 0.59)	0.99	8731.1	40100.00
4	523.14	85.33	0.346	0.60( 0.59)	0.99	10463.5	11831.00
5	633.45	109.78	0.297	0.60( 0.60)	0.99	14158.7	11530.00
6	728.07	130.15	0.267	0.60( 0.60)	0.99	18315.4	11000.00
7	847.22	153.40	0.244	0.60( 0.60)	0.99	25106.5	10850.00
8	776.68	168.51	0.228	0.60( 0.60)	0.99	28454.1	11220.00
9	721.73	179.43	0.218	0.60( 0.60)	0.99	30209.3	10910.00
10	575.70	218.39	0.204	0.60( 0.60)	0.99	36793.3	12410.00
11	543.30	250.88	0.193	0.60( 0.59)	0.99	42871.6	12261.00

12	533.10	263.62	0.189	0.60	( 0.59)	0.99	44356.3	10410.00
13	523.01	275.64	0.185	0.60	( 0.59)	0.99	45462.1	12101.10
14	511.45	285.23	0.182	0.60	( 0.59)	0.99	46291.7	10700.00
15	500.20	302.69	0.176	0.60	( 0.59)	0.99	47839.9	10200.00
16	488.39	315.89	0.172	0.60	( 0.59)	0.99	48779.5	12010.00
17	476.93	326.02	0.168	0.60	( 0.60)	0.99	49151.2	10300.00
18	453.08	344.68	0.162	0.60	( 0.60)	0.99	49457.0	10210.00
19	399.84	392.89	0.154	0.60	( 0.60)	0.99	49958.7	12000.00
20	368.86	459.28	0.148	0.60	( 0.60)	0.99	50527.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 847.22 Tc(MIN.) = 153.40  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 25106.48

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 153.40  
 RAINFALL INTENSITY(INCH/HR) = 0.24  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 25106.48  
 TOTAL STREAM AREA(ACRES) = 50527.07  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 847.22

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FLOW PROCESS FROM NODE 12710.00 TO NODE 12711.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.56

ELEVATION DATA: UPSTREAM(FEET) = 940.78 DOWNSTREAM(FEET) = 657.79

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.910

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.009

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"GRASS"	-	6.56	0.60	1.000	0	13.91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 2.42  
 TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 2.42

\*\*\*\*\*

FLOW PROCESS FROM NODE 12711.00 TO NODE 12712.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.79 DOWNSTREAM(FEET) = 585.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 766.00 CHANNEL SLOPE = 0.0942  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.863

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.94	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.72

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.67

AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 3.47

Tc(MIN.) = 17.38

SUBAREA AREA(ACRES) = 26.94 SUBAREA RUNOFF(CFS) = 6.39

EFFECTIVE AREA(ACRES) = 33.50 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 33.5 PEAK FLOW RATE(CFS) = 7.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.81 FLOW VELOCITY(FEET/SEC.) = 4.02

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12712.00 = 1709.56 FEET.

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FLOW PROCESS FROM NODE 12712.00 TO NODE 12713.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 585.63 DOWNSTREAM(FEET) = 463.75

CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.79 CHANNEL SLOPE = 0.1188

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.749

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.73	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.95

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.53

AVERAGE FLOW DEPTH(FEET) = 0.81 TRAVEL TIME(MIN.) = 3.78

Tc(MIN.) = 21.16

SUBAREA AREA(ACRES) = 14.73 SUBAREA RUNOFF(CFS) = 1.98

EFFECTIVE AREA(ACRES) = 48.23 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 48.2 PEAK FLOW RATE(CFS) = 7.95

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 4.41

LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12713.00 = 2735.35 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12713.00 TO NODE 12714.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 463.75 DOWNSTREAM(FEET) = 360.30  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1148.54 CHANNEL SLOPE = 0.0901  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.657  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	105.64	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.01  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.28  
 AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 4.47  
 Tc(MIN.) = 25.63  
 SUBAREA AREA(ACRES) = 105.64 SUBAREA RUNOFF(CFS) = 5.47  
 EFFECTIVE AREA(ACRES) = 153.87 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 153.9 PEAK FLOW RATE(CFS) = 7.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.82 FLOW VELOCITY(FEET/SEC.) = 3.96  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12714.00 = 3883.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 360.30 DOWNSTREAM(FEET) = 275.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1314.99 CHANNEL SLOPE = 0.0649  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.575  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.13	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.97  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.49  
 AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 6.29  
 Tc(MIN.) = 31.92  
 SUBAREA AREA(ACRES) = 127.13 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 281.00 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 281.0 PEAK FLOW RATE(CFS) = 7.97  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 3.49  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12720.00 = 5198.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 31.92  
 RAINFALL INTENSITY(INCH/HR) = 0.58  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 281.00  
 TOTAL STREAM AREA(ACRES) = 281.00  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.97

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	559.72	22.55	0.719	0.60( 0.59)	0.99	2075.4	40510.00
1	452.74	41.13	0.504	0.60( 0.59)	0.99	4314.5	31810.00
1	476.37	72.34	0.372	0.60( 0.59)	0.99	8731.1	40100.00
1	523.14	85.33	0.346	0.60( 0.59)	0.99	10463.5	11831.00
1	633.45	109.78	0.297	0.60( 0.60)	0.99	14158.7	11530.00
1	728.07	130.15	0.267	0.60( 0.60)	0.99	18315.4	11000.00
1	847.22	153.40	0.244	0.60( 0.60)	0.99	25106.5	10850.00
1	776.68	168.51	0.228	0.60( 0.60)	0.99	28454.1	11220.00
1	721.73	179.43	0.218	0.60( 0.60)	0.99	30209.3	10910.00
1	575.70	218.39	0.204	0.60( 0.60)	0.99	36793.3	12410.00
1	543.30	250.88	0.193	0.60( 0.59)	0.99	42871.6	12261.00
1	533.10	263.62	0.189	0.60( 0.59)	0.99	44356.3	10410.00
1	523.01	275.64	0.185	0.60( 0.59)	0.99	45462.1	12101.10
1	511.45	285.23	0.182	0.60( 0.59)	0.99	46291.7	10700.00
1	500.20	302.69	0.176	0.60( 0.59)	0.99	47839.9	10200.00
1	488.39	315.89	0.172	0.60( 0.59)	0.99	48779.5	12010.00
1	476.93	326.02	0.168	0.60( 0.60)	0.99	49151.2	10300.00
1	453.08	344.68	0.162	0.60( 0.60)	0.99	49457.0	10210.00
1	399.84	392.89	0.154	0.60( 0.60)	0.99	49958.7	12000.00
1	368.86	459.28	0.148	0.60( 0.60)	0.99	50527.1	10100.00
2	7.97	31.92	0.575	0.60( 0.60)	1.00	281.0	12710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	566.76	22.55	0.719	0.60( 0.59)	0.99	2273.9	40510.00
2	513.74	31.92	0.575	0.60( 0.59)	0.99	3485.4	12710.00
3	459.71	41.13	0.504	0.60( 0.59)	0.99	4595.5	31810.00
4	481.52	72.34	0.372	0.60( 0.59)	0.99	9012.1	40100.00
5	527.93	85.33	0.346	0.60( 0.60)	0.99	10744.5	11831.00
6	637.57	109.78	0.297	0.60( 0.60)	0.99	14439.7	11530.00

7	731.77	130.15	0.267	0.60	( 0.60)	0.99	18596.4	11000.00
8	850.59	153.40	0.244	0.60	( 0.60)	0.99	25387.5	10850.00
9	779.84	168.51	0.228	0.60	( 0.60)	0.99	28735.1	11220.00
10	724.74	179.43	0.218	0.60	( 0.60)	0.99	30490.3	10910.00
11	578.53	218.39	0.204	0.60	( 0.60)	0.99	37074.3	12410.00
12	545.98	250.88	0.193	0.60	( 0.59)	0.99	43152.6	12261.00
13	535.72	263.62	0.189	0.60	( 0.59)	0.99	44637.3	10410.00
14	525.57	275.64	0.185	0.60	( 0.59)	0.99	45743.1	12101.10
15	513.96	285.23	0.182	0.60	( 0.59)	0.99	46572.7	10700.00
16	502.64	302.69	0.176	0.60	( 0.59)	0.99	48120.9	10200.00
17	490.77	315.89	0.172	0.60	( 0.60)	0.99	49060.5	12010.00
18	479.26	326.02	0.168	0.60	( 0.60)	0.99	49432.2	10300.00
19	455.32	344.68	0.162	0.60	( 0.60)	0.99	49738.0	10210.00
20	401.97	392.89	0.154	0.60	( 0.60)	0.99	50239.7	12000.00
21	370.92	459.28	0.148	0.60	( 0.60)	0.99	50808.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 850.59 Tc(MIN.) = 153.40  
EFFECTIVE AREA(ACRES) = 25387.48 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 50808.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610316T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.75	40.03	0.60( 0.59)	0.98	231.4	31600.00
TOTAL AREA(ACRES) =						231.4

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	566.76	22.55	0.719	0.60( 0.59)	0.99	2273.9	40510.00
2	513.74	31.92	0.575	0.60( 0.59)	0.99	3485.4	12710.00
3	459.71	41.13	0.504	0.60( 0.59)	0.99	4595.5	31810.00
4	481.52	72.34	0.372	0.60( 0.59)	0.99	9012.1	40100.00
5	527.93	85.33	0.346	0.60( 0.60)	0.99	10744.5	11831.00
6	637.57	109.78	0.297	0.60( 0.60)	0.99	14439.7	11530.00
7	731.77	130.15	0.267	0.60( 0.60)	0.99	18596.4	11000.00

8	850.59	153.40	0.244	0.60	( 0.60)	0.99	25387.5	10850.00
9	779.84	168.51	0.228	0.60	( 0.60)	0.99	28735.1	11220.00
10	724.74	179.43	0.218	0.60	( 0.60)	0.99	30490.3	10910.00
11	578.53	218.39	0.204	0.60	( 0.60)	0.99	37074.3	12410.00
12	545.98	250.88	0.193	0.60	( 0.59)	0.99	43152.6	12261.00
13	535.72	263.62	0.189	0.60	( 0.59)	0.99	44637.3	10410.00
14	525.57	275.64	0.185	0.60	( 0.59)	0.99	45743.1	12101.10
15	513.96	285.23	0.182	0.60	( 0.59)	0.99	46572.7	10700.00
16	502.64	302.69	0.176	0.60	( 0.59)	0.99	48120.9	10200.00
17	490.77	315.89	0.172	0.60	( 0.60)	0.99	49060.5	12010.00
18	479.26	326.02	0.168	0.60	( 0.60)	0.99	49432.2	10300.00
19	455.32	344.68	0.162	0.60	( 0.60)	0.99	49738.0	10210.00
20	401.97	392.89	0.154	0.60	( 0.60)	0.99	50239.7	12000.00
21	370.92	459.28	0.148	0.60	( 0.60)	0.99	50808.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.75	40.03	0.510	0.60( 0.59)	0.98	231.4	31600.00

LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	574.51	22.55	0.719	0.60( 0.59)	0.99	2404.2	40510.00
2	522.52	31.92	0.575	0.60( 0.59)	0.99	3669.9	12710.00
3	475.90	40.03	0.510	0.60( 0.59)	0.99	4694.6	31600.00
4	469.34	41.13	0.504	0.60( 0.59)	0.99	4826.9	31810.00
5	488.64	72.34	0.372	0.60( 0.59)	0.99	9243.5	40100.00
6	534.55	85.33	0.346	0.60( 0.59)	0.99	10975.9	11831.00
7	643.26	109.78	0.297	0.60( 0.60)	0.99	14671.0	11530.00
8	736.87	130.15	0.267	0.60( 0.60)	0.99	18827.8	11000.00
9	855.25	153.40	0.244	0.60( 0.60)	0.99	25618.9	10850.00
10	784.21	168.51	0.228	0.60( 0.60)	0.99	28966.5	11220.00
11	728.90	179.43	0.218	0.60( 0.60)	0.99	30721.7	10910.00
12	582.43	218.39	0.204	0.60( 0.60)	0.99	37305.7	12410.00
13	549.68	250.88	0.193	0.60( 0.59)	0.99	43384.0	12261.00
14	539.34	263.62	0.189	0.60( 0.59)	0.99	44868.7	10410.00
15	529.11	275.64	0.185	0.60( 0.59)	0.99	45974.5	12101.10
16	517.44	285.23	0.182	0.60( 0.59)	0.99	46804.1	10700.00
17	506.00	302.69	0.176	0.60( 0.59)	0.99	48352.3	10200.00
18	494.06	315.89	0.172	0.60( 0.59)	0.99	49291.9	12010.00
19	482.48	326.02	0.168	0.60( 0.60)	0.99	49663.6	10300.00
20	458.42	344.68	0.162	0.60( 0.60)	0.99	49969.3	10210.00
21	404.92	392.89	0.154	0.60( 0.60)	0.99	50471.1	12000.00
22	373.75	459.28	0.148	0.60( 0.60)	0.99	51039.5	10100.00

TOTAL AREA(ACRES) = 51039.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 855.25 Tc(MIN.) = 153.398  
EFFECTIVE AREA(ACRES) = 25618.87 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 51039.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.50 IS CODE = 51



-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 258.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2669.21 CHANNEL SLOPE = 0.0064  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 855.25  
FLOW VELOCITY(FEET/SEC.) = 7.94 FLOW DEPTH(FEET) = 5.99  
TRAVEL TIME(MIN.) = 5.61 Tc(MIN.) = 159.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	574.51	28.74	0.610	0.60( 0.59)	0.99	2404.2	40510.00
2	522.52	38.27	0.524	0.60( 0.59)	0.99	3669.9	12710.00
3	475.90	46.52	0.473	0.60( 0.59)	0.99	4694.6	31600.00
4	469.34	47.65	0.466	0.60( 0.59)	0.99	4826.9	31810.00
5	488.64	78.78	0.359	0.60( 0.59)	0.99	9243.5	40100.00
6	534.55	91.64	0.334	0.60( 0.59)	0.99	10975.9	11831.00
7	643.26	115.81	0.285	0.60( 0.60)	0.99	14671.0	11530.00
8	736.87	135.97	0.261	0.60( 0.60)	0.99	18827.8	11000.00
9	855.25	159.00	0.238	0.60( 0.60)	0.99	25618.9	10850.00
10	784.21	174.24	0.223	0.60( 0.60)	0.99	28966.5	11220.00
11	728.90	185.26	0.215	0.60( 0.60)	0.99	30721.7	10910.00
12	582.43	224.56	0.202	0.60( 0.60)	0.99	37305.7	12410.00
13	549.68	257.14	0.191	0.60( 0.59)	0.99	43384.0	12261.00
14	539.34	269.91	0.187	0.60( 0.59)	0.99	44868.7	10410.00
15	529.11	281.97	0.183	0.60( 0.59)	0.99	45974.5	12101.10
16	517.44	291.59	0.180	0.60( 0.59)	0.99	46804.1	10700.00
17	506.00	309.09	0.174	0.60( 0.59)	0.99	48352.3	10200.00
18	494.06	322.32	0.170	0.60( 0.59)	0.99	49291.9	12010.00
19	482.48	332.49	0.166	0.60( 0.60)	0.99	49663.6	10300.00
20	458.42	351.22	0.160	0.60( 0.60)	0.99	49969.3	10210.00
21	404.92	399.65	0.154	0.60( 0.60)	0.99	50471.1	12000.00
22	373.75	466.19	0.148	0.60( 0.60)	0.99	51039.5	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 855.25 Tc(MIN.) = 159.00  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 25618.87

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610315T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 6.20 34.15 0.60( 0.50) 0.83 68.1 31500.00  
TOTAL AREA(ACRES) = 68.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	574.51	28.74	0.610	0.60( 0.59)	0.99	2404.2	40510.00
2	522.52	38.27	0.524	0.60( 0.59)	0.99	3669.9	12710.00
3	475.90	46.52	0.473	0.60( 0.59)	0.99	4694.6	31600.00
4	469.34	47.65	0.466	0.60( 0.59)	0.99	4826.9	31810.00
5	488.64	78.78	0.359	0.60( 0.59)	0.99	9243.5	40100.00
6	534.55	91.64	0.334	0.60( 0.59)	0.99	10975.9	11831.00
7	643.26	115.81	0.285	0.60( 0.60)	0.99	14671.0	11530.00
8	736.87	135.97	0.261	0.60( 0.60)	0.99	18827.8	11000.00
9	855.25	159.00	0.238	0.60( 0.60)	0.99	25618.9	10850.00
10	784.21	174.24	0.223	0.60( 0.60)	0.99	28966.5	11220.00
11	728.90	185.26	0.215	0.60( 0.60)	0.99	30721.7	10910.00
12	582.43	224.56	0.202	0.60( 0.60)	0.99	37305.7	12410.00
13	549.68	257.14	0.191	0.60( 0.59)	0.99	43384.0	12261.00
14	539.34	269.91	0.187	0.60( 0.59)	0.99	44868.7	10410.00
15	529.11	281.97	0.183	0.60( 0.59)	0.99	45974.5	12101.10
16	517.44	291.59	0.180	0.60( 0.59)	0.99	46804.1	10700.00
17	506.00	309.09	0.174	0.60( 0.59)	0.99	48352.3	10200.00
18	494.06	322.32	0.170	0.60( 0.59)	0.99	49291.9	12010.00
19	482.48	332.49	0.166	0.60( 0.60)	0.99	49663.6	10300.00
20	458.42	351.22	0.160	0.60( 0.60)	0.99	49969.3	10210.00
21	404.92	399.65	0.154	0.60( 0.60)	0.99	50471.1	12000.00
22	373.75	466.19	0.148	0.60( 0.60)	0.99	51039.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.20	34.15	0.557	0.60( 0.50)	0.83	68.1	31500.00

LONGEST FLOWPATH FROM NODE 31500.00 TO NODE 12720.50 = 4043.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	28.74	0.610	0.60( 0.59)	0.99	2461.5	40510.00
2	551.19	34.15	0.557	0.60( 0.59)	0.99	3191.1	31500.00
3	528.35	38.27	0.524	0.60( 0.59)	0.99	3738.0	12710.00
4	481.16	46.52	0.473	0.60( 0.59)	0.99	4762.7	31600.00
5	474.53	47.65	0.466	0.60( 0.59)	0.99	4895.0	31810.00
6	492.64	78.78	0.359	0.60( 0.59)	0.99	9311.5	40100.00
7	538.27	91.64	0.334	0.60( 0.59)	0.99	11044.0	11831.00
8	646.43	115.81	0.285	0.60( 0.59)	0.99	14739.1	11530.00
9	739.77	135.97	0.261	0.60( 0.60)	0.99	18895.9	11000.00
10	857.90	159.00	0.238	0.60( 0.60)	0.99	25687.0	10850.00
11	786.69	174.24	0.223	0.60( 0.60)	0.99	29034.6	11220.00
12	731.30	185.26	0.215	0.60( 0.60)	0.99	30789.8	10910.00
13	584.68	224.56	0.202	0.60( 0.60)	0.99	37373.8	12410.00

14	551.81	257.14	0.191	0.60	( 0.59)	0.99	43452.1	12261.00
15	541.42	269.91	0.187	0.60	( 0.59)	0.99	44936.8	10410.00
16	531.14	281.97	0.183	0.60	( 0.59)	0.99	46042.6	12101.10
17	519.44	291.59	0.180	0.60	( 0.59)	0.99	46872.2	10700.00
18	507.94	309.09	0.174	0.60	( 0.59)	0.99	48420.4	10200.00
19	495.94	322.32	0.170	0.60	( 0.59)	0.99	49360.0	12010.00
20	484.33	332.49	0.166	0.60	( 0.59)	0.99	49731.7	10300.00
21	460.20	351.22	0.160	0.60	( 0.59)	0.99	50037.4	10210.00
22	406.62	399.65	0.154	0.60	( 0.59)	0.99	50539.2	12000.00
23	375.39	466.19	0.148	0.60	( 0.60)	0.99	51107.6	10100.00

TOTAL AREA (ACRES) = 51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 857.90 Tc (MIN.) = 159.004  
EFFECTIVE AREA (ACRES) = 25686.97 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 51107.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

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FLOW PROCESS FROM NODE 12720.50 TO NODE 12721.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 258.00 DOWNSTREAM (FEET) = 256.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 438.77 CHANNEL SLOPE = 0.0046  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.237

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.15	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 857.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.00  
AVERAGE FLOW DEPTH (FEET) = 6.39 TRAVEL TIME (MIN.) = 1.04  
Tc (MIN.) = 160.05  
SUBAREA AREA (ACRES) = 62.15 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 25749.12 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 51169.7 PEAK FLOW RATE (CFS) = 857.90  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.39 FLOW VELOCITY (FEET/SEC.) = 7.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12721.00 = 109120.82 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	29.89	0.593	0.60 ( 0.59)	0.99	2523.7	40510.00

2	551.19	35.31	0.548	0.60	( 0.59)	0.99	3253.2	31500.00
3	528.35	39.44	0.515	0.60	( 0.59)	0.99	3800.2	12710.00
4	481.16	47.73	0.466	0.60	( 0.59)	0.99	4824.9	31600.00
5	474.53	48.86	0.460	0.60	( 0.59)	0.99	4957.2	31810.00
6	492.64	79.98	0.357	0.60	( 0.59)	0.99	9373.7	40100.00
7	538.27	92.81	0.331	0.60	( 0.59)	0.99	11106.2	11831.00
8	646.43	116.93	0.283	0.60	( 0.59)	0.99	14801.3	11530.00
9	739.77	137.05	0.260	0.60	( 0.60)	0.99	18958.0	11000.00
10	857.90	160.05	0.237	0.60	( 0.60)	0.99	25749.1	10850.00
11	786.69	175.30	0.222	0.60	( 0.60)	0.99	29096.8	11220.00
12	731.30	186.34	0.215	0.60	( 0.60)	0.99	30852.0	10910.00
13	584.68	225.71	0.202	0.60	( 0.60)	0.99	37435.9	12410.00
14	551.81	258.31	0.191	0.60	( 0.59)	0.99	43514.2	12261.00
15	541.42	271.08	0.187	0.60	( 0.59)	0.99	44999.0	10410.00
16	531.14	283.15	0.183	0.60	( 0.59)	0.99	46104.7	12101.10
17	519.44	292.77	0.179	0.60	( 0.59)	0.99	46934.4	10700.00
18	507.94	310.28	0.174	0.60	( 0.59)	0.99	48482.5	10200.00
19	495.94	323.52	0.169	0.60	( 0.59)	0.99	49422.2	12010.00
20	484.33	333.69	0.166	0.60	( 0.59)	0.99	49793.9	10300.00
21	460.20	352.45	0.160	0.60	( 0.59)	0.99	50099.6	10210.00
22	406.62	400.91	0.153	0.60	( 0.59)	0.99	50601.3	12000.00
23	375.39	467.47	0.148	0.60	( 0.60)	0.99	51169.7	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 857.90 Tc (MIN.) = 160.05  
AREA-AVERAGED Fm (INCH/HR) = 0.60 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 25749.12

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FLOW PROCESS FROM NODE 12721.00 TO NODE 12722.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 256.00 DOWNSTREAM (FEET) = 255.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 830.42 CHANNEL SLOPE = 0.0012  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.234

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.24	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 857.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.25  
AVERAGE FLOW DEPTH (FEET) = 8.20 TRAVEL TIME (MIN.) = 3.25  
Tc (MIN.) = 163.30  
SUBAREA AREA (ACRES) = 11.24 SUBAREA RUNOFF (CFS) = 0.00  
EFFECTIVE AREA (ACRES) = 25760.36 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 51180.9 PEAK FLOW RATE (CFS) = 857.90  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.20 FLOW VELOCITY(FEET/SEC.) = 4.25  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	33.48	0.563	0.60 ( 0.59)	0.99	2534.9	40510.00
2	551.19	38.95	0.518	0.60 ( 0.59)	0.99	3264.5	31500.00
3	528.35	43.12	0.492	0.60 ( 0.59)	0.99	3811.4	12710.00
4	481.16	51.49	0.445	0.60 ( 0.59)	0.99	4836.1	31600.00
5	474.53	52.63	0.438	0.60 ( 0.59)	0.99	4968.4	31810.00
6	492.64	83.73	0.350	0.60 ( 0.59)	0.99	9384.9	40100.00
7	538.27	96.47	0.324	0.60 ( 0.59)	0.99	11117.4	11831.00
8	646.43	120.42	0.277	0.60 ( 0.59)	0.99	14812.5	11530.00
9	739.77	140.43	0.257	0.60 ( 0.60)	0.99	18969.3	11000.00
10	857.90	163.30	0.234	0.60 ( 0.60)	0.99	25760.4	10850.00
11	786.69	178.63	0.218	0.60 ( 0.60)	0.99	29108.0	11220.00
12	731.30	189.73	0.214	0.60 ( 0.60)	0.99	30863.2	10910.00
13	584.68	229.29	0.201	0.60 ( 0.60)	0.99	37447.2	12410.00
14	551.81	261.94	0.190	0.60 ( 0.59)	0.99	43525.4	12261.00
15	541.42	274.73	0.185	0.60 ( 0.59)	0.99	45010.2	10410.00
16	531.14	286.82	0.181	0.60 ( 0.59)	0.99	46116.0	12101.10
17	519.44	296.46	0.178	0.60 ( 0.59)	0.99	46945.6	10700.00
18	507.94	313.99	0.172	0.60 ( 0.59)	0.99	48493.8	10200.00
19	495.94	327.25	0.168	0.60 ( 0.59)	0.99	49433.4	12010.00
20	484.33	337.44	0.165	0.60 ( 0.59)	0.99	49805.1	10300.00
21	460.20	356.25	0.158	0.60 ( 0.59)	0.99	50110.8	10210.00
22	406.62	404.83	0.153	0.60 ( 0.59)	0.99	50612.5	12000.00
23	375.39	471.47	0.147	0.60 ( 0.60)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 857.90 Tc(MIN.) = 163.30  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 25760.36

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FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610314T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.13	72.18	0.60 ( 0.59)	0.99	497.2	31400.00
TOTAL AREA(ACRES) = 497.2						

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FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	580.68	33.48	0.563	0.60 ( 0.59)	0.99	2534.9	40510.00
2	551.19	38.95	0.518	0.60 ( 0.59)	0.99	3264.5	31500.00

3	528.35	43.12	0.492	0.60 ( 0.59)	0.99	3811.4	12710.00
4	481.16	51.49	0.445	0.60 ( 0.59)	0.99	4836.1	31600.00
5	474.53	52.63	0.438	0.60 ( 0.59)	0.99	4968.4	31810.00
6	492.64	83.73	0.350	0.60 ( 0.59)	0.99	9384.9	40100.00
7	538.27	96.47	0.324	0.60 ( 0.59)	0.99	11117.4	11831.00
8	646.43	120.42	0.277	0.60 ( 0.59)	0.99	14812.5	11530.00
9	739.77	140.43	0.257	0.60 ( 0.60)	0.99	18969.3	11000.00
10	857.90	163.30	0.234	0.60 ( 0.60)	0.99	25760.4	10850.00
11	786.69	178.63	0.218	0.60 ( 0.60)	0.99	29108.0	11220.00
12	731.30	189.73	0.214	0.60 ( 0.60)	0.99	30863.2	10910.00
13	584.68	229.29	0.201	0.60 ( 0.60)	0.99	37447.2	12410.00
14	551.81	261.94	0.190	0.60 ( 0.59)	0.99	43525.4	12261.00
15	541.42	274.73	0.185	0.60 ( 0.59)	0.99	45010.2	10410.00
16	531.14	286.82	0.181	0.60 ( 0.59)	0.99	46116.0	12101.10
17	519.44	296.46	0.178	0.60 ( 0.59)	0.99	46945.6	10700.00
18	507.94	313.99	0.172	0.60 ( 0.59)	0.99	48493.8	10200.00
19	495.94	327.25	0.168	0.60 ( 0.59)	0.99	49433.4	12010.00
20	484.33	337.44	0.165	0.60 ( 0.59)	0.99	49805.1	10300.00
21	460.20	356.25	0.158	0.60 ( 0.59)	0.99	50110.8	10210.00
22	406.62	404.83	0.153	0.60 ( 0.59)	0.99	50612.5	12000.00
23	375.39	471.47	0.147	0.60 ( 0.60)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.13	72.18	0.373	0.60 ( 0.59)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	587.78	33.48	0.563	0.60 ( 0.59)	0.99	2765.5	40510.00
2	558.79	38.95	0.518	0.60 ( 0.59)	0.99	3532.8	31500.00
3	536.34	43.12	0.492	0.60 ( 0.59)	0.99	4108.4	12710.00
4	489.78	51.49	0.445	0.60 ( 0.59)	0.99	5190.8	31600.00
5	483.21	52.63	0.438	0.60 ( 0.59)	0.99	5330.9	31810.00
6	496.04	72.18	0.373	0.60 ( 0.59)	0.99	8242.3	31400.00
7	502.14	83.73	0.350	0.60 ( 0.59)	0.99	9882.1	40100.00
8	547.07	96.47	0.324	0.60 ( 0.59)	0.99	11614.6	11831.00
9	653.95	120.42	0.277	0.60 ( 0.59)	0.99	15309.7	11530.00
10	746.74	140.43	0.257	0.60 ( 0.60)	0.99	19466.5	11000.00
11	864.25	163.30	0.234	0.60 ( 0.60)	0.99	26257.6	10850.00
12	792.62	178.63	0.218	0.60 ( 0.60)	0.99	29605.2	11220.00
13	737.11	189.73	0.214	0.60 ( 0.60)	0.99	31360.4	10910.00
14	590.13	229.29	0.201	0.60 ( 0.60)	0.99	37944.4	12410.00
15	556.96	261.94	0.190	0.60 ( 0.59)	0.99	44022.6	12261.00
16	546.46	274.73	0.185	0.60 ( 0.59)	0.99	45507.4	10410.00
17	536.07	286.82	0.181	0.60 ( 0.59)	0.99	46613.2	12101.10
18	524.29	296.46	0.178	0.60 ( 0.59)	0.99	47442.8	10700.00
19	512.62	313.99	0.172	0.60 ( 0.59)	0.99	48991.0	10200.00
20	500.50	327.25	0.168	0.60 ( 0.59)	0.99	49930.6	12010.00
21	488.80	337.44	0.165	0.60 ( 0.59)	0.99	50302.3	10300.00
22	464.50	356.25	0.158	0.60 ( 0.59)	0.99	50608.0	10210.00
23	410.78	404.83	0.153	0.60 ( 0.59)	0.99	51109.7	12000.00
24	379.39	471.47	0.147	0.60 ( 0.60)	0.99	51678.1	10100.00

TOTAL AREA(ACRES) = 51678.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 864.25 Tc(MIN.) = 163.302  
 EFFECTIVE AREA(ACRES) = 26257.56 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51678.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 255.00 DOWNSTREAM(FEET) = 252.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 624.00 CHANNEL SLOPE = 0.0046  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.232

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.42	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 864.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.07

AVERAGE FLOW DEPTH(FEET) = 6.38 TRAVEL TIME(MIN.) = 1.47

Tc(MIN.) = 164.77

SUBAREA AREA(ACRES) = 62.42 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 26319.98 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 51740.6 PEAK FLOW RATE(CFS) = 864.25

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.38 FLOW VELOCITY(FEET/SEC.) = 7.07

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	587.78	35.10	0.550	0.60( 0.59)	0.99	2828.0	40510.00
2	558.79	40.59	0.507	0.60( 0.59)	0.99	3595.2	31500.00
3	536.34	44.78	0.483	0.60( 0.59)	0.99	4170.9	12710.00
4	489.78	53.19	0.435	0.60( 0.59)	0.99	5253.3	31600.00
5	483.21	54.33	0.429	0.60( 0.59)	0.99	5393.4	31810.00
6	496.04	73.87	0.369	0.60( 0.59)	0.99	8304.8	31400.00
7	502.14	85.41	0.346	0.60( 0.59)	0.99	9944.6	40100.00
8	547.07	98.12	0.321	0.60( 0.59)	0.99	11677.0	11831.00
9	653.95	122.00	0.275	0.60( 0.59)	0.99	15372.2	11530.00
10	746.74	141.96	0.255	0.60( 0.60)	0.99	19528.9	11000.00
11	864.25	164.77	0.232	0.60( 0.60)	0.99	26320.0	10850.00
12	792.62	180.14	0.217	0.60( 0.60)	0.99	29667.6	11220.00
13	737.11	191.26	0.213	0.60( 0.60)	0.99	31422.8	10910.00

14	590.13	230.91	0.200	0.60( 0.60)	0.99	38006.8	12410.00
15	556.96	263.58	0.189	0.60( 0.59)	0.99	44085.1	12261.00
16	546.46	276.38	0.185	0.60( 0.59)	0.99	45569.8	10410.00
17	536.07	288.48	0.181	0.60( 0.59)	0.99	46675.6	12101.10
18	524.29	298.13	0.178	0.60( 0.59)	0.99	47505.2	10700.00
19	512.62	315.67	0.172	0.60( 0.59)	0.99	49053.4	10200.00
20	500.50	328.94	0.167	0.60( 0.59)	0.99	49993.0	12010.00
21	488.80	339.14	0.164	0.60( 0.59)	0.99	50364.7	10300.00
22	464.50	357.97	0.158	0.60( 0.59)	0.99	50670.4	10210.00
23	410.78	406.61	0.153	0.60( 0.59)	0.99	51172.2	12000.00
24	379.39	473.28	0.147	0.60( 0.60)	0.99	51740.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 864.25 Tc(MIN.) = 164.77  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 26319.98

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 164.77

RAINFALL INTENSITY(INCH/HR) = 0.23

AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.99

EFFECTIVE STREAM AREA(ACRES) = 26319.98

TOTAL STREAM AREA(ACRES) = 51740.56

PEAK FLOW RATE(CFS) AT CONFLUENCE = 864.25

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12730.00 TO NODE 12731.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 561.54

ELEVATION DATA: UPSTREAM(FEET) = 613.29 DOWNSTREAM(FEET) = 551.75

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.823

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.014

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	6.33	0.60	1.000	0	13.82

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.36

TOTAL AREA(ACRES) = 6.33 PEAK FLOW RATE(CFS) = 2.36

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12731.00 TO NODE 12732.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 551.75 DOWNSTREAM(FEET) = 494.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 971.91 CHANNEL SLOPE = 0.0590
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.809
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.62 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.14
AVERAGE FLOW DEPTH(FEET) = 0.79 TRAVEL TIME(MIN.) = 5.17
Tc(MIN.) = 18.99
SUBAREA AREA(ACRES) = 34.62 SUBAREA RUNOFF(CFS) = 6.50
EFFECTIVE AREA(ACRES) = 40.95 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 40.9 PEAK FLOW RATE(CFS) = 7.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 3.35
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12732.00 = 1533.45 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12732.00 TO NODE 12733.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 494.40 DOWNSTREAM(FEET) = 431.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1156.41 CHANNEL SLOPE = 0.0548
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.677
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 59.52 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.47
AVERAGE FLOW DEPTH(FEET) = 0.98 TRAVEL TIME(MIN.) = 5.56
Tc(MIN.) = 24.55
SUBAREA AREA(ACRES) = 59.52 SUBAREA RUNOFF(CFS) = 4.12
EFFECTIVE AREA(ACRES) = 100.47 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 100.5 PEAK FLOW RATE(CFS) = 7.69

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.89 FLOW VELOCITY(FEET/SEC.) = 3.25
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12733.00 = 2689.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12733.00 TO NODE 12734.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 431.00 DOWNSTREAM(FEET) = 367.11
CHANNEL LENGTH THRU SUBAREA(FEET) = 1654.48 CHANNEL SLOPE = 0.0386
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.557
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 64.05 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.69
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.85
AVERAGE FLOW DEPTH(FEET) = 0.95 TRAVEL TIME(MIN.) = 9.68
Tc(MIN.) = 34.23
SUBAREA AREA(ACRES) = 64.05 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 164.52 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 164.5 PEAK FLOW RATE(CFS) = 7.69
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 2.85
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12734.00 = 4344.34 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 367.11 DOWNSTREAM(FEET) = 252.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.98 CHANNEL SLOPE = 0.0611
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.491
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 26.02 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.69
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.41
AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 9.19
Tc(MIN.) = 43.42
SUBAREA AREA(ACRES) = 26.02 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 190.54 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 190.5 PEAK FLOW RATE(CFS) = 7.69  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 3.41  
 LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 43.42  
 RAINFALL INTENSITY(INCH/HR) = 0.49  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 190.54  
 TOTAL STREAM AREA(ACRES) = 190.54  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.69

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	587.78	35.10	0.550	0.60( 0.59)	0.99	2828.0	40510.00
1	558.79	40.59	0.507	0.60( 0.59)	0.99	3595.2	31500.00
1	536.34	44.78	0.483	0.60( 0.59)	0.99	4170.9	12710.00
1	489.78	53.19	0.435	0.60( 0.59)	0.99	5253.3	31600.00
1	483.21	54.33	0.429	0.60( 0.59)	0.99	5393.4	31810.00
1	496.04	73.87	0.369	0.60( 0.59)	0.99	8304.8	31400.00
1	502.14	85.41	0.346	0.60( 0.59)	0.99	9944.6	40100.00
1	547.07	98.12	0.321	0.60( 0.59)	0.99	11677.0	11831.00
1	653.95	122.00	0.275	0.60( 0.59)	0.99	15372.2	11530.00
1	746.74	141.96	0.255	0.60( 0.60)	0.99	19528.9	11000.00
1	864.25	164.77	0.232	0.60( 0.60)	0.99	26320.0	10850.00
1	792.62	180.14	0.217	0.60( 0.60)	0.99	29667.6	11220.00
1	737.11	191.26	0.213	0.60( 0.60)	0.99	31422.8	10910.00
1	590.13	230.91	0.200	0.60( 0.60)	0.99	38006.8	12410.00
1	556.96	263.58	0.189	0.60( 0.59)	0.99	44085.1	12261.00
1	546.46	276.38	0.185	0.60( 0.59)	0.99	45569.8	10410.00
1	536.07	288.48	0.181	0.60( 0.59)	0.99	46675.6	12101.10
1	524.29	298.13	0.178	0.60( 0.59)	0.99	47505.2	10700.00
1	512.62	315.67	0.172	0.60( 0.59)	0.99	49053.4	10200.00
1	500.50	328.94	0.167	0.60( 0.59)	0.99	49993.0	12010.00
1	488.80	339.14	0.164	0.60( 0.59)	0.99	50364.7	10300.00
1	464.50	357.97	0.158	0.60( 0.59)	0.99	50670.4	10210.00
1	410.78	406.61	0.153	0.60( 0.59)	0.99	51172.2	12000.00
1	379.39	473.28	0.147	0.60( 0.60)	0.99	51740.6	10100.00
2	7.69	43.42	0.491	0.60( 0.60)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	594.74	35.10	0.550	0.60( 0.59)	0.99	2982.0	40510.00
2	566.22	40.59	0.507	0.60( 0.59)	0.99	3773.3	31500.00
3	551.33	43.42	0.491	0.60( 0.59)	0.99	4174.3	12730.00
4	543.91	44.78	0.483	0.60( 0.59)	0.99	4361.4	12710.00
5	496.60	53.19	0.435	0.60( 0.59)	0.99	5443.8	31600.00
6	489.94	54.33	0.429	0.60( 0.59)	0.99	5583.9	31810.00
7	501.83	73.87	0.369	0.60( 0.59)	0.99	8495.3	31400.00
8	507.57	85.41	0.346	0.60( 0.59)	0.99	10135.1	40100.00
9	552.10	98.12	0.321	0.60( 0.59)	0.99	11867.6	11831.00
10	658.26	122.00	0.275	0.60( 0.59)	0.99	15562.7	11530.00
11	750.74	141.96	0.255	0.60( 0.60)	0.99	19719.4	11000.00
12	867.89	164.77	0.232	0.60( 0.60)	0.99	26510.5	10850.00
13	796.02	180.14	0.217	0.60( 0.60)	0.99	29858.1	11220.00
14	740.45	191.26	0.213	0.60( 0.60)	0.99	31613.4	10910.00
15	593.27	230.91	0.200	0.60( 0.60)	0.99	38197.3	12410.00
16	559.93	263.58	0.189	0.60( 0.59)	0.99	44275.6	12261.00
17	549.36	276.38	0.185	0.60( 0.59)	0.99	45760.4	10410.00
18	538.91	288.48	0.181	0.60( 0.59)	0.99	46866.1	12101.10
19	527.07	298.13	0.178	0.60( 0.59)	0.99	47695.8	10700.00
20	515.32	315.67	0.172	0.60( 0.59)	0.99	49243.9	10200.00
21	503.13	328.94	0.167	0.60( 0.59)	0.99	50183.6	12010.00
22	491.37	339.14	0.164	0.60( 0.59)	0.99	50555.3	10300.00
23	466.97	357.97	0.158	0.60( 0.59)	0.99	50861.0	10210.00
24	413.18	406.61	0.153	0.60( 0.59)	0.99	51362.7	12000.00
25	381.70	473.28	0.147	0.60( 0.60)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 867.89 Tc(MIN.) = 164.77  
 EFFECTIVE AREA(ACRES) = 26510.52 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51931.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

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 FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 867.89  
 FLOW VELOCITY(FEET/SEC.) = 10.31 FLOW DEPTH(FEET) = 5.30  
 TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 165.42  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	594.74	35.81	0.544	0.60( 0.59)	0.99	2982.0	40510.00
2	566.22	41.31	0.503	0.60( 0.59)	0.99	3773.3	31500.00

3	551.33	44.14	0.486	0.60	(0.59)	0.99	4174.3	12730.00
4	543.91	45.51	0.479	0.60	(0.59)	0.99	4361.4	12710.00
5	496.60	53.93	0.431	0.60	(0.59)	0.99	5443.8	31600.00
6	489.94	55.08	0.425	0.60	(0.59)	0.99	5583.9	31810.00
7	501.83	74.61	0.368	0.60	(0.59)	0.99	8495.3	31400.00
8	507.57	86.15	0.345	0.60	(0.59)	0.99	10135.1	40100.00
9	552.10	98.84	0.319	0.60	(0.59)	0.99	11867.6	11831.00
10	658.26	122.69	0.274	0.60	(0.59)	0.99	15562.7	11530.00
11	750.74	142.63	0.254	0.60	(0.60)	0.99	19719.4	11000.00
12	867.89	165.42	0.232	0.60	(0.60)	0.99	26510.5	10850.00
13	796.02	180.80	0.217	0.60	(0.60)	0.99	29858.1	11220.00
14	740.45	191.94	0.213	0.60	(0.60)	0.99	31613.4	10910.00
15	593.27	231.62	0.200	0.60	(0.60)	0.99	38197.3	12410.00
16	559.93	264.31	0.189	0.60	(0.59)	0.99	44275.6	12261.00
17	549.36	277.11	0.185	0.60	(0.59)	0.99	45760.4	10410.00
18	538.91	289.21	0.181	0.60	(0.59)	0.99	46866.1	12101.10
19	527.07	298.86	0.177	0.60	(0.59)	0.99	47695.8	10700.00
20	515.32	316.41	0.172	0.60	(0.59)	0.99	49243.9	10200.00
21	503.13	329.68	0.167	0.60	(0.59)	0.99	50183.6	12010.00
22	491.37	339.89	0.164	0.60	(0.59)	0.99	50555.3	10300.00
23	466.97	358.73	0.157	0.60	(0.59)	0.99	50861.0	10210.00
24	413.18	407.39	0.153	0.60	(0.59)	0.99	51362.7	12000.00
25	381.70	474.08	0.147	0.60	(0.60)	0.99	51931.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 867.89 Tc(MIN.) = 165.42  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 26510.52

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610313T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.76	33.47	0.60 (0.58)	0.97	132.0	31300.00
TOTAL AREA(ACRES) =						132.0

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	594.74	35.81	0.544	0.60 (0.59)	0.99	2982.0	40510.00
2	566.22	41.31	0.503	0.60 (0.59)	0.99	3773.3	31500.00
3	551.33	44.14	0.486	0.60 (0.59)	0.99	4174.3	12730.00

4	543.91	45.51	0.479	0.60	(0.59)	0.99	4361.4	12710.00
5	496.60	53.93	0.431	0.60	(0.59)	0.99	5443.8	31600.00
6	489.94	55.08	0.425	0.60	(0.59)	0.99	5583.9	31810.00
7	501.83	74.61	0.368	0.60	(0.59)	0.99	8495.3	31400.00
8	507.57	86.15	0.345	0.60	(0.59)	0.99	10135.1	40100.00
9	552.10	98.84	0.319	0.60	(0.59)	0.99	11867.6	11831.00
10	658.26	122.69	0.274	0.60	(0.59)	0.99	15562.7	11530.00
11	750.74	142.63	0.254	0.60	(0.60)	0.99	19719.4	11000.00
12	867.89	165.42	0.232	0.60	(0.60)	0.99	26510.5	10850.00
13	796.02	180.80	0.217	0.60	(0.60)	0.99	29858.1	11220.00
14	740.45	191.94	0.213	0.60	(0.60)	0.99	31613.4	10910.00
15	593.27	231.62	0.200	0.60	(0.60)	0.99	38197.3	12410.00
16	559.93	264.31	0.189	0.60	(0.59)	0.99	44275.6	12261.00
17	549.36	277.11	0.185	0.60	(0.59)	0.99	45760.4	10410.00
18	538.91	289.21	0.181	0.60	(0.59)	0.99	46866.1	12101.10
19	527.07	298.86	0.177	0.60	(0.59)	0.99	47695.8	10700.00
20	515.32	316.41	0.172	0.60	(0.59)	0.99	49243.9	10200.00
21	503.13	329.68	0.167	0.60	(0.59)	0.99	50183.6	12010.00
22	491.37	339.89	0.164	0.60	(0.59)	0.99	50555.3	10300.00
23	466.97	358.73	0.157	0.60	(0.59)	0.99	50861.0	10210.00
24	413.18	407.39	0.153	0.60	(0.59)	0.99	51362.7	12000.00
25	381.70	474.08	0.147	0.60	(0.60)	0.99	51931.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.76	33.47	0.563	0.60 (0.58)	0.97	132.0	31300.00
LONGEST FLOWPATH FROM NODE 31300.00 TO NODE 12741.00 = 5775.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	582.94	33.47	0.563	0.60 (0.59)	0.99	2918.5	31300.00
2	602.24	35.81	0.544	0.60 (0.59)	0.99	3114.0	40510.00
3	573.14	41.31	0.503	0.60 (0.59)	0.99	3905.3	31500.00
4	558.03	44.14	0.486	0.60 (0.59)	0.99	4306.3	12730.00
5	550.51	45.51	0.479	0.60 (0.59)	0.99	4493.4	12710.00
6	502.54	53.93	0.431	0.60 (0.59)	0.99	5575.8	31600.00
7	495.79	55.08	0.425	0.60 (0.59)	0.99	5715.9	31810.00
8	506.90	74.61	0.368	0.60 (0.59)	0.99	8627.3	31400.00
9	512.32	86.15	0.345	0.60 (0.59)	0.99	10267.1	40100.00
10	556.50	98.84	0.319	0.60 (0.59)	0.99	11999.5	11831.00
11	662.04	122.69	0.274	0.60 (0.59)	0.99	15694.7	11530.00
12	754.25	142.63	0.254	0.60 (0.60)	0.99	19851.4	11000.00
13	871.08	165.42	0.232	0.60 (0.60)	0.99	26642.5	10850.00
14	799.01	180.80	0.217	0.60 (0.60)	0.99	29990.1	11220.00
15	743.39	191.94	0.213	0.60 (0.60)	0.99	31745.3	10910.00
16	596.02	231.62	0.200	0.60 (0.60)	0.99	38329.3	12410.00
17	562.53	264.31	0.189	0.60 (0.59)	0.99	44407.6	12261.00
18	551.90	277.11	0.185	0.60 (0.59)	0.99	45892.3	10410.00
19	541.40	289.21	0.181	0.60 (0.59)	0.99	46998.1	12101.10
20	529.52	298.86	0.177	0.60 (0.59)	0.99	47827.7	10700.00
21	517.68	316.41	0.172	0.60 (0.59)	0.99	49375.9	10200.00
22	505.43	329.68	0.167	0.60 (0.59)	0.99	50315.6	12010.00
23	493.62	339.89	0.164	0.60 (0.59)	0.99	50687.2	10300.00
24	469.14	358.73	0.157	0.60 (0.59)	0.99	50993.0	10210.00
25	415.29	407.39	0.153	0.60 (0.59)	0.99	51494.7	12000.00

26 383.72 474.08 0.147 0.60( 0.60) 0.99 52063.1 10100.00  
TOTAL AREA(ACRES) = 52063.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 871.08 Tc(MIN.) = 165.422  
EFFECTIVE AREA(ACRES) = 26642.49 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 52063.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12800.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 247.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 819.00 CHANNEL SLOPE = 0.0085  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.230

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.31	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 871.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.90

AVERAGE FLOW DEPTH(FEET) = 5.71 TRAVEL TIME(MIN.) = 1.53

Tc(MIN.) = 166.96

SUBAREA AREA(ACRES) = 17.31 SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 26659.80 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 52080.4 PEAK FLOW RATE(CFS) = 871.08

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.71 FLOW VELOCITY(FEET/SEC.) = 8.90

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	582.94	35.16	0.549	0.60( 0.59)	0.99	2935.8	31300.00
2	602.24	37.49	0.530	0.60( 0.59)	0.99	3131.3	40510.00
3	573.14	43.02	0.493	0.60( 0.59)	0.99	3922.6	31500.00
4	558.03	45.86	0.477	0.60( 0.59)	0.99	4323.6	12730.00
5	550.51	47.23	0.469	0.60( 0.59)	0.99	4510.7	12710.00
6	502.54	55.70	0.421	0.60( 0.59)	0.99	5593.1	31600.00
7	495.79	56.84	0.415	0.60( 0.59)	0.99	5733.2	31810.00
8	506.90	76.37	0.364	0.60( 0.59)	0.99	8644.6	31400.00
9	512.32	87.90	0.341	0.60( 0.59)	0.99	10284.4	40100.00
10	556.50	100.56	0.316	0.60( 0.59)	0.99	12016.9	11831.00

11	662.04	124.34	0.273	0.60( 0.59)	0.99	15712.0	11530.00
12	754.25	144.22	0.253	0.60( 0.60)	0.99	19868.7	11000.00
13	871.08	166.96	0.230	0.60( 0.60)	0.99	26659.8	10850.00
14	799.01	182.36	0.216	0.60( 0.60)	0.99	30007.4	11220.00
15	743.39	193.53	0.212	0.60( 0.60)	0.99	31762.6	10910.00
16	596.02	233.31	0.199	0.60( 0.60)	0.99	38346.6	12410.00
17	562.53	266.02	0.188	0.60( 0.59)	0.99	44424.9	12261.00
18	551.90	278.83	0.184	0.60( 0.59)	0.99	45909.6	10410.00
19	541.40	290.93	0.180	0.60( 0.59)	0.99	47015.4	12101.10
20	529.52	300.60	0.177	0.60( 0.59)	0.99	47845.0	10700.00
21	517.68	318.15	0.171	0.60( 0.59)	0.99	49393.2	10200.00
22	505.43	331.44	0.167	0.60( 0.59)	0.99	50332.9	12010.00
23	493.62	341.66	0.163	0.60( 0.59)	0.99	50704.6	10300.00
24	469.14	360.52	0.157	0.60( 0.59)	0.99	51010.3	10210.00
25	415.29	409.24	0.153	0.60( 0.59)	0.99	51512.0	12000.00
26	383.72	475.96	0.147	0.60( 0.60)	0.99	52080.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 871.08 Tc(MIN.) = 166.96  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 26659.80

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 52080.4 TC(MIN.) = 166.96  
EFFECTIVE AREA(ACRES) = 26659.80 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.994  
PEAK FLOW RATE(CFS) = 871.08

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	582.94	35.16	0.549	0.60( 0.59)	0.99	2935.8	31300.00
2	602.24	37.49	0.530	0.60( 0.59)	0.99	3131.3	40510.00
3	573.14	43.02	0.493	0.60( 0.59)	0.99	3922.6	31500.00
4	558.03	45.86	0.477	0.60( 0.59)	0.99	4323.6	12730.00
5	550.51	47.23	0.469	0.60( 0.59)	0.99	4510.7	12710.00
6	502.54	55.70	0.421	0.60( 0.59)	0.99	5593.1	31600.00
7	495.79	56.84	0.415	0.60( 0.59)	0.99	5733.2	31810.00
8	506.90	76.37	0.364	0.60( 0.59)	0.99	8644.6	31400.00
9	512.32	87.90	0.341	0.60( 0.59)	0.99	10284.4	40100.00
10	556.50	100.56	0.316	0.60( 0.59)	0.99	12016.9	11831.00
11	662.04	124.34	0.273	0.60( 0.59)	0.99	15712.0	11530.00
12	754.25	144.22	0.253	0.60( 0.60)	0.99	19868.7	11000.00
13	871.08	166.96	0.230	0.60( 0.60)	0.99	26659.8	10850.00
14	799.01	182.36	0.216	0.60( 0.60)	0.99	30007.4	11220.00
15	743.39	193.53	0.212	0.60( 0.60)	0.99	31762.6	10910.00
16	596.02	233.31	0.199	0.60( 0.60)	0.99	38346.6	12410.00
17	562.53	266.02	0.188	0.60( 0.59)	0.99	44424.9	12261.00
18	551.90	278.83	0.184	0.60( 0.59)	0.99	45909.6	10410.00
19	541.40	290.93	0.180	0.60( 0.59)	0.99	47015.4	12101.10
20	529.52	300.60	0.177	0.60( 0.59)	0.99	47845.0	10700.00
21	517.68	318.15	0.171	0.60( 0.59)	0.99	49393.2	10200.00
22	505.43	331.44	0.167	0.60( 0.59)	0.99	50332.9	12010.00
23	493.62	341.66	0.163	0.60( 0.59)	0.99	50704.6	10300.00
24	469.14	360.52	0.157	0.60( 0.59)	0.99	51010.3	10210.00
25	415.29	409.24	0.153	0.60( 0.59)	0.99	51512.0	12000.00
26	383.72	475.96	0.147	0.60( 0.60)	0.99	52080.4	10100.00



\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S28.DAT  
TIME/DATE OF STUDY: 07:54 07/16/2018  
=====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14  
1) 5.00; 1.860  
2) 10.00; 1.240  
3) 15.00; 0.945  
4) 20.00; 0.774  
5) 25.00; 0.667  
6) 30.00; 0.591  
7) 40.00; 0.510  
8) 50.00; 0.453  
9) 60.00; 0.399  
10) 90.00; 0.345  
11) 120.00; 0.289  
12) 180.00; 0.235  
13) 360.00; 0.179  
14) 1200.00; 0.083  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING  
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR  
NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0313 0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610501T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.60 ( 0.59)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.60 ( 0.59)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1063.4 TC (MIN.) = 40.57  
EFFECTIVE AREA (ACRES) = 1023.70 AREA-AVERAGED Fm (INCH/HR) = 0.59  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.981  
PEAK FLOW RATE (CFS) = 71.25

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.507	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.486	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.443	0.60 ( 0.59)	0.98	1063.4	50100.00

END OF RATIONAL METHOD ANALYSIS  
=====

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S29.DAT  
TIME/DATE OF STUDY: 07:57 07/16/2018  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.854
- 2) 10.00; 1.237
- 3) 15.00; 0.943
- 4) 20.00; 0.773
- 5) 25.00; 0.666
- 6) 30.00; 0.591
- 7) 40.00; 0.509
- 8) 50.00; 0.452
- 9) 60.00; 0.396
- 10) 90.00; 0.339
- 11) 120.00; 0.285
- 12) 180.00; 0.229
- 13) 360.00; 0.175
- 14) 1200.00; 0.082

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)
- \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*
- \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S27.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	602.24	37.49	0.60 ( 0.59)	0.99	3131.3	40510.00
2	502.54	55.70	0.60 ( 0.59)	0.99	5593.1	31600.00
3	506.90	76.37	0.60 ( 0.59)	0.99	8644.6	31400.00
4	512.32	87.90	0.60 ( 0.59)	0.99	10284.4	40100.00
5	556.50	100.56	0.60 ( 0.59)	0.99	12016.9	11831.00
6	662.04	124.34	0.60 ( 0.59)	0.99	15712.0	11530.00
7	754.25	144.22	0.60 ( 0.60)	0.99	19868.7	11000.00
8	871.08	166.96	0.60 ( 0.60)	0.99	26659.8	10850.00
9	799.01	182.36	0.60 ( 0.60)	0.99	30007.4	11220.00
10	743.39	193.53	0.60 ( 0.60)	0.99	31762.6	10910.00
11	596.02	233.31	0.60 ( 0.60)	0.99	38346.6	12410.00
12	562.53	266.02	0.60 ( 0.59)	0.99	44424.9	12261.00
13	551.90	278.83	0.60 ( 0.59)	0.99	45909.6	10410.00
14	541.40	290.93	0.60 ( 0.59)	0.99	47015.4	12101.10
15	517.68	318.15	0.60 ( 0.59)	0.99	49393.2	10200.00
16	505.43	331.44	0.60 ( 0.59)	0.99	50332.9	12010.00
17	493.62	341.66	0.60 ( 0.59)	0.99	50704.6	10300.00
18	469.14	360.52	0.60 ( 0.59)	0.99	51010.3	10210.00
19	415.29	409.24	0.60 ( 0.59)	0.99	51512.0	12000.00
20	383.72	475.96	0.60 ( 0.60)	0.99	52080.4	10100.00

TOTAL AREA (ACRES) = 52080.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S28.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.60 ( 0.59)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.60 ( 0.59)	0.98	1063.4	50100.00

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.25	40.57	0.506	0.60 ( 0.59)	0.98	1023.7	50120.00
2	56.82	44.15	0.485	0.60 ( 0.59)	0.98	1046.4	50150.00
3	24.29	51.88	0.441	0.60 ( 0.59)	0.98	1063.4	50100.00

LONGEST FLOWPATH FROM NODE 50150.00 TO NODE 12800.00 = 11349.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	602.24	37.49	0.530	0.60 ( 0.59)	0.99	3131.3	40510.00
2	502.54	55.70	0.420	0.60 ( 0.59)	0.99	5593.1	31600.00
3	506.90	76.37	0.365	0.60 ( 0.59)	0.99	8644.6	31400.00
4	512.32	87.90	0.343	0.60 ( 0.59)	0.99	10284.4	40100.00
5	556.50	100.56	0.320	0.60 ( 0.59)	0.99	12016.9	11831.00
6	662.04	124.34	0.281	0.60 ( 0.59)	0.99	15712.0	11530.00
7	754.25	144.22	0.262	0.60 ( 0.60)	0.99	19868.7	11000.00
8	871.08	166.96	0.241	0.60 ( 0.60)	0.99	26659.8	10850.00
9	799.01	182.36	0.228	0.60 ( 0.60)	0.99	30007.4	11220.00
10	743.39	193.53	0.225	0.60 ( 0.60)	0.99	31762.6	10910.00
11	596.02	233.31	0.213	0.60 ( 0.60)	0.99	38346.6	12410.00
12	562.53	266.02	0.203	0.60 ( 0.59)	0.99	44424.9	12261.00
13	551.90	278.83	0.199	0.60 ( 0.59)	0.99	45909.6	10410.00
14	541.40	290.93	0.196	0.60 ( 0.59)	0.99	47015.4	12101.10
15	517.68	318.15	0.188	0.60 ( 0.59)	0.99	49393.2	10200.00
16	505.43	331.44	0.184	0.60 ( 0.59)	0.99	50332.9	12010.00
17	493.62	341.66	0.181	0.60 ( 0.59)	0.99	50704.6	10300.00
18	469.14	360.52	0.175	0.60 ( 0.59)	0.99	51010.3	10210.00
19	415.29	409.24	0.170	0.60 ( 0.59)	0.99	51512.0	12000.00
20	383.72	475.96	0.162	0.60 ( 0.60)	0.99	52080.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	671.19	37.49	0.530	0.60 ( 0.59)	0.99	4077.3	40510.00
2	656.63	40.57	0.506	0.60 ( 0.59)	0.99	4571.4	50120.00
3	622.61	44.15	0.485	0.60 ( 0.59)	0.99	5077.8	50150.00
4	547.74	51.88	0.441	0.60 ( 0.59)	0.99	6140.3	50100.00
5	525.66	55.70	0.420	0.60 ( 0.59)	0.99	6656.5	31600.00
6	526.98	76.37	0.365	0.60 ( 0.59)	0.99	9708.0	31400.00
7	531.20	87.90	0.343	0.60 ( 0.59)	0.99	11347.8	40100.00
8	574.11	100.56	0.320	0.60 ( 0.59)	0.99	13080.2	11831.00
9	677.50	124.34	0.281	0.60 ( 0.59)	0.99	16775.4	11530.00
10	768.69	144.22	0.262	0.60 ( 0.59)	0.99	20932.1	11000.00
11	884.35	166.96	0.241	0.60 ( 0.60)	0.99	27723.2	10850.00
12	811.57	182.36	0.228	0.60 ( 0.60)	0.99	31070.8	11220.00
13	755.77	193.53	0.225	0.60 ( 0.60)	0.99	32826.0	10910.00
14	607.75	233.31	0.213	0.60 ( 0.60)	0.99	39410.0	12410.00
15	573.71	266.02	0.203	0.60 ( 0.59)	0.99	45488.3	12261.00

16	562.87	278.83	0.199	0.60 ( 0.59)	0.99	46973.0	10410.00
17	552.17	290.93	0.196	0.60 ( 0.59)	0.99	48078.8	12101.10
18	528.00	318.15	0.188	0.60 ( 0.59)	0.99	50456.6	10200.00
19	515.53	331.44	0.184	0.60 ( 0.59)	0.99	51396.2	12010.00
20	503.56	341.66	0.181	0.60 ( 0.59)	0.99	51767.9	10300.00
21	478.77	360.52	0.175	0.60 ( 0.59)	0.99	52073.7	10210.00
22	424.62	409.24	0.170	0.60 ( 0.59)	0.99	52575.4	12000.00
23	392.65	475.96	0.162	0.60 ( 0.59)	0.99	53143.8	10100.00

TOTAL AREA(ACRES) = 53143.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 884.35 Tc(MIN.) = 166.955  
EFFECTIVE AREA(ACRES) = 27723.18 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 53143.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12801.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 234.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1110.96 CHANNEL SLOPE = 0.0054  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 884.35  
FLOW VELOCITY(FEET/SEC.) = 7.52 FLOW DEPTH(FEET) = 6.26  
TRAVEL TIME(MIN.) = 2.46 Tc(MIN.) = 169.42  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	671.19	40.13	0.508	0.60 ( 0.59)	0.99	4077.3	40510.00
2	656.63	43.22	0.491	0.60 ( 0.59)	0.99	4571.4	50120.00
3	622.61	46.84	0.470	0.60 ( 0.59)	0.99	5077.8	50150.00
4	547.74	54.65	0.426	0.60 ( 0.59)	0.99	6140.3	50100.00
5	525.66	58.50	0.404	0.60 ( 0.59)	0.99	6656.5	31600.00
6	526.98	79.17	0.360	0.60 ( 0.59)	0.99	9708.0	31400.00
7	531.20	90.70	0.338	0.60 ( 0.59)	0.99	11347.8	40100.00
8	574.11	103.30	0.315	0.60 ( 0.59)	0.99	13080.2	11831.00
9	677.50	126.97	0.278	0.60 ( 0.59)	0.99	16775.4	11530.00
10	768.69	146.77	0.260	0.60 ( 0.59)	0.99	20932.1	11000.00
11	884.35	169.42	0.239	0.60 ( 0.60)	0.99	27723.2	10850.00
12	811.57	184.88	0.228	0.60 ( 0.60)	0.99	31070.8	11220.00
13	755.77	196.09	0.224	0.60 ( 0.60)	0.99	32826.0	10910.00
14	607.75	236.01	0.212	0.60 ( 0.60)	0.99	39410.0	12410.00
15	573.71	268.76	0.202	0.60 ( 0.59)	0.99	45488.3	12261.00
16	562.87	281.58	0.199	0.60 ( 0.59)	0.99	46973.0	10410.00
17	552.17	293.70	0.195	0.60 ( 0.59)	0.99	48078.8	12101.10
18	528.00	320.95	0.187	0.60 ( 0.59)	0.99	50456.6	10200.00
19	515.53	334.25	0.183	0.60 ( 0.59)	0.99	51396.2	12010.00
20	503.56	344.49	0.180	0.60 ( 0.59)	0.99	51767.9	10300.00
21	478.77	363.38	0.175	0.60 ( 0.59)	0.99	52073.7	10210.00
22	424.62	412.19	0.169	0.60 ( 0.59)	0.99	52575.4	12000.00
23	392.65	478.98	0.162	0.60 ( 0.59)	0.99	53143.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 884.35 Tc(MIN.) = 169.42  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 27723.18

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610502T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.59	11.93	0.60 ( 0.56)	0.94	28.9	50200.00
TOTAL AREA(ACRES) =						28.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	671.19	40.13	0.508	0.60 ( 0.59)	0.99	4077.3	40510.00
2	656.63	43.22	0.491	0.60 ( 0.59)	0.99	4571.4	50120.00
3	622.61	46.84	0.470	0.60 ( 0.59)	0.99	5077.8	50150.00
4	547.74	54.65	0.426	0.60 ( 0.59)	0.99	6140.3	50100.00
5	525.66	58.50	0.404	0.60 ( 0.59)	0.99	6656.5	31600.00
6	526.98	79.17	0.360	0.60 ( 0.59)	0.99	9708.0	31400.00
7	531.20	90.70	0.338	0.60 ( 0.59)	0.99	11347.8	40100.00
8	574.11	103.30	0.315	0.60 ( 0.59)	0.99	13080.2	11831.00
9	677.50	126.97	0.278	0.60 ( 0.59)	0.99	16775.4	11530.00
10	768.69	146.77	0.260	0.60 ( 0.59)	0.99	20932.1	11000.00
11	884.35	169.42	0.239	0.60 ( 0.60)	0.99	27723.2	10850.00
12	811.57	184.88	0.228	0.60 ( 0.60)	0.99	31070.8	11220.00
13	755.77	196.09	0.224	0.60 ( 0.60)	0.99	32826.0	10910.00
14	607.75	236.01	0.212	0.60 ( 0.60)	0.99	39410.0	12410.00
15	573.71	268.76	0.202	0.60 ( 0.59)	0.99	45488.3	12261.00
16	562.87	281.58	0.199	0.60 ( 0.59)	0.99	46973.0	10410.00
17	552.17	293.70	0.195	0.60 ( 0.59)	0.99	48078.8	12101.10
18	528.00	320.95	0.187	0.60 ( 0.59)	0.99	50456.6	10200.00
19	515.53	334.25	0.183	0.60 ( 0.59)	0.99	51396.2	12010.00
20	503.56	344.49	0.180	0.60 ( 0.59)	0.99	51767.9	10300.00
21	478.77	363.38	0.175	0.60 ( 0.59)	0.99	52073.7	10210.00
22	424.62	412.19	0.169	0.60 ( 0.59)	0.99	52575.4	12000.00
23	392.65	478.98	0.162	0.60 ( 0.59)	0.99	53143.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.59	11.93	1.124	0.60 ( 0.56)	0.94	28.9	50200.00

LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 = 1426.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	455.60	11.93	1.124	0.60 ( 0.59)	0.99	1240.5	50200.00
2	672.03	40.13	0.508	0.60 ( 0.59)	0.99	4106.2	40510.00
3	657.44	43.22	0.491	0.60 ( 0.59)	0.99	4600.3	50120.00
4	623.39	46.84	0.470	0.60 ( 0.59)	0.99	5106.6	50150.00
5	548.44	54.65	0.426	0.60 ( 0.59)	0.99	6169.2	50100.00
6	526.33	58.50	0.404	0.60 ( 0.59)	0.99	6685.3	31600.00
7	527.58	79.17	0.360	0.60 ( 0.59)	0.99	9736.8	31400.00
8	531.75	90.70	0.338	0.60 ( 0.59)	0.99	11376.6	40100.00
9	574.64	103.30	0.315	0.60 ( 0.59)	0.99	13109.1	11831.00
10	677.96	126.97	0.278	0.60 ( 0.59)	0.99	16804.2	11530.00
11	769.12	146.77	0.260	0.60 ( 0.59)	0.99	20961.0	11000.00
12	884.75	169.42	0.239	0.60 ( 0.60)	0.99	27752.1	10850.00
13	811.95	184.88	0.228	0.60 ( 0.60)	0.99	31099.7	11220.00
14	756.14	196.09	0.224	0.60 ( 0.60)	0.99	32854.9	10910.00
15	608.10	236.01	0.212	0.60 ( 0.60)	0.99	39438.9	12410.00
16	574.05	268.76	0.202	0.60 ( 0.59)	0.99	45517.1	12261.00
17	563.20	281.58	0.199	0.60 ( 0.59)	0.99	47001.9	10410.00
18	552.49	293.70	0.195	0.60 ( 0.59)	0.99	48107.7	12101.10
19	528.31	320.95	0.187	0.60 ( 0.59)	0.99	50485.5	10200.00
20	515.84	334.25	0.183	0.60 ( 0.59)	0.99	51425.1	12010.00
21	503.85	344.49	0.180	0.60 ( 0.59)	0.99	51796.8	10300.00
22	479.06	363.38	0.175	0.60 ( 0.59)	0.99	52102.5	10210.00
23	424.90	412.19	0.169	0.60 ( 0.59)	0.99	52604.2	12000.00
24	392.92	478.98	0.162	0.60 ( 0.59)	0.99	53172.6	10100.00
TOTAL AREA(ACRES) =						53172.6	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 884.75 Tc(MIN.) = 169.417  
 EFFECTIVE AREA(ACRES) = 27752.05 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 53172.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

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FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 234.00 DOWNSTREAM(FEET) = 216.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2009.32 CHANNEL SLOPE = 0.0090  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 884.75  
 FLOW VELOCITY(FEET/SEC.) = 9.10 FLOW DEPTH(FEET) = 5.69  
 TRAVEL TIME(MIN.) = 3.68 Tc(MIN.) = 173.10  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	455.60	16.27	0.900	0.60 ( 0.59)	0.99	1240.5 50200.00
2	672.03	44.08	0.486	0.60 ( 0.59)	0.99	4106.2 40510.00
3	657.44	47.19	0.468	0.60 ( 0.59)	0.99	4600.3 50120.00
4	623.39	50.86	0.447	0.60 ( 0.59)	0.99	5106.6 50150.00
5	548.44	58.80	0.403	0.60 ( 0.59)	0.99	6169.2 50100.00
6	526.33	62.69	0.391	0.60 ( 0.59)	0.99	6685.3 31600.00
7	527.58	83.36	0.352	0.60 ( 0.59)	0.99	9736.8 31400.00
8	531.75	94.88	0.330	0.60 ( 0.59)	0.99	11376.6 40100.00
9	574.64	107.40	0.308	0.60 ( 0.59)	0.99	13109.1 11831.00
10	677.96	130.90	0.275	0.60 ( 0.59)	0.99	16804.2 11530.00
11	769.12	150.58	0.256	0.60 ( 0.59)	0.99	20961.0 11000.00
12	884.75	173.10	0.235	0.60 ( 0.60)	0.99	27752.1 10850.00
13	811.95	188.64	0.226	0.60 ( 0.60)	0.99	31099.7 11220.00
14	756.14	199.92	0.223	0.60 ( 0.60)	0.99	32854.9 10910.00
15	608.10	240.06	0.211	0.60 ( 0.60)	0.99	39438.9 12410.00
16	574.05	272.86	0.201	0.60 ( 0.59)	0.99	45517.1 12261.00
17	563.20	285.71	0.197	0.60 ( 0.59)	0.99	47001.9 10410.00
18	552.49	297.85	0.194	0.60 ( 0.59)	0.99	48107.7 12101.10
19	528.31	325.14	0.185	0.60 ( 0.59)	0.99	50485.5 10200.00
20	515.84	338.47	0.181	0.60 ( 0.59)	0.99	51425.1 12010.00
21	503.85	348.73	0.178	0.60 ( 0.59)	0.99	51796.8 10300.00
22	479.06	367.68	0.174	0.60 ( 0.59)	0.99	52102.5 10210.00
23	424.90	416.61	0.169	0.60 ( 0.59)	0.99	52604.2 12000.00
24	392.92	483.49	0.161	0.60 ( 0.59)	0.99	53172.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 884.75 Tc(MIN.) = 173.10  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 27752.05

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610312T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.12	50.76	0.60 ( 0.57)	0.96	385.8	31200.00
TOTAL AREA(ACRES) = 385.8						

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 FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	455.60	16.27	0.900	0.60 ( 0.59)	0.99	1240.5	50200.00
2	672.03	44.08	0.486	0.60 ( 0.59)	0.99	4106.2	40510.00
3	657.44	47.19	0.468	0.60 ( 0.59)	0.99	4600.3	50120.00
4	623.39	50.86	0.447	0.60 ( 0.59)	0.99	5106.6	50150.00
5	548.44	58.80	0.403	0.60 ( 0.59)	0.99	6169.2	50100.00
6	526.33	62.69	0.391	0.60 ( 0.59)	0.99	6685.3	31600.00
7	527.58	83.36	0.352	0.60 ( 0.59)	0.99	9736.8	31400.00

8	531.75	94.88	0.330	0.60 ( 0.59)	0.99	11376.6	40100.00
9	574.64	107.40	0.308	0.60 ( 0.59)	0.99	13109.1	11831.00
10	677.96	130.90	0.275	0.60 ( 0.59)	0.99	16804.2	11530.00
11	769.12	150.58	0.256	0.60 ( 0.59)	0.99	20961.0	11000.00
12	884.75	173.10	0.235	0.60 ( 0.60)	0.99	27752.1	10850.00
13	811.95	188.64	0.226	0.60 ( 0.60)	0.99	31099.7	11220.00
14	756.14	199.92	0.223	0.60 ( 0.60)	0.99	32854.9	10910.00
15	608.10	240.06	0.211	0.60 ( 0.60)	0.99	39438.9	12410.00
16	574.05	272.86	0.201	0.60 ( 0.59)	0.99	45517.1	12261.00
17	563.20	285.71	0.197	0.60 ( 0.59)	0.99	47001.9	10410.00
18	552.49	297.85	0.194	0.60 ( 0.59)	0.99	48107.7	12101.10
19	528.31	325.14	0.185	0.60 ( 0.59)	0.99	50485.5	10200.00
20	515.84	338.47	0.181	0.60 ( 0.59)	0.99	51425.1	12010.00
21	503.85	348.73	0.178	0.60 ( 0.59)	0.99	51796.8	10300.00
22	479.06	367.68	0.174	0.60 ( 0.59)	0.99	52102.5	10210.00
23	424.90	416.61	0.169	0.60 ( 0.59)	0.99	52604.2	12000.00
24	392.92	483.49	0.161	0.60 ( 0.59)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.12	50.76	0.448	0.60 ( 0.57)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	472.72	16.27	0.900	0.60 ( 0.59)	0.98	1364.1	50200.00
2	688.16	44.08	0.486	0.60 ( 0.59)	0.98	4441.1	40510.00
3	674.08	47.19	0.468	0.60 ( 0.59)	0.98	4958.9	50120.00
4	641.37	50.76	0.448	0.60 ( 0.59)	0.99	5479.6	31200.00
5	640.49	50.86	0.447	0.60 ( 0.59)	0.99	5492.4	50150.00
6	563.85	58.80	0.403	0.60 ( 0.59)	0.99	6555.0	50100.00
7	541.28	62.69	0.391	0.60 ( 0.59)	0.99	7071.1	31600.00
8	541.03	83.36	0.352	0.60 ( 0.59)	0.99	10122.6	31400.00
9	544.38	94.88	0.330	0.60 ( 0.59)	0.99	11762.4	40100.00
10	586.40	107.40	0.308	0.60 ( 0.59)	0.99	13494.9	11831.00
11	688.47	130.90	0.275	0.60 ( 0.59)	0.99	17190.0	11530.00
12	778.93	150.58	0.256	0.60 ( 0.59)	0.99	21346.8	11000.00
13	893.75	173.10	0.235	0.60 ( 0.60)	0.99	28137.8	10850.00
14	820.61	188.64	0.226	0.60 ( 0.60)	0.99	31485.5	11220.00
15	764.67	199.92	0.223	0.60 ( 0.60)	0.99	33240.7	10910.00
16	616.17	240.06	0.211	0.60 ( 0.59)	0.99	39824.6	12410.00
17	581.74	272.86	0.201	0.60 ( 0.59)	0.99	45902.9	12261.00
18	570.75	285.71	0.197	0.60 ( 0.59)	0.99	47387.7	10410.00
19	559.90	297.85	0.194	0.60 ( 0.59)	0.99	48493.4	12101.10
20	535.40	325.14	0.185	0.60 ( 0.59)	0.99	50871.2	10200.00
21	522.78	338.47	0.181	0.60 ( 0.59)	0.99	51810.9	12010.00
22	510.68	348.73	0.178	0.60 ( 0.59)	0.99	52182.6	10300.00
23	485.72	367.68	0.174	0.60 ( 0.59)	0.99	52488.3	10210.00
24	431.35	416.61	0.169	0.60 ( 0.59)	0.99	52990.0	12000.00
25	399.09	483.49	0.161	0.60 ( 0.59)	0.99	53558.4	10100.00

TOTAL AREA(ACRES) = 53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 893.75 Tc(MIN.) = 173.099  
 EFFECTIVE AREA(ACRES) = 28137.83 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 53558.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

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FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610503T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.18	36.15	0.60 ( 0.60)	0.99	366.1	50300.00
TOTAL AREA (ACRES) = 366.1						

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FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	472.72	16.27	0.900	0.60 ( 0.59)	0.98	1364.1	50200.00
2	688.16	44.08	0.486	0.60 ( 0.59)	0.98	4441.1	40510.00
3	674.08	47.19	0.468	0.60 ( 0.59)	0.98	4958.9	50120.00
4	641.37	50.76	0.448	0.60 ( 0.59)	0.99	5479.6	31200.00
5	640.49	50.86	0.447	0.60 ( 0.59)	0.99	5492.4	50150.00
6	563.85	58.80	0.403	0.60 ( 0.59)	0.99	6555.0	50100.00
7	541.28	62.69	0.391	0.60 ( 0.59)	0.99	7071.1	31600.00
8	541.03	83.36	0.352	0.60 ( 0.59)	0.99	10122.6	31400.00
9	544.38	94.88	0.330	0.60 ( 0.59)	0.99	11762.4	40100.00
10	586.40	107.40	0.308	0.60 ( 0.59)	0.99	13494.9	11831.00
11	688.47	130.90	0.275	0.60 ( 0.59)	0.99	17190.0	11530.00
12	778.93	150.58	0.256	0.60 ( 0.59)	0.99	21346.8	11000.00
13	893.75	173.10	0.235	0.60 ( 0.60)	0.99	28137.8	10850.00
14	820.61	188.64	0.226	0.60 ( 0.60)	0.99	31485.5	11220.00
15	764.67	199.92	0.223	0.60 ( 0.60)	0.99	33240.7	10910.00
16	616.17	240.06	0.211	0.60 ( 0.59)	0.99	39824.6	12410.00
17	581.74	272.86	0.201	0.60 ( 0.59)	0.99	45902.9	12261.00
18	570.75	285.71	0.197	0.60 ( 0.59)	0.99	47387.7	10410.00
19	559.90	297.85	0.194	0.60 ( 0.59)	0.99	48493.4	12101.10
20	535.40	325.14	0.185	0.60 ( 0.59)	0.99	50871.2	10200.00
21	522.78	338.47	0.181	0.60 ( 0.59)	0.99	51810.9	12010.00
22	510.68	348.73	0.178	0.60 ( 0.59)	0.99	52182.6	10300.00
23	485.72	367.68	0.174	0.60 ( 0.59)	0.99	52488.3	10210.00
24	431.35	416.61	0.169	0.60 ( 0.59)	0.99	52990.0	12000.00
25	399.09	483.49	0.161	0.60 ( 0.59)	0.99	53558.4	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.18	36.15	0.541	0.60 ( 0.60)	0.99	366.1	50300.00
LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.09	16.27	0.900	0.60 ( 0.59)	0.98	1528.9	50200.00
2	645.94	36.15	0.541	0.60 ( 0.59)	0.98	3930.3	50300.00
3	705.40	44.08	0.486	0.60 ( 0.59)	0.98	4807.2	40510.00
4	690.69	47.19	0.468	0.60 ( 0.59)	0.99	5325.0	50120.00
5	657.26	50.76	0.448	0.60 ( 0.59)	0.99	5845.7	31200.00
6	656.36	50.86	0.447	0.60 ( 0.59)	0.99	5858.5	50150.00
7	578.14	58.80	0.403	0.60 ( 0.59)	0.99	6921.1	50100.00
8	555.15	62.69	0.391	0.60 ( 0.59)	0.99	7437.2	31600.00
9	553.51	83.36	0.352	0.60 ( 0.59)	0.99	10488.7	31400.00
10	556.10	94.88	0.330	0.60 ( 0.59)	0.99	12128.5	40100.00
11	597.32	107.40	0.308	0.60 ( 0.59)	0.99	13861.0	11831.00
12	698.23	130.90	0.275	0.60 ( 0.59)	0.99	17556.1	11530.00
13	788.03	150.58	0.256	0.60 ( 0.59)	0.99	21712.9	11000.00
14	902.11	173.10	0.235	0.60 ( 0.60)	0.99	28503.9	10850.00
15	828.65	188.64	0.226	0.60 ( 0.60)	0.99	31851.6	11220.00
16	772.58	199.92	0.223	0.60 ( 0.60)	0.99	33606.8	10910.00
17	623.65	240.06	0.211	0.60 ( 0.59)	0.99	40190.7	12410.00
18	588.88	272.86	0.201	0.60 ( 0.59)	0.99	46269.0	12261.00
19	577.75	285.71	0.197	0.60 ( 0.59)	0.99	47753.8	10410.00
20	566.77	297.85	0.194	0.60 ( 0.59)	0.99	48859.6	12101.10
21	541.99	325.14	0.185	0.60 ( 0.59)	0.99	51237.3	10200.00
22	529.22	338.47	0.181	0.60 ( 0.59)	0.99	52177.0	12010.00
23	517.01	348.73	0.178	0.60 ( 0.59)	0.99	52548.7	10300.00
24	491.90	367.68	0.174	0.60 ( 0.59)	0.99	52854.4	10210.00
25	437.34	416.61	0.169	0.60 ( 0.59)	0.99	53356.1	12000.00
26	404.81	483.49	0.161	0.60 ( 0.59)	0.99	53924.5	10100.00
TOTAL AREA (ACRES) = 53924.5							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 902.11 Tc (MIN.) = 173.099  
 EFFECTIVE AREA (ACRES) = 28503.94 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 53924.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 216.00 DOWNSTREAM (FEET) = 215.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 122.04 CHANNEL SLOPE = 0.0082  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 902.11  
 FLOW VELOCITY (FEET/SEC.) = 8.84 FLOW DEPTH (FEET) = 5.83  
 TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 173.33  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	487.09	16.54	0.891	0.60 ( 0.59)	0.98	1528.9	50200.00
2	645.94	36.40	0.539	0.60 ( 0.59)	0.98	3930.3	50300.00
3	705.40	44.32	0.484	0.60 ( 0.59)	0.98	4807.2	40510.00
4	690.69	47.43	0.467	0.60 ( 0.59)	0.99	5325.0	50120.00
5	657.26	51.01	0.446	0.60 ( 0.59)	0.99	5845.7	31200.00
6	656.36	51.11	0.446	0.60 ( 0.59)	0.99	5858.5	50150.00
7	578.14	59.06	0.401	0.60 ( 0.59)	0.99	6921.1	50100.00
8	555.15	62.95	0.390	0.60 ( 0.59)	0.99	7437.2	31600.00
9	553.51	83.62	0.351	0.60 ( 0.59)	0.99	10488.7	31400.00
10	556.10	95.14	0.330	0.60 ( 0.59)	0.99	12128.5	40100.00
11	597.32	107.65	0.307	0.60 ( 0.59)	0.99	13861.0	11831.00
12	698.23	131.15	0.275	0.60 ( 0.59)	0.99	17556.1	11530.00
13	788.03	150.82	0.256	0.60 ( 0.59)	0.99	21712.9	11000.00
14	902.11	173.33	0.235	0.60 ( 0.60)	0.99	28503.9	10850.00
15	828.65	188.88	0.226	0.60 ( 0.60)	0.99	31851.6	11220.00
16	772.58	200.16	0.223	0.60 ( 0.60)	0.99	33606.8	10910.00
17	623.65	240.31	0.211	0.60 ( 0.59)	0.99	40190.7	12410.00
18	588.88	273.12	0.201	0.60 ( 0.59)	0.99	46269.0	12261.00
19	577.75	285.97	0.197	0.60 ( 0.59)	0.99	47753.8	10410.00
20	566.77	298.10	0.194	0.60 ( 0.59)	0.99	48859.6	12101.10
21	541.99	325.41	0.185	0.60 ( 0.59)	0.99	51237.3	10200.00
22	529.22	338.73	0.181	0.60 ( 0.59)	0.99	52177.0	12010.00
23	517.01	348.99	0.178	0.60 ( 0.59)	0.99	52548.7	10300.00
24	491.90	367.95	0.174	0.60 ( 0.59)	0.99	52854.4	10210.00
25	437.34	416.89	0.169	0.60 ( 0.59)	0.99	53356.1	12000.00
26	404.81	483.77	0.161	0.60 ( 0.59)	0.99	53924.5	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 902.11 Tc(MIN.) = 173.33  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 28503.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

-----  
 >>>>CLEAR MEMORY BANK # 2 <<<<<

-----  
 >>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM( FEET) = 215.00 DOWNSTREAM( FEET) = 214.00  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 895.53 CHANNEL SLOPE = 0.0011  
 CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH( FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA( CFS) = 902.11  
 FLOW VELOCITY( FEET/SEC.) = 4.19 FLOW DEPTH( FEET) = 8.47  
 TRAVEL TIME( MIN.) = 3.56 Tc( MIN.) = 176.89  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	487.09	20.69	0.758	0.60 ( 0.59)	0.98	1528.9
2	645.94	40.28	0.507	0.60 ( 0.59)	0.98	3930.3
3	705.40	48.11	0.463	0.60 ( 0.59)	0.98	4807.2
4	690.69	51.25	0.445	0.60 ( 0.59)	0.99	5325.0
5	657.26	54.87	0.425	0.60 ( 0.59)	0.99	5845.7
6	656.36	54.97	0.424	0.60 ( 0.59)	0.99	5858.5
7	578.14	63.05	0.390	0.60 ( 0.59)	0.99	6921.1
8	555.15	66.98	0.383	0.60 ( 0.59)	0.99	7437.2
9	553.51	87.65	0.343	0.60 ( 0.59)	0.99	10488.7
10	556.10	99.16	0.323	0.60 ( 0.59)	0.99	12128.5
11	597.32	111.60	0.300	0.60 ( 0.59)	0.99	13861.0
12	698.23	134.95	0.271	0.60 ( 0.59)	0.99	17556.1
13	788.03	154.51	0.253	0.60 ( 0.59)	0.99	21712.9
14	902.11	176.89	0.232	0.60 ( 0.60)	0.99	28503.9
15	828.65	192.52	0.225	0.60 ( 0.60)	0.99	31851.6
16	772.58	203.87	0.222	0.60 ( 0.60)	0.99	33606.8
17	623.65	244.22	0.210	0.60 ( 0.59)	0.99	40190.7
18	588.88	277.09	0.200	0.60 ( 0.59)	0.99	46269.0
19	577.75	289.96	0.196	0.60 ( 0.59)	0.99	47753.8
20	566.77	302.11	0.192	0.60 ( 0.59)	0.99	48859.6
21	541.99	329.45	0.184	0.60 ( 0.59)	0.99	51237.3
22	529.22	342.80	0.180	0.60 ( 0.59)	0.99	52177.0
23	517.01	353.09	0.177	0.60 ( 0.59)	0.99	52548.7
24	491.90	372.10	0.174	0.60 ( 0.59)	0.99	52854.4
25	437.34	421.16	0.168	0.60 ( 0.59)	0.99	53356.1
26	404.81	488.13	0.161	0.60 ( 0.59)	0.99	53924.5

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 902.11 Tc(MIN.) = 176.89  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 28503.94

\*\*\*\*\*

FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

-----  
 >>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<

-----  
 PEAK FLOWRATE TABLE FILE NAME: 0610504T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.19	20.43	0.60 ( 0.58)	0.97	70.7	50400.00
TOTAL AREA(ACRES) =						70.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	487.09	20.69	0.758	0.60 ( 0.59)	0.98	1528.9 50200.00
2	645.94	40.28	0.507	0.60 ( 0.59)	0.98	3930.3 50300.00
3	705.40	48.11	0.463	0.60 ( 0.59)	0.98	4807.2 40510.00
4	690.69	51.25	0.445	0.60 ( 0.59)	0.99	5325.0 50120.00
5	657.26	54.87	0.425	0.60 ( 0.59)	0.99	5845.7 31200.00
6	656.36	54.97	0.424	0.60 ( 0.59)	0.99	5858.5 50150.00
7	578.14	63.05	0.390	0.60 ( 0.59)	0.99	6921.1 50100.00
8	555.15	66.98	0.383	0.60 ( 0.59)	0.99	7437.2 31600.00
9	553.51	87.65	0.343	0.60 ( 0.59)	0.99	10488.7 31400.00
10	556.10	99.16	0.323	0.60 ( 0.59)	0.99	12128.5 40100.00
11	597.32	111.60	0.300	0.60 ( 0.59)	0.99	13861.0 11831.00
12	698.23	134.95	0.271	0.60 ( 0.59)	0.99	17556.1 11530.00
13	788.03	154.51	0.253	0.60 ( 0.59)	0.99	21712.9 11000.00
14	902.11	176.89	0.232	0.60 ( 0.60)	0.99	28503.9 10850.00
15	828.65	192.52	0.225	0.60 ( 0.60)	0.99	31851.6 11220.00
16	772.58	203.87	0.222	0.60 ( 0.60)	0.99	33606.8 10910.00
17	623.65	244.22	0.210	0.60 ( 0.59)	0.99	40190.7 12410.00
18	588.88	277.09	0.200	0.60 ( 0.59)	0.99	46269.0 12261.00
19	577.75	289.96	0.196	0.60 ( 0.59)	0.99	47753.8 10410.00
20	566.77	302.11	0.192	0.60 ( 0.59)	0.99	48859.6 12101.10
21	541.99	329.45	0.184	0.60 ( 0.59)	0.99	51237.3 10200.00
22	529.22	342.80	0.180	0.60 ( 0.59)	0.99	52177.0 12010.00
23	517.01	353.09	0.177	0.60 ( 0.59)	0.99	52548.7 10300.00
24	491.90	372.10	0.174	0.60 ( 0.59)	0.99	52854.4 10210.00
25	437.34	421.16	0.168	0.60 ( 0.59)	0.99	53356.1 12000.00
26	404.81	488.13	0.161	0.60 ( 0.59)	0.99	53924.5 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.19	20.43	0.764	0.60 ( 0.58)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.28	20.43	0.764	0.60 ( 0.59)	0.98	1580.2	50400.00
2	498.90	20.69	0.758	0.60 ( 0.59)	0.98	1599.6	50200.00
3	646.82	40.28	0.507	0.60 ( 0.59)	0.98	4000.9	50300.00
4	706.20	48.11	0.463	0.60 ( 0.59)	0.98	4877.9	40510.00
5	691.46	51.25	0.445	0.60 ( 0.59)	0.98	5395.7	50120.00
6	658.00	54.87	0.425	0.60 ( 0.59)	0.99	5916.4	31200.00
7	657.10	54.97	0.424	0.60 ( 0.59)	0.99	5929.2	50150.00
8	578.81	63.05	0.390	0.60 ( 0.59)	0.99	6991.8	50100.00
9	555.82	66.98	0.383	0.60 ( 0.59)	0.99	7507.9	31600.00
10	554.10	87.65	0.343	0.60 ( 0.59)	0.99	10559.4	31400.00
11	556.66	99.16	0.323	0.60 ( 0.59)	0.99	12199.2	40100.00
12	597.84	111.60	0.300	0.60 ( 0.59)	0.99	13931.7	11831.00
13	698.70	134.95	0.271	0.60 ( 0.59)	0.99	17626.8	11530.00
14	788.47	154.51	0.253	0.60 ( 0.59)	0.99	21783.5	11000.00
15	902.51	176.89	0.232	0.60 ( 0.60)	0.99	28574.6	10850.00
16	829.04	192.52	0.225	0.60 ( 0.60)	0.99	31922.2	11220.00
17	772.97	203.87	0.222	0.60 ( 0.60)	0.99	33677.5	10910.00
18	624.02	244.22	0.210	0.60 ( 0.59)	0.99	40261.4	12410.00
19	589.23	277.09	0.200	0.60 ( 0.59)	0.99	46339.7	12261.00
20	578.09	289.96	0.196	0.60 ( 0.59)	0.99	47824.5	10410.00

21	567.10	302.11	0.192	0.60 ( 0.59)	0.99	48930.2	12101.10
22	542.30	329.45	0.184	0.60 ( 0.59)	0.99	51308.0	10200.00
23	529.53	342.80	0.180	0.60 ( 0.59)	0.99	52247.7	12010.00
24	517.31	353.09	0.177	0.60 ( 0.59)	0.99	52619.4	10300.00
25	492.20	372.10	0.174	0.60 ( 0.59)	0.99	52925.1	10210.00
26	437.63	421.16	0.168	0.60 ( 0.59)	0.99	53426.8	12000.00
27	405.09	488.13	0.161	0.60 ( 0.59)	0.99	53995.2	10100.00

TOTAL AREA (ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 902.51 Tc (MIN.) = 176.893  
EFFECTIVE AREA (ACRES) = 28574.62 AREA-AVERAGED Fm (INCH/HR) = 0.60  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53995.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

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FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 214.00 DOWNSTREAM (FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 767.57 CHANNEL SLOPE = 0.0013  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 902.51  
FLOW VELOCITY (FEET/SEC.) = 4.43 FLOW DEPTH (FEET) = 8.24  
TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 179.78  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.28	23.78	0.692	0.60 ( 0.59)	0.98	1580.2	50400.00
2	498.90	24.04	0.687	0.60 ( 0.59)	0.98	1599.6	50200.00
3	646.82	43.41	0.490	0.60 ( 0.59)	0.98	4000.9	50300.00
4	706.20	51.18	0.445	0.60 ( 0.59)	0.98	4877.9	40510.00
5	691.46	54.33	0.428	0.60 ( 0.59)	0.98	5395.7	50120.00
6	658.00	57.99	0.407	0.60 ( 0.59)	0.99	5916.4	31200.00
7	657.10	58.09	0.407	0.60 ( 0.59)	0.99	5929.2	50150.00
8	578.81	66.27	0.384	0.60 ( 0.59)	0.99	6991.8	50100.00
9	555.82	70.24	0.377	0.60 ( 0.59)	0.99	7507.9	31600.00
10	554.10	90.91	0.337	0.60 ( 0.59)	0.99	10559.4	31400.00
11	556.66	102.42	0.317	0.60 ( 0.59)	0.99	12199.2	40100.00
12	597.84	114.80	0.294	0.60 ( 0.59)	0.99	13931.7	11831.00
13	698.70	138.03	0.268	0.60 ( 0.59)	0.99	17626.8	11530.00
14	788.47	157.50	0.250	0.60 ( 0.59)	0.99	21783.5	11000.00
15	902.51	179.78	0.229	0.60 ( 0.60)	0.99	28574.6	10850.00
16	829.04	195.47	0.224	0.60 ( 0.60)	0.99	31922.2	11220.00
17	772.97	206.87	0.221	0.60 ( 0.60)	0.99	33677.5	10910.00
18	624.02	247.39	0.209	0.60 ( 0.59)	0.99	40261.4	12410.00
19	589.23	280.30	0.199	0.60 ( 0.59)	0.99	46339.7	12261.00
20	578.09	293.18	0.195	0.60 ( 0.59)	0.99	47824.5	10410.00
21	567.10	305.35	0.191	0.60 ( 0.59)	0.99	48930.2	12101.10
22	542.30	332.73	0.183	0.60 ( 0.59)	0.99	51308.0	10200.00
23	529.53	346.10	0.179	0.60 ( 0.59)	0.99	52247.7	12010.00
24	517.31	356.41	0.176	0.60 ( 0.59)	0.99	52619.4	10300.00



25 492.20 375.45 0.173 0.60( 0.59) 0.99 52925.1 10210.00  
26 437.63 424.61 0.168 0.60( 0.59) 0.99 53426.8 12000.00  
27 405.09 491.65 0.160 0.60( 0.59) 0.99 53995.2 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 902.51 Tc(MIN.) = 179.78  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 28574.62

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610311T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.65	43.71	0.60( 0.58)	0.97	114.8	31100.00
TOTAL AREA(ACRES) =						114.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	499.28	23.78	0.692	0.60( 0.59)	0.98	1580.2	50400.00
2	498.90	24.04	0.687	0.60( 0.59)	0.98	1599.6	50200.00
3	646.82	43.41	0.490	0.60( 0.59)	0.98	4000.9	50300.00
4	706.20	51.18	0.445	0.60( 0.59)	0.98	4877.9	40510.00
5	691.46	54.33	0.428	0.60( 0.59)	0.98	5395.7	50120.00
6	658.00	57.99	0.407	0.60( 0.59)	0.99	5916.4	31200.00
7	657.10	58.09	0.407	0.60( 0.59)	0.99	5929.2	50150.00
8	578.81	66.27	0.384	0.60( 0.59)	0.99	6991.8	50100.00
9	555.82	70.24	0.377	0.60( 0.59)	0.99	7507.9	31600.00
10	554.10	90.91	0.337	0.60( 0.59)	0.99	10559.4	31400.00
11	556.66	102.42	0.317	0.60( 0.59)	0.99	12199.2	40100.00
12	597.84	114.80	0.294	0.60( 0.59)	0.99	13931.7	11831.00
13	698.70	138.03	0.268	0.60( 0.59)	0.99	17626.8	11530.00
14	788.47	157.50	0.250	0.60( 0.59)	0.99	21783.5	11000.00
15	902.51	179.78	0.229	0.60( 0.60)	0.99	28574.6	10850.00
16	829.04	195.47	0.224	0.60( 0.60)	0.99	31922.2	11220.00
17	772.97	206.87	0.221	0.60( 0.60)	0.99	33677.5	10910.00
18	624.02	247.39	0.209	0.60( 0.59)	0.99	40261.4	12410.00
19	589.23	280.30	0.199	0.60( 0.59)	0.99	46339.7	12261.00
20	578.09	293.18	0.195	0.60( 0.59)	0.99	47824.5	10410.00
21	567.10	305.35	0.191	0.60( 0.59)	0.99	48930.2	12101.10
22	542.30	332.73	0.183	0.60( 0.59)	0.99	51308.0	10200.00
23	529.53	346.10	0.179	0.60( 0.59)	0.99	52247.7	12010.00

24 517.31 356.41 0.176 0.60( 0.59) 0.99 52619.4 10300.00  
25 492.20 375.45 0.173 0.60( 0.59) 0.99 52925.1 10210.00  
26 437.63 424.61 0.168 0.60( 0.59) 0.99 53426.8 12000.00  
27 405.09 491.65 0.160 0.60( 0.59) 0.99 53995.2 10100.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.65	43.71	0.488	0.60( 0.58)	0.97	114.8	31100.00
LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	23.78	0.692	0.60( 0.59)	0.98	1642.7	50400.00
2	503.55	24.04	0.687	0.60( 0.59)	0.98	1662.7	50200.00
3	651.45	43.41	0.490	0.60( 0.59)	0.98	4115.0	50300.00
4	653.77	43.71	0.488	0.60( 0.59)	0.98	4149.8	31100.00
5	710.45	51.18	0.445	0.60( 0.59)	0.98	4992.7	40510.00
6	695.54	54.33	0.428	0.60( 0.59)	0.98	5510.5	50120.00
7	661.88	57.99	0.407	0.60( 0.59)	0.99	6031.2	31200.00
8	660.97	58.09	0.407	0.60( 0.59)	0.99	6044.0	50150.00
9	582.48	66.27	0.384	0.60( 0.59)	0.99	7106.6	50100.00
10	559.40	70.24	0.377	0.60( 0.59)	0.99	7622.7	31600.00
11	557.32	90.91	0.337	0.60( 0.59)	0.99	10674.2	31400.00
12	559.68	102.42	0.317	0.60( 0.59)	0.99	12314.0	40100.00
13	600.65	114.80	0.294	0.60( 0.59)	0.99	14046.5	11831.00
14	701.25	138.03	0.268	0.60( 0.59)	0.99	17741.6	11530.00
15	790.85	157.50	0.250	0.60( 0.59)	0.99	21898.4	11000.00
16	904.69	179.78	0.229	0.60( 0.60)	0.99	28689.4	10850.00
17	831.17	195.47	0.224	0.60( 0.60)	0.99	32037.1	11220.00
18	775.07	206.87	0.221	0.60( 0.60)	0.99	33792.3	10910.00
19	626.01	247.39	0.209	0.60( 0.59)	0.99	40376.2	12410.00
20	591.12	280.30	0.199	0.60( 0.59)	0.99	46454.5	12261.00
21	579.95	293.18	0.195	0.60( 0.59)	0.99	47939.3	10410.00
22	568.93	305.35	0.191	0.60( 0.59)	0.99	49045.1	12101.10
23	544.05	332.73	0.183	0.60( 0.59)	0.99	51422.8	10200.00
24	531.24	346.10	0.179	0.60( 0.59)	0.99	52362.5	12010.00
25	518.99	356.41	0.176	0.60( 0.59)	0.99	52734.2	10300.00
26	493.85	375.45	0.173	0.60( 0.59)	0.99	53039.9	10210.00
27	439.23	424.61	0.168	0.60( 0.59)	0.99	53541.6	12000.00
28	406.62	491.65	0.160	0.60( 0.59)	0.99	54110.0	10100.00
TOTAL AREA(ACRES) =						54110.0	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 904.69 Tc(MIN.) = 179.779  
EFFECTIVE AREA(ACRES) = 28689.43 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 54110.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 54110.0 TC(MIN.) = 179.78  
EFFECTIVE AREA(ACRES) = 28689.43 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.993  
PEAK FLOW RATE(CFS) = 904.69

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	23.78	0.692	0.60 ( 0.59)	0.98	1642.7	50400.00
2	503.55	24.04	0.687	0.60 ( 0.59)	0.98	1662.7	50200.00
3	651.45	43.41	0.490	0.60 ( 0.59)	0.98	4115.0	50300.00
4	653.77	43.71	0.488	0.60 ( 0.59)	0.98	4149.8	31100.00
5	710.45	51.18	0.445	0.60 ( 0.59)	0.98	4992.7	40510.00
6	695.54	54.33	0.428	0.60 ( 0.59)	0.98	5510.5	50120.00
7	661.88	57.99	0.407	0.60 ( 0.59)	0.99	6031.2	31200.00
8	660.97	58.09	0.407	0.60 ( 0.59)	0.99	6044.0	50150.00
9	582.48	66.27	0.384	0.60 ( 0.59)	0.99	7106.6	50100.00
10	559.40	70.24	0.377	0.60 ( 0.59)	0.99	7622.7	31600.00
11	557.32	90.91	0.337	0.60 ( 0.59)	0.99	10674.2	31400.00
12	559.68	102.42	0.317	0.60 ( 0.59)	0.99	12314.0	40100.00
13	600.65	114.80	0.294	0.60 ( 0.59)	0.99	14046.5	11831.00
14	701.25	138.03	0.268	0.60 ( 0.59)	0.99	17741.6	11530.00
15	790.85	157.50	0.250	0.60 ( 0.59)	0.99	21898.4	11000.00
16	904.69	179.78	0.229	0.60 ( 0.60)	0.99	28689.4	10850.00
17	831.17	195.47	0.224	0.60 ( 0.60)	0.99	32037.1	11220.00
18	775.07	206.87	0.221	0.60 ( 0.60)	0.99	33792.3	10910.00
19	626.01	247.39	0.209	0.60 ( 0.59)	0.99	40376.2	12410.00
20	591.12	280.30	0.199	0.60 ( 0.59)	0.99	46454.5	12261.00
21	579.95	293.18	0.195	0.60 ( 0.59)	0.99	47939.3	10410.00
22	568.93	305.35	0.191	0.60 ( 0.59)	0.99	49045.1	12101.10
23	544.05	332.73	0.183	0.60 ( 0.59)	0.99	51422.8	10200.00
24	531.24	346.10	0.179	0.60 ( 0.59)	0.99	52362.5	12010.00
25	518.99	356.41	0.176	0.60 ( 0.59)	0.99	52734.2	10300.00
26	493.85	375.45	0.173	0.60 ( 0.59)	0.99	53039.9	10210.00
27	439.23	424.61	0.168	0.60 ( 0.59)	0.99	53541.6	12000.00
28	406.62	491.65	0.160	0.60 ( 0.59)	0.99	54110.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S30.DAT  
TIME/DATE OF STUDY: 14:37 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.596
- 2) 10.00; 1.064
- 3) 15.00; 0.843
- 4) 20.00; 0.715
- 5) 25.00; 0.629
- 6) 30.00; 0.560
- 7) 40.00; 0.480
- 8) 50.00; 0.423
- 9) 60.00; 0.371
- 10) 90.00; 0.302
- 11) 120.00; 0.256
- 12) 180.00; 0.208
- 13) 360.00; 0.142
- 14) 1440.00; 0.060

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13000.00 TO NODE 13001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 279.24  
ELEVATION DATA: UPSTREAM(FEET) = 1187.54 DOWNSTREAM(FEET) = 1104.45

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.560  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.217  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.65	0.60	1.000	0	8.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 0.36  
TOTAL AREA(ACRES) = 0.65 PEAK FLOW RATE(CFS) = 0.36

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13001.00 TO NODE 13002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1104.45 DOWNSTREAM(FEET) = 1034.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 736.73 CHANNEL SLOPE = 0.0945  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.036  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.74	0.60	0.968	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.91  
AVERAGE FLOW DEPTH(FEET) = 0.50 TRAVEL TIME(MIN.) = 2.08  
Tc(MIN.) = 10.64  
SUBAREA AREA(ACRES) = 19.74 SUBAREA RUNOFF(CFS) = 8.09  
EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 8.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 6.87  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13002.00 = 1015.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13002.00 TO NODE 13003.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1034.82 DOWNSTREAM(FEET) = 986.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1305.95 CHANNEL SLOPE = 0.0368  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.878

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.90	0.60	0.904	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.904

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.28

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.10

AVERAGE FLOW DEPTH(FEET) = 1.08 TRAVEL TIME(MIN.) = 3.57

Tc(MIN.) = 14.21

SUBAREA AREA(ACRES) = 83.90 SUBAREA RUNOFF(CFS) = 25.35

EFFECTIVE AREA(ACRES) = 104.29 AREA-AVERAGED Fm(INCH/HR) = 0.55

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.92

TOTAL AREA(ACRES) = 104.3 PEAK FLOW RATE(CFS) = 30.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.24 FLOW VELOCITY(FEET/SEC.) = 6.67

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13003.00 = 2321.92 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13003.00 TO NODE 13004.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 986.71 DOWNSTREAM(FEET) = 939.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.54 CHANNEL SLOPE = 0.0361  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.782

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	47.44	0.60	0.871	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.871

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.90

AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 3.18

Tc(MIN.) = 17.39

SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 11.07

EFFECTIVE AREA(ACRES) = 151.73 AREA-AVERAGED Fm(INCH/HR) = 0.54

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.90

TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 32.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.28 FLOW VELOCITY(FEET/SEC.) = 6.71

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13004.00 = 3640.46 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 939.06 DOWNSTREAM(FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1954.61 CHANNEL SLOPE = 0.0397  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.683

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	77.87	0.60	0.856	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.856

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.29

AVERAGE FLOW DEPTH(FEET) = 1.33 TRAVEL TIME(MIN.) = 4.47

Tc(MIN.) = 21.86

SUBAREA AREA(ACRES) = 77.87 SUBAREA RUNOFF(CFS) = 11.88

EFFECTIVE AREA(ACRES) = 229.60 AREA-AVERAGED Fm(INCH/HR) = 0.53

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.89

TOTAL AREA(ACRES) = 229.6 PEAK FLOW RATE(CFS) = 32.84

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.25 FLOW VELOCITY(FEET/SEC.) = 6.96

LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13020.00 = 5595.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 21.86

RAINFALL INTENSITY(INCH/HR) = 0.68

AREA-AVERAGED Fm(INCH/HR) = 0.53

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.89

EFFECTIVE STREAM AREA(ACRES) = 229.60

TOTAL STREAM AREA(ACRES) = 229.60

PEAK FLOW RATE(CFS) AT CONFLUENCE = 32.84

\*\*\*\*\*

FLOW PROCESS FROM NODE 13010.00 TO NODE 13011.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 284.64

ELEVATION DATA: UPSTREAM(FEET) = 1190.91 DOWNSTREAM(FEET) = 1110.50

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.716

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.201

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-					

NATURAL FAIR COVER  
"OPEN BRUSH" - 0.91 0.60 1.000 0 8.72  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 0.49  
TOTAL AREA (ACRES) = 0.91 PEAK FLOW RATE (CFS) = 0.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13011.00 TO NODE 13012.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 1110.50	DOWNSTREAM ELEVATION(FEET) = 1068.16
STREET LENGTH(FEET) = 581.12	CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 30.00	

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00  
INSIDE STREET CROSSFALL(DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALfstREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.53  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH(FEET) = 0.20  
HALFSTREET FLOOD WIDTH(FEET) = 2.00  
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.86  
PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.16  
STREET FLOW TRAVEL TIME(MIN.) = 1.65 Tc(MIN.) = 10.37  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.048

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	10.46	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA AREA(ACRES) = 10.46 SUBAREA RUNOFF(CFS) = 4.22  
EFFECTIVE AREA(ACRES) = 11.37 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 11.4 PEAK FLOW RATE(CFS) = 4.58

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH(FEET) = 0.26 HALFSTREET FLOOD WIDTH(FEET) = 5.47  
FLOW VELOCITY(FEET/SEC.) = 4.97 DEPTH\*VELOCITY(FT\*FT/SEC.) = 1.29  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13012.00 = 865.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13012.00 TO NODE 13013.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 1068.16	DOWNSTREAM ELEVATION(FEET) = 994.58
STREET LENGTH(FEET) = 1505.98	CURB HEIGHT(INCHES) = 8.0

STREET HALFWIDTH(FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00  
INSIDE STREET CROSSFALL(DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.018

SPECIFIED NUMBER OF HALfstREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.24  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH(FEET) = 0.33  
HALFSTREET FLOOD WIDTH(FEET) = 9.34  
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.75  
PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.56  
STREET FLOW TRAVEL TIME(MIN.) = 5.29 Tc(MIN.) = 15.65  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.826

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	35.49	0.60	0.901	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.901  
SUBAREA AREA(ACRES) = 35.49 SUBAREA RUNOFF(CFS) = 9.13  
EFFECTIVE AREA(ACRES) = 46.86 AREA-AVERAGED Fm(INCH/HR) = 0.55  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 46.9 PEAK FLOW RATE(CFS) = 11.44

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 10.35  
FLOW VELOCITY(FEET/SEC.) = 4.97 DEPTH\*VELOCITY(FT\*FT/SEC.) = 1.73  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13013.00 = 2371.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13013.00 TO NODE 13014.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 994.58	DOWNSTREAM(FEET) = 944.96
CHANNEL LENGTH THRU SUBAREA(FEET) = 1798.86	CHANNEL SLOPE = 0.0276
CHANNEL BASE(FEET) = 0.00	"Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030	MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.696	

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	73.31	0.60	0.616	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.616  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.52  
AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 5.44  
Tc(MIN.) = 21.09  
SUBAREA AREA(ACRES) = 73.31 SUBAREA RUNOFF(CFS) = 21.56  
EFFECTIVE AREA(ACRES) = 120.17 AREA-AVERAGED Fm(INCH/HR) = 0.44

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.74  
TOTAL AREA (ACRES) = 120.2 PEAK FLOW RATE (CFS) = 27.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.26 FLOW VELOCITY (FEET/SEC.) = 5.82  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13014.00 = 4170.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 944.96 DOWNSTREAM (FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1519.40 CHANNEL SLOPE = 0.0549  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.641

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.22	0.60	0.810	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 33.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.87  
AVERAGE FLOW DEPTH (FEET) = 1.19 TRAVEL TIME (MIN.) = 3.22  
Tc (MIN.) = 24.31  
SUBAREA AREA (ACRES) = 80.22 SUBAREA RUNOFF (CFS) = 11.19  
EFFECTIVE AREA (ACRES) = 200.39 AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.77  
TOTAL AREA (ACRES) = 200.4 PEAK FLOW RATE (CFS) = 32.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.18 FLOW VELOCITY (FEET/SEC.) = 7.86  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 24.31  
RAINFALL INTENSITY (INCH/HR) = 0.64  
AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.77  
EFFECTIVE STREAM AREA (ACRES) = 200.39  
TOTAL STREAM AREA (ACRES) = 200.39  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 32.72

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.84	21.86	0.683	0.60 (0.53)	0.89	229.6	13000.00

2 32.72 24.31 0.641 0.60 (0.46) 0.77 200.4 13010.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	65.56	21.86	0.683	0.60 (0.50)	0.83	409.8	13000.00
2	56.41	24.31	0.641	0.60 (0.50)	0.83	430.0	13010.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 65.56 Tc (MIN.) = 21.86  
EFFECTIVE AREA (ACRES) = 409.81 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83  
TOTAL AREA (ACRES) = 430.0  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13020.00 TO NODE 13021.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 861.53 DOWNSTREAM (FEET) = 843.84  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1274.71 CHANNEL SLOPE = 0.0139  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.621

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.78	0.60	0.818	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 70.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.67  
AVERAGE FLOW DEPTH (FEET) = 2.03 TRAVEL TIME (MIN.) = 3.74  
Tc (MIN.) = 25.60  
SUBAREA AREA (ACRES) = 80.78 SUBAREA RUNOFF (CFS) = 9.45  
EFFECTIVE AREA (ACRES) = 490.59 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83  
TOTAL AREA (ACRES) = 510.8 PEAK FLOW RATE (CFS) = 65.56  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.98 FLOW VELOCITY (FEET/SEC.) = 5.58  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13021.00 = 6964.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	65.56	25.60	0.621	0.60 (0.50)	0.83	490.6	13000.00
2	56.41	28.20	0.585	0.60 (0.50)	0.83	510.8	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE (CFS) = 65.56 Tc (MIN.) = 25.60  
AREA-AVERAGED Fm (INCH/HR) = 0.50 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA (ACRES) = 490.59

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FLOW PROCESS FROM NODE 13021.00 TO NODE 13022.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 843.84 DOWNSTREAM(FEET) = 842.14
CHANNEL LENGTH THRU SUBAREA(FEET) = 1448.62 CHANNEL SLOPE = 0.0012
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.510
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 124.44 0.60 0.803 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.19
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.26
AVERAGE FLOW DEPTH(FEET) = 3.24 TRAVEL TIME(MIN.) = 10.68
Tc(MIN.) = 36.28
SUBAREA AREA(ACRES) = 124.44 SUBAREA RUNOFF(CFS) = 11.25
EFFECTIVE AREA(ACRES) = 615.03 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 635.2 PEAK FLOW RATE(CFS) = 65.56
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.14 FLOW VELOCITY(FEET/SEC.) = 2.22
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13022.00 = 8413.33 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 65.56 36.28 0.510 0.60( 0.50) 0.83 615.0 13000.00
2 56.41 39.26 0.486 0.60( 0.49) 0.82 635.2 13010.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 65.56 Tc(MIN.) = 36.28
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 615.03

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*****
FLOW PROCESS FROM NODE 13022.00 TO NODE 13023.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 842.14 DOWNSTREAM(FEET) = 806.85
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.95 CHANNEL SLOPE = 0.0246
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.484
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 324.46 0.60 0.786 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.786
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 80.67
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.30
AVERAGE FLOW DEPTH(FEET) = 1.92 TRAVEL TIME(MIN.) = 3.27
Tc(MIN.) = 39.56
SUBAREA AREA(ACRES) = 324.46 SUBAREA RUNOFF(CFS) = 30.22
EFFECTIVE AREA(ACRES) = 939.49 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 959.7 PEAK FLOW RATE(CFS) = 76.96

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.89 FLOW VELOCITY(FEET/SEC.) = 7.20
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13023.00 = 9846.28 FEET.

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** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 76.96 39.56 0.484 0.60( 0.49) 0.81 939.5 13000.00
2 75.98 42.64 0.465 0.60( 0.49) 0.81 959.7 13010.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 76.96 Tc(MIN.) = 39.56
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA(ACRES) = 939.49

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FLOW PROCESS FROM NODE 13023.00 TO NODE 13024.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 806.85 DOWNSTREAM(FEET) = 767.07
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.17 CHANNEL SLOPE = 0.0423
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.473
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 367.12 0.60 0.795 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.795
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 92.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.27
AVERAGE FLOW DEPTH(FEET) = 1.83 TRAVEL TIME(MIN.) = 1.69
Tc(MIN.) = 41.25
SUBAREA AREA(ACRES) = 367.12 SUBAREA RUNOFF(CFS) = 32.03
EFFECTIVE AREA(ACRES) = 1306.61 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81

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\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1326.8 PEAK FLOW RATE (CFS) = 107.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.93 FLOW VELOCITY (FEET/SEC.) = 9.63  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13024.00 = 10786.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.30	41.25	0.473	0.60 ( 0.48)	0.81	1306.6	13000.00
2	105.24	44.34	0.455	0.60 ( 0.48)	0.81	1326.8	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 107.30 Tc (MIN.) = 41.25  
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 1306.61

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13024.00 TO NODE 13025.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 767.07 DOWNSTREAM (FEET) = 697.38  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3026.62 CHANNEL SLOPE = 0.0230  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.436

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 315.24 0.60 0.867 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.867  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 115.53  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.79  
 AVERAGE FLOW DEPTH (FEET) = 2.22 TRAVEL TIME (MIN.) = 6.47  
 Tc (MIN.) = 47.72  
 SUBAREA AREA (ACRES) = 315.24 SUBAREA RUNOFF (CFS) = 16.45  
 EFFECTIVE AREA (ACRES) = 1621.85 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.82  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 1642.0 PEAK FLOW RATE (CFS) = 115.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.22 FLOW VELOCITY (FEET/SEC.) = 7.78  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13025.00 = 13813.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.38	47.72	0.436	0.60 ( 0.49)	0.82	1621.8	13000.00
2	112.54	50.86	0.419	0.60 ( 0.49)	0.82	1642.0	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 115.38 Tc (MIN.) = 47.72  
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 1621.85

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 697.38 DOWNSTREAM (FEET) = 662.66  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2362.69 CHANNEL SLOPE = 0.0147  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.405

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 374.11 0.60 0.748 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.748  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 132.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.82  
 AVERAGE FLOW DEPTH (FEET) = 2.55 TRAVEL TIME (MIN.) = 5.77  
 Tc (MIN.) = 53.49  
 SUBAREA AREA (ACRES) = 374.11 SUBAREA RUNOFF (CFS) = 34.35  
 EFFECTIVE AREA (ACRES) = 1995.96 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 2016.1 PEAK FLOW RATE (CFS) = 141.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.61 FLOW VELOCITY (FEET/SEC.) = 6.91  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13026.00 = 16175.76 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	53.49	0.405	0.60 ( 0.48)	0.81	1996.0	13000.00
2	137.35	56.68	0.388	0.60 ( 0.48)	0.81	2016.1	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 141.48 Tc (MIN.) = 53.49  
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 1995.96

END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 2016.1 TC (MIN.) = 53.49  
 EFFECTIVE AREA (ACRES) = 1995.96 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.805  
 PEAK FLOW RATE (CFS) = 141.48

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	53.49	0.405	0.60 ( 0.48)	0.81	1996.0	13000.00



2 137.35 56.68 0.388 0.60 ( 0.48) 0.81 2016.1 13010.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S31.DAT  
TIME/DATE OF STUDY: 14:37 04/03/2013  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

=====

=====

- 1) 5.00; 1.596
- 2) 10.00; 1.064
- 3) 15.00; 0.843
- 4) 20.00; 0.715
- 5) 25.00; 0.629
- 6) 30.00; 0.560
- 7) 40.00; 0.480
- 8) 50.00; 0.423
- 9) 60.00; 0.371
- 10) 90.00; 0.302
- 11) 120.00; 0.256
- 12) 180.00; 0.208
- 13) 360.00; 0.142
- 14) 1440.00; 0.060

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

- GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
  2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13100.00 TO NODE 13101.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 282.58  
ELEVATION DATA: UPSTREAM (FEET) = 1069.66 DOWNSTREAM (FEET) = 969.92

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
 SUBAREA ANALYSIS USED MINIMUM  $T_c$  (MIN.) = 8.312  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.244  
 SUBAREA  $T_c$  AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.94	0.60	1.000	0	8.31

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 SUBAREA RUNOFF (CFS) = 0.54  
 TOTAL AREA (ACRES) = 0.94 PEAK FLOW RATE (CFS) = 0.54

\*\*\*\*\*

FLOW PROCESS FROM NODE 13101.00 TO NODE 13102.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 969.92 DOWNSTREAM (FEET) = 807.20  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 665.89 CHANNEL SLOPE = 0.2444  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.018  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
USER-DEFINED	-	7.67	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2.02  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.07  
 AVERAGE FLOW DEPTH (FEET) = 0.41 TRAVEL TIME (MIN.) = 2.73  
 $T_c$  (MIN.) = 11.04  
 SUBAREA AREA (ACRES) = 7.67 SUBAREA RUNOFF (CFS) = 2.89  
 EFFECTIVE AREA (ACRES) = 8.61 AREA-AVERAGED  $F_m$  (INCH/HR) = 0.60  
 AREA-AVERAGED  $F_p$  (INCH/HR) = 0.60 AREA-AVERAGED  $A_p$  = 1.00  
 TOTAL AREA (ACRES) = 8.6 PEAK FLOW RATE (CFS) = 3.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.49 FLOW VELOCITY (FEET/SEC.) = 4.58  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13102.00 = 948.47 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13102.00 TO NODE 13103.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 807.20 DOWNSTREAM(FEET) = 769.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 691.01 CHANNEL SLOPE = 0.0539  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.849

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	20.65	0.60	0.999	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.01  
AVERAGE FLOW DEPTH(FEET) = 0.79 TRAVEL TIME(MIN.) = 3.83  
Tc(MIN.) = 14.87  
SUBAREA AREA(ACRES) = 20.65 SUBAREA RUNOFF(CFS) = 4.64  
EFFECTIVE AREA(ACRES) = 29.26 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 6.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.84 FLOW VELOCITY(FEET/SEC.) = 3.13  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13103.00 = 1639.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 769.94 DOWNSTREAM(FEET) = 693.88  
FLOW LENGTH(FEET) = 1563.10 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.3 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.10  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 6.57  
PIPE TRAVEL TIME(MIN.) = 2.58 Tc(MIN.) = 17.45  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13104.00 = 3202.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 17.45  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.780  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.00	0.60	0.750	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.750  
SUBAREA AREA(ACRES) = 28.00 SUBAREA RUNOFF(CFS) = 8.33  
EFFECTIVE AREA(ACRES) = 57.26 AREA-AVERAGED Fm(INCH/HR) = 0.53  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 57.3 PEAK FLOW RATE(CFS) = 13.09

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 693.88 DOWNSTREAM(FEET) = 645.69  
FLOW LENGTH(FEET) = 1068.98 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 7.6 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.06  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 13.09  
PIPE TRAVEL TIME(MIN.) = 1.48 Tc(MIN.) = 18.92  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13105.00 = 4271.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 18.92  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.743  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.28	0.60	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867  
SUBAREA AREA(ACRES) = 35.28 SUBAREA RUNOFF(CFS) = 7.06  
EFFECTIVE AREA(ACRES) = 92.54 AREA-AVERAGED Fm(INCH/HR) = 0.52  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 92.5 PEAK FLOW RATE(CFS) = 18.21

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 645.69 DOWNSTREAM(FEET) = 608.48  
FLOW LENGTH(FEET) = 1127.55 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 9.7 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.88  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 18.21  
PIPE TRAVEL TIME(MIN.) = 1.58 Tc(MIN.) = 20.50  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 20.50  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.706  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.68 0.60 0.889 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889  
 SUBAREA AREA (ACRES) = 37.68 SUBAREA RUNOFF(CFS) = 5.87  
 EFFECTIVE AREA (ACRES) = 130.22 AREA-AVERAGED Fm (INCH/HR) = 0.53  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 130.2 PEAK FLOW RATE (CFS) = 21.06

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S30.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	53.49	0.60 ( 0.48)	0.81	1996.0	13000.00
2	137.35	56.68	0.60 ( 0.48)	0.81	2016.1	13010.00
TOTAL AREA (ACRES) = 2016.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	53.49	0.60 ( 0.48)	0.81	1996.0	13000.00
2	137.35	56.68	0.60 ( 0.48)	0.81	2016.1	13010.00
TOTAL AREA (ACRES) = 2016.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13026.00 TO NODE 13106.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 662.66 DOWNSTREAM(FEET) = 608.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3098.88 CHANNEL SLOPE = 0.0175  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.370  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 75.28 0.60 0.755 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.755  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.55  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.44  
 AVERAGE FLOW DEPTH(FEET) = 2.55 TRAVEL TIME(MIN.) = 6.94  
 Tc(MIN.) = 60.44  
 SUBAREA AREA (ACRES) = 75.28 SUBAREA RUNOFF(CFS) = 6.14  
 EFFECTIVE AREA (ACRES) = 2071.24 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 2091.4 PEAK FLOW RATE (CFS) = 141.48  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.53 FLOW VELOCITY(FEET/SEC.) = 7.38  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	60.44	0.370	0.60 ( 0.48)	0.80	2071.2	13000.00
2	137.35	63.69	0.363	0.60 ( 0.48)	0.80	2091.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 141.48 Tc(MIN.) = 60.44  
 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA (ACRES) = 2071.24

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	141.48	60.44	0.370	0.60 ( 0.48)	0.80	2071.2	13000.00
2	137.35	63.69	0.363	0.60 ( 0.48)	0.80	2091.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.06	20.50	0.706	0.60 ( 0.53)	0.88	130.2	13100.00
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	20.50	0.706	0.60 ( 0.49)	0.82	832.9	13100.00
2	146.77	60.44	0.370	0.60 ( 0.48)	0.81	2201.5	13000.00
3	142.54	63.69	0.363	0.60 ( 0.48)	0.81	2221.6	13010.00
TOTAL AREA (ACRES) = 2221.6							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 162.54 Tc(MIN.) = 20.504

EFFECTIVE AREA(ACRES) = 832.90 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 2221.6  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13106.00 TO NODE 13107.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 608.48 DOWNSTREAM(FEET) = 584.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1650.20 CHANNEL SLOPE = 0.0147  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.642

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	190.45	0.60	0.755	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.755  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 178.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.33  
AVERAGE FLOW DEPTH(FEET) = 2.85 TRAVEL TIME(MIN.) = 3.75  
Tc(MIN.) = 24.25  
SUBAREA AREA(ACRES) = 190.45 SUBAREA RUNOFF(CFS) = 32.38  
EFFECTIVE AREA(ACRES) = 1023.35 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 2412.1 PEAK FLOW RATE(CFS) = 162.54  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.75 FLOW VELOCITY(FEET/SEC.) = 7.16  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13107.00 = 20924.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	24.25	0.642	0.60( 0.48)	0.80	1023.4	13100.00
2	152.50	64.33	0.361	0.60( 0.48)	0.80	2391.9	13000.00
3	150.82	67.60	0.354	0.60( 0.48)	0.80	2412.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 162.54 Tc(MIN.) = 24.25  
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.80 EFFECTIVE AREA(ACRES) = 1023.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13107.00 TO NODE 13108.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 584.29 DOWNSTREAM(FEET) = 563.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1061.67 CHANNEL SLOPE = 0.0193  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.609

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	314.12	0.60	0.939	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.939  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 169.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.02  
AVERAGE FLOW DEPTH(FEET) = 2.65 TRAVEL TIME(MIN.) = 2.21  
Tc(MIN.) = 26.46  
SUBAREA AREA(ACRES) = 314.12 SUBAREA RUNOFF(CFS) = 12.89  
EFFECTIVE AREA(ACRES) = 1337.47 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 2726.2 PEAK FLOW RATE(CFS) = 162.54  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.61 FLOW VELOCITY(FEET/SEC.) = 7.94  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13108.00 = 21986.51 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	26.46	0.609	0.60( 0.50)	0.84	1337.5	13100.00
2	156.45	66.58	0.356	0.60( 0.49)	0.82	2706.0	13000.00
3	154.61	69.86	0.348	0.60( 0.49)	0.82	2726.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 162.54 Tc(MIN.) = 26.46  
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 1337.47

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13108.00 TO NODE 13109.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 563.78 DOWNSTREAM(FEET) = 541.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1657.28 CHANNEL SLOPE = 0.0134  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.557

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	203.63	0.60	0.785	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.785  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 173.51  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.04  
AVERAGE FLOW DEPTH(FEET) = 2.87 TRAVEL TIME(MIN.) = 3.92  
Tc(MIN.) = 30.38  
SUBAREA AREA(ACRES) = 203.63 SUBAREA RUNOFF(CFS) = 21.95  
EFFECTIVE AREA(ACRES) = 1541.10 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 2929.8 PEAK FLOW RATE (CFS) = 162.54  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.80 FLOW VELOCITY (FEET/SEC.) = 6.92  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13109.00 = 23643.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	30.38	0.557	0.60 ( 0.50)	0.83	1541.1	13100.00
2	166.08	70.57	0.347	0.60 ( 0.49)	0.82	2909.7	13000.00
3	163.89	73.86	0.339	0.60 ( 0.49)	0.82	2929.8	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 166.08 Tc (MIN.) = 70.57  
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 2909.66

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13109.00 TO NODE 13110.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 541.61 DOWNSTREAM (FEET) = 509.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2016.96 CHANNEL SLOPE = 0.0157  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.336

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	283.06	0.60	0.791	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.791  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 175.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.50  
 AVERAGE FLOW DEPTH (FEET) = 2.79 TRAVEL TIME (MIN.) = 4.48  
 Tc (MIN.) = 75.05  
 SUBAREA AREA (ACRES) = 283.06 SUBAREA RUNOFF (CFS) = 17.91  
 EFFECTIVE AREA (ACRES) = 3192.72 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 3212.9 PEAK FLOW RATE (CFS) = 179.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.82 FLOW VELOCITY (FEET/SEC.) = 7.52  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13110.00 = 25660.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	34.87	0.521	0.60 ( 0.49)	0.82	1824.2	13100.00
2	179.05	75.05	0.336	0.60 ( 0.49)	0.81	3192.7	13000.00

3 176.37 78.38 0.329 0.60 ( 0.49) 0.81 3212.9 13010.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 179.05 Tc (MIN.) = 75.05  
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3192.72

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13110.00 TO NODE 13111.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 509.94 DOWNSTREAM (FEET) = 461.07  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3058.95 CHANNEL SLOPE = 0.0160  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.321

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	248.05	0.60	0.783	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 186.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.66  
 AVERAGE FLOW DEPTH (FEET) = 2.85 TRAVEL TIME (MIN.) = 6.65  
 Tc (MIN.) = 81.70  
 SUBAREA AREA (ACRES) = 248.05 SUBAREA RUNOFF (CFS) = 15.55  
 EFFECTIVE AREA (ACRES) = 3440.77 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 3460.9 PEAK FLOW RATE (CFS) = 186.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.85 FLOW VELOCITY (FEET/SEC.) = 7.65  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13111.00 = 28719.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.54	41.64	0.471	0.60 ( 0.49)	0.82	2072.2	13100.00
2	186.46	81.70	0.321	0.60 ( 0.49)	0.81	3440.8	13000.00
3	183.31	85.06	0.313	0.60 ( 0.49)	0.81	3460.9	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 186.46 Tc (MIN.) = 81.70  
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3440.77

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13111.00 TO NODE 13112.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 461.07 DOWNSTREAM (FEET) = 452.77

CHANNEL LENGTH THRU SUBAREA (FEET) = 1781.78 CHANNEL SLOPE = 0.0047  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.307  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	179.91	0.60	0.694	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 194.06  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.87  
 AVERAGE FLOW DEPTH (FEET) = 3.64 TRAVEL TIME (MIN.) = 6.10  
 Tc (MIN.) = 87.80  
 SUBAREA AREA (ACRES) = 179.91 SUBAREA RUNOFF (CFS) = 15.21  
 EFFECTIVE AREA (ACRES) = 3620.68 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 3640.9 PEAK FLOW RATE (CFS) = 193.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.64 FLOW VELOCITY (FEET/SEC.) = 4.86  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13112.00 = 30501.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	168.92	47.91	0.435	0.60 ( 0.48)	0.81	2252.1	13100.00
2	193.53	87.80	0.307	0.60 ( 0.48)	0.81	3620.7	13000.00
3	190.47	91.18	0.300	0.60 ( 0.48)	0.81	3640.9	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 193.53 Tc (MIN.) = 87.80  
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3620.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVEL TIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 452.77 DOWNSTREAM (FEET) = 427.51  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1625.01 CHANNEL SLOPE = 0.0155  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.300  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	155.96	0.60	0.836	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 196.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.68  
 AVERAGE FLOW DEPTH (FEET) = 2.92 TRAVEL TIME (MIN.) = 3.53  
 Tc (MIN.) = 91.33  
 SUBAREA AREA (ACRES) = 155.96 SUBAREA RUNOFF (CFS) = 6.91  
 EFFECTIVE AREA (ACRES) = 3776.64 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 3796.8 PEAK FLOW RATE (CFS) = 195.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.92 FLOW VELOCITY (FEET/SEC.) = 7.68  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	170.71	51.55	0.415	0.60 ( 0.49)	0.81	2408.1	13100.00
2	195.96	91.33	0.300	0.60 ( 0.48)	0.81	3776.6	13000.00
3	193.82	94.72	0.295	0.60 ( 0.48)	0.81	3796.8	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 195.96 Tc (MIN.) = 91.33  
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 3776.64

=====

END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 3796.8 TC (MIN.) = 91.33  
 EFFECTIVE AREA (ACRES) = 3776.64 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.808  
 PEAK FLOW RATE (CFS) = 195.96

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	170.71	51.55	0.415	0.60 ( 0.49)	0.81	2408.1	13100.00
2	195.96	91.33	0.300	0.60 ( 0.48)	0.81	3776.6	13000.00
3	193.82	94.72	0.295	0.60 ( 0.48)	0.81	3796.8	13010.00

=====

END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

FILE NAME: S32.DAT
TIME/DATE OF STUDY: 14:37 04/03/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.596
2) 10.00; 1.064
3) 15.00; 0.843
4) 20.00; 0.715
5) 25.00; 0.629
6) 30.00; 0.560
7) 40.00; 0.480
8) 50.00; 0.423
9) 60.00; 0.371
10) 90.00; 0.302
11) 120.00; 0.256
12) 180.00; 0.208
13) 360.00; 0.142
14) 1440.00; 0.060

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE/ WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*
FLOW PROCESS FROM NODE 13200.00 TO NODE 13201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.57
ELEVATION DATA: UPSTREAM(FEET) = 1069.04 DOWNSTREAM(FEET) = 1005.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.410
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.127
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 0.67 0.60 1.000 0 9.41
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 0.32
TOTAL AREA(ACRES) = 0.67 PEAK FLOW RATE(CFS) = 0.32

\*\*\*\*\*
FLOW PROCESS FROM NODE 13201.00 TO NODE 13202.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1005.76 DOWNSTREAM(FEET) = 896.98
CHANNEL LENGTH THRU SUBAREA(FEET) = 747.55 CHANNEL SLOPE = 0.1455
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.910
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 7.41 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.05
AVERAGE FLOW DEPTH(FEET) = 0.39 TRAVEL TIME(MIN.) = 4.08
Tc(MIN.) = 13.49
SUBAREA AREA(ACRES) = 7.41 SUBAREA RUNOFF(CFS) = 2.07
EFFECTIVE AREA(ACRES) = 8.08 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 8.1 PEAK FLOW RATE(CFS) = 2.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.47 FLOW VELOCITY(FEET/SEC.) = 3.43
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13202.00 = 1046.12 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<



ELEVATION DATA: UPSTREAM(FEET) = 896.98 DOWNSTREAM(FEET) = 840.27  
FLOW LENGTH(FEET) = 1789.59 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 3.5 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.31  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 2.25  
PIPE TRAVEL TIME(MIN.) = 4.73 Tc(MIN.) = 18.22  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13203.00 = 2835.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 18.22  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.761  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 38.89 0.60 0.731 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.731  
SUBAREA AREA(ACRES) = 38.89 SUBAREA RUNOFF(CFS) = 11.28  
EFFECTIVE AREA(ACRES) = 46.97 AREA-AVERAGED Fm(INCH/HR) = 0.47  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.78  
TOTAL AREA(ACRES) = 47.0 PEAK FLOW RATE(CFS) = 12.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 840.27 DOWNSTREAM(FEET) = 782.97  
FLOW LENGTH(FEET) = 992.54 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 7.0 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.97  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 12.44  
PIPE TRAVEL TIME(MIN.) = 1.28 Tc(MIN.) = 19.49  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13204.00 = 3828.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 19.49  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.728  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 83.09 0.60 0.645 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645  
SUBAREA AREA(ACRES) = 83.09 SUBAREA RUNOFF(CFS) = 25.51

EFFECTIVE AREA(ACRES) = 130.06 AREA-AVERAGED Fm(INCH/HR) = 0.42  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.69  
TOTAL AREA(ACRES) = 130.1 PEAK FLOW RATE(CFS) = 36.57

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 782.97 DOWNSTREAM(FEET) = 692.52  
FLOW LENGTH(FEET) = 2046.57 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.9 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.06  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 36.57  
PIPE TRAVEL TIME(MIN.) = 2.12 Tc(MIN.) = 21.62  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13205.00 = 5874.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 21.62  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.687  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 88.51 0.60 0.679 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679  
SUBAREA AREA(ACRES) = 88.51 SUBAREA RUNOFF(CFS) = 22.30  
EFFECTIVE AREA(ACRES) = 218.57 AREA-AVERAGED Fm(INCH/HR) = 0.41  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.69  
TOTAL AREA(ACRES) = 218.6 PEAK FLOW RATE(CFS) = 54.09

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13205.00 TO NODE 13206.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 692.52 DOWNSTREAM(FEET) = 605.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2704.69 CHANNEL SLOPE = 0.0323  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.573  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 163.73 0.60 0.858 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.05  
 AVERAGE FLOW DEPTH (FEET) = 1.82 TRAVEL TIME (MIN.) = 7.45  
 Tc (MIN.) = 29.07  
 SUBAREA AREA (ACRES) = 163.73 SUBAREA RUNOFF (CFS) = 11.99  
 EFFECTIVE AREA (ACRES) = 382.30 AREA-AVERAGED Fm (INCH/HR) = 0.46  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.76  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 382.3 PEAK FLOW RATE (CFS) = 54.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.75 FLOW VELOCITY (FEET/SEC.) = 5.89  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13206.00 = 8579.51 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13206.00 TO NODE 13207.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 605.24 DOWNSTREAM (FEET) = 555.41  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2479.15 CHANNEL SLOPE = 0.0201  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.502  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	143.41	0.60	0.888	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.888  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 57.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.02  
 AVERAGE FLOW DEPTH (FEET) = 1.96 TRAVEL TIME (MIN.) = 8.23  
 Tc (MIN.) = 37.30  
 SUBAREA AREA (ACRES) = 143.41 SUBAREA RUNOFF (CFS) = 7.25  
 EFFECTIVE AREA (ACRES) = 525.71 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.80  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 525.7 PEAK FLOW RATE (CFS) = 54.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.91 FLOW VELOCITY (FEET/SEC.) = 4.93  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13207.00 = 11058.66 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 555.41 DOWNSTREAM (FEET) = 505.65  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1734.55 CHANNEL SLOPE = 0.0287

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.467  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.56	0.60	0.858	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 57.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.73  
 AVERAGE FLOW DEPTH (FEET) = 1.83 TRAVEL TIME (MIN.) = 5.05  
 Tc (MIN.) = 42.35

SUBAREA AREA (ACRES) = 123.56 SUBAREA RUNOFF (CFS) = 7.37  
 EFFECTIVE AREA (ACRES) = 649.27 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 649.3 PEAK FLOW RATE (CFS) = 54.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.79 FLOW VELOCITY (FEET/SEC.) = 5.64  
 LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION (MIN.) = 42.35  
 RAINFALL INTENSITY (INCH/HR) = 0.47  
 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.81  
 EFFECTIVE STREAM AREA (ACRES) = 649.27  
 TOTAL STREAM AREA (ACRES) = 649.27  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 54.09

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13210.00 TO NODE 13211.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 314.51  
 ELEVATION DATA: UPSTREAM (FEET) = 949.80 DOWNSTREAM (FEET) = 828.64

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.525  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.221  
 SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	123.56	0.60	0.858	-	-

NATURAL FAIR COVER  
"OPEN BRUSH" - 1.96 0.60 1.000 0 8.53  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.10  
TOTAL AREA(ACRES) = 1.96 PEAK FLOW RATE(CFS) = 1.10

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13211.00 TO NODE 13212.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	828.64	DOWNSTREAM(FEET) =	767.94
CHANNEL LENGTH THRU SUBAREA(FEET) =	652.49	CHANNEL SLOPE =	0.0930
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.979		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.95	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.20  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.20  
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 3.40  
Tc(MIN.) = 11.92  
SUBAREA AREA(ACRES) = 11.95 SUBAREA RUNOFF(CFS) = 4.08  
EFFECTIVE AREA(ACRES) = 13.91 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.9 PEAK FLOW RATE(CFS) = 4.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 3.54  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13212.00 = 967.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13212.00 TO NODE 13213.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	767.94	DOWNSTREAM(FEET) =	706.43
CHANNEL LENGTH THRU SUBAREA(FEET) =	967.91	CHANNEL SLOPE =	0.0635
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.801		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.07	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.41  
AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 4.74  
Tc(MIN.) = 16.66

SUBAREA AREA(ACRES) = 27.07 SUBAREA RUNOFF(CFS) = 4.89  
EFFECTIVE AREA(ACRES) = 40.98 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 41.0 PEAK FLOW RATE(CFS) = 7.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.85 FLOW VELOCITY(FEET/SEC.) = 3.42  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13213.00 = 1934.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13213.00 TO NODE 13214.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	706.43	DOWNSTREAM(FEET) =	659.31
CHANNEL LENGTH THRU SUBAREA(FEET) =	948.11	CHANNEL SLOPE =	0.0497
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.688		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.09	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.20  
AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 4.94  
Tc(MIN.) = 21.60  
SUBAREA AREA(ACRES) = 18.09 SUBAREA RUNOFF(CFS) = 1.43  
EFFECTIVE AREA(ACRES) = 59.07 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 59.1 PEAK FLOW RATE(CFS) = 7.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.89 FLOW VELOCITY(FEET/SEC.) = 3.12  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13214.00 = 2883.02 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13214.00 TO NODE 13215.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	659.31	DOWNSTREAM(FEET) =	628.91
CHANNEL LENGTH THRU SUBAREA(FEET) =	970.24	CHANNEL SLOPE =	0.0313
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) =	0.591		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	71.42	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.61  
 AVERAGE FLOW DEPTH(FEET) = 0.97 TRAVEL TIME(MIN.) = 6.19  
 Tc(MIN.) = 27.79  
 SUBAREA AREA(ACRES) = 71.42 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 130.49 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 130.5 PEAK FLOW RATE(CFS) = 7.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 2.61  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13215.00 = 3853.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13215.00 TO NODE 13216.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 628.91 DOWNSTREAM(FEET) = 598.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 922.63 CHANNEL SLOPE = 0.0331  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.531

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.33	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.65  
 AVERAGE FLOW DEPTH(FEET) = 0.96 TRAVEL TIME(MIN.) = 5.79  
 Tc(MIN.) = 33.58

SUBAREA AREA(ACRES) = 36.33 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 166.82 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 166.8 PEAK FLOW RATE(CFS) = 7.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 2.65  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13216.00 = 4775.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13216.00 TO NODE 13217.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 598.39 DOWNSTREAM(FEET) = 568.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 636.40 CHANNEL SLOPE = 0.0470  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.504

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.51	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.06  
 AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 3.46  
 Tc(MIN.) = 37.05

SUBAREA AREA(ACRES) = 42.51 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 209.33 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 209.3 PEAK FLOW RATE(CFS) = 7.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 3.06  
 LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13217.00 = 5412.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 568.48 DOWNSTREAM(FEET) = 505.65  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.50 CHANNEL SLOPE = 0.0331  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.431

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.24	0.60	0.951	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.951  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.73  
 AVERAGE FLOW DEPTH(FEET) = 0.99 TRAVEL TIME(MIN.) = 11.59  
 Tc(MIN.) = 48.63

SUBAREA AREA(ACRES) = 73.24 SUBAREA RUNOFF(CFS) = 1.39  
 EFFECTIVE AREA(ACRES) = 282.57 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 282.6 PEAK FLOW RATE(CFS) = 7.40

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 2.69  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13220.00 = 7308.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 48.63  
RAINFALL INTENSITY(INCH/HR) = 0.43  
AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 282.57  
TOTAL STREAM AREA(ACRES) = 282.57  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.40

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.09	42.35	0.467	0.60( 0.48)	0.81	649.3	13200.00
2	7.40	48.63	0.431	0.60( 0.59)	0.99	282.6	13210.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	61.07	42.35	0.467	0.60( 0.51)	0.86	895.3	13200.00
2	57.34	48.63	0.431	0.60( 0.52)	0.86	931.8	13210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 61.07 Tc(MIN.) = 42.35  
EFFECTIVE AREA(ACRES) = 895.33 AREA-AVERAGED Fm(INCH/HR) = 0.51  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.86  
TOTAL AREA(ACRES) = 931.8  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13220.00 TO NODE 13221.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 505.65 DOWNSTREAM(FEET) = 478.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1949.14 CHANNEL SLOPE = 0.0137  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.434  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 108.50 0.60 0.637 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 68.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.63  
AVERAGE FLOW DEPTH(FEET) = 2.02 TRAVEL TIME(MIN.) = 5.77  
Tc(MIN.) = 48.12  
SUBAREA AREA(ACRES) = 108.50 SUBAREA RUNOFF(CFS) = 15.37  
EFFECTIVE AREA(ACRES) = 1003.83 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 1040.3 PEAK FLOW RATE(CFS) = 65.48  
  
END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.98 FLOW VELOCITY(FEET/SEC.) = 5.56  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13221.00 = 14742.35 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	65.48	48.12	0.434	0.60( 0.50)	0.83	1003.8	13200.00
2	60.48	54.51	0.400	0.60( 0.50)	0.84	1040.3	13210.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 65.48 Tc(MIN.) = 48.12  
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 1003.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 478.94 DOWNSTREAM(FEET) = 427.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2078.70 CHANNEL SLOPE = 0.0247  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.407  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 87.26 0.60 0.699 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.07  
AVERAGE FLOW DEPTH(FEET) = 1.82 TRAVEL TIME(MIN.) = 4.90  
Tc(MIN.) = 53.02  
SUBAREA AREA(ACRES) = 87.26 SUBAREA RUNOFF(CFS) = 9.63  
EFFECTIVE AREA(ACRES) = 1091.09 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.82  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 1127.6 PEAK FLOW RATE (CFS) = 71.12

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.83 FLOW VELOCITY (FEET/SEC.) = 7.09

LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 = 16821.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.12	53.02	0.407	0.60 ( 0.49)	0.82	1091.1	13200.00
2	65.38	59.51	0.374	0.60 ( 0.50)	0.83	1127.6	13210.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 71.12 Tc (MIN.) = 53.02

AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA (ACRES) = 1091.09

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1127.6 TC (MIN.) = 53.02

EFFECTIVE AREA (ACRES) = 1091.09 AREA-AVERAGED Fm (INCH/HR) = 0.49

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.822

PEAK FLOW RATE (CFS) = 71.12

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	71.12	53.02	0.407	0.60 ( 0.49)	0.82	1091.1	13200.00
2	65.38	59.51	0.374	0.60 ( 0.50)	0.83	1127.6	13210.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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-----  
FILE NAME: S33.DAT  
TIME/DATE OF STUDY: 07:57 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.824
- 2) 10.00; 1.217
- 3) 15.00; 0.932
- 4) 20.00; 0.766
- 5) 25.00; 0.662
- 6) 30.00; 0.587
- 7) 40.00; 0.506
- 8) 50.00; 0.449
- 9) 60.00; 0.406
- 10) 90.00; 0.342
- 11) 120.00; 0.298
- 12) 180.00; 0.248
- 13) 360.00; 0.182
- 14) 1440.00; 0.080

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S31.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	170.71	51.55	0.60 ( 0.49)	0.81	2408.1	13100.00
2	195.96	91.33	0.60 ( 0.48)	0.81	3776.6	13000.00
3	193.82	94.72	0.60 ( 0.48)	0.81	3796.8	13010.00
TOTAL AREA (ACRES) =						3796.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S32.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	71.12	53.02	0.60 ( 0.49)	0.82	1091.1	13200.00
2	65.38	59.51	0.60 ( 0.50)	0.83	1127.6	13210.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	71.12	53.02	0.60 ( 0.49)	0.82	1091.1	13200.00
2	65.38	59.51	0.60 ( 0.50)	0.83	1127.6	13210.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	71.12	53.02	0.436	0.60 ( 0.49)	0.82	1091.1	13200.00
2	65.38	59.51	0.408	0.60 ( 0.50)	0.83	1127.6	13210.00
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 =							16821.05 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	170.71	51.55	0.442	0.60 ( 0.49)	0.81	2408.1	13100.00
2	195.96	91.33	0.340	0.60 ( 0.48)	0.81	3776.6	13000.00

3 193.82 94.72 0.335 0.60 ( 0.48) 0.81 3796.8 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	240.85	51.55	0.442	0.60 ( 0.49)	0.81	3468.9	13100.00
2	242.76	53.02	0.436	0.60 ( 0.49)	0.81	3549.8	13200.00
3	241.14	59.51	0.408	0.60 ( 0.49)	0.81	3809.7	13210.00
4	250.41	91.33	0.340	0.60 ( 0.49)	0.81	4904.2	13000.00
5	247.47	94.72	0.335	0.60 ( 0.49)	0.81	4924.4	13010.00

TOTAL AREA (ACRES) = 4924.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 250.41 Tc (MIN.) = 91.327  
EFFECTIVE AREA (ACRES) = 4904.24 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
TOTAL AREA (ACRES) = 4924.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13222.00 TO NODE 13223.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 427.51 DOWNSTREAM (FEET) = 416.40  
CHANNEL LENGTH THRU SUBAREA (FEET) = 864.00 CHANNEL SLOPE = 0.0129  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 250.41  
FLOW VELOCITY (FEET/SEC.) = 6.11 FLOW DEPTH (FEET) = 3.70  
TRAVEL TIME (MIN.) = 2.36 Tc (MIN.) = 93.68  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	251.15	53.92	0.432	0.60 ( 0.49)	0.81	3468.9	13100.00
2	253.35	55.39	0.426	0.60 ( 0.49)	0.81	3549.8	13200.00
3	255.22	61.89	0.402	0.60 ( 0.49)	0.81	3809.7	13210.00
4	278.88	93.68	0.337	0.60 ( 0.49)	0.81	4904.2	13000.00
5	276.13	97.07	0.332	0.60 ( 0.49)	0.81	4924.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 278.88 Tc (MIN.) = 93.68  
AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.81 EFFECTIVE AREA (ACRES) = 4904.24

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610301T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.17	14.05	0.60 ( 0.60)	1.00	29.3	30100.00
2	6.91	17.21	0.60 ( 0.60)	1.00	29.7	30110.00

TOTAL AREA (ACRES) = 29.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	251.15	53.92	0.432	0.60 ( 0.49)	0.81	3468.9	13100.00
2	253.35	55.39	0.426	0.60 ( 0.49)	0.81	3549.8	13200.00
3	255.22	61.89	0.402	0.60 ( 0.49)	0.81	3809.7	13210.00
4	278.88	93.68	0.337	0.60 ( 0.49)	0.81	4904.2	13000.00
5	276.13	97.07	0.332	0.60 ( 0.49)	0.81	4924.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.17	14.05	0.986	0.60 ( 0.60)	1.00	29.3	30100.00
2	6.91	17.21	0.859	0.60 ( 0.60)	1.00	29.7	30110.00

LONGEST FLOWPATH FROM NODE 30110.00 TO NODE 13223.00 = 2058.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	261.31	14.05	0.986	0.60 ( 0.49)	0.82	933.2	30100.00
2	258.05	17.21	0.859	0.60 ( 0.49)	0.82	1137.2	30110.00
3	251.15	53.92	0.432	0.60 ( 0.49)	0.82	3498.6	13100.00
4	253.35	55.39	0.426	0.60 ( 0.49)	0.82	3579.4	13200.00
5	255.22	61.89	0.402	0.60 ( 0.49)	0.82	3839.4	13210.00
6	278.88	93.68	0.337	0.60 ( 0.49)	0.81	4933.9	13000.00
7	276.13	97.07	0.332	0.60 ( 0.49)	0.81	4954.1	13010.00

TOTAL AREA (ACRES) = 4954.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 278.88 Tc (MIN.) = 93.683  
EFFECTIVE AREA (ACRES) = 4933.91 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.82  
TOTAL AREA (ACRES) = 4954.1  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13224.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 416.40 DOWNSTREAM (FEET) = 410.60



CHANNEL LENGTH THRU SUBAREA(FEET) = 408.51 CHANNEL SLOPE = 0.0142  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 278.88  
 FLOW VELOCITY(FEET/SEC.) = 6.53 FLOW DEPTH(FEET) = 3.77  
 TRAVEL TIME(MIN.) = 1.04 Tc(MIN.) = 94.73  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.60	15.11	0.928	0.60 ( 0.49)	0.82	933.2	30100.00
2	340.00	18.28	0.823	0.60 ( 0.49)	0.82	1137.2	30110.00
3	251.15	54.99	0.428	0.60 ( 0.49)	0.82	3498.6	13100.00
4	253.35	56.46	0.421	0.60 ( 0.49)	0.82	3579.4	13200.00
5	255.22	62.95	0.400	0.60 ( 0.49)	0.82	3839.4	13210.00
6	278.88	94.73	0.335	0.60 ( 0.49)	0.81	4933.9	13000.00
7	276.13	98.12	0.330	0.60 ( 0.49)	0.81	4954.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 366.60 Tc(MIN.) = 15.11  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 933.21

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610302T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.63	11.60	0.60 ( 0.60)	1.00	11.9	30210.00
2	5.47	11.96	0.60 ( 0.60)	1.00	12.0	30200.00
TOTAL AREA(ACRES) = 12.0						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.60	15.11	0.928	0.60 ( 0.49)	0.82	933.2	30100.00
2	340.00	18.28	0.823	0.60 ( 0.49)	0.82	1137.2	30110.00
3	251.15	54.99	0.428	0.60 ( 0.49)	0.82	3498.6	13100.00
4	253.35	56.46	0.421	0.60 ( 0.49)	0.82	3579.4	13200.00
5	255.22	62.95	0.400	0.60 ( 0.49)	0.82	3839.4	13210.00
6	278.88	94.73	0.335	0.60 ( 0.49)	0.81	4933.9	13000.00
7	276.13	98.12	0.330	0.60 ( 0.49)	0.81	4954.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.63	11.60	1.126	0.60 ( 0.60)	1.00	11.9	30210.00
2	5.47	11.96	1.105	0.60 ( 0.60)	1.00	12.0	30200.00
LONGEST FLOWPATH FROM NODE 30200.00 TO NODE 13224.00 = 1209.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	372.23	11.60	1.126	0.60 ( 0.49)	0.82	728.2	30210.00
2	372.07	11.96	1.105	0.60 ( 0.49)	0.82	750.5	30200.00
3	370.15	15.11	0.928	0.60 ( 0.49)	0.82	945.2	30100.00
4	342.42	18.28	0.823	0.60 ( 0.49)	0.82	1149.3	30110.00
5	251.15	54.99	0.428	0.60 ( 0.49)	0.82	3510.6	13100.00
6	253.35	56.46	0.421	0.60 ( 0.49)	0.82	3591.5	13200.00
7	255.22	62.95	0.400	0.60 ( 0.49)	0.82	3851.4	13210.00
8	278.88	94.73	0.335	0.60 ( 0.49)	0.81	4945.9	13000.00
9	276.13	98.12	0.330	0.60 ( 0.49)	0.81	4966.1	13010.00
TOTAL AREA(ACRES) = 4966.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 372.23 Tc(MIN.) = 11.598  
 EFFECTIVE AREA(ACRES) = 728.24 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 4966.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13301.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 410.60 DOWNSTREAM(FEET) = 382.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.70 CHANNEL SLOPE = 0.0227

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.983

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.66	0.60	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 382.92

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.42

AVERAGE FLOW DEPTH(FEET) = 3.89 TRAVEL TIME(MIN.) = 2.50

Tc(MIN.) = 14.09

SUBAREA AREA(ACRES) = 61.66 SUBAREA RUNOFF(CFS) = 21.35

EFFECTIVE AREA(ACRES) = 789.90 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.84

TOTAL AREA(ACRES) = 5027.8 PEAK FLOW RATE(CFS) = 372.23

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.85 FLOW VELOCITY(FEET/SEC.) = 8.37  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	372.23	14.09	0.983	0.60 ( 0.50)	0.84	789.9	30210.00
2	372.07	14.45	0.963	0.60 ( 0.50)	0.84	812.2	30200.00
3	370.15	17.62	0.845	0.60 ( 0.50)	0.83	1006.9	30100.00
4	342.42	20.84	0.749	0.60 ( 0.50)	0.83	1210.9	30110.00
5	251.15	57.76	0.416	0.60 ( 0.49)	0.82	3572.3	13100.00
6	253.35	59.23	0.410	0.60 ( 0.49)	0.82	3653.1	13200.00
7	255.22	65.72	0.394	0.60 ( 0.49)	0.82	3913.1	13210.00
8	278.88	97.43	0.331	0.60 ( 0.49)	0.82	5007.6	13000.00
9	276.13	100.83	0.326	0.60 ( 0.49)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 372.23 Tc(MIN.) = 14.09  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.84 EFFECTIVE AREA(ACRES) = 789.90

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610303T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.28	28.99	0.60 ( 0.60)	1.00	166.2	30300.00
TOTAL AREA(ACRES) = 166.2						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	372.23	14.09	0.983	0.60 ( 0.50)	0.84	789.9	30210.00
2	372.07	14.45	0.963	0.60 ( 0.50)	0.84	812.2	30200.00
3	370.15	17.62	0.845	0.60 ( 0.50)	0.83	1006.9	30100.00
4	342.42	20.84	0.749	0.60 ( 0.50)	0.83	1210.9	30110.00
5	251.15	57.76	0.416	0.60 ( 0.49)	0.82	3572.3	13100.00
6	253.35	59.23	0.410	0.60 ( 0.49)	0.82	3653.1	13200.00
7	255.22	65.72	0.394	0.60 ( 0.49)	0.82	3913.1	13210.00
8	278.88	97.43	0.331	0.60 ( 0.49)	0.82	5007.6	13000.00
9	276.13	100.83	0.326	0.60 ( 0.49)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.28	28.99	0.602	0.60 ( 0.60)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	388.33	14.09	0.983	0.60 ( 0.51)	0.85	870.7	30210.00
2	388.23	14.45	0.963	0.60 ( 0.51)	0.85	895.1	30200.00
3	387.44	17.62	0.845	0.60 ( 0.51)	0.85	1107.9	30100.00
4	360.54	20.84	0.749	0.60 ( 0.51)	0.84	1330.4	30110.00
5	342.55	28.99	0.602	0.60 ( 0.51)	0.84	1898.4	30300.00
6	265.15	57.76	0.416	0.60 ( 0.50)	0.83	3738.5	13100.00
7	267.14	59.23	0.410	0.60 ( 0.50)	0.83	3819.3	13200.00
8	268.48	65.72	0.394	0.60 ( 0.50)	0.83	4079.3	13210.00
9	290.03	97.43	0.331	0.60 ( 0.49)	0.82	5173.8	13000.00
10	287.11	100.83	0.326	0.60 ( 0.49)	0.82	5194.0	13010.00
TOTAL AREA(ACRES) = 5194.0							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 388.33 Tc(MIN.) = 14.094  
 EFFECTIVE AREA(ACRES) = 870.72 AREA-AVERAGED Fm(INCH/HR) = 0.51  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 5194.0

\*\*\*\*\*

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

>>>>FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.840

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 389.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.18

AVERAGE FLOW DEPTH(FEET) = 5.01 TRAVEL TIME(MIN.) = 3.67

Tc(MIN.) = 17.77

SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 2.04

EFFECTIVE AREA(ACRES) = 880.14 AREA-AVERAGED Fm(INCH/HR) = 0.51

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.85

TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 388.33

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.00 FLOW VELOCITY(FEET/SEC.) = 5.18

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	388.33	17.77	0.840	0.60 ( 0.51)	0.85	880.1	30210.00
2	388.23	18.13	0.828	0.60 ( 0.51)	0.85	904.5	30200.00

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
3	387.44	21.29	0.739	0.60 ( 0.51)	0.85	1117.3	30100.00
4	360.54	24.58	0.671	0.60 ( 0.51)	0.85	1339.8	30110.00
5	342.55	32.78	0.565	0.60 ( 0.51)	0.84	1907.8	30300.00
6	265.15	61.81	0.402	0.60 ( 0.50)	0.83	3747.9	13100.00
7	267.14	63.26	0.399	0.60 ( 0.50)	0.83	3828.8	13200.00
8	268.48	69.74	0.385	0.60 ( 0.50)	0.83	4088.7	13210.00
9	290.03	101.38	0.325	0.60 ( 0.49)	0.82	5183.2	13000.00
10	287.11	104.79	0.320	0.60 ( 0.49)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 388.33 Tc(MIN.) = 17.77  
 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 880.14

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610214T.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.24	37.30	0.60 ( 0.60)	1.00	227.7	21400.00

 TOTAL AREA(ACRES) = 227.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	388.33	17.77	0.840	0.60 ( 0.51)	0.85	880.1	30210.00
2	388.23	18.13	0.828	0.60 ( 0.51)	0.85	904.5	30200.00
3	387.44	21.29	0.739	0.60 ( 0.51)	0.85	1117.3	30100.00
4	360.54	24.58	0.671	0.60 ( 0.51)	0.85	1339.8	30110.00
5	342.55	32.78	0.565	0.60 ( 0.51)	0.84	1907.8	30300.00
6	265.15	61.81	0.402	0.60 ( 0.50)	0.83	3747.9	13100.00
7	267.14	63.26	0.399	0.60 ( 0.50)	0.83	3828.8	13200.00
8	268.48	69.74	0.385	0.60 ( 0.50)	0.83	4088.7	13210.00
9	290.03	101.38	0.325	0.60 ( 0.49)	0.82	5183.2	13000.00
10	287.11	104.79	0.320	0.60 ( 0.49)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.24	37.30	0.528	0.60 ( 0.60)	1.00	227.7	21400.00

LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.57	17.77	0.840	0.60 ( 0.52)	0.87	988.6	30210.00
2	394.51	18.13	0.828	0.60 ( 0.52)	0.87	1015.1	30200.00
3	394.03	21.29	0.739	0.60 ( 0.52)	0.86	1247.3	30100.00
4	367.44	24.58	0.671	0.60 ( 0.52)	0.86	1489.8	30110.00
5	350.29	32.78	0.565	0.60 ( 0.51)	0.86	2107.9	30300.00
6	338.73	37.30	0.528	0.60 ( 0.51)	0.86	2422.2	21400.00
7	271.43	61.81	0.402	0.60 ( 0.50)	0.84	3975.6	13100.00
8	273.37	63.26	0.399	0.60 ( 0.50)	0.84	4056.4	13200.00
9	274.50	69.74	0.385	0.60 ( 0.50)	0.84	4316.4	13210.00
10	295.10	101.38	0.325	0.60 ( 0.50)	0.83	5410.9	13000.00
11	292.11	104.79	0.320	0.60 ( 0.50)	0.83	5431.1	13010.00

TOTAL AREA(ACRES) = 5431.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 394.57 Tc(MIN.) = 17.769  
 EFFECTIVE AREA(ACRES) = 988.58 AREA-AVERAGED Fm(INCH/HR) = 0.52  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 5431.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

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 FLOW PROCESS FROM NODE 13302.00 TO NODE 13303.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 375.00 DOWNSTREAM(FEET) = 355.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2193.96 CHANNEL SLOPE = 0.0091  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 394.57  
 FLOW VELOCITY(FEET/SEC.) = 6.03 FLOW DEPTH(FEET) = 4.67  
 TRAVEL TIME(MIN.) = 6.07 Tc(MIN.) = 23.84  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.57	23.84	0.686	0.60 ( 0.52)	0.87	988.6	30210.00
2	394.51	24.20	0.679	0.60 ( 0.52)	0.87	1015.1	30200.00
3	394.03	27.35	0.627	0.60 ( 0.52)	0.86	1247.3	30100.00
4	367.44	30.76	0.581	0.60 ( 0.52)	0.86	1489.8	30110.00
5	350.29	39.03	0.514	0.60 ( 0.51)	0.86	2107.9	30300.00
6	338.73	43.61	0.485	0.60 ( 0.51)	0.86	2422.2	21400.00
7	271.43	68.48	0.388	0.60 ( 0.50)	0.84	3975.6	13100.00
8	273.37	69.91	0.385	0.60 ( 0.50)	0.84	4056.4	13200.00
9	274.50	76.39	0.371	0.60 ( 0.50)	0.84	4316.4	13210.00
10	295.10	107.91	0.316	0.60 ( 0.50)	0.83	5410.9	13000.00
11	292.11	111.32	0.311	0.60 ( 0.50)	0.83	5431.1	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 394.57 Tc(MIN.) = 23.84  
 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 988.58

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610213T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.34	19.10	0.60 ( 0.60)	1.00	98.2	21300.00
TOTAL AREA (ACRES) =			98.2			

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.57	23.84	0.686	0.60 ( 0.52)	0.87	988.6	30210.00
2	394.51	24.20	0.679	0.60 ( 0.52)	0.87	1015.1	30200.00
3	394.03	27.35	0.627	0.60 ( 0.52)	0.86	1247.3	30100.00
4	367.44	30.76	0.581	0.60 ( 0.52)	0.86	1489.8	30110.00
5	350.29	39.03	0.514	0.60 ( 0.51)	0.86	2107.9	30300.00
6	338.73	43.61	0.485	0.60 ( 0.51)	0.86	2422.2	21400.00
7	271.43	68.48	0.388	0.60 ( 0.50)	0.84	3975.6	13100.00
8	273.37	69.91	0.385	0.60 ( 0.50)	0.84	4056.4	13200.00
9	274.50	76.39	0.371	0.60 ( 0.50)	0.84	4316.4	13210.00
10	295.10	107.91	0.316	0.60 ( 0.50)	0.83	5410.9	13000.00
11	292.11	111.32	0.311	0.60 ( 0.50)	0.83	5431.1	13010.00
LONGEST FLOWPATH FROM NODE			13010.00 TO NODE 13303.00 =				37994.75 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.34	19.10	0.796	0.60 ( 0.60)	1.00	98.2	21300.00
LONGEST FLOWPATH FROM NODE			21300.00 TO NODE 13303.00 =				2988.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	411.91	19.10	0.796	0.60 ( 0.53)	0.88	890.4	21300.00
2	402.21	23.84	0.686	0.60 ( 0.53)	0.88	1086.8	30210.00
3	401.49	24.20	0.679	0.60 ( 0.53)	0.88	1113.3	30200.00
4	396.41	27.35	0.627	0.60 ( 0.52)	0.87	1345.5	30100.00
5	367.44	30.76	0.581	0.60 ( 0.52)	0.87	1588.0	30110.00
6	350.29	39.03	0.514	0.60 ( 0.52)	0.86	2206.1	30300.00
7	338.73	43.61	0.485	0.60 ( 0.52)	0.86	2520.4	21400.00
8	271.43	68.48	0.388	0.60 ( 0.50)	0.84	4073.8	13100.00
9	273.37	69.91	0.385	0.60 ( 0.50)	0.84	4154.6	13200.00
10	274.50	76.39	0.371	0.60 ( 0.50)	0.84	4414.6	13210.00

11	295.10	107.91	0.316	0.60 ( 0.50)	0.83	5509.1	13000.00
12	292.11	111.32	0.311	0.60 ( 0.50)	0.83	5529.3	13010.00
TOTAL AREA (ACRES) =			5529.3				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 411.91 Tc (MIN.) = 19.102  
EFFECTIVE AREA (ACRES) = 890.40 AREA-AVERAGED Fm (INCH/HR) = 0.53  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.83  
TOTAL AREA (ACRES) = 5529.3  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13304.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 355.00 DOWNSTREAM (FEET) = 350.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 925.40 CHANNEL SLOPE = 0.0054  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.721

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.84	0.60	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) =			0.60		
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =			1.000		
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) =			412.67		
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) =			5.01		
AVERAGE FLOW DEPTH (FEET) =			5.24 TRAVEL TIME (MIN.) =		
Tc (MIN.) =			22.18		
SUBAREA AREA (ACRES) =			13.84 SUBAREA RUNOFF (CFS) =		
EFFECTIVE AREA (ACRES) =			904.24 AREA-AVERAGED Fm (INCH/HR) =		
AREA-AVERAGED Fp (INCH/HR) =			0.60 AREA-AVERAGED Ap =		
TOTAL AREA (ACRES) =			5543.1 PEAK FLOW RATE (CFS) =		
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE			411.91		

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 5.24 FLOW VELOCITY (FEET/SEC.) = 5.01  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	411.91	22.18	0.721	0.60 ( 0.53)	0.89	904.2	21300.00
2	402.21	26.94	0.633	0.60 ( 0.53)	0.88	1100.6	30210.00
3	401.49	27.29	0.628	0.60 ( 0.53)	0.88	1127.2	30200.00
4	396.41	30.46	0.583	0.60 ( 0.53)	0.88	1359.3	30100.00
5	367.44	33.93	0.555	0.60 ( 0.52)	0.87	1601.9	30110.00
6	350.29	42.23	0.493	0.60 ( 0.52)	0.87	2219.9	30300.00
7	338.73	46.84	0.467	0.60 ( 0.52)	0.86	2534.2	21400.00
8	271.43	71.89	0.381	0.60 ( 0.51)	0.84	4087.6	13100.00
9	273.37	73.32	0.378	0.60 ( 0.50)	0.84	4168.5	13200.00
10	274.50	79.80	0.364	0.60 ( 0.50)	0.84	4428.4	13210.00
11	295.10	111.26	0.311	0.60 ( 0.50)	0.83	5523.0	13000.00
12	292.11	114.68	0.306	0.60 ( 0.50)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 411.91 Tc(MIN.) = 22.18  
 AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.89 EFFECTIVE AREA(ACRES) = 904.24

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FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610304T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22.20	25.64	0.60 ( 0.60)	1.00	159.9	30410.00
2	13.11	35.16	0.60 ( 0.60)	1.00	182.7	30400.00
TOTAL AREA(ACRES) =						182.7

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FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	411.91	22.18	0.721	0.60 ( 0.53)	0.89	904.2	21300.00
2	402.21	26.94	0.633	0.60 ( 0.53)	0.88	1100.6	30210.00
3	401.49	27.29	0.628	0.60 ( 0.53)	0.88	1127.2	30200.00
4	396.41	30.46	0.583	0.60 ( 0.53)	0.88	1359.3	30100.00
5	367.44	33.93	0.555	0.60 ( 0.52)	0.87	1601.9	30110.00
6	350.29	42.23	0.493	0.60 ( 0.52)	0.87	2219.9	30300.00
7	338.73	46.84	0.467	0.60 ( 0.52)	0.86	2534.2	21400.00
8	271.43	71.89	0.381	0.60 ( 0.51)	0.84	4087.6	13100.00
9	273.37	73.32	0.378	0.60 ( 0.50)	0.84	4168.5	13200.00
10	274.50	79.80	0.364	0.60 ( 0.50)	0.84	4428.4	13210.00
11	295.10	111.26	0.311	0.60 ( 0.50)	0.83	5523.0	13000.00
12	292.11	114.68	0.306	0.60 ( 0.50)	0.83	5543.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22.20	25.64	0.653	0.60 ( 0.60)	1.00	159.9	30410.00
2	13.11	35.16	0.545	0.60 ( 0.60)	1.00	182.7	30400.00

LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 = 5899.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	434.11	22.18	0.721	0.60 ( 0.54)	0.90	1042.5	21300.00
2	427.06	25.64	0.653	0.60 ( 0.54)	0.90	1206.8	30410.00

3	423.17	26.94	0.633	0.60 ( 0.54)	0.90	1263.6	30210.00
4	422.10	27.29	0.628	0.60 ( 0.54)	0.90	1291.0	30200.00
5	414.00	30.46	0.583	0.60 ( 0.53)	0.89	1530.8	30100.00
6	381.72	33.93	0.555	0.60 ( 0.53)	0.88	1781.6	30110.00
7	378.00	35.16	0.545	0.60 ( 0.53)	0.88	1876.3	30400.00
8	362.15	42.23	0.493	0.60 ( 0.53)	0.88	2402.6	30300.00
9	349.95	46.84	0.467	0.60 ( 0.52)	0.87	2716.9	21400.00
10	280.59	71.89	0.381	0.60 ( 0.51)	0.85	4270.3	13100.00
11	282.46	73.32	0.378	0.60 ( 0.51)	0.85	4351.2	13200.00
12	283.25	79.80	0.364	0.60 ( 0.51)	0.85	4611.2	13210.00
13	302.57	111.26	0.311	0.60 ( 0.50)	0.84	5705.7	13000.00
14	299.46	114.68	0.306	0.60 ( 0.50)	0.84	5725.8	13010.00
TOTAL AREA(ACRES) =						5725.8	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 434.11 Tc(MIN.) = 22.179  
 EFFECTIVE AREA(ACRES) = 1042.54 AREA-AVERAGED Fm(INCH/HR) = 0.54  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.90  
 TOTAL AREA(ACRES) = 5725.8  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

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FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.595  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 27.39 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 434.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.80  
 AVERAGE FLOW DEPTH(FEET) = 4.61 TRAVEL TIME(MIN.) = 7.27  
 Tc(MIN.) = 29.45  
 SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1069.93 AREA-AVERAGED Fm(INCH/HR) = 0.54  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.90  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 434.11  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.61 FLOW VELOCITY(FEET/SEC.) = 6.80  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp (Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	434.11	29.45	0.595	0.60( 0.54)	0.90	1069.9 21300.00
2	427.06	32.93	0.563	0.60( 0.54)	0.90	1234.2 30410.00
3	423.17	34.25	0.553	0.60( 0.54)	0.90	1291.0 30210.00
4	422.10	34.62	0.550	0.60( 0.54)	0.90	1318.4 30200.00
5	414.00	37.81	0.524	0.60( 0.54)	0.89	1558.2 30100.00
6	381.72	41.44	0.498	0.60( 0.53)	0.89	1809.0 30110.00
7	378.00	42.70	0.490	0.60( 0.53)	0.88	1903.7 30400.00
8	362.15	49.83	0.450	0.60( 0.53)	0.88	2430.0 30300.00
9	349.95	54.51	0.430	0.60( 0.52)	0.87	2744.3 21400.00
10	280.59	80.00	0.364	0.60( 0.51)	0.85	4297.7 13100.00
11	282.46	81.42	0.361	0.60( 0.51)	0.85	4378.6 13200.00
12	283.25	87.89	0.347	0.60( 0.51)	0.85	4638.5 13210.00
13	302.57	119.23	0.299	0.60( 0.50)	0.84	5733.1 13000.00
14	299.46	122.64	0.296	0.60( 0.50)	0.84	5753.2 13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 434.11 Tc(MIN.) = 29.45  
 AREA-AVERAGED Fm(INCH/HR) = 0.54 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.90 EFFECTIVE AREA(ACRES) = 1069.93

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610305T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.73	33.03	0.60( 0.60)	1.00	525.5	30520.00
2	41.97	36.79	0.60( 0.60)	1.00	566.3	30540.00
3	40.10	38.12	0.60( 0.60)	1.00	573.1	30510.00
4	32.81	41.91	0.60( 0.60)	1.00	582.8	30500.00
TOTAL AREA(ACRES) =						582.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	434.11	29.45	0.595	0.60( 0.54)	0.90	1069.9	21300.00
2	427.06	32.93	0.563	0.60( 0.54)	0.90	1234.2	30410.00
3	423.17	34.25	0.553	0.60( 0.54)	0.90	1291.0	30210.00
4	422.10	34.62	0.550	0.60( 0.54)	0.90	1318.4	30200.00
5	414.00	37.81	0.524	0.60( 0.54)	0.89	1558.2	30100.00
6	381.72	41.44	0.498	0.60( 0.53)	0.89	1809.0	30110.00
7	378.00	42.70	0.490	0.60( 0.53)	0.88	1903.7	30400.00
8	362.15	49.83	0.450	0.60( 0.53)	0.88	2430.0	30300.00

9	349.95	54.51	0.430	0.60( 0.52)	0.87	2744.3	21400.00
10	280.59	80.00	0.364	0.60( 0.51)	0.85	4297.7	13100.00
11	282.46	81.42	0.361	0.60( 0.51)	0.85	4378.6	13200.00
12	283.25	87.89	0.347	0.60( 0.51)	0.85	4638.5	13210.00
13	302.57	119.23	0.299	0.60( 0.50)	0.84	5733.1	13000.00
14	299.46	122.64	0.296	0.60( 0.50)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	45.73	33.03	0.563	0.60( 0.60)	1.00	525.5	30520.00
2	41.97	36.79	0.532	0.60( 0.60)	1.00	566.3	30540.00
3	40.10	38.12	0.521	0.60( 0.60)	1.00	573.1	30510.00
4	32.81	41.91	0.495	0.60( 0.60)	1.00	582.8	30500.00

LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 = 9458.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	29.45	0.595	0.60( 0.56)	0.93	1538.4	21300.00
2	472.72	32.93	0.563	0.60( 0.56)	0.93	1758.1	30410.00
3	472.50	33.03	0.563	0.60( 0.56)	0.93	1764.0	30520.00
4	467.68	34.25	0.553	0.60( 0.56)	0.93	1829.7	30210.00
5	466.25	34.62	0.550	0.60( 0.56)	0.93	1861.1	30200.00
6	458.56	36.79	0.532	0.60( 0.55)	0.92	2047.9	30540.00
7	454.54	37.81	0.524	0.60( 0.55)	0.92	2129.7	30100.00
8	451.34	38.12	0.521	0.60( 0.55)	0.92	2152.8	30510.00
9	415.42	41.44	0.498	0.60( 0.55)	0.91	2390.7	30110.00
10	413.15	41.91	0.495	0.60( 0.55)	0.91	2427.0	30500.00
11	410.51	42.70	0.490	0.60( 0.55)	0.91	2486.5	30400.00
12	391.96	49.83	0.450	0.60( 0.54)	0.90	3012.9	30300.00
13	378.43	54.51	0.430	0.60( 0.54)	0.89	3327.2	21400.00
14	304.68	80.00	0.364	0.60( 0.52)	0.87	4880.6	13100.00
15	306.35	81.42	0.361	0.60( 0.52)	0.87	4961.4	13200.00
16	306.23	87.89	0.347	0.60( 0.52)	0.86	5221.4	13210.00
17	322.38	119.23	0.299	0.60( 0.51)	0.85	6315.9	13000.00
18	319.05	122.64	0.296	0.60( 0.51)	0.85	6336.1	13010.00
TOTAL AREA(ACRES) =						6336.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 477.27 Tc(MIN.) = 29.449  
 EFFECTIVE AREA(ACRES) = 1538.44 AREA-AVERAGED Fm(INCH/HR) = 0.56  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93  
 TOTAL AREA(ACRES) = 6336.1

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 477.27

FLOW VELOCITY(FEET/SEC.) = 9.02 FLOW DEPTH(FEET) = 4.20  
 TRAVEL TIME(MIN.) = 2.43 Tc(MIN.) = 31.88  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	31.88	0.572	0.60( 0.56)	0.93	1538.4	21300.00
2	472.72	35.37	0.544	0.60( 0.56)	0.93	1758.1	30410.00
3	472.50	35.47	0.543	0.60( 0.56)	0.93	1764.0	30520.00
4	467.68	36.69	0.533	0.60( 0.56)	0.93	1829.7	30210.00
5	466.25	37.07	0.530	0.60( 0.56)	0.93	1861.1	30200.00
6	458.56	39.25	0.512	0.60( 0.55)	0.92	2047.9	30540.00
7	454.54	40.27	0.504	0.60( 0.55)	0.92	2129.7	30100.00
8	451.34	40.59	0.502	0.60( 0.55)	0.92	2152.8	30510.00
9	415.42	43.96	0.483	0.60( 0.55)	0.91	2390.7	30110.00
10	413.15	44.43	0.481	0.60( 0.55)	0.91	2427.0	30500.00
11	410.51	45.23	0.476	0.60( 0.55)	0.91	2486.5	30400.00
12	391.96	52.39	0.439	0.60( 0.54)	0.90	3012.9	30300.00
13	378.43	57.09	0.419	0.60( 0.54)	0.89	3327.2	21400.00
14	304.68	82.73	0.358	0.60( 0.52)	0.87	4880.6	13100.00
15	306.35	84.14	0.355	0.60( 0.52)	0.87	4961.4	13200.00
16	306.23	90.62	0.341	0.60( 0.52)	0.86	5221.4	13210.00
17	322.38	121.92	0.296	0.60( 0.51)	0.85	6315.9	13000.00
18	319.05	125.34	0.293	0.60( 0.51)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 477.27 Tc(MIN.) = 31.88  
 AREA-AVERAGED Fm(INCH/HR) = 0.56 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1538.44

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610306T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.23	23.73	0.60( 0.60)	1.00	40.4	30600.00
TOTAL AREA(ACRES) =		40.4				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	477.27	31.88	0.572	0.60( 0.56)	0.93	1538.4	21300.00

2	472.72	35.37	0.544	0.60( 0.56)	0.93	1758.1	30410.00
3	472.50	35.47	0.543	0.60( 0.56)	0.93	1764.0	30520.00
4	467.68	36.69	0.533	0.60( 0.56)	0.93	1829.7	30210.00
5	466.25	37.07	0.530	0.60( 0.56)	0.93	1861.1	30200.00
6	458.56	39.25	0.512	0.60( 0.55)	0.92	2047.9	30540.00
7	454.54	40.27	0.504	0.60( 0.55)	0.92	2129.7	30100.00
8	451.34	40.59	0.502	0.60( 0.55)	0.92	2152.8	30510.00
9	415.42	43.96	0.483	0.60( 0.55)	0.91	2390.7	30110.00
10	413.15	44.43	0.481	0.60( 0.55)	0.91	2427.0	30500.00
11	410.51	45.23	0.476	0.60( 0.55)	0.91	2486.5	30400.00
12	391.96	52.39	0.439	0.60( 0.54)	0.90	3012.9	30300.00
13	378.43	57.09	0.419	0.60( 0.54)	0.89	3327.2	21400.00
14	304.68	82.73	0.358	0.60( 0.52)	0.87	4880.6	13100.00
15	306.35	84.14	0.355	0.60( 0.52)	0.87	4961.4	13200.00
16	306.23	90.62	0.341	0.60( 0.52)	0.86	5221.4	13210.00
17	322.38	121.92	0.296	0.60( 0.51)	0.85	6315.9	13000.00
18	319.05	125.34	0.293	0.60( 0.51)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.23	23.73	0.689	0.60( 0.60)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	480.50	23.73	0.689	0.60( 0.56)	0.93	1185.4	30600.00
2	477.27	31.88	0.572	0.60( 0.56)	0.93	1578.8	21300.00
3	472.72	35.37	0.544	0.60( 0.56)	0.93	1798.4	30410.00
4	472.50	35.47	0.543	0.60( 0.56)	0.93	1804.3	30520.00
5	467.68	36.69	0.533	0.60( 0.56)	0.93	1870.0	30210.00
6	466.25	37.07	0.530	0.60( 0.56)	0.93	1901.4	30200.00
7	458.56	39.25	0.512	0.60( 0.55)	0.92	2088.2	30540.00
8	454.54	40.27	0.504	0.60( 0.55)	0.92	2170.0	30100.00
9	451.34	40.59	0.502	0.60( 0.55)	0.92	2193.1	30510.00
10	415.42	43.96	0.483	0.60( 0.55)	0.92	2431.0	30110.00
11	413.15	44.43	0.481	0.60( 0.55)	0.91	2467.3	30500.00
12	410.51	45.23	0.476	0.60( 0.55)	0.91	2526.9	30400.00
13	391.96	52.39	0.439	0.60( 0.54)	0.90	3053.2	30300.00
14	378.43	57.09	0.419	0.60( 0.54)	0.90	3367.5	21400.00
15	304.68	82.73	0.358	0.60( 0.52)	0.87	4920.9	13100.00
16	306.35	84.14	0.355	0.60( 0.52)	0.87	5001.8	13200.00
17	306.23	90.62	0.341	0.60( 0.52)	0.87	5261.7	13210.00
18	322.38	121.92	0.296	0.60( 0.51)	0.86	6356.2	13000.00
19	319.05	125.34	0.293	0.60( 0.51)	0.85	6376.4	13010.00
TOTAL AREA(ACRES) =		6376.4					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 480.50 Tc(MIN.) = 23.730  
 EFFECTIVE AREA(ACRES) = 1185.40 AREA-AVERAGED Fm(INCH/HR) = 0.56  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 6376.4

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

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 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 480.50
FLOW VELOCITY(FEET/SEC.) = 7.04 FLOW DEPTH(FEET) = 4.77
TRAVEL TIME(MIN.) = 1.96 Tc(MIN.) = 25.69
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	480.50	25.69	0.652	0.60( 0.56)	0.93	1185.4	30600.00
2	477.27	33.84	0.556	0.60( 0.56)	0.93	1578.8	21300.00
3	472.72	37.33	0.528	0.60( 0.56)	0.93	1798.4	30410.00
4	472.50	37.43	0.527	0.60( 0.56)	0.93	1804.3	30520.00
5	467.68	38.66	0.517	0.60( 0.56)	0.93	1870.0	30210.00
6	466.25	39.04	0.514	0.60( 0.56)	0.93	1901.4	30200.00
7	458.56	41.23	0.499	0.60( 0.55)	0.92	2088.2	30540.00
8	454.54	42.26	0.493	0.60( 0.55)	0.92	2170.0	30100.00
9	451.34	42.58	0.491	0.60( 0.55)	0.92	2193.1	30510.00
10	415.42	45.99	0.472	0.60( 0.55)	0.92	2431.0	30110.00
11	413.15	46.46	0.469	0.60( 0.55)	0.91	2467.3	30500.00
12	410.51	47.26	0.464	0.60( 0.55)	0.91	2526.9	30400.00
13	391.96	54.45	0.430	0.60( 0.54)	0.90	3053.2	30300.00
14	378.43	59.17	0.410	0.60( 0.54)	0.90	3367.5	21400.00
15	304.68	84.91	0.353	0.60( 0.52)	0.87	4920.9	13100.00
16	306.35	86.33	0.350	0.60( 0.52)	0.87	5001.8	13200.00
17	306.23	92.80	0.338	0.60( 0.52)	0.87	5261.7	13210.00
18	322.38	124.08	0.294	0.60( 0.51)	0.86	6356.2	13000.00
19	319.05	127.51	0.292	0.60( 0.51)	0.85	6376.4	13010.00

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NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 480.50 Tc(MIN.) = 25.69
AREA-AVERAGED Fm(INCH/HR) = 0.56 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1185.40

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*****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12
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>>>>CLEAR MEMORY BANK # 1 <<<<
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FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1
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>>>>DEFINE MEMORY BANK # 1 <<<<
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PEAK FLOWRATE TABLE FILE NAME: 0610307T.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.33	24.09	0.60( 0.60)	1.00	98.0	30700.00

TOTAL AREA(ACRES) = 98.0

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*****
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
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** MAIN STREAM CONFLUENCE DATA **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	480.50	25.69	0.652	0.60( 0.56)	0.93	1185.4	30600.00
2	477.27	33.84	0.556	0.60( 0.56)	0.93	1578.8	21300.00
3	472.72	37.33	0.528	0.60( 0.56)	0.93	1798.4	30410.00
4	472.50	37.43	0.527	0.60( 0.56)	0.93	1804.3	30520.00
5	467.68	38.66	0.517	0.60( 0.56)	0.93	1870.0	30210.00
6	466.25	39.04	0.514	0.60( 0.56)	0.93	1901.4	30200.00
7	458.56	41.23	0.499	0.60( 0.55)	0.92	2088.2	30540.00
8	454.54	42.26	0.493	0.60( 0.55)	0.92	2170.0	30100.00
9	451.34	42.58	0.491	0.60( 0.55)	0.92	2193.1	30510.00
10	415.42	45.99	0.472	0.60( 0.55)	0.92	2431.0	30110.00
11	413.15	46.46	0.469	0.60( 0.55)	0.91	2467.3	30500.00
12	410.51	47.26	0.464	0.60( 0.55)	0.91	2526.9	30400.00
13	391.96	54.45	0.430	0.60( 0.54)	0.90	3053.2	30300.00
14	378.43	59.17	0.410	0.60( 0.54)	0.90	3367.5	21400.00
15	304.68	84.91	0.353	0.60( 0.52)	0.87	4920.9	13100.00
16	306.35	86.33	0.350	0.60( 0.52)	0.87	5001.8	13200.00
17	306.23	92.80	0.338	0.60( 0.52)	0.87	5261.7	13210.00
18	322.38	124.08	0.294	0.60( 0.51)	0.86	6356.2	13000.00
19	319.05	127.51	0.292	0.60( 0.51)	0.85	6376.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

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** MEMORY BANK # 1 CONFLUENCE DATA **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.33	24.09	0.681	0.60( 0.60)	1.00	98.0	30700.00

LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.

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** PEAK FLOW RATE TABLE **

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	492.83	24.09	0.681	0.60( 0.56)	0.94	1209.7	30700.00
2	488.38	25.69	0.652	0.60( 0.56)	0.94	1283.4	30600.00
3	477.27	33.84	0.556	0.60( 0.56)	0.94	1676.8	21300.00
4	472.72	37.33	0.528	0.60( 0.56)	0.94	1896.4	30410.00
5	472.50	37.43	0.527	0.60( 0.56)	0.94	1902.3	30520.00
6	467.68	38.66	0.517	0.60( 0.56)	0.93	1968.0	30210.00
7	466.25	39.04	0.514	0.60( 0.56)	0.93	1999.4	30200.00
8	458.56	41.23	0.499	0.60( 0.56)	0.93	2186.2	30540.00
9	454.54	42.26	0.493	0.60( 0.56)	0.93	2268.0	30100.00
10	451.34	42.58	0.491	0.60( 0.55)	0.93	2291.1	30510.00
11	415.42	45.99	0.472	0.60( 0.55)	0.92	2529.0	30110.00
12	413.15	46.46	0.469	0.60( 0.55)	0.92	2565.3	30500.00
13	410.51	47.26	0.464	0.60( 0.55)	0.92	2624.9	30400.00
14	391.96	54.45	0.430	0.60( 0.54)	0.91	3151.2	30300.00
15	378.42	59.17	0.410	0.60( 0.54)	0.90	3465.5	21400.00
16	304.68	84.91	0.353	0.60( 0.52)	0.87	5018.9	13100.00
17	306.35	86.33	0.350	0.60( 0.52)	0.87	5099.8	13200.00
18	306.23	92.80	0.338	0.60( 0.52)	0.87	5359.7	13210.00
19	322.38	124.08	0.294	0.60( 0.51)	0.86	6454.2	13000.00



20 319.05 127.51 0.292 0.60 (0.51) 0.86 6474.4 13010.00  
TOTAL AREA (ACRES) = 6474.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 492.83 Tc (MIN.) = 24.090  
EFFECTIVE AREA (ACRES) = 1209.68 AREA-AVERAGED Fm (INCH/HR) = 0.56  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.86  
TOTAL AREA (ACRES) = 6474.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 51  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 274.00 DOWNSTREAM (FEET) = 258.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 733.85 CHANNEL SLOPE = 0.0218  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 492.83  
FLOW VELOCITY (FEET/SEC.) = 8.83 FLOW DEPTH (FEET) = 4.31  
TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 25.48  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	492.83	25.48	0.655	0.60 (0.56)	0.94	1209.7	30700.00
2	488.38	27.08	0.631	0.60 (0.56)	0.94	1283.4	30600.00
3	477.27	35.24	0.545	0.60 (0.56)	0.94	1676.8	21300.00
4	472.72	38.73	0.516	0.60 (0.56)	0.94	1896.4	30410.00
5	472.50	38.83	0.515	0.60 (0.56)	0.94	1902.3	30520.00
6	467.68	40.07	0.505	0.60 (0.56)	0.93	1968.0	30210.00
7	466.25	40.44	0.503	0.60 (0.56)	0.93	1999.4	30200.00
8	458.56	42.64	0.491	0.60 (0.56)	0.93	2186.2	30540.00
9	454.54	43.67	0.485	0.60 (0.56)	0.93	2268.0	30100.00
10	451.34	43.99	0.483	0.60 (0.55)	0.93	2291.1	30510.00
11	415.42	47.44	0.463	0.60 (0.55)	0.92	2529.0	30110.00
12	413.15	47.91	0.461	0.60 (0.55)	0.92	2565.3	30500.00
13	410.51	48.71	0.456	0.60 (0.55)	0.92	2624.9	30400.00
14	391.96	55.91	0.424	0.60 (0.54)	0.91	3151.2	30300.00
15	378.42	60.65	0.405	0.60 (0.54)	0.90	3465.5	21400.00
16	304.68	86.47	0.350	0.60 (0.52)	0.87	5018.9	13100.00
17	306.35	87.88	0.347	0.60 (0.52)	0.87	5099.8	13200.00
18	306.23	94.36	0.336	0.60 (0.52)	0.87	5359.7	13210.00
19	322.38	125.62	0.293	0.60 (0.51)	0.86	6454.2	13000.00
20	319.05	129.05	0.290	0.60 (0.51)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 492.83 Tc (MIN.) = 25.48  
AREA-AVERAGED Fm (INCH/HR) = 0.56 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA (ACRES) = 1209.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12  
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>>>> CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 1 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610308T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.26	22.38	0.60 (0.60)	1.00	64.8	30800.00
TOTAL AREA (ACRES) = 64.8						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11  
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>>>> CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	492.83	25.48	0.655	0.60 (0.56)	0.94	1209.7	30700.00
2	488.38	27.08	0.631	0.60 (0.56)	0.94	1283.4	30600.00
3	477.27	35.24	0.545	0.60 (0.56)	0.94	1676.8	21300.00
4	472.72	38.73	0.516	0.60 (0.56)	0.94	1896.4	30410.00
5	472.50	38.83	0.515	0.60 (0.56)	0.94	1902.3	30520.00
6	467.68	40.07	0.505	0.60 (0.56)	0.93	1968.0	30210.00
7	466.25	40.44	0.503	0.60 (0.56)	0.93	1999.4	30200.00
8	458.56	42.64	0.491	0.60 (0.56)	0.93	2186.2	30540.00
9	454.54	43.67	0.485	0.60 (0.56)	0.93	2268.0	30100.00
10	451.34	43.99	0.483	0.60 (0.55)	0.93	2291.1	30510.00
11	415.42	47.44	0.463	0.60 (0.55)	0.92	2529.0	30110.00
12	413.15	47.91	0.461	0.60 (0.55)	0.92	2565.3	30500.00
13	410.51	48.71	0.456	0.60 (0.55)	0.92	2624.9	30400.00
14	391.96	55.91	0.424	0.60 (0.54)	0.91	3151.2	30300.00
15	378.42	60.65	0.405	0.60 (0.54)	0.90	3465.5	21400.00
16	304.68	86.47	0.350	0.60 (0.52)	0.87	5018.9	13100.00
17	306.35	87.88	0.347	0.60 (0.52)	0.87	5099.8	13200.00
18	306.23	94.36	0.336	0.60 (0.52)	0.87	5359.7	13210.00
19	322.38	125.62	0.293	0.60 (0.51)	0.86	6454.2	13000.00
20	319.05	129.05	0.290	0.60 (0.51)	0.86	6474.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.26	22.38	0.717	0.60 (0.60)	1.00	64.8	30800.00

LONGEST FLOWPATH FROM NODE 30800.00 TO NODE 13305.60 = 4165.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	501.09	22.38	0.717	0.60 (0.57)	0.94	1127.6	30800.00
2	496.72	25.48	0.655	0.60 (0.57)	0.94	1274.5	30700.00
3	490.58	27.08	0.631	0.60 (0.57)	0.94	1348.2	30600.00
4	477.27	35.24	0.545	0.60 (0.56)	0.94	1741.6	21300.00
5	472.72	38.73	0.516	0.60 (0.56)	0.94	1961.3	30410.00

6	472.50	38.83	0.515	0.60	(0.56)	0.94	1967.2	30520.00
7	467.68	40.07	0.505	0.60	(0.56)	0.94	2032.9	30210.00
8	466.25	40.44	0.503	0.60	(0.56)	0.94	2064.3	30200.00
9	458.56	42.64	0.491	0.60	(0.56)	0.93	2251.0	30540.00
10	454.54	43.67	0.485	0.60	(0.56)	0.93	2332.9	30100.00
11	451.34	43.99	0.483	0.60	(0.56)	0.93	2356.0	30510.00
12	415.42	47.44	0.463	0.60	(0.55)	0.92	2593.8	30110.00
13	413.15	47.91	0.461	0.60	(0.55)	0.92	2630.1	30500.00
14	410.51	48.71	0.456	0.60	(0.55)	0.92	2689.7	30400.00
15	391.96	55.91	0.424	0.60	(0.54)	0.91	3216.1	30300.00
16	378.42	60.65	0.405	0.60	(0.54)	0.90	3530.3	21400.00
17	304.68	86.47	0.350	0.60	(0.52)	0.87	5083.8	13100.00
18	306.35	87.88	0.347	0.60	(0.52)	0.87	5164.6	13200.00
19	306.23	94.36	0.336	0.60	(0.52)	0.87	5424.6	13210.00
20	322.38	125.62	0.293	0.60	(0.52)	0.86	6519.1	13000.00
21	319.05	129.05	0.290	0.60	(0.51)	0.86	6539.3	13010.00

TOTAL AREA (ACRES) = 6539.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 501.09 Tc (MIN.) = 22.382  
EFFECTIVE AREA (ACRES) = 1127.60 AREA-AVERAGED Fm (INCH/HR) = 0.57  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.86  
TOTAL AREA (ACRES) = 6539.3  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

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FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.80 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 258.00 DOWNSTREAM (FEET) = 254.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 947.16 CHANNEL SLOPE = 0.0042  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 501.09  
FLOW VELOCITY (FEET/SEC.) = 4.79 FLOW DEPTH (FEET) = 5.90  
TRAVEL TIME (MIN.) = 3.29 Tc (MIN.) = 25.67  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	501.09	25.67	0.652	0.60 (0.57)	0.94	1127.6	30800.00
2	496.72	28.78	0.605	0.60 (0.57)	0.94	1274.5	30700.00
3	490.58	30.38	0.584	0.60 (0.57)	0.94	1348.2	30600.00
4	477.27	38.57	0.517	0.60 (0.56)	0.94	1741.6	21300.00
5	472.72	42.07	0.494	0.60 (0.56)	0.94	1961.3	30410.00
6	472.50	42.17	0.493	0.60 (0.56)	0.94	1967.2	30520.00
7	467.68	43.41	0.486	0.60 (0.56)	0.94	2032.9	30210.00
8	466.25	43.79	0.484	0.60 (0.56)	0.94	2064.3	30200.00
9	458.56	46.01	0.472	0.60 (0.56)	0.93	2251.0	30540.00
10	454.54	47.04	0.466	0.60 (0.56)	0.93	2332.9	30100.00
11	451.34	47.37	0.464	0.60 (0.56)	0.93	2356.0	30510.00
12	415.42	50.89	0.445	0.60 (0.55)	0.92	2593.8	30110.00
13	413.15	51.36	0.443	0.60 (0.55)	0.92	2630.1	30500.00
14	410.51	52.17	0.440	0.60 (0.55)	0.92	2689.7	30400.00
15	391.96	59.41	0.409	0.60 (0.54)	0.91	3216.1	30300.00

16	378.42	64.18	0.397	0.60	(0.54)	0.90	3530.3	21400.00
17	304.68	90.20	0.342	0.60	(0.52)	0.87	5083.8	13100.00
18	306.35	91.61	0.340	0.60	(0.52)	0.87	5164.6	13200.00
19	306.23	98.09	0.330	0.60	(0.52)	0.87	5424.6	13210.00
20	322.38	129.29	0.290	0.60	(0.52)	0.86	6519.1	13000.00
21	319.05	132.74	0.287	0.60	(0.51)	0.86	6539.3	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 501.09 Tc (MIN.) = 25.67  
AREA-AVERAGED Fm (INCH/HR) = 0.57 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA (ACRES) = 1127.60

\*\*\*\*\*

FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 12

>>>> CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 15.1

>>>> DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610309T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.80	21.16	0.60 (0.60)	1.00	65.9	30900.00
2	10.79	21.17	0.60 (0.60)	1.00	65.9	30910.00
TOTAL AREA (ACRES) = 65.9						

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FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 11

>>>> CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	501.09	25.67	0.652	0.60 (0.57)	0.94	1127.6	30800.00
2	496.72	28.78	0.605	0.60 (0.57)	0.94	1274.5	30700.00
3	490.58	30.38	0.584	0.60 (0.57)	0.94	1348.2	30600.00
4	477.27	38.57	0.517	0.60 (0.56)	0.94	1741.6	21300.00
5	472.72	42.07	0.494	0.60 (0.56)	0.94	1961.3	30410.00
6	472.50	42.17	0.493	0.60 (0.56)	0.94	1967.2	30520.00
7	467.68	43.41	0.486	0.60 (0.56)	0.94	2032.9	30210.00
8	466.25	43.79	0.484	0.60 (0.56)	0.94	2064.3	30200.00
9	458.56	46.01	0.472	0.60 (0.56)	0.93	2251.0	30540.00
10	454.54	47.04	0.466	0.60 (0.56)	0.93	2332.9	30100.00
11	451.34	47.37	0.464	0.60 (0.56)	0.93	2356.0	30510.00
12	415.42	50.89	0.445	0.60 (0.55)	0.92	2593.8	30110.00
13	413.15	51.36	0.443	0.60 (0.55)	0.92	2630.1	30500.00
14	410.51	52.17	0.440	0.60 (0.55)	0.92	2689.7	30400.00
15	391.96	59.41	0.409	0.60 (0.54)	0.91	3216.1	30300.00
16	378.42	64.18	0.397	0.60 (0.54)	0.90	3530.3	21400.00
17	304.68	90.20	0.342	0.60 (0.52)	0.87	5083.8	13100.00
18	306.35	91.61	0.340	0.60 (0.52)	0.87	5164.6	13200.00
19	306.23	98.09	0.330	0.60 (0.52)	0.87	5424.6	13210.00

20 322.38 129.29 0.290 0.60( 0.52) 0.86 6519.1 13000.00  
 21 319.05 132.74 0.287 0.60( 0.51) 0.86 6539.3 13010.00  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.80	21.16	0.742	0.60( 0.60)	1.00	65.9	30900.00
2	10.79	21.17	0.742	0.60( 0.60)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	21.16	0.742	0.60( 0.57)	0.95	995.2	30900.00
2	511.88	21.17	0.742	0.60( 0.57)	0.95	995.6	30910.00
3	505.05	25.67	0.652	0.60( 0.57)	0.95	1193.5	30800.00
4	497.15	28.78	0.605	0.60( 0.57)	0.95	1340.4	30700.00
5	490.58	30.38	0.584	0.60( 0.57)	0.95	1414.1	30600.00
6	477.27	38.57	0.517	0.60( 0.57)	0.94	1807.5	21300.00
7	472.72	42.07	0.494	0.60( 0.56)	0.94	2027.2	30410.00
8	472.50	42.17	0.493	0.60( 0.56)	0.94	2033.1	30520.00
9	467.68	43.41	0.486	0.60( 0.56)	0.94	2098.8	30210.00
10	466.25	43.79	0.484	0.60( 0.56)	0.94	2130.2	30200.00
11	458.56	46.01	0.472	0.60( 0.56)	0.93	2317.0	30540.00
12	454.54	47.04	0.466	0.60( 0.56)	0.93	2398.8	30100.00
13	451.34	47.37	0.464	0.60( 0.56)	0.93	2421.9	30510.00
14	415.42	50.89	0.445	0.60( 0.55)	0.92	2659.8	30110.00
15	413.15	51.36	0.443	0.60( 0.55)	0.92	2696.1	30500.00
16	410.51	52.17	0.440	0.60( 0.55)	0.92	2755.6	30400.00
17	391.96	59.41	0.409	0.60( 0.55)	0.91	3282.0	30300.00
18	378.42	64.18	0.397	0.60( 0.54)	0.90	3596.3	21400.00
19	304.68	90.20	0.342	0.60( 0.52)	0.87	5149.7	13100.00
20	306.35	91.61	0.340	0.60( 0.52)	0.87	5230.5	13200.00
21	306.23	98.09	0.330	0.60( 0.52)	0.87	5490.5	13210.00
22	322.38	129.29	0.290	0.60( 0.52)	0.86	6585.0	13000.00
23	319.05	132.74	0.287	0.60( 0.52)	0.86	6605.2	13010.00

TOTAL AREA(ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 511.89 Tc(MIN.) = 21.158  
 EFFECTIVE AREA(ACRES) = 995.17 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 6605.2  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 254.00 DOWNSTREAM(FEET) = 245.50  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 583.12 CHANNEL SLOPE = 0.0146  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.716  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.77	0.60	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 515.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.69  
 AVERAGE FLOW DEPTH(FEET) = 4.73 TRAVEL TIME(MIN.) = 1.26  
 Tc(MIN.) = 22.42  
 SUBAREA AREA(ACRES) = 68.77 SUBAREA RUNOFF(CFS) = 7.25  
 EFFECTIVE AREA(ACRES) = 1063.94 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 6673.9 PEAK FLOW RATE(CFS) = 511.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.72 FLOW VELOCITY(FEET/SEC.) = 7.67  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	22.42	0.716	0.60( 0.57)	0.95	1063.9	30900.00
2	511.88	22.43	0.716	0.60( 0.57)	0.95	1064.4	30910.00
3	505.05	26.95	0.633	0.60( 0.57)	0.95	1262.3	30800.00
4	497.15	30.05	0.587	0.60( 0.57)	0.95	1409.2	30700.00
5	490.58	31.66	0.574	0.60( 0.57)	0.95	1482.9	30600.00
6	477.27	39.86	0.507	0.60( 0.57)	0.94	1876.3	21300.00
7	472.72	43.36	0.487	0.60( 0.56)	0.94	2095.9	30410.00
8	472.50	43.46	0.486	0.60( 0.56)	0.94	2101.8	30520.00
9	467.68	44.71	0.479	0.60( 0.56)	0.94	2167.5	30210.00
10	466.25	45.09	0.477	0.60( 0.56)	0.94	2198.9	30200.00
11	458.56	47.31	0.464	0.60( 0.56)	0.93	2385.7	30540.00
12	454.54	48.35	0.458	0.60( 0.56)	0.93	2467.5	30100.00
13	451.34	48.68	0.456	0.60( 0.56)	0.93	2490.6	30510.00
14	415.42	52.22	0.439	0.60( 0.55)	0.92	2728.5	30110.00
15	413.15	52.70	0.437	0.60( 0.55)	0.92	2764.8	30500.00
16	410.51	53.51	0.434	0.60( 0.55)	0.92	2824.4	30400.00
17	391.96	60.77	0.405	0.60( 0.55)	0.91	3350.7	30300.00
18	378.42	65.54	0.394	0.60( 0.54)	0.90	3665.0	21400.00
19	304.68	91.64	0.340	0.60( 0.53)	0.88	5218.4	13100.00
20	306.35	93.05	0.338	0.60( 0.52)	0.88	5299.3	13200.00
21	306.23	99.52	0.328	0.60( 0.52)	0.87	5559.3	13210.00
22	322.38	130.71	0.289	0.60( 0.52)	0.86	6653.8	13000.00
23	319.05	134.16	0.286	0.60( 0.52)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 511.89 Tc(MIN.) = 22.42  
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1063.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 245.50 DOWNSTREAM(FEET) = 220.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1543.21 CHANNEL SLOPE = 0.0165

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 511.89  
 FLOW VELOCITY (FEET/SEC.) = 8.05 FLOW DEPTH (FEET) = 4.61  
 TRAVEL TIME (MIN.) = 3.20 Tc (MIN.) = 25.62  
 LONGEST FLOWPATH FROM NODE 13307.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	25.62	0.653	0.60 ( 0.57)	0.95	1063.9	30900.00
2	511.88	25.63	0.653	0.60 ( 0.57)	0.95	1064.4	30910.00
3	505.05	30.15	0.586	0.60 ( 0.57)	0.95	1262.3	30800.00
4	497.15	33.28	0.561	0.60 ( 0.57)	0.95	1409.2	30700.00
5	490.58	34.90	0.547	0.60 ( 0.57)	0.95	1482.9	30600.00
6	477.27	43.12	0.488	0.60 ( 0.57)	0.94	1876.3	21300.00
7	472.72	46.63	0.468	0.60 ( 0.56)	0.94	2095.9	30410.00
8	472.50	46.72	0.467	0.60 ( 0.56)	0.94	2101.8	30520.00
9	467.68	47.98	0.460	0.60 ( 0.56)	0.94	2167.5	30210.00
10	466.25	48.36	0.458	0.60 ( 0.56)	0.94	2198.9	30200.00
11	458.56	50.60	0.446	0.60 ( 0.56)	0.93	2385.7	30540.00
12	454.54	51.64	0.442	0.60 ( 0.56)	0.93	2467.5	30100.00
13	451.34	51.98	0.440	0.60 ( 0.56)	0.93	2490.6	30510.00
14	415.42	55.60	0.425	0.60 ( 0.55)	0.92	2728.5	30110.00
15	413.15	56.07	0.423	0.60 ( 0.55)	0.92	2764.8	30500.00
16	410.51	56.89	0.420	0.60 ( 0.55)	0.92	2824.4	30400.00
17	391.96	64.19	0.397	0.60 ( 0.55)	0.91	3350.7	30300.00
18	378.42	69.00	0.387	0.60 ( 0.54)	0.90	3665.0	21400.00
19	304.68	95.29	0.334	0.60 ( 0.53)	0.88	5218.4	13100.00
20	306.35	96.69	0.332	0.60 ( 0.52)	0.88	5299.3	13200.00
21	306.23	103.16	0.323	0.60 ( 0.52)	0.87	5559.3	13210.00
22	322.38	134.30	0.286	0.60 ( 0.52)	0.86	6653.8	13000.00
23	319.05	137.76	0.283	0.60 ( 0.52)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 511.89 Tc (MIN.) = 25.62  
 AREA-AVERAGED Fm (INCH/HR) = 0.57 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA (ACRES) = 1063.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610310T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.13	31.23	0.60 ( 0.60)	1.00	97.9	31000.00
TOTAL AREA (ACRES) = 97.9						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

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 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	511.89	25.62	0.653	0.60 ( 0.57)	0.95	1063.9	30900.00
2	511.88	25.63	0.653	0.60 ( 0.57)	0.95	1064.4	30910.00
3	505.05	30.15	0.586	0.60 ( 0.57)	0.95	1262.3	30800.00
4	497.15	33.28	0.561	0.60 ( 0.57)	0.95	1409.2	30700.00
5	490.58	34.90	0.547	0.60 ( 0.57)	0.95	1482.9	30600.00
6	477.27	43.12	0.488	0.60 ( 0.57)	0.94	1876.3	21300.00
7	472.72	46.63	0.468	0.60 ( 0.56)	0.94	2095.9	30410.00
8	472.50	46.72	0.467	0.60 ( 0.56)	0.94	2101.8	30520.00
9	467.68	47.98	0.460	0.60 ( 0.56)	0.94	2167.5	30210.00
10	466.25	48.36	0.458	0.60 ( 0.56)	0.94	2198.9	30200.00
11	458.56	50.60	0.446	0.60 ( 0.56)	0.93	2385.7	30540.00
12	454.54	51.64	0.442	0.60 ( 0.56)	0.93	2467.5	30100.00
13	451.34	51.98	0.440	0.60 ( 0.56)	0.93	2490.6	30510.00
14	415.42	55.60	0.425	0.60 ( 0.55)	0.92	2728.5	30110.00
15	413.15	56.07	0.423	0.60 ( 0.55)	0.92	2764.8	30500.00
16	410.51	56.89	0.420	0.60 ( 0.55)	0.92	2824.4	30400.00
17	391.96	64.19	0.397	0.60 ( 0.55)	0.91	3350.7	30300.00
18	378.42	69.00	0.387	0.60 ( 0.54)	0.90	3665.0	21400.00
19	304.68	95.29	0.334	0.60 ( 0.53)	0.88	5218.4	13100.00
20	306.35	96.69	0.332	0.60 ( 0.52)	0.88	5299.3	13200.00
21	306.23	103.16	0.323	0.60 ( 0.52)	0.87	5559.3	13210.00
22	322.38	134.30	0.286	0.60 ( 0.52)	0.86	6653.8	13000.00
23	319.05	137.76	0.283	0.60 ( 0.52)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13307.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.13	31.23	0.577	0.60 ( 0.60)	1.00	97.9	31000.00

LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	25.62	0.653	0.60 ( 0.57)	0.95	1144.2	30900.00
2	515.71	25.63	0.653	0.60 ( 0.57)	0.95	1144.7	30910.00
3	509.09	30.15	0.586	0.60 ( 0.57)	0.95	1356.8	30800.00
4	506.46	31.23	0.577	0.60 ( 0.57)	0.95	1410.7	31000.00
5	501.16	33.28	0.561	0.60 ( 0.57)	0.95	1507.1	30700.00
6	494.50	34.90	0.547	0.60 ( 0.57)	0.95	1580.8	30600.00
7	480.76	43.12	0.488	0.60 ( 0.57)	0.95	1974.2	21300.00
8	476.07	46.63	0.468	0.60 ( 0.57)	0.94	2193.8	30410.00
9	475.84	46.72	0.467	0.60 ( 0.57)	0.94	2199.7	30520.00
10	470.97	47.98	0.460	0.60 ( 0.57)	0.94	2265.4	30210.00
11	469.52	48.36	0.458	0.60 ( 0.56)	0.94	2296.8	30200.00
12	461.74	50.60	0.446	0.60 ( 0.56)	0.94	2483.6	30540.00
13	457.70	51.64	0.442	0.60 ( 0.56)	0.93	2565.4	30100.00
14	454.48	51.98	0.440	0.60 ( 0.56)	0.93	2588.5	30510.00
15	418.46	55.60	0.425	0.60 ( 0.56)	0.93	2826.4	30110.00
16	416.17	56.07	0.423	0.60 ( 0.56)	0.93	2862.7	30500.00
17	413.51	56.89	0.420	0.60 ( 0.55)	0.92	2922.3	30400.00

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18 394.80 64.19 0.397 0.60( 0.55) 0.91 3448.6 30300.00
19 381.19 69.00 0.387 0.60( 0.54) 0.91 3762.9 21400.00
20 307.07 95.29 0.334 0.60( 0.53) 0.88 5316.3 13100.00
21 308.73 96.69 0.332 0.60( 0.53) 0.88 5397.2 13200.00
22 308.53 103.16 0.323 0.60( 0.53) 0.88 5657.1 13210.00
23 324.43 134.30 0.286 0.60( 0.52) 0.86 6751.6 13000.00
24 321.07 137.76 0.283 0.60( 0.52) 0.86 6771.8 13010.00
TOTAL AREA(ACRES) = 6771.8

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

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PEAK FLOW RATE(CFS) = 515.72 Tc(MIN.) = 25.619
EFFECTIVE AREA(ACRES) = 1144.24 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 6771.8
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

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*****
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 220.00 DOWNSTREAM(FEET) = 212.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 925.62 CHANNEL SLOPE = 0.0086
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 515.72
FLOW VELOCITY(FEET/SEC.) = 6.32 FLOW DEPTH(FEET) = 5.22
TRAVEL TIME(MIN.) = 2.44 Tc(MIN.) = 28.06
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	28.06	0.616	0.60( 0.57)	0.95	1144.2	30900.00
2	515.71	28.07	0.616	0.60( 0.57)	0.95	1144.7	30910.00
3	509.09	32.60	0.566	0.60( 0.57)	0.95	1356.8	30800.00
4	506.46	33.68	0.557	0.60( 0.57)	0.95	1410.7	31000.00
5	501.16	35.74	0.541	0.60( 0.57)	0.95	1507.1	30700.00
6	494.50	37.37	0.527	0.60( 0.57)	0.95	1580.8	30600.00
7	480.76	45.60	0.474	0.60( 0.57)	0.95	1974.2	21300.00
8	476.07	49.12	0.454	0.60( 0.57)	0.94	2193.8	30410.00
9	475.84	49.22	0.453	0.60( 0.57)	0.94	2199.7	30520.00
10	470.97	50.48	0.447	0.60( 0.57)	0.94	2265.4	30210.00
11	469.52	50.86	0.445	0.60( 0.56)	0.94	2296.8	30200.00
12	461.74	53.11	0.436	0.60( 0.56)	0.94	2483.6	30540.00
13	457.70	54.16	0.431	0.60( 0.56)	0.93	2565.4	30100.00
14	454.48	54.50	0.430	0.60( 0.56)	0.93	2588.5	30510.00
15	418.46	58.17	0.414	0.60( 0.56)	0.93	2826.4	30110.00
16	416.17	58.65	0.412	0.60( 0.56)	0.93	2862.7	30500.00
17	413.51	59.47	0.409	0.60( 0.55)	0.92	2922.3	30400.00
18	394.80	66.80	0.392	0.60( 0.55)	0.91	3448.6	30300.00
19	381.19	71.63	0.381	0.60( 0.54)	0.91	3762.9	21400.00
20	307.07	98.06	0.330	0.60( 0.53)	0.88	5316.3	13100.00
21	308.73	99.47	0.328	0.60( 0.53)	0.88	5397.2	13200.00
22	308.53	105.93	0.319	0.60( 0.53)	0.88	5657.1	13210.00
23	324.43	137.04	0.284	0.60( 0.52)	0.86	6751.6	13000.00
24	321.07	140.51	0.281	0.60( 0.52)	0.86	6771.8	13010.00

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NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 515.72 Tc(MIN.) = 28.06
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 1144.24

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*****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 12

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>>>>CLEAR MEMORY BANK # 3 <<<<<

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*****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610212T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

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STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.29	62.94	0.60( 0.60)	1.00	342.8	21200.00
TOTAL AREA(ACRES) = 342.8						

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*****
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	515.72	28.06	0.616	0.60( 0.57)	0.95	1144.2	30900.00
2	515.71	28.07	0.616	0.60( 0.57)	0.95	1144.7	30910.00
3	509.09	32.60	0.566	0.60( 0.57)	0.95	1356.8	30800.00
4	506.46	33.68	0.557	0.60( 0.57)	0.95	1410.7	31000.00
5	501.16	35.74	0.541	0.60( 0.57)	0.95	1507.1	30700.00
6	494.50	37.37	0.527	0.60( 0.57)	0.95	1580.8	30600.00
7	480.76	45.60	0.474	0.60( 0.57)	0.95	1974.2	21300.00
8	476.07	49.12	0.454	0.60( 0.57)	0.94	2193.8	30410.00
9	475.84	49.22	0.453	0.60( 0.57)	0.94	2199.7	30520.00
10	470.97	50.48	0.447	0.60( 0.57)	0.94	2265.4	30210.00
11	469.52	50.86	0.445	0.60( 0.56)	0.94	2296.8	30200.00
12	461.74	53.11	0.436	0.60( 0.56)	0.94	2483.6	30540.00
13	457.70	54.16	0.431	0.60( 0.56)	0.93	2565.4	30100.00
14	454.48	54.50	0.430	0.60( 0.56)	0.93	2588.5	30510.00
15	418.46	58.17	0.414	0.60( 0.56)	0.93	2826.4	30110.00
16	416.17	58.65	0.412	0.60( 0.56)	0.93	2862.7	30500.00
17	413.51	59.47	0.409	0.60( 0.55)	0.92	2922.3	30400.00
18	394.80	66.80	0.392	0.60( 0.55)	0.91	3448.6	30300.00
19	381.19	71.63	0.381	0.60( 0.54)	0.91	3762.9	21400.00
20	307.07	98.06	0.330	0.60( 0.53)	0.88	5316.3	13100.00
21	308.73	99.47	0.328	0.60( 0.53)	0.88	5397.2	13200.00
22	308.53	105.93	0.319	0.60( 0.53)	0.88	5657.1	13210.00
23	324.43	137.04	0.284	0.60( 0.52)	0.86	6751.6	13000.00
24	321.07	140.51	0.281	0.60( 0.52)	0.86	6771.8	13010.00

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LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

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\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.29	62.94	0.400	0.60 ( 0.60)	1.00	342.8	21200.00

LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 13308.00 = 11049.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	521.42	28.06	0.616	0.60 ( 0.58)	0.96	1297.1	30900.00
2	521.41	28.07	0.616	0.60 ( 0.58)	0.96	1297.6	30910.00
3	515.17	32.60	0.566	0.60 ( 0.57)	0.96	1534.4	30800.00
4	512.64	33.68	0.557	0.60 ( 0.57)	0.96	1594.2	31000.00
5	507.52	35.74	0.541	0.60 ( 0.57)	0.96	1701.7	30700.00
6	500.99	37.37	0.527	0.60 ( 0.57)	0.96	1784.3	30600.00
7	487.88	45.60	0.474	0.60 ( 0.57)	0.95	2222.5	21300.00
8	483.41	49.12	0.454	0.60 ( 0.57)	0.95	2461.3	30410.00
9	483.19	49.22	0.453	0.60 ( 0.57)	0.95	2467.8	30520.00
10	478.40	50.48	0.447	0.60 ( 0.57)	0.95	2540.3	30210.00
11	476.98	50.86	0.445	0.60 ( 0.57)	0.95	2573.8	30200.00
12	469.36	53.11	0.436	0.60 ( 0.57)	0.94	2772.8	30540.00
13	465.39	54.16	0.431	0.60 ( 0.56)	0.94	2860.4	30100.00
14	462.20	54.50	0.430	0.60 ( 0.56)	0.94	2885.3	30510.00
15	426.39	58.17	0.414	0.60 ( 0.56)	0.93	3143.2	30110.00
16	424.13	58.65	0.412	0.60 ( 0.56)	0.93	3182.1	30500.00
17	421.51	59.47	0.409	0.60 ( 0.56)	0.93	3246.1	30400.00
18	412.94	62.94	0.400	0.60 ( 0.56)	0.93	3514.4	21200.00
19	402.92	66.80	0.392	0.60 ( 0.55)	0.92	3791.4	30300.00
20	389.10	71.63	0.381	0.60 ( 0.55)	0.91	4105.7	21400.00
21	313.92	98.06	0.330	0.60 ( 0.53)	0.89	5659.1	13100.00
22	315.53	99.47	0.328	0.60 ( 0.53)	0.88	5740.0	13200.00
23	315.14	105.93	0.319	0.60 ( 0.53)	0.88	5999.9	13210.00
24	330.31	137.04	0.284	0.60 ( 0.52)	0.87	7094.4	13000.00
25	326.89	140.51	0.281	0.60 ( 0.52)	0.87	7114.6	13010.00

TOTAL AREA (ACRES) = 7114.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 521.42 Tc (MIN.) = 28.060  
EFFECTIVE AREA (ACRES) = 1297.06 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 7114.6  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 2 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S29.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	23.78	0.60 ( 0.59)	0.98	1642.7	50400.00
2	710.45	51.18	0.60 ( 0.59)	0.98	4992.7	40510.00
3	582.48	66.27	0.60 ( 0.59)	0.99	7106.6	50100.00
4	557.32	90.91	0.60 ( 0.59)	0.99	10674.2	31400.00
5	559.68	102.42	0.60 ( 0.59)	0.99	12314.0	40100.00
6	600.65	114.80	0.60 ( 0.59)	0.99	14046.5	11831.00
7	701.25	138.03	0.60 ( 0.59)	0.99	17741.6	11530.00
8	790.85	157.50	0.60 ( 0.59)	0.99	21898.4	11000.00
9	904.69	179.78	0.60 ( 0.60)	0.99	28689.4	10850.00
10	831.17	195.47	0.60 ( 0.60)	0.99	32037.1	11220.00
11	775.07	206.87	0.60 ( 0.60)	0.99	33792.3	10910.00
12	626.01	247.39	0.60 ( 0.59)	0.99	40376.2	12410.00
13	591.12	280.30	0.60 ( 0.59)	0.99	46454.5	12261.00
14	579.95	293.18	0.60 ( 0.59)	0.99	47939.3	10410.00
15	568.93	305.35	0.60 ( 0.59)	0.99	49045.1	12101.10
16	544.05	332.73	0.60 ( 0.59)	0.99	51422.8	10200.00
17	531.24	346.10	0.60 ( 0.59)	0.99	52362.5	12010.00
18	493.85	375.45	0.60 ( 0.59)	0.99	53039.9	10210.00
19	439.23	424.61	0.60 ( 0.59)	0.99	53541.6	12000.00
20	406.62	491.65	0.60 ( 0.59)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	23.78	0.60 ( 0.59)	0.98	1642.7	50400.00
2	710.45	51.18	0.60 ( 0.59)	0.98	4992.7	40510.00
3	582.48	66.27	0.60 ( 0.59)	0.99	7106.6	50100.00
4	557.32	90.91	0.60 ( 0.59)	0.99	10674.2	31400.00
5	559.68	102.42	0.60 ( 0.59)	0.99	12314.0	40100.00
6	600.65	114.80	0.60 ( 0.59)	0.99	14046.5	11831.00
7	701.25	138.03	0.60 ( 0.59)	0.99	17741.6	11530.00
8	790.85	157.50	0.60 ( 0.59)	0.99	21898.4	11000.00
9	904.69	179.78	0.60 ( 0.60)	0.99	28689.4	10850.00
10	831.17	195.47	0.60 ( 0.60)	0.99	32037.1	11220.00
11	775.07	206.87	0.60 ( 0.60)	0.99	33792.3	10910.00
12	626.01	247.39	0.60 ( 0.59)	0.99	40376.2	12410.00
13	591.12	280.30	0.60 ( 0.59)	0.99	46454.5	12261.00
14	579.95	293.18	0.60 ( 0.59)	0.99	47939.3	10410.00
15	568.93	305.35	0.60 ( 0.59)	0.99	49045.1	12101.10

16	544.05	332.73	0.60	( 0.59)	0.99	51422.8	10200.00
17	531.24	346.10	0.60	( 0.59)	0.99	52362.5	12010.00
18	493.85	375.45	0.60	( 0.59)	0.99	53039.9	10210.00
19	439.23	424.61	0.60	( 0.59)	0.99	53541.6	12000.00
20	406.62	491.65	0.60	( 0.59)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12904.00 TO NODE 13308.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 212.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1389.52 CHANNEL SLOPE = 0.0007  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 904.69  
FLOW VELOCITY(FEET/SEC.) = 3.55 FLOW DEPTH(FEET) = 9.21  
TRAVEL TIME(MIN.) = 6.52 Tc(MIN.) = 186.30  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	503.93	31.32	0.576	0.60 ( 0.59)	0.98	1642.7	50400.00
2	710.45	58.11	0.414	0.60 ( 0.59)	0.98	4992.7	40510.00
3	582.48	73.54	0.377	0.60 ( 0.59)	0.99	7106.6	50100.00
4	557.32	98.28	0.330	0.60 ( 0.59)	0.99	10674.2	31400.00
5	559.68	109.77	0.313	0.60 ( 0.59)	0.99	12314.0	40100.00
6	600.65	122.02	0.296	0.60 ( 0.59)	0.99	14046.5	11831.00
7	701.25	144.98	0.277	0.60 ( 0.59)	0.99	17741.6	11530.00
8	790.85	164.24	0.261	0.60 ( 0.59)	0.99	21898.4	11000.00
9	904.69	186.30	0.246	0.60 ( 0.60)	0.99	28689.4	10850.00
10	831.17	202.12	0.240	0.60 ( 0.60)	0.99	32037.1	11220.00
11	775.07	213.64	0.236	0.60 ( 0.60)	0.99	33792.3	10910.00
12	626.01	254.53	0.221	0.60 ( 0.59)	0.99	40376.2	12410.00
13	591.12	287.55	0.209	0.60 ( 0.59)	0.99	46454.5	12261.00
14	579.95	300.47	0.204	0.60 ( 0.59)	0.99	47939.3	10410.00
15	568.93	312.67	0.199	0.60 ( 0.59)	0.99	49045.1	12101.10
16	544.05	340.13	0.189	0.60 ( 0.59)	0.99	51422.8	10200.00
17	531.24	353.55	0.184	0.60 ( 0.59)	0.99	52362.5	12010.00
18	493.85	383.04	0.180	0.60 ( 0.59)	0.99	53039.9	10210.00
19	439.23	432.43	0.175	0.60 ( 0.59)	0.99	53541.6	12000.00
20	406.62	499.61	0.169	0.60 ( 0.59)	0.99	54110.0	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 904.69 Tc(MIN.) = 186.30  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 28689.43

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	503.93	31.32	0.576	0.60 ( 0.59)	0.98	1642.7 50400.00
2	710.45	58.11	0.414	0.60 ( 0.59)	0.98	4992.7 40510.00
3	582.48	73.54	0.377	0.60 ( 0.59)	0.99	7106.6 50100.00
4	557.32	98.28	0.330	0.60 ( 0.59)	0.99	10674.2 31400.00
5	559.68	109.77	0.313	0.60 ( 0.59)	0.99	12314.0 40100.00
6	600.65	122.02	0.296	0.60 ( 0.59)	0.99	14046.5 11831.00
7	701.25	144.98	0.277	0.60 ( 0.59)	0.99	17741.6 11530.00
8	790.85	164.24	0.261	0.60 ( 0.59)	0.99	21898.4 11000.00
9	904.69	186.30	0.246	0.60 ( 0.60)	0.99	28689.4 10850.00
10	831.17	202.12	0.240	0.60 ( 0.60)	0.99	32037.1 11220.00
11	775.07	213.64	0.236	0.60 ( 0.60)	0.99	33792.3 10910.00
12	626.01	254.53	0.221	0.60 ( 0.59)	0.99	40376.2 12410.00
13	591.12	287.55	0.209	0.60 ( 0.59)	0.99	46454.5 12261.00
14	579.95	300.47	0.204	0.60 ( 0.59)	0.99	47939.3 10410.00
15	568.93	312.67	0.199	0.60 ( 0.59)	0.99	49045.1 12101.10
16	544.05	340.13	0.189	0.60 ( 0.59)	0.99	51422.8 10200.00
17	531.24	353.55	0.184	0.60 ( 0.59)	0.99	52362.5 12010.00
18	493.85	383.04	0.180	0.60 ( 0.59)	0.99	53039.9 10210.00
19	439.23	432.43	0.175	0.60 ( 0.59)	0.99	53541.6 12000.00
20	406.62	499.61	0.169	0.60 ( 0.59)	0.99	54110.0 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	521.42	28.06	0.616	0.60 ( 0.58)	0.96	1297.1	30900.00
2	521.41	28.07	0.616	0.60 ( 0.58)	0.96	1297.6	30910.00
3	515.17	32.60	0.566	0.60 ( 0.57)	0.96	1534.4	30800.00
4	512.64	33.68	0.557	0.60 ( 0.57)	0.96	1594.2	31000.00
5	507.52	35.74	0.541	0.60 ( 0.57)	0.96	1701.7	30700.00
6	500.99	37.37	0.527	0.60 ( 0.57)	0.96	1784.3	30600.00
7	487.88	45.60	0.474	0.60 ( 0.57)	0.95	2222.5	21300.00
8	483.41	49.12	0.454	0.60 ( 0.57)	0.95	2461.3	30410.00
9	483.19	49.22	0.453	0.60 ( 0.57)	0.95	2467.8	30520.00
10	478.40	50.48	0.447	0.60 ( 0.57)	0.95	2540.3	30210.00
11	476.98	50.86	0.445	0.60 ( 0.57)	0.95	2573.8	30200.00
12	469.36	53.11	0.436	0.60 ( 0.57)	0.94	2772.8	30540.00
13	465.39	54.16	0.431	0.60 ( 0.56)	0.94	2860.4	30100.00
14	462.20	54.50	0.430	0.60 ( 0.56)	0.94	2885.3	30510.00
15	426.39	58.17	0.414	0.60 ( 0.56)	0.93	3143.2	30110.00
16	424.13	58.65	0.412	0.60 ( 0.56)	0.93	3182.1	30500.00
17	421.51	59.47	0.409	0.60 ( 0.56)	0.93	3246.1	30400.00
18	412.94	62.94	0.400	0.60 ( 0.56)	0.93	3514.4	21200.00
19	402.92	66.80	0.392	0.60 ( 0.55)	0.92	3791.4	30300.00
20	389.10	71.63	0.381	0.60 ( 0.55)	0.91	4105.7	21400.00
21	313.92	98.06	0.330	0.60 ( 0.53)	0.89	5659.1	13100.00
22	315.53	99.47	0.328	0.60 ( 0.53)	0.88	5740.0	13200.00
23	315.14	105.93	0.319	0.60 ( 0.53)	0.88	5999.9	13210.00
24	330.31	137.04	0.284	0.60 ( 0.52)	0.87	7094.4	13000.00
25	326.89	140.51	0.281	0.60 ( 0.52)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.03	28.06	0.616	0.60 ( 0.58)	0.97	2768.6	30900.00
2	1004.08	28.07	0.616	0.60 ( 0.58)	0.97	2769.6	30910.00

3	1020.86	31.32	0.576	0.60	( 0.58)	0.97	3110.1	50400.00
4	1028.97	32.60	0.566	0.60	( 0.58)	0.97	3337.1	30800.00
5	1034.76	33.68	0.557	0.60	( 0.58)	0.97	3532.0	31000.00
6	1045.48	35.74	0.541	0.60	( 0.58)	0.97	3896.4	30700.00
7	1051.53	37.37	0.527	0.60	( 0.58)	0.97	4183.2	30600.00
8	1101.87	45.60	0.474	0.60	( 0.58)	0.97	5650.6	21300.00
9	1124.52	49.12	0.454	0.60	( 0.58)	0.97	6329.3	30410.00
10	1125.06	49.22	0.453	0.60	( 0.58)	0.97	6348.1	30520.00
11	1129.99	50.48	0.447	0.60	( 0.58)	0.97	6578.4	30210.00
12	1131.50	50.86	0.445	0.60	( 0.58)	0.97	6659.4	30200.00
13	1141.23	53.11	0.436	0.60	( 0.58)	0.97	7139.7	30540.00
14	1145.35	54.16	0.431	0.60	( 0.58)	0.97	7358.6	30100.00
15	1144.79	54.50	0.430	0.60	( 0.58)	0.97	7426.3	30510.00
16	1137.41	58.11	0.414	0.60	( 0.58)	0.97	8131.8	40510.00
17	1136.35	58.17	0.414	0.60	( 0.58)	0.96	8144.0	30110.00
18	1130.12	58.65	0.412	0.60	( 0.58)	0.96	8248.5	30500.00
19	1120.73	59.47	0.409	0.60	( 0.58)	0.96	8424.4	30400.00
20	1083.34	62.94	0.400	0.60	( 0.58)	0.96	9168.6	21200.00
21	1041.30	66.80	0.392	0.60	( 0.58)	0.96	9974.6	30300.00
22	987.43	71.63	0.381	0.60	( 0.57)	0.96	10950.3	21400.00
23	966.14	73.54	0.377	0.60	( 0.57)	0.96	11324.6	50100.00
24	871.45	98.06	0.330	0.60	( 0.57)	0.95	16302.4	13100.00
25	871.48	98.28	0.330	0.60	( 0.57)	0.95	16345.6	31400.00
26	873.09	99.47	0.328	0.60	( 0.57)	0.95	16583.9	13200.00
27	874.03	105.93	0.319	0.60	( 0.57)	0.95	17766.1	13210.00
28	876.69	109.77	0.313	0.60	( 0.57)	0.95	18449.0	40100.00
29	923.63	122.02	0.296	0.60	( 0.57)	0.95	20612.6	11831.00
30	996.79	137.04	0.284	0.60	( 0.57)	0.95	23559.0	13000.00
31	1008.58	140.51	0.281	0.60	( 0.57)	0.95	24137.7	13010.00
32	1023.88	144.98	0.277	0.60	( 0.57)	0.96	24856.2	11530.00
33	1095.06	164.24	0.261	0.60	( 0.58)	0.96	29013.0	11000.00
34	1191.12	186.30	0.246	0.60	( 0.58)	0.97	35804.0	10850.00
35	1110.77	202.12	0.240	0.60	( 0.58)	0.97	39151.7	11220.00
36	1049.70	213.64	0.236	0.60	( 0.58)	0.97	40906.9	10910.00
37	883.01	254.53	0.221	0.60	( 0.58)	0.97	47490.8	12410.00
38	833.89	287.55	0.209	0.60	( 0.58)	0.97	53569.1	12261.00
39	817.14	300.47	0.204	0.60	( 0.58)	0.98	55053.9	10410.00
40	800.86	312.67	0.199	0.60	( 0.59)	0.98	56159.7	12101.10
41	764.14	340.13	0.189	0.60	( 0.59)	0.98	58537.4	10200.00
42	745.54	353.55	0.184	0.60	( 0.59)	0.98	59477.1	12010.00
43	702.85	383.04	0.180	0.60	( 0.59)	0.98	60154.5	10210.00
44	642.79	432.43	0.175	0.60	( 0.59)	0.98	60656.2	12000.00
45	602.79	499.61	0.169	0.60	( 0.59)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1191.12 Tc(MIN.) = 186.298  
EFFECTIVE AREA(ACRES) = 35804.04 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 61224.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 61224.6 TC(MIN.) = 186.30  
EFFECTIVE AREA(ACRES) = 35804.04 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.968  
PEAK FLOW RATE(CFS) = 1191.12

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.03	28.06	0.616	0.60	( 0.58)	0.97	2768.6 30900.00
2	1004.08	28.07	0.616	0.60	( 0.58)	0.97	2769.6 30910.00
3	1020.86	31.32	0.576	0.60	( 0.58)	0.97	3110.1 50400.00
4	1028.97	32.60	0.566	0.60	( 0.58)	0.97	3337.1 30800.00
5	1034.76	33.68	0.557	0.60	( 0.58)	0.97	3532.0 31000.00
6	1045.48	35.74	0.541	0.60	( 0.58)	0.97	3896.4 30700.00
7	1051.53	37.37	0.527	0.60	( 0.58)	0.97	4183.2 30600.00
8	1101.87	45.60	0.474	0.60	( 0.58)	0.97	5650.6 21300.00
9	1124.52	49.12	0.454	0.60	( 0.58)	0.97	6329.3 30410.00
10	1125.06	49.22	0.453	0.60	( 0.58)	0.97	6348.1 30520.00
11	1129.99	50.48	0.447	0.60	( 0.58)	0.97	6578.4 30210.00
12	1131.50	50.86	0.445	0.60	( 0.58)	0.97	6659.4 30200.00
13	1141.23	53.11	0.436	0.60	( 0.58)	0.97	7139.7 30540.00
14	1145.35	54.16	0.431	0.60	( 0.58)	0.97	7358.6 30100.00
15	1144.79	54.50	0.430	0.60	( 0.58)	0.97	7426.3 30510.00
16	1137.41	58.11	0.414	0.60	( 0.58)	0.97	8131.8 40510.00
17	1136.35	58.17	0.414	0.60	( 0.58)	0.96	8144.0 30110.00
18	1130.12	58.65	0.412	0.60	( 0.58)	0.96	8248.5 30500.00
19	1120.73	59.47	0.409	0.60	( 0.58)	0.96	8424.4 30400.00
20	1083.34	62.94	0.400	0.60	( 0.58)	0.96	9168.6 21200.00
21	1041.30	66.80	0.392	0.60	( 0.58)	0.96	9974.6 30300.00
22	987.43	71.63	0.381	0.60	( 0.57)	0.96	10950.3 21400.00
23	966.14	73.54	0.377	0.60	( 0.57)	0.96	11324.6 50100.00
24	871.45	98.06	0.330	0.60	( 0.57)	0.95	16302.4 13100.00
25	871.48	98.28	0.330	0.60	( 0.57)	0.95	16345.6 31400.00
26	873.09	99.47	0.328	0.60	( 0.57)	0.95	16583.9 13200.00
27	874.03	105.93	0.319	0.60	( 0.57)	0.95	17766.1 13210.00
28	876.69	109.77	0.313	0.60	( 0.57)	0.95	18449.0 40100.00
29	923.63	122.02	0.296	0.60	( 0.57)	0.95	20612.6 11831.00
30	996.79	137.04	0.284	0.60	( 0.57)	0.95	23559.0 13000.00
31	1008.58	140.51	0.281	0.60	( 0.57)	0.95	24137.7 13010.00
32	1023.88	144.98	0.277	0.60	( 0.57)	0.96	24856.2 11530.00
33	1095.06	164.24	0.261	0.60	( 0.58)	0.96	29013.0 11000.00
34	1191.12	186.30	0.246	0.60	( 0.58)	0.97	35804.0 10850.00
35	1110.77	202.12	0.240	0.60	( 0.58)	0.97	39151.7 11220.00
36	1049.70	213.64	0.236	0.60	( 0.58)	0.97	40906.9 10910.00
37	883.01	254.53	0.221	0.60	( 0.58)	0.97	47490.8 12410.00
38	833.89	287.55	0.209	0.60	( 0.58)	0.97	53569.1 12261.00
39	817.14	300.47	0.204	0.60	( 0.58)	0.98	55053.9 10410.00
40	800.86	312.67	0.199	0.60	( 0.59)	0.98	56159.7 12101.10
41	764.14	340.13	0.189	0.60	( 0.59)	0.98	58537.4 10200.00
42	745.54	353.55	0.184	0.60	( 0.59)	0.98	59477.1 12010.00
43	702.85	383.04	0.180	0.60	( 0.59)	0.98	60154.5 10210.00
44	642.79	432.43	0.175	0.60	( 0.59)	0.98	60656.2 12000.00
45	602.79	499.61	0.169	0.60	( 0.59)	0.98	61224.6 10100.00

=====

END OF RATIONAL METHOD ANALYSIS



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S34.DAT  
TIME/DATE OF STUDY: 08:01 07/16/2018  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.820
- 2) 10.00; 1.213
- 3) 15.00; 0.930
- 4) 20.00; 0.765
- 5) 25.00; 0.661
- 6) 30.00; 0.587
- 7) 40.00; 0.505
- 8) 50.00; 0.448
- 9) 60.00; 0.406
- 10) 90.00; 0.341
- 11) 120.00; 0.297
- 12) 180.00; 0.248
- 13) 360.00; 0.181
- 14) 1440.00; 0.079

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN CROSSFALL (FT)	STREET / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S33.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.08	28.07	0.60 ( 0.58)	0.97	2769.6	30910.00
2	1145.35	54.16	0.60 ( 0.58)	0.97	7358.6	30100.00
3	987.43	71.63	0.60 ( 0.57)	0.96	10950.3	21400.00
4	873.09	99.47	0.60 ( 0.57)	0.95	16583.9	13200.00
5	876.69	109.77	0.60 ( 0.57)	0.95	18449.0	40100.00
6	923.63	122.02	0.60 ( 0.57)	0.95	20612.6	11831.00
7	1023.88	144.98	0.60 ( 0.57)	0.96	24856.2	11530.00
8	1095.06	164.24	0.60 ( 0.58)	0.96	29013.0	11000.00
9	1191.12	186.30	0.60 ( 0.58)	0.97	35804.0	10850.00
10	1110.77	202.12	0.60 ( 0.58)	0.97	39151.7	11220.00
11	1049.70	213.64	0.60 ( 0.58)	0.97	40906.9	10910.00
12	883.01	254.53	0.60 ( 0.58)	0.97	47490.8	12410.00
13	833.89	287.55	0.60 ( 0.58)	0.97	53569.1	12261.00
14	817.14	300.47	0.60 ( 0.58)	0.98	55053.9	10410.00
15	800.86	312.67	0.60 ( 0.59)	0.98	56159.7	12101.10
16	764.14	340.13	0.60 ( 0.59)	0.98	58537.4	10200.00
17	745.54	353.55	0.60 ( 0.59)	0.98	59477.1	12010.00
18	702.85	383.04	0.60 ( 0.59)	0.98	60154.5	10210.00
19	642.79	432.43	0.60 ( 0.59)	0.98	60656.2	12000.00
20	602.79	499.61	0.60 ( 0.59)	0.98	61224.6	10100.00

TOTAL AREA(ACRES) = 61224.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.08	28.07	0.60 ( 0.58)	0.97	2769.6	30910.00
2	1145.35	54.16	0.60 ( 0.58)	0.97	7358.6	30100.00
3	987.43	71.63	0.60 ( 0.57)	0.96	10950.3	21400.00
4	873.09	99.47	0.60 ( 0.57)	0.95	16583.9	13200.00
5	876.69	109.77	0.60 ( 0.57)	0.95	18449.0	40100.00
6	923.63	122.02	0.60 ( 0.57)	0.95	20612.6	11831.00
7	1023.88	144.98	0.60 ( 0.57)	0.96	24856.2	11530.00
8	1095.06	164.24	0.60 ( 0.58)	0.96	29013.0	11000.00
9	1191.12	186.30	0.60 ( 0.58)	0.97	35804.0	10850.00
10	1110.77	202.12	0.60 ( 0.58)	0.97	39151.7	11220.00
11	1049.70	213.64	0.60 ( 0.58)	0.97	40906.9	10910.00
12	883.01	254.53	0.60 ( 0.58)	0.97	47490.8	12410.00
13	833.89	287.55	0.60 ( 0.58)	0.97	53569.1	12261.00
14	817.14	300.47	0.60 ( 0.58)	0.98	55053.9	10410.00
15	800.86	312.67	0.60 ( 0.59)	0.98	56159.7	12101.10
16	764.14	340.13	0.60 ( 0.59)	0.98	58537.4	10200.00
17	745.54	353.55	0.60 ( 0.59)	0.98	59477.1	12010.00
18	702.85	383.04	0.60 ( 0.59)	0.98	60154.5	10210.00

19 642.79 432.43 0.60( 0.59) 0.98 60656.2 12000.00  
20 602.79 499.61 0.60( 0.59) 0.98 61224.6 10100.00  
TOTAL AREA (ACRES) = 61224.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13308.00 TO NODE 13402.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 212.00 DOWNSTREAM(FEET) = 209.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 623.02 CHANNEL SLOPE = 0.0048  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1191.12  
FLOW VELOCITY(FEET/SEC.) = 7.76 FLOW DEPTH(FEET) = 7.15  
TRAVEL TIME(MIN.) = 1.34 Tc(MIN.) = 187.64  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610505T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.45	28.69	0.60( 0.59)	0.99	153.2	50500.00
TOTAL AREA (ACRES) = 153.2						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1004.08	29.47	0.595	0.60( 0.58)	0.97	2769.6	30910.00
2	1145.35	55.51	0.425	0.60( 0.58)	0.97	7358.6	30100.00
3	987.43	73.03	0.378	0.60( 0.57)	0.96	10950.3	21400.00
4	873.09	100.91	0.325	0.60( 0.57)	0.95	16583.9	13200.00
5	876.69	111.21	0.310	0.60( 0.57)	0.95	18449.0	40100.00
6	923.63	123.45	0.294	0.60( 0.57)	0.95	20612.6	11831.00
7	1023.88	146.36	0.275	0.60( 0.57)	0.96	24856.2	11530.00
8	1095.06	165.61	0.260	0.60( 0.58)	0.96	29013.0	11000.00
9	1191.12	187.64	0.245	0.60( 0.58)	0.97	35804.0	10850.00
10	1110.77	203.48	0.239	0.60( 0.58)	0.97	39151.7	11220.00
11	1049.70	215.02	0.235	0.60( 0.58)	0.97	40906.9	10910.00
12	883.01	255.97	0.220	0.60( 0.58)	0.97	47490.8	12410.00
13	833.89	289.01	0.207	0.60( 0.58)	0.97	53569.1	12261.00
14	817.14	301.94	0.203	0.60( 0.58)	0.98	55053.9	10410.00
15	800.86	314.14	0.198	0.60( 0.59)	0.98	56159.7	12101.10
16	764.14	341.62	0.188	0.60( 0.59)	0.98	58537.4	10200.00
17	745.54	355.05	0.183	0.60( 0.59)	0.98	59477.1	12010.00
18	702.85	384.56	0.179	0.60( 0.59)	0.98	60154.5	10210.00

19 642.79 433.99 0.174 0.60( 0.59) 0.98 60656.2 12000.00  
20 602.79 501.20 0.168 0.60( 0.59) 0.98 61224.6 10100.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.45	28.69	0.606	0.60( 0.59)	0.99	153.2	50500.00
LONGEST FLOWPATH FROM NODE 50500.00 TO NODE 13402.00 = 6247.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1011.53	28.69	0.606	0.60( 0.58)	0.97	2849.8	50500.00
2	1008.18	29.47	0.595	0.60( 0.58)	0.97	2922.8	30910.00
3	1148.28	55.51	0.425	0.60( 0.58)	0.97	7511.8	30100.00
4	990.04	73.03	0.378	0.60( 0.58)	0.96	11103.5	21400.00
5	875.33	100.91	0.325	0.60( 0.57)	0.95	16737.1	13200.00
6	878.83	111.21	0.310	0.60( 0.57)	0.95	18602.2	40100.00
7	925.66	123.45	0.294	0.60( 0.57)	0.95	20765.7	11831.00
8	1025.78	146.36	0.275	0.60( 0.57)	0.96	25009.4	11530.00
9	1096.85	165.61	0.260	0.60( 0.58)	0.96	29166.1	11000.00
10	1192.81	187.64	0.245	0.60( 0.58)	0.97	35957.2	10850.00
11	1112.42	203.48	0.239	0.60( 0.58)	0.97	39304.9	11220.00
12	1051.33	215.02	0.235	0.60( 0.58)	0.97	41060.1	10910.00
13	884.52	255.97	0.220	0.60( 0.58)	0.97	47644.0	12410.00
14	835.32	289.01	0.207	0.60( 0.58)	0.97	53722.3	12261.00
15	818.54	301.94	0.203	0.60( 0.58)	0.98	55207.1	10410.00
16	802.23	314.14	0.198	0.60( 0.59)	0.98	56312.8	12101.10
17	765.44	341.62	0.188	0.60( 0.59)	0.98	58690.6	10200.00
18	746.80	355.05	0.183	0.60( 0.59)	0.98	59630.3	12010.00
19	704.08	384.56	0.179	0.60( 0.59)	0.98	60307.7	10210.00
20	643.99	433.99	0.174	0.60( 0.59)	0.98	60809.4	12000.00
21	603.95	501.20	0.168	0.60( 0.59)	0.98	61377.8	10100.00
TOTAL AREA (ACRES) = 61377.8							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1192.81 Tc(MIN.) = 187.635  
EFFECTIVE AREA(ACRES) = 35957.22 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 61377.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13402.00 TO NODE 13404.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 209.00 DOWNSTREAM(FEET) = 207.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 395.35 CHANNEL SLOPE = 0.0051  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1192.81  
FLOW VELOCITY(FEET/SEC.) = 7.91 FLOW DEPTH(FEET) = 7.09  
TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 188.47  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

```
*****
FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 3 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0610506T.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)  (INCH/HR)    (INCH/HR)  (ACRES)  NODE
1           7.14    22.42   0.60( 0.60)  1.00      49.6     50600.00
TOTAL AREA(ACRES) =          49.6
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*****
FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1011.53	29.56	0.594	0.60( 0.58)	0.97	2849.8	50500.00
2	1008.18	30.34	0.584	0.60( 0.58)	0.97	2922.8	30910.00
3	1148.28	56.35	0.421	0.60( 0.58)	0.97	7511.8	30100.00
4	990.04	73.90	0.376	0.60( 0.58)	0.96	11103.5	21400.00
5	875.33	101.81	0.324	0.60( 0.57)	0.95	16737.1	13200.00
6	878.83	112.11	0.309	0.60( 0.57)	0.95	18602.2	40100.00
7	925.66	124.34	0.293	0.60( 0.57)	0.95	20765.7	11831.00
8	1025.78	147.23	0.275	0.60( 0.57)	0.96	25009.4	11530.00
9	1096.85	166.46	0.259	0.60( 0.58)	0.96	29166.1	11000.00
10	1192.81	188.47	0.245	0.60( 0.58)	0.97	35957.2	10850.00
11	1112.42	204.33	0.239	0.60( 0.58)	0.97	39304.9	11220.00
12	1051.33	215.88	0.235	0.60( 0.58)	0.97	41060.1	10910.00
13	884.52	256.87	0.219	0.60( 0.58)	0.97	47644.0	12410.00
14	835.32	289.92	0.207	0.60( 0.58)	0.97	53722.3	12261.00
15	818.54	302.85	0.202	0.60( 0.58)	0.98	55207.1	10410.00
16	802.23	315.06	0.198	0.60( 0.59)	0.98	56312.8	12101.10
17	765.44	342.55	0.187	0.60( 0.59)	0.98	58690.6	10200.00
18	746.80	355.99	0.182	0.60( 0.59)	0.98	59630.3	12010.00
19	704.08	385.51	0.179	0.60( 0.59)	0.98	60307.7	10210.00
20	643.99	434.96	0.174	0.60( 0.59)	0.98	60809.4	12000.00
21	603.95	502.19	0.168	0.60( 0.59)	0.98	61377.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.14	22.42	0.715	0.60( 0.60)	1.00	49.6	50600.00

LONGEST FLOWPATH FROM NODE 50600.00 TO NODE 13404.00 = 4378.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1018.66	22.42	0.715	0.60( 0.58)	0.97	2211.7	50600.00
2	1011.53	29.56	0.594	0.60( 0.58)	0.97	2899.4	50500.00
3	1008.18	30.34	0.584	0.60( 0.58)	0.97	2972.4	30910.00
4	1148.28	56.35	0.421	0.60( 0.58)	0.97	7561.4	30100.00
5	990.04	73.90	0.376	0.60( 0.58)	0.96	11153.1	21400.00

6	875.33	101.81	0.324	0.60( 0.57)	0.95	16786.7	13200.00
7	878.83	112.11	0.309	0.60( 0.57)	0.95	18651.8	40100.00
8	925.66	124.34	0.293	0.60( 0.57)	0.95	20815.3	11831.00
9	1025.78	147.23	0.275	0.60( 0.57)	0.96	25059.0	11530.00
10	1096.85	166.46	0.259	0.60( 0.58)	0.96	29215.7	11000.00
11	1192.81	188.47	0.245	0.60( 0.58)	0.97	36006.8	10850.00
12	1112.42	204.33	0.239	0.60( 0.58)	0.97	39354.4	11220.00
13	1051.33	215.88	0.235	0.60( 0.58)	0.97	41109.7	10910.00
14	884.52	256.87	0.219	0.60( 0.58)	0.97	47693.6	12410.00
15	835.32	289.92	0.207	0.60( 0.58)	0.97	53771.9	12261.00
16	818.54	302.85	0.202	0.60( 0.58)	0.98	55256.7	10410.00
17	802.23	315.06	0.198	0.60( 0.59)	0.98	56362.4	12101.10
18	765.44	342.55	0.187	0.60( 0.59)	0.98	58740.2	10200.00
19	746.80	355.99	0.182	0.60( 0.59)	0.98	59679.9	12010.00
20	704.08	385.51	0.179	0.60( 0.59)	0.98	60357.3	10210.00
21	643.99	434.96	0.174	0.60( 0.59)	0.98	60859.0	12000.00
22	603.95	502.19	0.168	0.60( 0.59)	0.98	61427.4	10100.00

TOTAL AREA(ACRES) = 61427.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1192.81 Tc(MIN.) = 188.468  
EFFECTIVE AREA(ACRES) = 36006.81 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 61427.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

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*****
FLOW PROCESS FROM NODE 13404.00 TO NODE 13406.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
```

ELEVATION DATA: UPSTREAM(FEET) = 207.00 DOWNSTREAM(FEET) = 195.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.97 CHANNEL SLOPE = 0.0075  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1192.81  
FLOW VELOCITY(FEET/SEC.) = 9.16 FLOW DEPTH(FEET) = 6.59  
TRAVEL TIME(MIN.) = 2.91 Tc(MIN.) = 191.38  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

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*****
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 12
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>>>>CLEAR MEMORY BANK # 1 <<<<
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*****
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 15.1
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>>>>DEFINE MEMORY BANK # 1 <<<<
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PEAK FLOWRATE TABLE FILE NAME: 0610211T.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23.25	16.01	0.60( 0.60)	1.00	87.0	21100.00

TOTAL AREA(ACRES) = 87.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1018.66	25.45	0.654	0.60 ( 0.58)	0.97	2211.7	50600.00
2	1011.53	32.59	0.566	0.60 ( 0.58)	0.97	2899.4	50500.00
3	1008.18	33.37	0.559	0.60 ( 0.58)	0.97	2972.4	30910.00
4	1148.28	59.29	0.409	0.60 ( 0.58)	0.97	7561.4	30100.00
5	990.04	76.96	0.369	0.60 ( 0.58)	0.96	11153.1	21400.00
6	875.33	104.96	0.319	0.60 ( 0.57)	0.95	16786.7	13200.00
7	878.83	115.26	0.304	0.60 ( 0.57)	0.95	18651.8	40100.00
8	925.66	127.45	0.291	0.60 ( 0.57)	0.95	20815.3	11831.00
9	1025.78	150.25	0.272	0.60 ( 0.57)	0.96	25059.0	11530.00
10	1096.85	169.43	0.257	0.60 ( 0.58)	0.96	29215.7	11000.00
11	1192.81	191.38	0.244	0.60 ( 0.58)	0.97	36006.8	10850.00
12	1112.42	207.30	0.238	0.60 ( 0.58)	0.97	39354.4	11220.00
13	1051.33	218.89	0.234	0.60 ( 0.58)	0.97	41109.7	10910.00
14	884.52	260.01	0.218	0.60 ( 0.58)	0.97	47693.6	12410.00
15	835.32	293.11	0.206	0.60 ( 0.58)	0.97	53771.9	12261.00
16	818.54	306.05	0.201	0.60 ( 0.58)	0.98	55256.7	10410.00
17	802.23	318.28	0.197	0.60 ( 0.59)	0.98	56362.4	12101.10
18	765.44	345.81	0.186	0.60 ( 0.59)	0.98	58740.2	10200.00
19	746.80	359.27	0.181	0.60 ( 0.59)	0.98	59679.9	12010.00
20	704.08	388.84	0.178	0.60 ( 0.59)	0.98	60357.3	10210.00
21	643.99	438.36	0.174	0.60 ( 0.59)	0.98	60859.0	12000.00
22	603.95	505.64	0.167	0.60 ( 0.59)	0.98	61427.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23.25	16.01	0.897	0.60 ( 0.60)	1.00	87.0	21100.00

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 13406.00 = 2859.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1041.91	16.01	0.897	0.60 ( 0.58)	0.97	1477.9	21100.00
2	1022.92	25.45	0.654	0.60 ( 0.58)	0.97	2298.7	50600.00
3	1011.53	32.59	0.566	0.60 ( 0.58)	0.97	2986.4	50500.00
4	1008.18	33.37	0.559	0.60 ( 0.58)	0.97	3059.4	30910.00
5	1148.28	59.29	0.409	0.60 ( 0.58)	0.97	7648.4	30100.00
6	990.04	76.96	0.369	0.60 ( 0.58)	0.96	11240.1	21400.00
7	875.33	104.96	0.319	0.60 ( 0.57)	0.95	16873.7	13200.00
8	878.83	115.26	0.304	0.60 ( 0.57)	0.95	18738.8	40100.00
9	925.66	127.45	0.291	0.60 ( 0.57)	0.95	20902.3	11831.00
10	1025.78	150.25	0.272	0.60 ( 0.57)	0.96	25146.0	11530.00
11	1096.85	169.43	0.257	0.60 ( 0.58)	0.96	29302.7	11000.00
12	1192.81	191.38	0.244	0.60 ( 0.58)	0.97	36093.8	10850.00
13	1112.42	207.30	0.238	0.60 ( 0.58)	0.97	39441.4	11220.00
14	1051.33	218.89	0.234	0.60 ( 0.58)	0.97	41196.7	10910.00
15	884.52	260.01	0.218	0.60 ( 0.58)	0.97	47780.6	12410.00

16	835.32	293.11	0.206	0.60 ( 0.58)	0.97	53858.9	12261.00
17	818.54	306.05	0.201	0.60 ( 0.58)	0.98	55343.7	10410.00
18	802.23	318.28	0.197	0.60 ( 0.59)	0.98	56449.4	12101.10
19	765.44	345.81	0.186	0.60 ( 0.59)	0.98	58827.2	10200.00
20	746.80	359.27	0.181	0.60 ( 0.59)	0.98	59766.9	12010.00
21	704.08	388.84	0.178	0.60 ( 0.59)	0.98	60444.3	10210.00
22	643.99	438.36	0.174	0.60 ( 0.59)	0.98	60946.0	12000.00
23	603.95	505.64	0.167	0.60 ( 0.59)	0.98	61514.4	10100.00

TOTAL AREA (ACRES) = 61514.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1192.81 Tc (MIN.) = 191.382

EFFECTIVE AREA (ACRES) = 36093.82 AREA-AVERAGED Fm (INCH/HR) = 0.58

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96

TOTAL AREA (ACRES) = 61514.4

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

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FLOW PROCESS FROM NODE 13406.00 TO NODE 13408.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 195.00 DOWNSTREAM (FEET) = 182.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 2458.36 CHANNEL SLOPE = 0.0053

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.242

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	12.41	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1192.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.04

AVERAGE FLOW DEPTH (FEET) = 7.03 TRAVEL TIME (MIN.) = 5.09

Tc (MIN.) = 196.48

SUBAREA AREA (ACRES) = 12.41 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 36106.23 AREA-AVERAGED Fm (INCH/HR) = 0.58

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 61526.8 PEAK FLOW RATE (CFS) = 1192.81

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 7.03 FLOW VELOCITY (FEET/SEC.) = 8.04

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

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FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

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*****
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 15.1
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>>>>DEFINE MEMORY BANK # 2 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0610507T.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)    (INCH/HR)    (INCH/HR)    (ACRES)    NODE
1          10.23    29.92    0.60( 0.60) 0.99      236.8     50700.00
TOTAL AREA(ACRES) =      236.8

*****
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
=====

** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity    Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)    (INCH/HR)    (INCH/HR)    (ACRES)    NODE
1          1041.91    21.28    0.738    0.60( 0.58) 0.98      1490.3     21100.00
2          1022.92    30.75    0.581    0.60( 0.58) 0.97      2311.1     50600.00
3          1011.53    37.90    0.522    0.60( 0.58) 0.97      2998.8     50500.00
4          1008.18    38.69    0.516    0.60( 0.58) 0.97      3071.8     30910.00
5          1148.28    64.44    0.396    0.60( 0.58) 0.97      7660.8     30100.00
6          990.04     82.30    0.358    0.60( 0.58) 0.96      11252.5    21400.00
7          875.33    110.46    0.311    0.60( 0.57) 0.95      16886.1    13200.00
8          878.83    120.75    0.296    0.60( 0.57) 0.95      18751.2    40100.00
9          925.66    132.88    0.286    0.60( 0.57) 0.95      20914.7    11831.00
10         1025.78    155.54    0.268    0.60( 0.57) 0.96      25158.4    11530.00
11         1096.85    174.64    0.252    0.60( 0.58) 0.96      29315.1    11000.00
12         1192.81    196.48    0.242    0.60( 0.58) 0.97      36106.2    10850.00
13         1112.42    212.48    0.236    0.60( 0.58) 0.97      39453.9    11220.00
14         1051.33    224.15    0.232    0.60( 0.58) 0.97      41209.1    10910.00
15         884.52    265.50    0.216    0.60( 0.58) 0.97      47793.0    12410.00
16         835.32    298.68    0.204    0.60( 0.58) 0.97      53871.3    12261.00
17         818.54    311.65    0.199    0.60( 0.58) 0.98      55356.1    10410.00
18         802.23    323.91    0.194    0.60( 0.59) 0.98      56461.9    12101.10
19         765.44    351.50    0.184    0.60( 0.59) 0.98      58839.6    10200.00
20         746.80    365.00    0.181    0.60( 0.59) 0.98      59779.3    12010.00
21         704.08    394.65    0.178    0.60( 0.59) 0.98      60456.7    10210.00
22         643.99    444.31    0.173    0.60( 0.59) 0.98      60958.4    12000.00
23         603.95    511.69    0.167    0.60( 0.59) 0.98      61526.8    10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM      Q      Tc      Intensity    Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)    (INCH/HR)    (INCH/HR)    (ACRES)    NODE
1          10.23    29.92    0.588    0.60( 0.60) 0.99      236.8     50700.00
LONGEST FLOWPATH FROM NODE 50700.00 TO NODE 13408.00 = 7903.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity    Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)    (INCH/HR)    (INCH/HR)    (ACRES)    NODE
1          1051.05    21.28    0.738    0.60( 0.59) 0.98      1658.7     21100.00
2          1034.82    29.92    0.588    0.60( 0.59) 0.98      2475.8     50700.00
3          1033.03    30.75    0.581    0.60( 0.59) 0.98      2547.9     50600.00

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4          1020.61    37.90    0.522    0.60( 0.58) 0.98      3235.6     50500.00
5          1017.15    38.69    0.516    0.60( 0.58) 0.98      3308.6     30910.00
6          1155.18    64.44    0.396    0.60( 0.58) 0.97      7897.6     30100.00
7          996.26     82.30    0.358    0.60( 0.58) 0.96      11489.3    21400.00
8          880.74    110.46    0.311    0.60( 0.57) 0.95      17122.9    13200.00
9          883.98    120.75    0.296    0.60( 0.57) 0.95      18988.0    40100.00
10         930.65    132.88    0.286    0.60( 0.57) 0.95      21151.5    11831.00
11         1030.44    155.54    0.268    0.60( 0.57) 0.96      25395.2    11530.00
12         1101.24    174.64    0.252    0.60( 0.58) 0.96      29551.9    11000.00
13         1197.02    196.48    0.242    0.60( 0.58) 0.97      36343.0    10850.00
14         1116.53    212.48    0.236    0.60( 0.58) 0.97      39690.6    11220.00
15         1055.35    224.15    0.232    0.60( 0.58) 0.97      41445.9    10910.00
16         888.28    265.50    0.216    0.60( 0.58) 0.97      48029.8    12410.00
17         838.86    298.68    0.204    0.60( 0.58) 0.97      54108.1    12261.00
18         822.00    311.65    0.199    0.60( 0.58) 0.98      55592.9    10410.00
19         805.61    323.91    0.194    0.60( 0.59) 0.98      56698.6    12101.10
20         768.64    351.50    0.184    0.60( 0.59) 0.98      59076.4    10200.00
21         749.94    365.00    0.181    0.60( 0.59) 0.98      60016.1    12010.00
22         707.17    394.65    0.178    0.60( 0.59) 0.98      60693.5    10210.00
23         647.00    444.31    0.173    0.60( 0.59) 0.98      61195.2    12000.00
24         606.85    511.69    0.167    0.60( 0.59) 0.98      61763.6    10100.00
TOTAL AREA(ACRES) =      61763.6

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

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PEAK FLOW RATE(CFS) = 1197.02 Tc(MIN.) = 196.477
EFFECTIVE AREA(ACRES) = 36343.01 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 61763.6
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

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FLOW PROCESS FROM NODE 13408.00 TO NODE 13410.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 182.00 DOWNSTREAM(FEET) = 178.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 952.73 CHANNEL SLOPE = 0.0034
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.241
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL      AREA      Fp      Ap      SCS
LAND USE      GROUP      (ACRES)    (INCH/HR)    (DECIMAL)    CN
USER-DEFINED      -      3.31      0.60      1.000      -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1197.02
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.85
AVERAGE FLOW DEPTH(FEET) = 7.63 TRAVEL TIME(MIN.) = 2.32
Tc(MIN.) = 198.79
SUBAREA AREA(ACRES) = 3.31 SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 36346.32 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

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TOTAL AREA (ACRES) = 61766.9 PEAK FLOW RATE (CFS) = 1197.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 7.63 FLOW VELOCITY (FEET/SEC.) = 6.85  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12

-----  
>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 3 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: S36.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.599	0.60 (0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.548	0.60 (0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.543	0.60 (0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.500	0.60 (0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.470	0.60 (0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.405	0.60 (0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.386	0.60 (0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.375	0.60 (0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.372	0.60 (0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.356	0.60 (0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.355	0.60 (0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.346	0.60 (0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.334	0.60 (0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.233	0.60 (0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.229	0.60 (0.58)	0.97	4067.7	13500.00

TOTAL AREA (ACRES) = 4067.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1051.05	23.67	0.689	0.60 (0.59)	0.98	1662.0	21100.00
2	1034.82	32.33	0.568	0.60 (0.59)	0.98	2479.1	50700.00
3	1033.03	33.16	0.561	0.60 (0.59)	0.98	2551.2	50600.00
4	1020.61	40.32	0.503	0.60 (0.58)	0.98	3238.9	50500.00
5	1017.15	41.10	0.499	0.60 (0.58)	0.98	3311.9	30910.00
6	1155.18	66.77	0.391	0.60 (0.58)	0.97	7900.9	30100.00
7	996.26	84.72	0.352	0.60 (0.58)	0.96	11492.6	21400.00
8	880.74	112.97	0.307	0.60 (0.57)	0.95	17126.2	13200.00
9	883.98	123.25	0.294	0.60 (0.57)	0.95	18991.3	40100.00
10	930.65	135.35	0.284	0.60 (0.57)	0.95	21154.8	11831.00

11	1030.44	157.95	0.266	0.60 (0.57)	0.96	25398.5	11530.00
12	1101.24	177.01	0.250	0.60 (0.58)	0.96	29555.2	11000.00
13	1197.02	198.79	0.241	0.60 (0.58)	0.97	36346.3	10850.00
14	1116.53	214.84	0.235	0.60 (0.58)	0.97	39694.0	11220.00
15	1055.35	226.55	0.231	0.60 (0.58)	0.97	41449.2	10910.00
16	888.28	267.99	0.215	0.60 (0.58)	0.97	48033.1	12410.00
17	838.86	301.21	0.203	0.60 (0.58)	0.97	54111.4	12261.00
18	822.00	314.20	0.198	0.60 (0.58)	0.98	55596.2	10410.00
19	805.61	326.47	0.193	0.60 (0.59)	0.98	56701.9	12101.10
20	768.64	354.09	0.183	0.60 (0.59)	0.98	59079.7	10200.00
21	749.94	367.60	0.180	0.60 (0.59)	0.98	60019.4	12010.00
22	707.17	397.30	0.177	0.60 (0.59)	0.98	60696.8	10210.00
23	647.00	447.01	0.173	0.60 (0.59)	0.98	61198.5	12000.00
24	606.85	514.43	0.166	0.60 (0.59)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.599	0.60 (0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.548	0.60 (0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.543	0.60 (0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.500	0.60 (0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.470	0.60 (0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.405	0.60 (0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.386	0.60 (0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.375	0.60 (0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.372	0.60 (0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.356	0.60 (0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.355	0.60 (0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.346	0.60 (0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.334	0.60 (0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.233	0.60 (0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.229	0.60 (0.58)	0.97	4067.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1193.49	23.67	0.689	0.60 (0.59)	0.98	2406.8	21100.00
2	1193.49	29.17	0.599	0.60 (0.59)	0.98	3098.3	21000.00
3	1183.47	32.33	0.568	0.60 (0.59)	0.98	3512.1	50700.00
4	1180.60	33.16	0.561	0.60 (0.59)	0.98	3614.6	50600.00
5	1175.59	34.81	0.548	0.60 (0.59)	0.98	3833.9	20810.00
6	1174.22	35.39	0.543	0.60 (0.59)	0.98	3915.4	20900.00
7	1158.06	40.32	0.503	0.60 (0.59)	0.98	4587.3	50500.00
8	1154.91	40.84	0.500	0.60 (0.59)	0.98	4658.0	20800.00
9	1153.16	41.10	0.499	0.60 (0.59)	0.98	4690.6	30910.00
10	1168.28	46.22	0.470	0.60 (0.59)	0.98	5782.7	20700.00
11	1242.14	60.29	0.405	0.60 (0.58)	0.98	8845.4	20600.00
12	1283.94	66.77	0.391	0.60 (0.58)	0.97	10246.7	30100.00
13	1263.85	69.35	0.386	0.60 (0.58)	0.97	10859.3	20500.00
14	1219.15	74.11	0.375	0.60 (0.58)	0.97	11920.3	20400.00
15	1199.45	75.61	0.372	0.60 (0.58)	0.97	12233.9	20300.00
16	1111.84	82.99	0.356	0.60 (0.58)	0.97	13773.0	20200.00
17	1102.93	83.76	0.355	0.60 (0.58)	0.97	13935.2	20210.00
18	1092.88	84.72	0.352	0.60 (0.58)	0.97	14138.1	21400.00
19	1076.47	87.59	0.346	0.60 (0.58)	0.97	14743.6	20100.00

20	1037.69	95.10	0.334	0.60	(0.58)	0.96	16331.9	13600.00
21	957.33	112.97	0.307	0.60	(0.57)	0.96	20073.3	13200.00
22	956.36	123.25	0.294	0.60	(0.57)	0.96	22041.4	40100.00
23	998.07	135.35	0.284	0.60	(0.57)	0.96	24326.0	11831.00
24	1088.62	157.95	0.266	0.60	(0.58)	0.96	28795.9	11530.00
25	1151.62	177.01	0.250	0.60	(0.58)	0.96	33143.4	11000.00
26	1238.48	198.79	0.241	0.60	(0.58)	0.97	40152.5	10850.00
27	1151.42	214.84	0.235	0.60	(0.58)	0.97	43660.8	11220.00
28	1116.17	221.10	0.233	0.60	(0.58)	0.97	44661.4	13510.00
29	1087.85	226.55	0.231	0.60	(0.58)	0.97	45501.1	10910.00
30	1072.55	230.37	0.229	0.60	(0.58)	0.97	46124.1	13500.00
31	918.90	267.99	0.215	0.60	(0.58)	0.97	52100.9	12410.00
32	867.71	301.21	0.203	0.60	(0.58)	0.97	58179.2	12261.00
33	850.16	314.20	0.198	0.60	(0.58)	0.98	59663.9	10410.00
34	833.13	326.47	0.193	0.60	(0.59)	0.98	60769.7	12101.10
35	794.70	354.09	0.183	0.60	(0.59)	0.98	63147.5	10200.00
36	775.58	367.60	0.180	0.60	(0.59)	0.98	64087.1	12010.00
37	732.41	397.30	0.177	0.60	(0.59)	0.98	64764.5	10210.00
38	671.57	447.01	0.173	0.60	(0.59)	0.98	65266.3	12000.00
39	630.52	514.43	0.166	0.60	(0.59)	0.98	65834.6	10100.00

TOTAL AREA (ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1283.94 Tc (MIN.) = 66.773  
EFFECTIVE AREA (ACRES) = 10246.66 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 65834.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 178.72 DOWNSTREAM (FEET) = 176.93  
CHANNEL LENGTH THRU SUBAREA (FEET) = 169.78 CHANNEL SLOPE = 0.0105  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 1283.94  
FLOW VELOCITY (FEET/SEC.) = 10.61 FLOW DEPTH (FEET) = 6.35  
TRAVEL TIME (MIN.) = 0.27 Tc (MIN.) = 67.04  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509101T.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp (Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(ACRES)	NODE	
1	9.27	73.72	0.60 (0.60)	1.00	585.7	10100.00
TOTAL AREA (ACRES) = 585.7						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1193.49	23.94	0.683	0.60 (0.59)	0.98	2406.8	21100.00
2	1193.49	29.44	0.595	0.60 (0.59)	0.98	3098.3	21000.00
3	1183.47	32.60	0.566	0.60 (0.59)	0.98	3512.1	50700.00
4	1180.60	33.43	0.559	0.60 (0.59)	0.98	3614.6	50600.00
5	1175.59	35.08	0.545	0.60 (0.59)	0.98	3833.9	20810.00
6	1174.22	35.66	0.541	0.60 (0.59)	0.98	3915.4	20900.00
7	1158.06	40.59	0.502	0.60 (0.59)	0.98	4587.3	50500.00
8	1154.91	41.12	0.499	0.60 (0.59)	0.98	4658.0	20800.00
9	1153.16	41.37	0.497	0.60 (0.59)	0.98	4690.6	30910.00
10	1168.28	46.49	0.468	0.60 (0.59)	0.98	5782.7	20700.00
11	1242.14	60.56	0.405	0.60 (0.58)	0.98	8845.4	20600.00
12	1283.94	67.04	0.391	0.60 (0.58)	0.97	10246.7	30100.00
13	1263.85	69.62	0.385	0.60 (0.58)	0.97	10859.3	20500.00
14	1219.15	74.38	0.375	0.60 (0.58)	0.97	11920.3	20400.00
15	1199.45	75.89	0.372	0.60 (0.58)	0.97	12233.9	20300.00
16	1111.84	83.26	0.356	0.60 (0.58)	0.97	13773.0	20200.00
17	1102.93	84.04	0.354	0.60 (0.58)	0.97	13935.2	20210.00
18	1092.88	85.00	0.352	0.60 (0.58)	0.97	14138.1	21400.00
19	1076.47	87.87	0.346	0.60 (0.58)	0.97	14743.6	20100.00
20	1037.69	95.39	0.333	0.60 (0.58)	0.96	16331.9	13600.00
21	957.33	113.25	0.307	0.60 (0.57)	0.96	20073.3	13200.00
22	956.36	123.54	0.294	0.60 (0.57)	0.96	22041.4	40100.00
23	998.07	135.63	0.284	0.60 (0.57)	0.96	24326.0	11831.00
24	1088.62	158.22	0.266	0.60 (0.58)	0.96	28795.9	11530.00
25	1151.62	177.28	0.250	0.60 (0.58)	0.96	33143.4	11000.00
26	1238.48	199.06	0.241	0.60 (0.58)	0.97	40152.5	10850.00
27	1151.42	215.11	0.235	0.60 (0.58)	0.97	43660.8	11220.00
28	1116.17	221.37	0.233	0.60 (0.58)	0.97	44661.4	13510.00
29	1087.85	226.83	0.231	0.60 (0.58)	0.97	45501.1	10910.00
30	1072.55	230.65	0.229	0.60 (0.58)	0.97	46124.1	13500.00
31	918.90	268.28	0.215	0.60 (0.58)	0.97	52100.9	12410.00
32	867.71	301.51	0.203	0.60 (0.58)	0.97	58179.2	12261.00
33	850.16	314.49	0.198	0.60 (0.58)	0.98	59663.9	10410.00
34	833.13	326.77	0.193	0.60 (0.59)	0.98	60769.7	12101.10
35	794.70	354.39	0.183	0.60 (0.59)	0.98	63147.5	10200.00
36	775.58	367.90	0.180	0.60 (0.59)	0.98	64087.1	12010.00
37	732.41	397.60	0.177	0.60 (0.59)	0.98	64764.5	10210.00
38	671.57	447.32	0.173	0.60 (0.59)	0.98	65266.3	12000.00
39	630.52	514.75	0.166	0.60 (0.59)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.27	73.72	0.376	0.60 (0.60)	1.00	585.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.

\*\*\* PEAK FLOW RATE TABLE \*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1198.95	23.94	0.683	0.60 ( 0.59)	0.98	2597.0	21100.00
2	1199.35	29.44	0.595	0.60 ( 0.59)	0.98	3332.1	21000.00
3	1189.64	32.60	0.566	0.60 ( 0.59)	0.98	3771.1	50700.00
4	1186.85	33.43	0.559	0.60 ( 0.59)	0.98	3880.3	50600.00
5	1181.99	35.08	0.545	0.60 ( 0.59)	0.98	4112.6	20810.00
6	1180.67	35.66	0.541	0.60 ( 0.59)	0.98	4198.7	20900.00
7	1164.86	40.59	0.502	0.60 ( 0.59)	0.98	4909.8	50500.00
8	1161.76	41.12	0.499	0.60 ( 0.59)	0.98	4984.7	20800.00
9	1160.04	41.37	0.497	0.60 ( 0.59)	0.98	5019.3	30910.00
10	1175.55	46.49	0.468	0.60 ( 0.59)	0.98	6152.0	20700.00
11	1250.34	60.56	0.405	0.60 ( 0.59)	0.98	9326.5	20600.00
12	1292.70	67.04	0.391	0.60 ( 0.58)	0.98	10779.3	30100.00
13	1272.82	69.62	0.385	0.60 ( 0.58)	0.97	11412.4	20500.00
14	1234.64	73.72	0.376	0.60 ( 0.58)	0.97	12358.7	10100.00
15	1228.39	74.38	0.375	0.60 ( 0.58)	0.97	12506.0	20400.00
16	1208.61	75.89	0.372	0.60 ( 0.58)	0.97	12819.6	20300.00
17	1120.61	83.26	0.356	0.60 ( 0.58)	0.97	14358.7	20200.00
18	1111.65	84.04	0.354	0.60 ( 0.58)	0.97	14520.9	20210.00
19	1101.55	85.00	0.352	0.60 ( 0.58)	0.97	14723.8	21400.00
20	1084.99	87.87	0.346	0.60 ( 0.58)	0.97	15329.3	20100.00
21	1045.90	95.39	0.333	0.60 ( 0.58)	0.96	16917.6	13600.00
22	964.89	113.25	0.307	0.60 ( 0.58)	0.96	20659.1	13200.00
23	963.61	123.54	0.294	0.60 ( 0.58)	0.96	22627.1	40100.00
24	1005.08	135.63	0.284	0.60 ( 0.58)	0.96	24911.7	11831.00
25	1095.17	158.22	0.266	0.60 ( 0.58)	0.96	29381.6	11530.00
26	1157.79	177.28	0.250	0.60 ( 0.58)	0.96	33729.1	11000.00
27	1244.42	199.06	0.241	0.60 ( 0.58)	0.97	40738.3	10850.00
28	1157.22	215.11	0.235	0.60 ( 0.58)	0.97	44246.5	11220.00
29	1121.91	221.37	0.233	0.60 ( 0.58)	0.97	45247.1	13510.00
30	1093.53	226.83	0.231	0.60 ( 0.58)	0.97	46086.9	10910.00
31	1078.20	230.65	0.229	0.60 ( 0.58)	0.97	46709.8	13500.00
32	924.20	268.28	0.215	0.60 ( 0.58)	0.97	52686.6	12410.00
33	872.71	301.51	0.203	0.60 ( 0.58)	0.97	58764.9	12261.00
34	855.04	314.49	0.198	0.60 ( 0.58)	0.98	60249.6	10410.00
35	837.89	326.77	0.193	0.60 ( 0.59)	0.98	61355.4	12101.10
36	799.21	354.39	0.183	0.60 ( 0.59)	0.98	63733.2	10200.00
37	780.02	367.90	0.180	0.60 ( 0.59)	0.98	64672.9	12010.00
38	736.78	397.60	0.177	0.60 ( 0.59)	0.98	65350.3	10210.00
39	675.83	447.32	0.173	0.60 ( 0.59)	0.98	65852.0	12000.00
40	634.62	514.75	0.166	0.60 ( 0.59)	0.98	66420.4	10100.00

TOTAL AREA (ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1292.70 Tc (MIN.) = 67.040  
EFFECTIVE AREA (ACRES) = 10779.31 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 66420.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 51  
-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 176.93 DOWNSTREAM (FEET) = 173.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 260.10 CHANNEL SLOPE = 0.0151  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 1292.70  
FLOW VELOCITY (FEET/SEC.) = 12.16 FLOW DEPTH (FEET) = 5.95  
TRAVEL TIME (MIN.) = 0.36 Tc (MIN.) = 67.40  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610508T.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.79	30.21	0.60 ( 0.59)	0.99	131.3	50800.00

TOTAL AREA (ACRES) = 131.3

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\*\* MAIN STREAM CONFLUENCE DATA \*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1198.95	24.31	0.675	0.60 ( 0.59)	0.98	2597.0	21100.00
2	1199.35	29.80	0.590	0.60 ( 0.59)	0.98	3332.1	21000.00
3	1189.64	32.96	0.563	0.60 ( 0.59)	0.98	3771.1	50700.00
4	1186.85	33.79	0.556	0.60 ( 0.59)	0.98	3880.3	50600.00
5	1181.99	35.45	0.542	0.60 ( 0.59)	0.98	4112.6	20810.00
6	1180.67	36.03	0.538	0.60 ( 0.59)	0.98	4198.7	20900.00
7	1164.86	40.95	0.500	0.60 ( 0.59)	0.98	4909.8	50500.00
8	1161.76	41.49	0.497	0.60 ( 0.59)	0.98	4984.7	20800.00
9	1160.04	41.74	0.495	0.60 ( 0.59)	0.98	5019.3	30910.00
10	1175.55	46.85	0.466	0.60 ( 0.59)	0.98	6152.0	20700.00
11	1250.34	60.91	0.404	0.60 ( 0.59)	0.98	9326.5	20600.00
12	1292.70	67.40	0.390	0.60 ( 0.58)	0.98	10779.3	30100.00
13	1272.82	69.98	0.384	0.60 ( 0.58)	0.97	11412.4	20500.00
14	1234.64	74.08	0.375	0.60 ( 0.58)	0.97	12358.7	10100.00
15	1228.39	74.74	0.374	0.60 ( 0.58)	0.97	12506.0	20400.00
16	1208.61	76.25	0.371	0.60 ( 0.58)	0.97	12819.6	20300.00
17	1120.61	83.63	0.355	0.60 ( 0.58)	0.97	14358.7	20200.00
18	1111.65	84.41	0.353	0.60 ( 0.58)	0.97	14520.9	20210.00
19	1101.55	85.37	0.351	0.60 ( 0.58)	0.97	14723.8	21400.00
20	1084.99	88.24	0.345	0.60 ( 0.58)	0.97	15329.3	20100.00



21	1045.90	95.76	0.333	0.60 ( 0.58)	0.96	16917.6	13600.00
22	964.89	113.64	0.306	0.60 ( 0.58)	0.96	20659.1	13200.00
23	963.61	123.92	0.294	0.60 ( 0.58)	0.96	22627.1	40100.00
24	1005.08	136.01	0.284	0.60 ( 0.58)	0.96	24911.7	11831.00
25	1095.17	158.60	0.265	0.60 ( 0.58)	0.96	29381.6	11530.00
26	1157.79	177.65	0.250	0.60 ( 0.58)	0.96	33729.1	11000.00
27	1244.42	199.42	0.241	0.60 ( 0.58)	0.97	40738.3	10850.00
28	1157.22	215.48	0.235	0.60 ( 0.58)	0.97	44246.5	11220.00
29	1121.91	221.74	0.232	0.60 ( 0.58)	0.97	45247.1	13510.00
30	1093.53	227.20	0.230	0.60 ( 0.58)	0.97	46086.9	10910.00
31	1078.20	231.02	0.229	0.60 ( 0.58)	0.97	46709.8	13500.00
32	924.20	268.67	0.215	0.60 ( 0.58)	0.97	52686.6	12410.00
33	872.71	301.90	0.203	0.60 ( 0.58)	0.97	58764.9	12261.00
34	855.04	314.89	0.198	0.60 ( 0.58)	0.98	60249.6	10410.00
35	837.89	327.16	0.193	0.60 ( 0.59)	0.98	61355.4	12101.10
36	799.21	354.80	0.183	0.60 ( 0.59)	0.98	63733.2	10200.00
37	780.02	368.31	0.180	0.60 ( 0.59)	0.98	64672.9	12010.00
38	736.78	398.01	0.177	0.60 ( 0.59)	0.98	65350.3	10210.00
39	675.83	447.74	0.173	0.60 ( 0.59)	0.98	65852.0	12000.00
40	634.62	515.18	0.166	0.60 ( 0.59)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.79	30.21	0.585	0.60 ( 0.59)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1204.33	24.31	0.675	0.60 ( 0.59)	0.98	2702.6	21100.00
2	1205.11	29.80	0.590	0.60 ( 0.59)	0.98	3461.7	21000.00
3	1203.90	30.21	0.585	0.60 ( 0.59)	0.98	3519.7	50800.00
4	1195.21	32.96	0.563	0.60 ( 0.59)	0.98	3902.4	50700.00
5	1192.35	33.79	0.556	0.60 ( 0.59)	0.98	4011.5	50600.00
6	1187.35	35.45	0.542	0.60 ( 0.59)	0.98	4243.9	20810.00
7	1185.98	36.03	0.538	0.60 ( 0.59)	0.98	4330.0	20900.00
8	1169.81	40.95	0.500	0.60 ( 0.59)	0.98	5041.1	50500.00
9	1166.67	41.49	0.497	0.60 ( 0.59)	0.98	5115.9	20800.00
10	1164.94	41.74	0.495	0.60 ( 0.59)	0.98	5150.6	30910.00
11	1180.16	46.85	0.466	0.60 ( 0.59)	0.98	6283.3	20700.00
12	1254.34	60.91	0.404	0.60 ( 0.59)	0.98	9457.8	20600.00
13	1296.56	67.40	0.390	0.60 ( 0.58)	0.98	10910.6	30100.00
14	1276.62	69.98	0.384	0.60 ( 0.58)	0.97	11543.7	20500.00
15	1238.35	74.08	0.375	0.60 ( 0.58)	0.97	12489.9	10100.00
16	1232.09	74.74	0.374	0.60 ( 0.58)	0.97	12637.3	20400.00
17	1212.28	76.25	0.371	0.60 ( 0.58)	0.97	12950.9	20300.00
18	1124.12	83.63	0.355	0.60 ( 0.58)	0.97	14490.0	20200.00
19	1115.15	84.41	0.353	0.60 ( 0.58)	0.97	14652.2	20210.00
20	1105.03	85.37	0.351	0.60 ( 0.58)	0.97	14855.1	21400.00
21	1088.40	88.24	0.345	0.60 ( 0.58)	0.97	15460.6	20100.00
22	1049.19	95.76	0.333	0.60 ( 0.58)	0.96	17048.8	13600.00
23	967.92	113.64	0.306	0.60 ( 0.58)	0.96	20790.3	13200.00
24	966.52	123.92	0.294	0.60 ( 0.58)	0.96	22758.4	40100.00
25	1007.89	136.01	0.284	0.60 ( 0.58)	0.96	25043.0	11831.00
26	1097.80	158.60	0.265	0.60 ( 0.58)	0.96	29512.9	11530.00
27	1160.26	177.65	0.250	0.60 ( 0.58)	0.96	33860.4	11000.00

28	1246.80	199.42	0.241	0.60 ( 0.58)	0.97	40869.5	10850.00
29	1159.54	215.48	0.235	0.60 ( 0.58)	0.97	44377.8	11220.00
30	1124.21	221.74	0.232	0.60 ( 0.58)	0.97	45378.4	13510.00
31	1095.81	227.20	0.230	0.60 ( 0.58)	0.97	46218.1	10910.00
32	1080.46	231.02	0.229	0.60 ( 0.58)	0.97	46841.1	13500.00
33	926.33	268.67	0.215	0.60 ( 0.58)	0.97	52817.9	12410.00
34	874.72	301.90	0.203	0.60 ( 0.58)	0.97	58896.1	12261.00
35	857.00	314.89	0.198	0.60 ( 0.58)	0.98	60380.9	10410.00
36	839.80	327.16	0.193	0.60 ( 0.59)	0.98	61486.7	12101.10
37	801.02	354.80	0.183	0.60 ( 0.59)	0.98	63864.5	10200.00
38	781.81	368.31	0.180	0.60 ( 0.59)	0.98	64804.1	12010.00
39	738.54	398.01	0.177	0.60 ( 0.59)	0.98	65481.5	10210.00
40	677.54	447.74	0.173	0.60 ( 0.59)	0.98	65983.2	12000.00
41	636.26	515.18	0.166	0.60 ( 0.59)	0.98	66551.6	10100.00

TOTAL AREA (ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1296.56 Tc (MIN.) = 67.396  
EFFECTIVE AREA (ACRES) = 10910.58 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 66551.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 66551.6 TC (MIN.) = 67.40  
EFFECTIVE AREA (ACRES) = 10910.58 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.976  
PEAK FLOW RATE (CFS) = 1296.56

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1204.33	24.31	0.675	0.60 ( 0.59)	0.98	2702.6	21100.00
2	1205.11	29.80	0.590	0.60 ( 0.59)	0.98	3461.7	21000.00
3	1203.90	30.21	0.585	0.60 ( 0.59)	0.98	3519.7	50800.00
4	1195.21	32.96	0.563	0.60 ( 0.59)	0.98	3902.4	50700.00
5	1192.35	33.79	0.556	0.60 ( 0.59)	0.98	4011.5	50600.00
6	1187.35	35.45	0.542	0.60 ( 0.59)	0.98	4243.9	20810.00
7	1185.98	36.03	0.538	0.60 ( 0.59)	0.98	4330.0	20900.00
8	1169.81	40.95	0.500	0.60 ( 0.59)	0.98	5041.1	50500.00
9	1166.67	41.49	0.497	0.60 ( 0.59)	0.98	5115.9	20800.00
10	1164.94	41.74	0.495	0.60 ( 0.59)	0.98	5150.6	30910.00
11	1180.16	46.85	0.466	0.60 ( 0.59)	0.98	6283.3	20700.00
12	1254.34	60.91	0.404	0.60 ( 0.59)	0.98	9457.8	20600.00
13	1296.56	67.40	0.390	0.60 ( 0.58)	0.98	10910.6	30100.00
14	1276.62	69.98	0.384	0.60 ( 0.58)	0.97	11543.7	20500.00
15	1238.35	74.08	0.375	0.60 ( 0.58)	0.97	12489.9	10100.00
16	1232.09	74.74	0.374	0.60 ( 0.58)	0.97	12637.3	20400.00
17	1212.28	76.25	0.371	0.60 ( 0.58)	0.97	12950.9	20300.00
18	1124.12	83.63	0.355	0.60 ( 0.58)	0.97	14490.0	20200.00
19	1115.15	84.41	0.353	0.60 ( 0.58)	0.97	14652.2	20210.00
20	1105.03	85.37	0.351	0.60 ( 0.58)	0.97	14855.1	21400.00
21	1088.40	88.24	0.345	0.60 ( 0.58)	0.97	15460.6	20100.00
22	1049.19	95.76	0.333	0.60 ( 0.58)	0.96	17048.8	13600.00
23	967.92	113.64	0.306	0.60 ( 0.58)	0.96	20790.3	13200.00
24	966.52	123.92	0.294	0.60 ( 0.58)	0.96	22758.4	40100.00
25	1007.89	136.01	0.284	0.60 ( 0.58)	0.96	25043.0	11831.00
26	1097.80	158.60	0.265	0.60 ( 0.58)	0.96	29512.9	11530.00

27	1160.26	177.65	0.250	0.60	( 0.58)	0.96	33860.4	11000.00
28	1246.80	199.42	0.241	0.60	( 0.58)	0.97	40869.5	10850.00
29	1159.54	215.48	0.235	0.60	( 0.58)	0.97	44377.8	11220.00
30	1124.21	221.74	0.232	0.60	( 0.58)	0.97	45378.4	13510.00
31	1095.81	227.20	0.230	0.60	( 0.58)	0.97	46218.1	10910.00
32	1080.46	231.02	0.229	0.60	( 0.58)	0.97	46841.1	13500.00
33	926.33	268.67	0.215	0.60	( 0.58)	0.97	52817.9	12410.00
34	874.72	301.90	0.203	0.60	( 0.58)	0.97	58896.1	12261.00
35	857.00	314.89	0.198	0.60	( 0.58)	0.98	60380.9	10410.00
36	839.80	327.16	0.193	0.60	( 0.59)	0.98	61486.7	12101.10
37	801.02	354.80	0.183	0.60	( 0.59)	0.98	63864.5	10200.00
38	781.81	368.31	0.180	0.60	( 0.59)	0.98	64804.1	12010.00
39	738.54	398.01	0.177	0.60	( 0.59)	0.98	65481.5	10210.00
40	677.54	447.74	0.173	0.60	( 0.59)	0.98	65983.2	12000.00
41	636.26	515.18	0.166	0.60	( 0.59)	0.98	66551.6	10100.00

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=====  
END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

Michael Baker International
5 Hutton Centre Drive, Suite 500
Santa Ana, CA
92707

FILE NAME: S35.DAT
TIME/DATE OF STUDY: 08:01 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.596
2) 10.00; 1.064
3) 15.00; 0.843
4) 20.00; 0.715
5) 25.00; 0.629
6) 30.00; 0.560
7) 40.00; 0.480
8) 50.00; 0.423
9) 60.00; 0.371
10) 90.00; 0.302
11) 120.00; 0.256
12) 180.00; 0.208
13) 360.00; 0.142
14) 1440.00; 0.060

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, / WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES (LIP, HIKE), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*
FLOW PROCESS FROM NODE 13500.00 TO NODE 13500.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 548.43
ELEVATION DATA: UPSTREAM(FEET) = 1183.47 DOWNSTREAM(FEET) = 1065.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.955
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.978

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 5.11 0.60 1.000 0 11.96
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.74
TOTAL AREA(ACRES) = 5.11 PEAK FLOW RATE(CFS) = 1.74

\*\*\*\*\*
FLOW PROCESS FROM NODE 13500.50 TO NODE 13501.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1033.15
CHANNEL LENGTH THRU SUBAREA(FEET) = 431.71 CHANNEL SLOPE = 0.0738
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.865
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 8.87 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.81
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.83
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 2.54
Tc(MIN.) = 14.49
SUBAREA AREA(ACRES) = 8.87 SUBAREA RUNOFF(CFS) = 2.12
EFFECTIVE AREA(ACRES) = 13.98 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 3.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.61 FLOW VELOCITY(FEET/SEC.) = 2.96
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13501.00 = 980.14 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13501.00 TO NODE 13502.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1033.15 DOWNSTREAM(FEET) = 990.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 948.63 CHANNEL SLOPE = 0.0452  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.706

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.82	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.62  
AVERAGE FLOW DEPTH(FEET) = 0.73 TRAVEL TIME(MIN.) = 6.04  
Tc(MIN.) = 20.53  
SUBAREA AREA(ACRES) = 16.82 SUBAREA RUNOFF(CFS) = 1.61  
EFFECTIVE AREA(ACRES) = 30.80 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 30.8 PEAK FLOW RATE(CFS) = 3.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 2.45  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13502.00 = 1928.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13502.00 TO NODE 13503.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 990.26 DOWNSTREAM(FEET) = 956.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.98 CHANNEL SLOPE = 0.0363  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.596

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.02	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.30  
AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 6.83  
Tc(MIN.) = 27.36  
SUBAREA AREA(ACRES) = 46.02 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 76.8 PEAK FLOW RATE(CFS) = 3.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.70 FLOW VELOCITY(FEET/SEC.) = 2.28

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13503.00 = 2869.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13503.00 TO NODE 13504.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 956.06 DOWNSTREAM(FEET) = 889.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2131.31 CHANNEL SLOPE = 0.0312  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.457

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.46	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.14  
AVERAGE FLOW DEPTH(FEET) = 0.72 TRAVEL TIME(MIN.) = 16.63  
Tc(MIN.) = 43.98  
SUBAREA AREA(ACRES) = 58.46 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 135.28 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 135.3 PEAK FLOW RATE(CFS) = 3.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.72 FLOW VELOCITY(FEET/SEC.) = 2.14  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13504.00 = 5001.06 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13504.00 TO NODE 13505.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 889.48 DOWNSTREAM(FEET) = 848.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1661.97 CHANNEL SLOPE = 0.0249  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.381

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	49.30	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.34  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.97

AVERAGE FLOW DEPTH (FEET) = 0.75 TRAVEL TIME (MIN.) = 14.08  
 Tc (MIN.) = 58.07  
 SUBAREA AREA (ACRES) = 49.30 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 184.58 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 184.6 PEAK FLOW RATE (CFS) = 3.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.75 FLOW VELOCITY (FEET/SEC.) = 1.97  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.00 = 6663.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.00 TO NODE 13505.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 848.10 DOWNSTREAM (FEET) = 811.10  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1234.61 CHANNEL SLOPE = 0.0300  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.355

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	39.35	0.60	0.811	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.811  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.28  
 AVERAGE FLOW DEPTH (FEET) = 0.81 TRAVEL TIME (MIN.) = 9.03  
 Tc (MIN.) = 67.10  
 SUBAREA AREA (ACRES) = 39.35 SUBAREA RUNOFF (CFS) = 2.37  
 EFFECTIVE AREA (ACRES) = 223.93 AREA-AVERAGED Fm (INCH/HR) = 0.58  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 223.9 PEAK FLOW RATE (CFS) = 3.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.73 FLOW VELOCITY (FEET/SEC.) = 2.10  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.50 = 7897.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13505.50 TO NODE 13506.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 811.10 DOWNSTREAM (FEET) = 781.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1415.98 CHANNEL SLOPE = 0.0213  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.329  
 SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.33	0.60	0.738	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.10  
 AVERAGE FLOW DEPTH (FEET) = 0.93 TRAVEL TIME (MIN.) = 11.23  
 Tc (MIN.) = 78.32

SUBAREA AREA (ACRES) = 54.33 SUBAREA RUNOFF (CFS) = 4.21  
 EFFECTIVE AREA (ACRES) = 278.26 AREA-AVERAGED Fm (INCH/HR) = 0.55  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.92  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 278.3 PEAK FLOW RATE (CFS) = 6.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.99 FLOW VELOCITY (FEET/SEC.) = 2.19  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.00 = 9313.62 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13506.00 TO NODE 13506.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 781.00 DOWNSTREAM (FEET) = 743.17  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1542.62 CHANNEL SLOPE = 0.0245  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.305

SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.33	0.60	0.783	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 8.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.45  
 AVERAGE FLOW DEPTH (FEET) = 1.06 TRAVEL TIME (MIN.) = 10.48  
 Tc (MIN.) = 88.80  
 SUBAREA AREA (ACRES) = 61.33 SUBAREA RUNOFF (CFS) = 3.65  
 EFFECTIVE AREA (ACRES) = 339.59 AREA-AVERAGED Fm (INCH/HR) = 0.54  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.90  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 339.6 PEAK FLOW RATE (CFS) = 9.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.12 FLOW VELOCITY (FEET/SEC.) = 2.56  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.50 = 10856.24 FEET.

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*****
FLOW PROCESS FROM NODE 13506.50 TO NODE 13520.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 743.17 DOWNSTREAM(FEET) = 717.04
CHANNEL LENGTH THRU SUBAREA(FEET) = 1370.93 CHANNEL SLOPE = 0.0191
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.289
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 39.86 0.60 0.848 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.848
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.38
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.36
AVERAGE FLOW DEPTH(FEET) = 1.21 TRAVEL TIME(MIN.) = 9.67
Tc(MIN.) = 98.47
SUBAREA AREA(ACRES) = 39.86 SUBAREA RUNOFF(CFS) = 1.58
EFFECTIVE AREA(ACRES) = 379.45 AREA-AVERAGED Fm(INCH/HR) = 0.53
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.89
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 379.5 PEAK FLOW RATE(CFS) = 10.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 2.38
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

*****
FLOW PROCESS FROM NODE 13506.00 TO NODE 13520.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 98.47
RAINFALL INTENSITY(INCH/HR) = 0.29
AREA-AVERAGED Fm(INCH/HR) = 0.53
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.89
EFFECTIVE STREAM AREA(ACRES) = 379.45
TOTAL STREAM AREA(ACRES) = 379.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.67

*****
FLOW PROCESS FROM NODE 13510.00 TO NODE 13511.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 903.68

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ELEVATION DATA: UPSTREAM(FEET) = 1216.90 DOWNSTREAM(FEET) = 1022.78

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.615
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.860
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"GRASS" - 6.66 0.60 1.000 0 14.62
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.56
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 1.56

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FLOW PROCESS FROM NODE 13511.00 TO NODE 13512.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1022.78 DOWNSTREAM(FEET) = 954.27
CHANNEL LENGTH THRU SUBAREA(FEET) = 1027.63 CHANNEL SLOPE = 0.0667
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.699
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 25.40 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.72
AVERAGE FLOW DEPTH(FEET) = 0.59 TRAVEL TIME(MIN.) = 6.29
Tc(MIN.) = 20.91
SUBAREA AREA(ACRES) = 25.40 SUBAREA RUNOFF(CFS) = 2.27
EFFECTIVE AREA(ACRES) = 32.06 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 32.1 PEAK FLOW RATE(CFS) = 2.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 2.75
LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13512.00 = 1931.31 FEET.

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FLOW PROCESS FROM NODE 13512.00 TO NODE 13513.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 954.27 DOWNSTREAM(FEET) = 872.45
CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.42 CHANNEL SLOPE = 0.0425
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.522
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

```

LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -            90.23       0.60       1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =            2.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.31  
 AVERAGE FLOW DEPTH(FEET) = 0.64    TRAVEL TIME(MIN.) = 13.90  
 Tc(MIN.) = 34.81  
 SUBAREA AREA(ACRES) = 90.23            SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 122.29        AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60    AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 122.3            PEAK FLOW RATE(CFS) =            2.87  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.64    FLOW VELOCITY(FEET/SEC.) = 2.31  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13513.00 = 3857.73 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13513.00 TO NODE 13514.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 872.45    DOWNSTREAM(FEET) = 813.12  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.66    CHANNEL SLOPE = 0.0313  
 CHANNEL BASE(FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060    MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.422  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/    SCS SOIL    AREA       Fp            Ap       SCS  
 LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -            135.65       0.60       1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =            2.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.06  
 AVERAGE FLOW DEPTH(FEET) = 0.68    TRAVEL TIME(MIN.) = 15.35  
 Tc(MIN.) = 50.16  
 SUBAREA AREA(ACRES) = 135.65            SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 257.94        AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60    AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 257.9            PEAK FLOW RATE(CFS) =            2.87  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.68    FLOW VELOCITY(FEET/SEC.) = 2.06  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13514.00 = 5753.39 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13514.00 TO NODE 13515.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 813.12    DOWNSTREAM(FEET) = 773.74  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.15    CHANNEL SLOPE = 0.0204  
 CHANNEL BASE(FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060    MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.352  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/    SCS SOIL    AREA       Fp            Ap       SCS  
 LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -            109.30       0.60       1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =            2.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.76  
 AVERAGE FLOW DEPTH(FEET) = 0.74    TRAVEL TIME(MIN.) = 18.23  
 Tc(MIN.) = 68.39  
 SUBAREA AREA(ACRES) = 109.30            SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 367.24        AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60    AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 367.2            PEAK FLOW RATE(CFS) =            2.87  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.74    FLOW VELOCITY(FEET/SEC.) = 1.76  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13515.00 = 7679.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 773.74    DOWNSTREAM(FEET) = 717.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2279.49    CHANNEL SLOPE = 0.0249  
 CHANNEL BASE(FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060    MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.305  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/    SCS SOIL    AREA       Fp            Ap       SCS  
 LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -            231.44       0.60       1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =            2.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.89  
 AVERAGE FLOW DEPTH(FEET) = 0.71    TRAVEL TIME(MIN.) = 20.15  
 Tc(MIN.) = 88.54  
 SUBAREA AREA(ACRES) = 231.44            SUBAREA RUNOFF(CFS) = 0.00

EFFECTIVE AREA(ACRES) = 598.68 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 598.7 PEAK FLOW RATE(CFS) = 2.87  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 1.89  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13520.00 = 9959.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 88.54  
 RAINFALL INTENSITY(INCH/HR) = 0.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 598.68  
 TOTAL STREAM AREA(ACRES) = 598.68  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.87

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.67	98.47	0.289	0.60( 0.53)	0.89	379.5	13500.00
2	2.87	88.54	0.305	0.60( 0.60)	1.00	598.7	13510.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.01	88.54	0.305	0.60( 0.58)	0.96	939.8	13510.00
2	13.39	98.47	0.289	0.60( 0.57)	0.96	978.1	13500.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 13.39 Tc(MIN.) = 98.47  
 EFFECTIVE AREA(ACRES) = 978.13 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 978.1  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.00 TO NODE 13520.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 717.04 DOWNSTREAM(FEET) = 700.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.22 CHANNEL SLOPE = 0.0084

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.269

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 193.31 0.60 0.965 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.965

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.55  
 AVERAGE FLOW DEPTH(FEET) = 1.36 TRAVEL TIME(MIN.) = 13.19  
 Tc(MIN.) = 111.67

SUBAREA AREA(ACRES) = 193.31 SUBAREA RUNOFF(CFS) = 1.64  
 EFFECTIVE AREA(ACRES) = 1171.44 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 1171.4 PEAK FLOW RATE(CFS) = 13.39  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.33 FLOW VELOCITY(FEET/SEC.) = 2.51  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.50 = 14246.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13520.50 TO NODE 13521.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 700.00 DOWNSTREAM(FEET) = 661.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1622.36 CHANNEL SLOPE = 0.0235  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.258

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 129.79 0.60 0.897 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.94  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.78  
 AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 7.15  
 Tc(MIN.) = 118.81

SUBAREA AREA(ACRES) = 129.79 SUBAREA RUNOFF(CFS) = 3.10  
 EFFECTIVE AREA(ACRES) = 1301.23 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 1301.2 PEAK FLOW RATE(CFS) = 14.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:



DEPTH(FEET) = 1.12 FLOW VELOCITY(FEET/SEC.) = 3.74  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13521.00 = 15868.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13521.00 TO NODE 13522.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 661.95 DOWNSTREAM(FEET) = 632.19  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2746.01 CHANNEL SLOPE = 0.0108  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.244

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.60	0.60	0.905	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.905

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.10

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.94

AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 15.58

Tc(MIN.) = 134.40

SUBAREA AREA(ACRES) = 278.60 SUBAREA RUNOFF(CFS) = 5.82

EFFECTIVE AREA(ACRES) = 1579.83 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 1579.8 PEAK FLOW RATE(CFS) = 19.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.46 FLOW VELOCITY(FEET/SEC.) = 3.02

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13522.00 = 18614.76 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1579.8 TC(MIN.) = 134.40

EFFECTIVE AREA(ACRES) = 1579.83 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.945

PEAK FLOW RATE(CFS) = 19.28

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18.96	124.68	0.252	0.60( 0.57)	0.95	1541.5	13510.00
2	19.28	134.40	0.244	0.60( 0.57)	0.94	1579.8	13500.00

-----  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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Santa Ana, CA
92707

FILE NAME: S36.DAT
TIME/DATE OF STUDY: 08:02 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.806
2) 10.00; 1.204
3) 15.00; 0.925
4) 20.00; 0.762
5) 25.00; 0.659
6) 30.00; 0.585
7) 40.00; 0.504
8) 50.00; 0.447
9) 60.00; 0.403
10) 90.00; 0.339
11) 120.00; 0.294
12) 180.00; 0.245
13) 360.00; 0.179
14) 1440.00; 0.078

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, / WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES, MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13600.00 TO NODE 13600.50 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 488.61
ELEVATION DATA: UPSTREAM(FEET) = 872.12 DOWNSTREAM(FEET) = 744.80

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.995
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.149

SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS Tc
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 3.39 0.60 1.000 0 11.00
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 1.67
TOTAL AREA(ACRES) = 3.39 PEAK FLOW RATE(CFS) = 1.67

\*\*\*\*\*

FLOW PROCESS FROM NODE 13600.50 TO NODE 13601.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 744.80 DOWNSTREAM(FEET) = 707.32
CHANNEL LENGTH THRU SUBAREA(FEET) = 418.30 CHANNEL SLOPE = 0.0896
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.024
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 7.45 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.13
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 2.23
Tc(MIN.) = 13.22
SUBAREA AREA(ACRES) = 7.45 SUBAREA RUNOFF(CFS) = 2.84
EFFECTIVE AREA(ACRES) = 10.84 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10.8 PEAK FLOW RATE(CFS) = 4.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 3.33
LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13601.00 = 906.91 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13601.00 TO NODE 13602.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

\*\*\*\*\*

ELEVATION DATA: UPSTREAM(FEET) = 707.32 DOWNSTREAM(FEET) = 657.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 777.60 CHANNEL SLOPE = 0.0646  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.862

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.96	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.50

AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 3.71

Tc(MIN.) = 16.93

SUBAREA AREA(ACRES) = 30.96 SUBAREA RUNOFF(CFS) = 7.30

EFFECTIVE AREA(ACRES) = 41.80 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.8 PEAK FLOW RATE(CFS) = 9.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.94 FLOW VELOCITY(FEET/SEC.) = 3.69

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13602.00 = 1684.51 FEET.

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FLOW PROCESS FROM NODE 13602.00 TO NODE 13603.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.12 DOWNSTREAM(FEET) = 584.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1186.54 CHANNEL SLOPE = 0.0611  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.716

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.36	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.73

AVERAGE FLOW DEPTH(FEET) = 1.00 TRAVEL TIME(MIN.) = 5.30

Tc(MIN.) = 22.23

SUBAREA AREA(ACRES) = 23.36 SUBAREA RUNOFF(CFS) = 2.45

EFFECTIVE AREA(ACRES) = 65.16 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 65.2 PEAK FLOW RATE(CFS) = 9.86

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 3.59

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13603.00 = 2871.05 FEET.

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FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 584.58 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 860.98 CHANNEL SLOPE = 0.0461  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.635

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.24	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.22

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.28

AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 4.38

Tc(MIN.) = 26.61

SUBAREA AREA(ACRES) = 21.24 SUBAREA RUNOFF(CFS) = 0.68

EFFECTIVE AREA(ACRES) = 86.40 AREA-AVERAGED Fm(INCH/HR) = 0.60

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 86.4 PEAK FLOW RATE(CFS) = 9.86

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.00 FLOW VELOCITY(FEET/SEC.) = 3.26

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

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FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

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FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S35.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18.96	124.68	0.60( 0.57)	0.95	1541.5	13510.00
2	19.28	134.40	0.60( 0.57)	0.94	1579.8	13500.00
TOTAL AREA(ACRES) =		1579.8				

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FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	18.96	124.68	0.60( 0.57)	0.95	1541.5	13510.00
2	19.28	134.40	0.60( 0.57)	0.94	1579.8	13500.00

TOTAL AREA(ACRES) = 1579.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 13522.00 TO NODE 13523.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 632.19 DOWNSTREAM(FEET) = 561.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1151.68 CHANNEL SLOPE = 0.0618
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 19.28
FLOW VELOCITY(FEET/SEC.) = 5.83 FLOW DEPTH(FEET) = 1.05
TRAVEL TIME(MIN.) = 3.29 Tc(MIN.) = 137.69
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 21.63 127.98 0.288 0.60( 0.57) 0.95 1541.5 13510.00
2 22.07 137.69 0.280 0.60( 0.57) 0.94 1579.8 13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 22.07 Tc(MIN.) = 137.69
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA(ACRES) = 1579.83

\*\*\*\*\*

FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

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FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610201T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 8.36 17.46 0.60( 0.60) 1.00 37.9 20100.00
TOTAL AREA(ACRES) = 37.9

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FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 21.63 127.98 0.288 0.60( 0.57) 0.95 1541.5 13510.00
2 22.07 137.69 0.280 0.60( 0.57) 0.94 1579.8 13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 8.36 17.46 0.845 0.60( 0.60) 1.00 37.9 20100.00
LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 13523.00 = 2767.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 29.99 17.46 0.845 0.60( 0.57) 0.95 248.3 20100.00
2 21.63 127.98 0.288 0.60( 0.57) 0.95 1579.5 13510.00
3 22.07 137.69 0.280 0.60( 0.57) 0.95 1617.8 13500.00
TOTAL AREA(ACRES) = 1617.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 29.99 Tc(MIN.) = 17.461
EFFECTIVE AREA(ACRES) = 248.25 AREA-AVERAGED Fm(INCH/HR) = 0.57
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 1617.8
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

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FLOW PROCESS FROM NODE 13523.00 TO NODE 13524.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 561.00 DOWNSTREAM(FEET) = 556.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 238.34 CHANNEL SLOPE = 0.0210
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 29.99
FLOW VELOCITY(FEET/SEC.) = 4.32 FLOW DEPTH(FEET) = 1.52
TRAVEL TIME(MIN.) = 0.92 Tc(MIN.) = 18.38
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 54.17 18.38 0.815 0.60( 0.57) 0.95 248.3 20100.00
2 21.63 128.98 0.287 0.60( 0.57) 0.95 1579.5 13510.00
3 22.07 138.68 0.279 0.60( 0.57) 0.95 1617.8 13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 54.17 Tc(MIN.) = 18.38
AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 248.25

\*\*\*\*\*

FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610202T.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.14	15.32	0.60 ( 0.60)	1.00	28.8	20200.00
2	7.91	15.71	0.60 ( 0.60)	1.00	29.1	20210.00
TOTAL AREA (ACRES) =		29.1				

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FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.17	18.38	0.815	0.60 ( 0.57)	0.95	248.3	20100.00
2	21.63	128.98	0.287	0.60 ( 0.57)	0.95	1579.5	13510.00
3	22.07	138.68	0.279	0.60 ( 0.57)	0.95	1617.8	13500.00
LONGEST FLOWPATH FROM NODE		13500.00 TO NODE 13524.00 = 20004.78 FEET.					

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.14	15.32	0.914	0.60 ( 0.60)	1.00	28.8	20200.00
2	7.91	15.71	0.902	0.60 ( 0.60)	1.00	29.1	20210.00
LONGEST FLOWPATH FROM NODE		20210.00 TO NODE 13524.00 = 2247.00 FEET.					

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	62.31	15.32	0.914	0.60 ( 0.58)	0.96	235.7	20200.00
2	62.08	15.71	0.902	0.60 ( 0.58)	0.96	241.2	20210.00
3	59.80	18.38	0.815	0.60 ( 0.58)	0.96	277.4	20100.00
4	21.63	128.98	0.287	0.60 ( 0.57)	0.95	1608.6	13510.00
5	22.07	138.68	0.279	0.60 ( 0.57)	0.95	1646.9	13500.00
TOTAL AREA (ACRES) =		1646.9					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 62.31 Tc(MIN.) = 15.319  
EFFECTIVE AREA(ACRES) = 235.67 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
TOTAL AREA (ACRES) = 1646.9  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

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FLOW PROCESS FROM NODE 13524.00 TO NODE 13620.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 556.00 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 672.93 CHANNEL SLOPE = 0.0165  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.839  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 27.94 0.60 0.884 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 66.19

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.81

AVERAGE FLOW DEPTH(FEET) = 2.14 TRAVEL TIME(MIN.) = 2.33

Tc(MIN.) = 17.65

SUBAREA AREA(ACRES) = 27.94 SUBAREA RUNOFF(CFS) = 7.75

EFFECTIVE AREA(ACRES) = 263.61 AREA-AVERAGED Fm(INCH/HR) = 0.57

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95

TOTAL AREA (ACRES) = 1674.8 PEAK FLOW RATE (CFS) = 63.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.11 FLOW VELOCITY(FEET/SEC.) = 4.76

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.51	17.65	0.839	0.60 ( 0.57)	0.95	263.6	20200.00
2	62.08	18.03	0.826	0.60 ( 0.57)	0.95	269.2	20210.00
3	59.80	20.74	0.747	0.60 ( 0.57)	0.95	305.3	20100.00
4	22.21	132.04	0.284	0.60 ( 0.57)	0.95	1636.5	13510.00
5	22.62	141.74	0.277	0.60 ( 0.57)	0.95	1674.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 63.51 Tc(MIN.) = 17.65

AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 263.61

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FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.51	17.65	0.839	0.60 ( 0.57)	0.95	263.6	20200.00
2	62.08	18.03	0.826	0.60 ( 0.57)	0.95	269.2	20210.00
3	59.80	20.74	0.747	0.60 ( 0.57)	0.95	305.3	20100.00
4	22.21	132.04	0.284	0.60 ( 0.57)	0.95	1636.5	13510.00
5	22.62	141.74	0.277	0.60 ( 0.57)	0.95	1674.8	13500.00
LONGEST FLOWPATH FROM NODE		13500.00 TO NODE 13620.00 = 20677.71 FEET.					

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.86	26.61	0.635	0.60 ( 0.60)	1.00	86.4	13600.00
LONGEST FLOWPATH FROM NODE		13600.00 TO NODE 13620.00 = 3732.03 FEET.					

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.37	17.65	0.839	0.60 ( 0.58)	0.96	320.9	20200.00
2	71.94	18.03	0.826	0.60 ( 0.58)	0.96	327.7	20210.00

3 69.66 20.74 0.747 0.60( 0.58) 0.96 372.7 20100.00  
 4 67.68 26.61 0.635 0.60( 0.58) 0.96 461.9 13600.00  
 5 22.21 132.04 0.284 0.60( 0.57) 0.95 1722.9 13510.00  
 6 22.62 141.74 0.277 0.60( 0.57) 0.95 1761.2 13500.00  
 TOTAL AREA(ACRES) = 1761.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 73.37 Tc(MIN.) = 17.650  
 EFFECTIVE AREA(ACRES) = 320.92 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 1761.2  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 544.91 DOWNSTREAM(FEET) = 527.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 868.57 CHANNEL SLOPE = 0.0206  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 73.37  
 FLOW VELOCITY(FEET/SEC.) = 5.37 FLOW DEPTH(FEET) = 2.13  
 TRAVEL TIME(MIN.) = 2.69 Tc(MIN.) = 20.34  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.37	20.34	0.755	0.60( 0.58)	0.96	320.9	20200.00
2	71.94	20.74	0.747	0.60( 0.58)	0.96	327.7	20210.00
3	69.66	23.48	0.691	0.60( 0.58)	0.96	372.7	20100.00
4	67.68	29.36	0.595	0.60( 0.58)	0.96	461.9	13600.00
5	22.21	135.68	0.281	0.60( 0.57)	0.95	1722.9	13510.00
6	22.62	145.35	0.274	0.60( 0.57)	0.95	1761.2	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 73.37 Tc(MIN.) = 20.34  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 320.92

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610203T.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.97	16.31	0.60( 0.60)	1.00	27.4	20300.00

TOTAL AREA(ACRES) = 27.4

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.37	20.34	0.755	0.60( 0.58)	0.96	320.9	20200.00
2	71.94	20.74	0.747	0.60( 0.58)	0.96	327.7	20210.00
3	69.66	23.48	0.691	0.60( 0.58)	0.96	372.7	20100.00
4	67.68	29.36	0.595	0.60( 0.58)	0.96	461.9	13600.00
5	22.21	135.68	0.281	0.60( 0.57)	0.95	1722.9	13510.00
6	22.62	145.35	0.274	0.60( 0.57)	0.95	1761.2	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.97	16.31	0.882	0.60( 0.60)	1.00	27.4	20300.00

LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 13621.00 = 2609.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	80.34	16.31	0.882	0.60( 0.58)	0.96	284.6	20300.00
2	77.20	20.34	0.755	0.60( 0.58)	0.96	348.3	20200.00
3	75.57	20.74	0.747	0.60( 0.58)	0.96	355.1	20210.00
4	71.91	23.48	0.691	0.60( 0.58)	0.96	400.1	20100.00
5	67.68	29.36	0.595	0.60( 0.58)	0.96	489.3	13600.00
6	22.21	135.68	0.281	0.60( 0.57)	0.95	1750.3	13510.00
7	22.62	145.35	0.274	0.60( 0.57)	0.95	1788.6	13500.00

TOTAL AREA(ACRES) = 1788.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 80.34 Tc(MIN.) = 16.305  
 EFFECTIVE AREA(ACRES) = 284.63 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1788.6  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13621.00 TO NODE 13622.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 527.00 DOWNSTREAM(FEET) = 512.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 56.08 CHANNEL SLOPE = 0.2675  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 80.34  
 FLOW VELOCITY(FEET/SEC.) = 14.42 FLOW DEPTH(FEET) = 1.36  
 TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 16.37  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	80.34	16.37	0.880	0.60 ( 0.58)	0.96	284.6	20300.00
2	77.20	20.41	0.754	0.60 ( 0.58)	0.96	348.3	20200.00
3	75.57	20.81	0.746	0.60 ( 0.58)	0.96	355.1	20210.00
4	71.91	23.54	0.689	0.60 ( 0.58)	0.96	400.1	20100.00
5	67.68	29.43	0.594	0.60 ( 0.58)	0.96	489.3	13600.00
6	22.21	135.77	0.281	0.60 ( 0.57)	0.95	1750.3	13510.00
7	22.62	145.44	0.273	0.60 ( 0.57)	0.95	1788.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 80.34 Tc(MIN.) = 16.37  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 284.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610204T.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.80	15.63	0.60 ( 0.60)	1.00	32.2	20400.00

TOTAL AREA(ACRES) = 32.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	80.34	16.37	0.880	0.60 ( 0.58)	0.96	284.6	20300.00
2	77.20	20.41	0.754	0.60 ( 0.58)	0.96	348.3	20200.00
3	75.57	20.81	0.746	0.60 ( 0.58)	0.96	355.1	20210.00
4	71.91	23.54	0.689	0.60 ( 0.58)	0.96	400.1	20100.00
5	67.68	29.43	0.594	0.60 ( 0.58)	0.96	489.3	13600.00
6	22.21	135.77	0.281	0.60 ( 0.57)	0.95	1750.3	13510.00
7	22.62	145.44	0.273	0.60 ( 0.57)	0.95	1788.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.80	15.63	0.904	0.60 ( 0.60)	1.00	32.2	20400.00

LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 13622.00 = 2281.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	89.14	15.63	0.904	0.60 ( 0.58)	0.97	304.0	20400.00
2	88.45	16.37	0.880	0.60 ( 0.58)	0.97	316.8	20300.00
3	81.65	20.41	0.754	0.60 ( 0.58)	0.97	380.5	20200.00
4	79.79	20.81	0.746	0.60 ( 0.58)	0.97	387.3	20210.00
5	74.50	23.54	0.689	0.60 ( 0.58)	0.97	432.2	20100.00
6	67.68	29.43	0.594	0.60 ( 0.58)	0.97	521.4	13600.00
7	22.21	135.77	0.281	0.60 ( 0.57)	0.95	1782.5	13510.00
8	22.62	145.44	0.273	0.60 ( 0.57)	0.95	1820.8	13500.00

TOTAL AREA(ACRES) = 1820.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 89.14 Tc(MIN.) = 15.634  
 EFFECTIVE AREA(ACRES) = 304.00 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1820.8  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13622.00 TO NODE 13640.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 512.00 DOWNSTREAM(FEET) = 489.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 459.72 CHANNEL SLOPE = 0.0500  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.874  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
 USER-DEFINED - 112.88 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.18  
 AVERAGE FLOW DEPTH(FEET) = 2.05 TRAVEL TIME(MIN.) = 0.94  
 Tc(MIN.) = 16.57  
 SUBAREA AREA(ACRES) = 112.88 SUBAREA RUNOFF(CFS) = 27.81  
 EFFECTIVE AREA(ACRES) = 416.88 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 1933.7 PEAK FLOW RATE(CFS) = 107.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 8.26  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.97	16.57	0.874	0.60 ( 0.59)	0.98	416.9	20400.00
2	102.01	17.32	0.849	0.60 ( 0.59)	0.98	429.7	20300.00
3	81.65	21.38	0.734	0.60 ( 0.58)	0.97	493.4	20200.00
4	79.79	21.79	0.725	0.60 ( 0.58)	0.97	500.2	20210.00
5	74.50	24.55	0.669	0.60 ( 0.58)	0.97	545.1	20100.00

6 67.68 30.47 0.581 0.60( 0.58) 0.97 634.3 13600.00  
 7 22.21 137.15 0.280 0.60( 0.57) 0.95 1895.4 13510.00  
 8 22.62 146.81 0.272 0.60( 0.57) 0.95 1933.7 13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 107.97 Tc(MIN.) = 16.57  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 416.88

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610205T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.47	12.24	0.60( 0.60)	1.00	8.1	20500.00
TOTAL AREA(ACRES) =			8.1			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.97	16.57	0.874	0.60( 0.59)	0.98	416.9	20400.00
2	102.01	17.32	0.849	0.60( 0.59)	0.98	429.7	20300.00
3	81.65	21.38	0.734	0.60( 0.58)	0.97	493.4	20200.00
4	79.79	21.79	0.725	0.60( 0.58)	0.97	500.2	20210.00
5	74.50	24.55	0.669	0.60( 0.58)	0.97	545.1	20100.00
6	67.68	30.47	0.581	0.60( 0.58)	0.97	634.3	13600.00
7	22.21	137.15	0.280	0.60( 0.57)	0.95	1895.4	13510.00
8	22.62	146.81	0.272	0.60( 0.57)	0.95	1933.7	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.47	12.24	1.079	0.60( 0.60)	1.00	8.1	20500.00
LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 13640.00 = 1025.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	111.45	12.24	1.079	0.60( 0.59)	0.98	315.9	20500.00
2	109.96	16.57	0.874	0.60( 0.59)	0.98	424.9	20400.00
3	103.82	17.32	0.849	0.60( 0.59)	0.98	437.7	20300.00
4	82.62	21.38	0.734	0.60( 0.58)	0.97	501.4	20200.00
5	80.70	21.79	0.725	0.60( 0.58)	0.97	508.2	20210.00
6	74.99	24.55	0.669	0.60( 0.58)	0.97	553.2	20100.00
7	67.68	30.47	0.581	0.60( 0.58)	0.97	642.4	13600.00
8	22.21	137.15	0.280	0.60( 0.57)	0.95	1903.4	13510.00
9	22.62	146.81	0.272	0.60( 0.57)	0.95	1941.7	13500.00
TOTAL AREA(ACRES) =			1941.7				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 111.45 Tc(MIN.) = 12.239  
 EFFECTIVE AREA(ACRES) = 315.95 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
 TOTAL AREA(ACRES) = 1941.7  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13640.00 TO NODE 13641.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 489.00 DOWNSTREAM(FEET) = 436.89  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2992.90 CHANNEL SLOPE = 0.0174  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.744

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.31	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.76

AVERAGE FLOW DEPTH(FEET) = 2.68 TRAVEL TIME(MIN.) = 8.66

Tc(MIN.) = 20.90

SUBAREA AREA(ACRES) = 180.31 SUBAREA RUNOFF(CFS) = 23.33

EFFECTIVE AREA(ACRES) = 496.26 AREA-AVERAGED Fm(INCH/HR) = 0.59

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 2122.0 PEAK FLOW RATE(CFS) = 111.45

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.58 FLOW VELOCITY(FEET/SEC.) = 5.60

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13641.00 = 25054.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	111.45	20.90	0.744	0.60( 0.59)	0.99	496.3	20500.00
2	109.96	25.42	0.653	0.60( 0.59)	0.98	605.2	20400.00
3	103.82	26.28	0.640	0.60( 0.59)	0.98	618.0	20300.00
4	82.62	30.97	0.577	0.60( 0.59)	0.98	681.7	20200.00
5	80.70	31.46	0.573	0.60( 0.59)	0.98	688.6	20210.00
6	74.99	34.36	0.550	0.60( 0.59)	0.98	733.5	20100.00
7	67.68	40.53	0.501	0.60( 0.59)	0.98	822.7	13600.00
8	22.21	150.48	0.269	0.60( 0.57)	0.96	2083.7	13510.00
9	22.62	160.08	0.261	0.60( 0.57)	0.96	2122.0	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 111.45 Tc(MIN.) = 20.90  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 496.26

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13641.00 TO NODE 13642.00 IS CODE = 51



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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 436.89 DOWNSTREAM(FEET) = 394.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2814.16 CHANNEL SLOPE = 0.0150  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.589  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 434.58 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.29  
AVERAGE FLOW DEPTH(FEET) = 2.65 TRAVEL TIME(MIN.) = 8.86  
Tc(MIN.) = 29.76  
SUBAREA AREA(ACRES) = 451.39 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 947.65 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 2573.4 PEAK FLOW RATE(CFS) = 111.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.65 FLOW VELOCITY(FEET/SEC.) = 5.29  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13642.00 = 27869.14 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 111.45 29.76 0.589 0.60( 0.60) 0.99 947.6 20500.00  
2 109.96 34.32 0.550 0.60( 0.59) 0.99 1056.6 20400.00  
3 103.82 35.31 0.542 0.60( 0.59) 0.99 1069.4 20300.00  
4 82.62 40.52 0.501 0.60( 0.59) 0.99 1133.1 20200.00  
5 80.70 41.07 0.498 0.60( 0.59) 0.99 1139.9 20210.00  
6 74.99 44.15 0.480 0.60( 0.59) 0.99 1184.9 20100.00  
7 67.68 50.60 0.444 0.60( 0.59) 0.99 1274.1 13600.00  
8 22.21 163.74 0.258 0.60( 0.58) 0.97 2535.1 13510.00  
9 22.62 173.24 0.251 0.60( 0.58) 0.96 2573.4 13500.00  
NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 111.45 Tc(MIN.) = 29.76  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 947.65

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13642.00 TO NODE 13643.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 394.80 DOWNSTREAM(FEET) = 342.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2913.57 CHANNEL SLOPE = 0.0180

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.517  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 434.58 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.45  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.67  
AVERAGE FLOW DEPTH(FEET) = 2.56 TRAVEL TIME(MIN.) = 8.56  
Tc(MIN.) = 38.32  
SUBAREA AREA(ACRES) = 434.58 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 1382.23 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 3008.0 PEAK FLOW RATE(CFS) = 111.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.56 FLOW VELOCITY(FEET/SEC.) = 5.67  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13643.00 = 30782.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 111.45 38.32 0.517 0.60( 0.60) 0.99 1382.2 20500.00  
2 109.96 42.90 0.487 0.60( 0.60) 0.99 1491.2 20400.00  
3 103.82 44.03 0.481 0.60( 0.60) 0.99 1504.0 20300.00  
4 82.62 49.74 0.448 0.60( 0.59) 0.99 1567.7 20200.00  
5 80.70 50.36 0.445 0.60( 0.59) 0.99 1574.5 20210.00  
6 74.99 53.62 0.431 0.60( 0.59) 0.99 1619.5 20100.00  
7 67.68 60.31 0.403 0.60( 0.59) 0.99 1708.7 13600.00  
8 22.21 176.58 0.248 0.60( 0.58) 0.97 2969.7 13510.00  
9 22.62 185.99 0.243 0.60( 0.58) 0.97 3008.0 13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 111.45 Tc(MIN.) = 38.32  
AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1382.23

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 342.39 DOWNSTREAM(FEET) = 300.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1591.23 CHANNEL SLOPE = 0.0266  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.490  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 109.24 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.45  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.57  
 AVERAGE FLOW DEPTH(FEET) = 2.38 TRAVEL TIME(MIN.) = 4.04  
 Tc(MIN.) = 42.35  
 SUBAREA AREA(ACRES) = 109.24 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1491.47 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 3117.3 PEAK FLOW RATE(CFS) = 111.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.38 FLOW VELOCITY(FEET/SEC.) = 6.57  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	111.45	42.35	0.490	0.60( 0.60)	1.00	1491.5	20500.00
2	109.96	46.96	0.464	0.60( 0.60)	0.99	1600.5	20400.00
3	103.82	48.13	0.457	0.60( 0.60)	0.99	1613.2	20300.00
4	82.62	54.09	0.429	0.60( 0.60)	0.99	1677.0	20200.00
5	80.70	54.74	0.426	0.60( 0.60)	0.99	1683.8	20210.00
6	74.99	58.07	0.412	0.60( 0.59)	0.99	1728.7	20100.00
7	67.68	64.88	0.393	0.60( 0.59)	0.99	1817.9	13600.00
8	22.21	182.64	0.244	0.60( 0.58)	0.97	3079.0	13510.00
9	22.62	192.00	0.241	0.60( 0.58)	0.97	3117.3	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 111.45 Tc(MIN.) = 42.35  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1491.47

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 12

=====  
 >>>>CLEAR MEMORY BANK # 1 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 15.1

=====  
 >>>>DEFINE MEMORY BANK # 1 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610206T.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.14	32.76	0.60( 0.60)	1.00	186.0	20600.00
TOTAL AREA(ACRES) = 186.0						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	111.45	42.35	0.490	0.60( 0.60)	1.00	1491.5	20500.00
2	109.96	46.96	0.464	0.60( 0.60)	0.99	1600.5	20400.00
3	103.82	48.13	0.457	0.60( 0.60)	0.99	1613.2	20300.00
4	82.62	54.09	0.429	0.60( 0.60)	0.99	1677.0	20200.00
5	80.70	54.74	0.426	0.60( 0.60)	0.99	1683.8	20210.00
6	74.99	58.07	0.412	0.60( 0.59)	0.99	1728.7	20100.00
7	67.68	64.88	0.393	0.60( 0.59)	0.99	1817.9	13600.00
8	22.21	182.64	0.244	0.60( 0.58)	0.97	3079.0	13510.00
9	22.62	192.00	0.241	0.60( 0.58)	0.97	3117.3	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.14	32.76	0.563	0.60( 0.60)	1.00	186.0	20600.00
LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 13660.00 = 6967.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	114.03	32.76	0.563	0.60( 0.60)	1.00	1339.6	20600.00
2	124.64	42.35	0.490	0.60( 0.60)	1.00	1677.5	20500.00
3	122.44	46.96	0.464	0.60( 0.60)	0.99	1786.5	20400.00
4	116.12	48.13	0.457	0.60( 0.60)	0.99	1799.3	20300.00
5	94.16	54.09	0.429	0.60( 0.60)	0.99	1863.0	20200.00
6	92.16	54.74	0.426	0.60( 0.60)	0.99	1869.8	20210.00
7	86.07	58.07	0.412	0.60( 0.60)	0.99	1914.7	20100.00
8	78.25	64.88	0.393	0.60( 0.59)	0.99	2003.9	13600.00
9	28.78	182.64	0.244	0.60( 0.58)	0.97	3265.0	13510.00
10	29.09	192.00	0.241	0.60( 0.58)	0.97	3303.3	13500.00
TOTAL AREA(ACRES) = 3303.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 124.64 Tc(MIN.) = 42.354  
 EFFECTIVE AREA(ACRES) = 1677.49 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3303.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 51

=====  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 300.00 DOWNSTREAM(FEET) = 288.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 933.89 CHANNEL SLOPE = 0.0128  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.473  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 61.43 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 124.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 5.14  
 AVERAGE FLOW DEPTH( FEET) = 2.84 TRAVEL TIME(MIN.) = 3.03  
 Tc(MIN.) = 45.38  
 SUBAREA AREA(ACRES) = 61.43 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 1738.92 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 3364.7 PEAK FLOW RATE(CFS) = 124.64  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH( FEET) = 2.84 FLOW VELOCITY( FEET/SEC.) = 5.14  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	114.03	35.85	0.537	0.60( 0.60)	1.00	1401.0	20600.00
2	124.64	45.38	0.473	0.60( 0.60)	1.00	1738.9	20500.00
3	122.44	50.00	0.447	0.60( 0.60)	0.99	1847.9	20400.00
4	116.12	51.21	0.441	0.60( 0.60)	0.99	1860.7	20300.00
5	94.16	57.33	0.415	0.60( 0.60)	0.99	1924.4	20200.00
6	92.16	58.01	0.412	0.60( 0.60)	0.99	1931.2	20210.00
7	86.07	61.39	0.400	0.60( 0.60)	0.99	1976.2	20100.00
8	78.25	68.28	0.386	0.60( 0.59)	0.99	2065.4	13600.00
9	28.78	187.02	0.243	0.60( 0.58)	0.97	3326.4	13510.00
10	29.09	196.34	0.239	0.60( 0.58)	0.97	3364.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 124.64 Tc(MIN.) = 45.38  
 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00 EFFECTIVE AREA(ACRES) = 1738.92

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610207T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29.02	21.84	0.60( 0.55)	0.92	174.5	20700.00
TOTAL AREA(ACRES) = 174.5						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	114.03	35.85	0.537	0.60( 0.60)	1.00	1401.0	20600.00
2	124.64	45.38	0.473	0.60( 0.60)	1.00	1738.9	20500.00
3	122.44	50.00	0.447	0.60( 0.60)	0.99	1847.9	20400.00
4	116.12	51.21	0.441	0.60( 0.60)	0.99	1860.7	20300.00
5	94.16	57.33	0.415	0.60( 0.60)	0.99	1924.4	20200.00
6	92.16	58.01	0.412	0.60( 0.60)	0.99	1931.2	20210.00
7	86.07	61.39	0.400	0.60( 0.60)	0.99	1976.2	20100.00
8	78.25	68.28	0.386	0.60( 0.59)	0.99	2065.4	13600.00
9	28.78	187.02	0.243	0.60( 0.58)	0.97	3326.4	13510.00
10	29.09	196.34	0.239	0.60( 0.58)	0.97	3364.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29.02	21.84	0.724	0.60( 0.55)	0.92	174.5	20700.00

LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 13680.00 = 6221.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	122.64	21.84	0.724	0.60( 0.59)	0.98	1027.9	20700.00
2	121.03	35.85	0.537	0.60( 0.59)	0.99	1575.5	20600.00
3	130.80	45.38	0.473	0.60( 0.59)	0.99	1913.4	20500.00
4	128.26	50.00	0.447	0.60( 0.59)	0.99	2022.4	20400.00
5	121.87	51.21	0.441	0.60( 0.59)	0.99	2035.2	20300.00
6	99.57	57.33	0.415	0.60( 0.59)	0.99	2098.9	20200.00
7	97.53	58.01	0.412	0.60( 0.59)	0.99	2105.7	20210.00
8	91.29	61.39	0.400	0.60( 0.59)	0.99	2150.7	20100.00
9	83.27	68.28	0.386	0.60( 0.59)	0.99	2239.9	13600.00
10	31.93	187.02	0.243	0.60( 0.58)	0.97	3500.9	13510.00
11	32.21	196.34	0.239	0.60( 0.58)	0.97	3539.2	13500.00

TOTAL AREA(ACRES) = 3539.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 130.80 Tc(MIN.) = 45.382  
 EFFECTIVE AREA(ACRES) = 1913.43 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3539.2  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

ELEVATION DATA: UPSTREAM( FEET) = 288.00 DOWNSTREAM( FEET) = 242.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 2860.77 CHANNEL SLOPE = 0.0161  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.430  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 112.53 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 130.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.66  
 AVERAGE FLOW DEPTH (FEET) = 2.77 TRAVEL TIME (MIN.) = 8.42  
 Tc (MIN.) = 53.80  
 SUBAREA AREA (ACRES) = 112.53 SUBAREA RUNOFF (CFS) = 0.00  
 EFFECTIVE AREA (ACRES) = 2025.96 AREA-AVERAGED Fm (INCH/HR) = 0.59  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 3651.8 PEAK FLOW RATE (CFS) = 130.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  
 END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.77 FLOW VELOCITY (FEET/SEC.) = 5.66  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	122.64	30.41	0.582	0.60 (0.59)	0.99	1140.4	20700.00
2	121.03	44.44	0.478	0.60 (0.59)	0.99	1688.0	20600.00
3	130.80	53.80	0.430	0.60 (0.59)	0.99	2026.0	20500.00
4	128.26	58.48	0.410	0.60 (0.59)	0.99	2134.9	20400.00
5	121.87	59.79	0.404	0.60 (0.59)	0.99	2147.7	20300.00
6	99.57	66.35	0.390	0.60 (0.59)	0.99	2211.4	20200.00
7	97.53	67.06	0.388	0.60 (0.59)	0.99	2218.3	20210.00
8	91.29	70.60	0.381	0.60 (0.59)	0.99	2263.2	20100.00
9	83.27	77.72	0.365	0.60 (0.59)	0.99	2352.4	13600.00
10	31.93	199.00	0.238	0.60 (0.58)	0.97	3613.5	13510.00
11	32.21	208.34	0.235	0.60 (0.58)	0.97	3651.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 130.80 Tc (MIN.) = 53.80  
 AREA-AVERAGED Fm (INCH/HR) = 0.59 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 2025.96

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610208T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.86	19.60	0.60 (0.60)	0.99	160.7	20810.00
2	18.74	25.44	0.60 (0.60)	0.99	185.8	20800.00
TOTAL AREA (ACRES) =			185.8			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	122.64	30.41	0.582	0.60 (0.59)	0.99	1140.4	20700.00
2	121.03	44.44	0.478	0.60 (0.59)	0.99	1688.0	20600.00
3	130.80	53.80	0.430	0.60 (0.59)	0.99	2026.0	20500.00
4	128.26	58.48	0.410	0.60 (0.59)	0.99	2134.9	20400.00
5	121.87	59.79	0.404	0.60 (0.59)	0.99	2147.7	20300.00
6	99.57	66.35	0.390	0.60 (0.59)	0.99	2211.4	20200.00
7	97.53	67.06	0.388	0.60 (0.59)	0.99	2218.3	20210.00
8	91.29	70.60	0.381	0.60 (0.59)	0.99	2263.2	20100.00
9	83.27	77.72	0.365	0.60 (0.59)	0.99	2352.4	13600.00
10	31.93	199.00	0.238	0.60 (0.58)	0.97	3613.5	13510.00
11	32.21	208.34	0.235	0.60 (0.58)	0.97	3651.8	13500.00
LONGEST FLOWPATH FROM NODE			13500.00	TO NODE	13682.00	=	36168.60 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.86	19.60	0.775	0.60 (0.60)	0.99	160.7	20810.00
2	18.74	25.44	0.653	0.60 (0.60)	0.99	185.8	20800.00
LONGEST FLOWPATH FROM NODE			20800.00	TO NODE	13682.00	=	5285.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	131.20	19.60	0.775	0.60 (0.59)	0.99	895.7	20810.00
2	133.89	25.44	0.653	0.60 (0.59)	0.99	1139.7	20800.00
3	123.62	30.41	0.582	0.60 (0.59)	0.99	1326.2	20700.00
4	121.84	44.44	0.478	0.60 (0.59)	0.99	1873.8	20600.00
5	131.52	53.80	0.430	0.60 (0.59)	0.99	2211.8	20500.00
6	128.95	58.48	0.410	0.60 (0.59)	0.99	2320.8	20400.00
7	122.55	59.79	0.404	0.60 (0.59)	0.99	2333.6	20300.00
8	100.23	66.35	0.390	0.60 (0.59)	0.99	2397.3	20200.00
9	98.19	67.06	0.388	0.60 (0.59)	0.99	2404.1	20210.00
10	91.93	70.60	0.381	0.60 (0.59)	0.99	2449.0	20100.00
11	83.89	77.72	0.365	0.60 (0.59)	0.99	2538.2	13600.00
12	32.34	199.00	0.238	0.60 (0.58)	0.97	3799.3	13510.00
13	32.60	208.34	0.235	0.60 (0.58)	0.97	3837.6	13500.00
TOTAL AREA (ACRES) =			3837.6				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 133.89 Tc (MIN.) = 25.437  
 EFFECTIVE AREA (ACRES) = 1139.66 AREA-AVERAGED Fm (INCH/HR) = 0.59

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 3837.6  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 242.00 DOWNSTREAM(FEET) = 230.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 660.20 CHANNEL SLOPE = 0.0182  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 133.89  
 FLOW VELOCITY(FEET/SEC.) = 5.96 FLOW DEPTH(FEET) = 2.74  
 TRAVEL TIME(MIN.) = 1.85 Tc(MIN.) = 27.28  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	131.20	21.45	0.732	0.60 ( 0.59)	0.99	895.7	20810.00
2	133.89	27.28	0.625	0.60 ( 0.59)	0.99	1139.7	20800.00
3	123.62	32.30	0.566	0.60 ( 0.59)	0.99	1326.2	20700.00
4	121.84	46.34	0.468	0.60 ( 0.59)	0.99	1873.8	20600.00
5	131.52	55.65	0.422	0.60 ( 0.59)	0.99	2211.8	20500.00
6	128.95	60.35	0.403	0.60 ( 0.59)	0.99	2320.8	20400.00
7	122.55	61.67	0.400	0.60 ( 0.59)	0.99	2333.6	20300.00
8	100.23	68.33	0.386	0.60 ( 0.59)	0.99	2397.3	20200.00
9	98.19	69.05	0.384	0.60 ( 0.59)	0.99	2404.1	20210.00
10	91.93	72.63	0.376	0.60 ( 0.59)	0.99	2449.0	20100.00
11	83.89	79.80	0.361	0.60 ( 0.59)	0.99	2538.2	13600.00
12	32.34	201.64	0.237	0.60 ( 0.58)	0.97	3799.3	13510.00
13	32.60	210.97	0.234	0.60 ( 0.58)	0.97	3837.6	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 133.89 Tc(MIN.) = 27.28  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1139.66

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610209T.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.94	22.02	0.60 ( 0.60)	1.00	76.8	20900.00
TOTAL AREA(ACRES) =						76.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	131.20	21.45	0.732	0.60 ( 0.59)	0.99	895.7	20810.00
2	133.89	27.28	0.625	0.60 ( 0.59)	0.99	1139.7	20800.00
3	123.62	32.30	0.566	0.60 ( 0.59)	0.99	1326.2	20700.00
4	121.84	46.34	0.468	0.60 ( 0.59)	0.99	1873.8	20600.00
5	131.52	55.65	0.422	0.60 ( 0.59)	0.99	2211.8	20500.00
6	128.95	60.35	0.403	0.60 ( 0.59)	0.99	2320.8	20400.00
7	122.55	61.67	0.400	0.60 ( 0.59)	0.99	2333.6	20300.00
8	100.23	68.33	0.386	0.60 ( 0.59)	0.99	2397.3	20200.00
9	98.19	69.05	0.384	0.60 ( 0.59)	0.99	2404.1	20210.00
10	91.93	72.63	0.376	0.60 ( 0.59)	0.99	2449.0	20100.00
11	83.89	79.80	0.361	0.60 ( 0.59)	0.99	2538.2	13600.00
12	32.34	201.64	0.237	0.60 ( 0.58)	0.97	3799.3	13510.00
13	32.60	210.97	0.234	0.60 ( 0.58)	0.97	3837.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.94	22.02	0.721	0.60 ( 0.60)	1.00	76.8	20900.00

LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	144.14	21.45	0.732	0.60 ( 0.59)	0.99	970.5	20810.00
2	144.40	22.02	0.721	0.60 ( 0.59)	0.99	996.1	20900.00
3	136.63	27.28	0.625	0.60 ( 0.59)	0.99	1216.4	20800.00
4	123.62	32.30	0.566	0.60 ( 0.59)	0.99	1403.0	20700.00
5	121.84	46.34	0.468	0.60 ( 0.59)	0.99	1950.6	20600.00
6	131.52	55.65	0.422	0.60 ( 0.59)	0.99	2288.5	20500.00
7	128.95	60.35	0.403	0.60 ( 0.59)	0.99	2397.5	20400.00
8	122.55	61.67	0.400	0.60 ( 0.59)	0.99	2410.3	20300.00
9	100.23	68.33	0.386	0.60 ( 0.59)	0.99	2474.0	20200.00
10	98.19	69.05	0.384	0.60 ( 0.59)	0.99	2480.8	20210.00
11	91.93	72.63	0.376	0.60 ( 0.59)	0.99	2525.8	20100.00
12	83.89	79.80	0.361	0.60 ( 0.59)	0.99	2615.0	13600.00
13	32.34	201.64	0.237	0.60 ( 0.58)	0.97	3876.0	13510.00
14	32.60	210.97	0.234	0.60 ( 0.58)	0.97	3914.3	13500.00

TOTAL AREA(ACRES) = 3914.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 144.40 Tc(MIN.) = 22.018  
 EFFECTIVE AREA(ACRES) = 996.12 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 3914.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.613

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 62.32 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.80  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.12  
AVERAGE FLOW DEPTH(FEET) = 3.07 TRAVEL TIME(MIN.) = 6.07  
Tc(MIN.) = 28.09  
SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 0.76  
EFFECTIVE AREA(ACRES) = 1058.44 AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 144.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.07 FLOW VELOCITY(FEET/SEC.) = 5.11  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 144.14 27.53 0.622 0.60( 0.59) 0.99 1032.8 20810.00  
2 144.40 28.09 0.613 0.60( 0.59) 0.99 1058.4 20900.00  
3 136.63 33.44 0.557 0.60( 0.59) 0.99 1278.7 20800.00  
4 123.62 38.62 0.515 0.60( 0.59) 0.99 1465.3 20700.00  
5 121.84 52.68 0.435 0.60( 0.59) 0.99 2012.9 20600.00  
6 131.52 61.88 0.399 0.60( 0.59) 0.99 2350.8 20500.00  
7 128.95 66.60 0.389 0.60( 0.59) 0.99 2459.8 20400.00  
8 122.55 68.02 0.386 0.60( 0.59) 0.99 2472.6 20300.00  
9 100.23 75.00 0.371 0.60( 0.59) 0.99 2536.3 20200.00  
10 98.19 75.74 0.370 0.60( 0.59) 0.99 2543.1 20210.00  
11 91.93 79.43 0.362 0.60( 0.59) 0.99 2588.1 20100.00  
12 83.89 86.75 0.346 0.60( 0.59) 0.99 2677.3 13600.00  
13 32.34 210.47 0.234 0.60( 0.58) 0.97 3938.3 13510.00  
14 32.60 219.81 0.230 0.60( 0.58) 0.97 3976.6 13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 144.40 Tc(MIN.) = 28.09  
AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1058.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 144.40  
FLOW VELOCITY(FEET/SEC.) = 8.97 FLOW DEPTH(FEET) = 2.32  
TRAVEL TIME(MIN.) = 0.31 Tc(MIN.) = 28.40  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 144.14 27.84 0.617 0.60( 0.59) 0.99 1032.8 20810.00  
2 144.40 28.40 0.609 0.60( 0.59) 0.99 1058.4 20900.00  
3 136.63 33.76 0.554 0.60( 0.59) 0.99 1278.7 20800.00  
4 123.62 38.94 0.512 0.60( 0.59) 0.99 1465.3 20700.00  
5 121.84 53.01 0.434 0.60( 0.59) 0.99 2012.9 20600.00  
6 131.52 62.20 0.399 0.60( 0.59) 0.99 2350.8 20500.00  
7 128.95 66.92 0.389 0.60( 0.59) 0.99 2459.8 20400.00  
8 122.55 68.34 0.386 0.60( 0.59) 0.99 2472.6 20300.00  
9 100.23 75.34 0.370 0.60( 0.59) 0.99 2536.3 20200.00  
10 98.19 76.08 0.369 0.60( 0.59) 0.99 2543.1 20210.00  
11 91.93 79.78 0.361 0.60( 0.59) 0.99 2588.1 20100.00  
12 83.89 87.11 0.345 0.60( 0.59) 0.99 2677.3 13600.00  
13 32.34 210.92 0.234 0.60( 0.58) 0.97 3938.3 13510.00  
14 32.60 220.26 0.230 0.60( 0.58) 0.97 3976.6 13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 144.40 Tc(MIN.) = 28.40  
AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1058.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610210T.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:  
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 8.60 22.27 0.60( 0.60) 1.00 82.7 21000.00  
TOTAL AREA(ACRES) = 82.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*  
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
1 144.14 27.84 0.617 0.60( 0.59) 0.99 1032.8 20810.00

2	144.40	28.40	0.609	0.60	( 0.59)	0.99	1058.4	20900.00
3	136.63	33.76	0.554	0.60	( 0.59)	0.99	1278.7	20800.00
4	123.62	38.94	0.512	0.60	( 0.59)	0.99	1465.3	20700.00
5	121.84	53.01	0.434	0.60	( 0.59)	0.99	2012.9	20600.00
6	131.52	62.20	0.399	0.60	( 0.59)	0.99	2350.8	20500.00
7	128.95	66.92	0.389	0.60	( 0.59)	0.99	2459.8	20400.00
8	122.55	68.34	0.386	0.60	( 0.59)	0.99	2472.6	20300.00
9	100.23	75.34	0.370	0.60	( 0.59)	0.99	2536.3	20200.00
10	98.19	76.08	0.369	0.60	( 0.59)	0.99	2543.1	20210.00
11	91.93	79.78	0.361	0.60	( 0.59)	0.99	2588.1	20100.00
12	83.89	87.11	0.345	0.60	( 0.59)	0.99	2677.3	13600.00
13	32.34	210.92	0.234	0.60	( 0.58)	0.97	3938.3	13510.00
14	32.60	220.26	0.230	0.60	( 0.58)	0.97	3976.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.60	22.27	0.715	0.60	( 0.60)	1.00	82.7 21000.00

LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 13684.00 = 4160.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	22.27	0.715	0.60	( 0.59)	0.99	909.2 21000.00
2	145.43	27.84	0.617	0.60	( 0.59)	0.99	1115.5 20810.00
3	145.07	28.40	0.609	0.60	( 0.59)	0.99	1141.1 20900.00
4	136.63	33.76	0.554	0.60	( 0.59)	0.99	1361.4 20800.00
5	123.62	38.94	0.512	0.60	( 0.59)	0.99	1548.0 20700.00
6	121.84	53.01	0.434	0.60	( 0.59)	0.99	2095.6 20600.00
7	131.52	62.20	0.399	0.60	( 0.59)	0.99	2433.6 20500.00
8	128.95	66.92	0.389	0.60	( 0.59)	0.99	2542.5 20400.00
9	122.55	68.34	0.386	0.60	( 0.59)	0.99	2555.3 20300.00
10	100.23	75.34	0.370	0.60	( 0.59)	0.99	2619.0 20200.00
11	98.19	76.08	0.369	0.60	( 0.59)	0.99	2625.9 20210.00
12	91.93	79.78	0.361	0.60	( 0.59)	0.99	2670.8 20100.00
13	83.89	87.11	0.345	0.60	( 0.59)	0.99	2760.0 13600.00
14	32.34	210.92	0.234	0.60	( 0.58)	0.97	4021.1 13510.00
15	32.60	220.26	0.230	0.60	( 0.58)	0.97	4059.3 13500.00

TOTAL AREA (ACRES) = 4059.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 152.74 Tc(MIN.) = 22.275  
 EFFECTIVE AREA(ACRES) = 909.15 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 4059.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13684.00 TO NODE 13685.00 IS CODE = 51  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 200.00 DOWNSTREAM(FEET) = 194.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 122.69 CHANNEL SLOPE = 0.0469  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

CHANNEL FLOW THRU SUBAREA(CFS) = 152.74  
 FLOW VELOCITY(FEET/SEC.) = 8.79 FLOW DEPTH(FEET) = 2.41  
 TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 22.51  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13685.00 = 38984.01 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	22.51	0.711	0.60	( 0.59)	0.99	909.2 21000.00
2	145.43	28.07	0.614	0.60	( 0.59)	0.99	1115.5 20810.00
3	145.07	28.64	0.605	0.60	( 0.59)	0.99	1141.1 20900.00
4	136.63	34.00	0.553	0.60	( 0.59)	0.99	1361.4 20800.00
5	123.62	39.19	0.510	0.60	( 0.59)	0.99	1548.0 20700.00
6	121.84	53.25	0.433	0.60	( 0.59)	0.99	2095.6 20600.00
7	131.52	62.44	0.398	0.60	( 0.59)	0.99	2433.6 20500.00
8	128.95	67.16	0.388	0.60	( 0.59)	0.99	2542.5 20400.00
9	122.55	68.59	0.385	0.60	( 0.59)	0.99	2555.3 20300.00
10	100.23	75.59	0.370	0.60	( 0.59)	0.99	2619.0 20200.00
11	98.19	76.34	0.368	0.60	( 0.59)	0.99	2625.9 20210.00
12	91.93	80.04	0.360	0.60	( 0.59)	0.99	2670.8 20100.00
13	83.89	87.38	0.345	0.60	( 0.59)	0.99	2760.0 13600.00
14	32.34	211.27	0.234	0.60	( 0.58)	0.97	4021.1 13510.00
15	32.60	220.60	0.230	0.60	( 0.58)	0.97	4059.3 13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 152.74 Tc(MIN.) = 22.51  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 909.15

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13685.00 TO NODE 13410.00 IS CODE = 51  
 -----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 194.24 DOWNSTREAM(FEET) = 178.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1843.57 CHANNEL SLOPE = 0.0084  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.597  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 8.39 0.60 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 152.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.61  
 AVERAGE FLOW DEPTH(FEET) = 3.32 TRAVEL TIME(MIN.) = 6.66  
 Tc(MIN.) = 29.17  
 SUBAREA AREA(ACRES) = 8.39 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 917.54 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 4067.7 PEAK FLOW RATE(CFS) = 152.74  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.32 FLOW VELOCITY(FEET/SEC.) = 4.61  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.597	0.60 ( 0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.546	0.60 ( 0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.541	0.60 ( 0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.499	0.60 ( 0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.468	0.60 ( 0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.403	0.60 ( 0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.383	0.60 ( 0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.373	0.60 ( 0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.370	0.60 ( 0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.354	0.60 ( 0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.352	0.60 ( 0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.344	0.60 ( 0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.331	0.60 ( 0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.230	0.60 ( 0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.227	0.60 ( 0.58)	0.97	4067.7	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 152.74 Tc(MIN.) = 29.17  
 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 917.54

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4067.7 TC(MIN.) = 29.17  
 EFFECTIVE AREA(ACRES) = 917.54 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.990  
 PEAK FLOW RATE(CFS) = 152.74

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	152.74	29.17	0.597	0.60 ( 0.59)	0.99	917.5	21000.00
2	145.43	34.81	0.546	0.60 ( 0.59)	0.99	1123.9	20810.00
3	145.07	35.39	0.541	0.60 ( 0.59)	0.99	1149.5	20900.00
4	136.63	40.84	0.499	0.60 ( 0.59)	0.99	1369.8	20800.00
5	123.62	46.22	0.468	0.60 ( 0.59)	0.99	1556.4	20700.00
6	121.84	60.29	0.403	0.60 ( 0.59)	0.99	2104.0	20600.00
7	131.52	69.35	0.383	0.60 ( 0.59)	0.99	2441.9	20500.00
8	128.95	74.11	0.373	0.60 ( 0.59)	0.99	2550.9	20400.00
9	122.55	75.61	0.370	0.60 ( 0.59)	0.99	2563.7	20300.00
10	100.23	82.99	0.354	0.60 ( 0.59)	0.99	2627.4	20200.00
11	98.19	83.76	0.352	0.60 ( 0.59)	0.99	2634.2	20210.00
12	91.93	87.59	0.344	0.60 ( 0.59)	0.99	2679.2	20100.00
13	83.89	95.10	0.331	0.60 ( 0.59)	0.99	2768.4	13600.00
14	32.34	221.10	0.230	0.60 ( 0.58)	0.97	4029.4	13510.00
15	32.60	230.37	0.227	0.60 ( 0.58)	0.97	4067.7	13500.00

=====  
 END OF RATIONAL METHOD ANALYSIS



\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S37.DAT  
TIME/DATE OF STUDY: 08:02 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.802
- 2) 10.00; 1.202
- 3) 15.00; 0.923
- 4) 20.00; 0.761
- 5) 25.00; 0.659
- 6) 30.00; 0.585
- 7) 40.00; 0.503
- 8) 50.00; 0.446
- 9) 60.00; 0.403
- 10) 90.00; 0.338
- 11) 120.00; 0.294
- 12) 180.00; 0.244
- 13) 360.00; 0.178
- 14) 1440.00; 0.078

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 3 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S34.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1205.11	29.80	0.60 ( 0.59)	0.98	3461.7	21000.00
2	1180.16	46.85	0.60 ( 0.59)	0.98	6283.3	20700.00
3	1296.56	67.40	0.60 ( 0.58)	0.98	10910.6	30100.00
4	1124.12	83.63	0.60 ( 0.58)	0.97	14490.0	20200.00
5	1049.19	95.76	0.60 ( 0.58)	0.96	17048.8	13600.00
6	967.92	113.64	0.60 ( 0.58)	0.96	20790.3	13200.00
7	1007.89	136.01	0.60 ( 0.58)	0.96	25043.0	11831.00
8	1097.80	158.60	0.60 ( 0.58)	0.96	29512.9	11530.00
9	1160.26	177.65	0.60 ( 0.58)	0.96	33860.4	11000.00
10	1246.80	199.42	0.60 ( 0.58)	0.97	40869.5	10850.00
11	1159.54	215.48	0.60 ( 0.58)	0.97	44377.8	11220.00
12	926.33	268.67	0.60 ( 0.58)	0.97	52817.9	12410.00
13	874.72	301.90	0.60 ( 0.58)	0.97	58896.1	12261.00
14	857.00	314.89	0.60 ( 0.58)	0.98	60380.9	10410.00
15	839.80	327.16	0.60 ( 0.59)	0.98	61486.7	12101.10
16	801.02	354.80	0.60 ( 0.59)	0.98	63864.5	10200.00
17	781.81	368.31	0.60 ( 0.59)	0.98	64804.1	12010.00
18	738.54	398.01	0.60 ( 0.59)	0.98	65481.5	10210.00
19	677.54	447.74	0.60 ( 0.59)	0.98	65983.2	12000.00
20	636.26	515.18	0.60 ( 0.59)	0.98	66551.6	10100.00

TOTAL AREA(ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1205.11	29.80	0.60 ( 0.59)	0.98	3461.7	21000.00
2	1180.16	46.85	0.60 ( 0.59)	0.98	6283.3	20700.00
3	1296.56	67.40	0.60 ( 0.58)	0.98	10910.6	30100.00
4	1124.12	83.63	0.60 ( 0.58)	0.97	14490.0	20200.00
5	1049.19	95.76	0.60 ( 0.58)	0.96	17048.8	13600.00
6	967.92	113.64	0.60 ( 0.58)	0.96	20790.3	13200.00
7	1007.89	136.01	0.60 ( 0.58)	0.96	25043.0	11831.00
8	1097.80	158.60	0.60 ( 0.58)	0.96	29512.9	11530.00
9	1160.26	177.65	0.60 ( 0.58)	0.96	33860.4	11000.00
10	1246.80	199.42	0.60 ( 0.58)	0.97	40869.5	10850.00
11	1159.54	215.48	0.60 ( 0.58)	0.97	44377.8	11220.00
12	926.33	268.67	0.60 ( 0.58)	0.97	52817.9	12410.00
13	874.72	301.90	0.60 ( 0.58)	0.97	58896.1	12261.00
14	857.00	314.89	0.60 ( 0.58)	0.98	60380.9	10410.00
15	839.80	327.16	0.60 ( 0.59)	0.98	61486.7	12101.10
16	801.02	354.80	0.60 ( 0.59)	0.98	63864.5	10200.00
17	781.81	368.31	0.60 ( 0.59)	0.98	64804.1	12010.00
18	738.54	398.01	0.60 ( 0.59)	0.98	65481.5	10210.00

19 677.54 447.74 0.60( 0.59) 0.98 65983.2 12000.00  
20 636.26 515.18 0.60( 0.59) 0.98 66551.6 10100.00  
TOTAL AREA(ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13701.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 170.00 DOWNSTREAM(FEET) = 167.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.11 CHANNEL SLOPE = 0.0015  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1296.56  
FLOW VELOCITY(FEET/SEC.) = 5.08 FLOW DEPTH(FEET) = 9.22  
TRAVEL TIME(MIN.) = 5.57 Tc(MIN.) = 72.97  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1205.11	35.48	0.540	0.60( 0.59)	0.98	3461.7	21000.00
2	1180.16	52.56	0.435	0.60( 0.59)	0.98	6283.3	20700.00
3	1296.56	72.97	0.375	0.60( 0.58)	0.98	10910.6	30100.00
4	1124.12	89.41	0.339	0.60( 0.58)	0.97	14490.0	20200.00
5	1049.19	101.64	0.321	0.60( 0.58)	0.96	17048.8	13600.00
6	967.92	119.63	0.295	0.60( 0.58)	0.96	20790.3	13200.00
7	1007.89	141.94	0.276	0.60( 0.58)	0.96	25043.0	11831.00
8	1097.80	164.41	0.257	0.60( 0.58)	0.96	29512.9	11530.00
9	1160.26	183.37	0.243	0.60( 0.58)	0.96	33860.4	11000.00
10	1246.80	205.05	0.235	0.60( 0.58)	0.97	40869.5	10850.00
11	1159.54	221.21	0.229	0.60( 0.58)	0.97	44377.8	11220.00
12	926.33	274.73	0.209	0.60( 0.58)	0.97	52817.9	12410.00
13	874.72	308.04	0.197	0.60( 0.58)	0.97	58896.1	12261.00
14	857.00	321.07	0.192	0.60( 0.58)	0.98	60380.9	10410.00
15	839.80	333.38	0.188	0.60( 0.59)	0.98	61486.7	12101.10
16	801.02	361.09	0.178	0.60( 0.59)	0.98	63864.5	10200.00
17	781.81	374.63	0.177	0.60( 0.59)	0.98	64804.1	12010.00
18	738.54	404.43	0.174	0.60( 0.59)	0.98	65481.5	10210.00
19	677.54	454.30	0.169	0.60( 0.59)	0.98	65983.2	12000.00
20	636.26	521.84	0.163	0.60( 0.59)	0.98	66551.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1296.56 Tc(MIN.) = 72.97  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 10910.58

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509102T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.41	29.68	0.60( 0.52)	0.87	167.7	10200.00

TOTAL AREA(ACRES) = 167.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1205.11	35.48	0.540	0.60( 0.59)	0.98	3461.7	21000.00
2	1180.16	52.56	0.435	0.60( 0.59)	0.98	6283.3	20700.00
3	1296.56	72.97	0.375	0.60( 0.58)	0.98	10910.6	30100.00
4	1124.12	89.41	0.339	0.60( 0.58)	0.97	14490.0	20200.00
5	1049.19	101.64	0.321	0.60( 0.58)	0.96	17048.8	13600.00
6	967.92	119.63	0.295	0.60( 0.58)	0.96	20790.3	13200.00
7	1007.89	141.94	0.276	0.60( 0.58)	0.96	25043.0	11831.00
8	1097.80	164.41	0.257	0.60( 0.58)	0.96	29512.9	11530.00
9	1160.26	183.37	0.243	0.60( 0.58)	0.96	33860.4	11000.00
10	1246.80	205.05	0.235	0.60( 0.58)	0.97	40869.5	10850.00
11	1159.54	221.21	0.229	0.60( 0.58)	0.97	44377.8	11220.00
12	926.33	274.73	0.209	0.60( 0.58)	0.97	52817.9	12410.00
13	874.72	308.04	0.197	0.60( 0.58)	0.97	58896.1	12261.00
14	857.00	321.07	0.192	0.60( 0.58)	0.98	60380.9	10410.00
15	839.80	333.38	0.188	0.60( 0.59)	0.98	61486.7	12101.10
16	801.02	361.09	0.178	0.60( 0.59)	0.98	63864.5	10200.00
17	781.81	374.63	0.177	0.60( 0.59)	0.98	64804.1	12010.00
18	738.54	404.43	0.174	0.60( 0.59)	0.98	65481.5	10210.00
19	677.54	454.30	0.169	0.60( 0.59)	0.98	65983.2	12000.00
20	636.26	521.84	0.163	0.60( 0.59)	0.98	66551.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	17.41	29.68	0.590	0.60( 0.52)	0.87	167.7	10200.00

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 13701.00 = 9099.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1118.23	29.68	0.590	0.60( 0.59)	0.98	3063.3	10200.00
2	1221.05	35.48	0.540	0.60( 0.59)	0.98	3629.3	21000.00
3	1193.01	52.56	0.435	0.60( 0.59)	0.98	6451.0	20700.00
4	1307.63	72.97	0.375	0.60( 0.58)	0.97	11078.2	30100.00
5	1134.14	89.41	0.339	0.60( 0.58)	0.97	14657.6	20200.00
6	1058.67	101.64	0.321	0.60( 0.58)	0.96	17216.5	13600.00
7	976.62	119.63	0.295	0.60( 0.58)	0.96	20958.0	13200.00
8	1016.03	141.94	0.276	0.60( 0.57)	0.96	25210.7	11831.00
9	1105.38	164.41	0.257	0.60( 0.58)	0.96	29680.5	11530.00
10	1167.43	183.37	0.243	0.60( 0.58)	0.96	34028.0	11000.00
11	1253.73	205.05	0.235	0.60( 0.58)	0.97	41037.2	10850.00

12	1166.30	221.21	0.229	0.60	( 0.58)	0.97	44545.4	11220.00
13	932.50	274.73	0.209	0.60	( 0.58)	0.97	52985.5	12410.00
14	880.53	308.04	0.197	0.60	( 0.58)	0.97	59063.8	12261.00
15	862.68	321.07	0.192	0.60	( 0.58)	0.98	60548.6	10410.00
16	845.35	333.38	0.188	0.60	( 0.59)	0.98	61654.3	12101.10
17	806.27	361.09	0.178	0.60	( 0.59)	0.98	64032.1	10200.00
18	787.02	374.63	0.177	0.60	( 0.59)	0.98	64971.8	12010.00
19	743.67	404.43	0.174	0.60	( 0.59)	0.98	65649.2	10210.00
20	682.54	454.30	0.169	0.60	( 0.59)	0.98	66150.9	12000.00
21	641.08	521.84	0.163	0.60	( 0.59)	0.98	66719.3	10100.00

TOTAL AREA (ACRES) = 66719.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1307.63 Tc(MIN.) = 72.967  
EFFECTIVE AREA(ACRES) = 11078.25 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 66719.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

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FLOW PROCESS FROM NODE 13701.00 TO NODE 13720.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 167.50 DOWNSTREAM(FEET) = 165.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 192.72 CHANNEL SLOPE = 0.0103  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1307.63  
FLOW VELOCITY(FEET/SEC.) = 10.58 FLOW DEPTH(FEET) = 6.42  
TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 73.27  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13720.00 = 126443.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1118.23	29.99	0.585	0.60 ( 0.59)	0.98	3063.3	10200.00
2	1221.05	35.79	0.538	0.60 ( 0.59)	0.98	3629.3	21000.00
3	1193.01	52.87	0.434	0.60 ( 0.59)	0.98	6451.0	20700.00
4	1307.63	73.27	0.374	0.60 ( 0.58)	0.97	11078.2	30100.00
5	1134.14	89.72	0.339	0.60 ( 0.58)	0.97	14657.6	20200.00
6	1058.67	101.96	0.320	0.60 ( 0.58)	0.96	17216.5	13600.00
7	976.62	119.96	0.294	0.60 ( 0.58)	0.96	20958.0	13200.00
8	1016.03	142.27	0.275	0.60 ( 0.57)	0.96	25210.7	11831.00
9	1105.38	164.72	0.257	0.60 ( 0.58)	0.96	29680.5	11530.00
10	1167.43	183.69	0.243	0.60 ( 0.58)	0.96	34028.0	11000.00
11	1253.73	205.36	0.235	0.60 ( 0.58)	0.97	41037.2	10850.00
12	1166.30	221.52	0.229	0.60 ( 0.58)	0.97	44545.4	11220.00
13	932.50	275.06	0.209	0.60 ( 0.58)	0.97	52985.5	12410.00
14	880.53	308.38	0.197	0.60 ( 0.58)	0.97	59063.8	12261.00
15	862.68	321.40	0.192	0.60 ( 0.58)	0.98	60548.6	10410.00
16	845.35	333.72	0.188	0.60 ( 0.59)	0.98	61654.3	12101.10
17	806.27	361.43	0.178	0.60 ( 0.59)	0.98	64032.1	10200.00
18	787.02	374.97	0.177	0.60 ( 0.59)	0.98	64971.8	12010.00
19	743.67	404.78	0.174	0.60 ( 0.59)	0.98	65649.2	10210.00
20	682.54	454.65	0.169	0.60 ( 0.59)	0.98	66150.9	12000.00
21	641.08	522.20	0.163	0.60 ( 0.59)	0.98	66719.3	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 1307.63 Tc(MIN.) = 73.27  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 11078.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 165.51 DOWNSTREAM(FEET) = 161.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2042.40 CHANNEL SLOPE = 0.0019  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1307.63  
FLOW VELOCITY(FEET/SEC.) = 5.61 FLOW DEPTH(FEET) = 8.82  
TRAVEL TIME(MIN.) = 6.07 Tc(MIN.) = 79.34  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1118.23	36.30	0.533	0.60 ( 0.59)	0.98	3063.3	10200.00
2	1221.05	41.97	0.492	0.60 ( 0.59)	0.98	3629.3	21000.00
3	1193.01	59.08	0.407	0.60 ( 0.59)	0.98	6451.0	20700.00
4	1307.63	79.34	0.361	0.60 ( 0.58)	0.97	11078.2	30100.00
5	1134.14	96.01	0.329	0.60 ( 0.58)	0.97	14657.6	20200.00
6	1058.67	108.36	0.311	0.60 ( 0.58)	0.96	17216.5	13600.00
7	976.62	126.50	0.289	0.60 ( 0.58)	0.96	20958.0	13200.00
8	1016.03	148.73	0.270	0.60 ( 0.57)	0.96	25210.7	11831.00
9	1105.38	171.06	0.251	0.60 ( 0.58)	0.96	29680.5	11530.00
10	1167.43	189.93	0.240	0.60 ( 0.58)	0.96	34028.0	11000.00
11	1253.73	211.50	0.232	0.60 ( 0.58)	0.97	41037.2	10850.00
12	1166.30	227.77	0.226	0.60 ( 0.58)	0.97	44545.4	11220.00
13	932.50	281.67	0.207	0.60 ( 0.58)	0.97	52985.5	12410.00
14	880.53	315.09	0.194	0.60 ( 0.58)	0.97	59063.8	12261.00
15	862.68	328.14	0.190	0.60 ( 0.58)	0.98	60548.6	10410.00
16	845.35	340.49	0.185	0.60 ( 0.59)	0.98	61654.3	12101.10
17	806.27	368.28	0.177	0.60 ( 0.59)	0.98	64032.1	10200.00
18	787.02	381.87	0.176	0.60 ( 0.59)	0.98	64971.8	12010.00
19	743.67	411.77	0.173	0.60 ( 0.59)	0.98	65649.2	10210.00
20	682.54	461.80	0.169	0.60 ( 0.59)	0.98	66150.9	12000.00
21	641.08	529.46	0.162	0.60 ( 0.59)	0.98	66719.3	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 1307.63 Tc(MIN.) = 79.34  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 11078.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<

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FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509103T.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	35.43	32.96	0.60 ( 0.57)	0.95	474.8	10300.00
TOTAL AREA (ACRES) = 474.8						

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FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1118.23	36.30	0.533	0.60 ( 0.59)	0.98	3063.3	10200.00
2	1221.05	41.97	0.492	0.60 ( 0.59)	0.98	3629.3	21000.00
3	1193.01	59.08	0.407	0.60 ( 0.59)	0.98	6451.0	20700.00
4	1307.63	79.34	0.361	0.60 ( 0.58)	0.97	11078.2	30100.00
5	1134.14	96.01	0.329	0.60 ( 0.58)	0.97	14657.6	20200.00
6	1058.67	108.36	0.311	0.60 ( 0.58)	0.96	17216.5	13600.00
7	976.62	126.50	0.289	0.60 ( 0.58)	0.96	20958.0	13200.00
8	1016.03	148.73	0.270	0.60 ( 0.57)	0.96	25210.7	11831.00
9	1105.38	171.06	0.251	0.60 ( 0.58)	0.96	29680.5	11530.00
10	1167.43	189.93	0.240	0.60 ( 0.58)	0.96	34028.0	11000.00
11	1253.73	211.50	0.232	0.60 ( 0.58)	0.97	41037.2	10850.00
12	1166.30	227.77	0.226	0.60 ( 0.58)	0.97	44545.4	11220.00
13	932.50	281.67	0.207	0.60 ( 0.58)	0.97	52985.5	12410.00
14	880.53	315.09	0.194	0.60 ( 0.58)	0.97	59063.8	12261.00
15	862.68	328.14	0.190	0.60 ( 0.58)	0.98	60548.6	10410.00
16	845.35	340.49	0.185	0.60 ( 0.59)	0.98	61654.3	12101.10
17	806.27	368.28	0.177	0.60 ( 0.59)	0.98	64032.1	10200.00
18	787.02	381.87	0.176	0.60 ( 0.59)	0.98	64971.8	12010.00
19	743.67	411.77	0.173	0.60 ( 0.59)	0.98	65649.2	10210.00
20	682.54	461.80	0.169	0.60 ( 0.59)	0.98	66150.9	12000.00
21	641.08	529.46	0.162	0.60 ( 0.59)	0.98	66719.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	35.43	32.96	0.561	0.60 ( 0.57)	0.95	474.8	10300.00

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 13740.00 = 8072.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1102.80	32.96	0.561	0.60 ( 0.58)	0.97	3255.6	10300.00
2	1151.93	36.30	0.533	0.60 ( 0.58)	0.97	3538.1	10200.00
3	1252.13	41.97	0.492	0.60 ( 0.58)	0.97	4104.1	21000.00
4	1218.72	59.08	0.407	0.60 ( 0.58)	0.97	6925.7	20700.00
5	1330.45	79.34	0.361	0.60 ( 0.58)	0.97	11553.0	30100.00
6	1154.94	96.01	0.329	0.60 ( 0.58)	0.97	15132.4	20200.00
7	1078.32	108.36	0.311	0.60 ( 0.58)	0.96	17691.3	13600.00
8	994.85	126.50	0.289	0.60 ( 0.57)	0.96	21432.8	13200.00

9	1033.09	148.73	0.270	0.60 ( 0.57)	0.96	25685.4	11831.00
10	1121.27	171.06	0.251	0.60 ( 0.58)	0.96	30155.3	11530.00
11	1182.61	189.93	0.240	0.60 ( 0.58)	0.96	34502.8	11000.00
12	1268.42	211.50	0.232	0.60 ( 0.58)	0.97	41512.0	10850.00
13	1180.61	227.77	0.226	0.60 ( 0.58)	0.97	45020.2	11220.00
14	945.57	281.67	0.207	0.60 ( 0.58)	0.97	53460.3	12410.00
15	892.82	315.09	0.194	0.60 ( 0.58)	0.97	59538.6	12261.00
16	874.66	328.14	0.190	0.60 ( 0.58)	0.97	61023.3	10410.00
17	857.05	340.49	0.185	0.60 ( 0.58)	0.98	62129.1	12101.10
18	817.47	368.28	0.177	0.60 ( 0.59)	0.98	64506.9	10200.00
19	798.14	381.87	0.176	0.60 ( 0.59)	0.98	65446.5	12010.00
20	754.62	411.77	0.173	0.60 ( 0.59)	0.98	66124.0	10210.00
21	693.19	461.80	0.169	0.60 ( 0.59)	0.98	66625.7	12000.00
22	651.33	529.46	0.162	0.60 ( 0.59)	0.98	67194.1	10100.00
TOTAL AREA (ACRES) = 67194.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1330.45 Tc (MIN.) = 79.342  
EFFECTIVE AREA (ACRES) = 11553.00 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 67194.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

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FLOW PROCESS FROM NODE 13740.00 TO NODE 13741.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 161.63 DOWNSTREAM (FEET) = 141.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 389.20 CHANNEL SLOPE = 0.0530  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 1330.45  
FLOW VELOCITY (FEET/SEC.) = 19.61 FLOW DEPTH (FEET) = 4.76  
TRAVEL TIME (MIN.) = 0.33 Tc (MIN.) = 79.67  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13741.00 = 128875.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1102.80	33.30	0.558	0.60 ( 0.58)	0.97	3255.6	10300.00
2	1151.93	36.65	0.530	0.60 ( 0.58)	0.97	3538.1	10200.00
3	1252.13	42.30	0.490	0.60 ( 0.58)	0.97	4104.1	21000.00
4	1218.72	59.42	0.406	0.60 ( 0.58)	0.97	6925.7	20700.00
5	1330.45	79.67	0.360	0.60 ( 0.58)	0.97	11553.0	30100.00
6	1154.94	96.36	0.329	0.60 ( 0.58)	0.97	15132.4	20200.00
7	1078.32	108.70	0.311	0.60 ( 0.58)	0.96	17691.3	13600.00
8	994.85	126.85	0.288	0.60 ( 0.57)	0.96	21432.8	13200.00
9	1033.09	149.09	0.270	0.60 ( 0.57)	0.96	25685.4	11831.00
10	1121.27	171.40	0.251	0.60 ( 0.58)	0.96	30155.3	11530.00
11	1182.61	190.27	0.240	0.60 ( 0.58)	0.96	34502.8	11000.00
12	1268.42	211.83	0.232	0.60 ( 0.58)	0.97	41512.0	10850.00
13	1180.61	228.11	0.226	0.60 ( 0.58)	0.97	45020.2	11220.00
14	945.57	282.03	0.207	0.60 ( 0.58)	0.97	53460.3	12410.00
15	892.82	315.45	0.194	0.60 ( 0.58)	0.97	59538.6	12261.00
16	874.66	328.51	0.190	0.60 ( 0.58)	0.97	61023.3	10410.00
17	857.05	340.86	0.185	0.60 ( 0.58)	0.98	62129.1	12101.10

18	817.47	368.66	0.177	0.60	(0.59)	0.98	64506.9	10200.00
19	798.14	382.24	0.176	0.60	(0.59)	0.98	65446.5	12010.00
20	754.62	412.15	0.173	0.60	(0.59)	0.98	66124.0	10210.00
21	693.19	462.19	0.169	0.60	(0.59)	0.98	66625.7	12000.00
22	651.33	529.85	0.162	0.60	(0.59)	0.98	67194.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1330.45 Tc(MIN.) = 79.67  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 11553.00

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13741.00 TO NODE 13802.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 141.00 DOWNSTREAM(FEET) = 135.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1533.41 CHANNEL SLOPE = 0.0039  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1330.45  
 FLOW VELOCITY(FEET/SEC.) = 7.39 FLOW DEPTH(FEET) = 7.75  
 TRAVEL TIME(MIN.) = 3.46 Tc(MIN.) = 83.13  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1102.80	36.93	0.528	0.60 (0.58)	0.97	3255.6	10300.00
2	1151.93	40.24	0.502	0.60 (0.58)	0.97	3538.1	10200.00
3	1252.13	45.82	0.470	0.60 (0.58)	0.97	4104.1	21000.00
4	1218.72	62.96	0.397	0.60 (0.58)	0.97	6925.7	20700.00
5	1330.45	83.13	0.353	0.60 (0.58)	0.97	11553.0	30100.00
6	1154.94	99.94	0.323	0.60 (0.58)	0.97	15132.4	20200.00
7	1078.32	112.35	0.305	0.60 (0.58)	0.96	17691.3	13600.00
8	994.85	130.58	0.285	0.60 (0.57)	0.96	21432.8	13200.00
9	1033.09	152.78	0.267	0.60 (0.57)	0.96	25685.4	11831.00
10	1121.27	175.01	0.248	0.60 (0.58)	0.96	30155.3	11530.00
11	1182.61	193.84	0.239	0.60 (0.58)	0.96	34502.8	11000.00
12	1268.42	215.33	0.231	0.60 (0.58)	0.97	41512.0	10850.00
13	1180.61	231.68	0.225	0.60 (0.58)	0.97	45020.2	11220.00
14	945.57	285.80	0.205	0.60 (0.58)	0.97	53460.3	12410.00
15	892.82	319.27	0.193	0.60 (0.58)	0.97	59538.6	12261.00
16	874.66	332.35	0.188	0.60 (0.58)	0.97	61023.3	10410.00
17	857.05	344.73	0.184	0.60 (0.58)	0.98	62129.1	12101.10
18	817.47	372.57	0.177	0.60 (0.59)	0.98	64506.9	10200.00
19	798.14	386.18	0.176	0.60 (0.59)	0.98	65446.5	12010.00
20	754.62	416.14	0.173	0.60 (0.59)	0.98	66124.0	10210.00
21	693.19	466.26	0.168	0.60 (0.59)	0.98	66625.7	12000.00
22	651.33	533.99	0.162	0.60 (0.59)	0.98	67194.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1330.45 Tc(MIN.) = 83.13  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 11553.00

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509104T.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.76	57.28	0.60 (0.56)	0.94	599.8	10400.00
TOTAL AREA(ACRES) =						599.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1102.80	36.93	0.528	0.60 (0.58)	0.97	3255.6	10300.00
2	1151.93	40.24	0.502	0.60 (0.58)	0.97	3538.1	10200.00
3	1252.13	45.82	0.470	0.60 (0.58)	0.97	4104.1	21000.00
4	1218.72	62.96	0.397	0.60 (0.58)	0.97	6925.7	20700.00
5	1330.45	83.13	0.353	0.60 (0.58)	0.97	11553.0	30100.00
6	1154.94	99.94	0.323	0.60 (0.58)	0.97	15132.4	20200.00
7	1078.32	112.35	0.305	0.60 (0.58)	0.96	17691.3	13600.00
8	994.85	130.58	0.285	0.60 (0.57)	0.96	21432.8	13200.00
9	1033.09	152.78	0.267	0.60 (0.57)	0.96	25685.4	11831.00
10	1121.27	175.01	0.248	0.60 (0.58)	0.96	30155.3	11530.00
11	1182.61	193.84	0.239	0.60 (0.58)	0.96	34502.8	11000.00
12	1268.42	215.33	0.231	0.60 (0.58)	0.97	41512.0	10850.00
13	1180.61	231.68	0.225	0.60 (0.58)	0.97	45020.2	11220.00
14	945.57	285.80	0.205	0.60 (0.58)	0.97	53460.3	12410.00
15	892.82	319.27	0.193	0.60 (0.58)	0.97	59538.6	12261.00
16	874.66	332.35	0.188	0.60 (0.58)	0.97	61023.3	10410.00
17	857.05	344.73	0.184	0.60 (0.58)	0.98	62129.1	12101.10
18	817.47	372.57	0.177	0.60 (0.59)	0.98	64506.9	10200.00
19	798.14	386.18	0.176	0.60 (0.59)	0.98	65446.5	12010.00
20	754.62	416.14	0.173	0.60 (0.59)	0.98	66124.0	10210.00
21	693.19	466.26	0.168	0.60 (0.59)	0.98	66625.7	12000.00
22	651.33	533.99	0.162	0.60 (0.59)	0.98	67194.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.76	57.28	0.415	0.60 (0.56)	0.94	599.8	10400.00

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 13802.00 = 12273.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1114.10	36.93	0.528	0.60 (0.58)	0.97	3642.3	10300.00

2	1163.62	40.24	0.502	0.60	(0.58)	0.97	3959.4	10200.00
3	1264.59	45.82	0.470	0.60	(0.58)	0.97	4583.8	21000.00
4	1243.54	57.28	0.415	0.60	(0.58)	0.97	6590.7	10400.00
5	1231.88	62.96	0.397	0.60	(0.58)	0.97	7525.5	20700.00
6	1342.15	83.13	0.353	0.60	(0.58)	0.97	12152.8	30100.00
7	1165.67	99.94	0.323	0.60	(0.58)	0.97	15732.2	20200.00
8	1088.45	112.35	0.305	0.60	(0.58)	0.96	18291.1	13600.00
9	1004.31	130.58	0.285	0.60	(0.57)	0.96	22032.5	13200.00
10	1041.94	152.78	0.267	0.60	(0.57)	0.96	26285.2	11831.00
11	1129.50	175.01	0.248	0.60	(0.58)	0.96	30755.1	11530.00
12	1190.54	193.84	0.239	0.60	(0.58)	0.96	35102.6	11000.00
13	1276.08	215.33	0.231	0.60	(0.58)	0.97	42111.7	10850.00
14	1188.07	231.68	0.225	0.60	(0.58)	0.97	45620.0	11220.00
15	952.37	285.80	0.205	0.60	(0.58)	0.97	54060.1	12410.00
16	899.22	319.27	0.193	0.60	(0.58)	0.97	60138.3	12261.00
17	880.90	332.35	0.188	0.60	(0.58)	0.97	61623.1	10410.00
18	863.14	344.73	0.184	0.60	(0.58)	0.98	62728.9	12101.10
19	823.34	372.57	0.177	0.60	(0.59)	0.98	65106.7	10200.00
20	803.97	386.18	0.176	0.60	(0.59)	0.98	66046.3	12010.00
21	760.35	416.14	0.173	0.60	(0.59)	0.98	66723.7	10210.00
22	698.77	466.26	0.168	0.60	(0.59)	0.98	67225.5	12000.00
23	656.70	533.99	0.162	0.60	(0.59)	0.98	67793.9	10100.00

TOTAL AREA (ACRES) = 67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1342.15 Tc (MIN.) = 83.133  
EFFECTIVE AREA (ACRES) = 12152.78 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 67793.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 135.00 DOWNSTREAM (FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 207.23 CHANNEL SLOPE = 0.0097  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 1342.15  
FLOW VELOCITY (FEET/SEC.) = 10.38 FLOW DEPTH (FEET) = 6.57  
TRAVEL TIME (MIN.) = 0.33 Tc (MIN.) = 83.47  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1114.10	37.28	0.525	0.60 (0.58)	0.97	3642.3	10300.00
2	1163.62	40.58	0.500	0.60 (0.58)	0.97	3959.4	10200.00
3	1264.59	46.16	0.468	0.60 (0.58)	0.97	4583.8	21000.00
4	1243.54	57.62	0.413	0.60 (0.58)	0.97	6590.7	10400.00
5	1231.88	63.30	0.396	0.60 (0.58)	0.97	7525.5	20700.00
6	1342.15	83.47	0.352	0.60 (0.58)	0.97	12152.8	30100.00
7	1165.67	100.29	0.323	0.60 (0.58)	0.97	15732.2	20200.00
8	1088.45	112.70	0.305	0.60 (0.58)	0.96	18291.1	13600.00
9	1004.31	130.94	0.285	0.60 (0.57)	0.96	22032.5	13200.00

10	1041.94	153.13	0.266	0.60	(0.57)	0.96	26285.2	11831.00
11	1129.50	175.36	0.248	0.60	(0.58)	0.96	30755.1	11530.00
12	1190.54	194.19	0.239	0.60	(0.58)	0.96	35102.6	11000.00
13	1276.08	215.67	0.231	0.60	(0.58)	0.97	42111.7	10850.00
14	1188.07	232.03	0.225	0.60	(0.58)	0.97	45620.0	11220.00
15	952.37	286.17	0.205	0.60	(0.58)	0.97	54060.1	12410.00
16	899.22	319.64	0.193	0.60	(0.58)	0.97	60138.3	12261.00
17	880.90	332.72	0.188	0.60	(0.58)	0.97	61623.1	10410.00
18	863.14	345.10	0.183	0.60	(0.58)	0.98	62728.9	12101.10
19	823.34	372.94	0.177	0.60	(0.59)	0.98	65106.7	10200.00
20	803.97	386.55	0.176	0.60	(0.59)	0.98	66046.3	12010.00
21	760.35	416.52	0.173	0.60	(0.59)	0.98	66723.7	10210.00
22	698.77	466.65	0.168	0.60	(0.59)	0.98	67225.5	12000.00
23	656.70	534.39	0.162	0.60	(0.59)	0.98	67793.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1342.15 Tc (MIN.) = 83.47  
AREA-AVERAGED Fm (INCH/HR) = 0.58 AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA (ACRES) = 12152.78

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 67793.9 TC (MIN.) = 83.47  
EFFECTIVE AREA (ACRES) = 12152.78 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.971  
PEAK FLOW RATE (CFS) = 1342.15

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1114.10	37.28	0.525	0.60 (0.58)	0.97	3642.3	10300.00
2	1163.62	40.58	0.500	0.60 (0.58)	0.97	3959.4	10200.00
3	1264.59	46.16	0.468	0.60 (0.58)	0.97	4583.8	21000.00
4	1243.54	57.62	0.413	0.60 (0.58)	0.97	6590.7	10400.00
5	1231.88	63.30	0.396	0.60 (0.58)	0.97	7525.5	20700.00
6	1342.15	83.47	0.352	0.60 (0.58)	0.97	12152.8	30100.00
7	1165.67	100.29	0.323	0.60 (0.58)	0.97	15732.2	20200.00
8	1088.45	112.70	0.305	0.60 (0.58)	0.96	18291.1	13600.00
9	1004.31	130.94	0.285	0.60 (0.57)	0.96	22032.5	13200.00
10	1041.94	153.13	0.266	0.60 (0.57)	0.96	26285.2	11831.00
11	1129.50	175.36	0.248	0.60 (0.58)	0.96	30755.1	11530.00
12	1190.54	194.19	0.239	0.60 (0.58)	0.96	35102.6	11000.00
13	1276.08	215.67	0.231	0.60 (0.58)	0.97	42111.7	10850.00
14	1188.07	232.03	0.225	0.60 (0.58)	0.97	45620.0	11220.00
15	952.37	286.17	0.205	0.60 (0.58)	0.97	54060.1	12410.00
16	899.22	319.64	0.193	0.60 (0.58)	0.97	60138.3	12261.00
17	880.90	332.72	0.188	0.60 (0.58)	0.97	61623.1	10410.00
18	863.14	345.10	0.183	0.60 (0.58)	0.98	62728.9	12101.10
19	823.34	372.94	0.177	0.60 (0.59)	0.98	65106.7	10200.00
20	803.97	386.55	0.176	0.60 (0.59)	0.98	66046.3	12010.00
21	760.35	416.52	0.173	0.60 (0.59)	0.98	66723.7	10210.00
22	698.77	466.65	0.168	0.60 (0.59)	0.98	67225.5	12000.00
23	656.70	534.39	0.162	0.60 (0.59)	0.98	67793.9	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S38.DAT  
TIME/DATE OF STUDY: 08:06 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.798
- 2) 10.00; 1.199
- 3) 15.00; 0.922
- 4) 20.00; 0.760
- 5) 25.00; 0.658
- 6) 30.00; 0.584
- 7) 40.00; 0.503
- 8) 50.00; 0.446
- 9) 60.00; 0.402
- 10) 90.00; 0.337
- 11) 120.00; 0.293
- 12) 180.00; 0.244
- 13) 360.00; 0.177
- 14) 1440.00; 0.077

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	HEIGHT (FT)	GUTTER GEOMETRIES WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S37.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1264.59	46.16	0.60 ( 0.58)	0.97	4583.8	21000.00
2	1243.54	57.62	0.60 ( 0.58)	0.97	6590.7	10400.00
3	1342.15	83.47	0.60 ( 0.58)	0.97	12152.8	30100.00
4	1165.67	100.29	0.60 ( 0.58)	0.97	15732.2	20200.00
5	1088.45	112.70	0.60 ( 0.58)	0.96	18291.1	13600.00
6	1004.31	130.94	0.60 ( 0.57)	0.96	22032.5	13200.00
7	1041.94	153.13	0.60 ( 0.57)	0.96	26285.2	11831.00
8	1129.50	175.36	0.60 ( 0.58)	0.96	30755.1	11530.00
9	1190.54	194.19	0.60 ( 0.58)	0.96	35102.6	11000.00
10	1276.08	215.67	0.60 ( 0.58)	0.97	42111.7	10850.00
11	1188.07	232.03	0.60 ( 0.58)	0.97	45620.0	11220.00
12	952.37	286.17	0.60 ( 0.58)	0.97	54060.1	12410.00
13	899.22	319.64	0.60 ( 0.58)	0.97	60138.3	12261.00
14	880.90	332.72	0.60 ( 0.58)	0.97	61623.1	10410.00
15	863.14	345.10	0.60 ( 0.58)	0.98	62728.9	12101.10
16	823.34	372.94	0.60 ( 0.59)	0.98	65106.7	10200.00
17	803.97	386.55	0.60 ( 0.59)	0.98	66046.3	12010.00
18	760.35	416.52	0.60 ( 0.59)	0.98	66723.7	10210.00
19	698.77	466.65	0.60 ( 0.59)	0.98	67225.5	12000.00
20	656.70	534.39	0.60 ( 0.59)	0.98	67793.9	10100.00

TOTAL AREA(ACRES) = 67793.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1264.59	46.16	0.60 ( 0.58)	0.97	4583.8	21000.00
2	1243.54	57.62	0.60 ( 0.58)	0.97	6590.7	10400.00
3	1342.15	83.47	0.60 ( 0.58)	0.97	12152.8	30100.00
4	1165.67	100.29	0.60 ( 0.58)	0.97	15732.2	20200.00
5	1088.45	112.70	0.60 ( 0.58)	0.96	18291.1	13600.00
6	1004.31	130.94	0.60 ( 0.57)	0.96	22032.5	13200.00
7	1041.94	153.13	0.60 ( 0.57)	0.96	26285.2	11831.00
8	1129.50	175.36	0.60 ( 0.58)	0.96	30755.1	11530.00
9	1190.54	194.19	0.60 ( 0.58)	0.96	35102.6	11000.00
10	1276.08	215.67	0.60 ( 0.58)	0.97	42111.7	10850.00
11	1188.07	232.03	0.60 ( 0.58)	0.97	45620.0	11220.00
12	952.37	286.17	0.60 ( 0.58)	0.97	54060.1	12410.00
13	899.22	319.64	0.60 ( 0.58)	0.97	60138.3	12261.00
14	880.90	332.72	0.60 ( 0.58)	0.97	61623.1	10410.00
15	863.14	345.10	0.60 ( 0.58)	0.98	62728.9	12101.10
16	823.34	372.94	0.60 ( 0.59)	0.98	65106.7	10200.00
17	803.97	386.55	0.60 ( 0.59)	0.98	66046.3	12010.00
18	760.35	416.52	0.60 ( 0.59)	0.98	66723.7	10210.00



19 698.77 466.65 0.60( 0.59) 0.98 67225.5 12000.00  
20 656.70 534.39 0.60( 0.59) 0.98 67793.9 10100.00  
TOTAL AREA(ACRES) = 67793.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 140.00 DOWNSTREAM(FEET) = 137.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.91 CHANNEL SLOPE = 0.0032  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.346

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.70	0.60	0.983	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.983

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1342.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.89

AVERAGE FLOW DEPTH(FEET) = 8.06 TRAVEL TIME(MIN.) = 2.24

Tc(MIN.) = 85.71

SUBAREA AREA(ACRES) = 53.70 SUBAREA RUNOFF(CFS) = 0.28

EFFECTIVE AREA(ACRES) = 12206.48 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 67847.6 PEAK FLOW RATE(CFS) = 1342.15

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.06 FLOW VELOCITY(FEET/SEC.) = 6.89

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1264.59	48.43	0.455	0.60( 0.58)	0.97	4637.5	21000.00
2	1243.54	59.91	0.402	0.60( 0.58)	0.97	6644.4	10400.00
3	1342.15	85.71	0.346	0.60( 0.58)	0.97	12206.5	30100.00
4	1165.67	102.61	0.319	0.60( 0.58)	0.97	15785.9	20200.00
5	1088.45	115.06	0.300	0.60( 0.58)	0.96	18344.8	13600.00
6	1004.31	133.35	0.282	0.60( 0.57)	0.96	22086.2	13200.00
7	1041.94	155.52	0.264	0.60( 0.57)	0.96	26338.9	11831.00
8	1129.50	177.70	0.246	0.60( 0.58)	0.96	30808.8	11530.00
9	1190.54	196.49	0.238	0.60( 0.58)	0.96	35156.3	11000.00
10	1276.08	217.94	0.230	0.60( 0.58)	0.97	42165.4	10850.00
11	1188.07	234.34	0.224	0.60( 0.58)	0.97	45673.7	11220.00
12	952.37	288.61	0.204	0.60( 0.58)	0.97	54113.8	12410.00
13	899.22	322.12	0.191	0.60( 0.58)	0.97	60192.0	12261.00
14	880.90	335.21	0.186	0.60( 0.58)	0.97	61676.8	10410.00
15	863.14	347.60	0.182	0.60( 0.58)	0.98	62782.6	12101.10
16	823.34	375.48	0.176	0.60( 0.59)	0.98	65160.4	10200.00

17 803.97 389.10 0.174 0.60( 0.59) 0.98 66100.0 12010.00  
18 760.35 419.11 0.172 0.60( 0.59) 0.98 66777.4 10210.00  
19 698.77 469.29 0.167 0.60( 0.59) 0.98 67279.2 12000.00  
20 656.70 537.07 0.161 0.60( 0.59) 0.98 67847.6 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1342.15 Tc(MIN.) = 85.71

AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 12206.48

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 85.71

RAINFALL INTENSITY(INCH/HR) = 0.35

AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 12206.48

TOTAL STREAM AREA(ACRES) = 67847.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1342.15

\*\*\*\*\*

FLOW PROCESS FROM NODE 13810.00 TO NODE 13811.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 648.54

ELEVATION DATA: UPSTREAM(FEET) = 756.46 DOWNSTREAM(FEET) = 586.02

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.293

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.072

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.58	0.60	1.000	0	12.29

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.37

TOTAL AREA(ACRES) = 5.58 PEAK FLOW RATE(CFS) = 2.37

\*\*\*\*\*

FLOW PROCESS FROM NODE 13811.00 TO NODE 13811.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 586.02 DOWNSTREAM(FEET) = 437.69

CHANNEL LENGTH THRU SUBAREA(FEET) = 696.28 CHANNEL SLOPE = 0.2130

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.938

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.79	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 4.79  
AVERAGE FLOW DEPTH( FEET) = 0.57 TRAVEL TIME(MIN.) = 2.42  
Tc(MIN.) = 14.72  
SUBAREA AREA(ACRES) = 14.79 SUBAREA RUNOFF(CFS) = 4.50  
EFFECTIVE AREA(ACRES) = 20.37 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 6.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH( FEET) = 0.64 FLOW VELOCITY( FEET/SEC.) = 5.10  
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13811.50 = 1344.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13811.50 TO NODE 13812.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM( FEET) = 437.69 DOWNSTREAM( FEET) = 402.36  
CHANNEL LENGTH THRU SUBAREA( FEET) = 681.04 CHANNEL SLOPE = 0.0519  
CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH( FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.817

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.41	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 3.22  
AVERAGE FLOW DEPTH( FEET) = 0.91 TRAVEL TIME(MIN.) = 3.52  
Tc(MIN.) = 18.24  
SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 3.60  
EFFECTIVE AREA(ACRES) = 38.78 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 38.8 PEAK FLOW RATE(CFS) = 7.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH( FEET) = 0.89 FLOW VELOCITY( FEET/SEC.) = 3.19  
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13812.00 = 2025.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13812.00 TO NODE 13813.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM( FEET) = 402.36 DOWNSTREAM( FEET) = 259.72  
CHANNEL LENGTH THRU SUBAREA( FEET) = 1282.56 CHANNEL SLOPE = 0.1112  
CHANNEL BASE( FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH( FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.699

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.87	0.60	0.858	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC.) = 4.49  
AVERAGE FLOW DEPTH( FEET) = 0.86 TRAVEL TIME(MIN.) = 4.76  
Tc(MIN.) = 23.00  
SUBAREA AREA(ACRES) = 27.87 SUBAREA RUNOFF(CFS) = 4.62  
EFFECTIVE AREA(ACRES) = 66.65 AREA-AVERAGED Fm(INCH/HR) = 0.56  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 8.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH( FEET) = 0.79 FLOW VELOCITY( FEET/SEC.) = 4.31  
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13813.00 = 3308.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 31

-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

=====

ELEVATION DATA: UPSTREAM( FEET) = 259.72 DOWNSTREAM( FEET) = 137.00  
FLOW LENGTH( FEET) = 2412.88 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER( INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.8 INCHES  
PIPE-FLOW VELOCITY( FEET/SEC.) = 10.92  
ESTIMATED PIPE DIAMETER( INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 8.07  
PIPE TRAVEL TIME(MIN.) = 3.68 Tc(MIN.) = 26.68  
LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13820.00 = 5721.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 81

-----  
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

=====

MAINLINE Tc(MIN.) = 26.68  
\* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.633

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.54	0.60	0.570	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.570  
SUBAREA AREA(ACRES) = 82.54 SUBAREA RUNOFF(CFS) = 21.63  
EFFECTIVE AREA(ACRES) = 149.19 AREA-AVERAGED Fm(INCH/HR) = 0.44  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.74  
TOTAL AREA(ACRES) = 149.2 PEAK FLOW RATE(CFS) = 25.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 26.68  
 RAINFALL INTENSITY(INCH/HR) = 0.63  
 AREA-AVERAGED Fm(INCH/HR) = 0.44  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.74  
 EFFECTIVE STREAM AREA(ACRES) = 149.19  
 TOTAL STREAM AREA(ACRES) = 149.19  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 25.76

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1264.59	48.43	0.455	0.60( 0.58)	0.97	4637.5	21000.00
1	1243.54	59.91	0.402	0.60( 0.58)	0.97	6644.4	10400.00
1	1342.15	85.71	0.346	0.60( 0.58)	0.97	12206.5	30100.00
1	1165.67	102.61	0.319	0.60( 0.58)	0.97	15785.9	20200.00
1	1088.45	115.06	0.300	0.60( 0.58)	0.96	18344.8	13600.00
1	1004.31	133.35	0.282	0.60( 0.57)	0.96	22086.2	13200.00
1	1041.94	155.52	0.264	0.60( 0.57)	0.96	26338.9	11831.00
1	1129.50	177.70	0.246	0.60( 0.58)	0.96	30808.8	11530.00
1	1190.54	196.49	0.238	0.60( 0.58)	0.96	35156.3	11000.00
1	1276.08	217.94	0.230	0.60( 0.58)	0.97	42165.4	10850.00
1	1188.07	234.34	0.224	0.60( 0.58)	0.97	45673.7	11220.00
1	952.37	288.61	0.204	0.60( 0.58)	0.97	54113.8	12410.00
1	899.22	322.12	0.191	0.60( 0.58)	0.97	60192.0	12261.00
1	880.90	335.21	0.186	0.60( 0.58)	0.97	61676.8	10410.00
1	863.14	347.60	0.182	0.60( 0.58)	0.98	62782.6	12101.10
1	823.34	375.48	0.176	0.60( 0.59)	0.98	65160.4	10200.00
1	803.97	389.10	0.174	0.60( 0.59)	0.98	66100.0	12010.00
1	760.35	419.11	0.172	0.60( 0.59)	0.98	66777.4	10210.00
1	698.77	469.29	0.167	0.60( 0.59)	0.98	67279.2	12000.00
1	656.70	537.07	0.161	0.60( 0.59)	0.98	67847.6	10100.00
2	25.76	26.68	0.633	0.60( 0.44)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.36	26.68	0.633	0.60( 0.57)	0.96	2704.1	13810.00
2	1280.75	48.43	0.455	0.60( 0.58)	0.96	4786.7	21000.00
3	1257.83	59.91	0.402	0.60( 0.58)	0.97	6793.6	10400.00
4	1354.45	85.71	0.346	0.60( 0.58)	0.97	12355.7	30100.00
5	1176.97	102.61	0.319	0.60( 0.58)	0.96	15935.1	20200.00
6	1099.11	115.06	0.300	0.60( 0.58)	0.96	18493.9	13600.00
7	1014.33	133.35	0.282	0.60( 0.57)	0.96	22235.4	13200.00
8	1051.31	155.52	0.264	0.60( 0.57)	0.96	26488.1	11831.00
9	1138.23	177.70	0.246	0.60( 0.57)	0.96	30958.0	11530.00
10	1198.98	196.49	0.238	0.60( 0.58)	0.96	35305.5	11000.00
11	1284.24	217.94	0.230	0.60( 0.58)	0.97	42314.6	10850.00
12	1196.02	234.34	0.224	0.60( 0.58)	0.97	45822.9	11220.00
13	959.60	288.61	0.204	0.60( 0.58)	0.97	54262.9	12410.00

14	906.01	322.12	0.191	0.60( 0.58)	0.97	60341.2	12261.00
15	887.51	335.21	0.186	0.60( 0.58)	0.97	61826.0	10410.00
16	869.58	347.60	0.182	0.60( 0.58)	0.97	62931.8	12101.10
17	829.57	375.48	0.176	0.60( 0.58)	0.98	65309.6	10200.00
18	810.16	389.10	0.174	0.60( 0.59)	0.98	66249.2	12010.00
19	766.44	419.11	0.172	0.60( 0.59)	0.98	66926.6	10210.00
20	704.69	469.29	0.167	0.60( 0.59)	0.98	67428.4	12000.00
21	662.40	537.07	0.161	0.60( 0.59)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1354.45 Tc(MIN.) = 85.71  
 EFFECTIVE AREA(ACRES) = 12355.67 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67996.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.340

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.60	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1355.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.85

AVERAGE FLOW DEPTH(FEET) = 8.12 TRAVEL TIME(MIN.) = 3.07

Tc(MIN.) = 88.78

SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 3.06

EFFECTIVE AREA(ACRES) = 12387.27 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 1354.45

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.11 FLOW VELOCITY(FEET/SEC.) = 6.86

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.36	29.79	0.587	0.60( 0.57)	0.95	2735.7	13810.00
2	1280.75	51.54	0.439	0.60( 0.58)	0.96	4818.3	21000.00
3	1257.83	63.03	0.395	0.60( 0.58)	0.96	6825.2	10400.00
4	1354.45	88.78	0.340	0.60( 0.58)	0.97	12387.3	30100.00

5	1176.97	105.78	0.314	0.60	( 0.58)	0.96	15966.7	20200.00
6	1099.11	118.30	0.295	0.60	( 0.58)	0.96	18525.5	13600.00
7	1014.33	136.65	0.279	0.60	( 0.57)	0.96	22267.0	13200.00
8	1051.31	158.79	0.261	0.60	( 0.57)	0.96	26519.7	11831.00
9	1138.23	180.91	0.244	0.60	( 0.57)	0.96	30989.6	11530.00
10	1198.98	199.66	0.237	0.60	( 0.58)	0.96	35337.1	11000.00
11	1284.24	221.05	0.229	0.60	( 0.58)	0.97	42346.2	10850.00
12	1196.02	237.50	0.223	0.60	( 0.58)	0.97	45854.5	11220.00
13	959.60	291.95	0.202	0.60	( 0.58)	0.97	54294.6	12410.00
14	906.01	325.51	0.190	0.60	( 0.58)	0.97	60372.8	12261.00
15	887.51	338.62	0.185	0.60	( 0.58)	0.97	61857.6	10410.00
16	869.58	351.03	0.180	0.60	( 0.58)	0.97	62963.4	12101.10
17	829.57	378.95	0.175	0.60	( 0.58)	0.98	65341.2	10200.00
18	810.16	392.59	0.174	0.60	( 0.59)	0.98	66280.8	12010.00
19	766.44	422.64	0.171	0.60	( 0.59)	0.98	66958.2	10210.00
20	704.69	472.91	0.167	0.60	( 0.59)	0.98	67460.0	12000.00
21	662.40	540.73	0.160	0.60	( 0.59)	0.98	68028.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1354.45 Tc(MIN.) = 88.78  
 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 12387.27

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1  
 \*\*\*\*\*

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 88.78  
 RAINFALL INTENSITY(INCH/HR) = 0.34  
 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 12387.27  
 TOTAL STREAM AREA(ACRES) = 68028.34  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1354.45

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21  
 \*\*\*\*\*

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71  
 ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.985  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.06	0.60	1.000	0	13.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 1.76

TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 1.76

\*\*\*\*\*

FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 51  
 \*\*\*\*\*

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 959.21 DOWNSTREAM(FEET) = 832.83  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1076.71 CHANNEL SLOPE = 0.1174  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.809  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.57	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.86  
 AVERAGE FLOW DEPTH(FEET) = 0.66 TRAVEL TIME(MIN.) = 4.64  
 Tc(MIN.) = 18.50  
 SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 6.12  
 EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 7.07

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 4.25  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 51  
 \*\*\*\*\*

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 832.83 DOWNSTREAM(FEET) = 572.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.58 CHANNEL SLOPE = 0.1382  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.655  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.23	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.95  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.68  
 AVERAGE FLOW DEPTH(FEET) = 0.75 TRAVEL TIME(MIN.) = 6.71  
 Tc(MIN.) = 25.21  
 SUBAREA AREA(ACRES) = 32.23 SUBAREA RUNOFF(CFS) = 1.59  
 EFFECTIVE AREA(ACRES) = 69.86 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.9 PEAK FLOW RATE(CFS) = 7.07  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.72 FLOW VELOCITY (FEET/SEC.) = 4.52  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13833.00 = 3705.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13833.00 TO NODE 13834.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 572.49 DOWNSTREAM (FEET) = 471.65  
CHANNEL LENGTH THRU SUBAREA (FEET) = 943.78 CHANNEL SLOPE = 0.1068  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.598

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.51	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.10

AVERAGE FLOW DEPTH (FEET) = 0.76 TRAVEL TIME (MIN.) = 3.83

Tc (MIN.) = 29.05

SUBAREA AREA (ACRES) = 27.51 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 97.37 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 97.4 PEAK FLOW RATE (CFS) = 7.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.76 FLOW VELOCITY (FEET/SEC.) = 4.10

LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13834.00 = 4648.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13834.00 TO NODE 13835.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 471.65 DOWNSTREAM (FEET) = 347.06  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1647.45 CHANNEL SLOPE = 0.0756  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.530

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	94.21	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.58

AVERAGE FLOW DEPTH (FEET) = 0.81 TRAVEL TIME (MIN.) = 7.68

Tc (MIN.) = 36.72

SUBAREA AREA (ACRES) = 94.21 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 191.58 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 191.6 PEAK FLOW RATE (CFS) = 7.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.81 FLOW VELOCITY (FEET/SEC.) = 3.58

LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13835.00 = 6296.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13835.00 TO NODE 13836.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 347.06 DOWNSTREAM (FEET) = 269.29  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1696.71 CHANNEL SLOPE = 0.0458

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.467

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	233.25	0.60	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.98

AVERAGE FLOW DEPTH (FEET) = 0.89 TRAVEL TIME (MIN.) = 9.50

Tc (MIN.) = 46.23

SUBAREA AREA (ACRES) = 233.25 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 424.83 AREA-AVERAGED Fm (INCH/HR) = 0.60

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 424.8 PEAK FLOW RATE (CFS) = 7.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.89 FLOW VELOCITY (FEET/SEC.) = 2.98

LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13836.00 = 7992.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13836.00 TO NODE 13837.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 269.29 DOWNSTREAM(FEET) = 191.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2529.21 CHANNEL SLOPE = 0.0306  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.399  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 134.70 0.60 0.880 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.80  
 AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 15.04  
 Tc(MIN.) = 61.26  
 SUBAREA AREA(ACRES) = 134.70 SUBAREA RUNOFF(CFS) = 5.81  
 EFFECTIVE AREA(ACRES) = 559.53 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 559.5 PEAK FLOW RATE(CFS) = 7.07  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 2.56  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13837.00 = 10522.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 191.87 DOWNSTREAM(FEET) = 133.00  
 FLOW LENGTH(FEET) = 1151.02 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.4 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.51  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 7.07  
 PIPE TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 63.09  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<  
 =====

MAINLINE Tc(MIN.) = 63.09  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.395  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 5.97 0.60 0.622 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 0.80  
 EFFECTIVE AREA(ACRES) = 565.50 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 565.5 PEAK FLOW RATE(CFS) = 7.07  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 63.09  
 RAINFALL INTENSITY(INCH/HR) = 0.40  
 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.97  
 EFFECTIVE STREAM AREA(ACRES) = 565.50  
 TOTAL STREAM AREA(ACRES) = 565.50  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 7.07

\*\*\* CONFLUENCE DATA \*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1290.36	29.79	0.587	0.60 ( 0.57)	0.95	2735.7	13810.00
1	1280.75	51.54	0.439	0.60 ( 0.58)	0.96	4818.3	21000.00
1	1257.83	63.03	0.395	0.60 ( 0.58)	0.96	6825.2	10400.00
1	1354.45	88.78	0.340	0.60 ( 0.58)	0.97	12387.3	30100.00
1	1176.97	105.78	0.314	0.60 ( 0.58)	0.96	15966.7	20200.00
1	1099.11	118.30	0.295	0.60 ( 0.58)	0.96	18525.5	13600.00
1	1014.33	136.65	0.279	0.60 ( 0.57)	0.96	22267.0	13200.00
1	1051.31	158.79	0.261	0.60 ( 0.57)	0.96	26519.7	11831.00
1	1138.23	180.91	0.244	0.60 ( 0.57)	0.96	30989.6	11530.00
1	1198.98	199.66	0.237	0.60 ( 0.58)	0.96	35337.1	11000.00
1	1284.24	221.05	0.229	0.60 ( 0.58)	0.97	42346.2	10850.00
1	1196.02	237.50	0.223	0.60 ( 0.58)	0.97	45854.5	11220.00
1	959.60	291.95	0.202	0.60 ( 0.58)	0.97	54294.6	12410.00
1	906.01	325.51	0.190	0.60 ( 0.58)	0.97	60372.8	12261.00
1	887.51	338.62	0.185	0.60 ( 0.58)	0.97	61857.6	10410.00
1	869.58	351.03	0.180	0.60 ( 0.58)	0.97	62963.4	12101.10
1	829.57	378.95	0.175	0.60 ( 0.58)	0.98	65341.2	10200.00
1	810.16	392.59	0.174	0.60 ( 0.59)	0.98	66280.8	12010.00
1	766.44	422.64	0.171	0.60 ( 0.59)	0.98	66958.2	10210.00
1	704.69	472.91	0.167	0.60 ( 0.59)	0.98	67460.0	12000.00
1	662.40	540.73	0.160	0.60 ( 0.59)	0.98	68028.3	10100.00
2	7.07	63.09	0.395	0.60 ( 0.58)	0.97	565.5	13830.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\*\* PEAK FLOW RATE TABLE \*\*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	1295.31	29.79	0.587	0.60( 0.57)	0.96	3002.7 13810.00
2	1287.16	51.54	0.439	0.60( 0.58)	0.96	5280.3 21000.00
3	1264.89	63.03	0.395	0.60( 0.58)	0.97	7390.2 10400.00
4	1265.12	63.09	0.395	0.60( 0.58)	0.97	7403.5 13830.00
5	1360.52	88.78	0.340	0.60( 0.58)	0.97	12952.8 30100.00
6	1182.58	105.78	0.314	0.60( 0.58)	0.96	16532.2 20200.00
7	1104.39	118.30	0.295	0.60( 0.58)	0.96	19091.0 13600.00
8	1019.32	136.65	0.279	0.60( 0.57)	0.96	22832.5 13200.00
9	1055.98	158.79	0.261	0.60( 0.57)	0.96	27085.2 11831.00
10	1142.59	180.91	0.244	0.60( 0.57)	0.96	31555.1 11530.00
11	1203.22	199.66	0.237	0.60( 0.58)	0.96	35902.6 11000.00
12	1288.33	221.05	0.229	0.60( 0.58)	0.97	42911.7 10850.00
13	1200.00	237.50	0.223	0.60( 0.58)	0.97	46420.0 11220.00
14	963.22	291.95	0.202	0.60( 0.58)	0.97	54860.1 12410.00
15	909.40	325.51	0.190	0.60( 0.58)	0.97	60938.3 12261.00
16	890.82	338.62	0.185	0.60( 0.58)	0.97	62423.1 10410.00
17	872.81	351.03	0.180	0.60( 0.58)	0.97	63528.9 12101.10
18	832.70	378.95	0.175	0.60( 0.58)	0.98	65906.7 10200.00
19	813.27	392.59	0.174	0.60( 0.59)	0.98	66846.3 12010.00
20	769.50	422.64	0.171	0.60( 0.59)	0.98	67523.7 10210.00
21	707.67	472.91	0.167	0.60( 0.59)	0.98	68025.5 12000.00
22	665.27	540.73	0.160	0.60( 0.59)	0.98	68593.8 10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1360.52 Tc(MIN.) = 88.78  
EFFECTIVE AREA(ACRES) = 12952.77 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68593.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.337

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.61	0.60	0.975	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1360.54

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.88

AVERAGE FLOW DEPTH(FEET) = 7.59 TRAVEL TIME(MIN.) = 1.38

Tc(MIN.) = 90.16

SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 0.05

EFFECTIVE AREA(ACRES) = 12959.38 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 1360.52

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.59 FLOW VELOCITY(FEET/SEC.) = 7.88

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1295.31	31.19	0.574	0.60( 0.57)	0.96	3009.3	13810.00
2	1287.16	52.95	0.433	0.60( 0.58)	0.96	5286.9	21000.00
3	1264.89	64.44	0.392	0.60( 0.58)	0.97	7396.8	10400.00
4	1265.12	64.50	0.392	0.60( 0.58)	0.97	7410.2	13830.00
5	1360.52	90.16	0.337	0.60( 0.58)	0.97	12959.4	30100.00
6	1182.58	107.22	0.312	0.60( 0.58)	0.96	16538.8	20200.00
7	1104.39	119.76	0.293	0.60( 0.58)	0.96	19097.7	13600.00
8	1019.32	138.14	0.278	0.60( 0.57)	0.96	22839.1	13200.00
9	1055.98	160.26	0.260	0.60( 0.57)	0.96	27091.8	11831.00
10	1142.59	182.36	0.243	0.60( 0.57)	0.96	31561.7	11530.00
11	1203.22	201.08	0.236	0.60( 0.58)	0.96	35909.2	11000.00
12	1288.33	222.45	0.228	0.60( 0.58)	0.97	42918.3	10850.00
13	1200.00	238.93	0.222	0.60( 0.58)	0.97	46426.6	11220.00
14	963.22	293.46	0.202	0.60( 0.58)	0.97	54866.7	12410.00
15	909.40	327.04	0.189	0.60( 0.58)	0.97	60944.9	12261.00
16	890.82	340.16	0.184	0.60( 0.58)	0.97	62429.7	10410.00
17	872.81	352.58	0.180	0.60( 0.58)	0.97	63535.5	12101.10
18	832.70	380.51	0.175	0.60( 0.58)	0.98	65913.3	10200.00
19	813.27	394.17	0.174	0.60( 0.59)	0.98	66852.9	12010.00
20	769.50	424.24	0.171	0.60( 0.59)	0.98	67530.3	10210.00
21	707.67	474.54	0.166	0.60( 0.59)	0.98	68032.1	12000.00
22	665.27	542.39	0.160	0.60( 0.59)	0.98	68600.5	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1360.52 Tc(MIN.) = 90.16  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 12959.38

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 90.16

RAINFALL INTENSITY(INCH/HR) = 0.34

AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 12959.38

TOTAL STREAM AREA(ACRES) = 68600.45

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1360.52

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 617.57  
ELEVATION DATA: UPSTREAM (FEET) = 646.95 DOWNSTREAM (FEET) = 490.10

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM  $T_c$  (MIN.) = 12.137

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 1.081

SUBAREA  $T_c$  AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
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NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	4.95	0.60	1.000	0	12.14
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SUBAREA AVERAGE PVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION,  $A_p$  = 1.000

SUBAREA RUNOFF (CFS) = 2.14

TOTAL AREA (ACRES) = 4.95 PEAK FLOW RATE (CFS) = 2.14

\*\*\*\*\*

FLOW PROCESS FROM NODE 13851.00 TO NODE 13851.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 490.10 DOWNSTREAM (FEET) = 440.98

CHANNEL LENGTH THRU SUBAREA (FEET) = 351.14 CHANNEL SLOPE = 0.1399

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.990

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
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USER-DEFINED	-	4.02	0.60	1.000	-
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SUBAREA AVERAGE PVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION,  $A_p$  = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 2.85

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.60

AVERAGE FLOW DEPTH (FEET) = 0.51 TRAVEL TIME (MIN.) = 1.63

$T_c$  (MIN.) = 13.76

SUBAREA AREA (ACRES) = 4.02 SUBAREA RUNOFF (CFS) = 1.41

EFFECTIVE AREA (ACRES) = 8.97 AREA-AVERAGED  $F_m$  (INCH/HR) = 0.60

AREA-AVERAGED  $F_p$  (INCH/HR) = 0.60 AREA-AVERAGED  $A_p$  = 1.00

TOTAL AREA (ACRES) = 9.0 PEAK FLOW RATE (CFS) = 3.15

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.53 FLOW VELOCITY (FEET/SEC.) = 3.73

LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13851.50 = 968.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13851.50 TO NODE 13852.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 440.98 DOWNSTREAM (FEET) = 395.76

CHANNEL LENGTH THRU SUBAREA (FEET) = 512.91 CHANNEL SLOPE = 0.0882

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.879

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
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USER-DEFINED	-	7.17	0.60	1.000	-
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SUBAREA AVERAGE PVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION,  $A_p$  = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.32

AVERAGE FLOW DEPTH (FEET) = 0.64 TRAVEL TIME (MIN.) = 2.57

$T_c$  (MIN.) = 16.34

SUBAREA AREA (ACRES) = 7.17 SUBAREA RUNOFF (CFS) = 1.80

EFFECTIVE AREA (ACRES) = 16.14 AREA-AVERAGED  $F_m$  (INCH/HR) = 0.60

AREA-AVERAGED  $F_p$  (INCH/HR) = 0.60 AREA-AVERAGED  $A_p$  = 1.00

TOTAL AREA (ACRES) = 16.1 PEAK FLOW RATE (CFS) = 4.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.64 FLOW VELOCITY (FEET/SEC.) = 3.32

LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13852.00 = 1481.62 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13852.00 TO NODE 13853.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 395.76 DOWNSTREAM (FEET) = 354.94

CHANNEL LENGTH THRU SUBAREA (FEET) = 443.69 CHANNEL SLOPE = 0.0920

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.810

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
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USER-DEFINED	-	6.76	0.60	1.000	-
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SUBAREA AVERAGE PVIOUS LOSS RATE,  $F_p$  (INCH/HR) = 0.60

SUBAREA AVERAGE PVIOUS AREA FRACTION,  $A_p$  = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4.69

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.50

AVERAGE FLOW DEPTH (FEET) = 0.67 TRAVEL TIME (MIN.) = 2.11

$T_c$  (MIN.) = 18.45

SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 1.28

EFFECTIVE AREA (ACRES) = 22.90 AREA-AVERAGED  $F_m$  (INCH/HR) = 0.60

AREA-AVERAGED  $F_p$  (INCH/HR) = 0.60 AREA-AVERAGED  $A_p$  = 1.00

TOTAL AREA (ACRES) = 22.9 PEAK FLOW RATE (CFS) = 4.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.65 FLOW VELOCITY (FEET/SEC.) = 3.41

LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13853.00 = 1925.31 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13853.00 TO NODE 13854.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 354.94 DOWNSTREAM (FEET) = 263.57

CHANNEL LENGTH THRU SUBAREA (FEET) = 962.09 CHANNEL SLOPE = 0.0950



CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.701  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.16	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.62  
 AVERAGE FLOW DEPTH (FEET) = 0.69 TRAVEL TIME (MIN.) = 4.42  
 Tc (MIN.) = 22.88  
 SUBAREA AREA (ACRES) = 18.16 SUBAREA RUNOFF (CFS) = 1.66  
 EFFECTIVE AREA (ACRES) = 41.06 AREA-AVERAGED Fm (INCH/HR) = 0.60  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 41.1 PEAK FLOW RATE (CFS) = 4.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.65 FLOW VELOCITY (FEET/SEC.) = 3.47  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13854.00 = 2887.40 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13854.00 TO NODE 13855.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 263.57 DOWNSTREAM (FEET) = 188.74  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1228.77 CHANNEL SLOPE = 0.0609  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.592  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	38.75	0.60	0.879	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.879  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.12  
 AVERAGE FLOW DEPTH (FEET) = 0.77 TRAVEL TIME (MIN.) = 6.57  
 Tc (MIN.) = 29.45  
 SUBAREA AREA (ACRES) = 38.75 SUBAREA RUNOFF (CFS) = 2.50  
 EFFECTIVE AREA (ACRES) = 79.81 AREA-AVERAGED Fm (INCH/HR) = 0.56  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 79.8 PEAK FLOW RATE (CFS) = 4.34  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.70 FLOW VELOCITY (FEET/SEC.) = 2.96  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13855.00 = 4116.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 188.74 DOWNSTREAM (FEET) = 130.00  
 FLOW LENGTH (FEET) = 2092.67 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.0 INCHES  
 PIPE-FLOW VELOCITY (FEET/SEC.) = 7.36  
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW (CFS) = 4.34  
 PIPE TRAVEL TIME (MIN.) = 4.74 Tc (MIN.) = 34.19  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13860.00 = 6208.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc (MIN.) = 34.19  
 \* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.550  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.41	0.60	0.707	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.707  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 SUBAREA AREA (ACRES) = 43.41 SUBAREA RUNOFF (CFS) = 6.30  
 EFFECTIVE AREA (ACRES) = 123.22 AREA-AVERAGED Fm (INCH/HR) = 0.52  
 AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.86  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA (ACRES) = 123.2 PEAK FLOW RATE (CFS) = 8.62

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 34.19  
 RAINFALL INTENSITY (INCH/HR) = 0.55  
 AREA-AVERAGED Fm (INCH/HR) = 0.52  
 AREA-AVERAGED Fp (INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.86  
 EFFECTIVE STREAM AREA (ACRES) = 123.22  
 TOTAL STREAM AREA (ACRES) = 123.22  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 8.62

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	1295.31	31.19	0.574	0.60	(0.57)	0.96	3009.3	13810.00
1	1287.16	52.95	0.433	0.60	(0.58)	0.96	5286.9	21000.00
1	1264.89	64.44	0.392	0.60	(0.58)	0.97	7396.8	10400.00
1	1265.12	64.50	0.392	0.60	(0.58)	0.97	7410.2	13830.00
1	1360.52	90.16	0.337	0.60	(0.58)	0.97	12959.4	30100.00
1	1182.58	107.22	0.312	0.60	(0.58)	0.96	16538.8	20200.00
1	1104.39	119.76	0.293	0.60	(0.58)	0.96	19097.7	13600.00
1	1019.32	138.14	0.278	0.60	(0.57)	0.96	22839.1	13200.00
1	1055.98	160.26	0.260	0.60	(0.57)	0.96	27091.8	11831.00
1	1142.59	182.36	0.243	0.60	(0.57)	0.96	31561.7	11530.00
1	1203.22	201.08	0.236	0.60	(0.58)	0.96	35909.2	11000.00
1	1288.33	222.45	0.228	0.60	(0.58)	0.97	42918.3	10850.00
1	1200.00	238.93	0.222	0.60	(0.58)	0.97	46426.6	11220.00
1	963.22	293.46	0.202	0.60	(0.58)	0.97	54866.7	12410.00
1	909.40	327.04	0.189	0.60	(0.58)	0.97	60944.9	12261.00
1	890.82	340.16	0.184	0.60	(0.58)	0.97	62429.7	10410.00
1	872.81	352.58	0.180	0.60	(0.58)	0.97	63535.5	12101.10
1	832.70	380.51	0.175	0.60	(0.58)	0.98	65913.3	10200.00
1	813.27	394.17	0.174	0.60	(0.59)	0.98	66852.9	12010.00
1	769.50	424.24	0.171	0.60	(0.59)	0.98	67530.3	10210.00
1	707.67	474.54	0.166	0.60	(0.59)	0.98	68032.1	12000.00
1	665.27	542.39	0.160	0.60	(0.59)	0.98	68600.5	10100.00
2	8.62	34.19	0.550	0.60	(0.52)	0.86	123.2	13850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	31.19	0.574	0.60 (0.57)	0.95	3121.7	13810.00
2	1302.81	34.19	0.550	0.60 (0.57)	0.95	3446.5	13850.00
3	1293.95	52.95	0.433	0.60 (0.58)	0.96	5410.2	21000.00
4	1271.04	64.44	0.392	0.60 (0.58)	0.96	7520.0	10400.00
5	1271.27	64.50	0.392	0.60 (0.58)	0.96	7533.4	13830.00
6	1365.79	90.16	0.337	0.60 (0.58)	0.97	13082.6	30100.00
7	1187.47	107.22	0.312	0.60 (0.58)	0.96	16662.0	20200.00
8	1108.99	119.76	0.293	0.60 (0.58)	0.96	19220.9	13600.00
9	1023.68	138.14	0.278	0.60 (0.57)	0.96	22962.4	13200.00
10	1060.06	160.26	0.260	0.60 (0.57)	0.96	27215.0	11831.00
11	1146.40	182.36	0.243	0.60 (0.57)	0.96	31684.9	11530.00
12	1206.91	201.08	0.236	0.60 (0.58)	0.96	36032.4	11000.00
13	1291.91	222.45	0.228	0.60 (0.58)	0.97	43041.6	10850.00
14	1203.48	238.93	0.222	0.60 (0.58)	0.97	46549.8	11220.00
15	966.38	293.46	0.202	0.60 (0.58)	0.97	54989.9	12410.00
16	912.37	327.04	0.189	0.60 (0.58)	0.97	61068.2	12261.00
17	893.71	340.16	0.184	0.60 (0.58)	0.97	62552.9	10410.00
18	875.63	352.58	0.180	0.60 (0.58)	0.97	63658.7	12101.10
19	835.45	380.51	0.175	0.60 (0.58)	0.97	66036.5	10200.00
20	815.99	394.17	0.174	0.60 (0.58)	0.98	66976.1	12010.00
21	772.18	424.24	0.171	0.60 (0.59)	0.98	67653.6	10210.00
22	710.28	474.54	0.166	0.60 (0.59)	0.98	68155.3	12000.00
23	667.78	542.39	0.160	0.60 (0.59)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1365.79 Tc (MIN.) = 90.16  
EFFECTIVE AREA (ACRES) = 13082.60 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

TOTAL AREA (ACRES) = 68723.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 51

-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 130.00 DOWNSTREAM (FEET) = 120.57

CHANNEL LENGTH THRU SUBAREA (FEET) = 610.77 CHANNEL SLOPE = 0.0154

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.336

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.89	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1365.79

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.43

AVERAGE FLOW DEPTH (FEET) = 6.05 TRAVEL TIME (MIN.) = 0.82

Tc (MIN.) = 90.98

SUBAREA AREA (ACRES) = 4.89 SUBAREA RUNOFF (CFS) = 0.00

EFFECTIVE AREA (ACRES) = 13087.49 AREA-AVERAGED Fm (INCH/HR) = 0.58

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 68728.6 PEAK FLOW RATE (CFS) = 1365.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.05 FLOW VELOCITY (FEET/SEC.) = 12.43

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	32.02	0.568	0.60 (0.57)	0.95	3126.6	13810.00
2	1302.81	35.02	0.543	0.60 (0.57)	0.95	3451.4	13850.00
3	1293.95	53.78	0.429	0.60 (0.58)	0.96	5415.0	21000.00
4	1271.04	65.27	0.391	0.60 (0.58)	0.96	7524.9	10400.00
5	1271.27	65.33	0.390	0.60 (0.58)	0.96	7538.3	13830.00
6	1365.79	90.98	0.336	0.60 (0.58)	0.97	13087.5	30100.00
7	1187.47	108.07	0.311	0.60 (0.58)	0.96	16666.9	20200.00
8	1108.99	120.62	0.292	0.60 (0.58)	0.96	19225.8	13600.00
9	1023.68	139.02	0.277	0.60 (0.57)	0.96	22967.3	13200.00
10	1060.06	161.13	0.259	0.60 (0.57)	0.96	27219.9	11831.00
11	1146.40	183.21	0.243	0.60 (0.57)	0.96	31689.8	11530.00
12	1206.91	201.93	0.236	0.60 (0.58)	0.96	36037.3	11000.00
13	1291.91	223.28	0.228	0.60 (0.58)	0.97	43046.5	10850.00
14	1203.48	239.77	0.222	0.60 (0.58)	0.97	46554.7	11220.00
15	966.38	294.35	0.201	0.60 (0.58)	0.97	54994.8	12410.00
16	912.37	327.95	0.189	0.60 (0.58)	0.97	61073.1	12261.00
17	893.71	341.07	0.184	0.60 (0.58)	0.97	62557.8	10410.00

18	875.63	353.49	0.179	0.60	( 0.58)	0.97	63663.6	12101.10
19	835.45	381.44	0.175	0.60	( 0.58)	0.97	66041.4	10200.00
20	815.99	395.10	0.174	0.60	( 0.58)	0.98	66981.0	12010.00
21	772.18	425.19	0.171	0.60	( 0.59)	0.98	67658.4	10210.00
22	710.28	475.50	0.166	0.60	( 0.59)	0.98	68160.2	12000.00
23	667.78	543.37	0.160	0.60	( 0.59)	0.98	68728.6	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 1365.79 Tc(MIN.) = 90.98  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 13087.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 90.98  
RAINFALL INTENSITY(INCH/HR) = 0.34  
AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 13087.49  
TOTAL STREAM AREA(ACRES) = 68728.56  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1365.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 872.65  
ELEVATION DATA: UPSTREAM(FEET) = 558.52 DOWNSTREAM(FEET) = 436.47

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.704  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.899  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"GRASS" - 9.32 0.60 1.000 0 15.70  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.51  
TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 2.51

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 436.47 DOWNSTREAM(FEET) = 337.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 827.95 CHANNEL SLOPE = 0.1194  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.775

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 14.27 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.61  
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 3.82  
Tc(MIN.) = 19.52  
SUBAREA AREA(ACRES) = 14.27 SUBAREA RUNOFF(CFS) = 2.25  
EFFECTIVE AREA(ACRES) = 23.59 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 3.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.58 FLOW VELOCITY(FEET/SEC.) = 3.64  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13872.00 = 1700.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13872.00 TO NODE 13873.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 337.62 DOWNSTREAM(FEET) = 253.88  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1049.16 CHANNEL SLOPE = 0.0798  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.666  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 35.74 0.60 0.923 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.923  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.45  
AVERAGE FLOW DEPTH(FEET) = 0.74 TRAVEL TIME(MIN.) = 5.06  
Tc(MIN.) = 24.59  
SUBAREA AREA(ACRES) = 35.74 SUBAREA RUNOFF(CFS) = 3.63  
EFFECTIVE AREA(ACRES) = 59.33 AREA-AVERAGED Fm(INCH/HR) = 0.57  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 59.3 PEAK FLOW RATE(CFS) = 5.04

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.70 FLOW VELOCITY(FEET/SEC.) = 3.38  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13873.00 = 2749.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13873.00 TO NODE 13874.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 253.88 DOWNSTREAM(FEET) = 160.73

CHANNEL LENGTH THRU SUBAREA (FEET) = 1518.60 CHANNEL SLOPE = 0.0613  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.580  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.43	0.60	0.900	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.32  
AVERAGE FLOW DEPTH (FEET) = 0.67 TRAVEL TIME (MIN.) = 5.86  
Tc (MIN.) = 30.45  
SUBAREA AREA (ACRES) = 32.43 SUBAREA RUNOFF (CFS) = 1.69  
EFFECTIVE AREA (ACRES) = 91.76 AREA-AVERAGED Fm (INCH/HR) = 0.56  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 91.8 PEAK FLOW RATE (CFS) = 5.04  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.64 FLOW VELOCITY (FEET/SEC.) = 4.15  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13874.00 = 4268.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13874.00 TO NODE 13875.00 IS CODE = 51  
-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM (FEET) = 160.73 DOWNSTREAM (FEET) = 158.14  
CHANNEL LENGTH THRU SUBAREA (FEET) = 582.74 CHANNEL SLOPE = 0.0044  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.532  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.67	0.60	0.930	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 1.63  
AVERAGE FLOW DEPTH (FEET) = 1.13 TRAVEL TIME (MIN.) = 5.95  
Tc (MIN.) = 36.40  
SUBAREA AREA (ACRES) = 73.67 SUBAREA RUNOFF (CFS) = 2.47  
EFFECTIVE AREA (ACRES) = 165.43 AREA-AVERAGED Fm (INCH/HR) = 0.56  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.93  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 165.4 PEAK FLOW RATE (CFS) = 5.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.07 FLOW VELOCITY (FEET/SEC.) = 1.57  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13875.00 = 4851.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 31  
-----  
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
-----  
ELEVATION DATA: UPSTREAM (FEET) = 158.14 DOWNSTREAM (FEET) = 120.57  
FLOW LENGTH (FEET) = 1855.67 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.9 INCHES  
PIPE-FLOW VELOCITY (FEET/SEC.) = 6.98  
ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW (CFS) = 5.34  
PIPE TRAVEL TIME (MIN.) = 4.43 Tc (MIN.) = 40.83  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13880.00 = 6706.77 FEET.  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 81  
-----  
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc (MIN.) = 40.83  
\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.498  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.90	0.60	0.743	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
SUBAREA AREA (ACRES) = 34.90 SUBAREA RUNOFF (CFS) = 4.02  
EFFECTIVE AREA (ACRES) = 200.33 AREA-AVERAGED Fm (INCH/HR) = 0.54  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.90  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA (ACRES) = 200.3 PEAK FLOW RATE (CFS) = 9.02  
\*\*\*\*\*  
FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 1  
-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 40.83  
RAINFALL INTENSITY (INCH/HR) = 0.50  
AREA-AVERAGED Fm (INCH/HR) = 0.54  
AREA-AVERAGED Fp (INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.90  
EFFECTIVE STREAM AREA (ACRES) = 200.33  
TOTAL STREAM AREA (ACRES) = 200.33  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 9.02

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1303.52	32.02	0.568	0.60 ( 0.57)	0.95	3126.6	13810.00
1	1302.81	35.02	0.543	0.60 ( 0.57)	0.95	3451.4	13850.00
1	1293.95	53.78	0.429	0.60 ( 0.58)	0.96	5415.0	21000.00
1	1271.04	65.27	0.391	0.60 ( 0.58)	0.96	7524.9	10400.00
1	1271.27	65.33	0.390	0.60 ( 0.58)	0.96	7538.3	13830.00
1	1365.79	90.98	0.336	0.60 ( 0.58)	0.97	13087.5	30100.00
1	1187.47	108.07	0.311	0.60 ( 0.58)	0.96	16666.9	20200.00
1	1108.99	120.62	0.292	0.60 ( 0.58)	0.96	19225.8	13600.00
1	1023.68	139.02	0.277	0.60 ( 0.57)	0.96	22967.3	13200.00
1	1060.06	161.13	0.259	0.60 ( 0.57)	0.96	27219.9	11831.00
1	1146.40	183.21	0.243	0.60 ( 0.57)	0.96	31689.8	11530.00
1	1206.91	201.93	0.236	0.60 ( 0.58)	0.96	36037.3	11000.00
1	1291.91	223.28	0.228	0.60 ( 0.58)	0.97	43046.5	10850.00
1	1203.48	239.77	0.222	0.60 ( 0.58)	0.97	46554.7	11220.00
1	966.38	294.35	0.201	0.60 ( 0.58)	0.97	54994.8	12410.00
1	912.37	327.95	0.189	0.60 ( 0.58)	0.97	61073.1	12261.00
1	893.71	341.07	0.184	0.60 ( 0.58)	0.97	62557.8	10410.00
1	875.63	353.49	0.179	0.60 ( 0.58)	0.97	63663.6	12101.10
1	835.45	381.44	0.175	0.60 ( 0.58)	0.97	66041.4	10200.00
1	815.99	395.10	0.174	0.60 ( 0.58)	0.98	66981.0	12010.00
1	772.18	425.19	0.171	0.60 ( 0.59)	0.98	67658.4	10210.00
1	710.28	475.50	0.166	0.60 ( 0.59)	0.98	68160.2	12000.00
1	667.78	543.37	0.160	0.60 ( 0.59)	0.98	68728.6	10100.00
2	9.02	40.83	0.498	0.60 ( 0.54)	0.90	200.3	13870.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1311.58	32.02	0.568	0.60 ( 0.57)	0.95	3283.7	13810.00
2	1311.25	35.02	0.543	0.60 ( 0.57)	0.95	3623.2	13850.00
3	1309.08	40.83	0.498	0.60 ( 0.57)	0.95	4260.3	13870.00
4	1301.72	53.78	0.429	0.60 ( 0.57)	0.96	5615.4	21000.00
5	1278.11	65.27	0.391	0.60 ( 0.58)	0.96	7725.2	10400.00
6	1278.34	65.33	0.390	0.60 ( 0.58)	0.96	7738.6	13830.00
7	1371.87	90.98	0.336	0.60 ( 0.58)	0.97	13287.8	30100.00
8	1193.09	108.07	0.311	0.60 ( 0.58)	0.96	16867.2	20200.00
9	1114.28	120.62	0.292	0.60 ( 0.58)	0.96	19426.1	13600.00
10	1028.70	139.02	0.277	0.60 ( 0.57)	0.96	23167.6	13200.00
11	1064.75	161.13	0.259	0.60 ( 0.57)	0.96	27420.3	11831.00
12	1150.79	183.21	0.243	0.60 ( 0.57)	0.96	31890.1	11530.00
13	1211.19	201.93	0.236	0.60 ( 0.58)	0.96	36237.6	11000.00
14	1296.03	223.28	0.228	0.60 ( 0.58)	0.97	43246.8	10850.00
15	1207.49	239.77	0.222	0.60 ( 0.58)	0.97	46755.0	11220.00
16	970.03	294.35	0.201	0.60 ( 0.58)	0.97	55195.1	12410.00
17	915.79	327.95	0.189	0.60 ( 0.58)	0.97	61273.4	12261.00
18	897.04	341.07	0.184	0.60 ( 0.58)	0.97	62758.1	10410.00
19	878.87	353.49	0.179	0.60 ( 0.58)	0.97	63863.9	12101.10
20	838.61	381.44	0.175	0.60 ( 0.58)	0.97	66241.7	10200.00
21	819.14	395.10	0.174	0.60 ( 0.58)	0.97	67181.4	12010.00
22	775.27	425.19	0.171	0.60 ( 0.58)	0.98	67858.8	10210.00
23	713.29	475.50	0.166	0.60 ( 0.59)	0.98	68360.5	12000.00

24 670.68 543.37 0.160 0.60 ( 0.59) 0.98 68928.9 10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1371.87 Tc(MIN.) = 90.98  
EFFECTIVE AREA(ACRES) = 13287.82 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 68928.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 120.57 DOWNSTREAM(FEET) = 119.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1190.21 CHANNEL SLOPE = 0.0007  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.328

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.69	0.60	0.724	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.724

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1376.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.97

AVERAGE FLOW DEPTH(FEET) = 10.75 TRAVEL TIME(MIN.) = 5.00

Tc(MIN.) = 95.98

SUBAREA AREA(ACRES) = 117.69 SUBAREA RUNOFF(CFS) = 9.60

EFFECTIVE AREA(ACRES) = 13405.51 AREA-AVERAGED Fm(INCH/HR) = 0.58

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA(ACRES) = 69046.6 PEAK FLOW RATE(CFS) = 1371.87

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 10.74 FLOW VELOCITY(FEET/SEC.) = 3.96

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1311.58	37.07	0.527	0.60 ( 0.56)	0.94	3401.4	13810.00
2	1311.25	40.07	0.503	0.60 ( 0.57)	0.94	3740.9	13850.00
3	1309.08	45.88	0.469	0.60 ( 0.57)	0.95	4378.0	13870.00
4	1301.72	58.84	0.407	0.60 ( 0.57)	0.95	5733.1	21000.00
5	1278.11	70.36	0.380	0.60 ( 0.57)	0.96	7842.9	10400.00
6	1278.34	70.42	0.379	0.60 ( 0.57)	0.96	7856.3	13830.00
7	1371.87	95.98	0.328	0.60 ( 0.58)	0.96	13405.5	30100.00
8	1193.09	113.24	0.303	0.60 ( 0.58)	0.96	16984.9	20200.00
9	1114.28	125.88	0.288	0.60 ( 0.57)	0.96	19543.8	13600.00
10	1028.70	144.39	0.273	0.60 ( 0.57)	0.95	23285.3	13200.00
11	1064.75	166.46	0.255	0.60 ( 0.57)	0.96	27537.9	11831.00

12	1150.79	188.44	0.241	0.60	( 0.57)	0.96	32007.8	11530.00
13	1211.19	207.09	0.234	0.60	( 0.58)	0.96	36355.3	11000.00
14	1296.03	228.36	0.226	0.60	( 0.58)	0.97	43364.5	10850.00
15	1207.49	244.94	0.220	0.60	( 0.58)	0.97	46872.7	11220.00
16	970.03	299.80	0.199	0.60	( 0.58)	0.97	55312.8	12410.00
17	915.79	333.48	0.187	0.60	( 0.58)	0.97	61391.1	12261.00
18	897.04	346.63	0.182	0.60	( 0.58)	0.97	62875.8	10410.00
19	878.87	359.08	0.177	0.60	( 0.58)	0.97	63981.6	12101.10
20	838.61	387.09	0.174	0.60	( 0.58)	0.97	66359.4	10200.00
21	819.14	400.78	0.173	0.60	( 0.58)	0.97	67299.1	12010.00
22	775.27	430.95	0.170	0.60	( 0.58)	0.97	67976.5	10210.00
23	713.29	481.39	0.166	0.60	( 0.58)	0.97	68478.2	12000.00
24	670.68	549.35	0.159	0.60	( 0.58)	0.98	69046.6	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 1371.87 Tc(MIN.) = 95.98  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 13405.51

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 95.98  
RAINFALL INTENSITY(INCH/HR) = 0.33  
AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.96  
EFFECTIVE STREAM AREA(ACRES) = 13405.51  
TOTAL STREAM AREA(ACRES) = 69046.58  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1371.87

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13889.00 TO NODE 13890.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 447.89  
ELEVATION DATA: UPSTREAM(FEET) = 564.89 DOWNSTREAM(FEET) = 421.92

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.976  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.561  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
PUBLIC PARK - 3.03 0.60 0.960 0 6.98  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960  
SUBAREA RUNOFF(CFS) = 2.69  
TOTAL AREA(ACRES) = 3.03 PEAK FLOW RATE(CFS) = 2.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13890.00 TO NODE 13891.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 421.92 DOWNSTREAM(FEET) = 392.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 435.33 CHANNEL SLOPE = 0.0673  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.365  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.12 0.60 0.986 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.53  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.42  
AVERAGE FLOW DEPTH(FEET) = 0.65 TRAVEL TIME(MIN.) = 1.64  
Tc(MIN.) = 8.62  
SUBAREA AREA(ACRES) = 8.12 SUBAREA RUNOFF(CFS) = 5.65  
EFFECTIVE AREA(ACRES) = 11.15 AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 11.1 PEAK FLOW RATE(CFS) = 7.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 4.78  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13891.00 = 883.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13891.00 TO NODE 13892.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 392.64 DOWNSTREAM(FEET) = 324.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 662.40 CHANNEL SLOPE = 0.1029  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.176  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 12.50 0.60 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.05  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.13  
AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 1.80  
Tc(MIN.) = 10.42  
SUBAREA AREA(ACRES) = 12.50 SUBAREA RUNOFF(CFS) = 6.48  
EFFECTIVE AREA(ACRES) = 23.65 AREA-AVERAGED Fm(INCH/HR) = 0.59  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 12.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.81 FLOW VELOCITY(FEET/SEC.) = 6.27  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13892.00 = 1545.62 FEET.

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FLOW PROCESS FROM NODE 13892.00 TO NODE 13893.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 324.46 DOWNSTREAM(FEET) = 240.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 980.03 CHANNEL SLOPE = 0.0853
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.030
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 15.87 0.60 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.22
AVERAGE FLOW DEPTH(FEET) = 0.91 TRAVEL TIME(MIN.) = 2.63
Tc(MIN.) = 13.05
SUBAREA AREA(ACRES) = 15.87 SUBAREA RUNOFF(CFS) = 6.15
EFFECTIVE AREA(ACRES) = 39.52 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 39.5 PEAK FLOW RATE(CFS) = 15.44

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 6.20
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13893.00 = 2525.65 FEET.

FLOW PROCESS FROM NODE 13893.00 TO NODE 13894.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 240.82 DOWNSTREAM(FEET) = 163.04
CHANNEL LENGTH THRU SUBAREA(FEET) = 1144.35 CHANNEL SLOPE = 0.0680
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.882
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 28.41 0.60 0.985 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.985
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.20
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.00
AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 3.18
Tc(MIN.) = 16.23
SUBAREA AREA(ACRES) = 28.41 SUBAREA RUNOFF(CFS) = 7.45
EFFECTIVE AREA(ACRES) = 67.93 AREA-AVERAGED Fm(INCH/HR) = 0.59
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 67.9 PEAK FLOW RATE(CFS) = 17.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.00 FLOW VELOCITY(FEET/SEC.) = 5.92
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13894.00 = 3670.00 FEET.

FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 163.04 DOWNSTREAM(FEET) = 119.70
FLOW LENGTH(FEET) = 1899.01 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000
DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.32
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 17.62
PIPE TRAVEL TIME(MIN.) = 3.07 Tc(MIN.) = 19.29
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13910.00 = 5569.01 FEET.

FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 19.29
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.783
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 11.69 0.60 0.634 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
SUBAREA AREA(ACRES) = 11.69 SUBAREA RUNOFF(CFS) = 4.24
EFFECTIVE AREA(ACRES) = 79.62 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94
TOTAL AREA(ACRES) = 79.6 PEAK FLOW RATE(CFS) = 17.62
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 19.29
RAINFALL INTENSITY(INCH/HR) = 0.78
AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 0.94
EFFECTIVE STREAM AREA(ACRES) = 79.62
TOTAL STREAM AREA(ACRES) = 79.62
PEAK FLOW RATE(CFS) AT CONFLUENCE = 17.62

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. It lists two stream entries with their respective flow characteristics.

1	1309.08	45.88	0.469	0.60 ( 0.57)	0.95	4378.0	13870.00
1	1301.72	58.84	0.407	0.60 ( 0.57)	0.95	5733.1	21000.00
1	1278.11	70.36	0.380	0.60 ( 0.57)	0.96	7842.9	10400.00
1	1278.34	70.42	0.379	0.60 ( 0.57)	0.96	7856.3	13830.00
1	1371.87	95.98	0.328	0.60 ( 0.58)	0.96	13405.5	30100.00
1	1193.09	113.24	0.303	0.60 ( 0.58)	0.96	16984.9	20200.00
1	1114.28	125.88	0.288	0.60 ( 0.57)	0.96	19543.8	13600.00
1	1028.70	144.39	0.273	0.60 ( 0.57)	0.95	23285.3	13200.00
1	1064.75	166.46	0.255	0.60 ( 0.57)	0.96	27537.9	11831.00
1	1150.79	188.44	0.241	0.60 ( 0.57)	0.96	32007.8	11530.00
1	1211.19	207.09	0.234	0.60 ( 0.58)	0.96	36355.3	11000.00
1	1296.03	228.36	0.226	0.60 ( 0.58)	0.97	43364.5	10850.00
1	1207.49	244.94	0.220	0.60 ( 0.58)	0.97	46872.7	11220.00
1	970.03	299.80	0.199	0.60 ( 0.58)	0.97	55312.8	12410.00
1	915.79	333.48	0.187	0.60 ( 0.58)	0.97	61391.1	12261.00
1	897.04	346.63	0.182	0.60 ( 0.58)	0.97	62875.8	10410.00
1	878.87	359.08	0.177	0.60 ( 0.58)	0.97	63981.6	12101.10
1	838.61	387.09	0.174	0.60 ( 0.58)	0.97	66359.4	10200.00
1	819.14	400.78	0.173	0.60 ( 0.58)	0.97	67299.1	12010.00
1	775.27	430.95	0.170	0.60 ( 0.58)	0.97	67976.5	10210.00
1	713.29	481.39	0.166	0.60 ( 0.58)	0.97	68478.2	12000.00
1	670.68	549.35	0.159	0.60 ( 0.58)	0.98	69046.6	10100.00
2	17.62	19.29	0.783	0.60 ( 0.56)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.783	0.60 ( 0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.527	0.60 ( 0.56)	0.94	3481.0	13810.00
3	1313.74	40.07	0.503	0.60 ( 0.57)	0.94	3820.5	13850.00
4	1311.41	45.88	0.469	0.60 ( 0.57)	0.95	4457.6	13870.00
5	1303.74	58.84	0.407	0.60 ( 0.57)	0.95	5812.7	21000.00
6	1280.00	70.36	0.380	0.60 ( 0.57)	0.96	7922.6	10400.00
7	1280.22	70.42	0.379	0.60 ( 0.57)	0.96	7935.9	13830.00
8	1373.50	95.98	0.328	0.60 ( 0.58)	0.96	13485.1	30100.00
9	1194.59	113.24	0.303	0.60 ( 0.58)	0.96	17064.5	20200.00
10	1115.71	125.88	0.288	0.60 ( 0.57)	0.96	19623.4	13600.00
11	1030.06	144.39	0.273	0.60 ( 0.57)	0.95	23364.9	13200.00
12	1066.02	166.46	0.255	0.60 ( 0.57)	0.96	27617.6	11831.00
13	1151.99	188.44	0.241	0.60 ( 0.57)	0.96	32087.4	11530.00
14	1212.35	207.09	0.234	0.60 ( 0.58)	0.96	36434.9	11000.00
15	1297.16	228.36	0.226	0.60 ( 0.58)	0.97	43444.1	10850.00
16	1208.58	244.94	0.220	0.60 ( 0.58)	0.97	46952.3	11220.00
17	971.02	299.80	0.199	0.60 ( 0.58)	0.97	55392.4	12410.00
18	916.72	333.48	0.187	0.60 ( 0.58)	0.97	61470.7	12261.00
19	897.95	346.63	0.182	0.60 ( 0.58)	0.97	62955.4	10410.00
20	879.75	359.08	0.177	0.60 ( 0.58)	0.97	64061.2	12101.10
21	839.48	387.09	0.174	0.60 ( 0.58)	0.97	66439.0	10200.00
22	820.00	400.78	0.173	0.60 ( 0.58)	0.97	67378.7	12010.00
23	776.12	430.95	0.170	0.60 ( 0.58)	0.97	68056.1	10210.00
24	714.11	481.39	0.166	0.60 ( 0.58)	0.97	68557.8	12000.00
25	671.47	549.35	0.159	0.60 ( 0.58)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1373.50 Tc(MIN.) = 95.98

EFFECTIVE AREA(ACRES) = 13485.13 AREA-AVERAGED Fm(INCH/HR) = 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 69126.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 69126.2 TC(MIN.) = 95.98  
 EFFECTIVE AREA(ACRES) = 13485.13 AREA-AVERAGED Fm(INCH/HR)= 0.58  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.963  
 PEAK FLOW RATE(CFS) = 1373.50

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.783	0.60 ( 0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.527	0.60 ( 0.56)	0.94	3481.0	13810.00
3	1313.74	40.07	0.503	0.60 ( 0.57)	0.94	3820.5	13850.00
4	1311.41	45.88	0.469	0.60 ( 0.57)	0.95	4457.6	13870.00
5	1303.74	58.84	0.407	0.60 ( 0.57)	0.95	5812.7	21000.00
6	1280.00	70.36	0.380	0.60 ( 0.57)	0.96	7922.6	10400.00
7	1280.22	70.42	0.379	0.60 ( 0.57)	0.96	7935.9	13830.00
8	1373.50	95.98	0.328	0.60 ( 0.58)	0.96	13485.1	30100.00
9	1194.59	113.24	0.303	0.60 ( 0.58)	0.96	17064.5	20200.00
10	1115.71	125.88	0.288	0.60 ( 0.57)	0.96	19623.4	13600.00
11	1030.06	144.39	0.273	0.60 ( 0.57)	0.95	23364.9	13200.00
12	1066.02	166.46	0.255	0.60 ( 0.57)	0.96	27617.6	11831.00
13	1151.99	188.44	0.241	0.60 ( 0.57)	0.96	32087.4	11530.00
14	1212.35	207.09	0.234	0.60 ( 0.58)	0.96	36434.9	11000.00
15	1297.16	228.36	0.226	0.60 ( 0.58)	0.97	43444.1	10850.00
16	1208.58	244.94	0.220	0.60 ( 0.58)	0.97	46952.3	11220.00
17	971.02	299.80	0.199	0.60 ( 0.58)	0.97	55392.4	12410.00
18	916.72	333.48	0.187	0.60 ( 0.58)	0.97	61470.7	12261.00
19	897.95	346.63	0.182	0.60 ( 0.58)	0.97	62955.4	10410.00
20	879.75	359.08	0.177	0.60 ( 0.58)	0.97	64061.2	12101.10
21	839.48	387.09	0.174	0.60 ( 0.58)	0.97	66439.0	10200.00
22	820.00	400.78	0.173	0.60 ( 0.58)	0.97	67378.7	12010.00
23	776.12	430.95	0.170	0.60 ( 0.58)	0.97	68056.1	10210.00
24	714.11	481.39	0.166	0.60 ( 0.58)	0.97	68557.8	12000.00
25	671.47	549.35	0.159	0.60 ( 0.58)	0.98	69126.2	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S39.DAT  
TIME/DATE OF STUDY: 08:06 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 1.797
- 2) 10.00; 1.198
- 3) 15.00; 0.921
- 4) 20.00; 0.760
- 5) 25.00; 0.658
- 6) 30.00; 0.584
- 7) 40.00; 0.503
- 8) 50.00; 0.446
- 9) 60.00; 0.402
- 10) 90.00; 0.337
- 11) 120.00; 0.293
- 12) 180.00; 0.244
- 13) 360.00; 0.177
- 14) 1440.00; 0.077

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13900.00 TO NODE 13901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 600.65  
ELEVATION DATA: UPSTREAM(FEET) = 442.40 DOWNSTREAM(FEET) = 385.16

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.859  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.150  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
AGRICULTURAL POOR COVER "FALLOW"	-	4.00	0.60	1.000	0	10.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.98  
TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 1.98

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13901.00 TO NODE 13902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 385.16 DOWNSTREAM(FEET) = 288.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 647.42 CHANNEL SLOPE = 0.1497  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.039  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.47	0.60	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.66  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.35  
AVERAGE FLOW DEPTH(FEET) = 0.48 TRAVEL TIME(MIN.) = 2.02  
Tc(MIN.) = 12.88  
SUBAREA AREA(ACRES) = 8.47 SUBAREA RUNOFF(CFS) = 3.35  
EFFECTIVE AREA(ACRES) = 12.47 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 4.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 5.69  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13902.00 = 1248.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13902.00 TO NODE 13903.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 288.21 DOWNSTREAM(FEET) = 184.89  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 669.27 CHANNEL SLOPE = 0.1544  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.947

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.85	0.60	0.982	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.982  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.74  
 AVERAGE FLOW DEPTH(FEET) = 0.66 TRAVEL TIME(MIN.) = 1.65  
 Tc(MIN.) = 14.53  
 SUBAREA AREA(ACRES) = 23.85 SUBAREA RUNOFF(CFS) = 7.68  
 EFFECTIVE AREA(ACRES) = 36.32 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 36.3 PEAK FLOW RATE(CFS) = 11.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.73 FLOW VELOCITY(FEET/SEC.) = 7.25  
 LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13903.00 = 1917.34 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 184.89 DOWNSTREAM(FEET) = 155.08  
 FLOW LENGTH(FEET) = 876.66 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 7.7 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.53  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 11.58  
 PIPE TRAVEL TIME(MIN.) = 1.39 Tc(MIN.) = 15.92  
 LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13904.00 = 2794.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

MAINLINE Tc(MIN.) = 15.92  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.891  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.29	0.60	0.996	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.996  
 SUBAREA AREA(ACRES) = 21.29 SUBAREA RUNOFF(CFS) = 5.63  
 EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.59  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) = 15.40

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 31  
 -----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 155.08 DOWNSTREAM(FEET) = 118.00  
 FLOW LENGTH(FEET) = 1961.38 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.3 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.28  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 15.40  
 PIPE TRAVEL TIME(MIN.) = 3.52 Tc(MIN.) = 19.44  
 LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

MAINLINE Tc(MIN.) = 19.44  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.778  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.53	0.60	0.649	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.649  
 SUBAREA AREA(ACRES) = 43.53 SUBAREA RUNOFF(CFS) = 15.23  
 EFFECTIVE AREA(ACRES) = 101.14 AREA-AVERAGED Fm(INCH/HR) = 0.51  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 101.1 PEAK FLOW RATE(CFS) = 24.74

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S38.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.60( 0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.60( 0.56)	0.94	3481.0	13810.00
3	1303.74	58.84	0.60( 0.57)	0.95	5812.7	21000.00
4	1373.50	95.98	0.60( 0.58)	0.96	13485.1	30100.00
5	1194.59	113.24	0.60( 0.58)	0.96	17064.5	20200.00
6	1115.71	125.88	0.60( 0.57)	0.96	19623.4	13600.00
7	1030.06	144.39	0.60( 0.57)	0.95	23364.9	13200.00
8	1066.02	166.46	0.60( 0.57)	0.96	27617.6	11831.00
9	1151.99	188.44	0.60( 0.57)	0.96	32087.4	11530.00

10	1212.35	207.09	0.60	( 0.58)	0.96	36434.9	11000.00
11	1297.16	228.36	0.60	( 0.58)	0.97	43444.1	10850.00
12	1208.58	244.94	0.60	( 0.58)	0.97	46952.3	11220.00
13	971.02	299.80	0.60	( 0.58)	0.97	55392.4	12410.00
14	916.72	333.48	0.60	( 0.58)	0.97	61470.7	12261.00
15	897.95	346.63	0.60	( 0.58)	0.97	62955.4	10410.00
16	839.48	387.09	0.60	( 0.58)	0.97	66439.0	10200.00
17	820.00	400.78	0.60	( 0.58)	0.97	67378.7	12010.00
18	776.12	430.95	0.60	( 0.58)	0.97	68056.1	10210.00
19	714.11	481.39	0.60	( 0.58)	0.97	68557.8	12000.00
20	671.47	549.35	0.60	( 0.58)	0.98	69126.2	10100.00
TOTAL AREA (ACRES) =							69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	19.29	0.60 ( 0.56)	0.94	1849.8	13889.00
2	1314.20	37.07	0.60 ( 0.56)	0.94	3481.0	13810.00
3	1303.74	58.84	0.60 ( 0.57)	0.95	5812.7	21000.00
4	1373.50	95.98	0.60 ( 0.58)	0.96	13485.1	30100.00
5	1194.59	113.24	0.60 ( 0.58)	0.96	17064.5	20200.00
6	1115.71	125.88	0.60 ( 0.57)	0.96	19623.4	13600.00
7	1030.06	144.39	0.60 ( 0.57)	0.95	23364.9	13200.00
8	1066.02	166.46	0.60 ( 0.57)	0.96	27617.6	11831.00
9	1151.99	188.44	0.60 ( 0.57)	0.96	32087.4	11530.00
10	1212.35	207.09	0.60 ( 0.58)	0.96	36434.9	11000.00
11	1297.16	228.36	0.60 ( 0.58)	0.97	43444.1	10850.00
12	1208.58	244.94	0.60 ( 0.58)	0.97	46952.3	11220.00
13	971.02	299.80	0.60 ( 0.58)	0.97	55392.4	12410.00
14	916.72	333.48	0.60 ( 0.58)	0.97	61470.7	12261.00
15	897.95	346.63	0.60 ( 0.58)	0.97	62955.4	10410.00
16	839.48	387.09	0.60 ( 0.58)	0.97	66439.0	10200.00
17	820.00	400.78	0.60 ( 0.58)	0.97	67378.7	12010.00
18	776.12	430.95	0.60 ( 0.58)	0.97	68056.1	10210.00
19	714.11	481.39	0.60 ( 0.58)	0.97	68557.8	12000.00
20	671.47	549.35	0.60 ( 0.58)	0.98	69126.2	10100.00
TOTAL AREA (ACRES) =						69126.2

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FLOW PROCESS FROM NODE 13910.00 TO NODE 13920.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 119.70 DOWNSTREAM(FEET) = 118.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1376.26 CHANNEL SLOPE = 0.0012  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.321  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 96.09 0.60 0.535 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1379.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.83  
AVERAGE FLOW DEPTH(FEET) = 9.76 TRAVEL TIME(MIN.) = 4.75  
Tc(MIN.) = 100.72  
SUBAREA AREA(ACRES) = 96.09 SUBAREA RUNOFF(CFS) = 12.92  
EFFECTIVE AREA(ACRES) = 13581.22 AREA-AVERAGED Fm(INCH/HR) = 0.58  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 69222.3 PEAK FLOW RATE(CFS) = 1373.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 9.74 FLOW VELOCITY(FEET/SEC.) = 4.83  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1329.21	24.07	0.677	0.60 ( 0.55)	0.92	1945.9	13889.00
2	1314.20	41.86	0.492	0.60 ( 0.56)	0.93	3577.1	13810.00
3	1303.74	63.65	0.394	0.60 ( 0.57)	0.95	5908.8	21000.00
4	1373.50	100.72	0.321	0.60 ( 0.58)	0.96	13581.2	30100.00
5	1194.59	118.15	0.296	0.60 ( 0.57)	0.96	17160.6	20200.00
6	1115.71	130.88	0.284	0.60 ( 0.57)	0.96	19719.5	13600.00
7	1030.06	149.49	0.269	0.60 ( 0.57)	0.95	23461.0	13200.00
8	1066.02	171.51	0.251	0.60 ( 0.57)	0.95	27713.7	11831.00
9	1151.99	193.39	0.239	0.60 ( 0.57)	0.96	32183.5	11530.00
10	1212.35	211.98	0.232	0.60 ( 0.58)	0.96	36531.0	11000.00
11	1297.16	233.17	0.224	0.60 ( 0.58)	0.97	43540.2	10850.00
12	1208.58	249.84	0.218	0.60 ( 0.58)	0.97	47048.4	11220.00
13	971.02	304.98	0.197	0.60 ( 0.58)	0.97	55488.5	12410.00
14	916.72	338.73	0.185	0.60 ( 0.58)	0.97	61566.8	12261.00
15	897.95	351.91	0.180	0.60 ( 0.58)	0.97	63051.5	10410.00
16	839.48	392.46	0.174	0.60 ( 0.58)	0.97	66535.1	10200.00
17	820.00	406.18	0.173	0.60 ( 0.58)	0.97	67474.8	12010.00
18	776.12	436.43	0.170	0.60 ( 0.58)	0.97	68152.2	10210.00
19	714.11	486.97	0.165	0.60 ( 0.58)	0.97	68653.9	12000.00
20	671.47	555.02	0.159	0.60 ( 0.58)	0.97	69222.3	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 1373.50 Tc(MIN.) = 100.72  
AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.60  
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 13581.22

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FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	1329.21	24.07	0.677	0.60 ( 0.55)	0.92	1945.9	13889.00
2	1314.20	41.86	0.492	0.60 ( 0.56)	0.93	3577.1	13810.00
3	1303.74	63.65	0.394	0.60 ( 0.57)	0.95	5908.8	21000.00
4	1373.50	100.72	0.321	0.60 ( 0.58)	0.96	13581.2	30100.00
5	1194.59	118.15	0.296	0.60 ( 0.57)	0.96	17160.6	20200.00
6	1115.71	130.88	0.284	0.60 ( 0.57)	0.96	19719.5	13600.00
7	1030.06	149.49	0.269	0.60 ( 0.57)	0.95	23461.0	13200.00
8	1066.02	171.51	0.251	0.60 ( 0.57)	0.95	27713.7	11831.00
9	1151.99	193.39	0.239	0.60 ( 0.57)	0.96	32183.5	11530.00
10	1212.35	211.98	0.232	0.60 ( 0.58)	0.96	36531.0	11000.00
11	1297.16	233.17	0.224	0.60 ( 0.58)	0.97	43540.2	10850.00
12	1208.58	249.84	0.218	0.60 ( 0.58)	0.97	47048.4	11220.00
13	971.02	304.98	0.197	0.60 ( 0.58)	0.97	55488.5	12410.00
14	916.72	338.73	0.185	0.60 ( 0.58)	0.97	61566.8	12261.00
15	897.95	351.91	0.180	0.60 ( 0.58)	0.97	63051.5	10410.00
16	839.48	392.46	0.174	0.60 ( 0.58)	0.97	66535.1	10200.00
17	820.00	406.18	0.173	0.60 ( 0.58)	0.97	67474.8	12010.00
18	776.12	436.43	0.170	0.60 ( 0.58)	0.97	68152.2	10210.00
19	714.11	486.97	0.165	0.60 ( 0.58)	0.97	68653.9	12000.00
20	671.47	555.02	0.159	0.60 ( 0.58)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	24.74	19.44	0.778	0.60 ( 0.51)	0.84	101.1	13900.00

LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	19.44	0.778	0.60 ( 0.55)	0.92	1672.7	13900.00
2	1344.75	24.07	0.677	0.60 ( 0.55)	0.92	2047.0	13889.00
3	1321.20	41.86	0.492	0.60 ( 0.56)	0.93	3678.2	13810.00
4	1309.34	63.65	0.394	0.60 ( 0.57)	0.94	6009.9	21000.00
5	1378.07	100.72	0.321	0.60 ( 0.58)	0.96	13682.4	30100.00
6	1198.80	118.15	0.296	0.60 ( 0.57)	0.96	17261.8	20200.00
7	1119.75	130.88	0.284	0.60 ( 0.57)	0.96	19820.6	13600.00
8	1033.88	149.49	0.269	0.60 ( 0.57)	0.95	23562.1	13200.00
9	1069.59	171.51	0.251	0.60 ( 0.57)	0.95	27814.8	11831.00
10	1155.39	193.39	0.239	0.60 ( 0.57)	0.96	32284.6	11530.00
11	1215.65	211.98	0.232	0.60 ( 0.58)	0.96	36632.2	11000.00
12	1300.34	233.17	0.224	0.60 ( 0.58)	0.97	43641.3	10850.00
13	1211.68	249.84	0.218	0.60 ( 0.58)	0.97	47149.5	11220.00
14	973.82	304.98	0.197	0.60 ( 0.58)	0.97	55589.6	12410.00
15	919.34	338.73	0.185	0.60 ( 0.58)	0.97	61667.9	12261.00
16	900.50	351.91	0.180	0.60 ( 0.58)	0.97	63152.7	10410.00
17	841.95	392.46	0.174	0.60 ( 0.58)	0.97	66636.2	10200.00
18	822.45	406.18	0.173	0.60 ( 0.58)	0.97	67575.9	12010.00
19	778.54	436.43	0.170	0.60 ( 0.58)	0.97	68253.3	10210.00
20	716.46	486.97	0.165	0.60 ( 0.58)	0.97	68755.0	12000.00
21	673.73	555.02	0.159	0.60 ( 0.58)	0.97	69323.4	10100.00

TOTAL AREA (ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1378.07 Tc (MIN.) = 100.723  
EFFECTIVE AREA (ACRES) = 13682.36 AREA-AVERAGED Fm (INCH/HR) = 0.58  
AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.94

TOTAL AREA (ACRES) = 69323.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

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FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 118.00 DOWNSTREAM (FEET) = 115.28

CHANNEL LENGTH THRU SUBAREA (FEET) = 335.44 CHANNEL SLOPE = 0.0081

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

\* 2 YEAR RAINFALL INTENSITY (INCH/HR) = 0.320

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.30	0.60	0.658	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.60

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1384.69

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.80

AVERAGE FLOW DEPTH (FEET) = 6.86 TRAVEL TIME (MIN.) = 0.57

Tc (MIN.) = 101.29

SUBAREA AREA (ACRES) = 134.30 SUBAREA RUNOFF (CFS) = 13.25

EFFECTIVE AREA (ACRES) = 13816.66 AREA-AVERAGED Fm (INCH/HR) = 0.57

AREA-AVERAGED Fp (INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 69457.7 PEAK FLOW RATE (CFS) = 1378.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.85 FLOW VELOCITY (FEET/SEC.) = 9.79

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	20.01	0.760	0.60 ( 0.54)	0.90	1807.0	13900.00
2	1344.75	24.64	0.665	0.60 ( 0.54)	0.90	2181.3	13889.00
3	1321.20	42.44	0.489	0.60 ( 0.55)	0.92	3812.5	13810.00
4	1309.34	64.22	0.393	0.60 ( 0.56)	0.94	6144.2	21000.00
5	1378.07	101.29	0.320	0.60 ( 0.57)	0.96	13816.7	30100.00
6	1198.80	118.74	0.295	0.60 ( 0.57)	0.95	17396.1	20200.00
7	1119.75	131.48	0.284	0.60 ( 0.57)	0.95	19954.9	13600.00
8	1033.88	150.10	0.268	0.60 ( 0.57)	0.95	23696.4	13200.00
9	1069.59	172.12	0.250	0.60 ( 0.57)	0.95	27949.1	11831.00
10	1155.39	193.99	0.239	0.60 ( 0.57)	0.95	32418.9	11530.00
11	1215.65	212.57	0.232	0.60 ( 0.57)	0.96	36766.5	11000.00
12	1300.34	233.75	0.224	0.60 ( 0.58)	0.96	43775.6	10850.00
13	1211.68	250.43	0.218	0.60 ( 0.58)	0.97	47283.8	11220.00
14	973.82	305.60	0.197	0.60 ( 0.58)	0.97	55723.9	12410.00
15	919.34	339.36	0.185	0.60 ( 0.58)	0.97	61802.2	12261.00
16	900.50	352.54	0.180	0.60 ( 0.58)	0.97	63287.0	10410.00
17	841.95	393.10	0.174	0.60 ( 0.58)	0.97	66770.5	10200.00

18 822.45 406.83 0.173 0.60( 0.58) 0.97 67710.2 12010.00  
 19 778.54 437.08 0.170 0.60( 0.58) 0.97 68387.6 10210.00  
 20 716.46 487.64 0.165 0.60( 0.58) 0.97 68889.3 12000.00  
 21 673.73 555.70 0.159 0.60( 0.58) 0.97 69457.7 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1378.07 Tc(MIN.) = 101.29  
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 13816.66

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FLOW PROCESS FROM NODE 13921.00 TO NODE 14010.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 115.28 DOWNSTREAM(FEET) = 100.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1396.08 CHANNEL SLOPE = 0.0109  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.317

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.27	0.60	0.723	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.723  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1381.88  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.96  
 AVERAGE FLOW DEPTH(FEET) = 6.48 TRAVEL TIME(MIN.) = 2.12  
 Tc(MIN.) = 103.42  
 SUBAREA AREA(ACRES) = 96.27 SUBAREA RUNOFF(CFS) = 7.62  
 EFFECTIVE AREA(ACRES) = 13912.93 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.96  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 69554.0 PEAK FLOW RATE(CFS) = 1378.07  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.47 FLOW VELOCITY(FEET/SEC.) = 10.96  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 14010.00 = 138367.47 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	22.14	0.716	0.60( 0.53)	0.89	1903.3	13900.00
2	1344.75	26.78	0.632	0.60( 0.54)	0.89	2277.6	13889.00
3	1321.20	44.58	0.477	0.60( 0.55)	0.91	3908.8	13810.00
4	1309.34	66.37	0.388	0.60( 0.56)	0.93	6240.5	21000.00
5	1378.07	103.42	0.317	0.60( 0.57)	0.96	13912.9	30100.00
6	1198.80	120.94	0.292	0.60( 0.57)	0.95	17492.3	20200.00
7	1119.75	133.71	0.282	0.60( 0.57)	0.95	20051.2	13600.00
8	1033.88	152.38	0.267	0.60( 0.57)	0.95	23792.7	13200.00
9	1069.59	174.38	0.249	0.60( 0.57)	0.95	28045.4	11831.00
10	1155.39	196.21	0.238	0.60( 0.57)	0.95	32515.2	11530.00
11	1215.65	214.76	0.231	0.60( 0.57)	0.96	36862.7	11000.00

12 1300.34 235.90 0.223 0.60( 0.58) 0.96 43871.9 10850.00  
 13 1211.68 252.62 0.217 0.60( 0.58) 0.97 47380.1 11220.00  
 14 973.82 307.92 0.196 0.60( 0.58) 0.97 55820.2 12410.00  
 15 919.34 341.71 0.184 0.60( 0.58) 0.97 61898.5 12261.00  
 16 900.50 354.90 0.179 0.60( 0.58) 0.97 63383.2 10410.00  
 17 841.95 395.50 0.174 0.60( 0.58) 0.97 66866.8 10200.00  
 18 822.45 409.25 0.172 0.60( 0.58) 0.97 67806.5 12010.00  
 19 778.54 439.53 0.170 0.60( 0.58) 0.97 68483.9 10210.00  
 20 716.46 490.14 0.165 0.60( 0.58) 0.97 68985.6 12000.00  
 21 673.73 558.24 0.159 0.60( 0.58) 0.97 69554.0 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1378.07 Tc(MIN.) = 103.42  
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 13912.93

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 69554.0 TC(MIN.) = 103.42  
 EFFECTIVE AREA(ACRES) = 13912.93 AREA-AVERAGED Fm(INCH/HR) = 0.57  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 0.955  
 PEAK FLOW RATE(CFS) = 1378.07

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1353.95	22.14	0.716	0.60( 0.53)	0.89	1903.3	13900.00
2	1344.75	26.78	0.632	0.60( 0.54)	0.89	2277.6	13889.00
3	1321.20	44.58	0.477	0.60( 0.55)	0.91	3908.8	13810.00
4	1309.34	66.37	0.388	0.60( 0.56)	0.93	6240.5	21000.00
5	1378.07	103.42	0.317	0.60( 0.57)	0.96	13912.9	30100.00
6	1198.80	120.94	0.292	0.60( 0.57)	0.95	17492.3	20200.00
7	1119.75	133.71	0.282	0.60( 0.57)	0.95	20051.2	13600.00
8	1033.88	152.38	0.267	0.60( 0.57)	0.95	23792.7	13200.00
9	1069.59	174.38	0.249	0.60( 0.57)	0.95	28045.4	11831.00
10	1155.39	196.21	0.238	0.60( 0.57)	0.95	32515.2	11530.00
11	1215.65	214.76	0.231	0.60( 0.57)	0.96	36862.7	11000.00
12	1300.34	235.90	0.223	0.60( 0.58)	0.96	43871.9	10850.00
13	1211.68	252.62	0.217	0.60( 0.58)	0.97	47380.1	11220.00
14	973.82	307.92	0.196	0.60( 0.58)	0.97	55820.2	12410.00
15	919.34	341.71	0.184	0.60( 0.58)	0.97	61898.5	12261.00
16	900.50	354.90	0.179	0.60( 0.58)	0.97	63383.2	10410.00
17	841.95	395.50	0.174	0.60( 0.58)	0.97	66866.8	10200.00
18	822.45	409.25	0.172	0.60( 0.58)	0.97	67806.5	12010.00
19	778.54	439.53	0.170	0.60( 0.58)	0.97	68483.9	10210.00
20	716.46	490.14	0.165	0.60( 0.58)	0.97	68985.6	12000.00
21	673.73	558.24	0.159	0.60( 0.58)	0.97	69554.0	10100.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S1.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- |     |          |       |
|-----|----------|-------|
| 1)  | 5.00;    | 3.309 |
| 2)  | 10.00;   | 2.128 |
| 3)  | 15.00;   | 1.452 |
| 4)  | 20.00;   | 1.250 |
| 5)  | 25.00;   | 1.077 |
| 6)  | 30.00;   | 0.947 |
| 7)  | 40.00;   | 0.827 |
| 8)  | 50.00;   | 0.743 |
| 9)  | 60.00;   | 0.687 |
| 10) | 90.00;   | 0.588 |
| 11) | 120.00;  | 0.539 |
| 12) | 180.00;  | 0.462 |
| 13) | 360.00;  | 0.360 |
| 14) | 1440.00; | 0.163 |

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP HIKE (FT) (FT) (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00 0.0313 0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10100.00 TO NODE 10101.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 934.06  
ELEVATION DATA: UPSTREAM(FEET) = 3351.52 DOWNSTREAM(FEET) = 3172.56

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.152  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.446  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	3.55	0.50	1.000	0	15.15

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.02  
TOTAL AREA(ACRES) = 3.55 PEAK FLOW RATE(CFS) = 3.02

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10101.00 TO NODE 10102.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3172.56 DOWNSTREAM(FEET) = 3090.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.40 CHANNEL SLOPE = 0.0870  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.292  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.22	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.12  
AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 3.81  
Tc(MIN.) = 18.96  
SUBAREA AREA(ACRES) = 19.22 SUBAREA RUNOFF(CFS) = 13.69  
EFFECTIVE AREA(ACRES) = 22.77 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 22.8 PEAK FLOW RATE(CFS) = 16.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 4.65  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10102.00 = 1876.46 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10102.00 TO NODE 10103.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3090.55 DOWNSTREAM(FEET) = 3022.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 920.65 CHANNEL SLOPE = 0.0740  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.174

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.77

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.77

AVERAGE FLOW DEPTH(FEET) = 1.26 TRAVEL TIME(MIN.) = 3.22

Tc(MIN.) = 22.18

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 13.06

EFFECTIVE AREA(ACRES) = 44.29 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 44.3 PEAK FLOW RATE(CFS) = 26.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 4.99

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 2797.11 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3022.44 DOWNSTREAM(FEET) = 2962.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.87 CHANNEL SLOPE = 0.0612  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.076

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	126.78	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.78

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.67

AVERAGE FLOW DEPTH(FEET) = 1.87 TRAVEL TIME(MIN.) = 2.87

Tc(MIN.) = 25.05

SUBAREA AREA(ACRES) = 126.78 SUBAREA RUNOFF(CFS) = 65.65

EFFECTIVE AREA(ACRES) = 171.07 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.1 PEAK FLOW RATE(CFS) = 88.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.17 FLOW VELOCITY(FEET/SEC.) = 6.26

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 3774.98 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2962.57 DOWNSTREAM(FEET) = 2917.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.94 CHANNEL SLOPE = 0.0240  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.926

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.68	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.65

AVERAGE FLOW DEPTH(FEET) = 2.81 TRAVEL TIME(MIN.) = 6.69

Tc(MIN.) = 31.74

SUBAREA AREA(ACRES) = 112.68 SUBAREA RUNOFF(CFS) = 43.19

EFFECTIVE AREA(ACRES) = 283.75 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 283.8 PEAK FLOW RATE(CFS) = 108.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.80 FLOW VELOCITY(FEET/SEC.) = 4.63

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 5639.92 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10105.00 TO NODE 10105.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2917.85 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1406.97 CHANNEL SLOPE = 0.0269  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.871

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	183.39	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 139.42

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.15

AVERAGE FLOW DEPTH(FEET) = 3.00 TRAVEL TIME(MIN.) = 4.55

Tc(MIN.) = 36.30

SUBAREA AREA(ACRES) = 183.39 SUBAREA RUNOFF(CFS) = 61.28

EFFECTIVE AREA(ACRES) = 467.14 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 467.1 PEAK FLOW RATE(CFS) = 156.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.13 FLOW VELOCITY(FEET/SEC.) = 5.30

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.50 = 7046.89 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10105.50 TO NODE 10106.00 IS CODE = 51

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-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2868.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 1701.11 CHANNEL SLOPE = 0.0070
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.784
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 60.63 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 163.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.23
AVERAGE FLOW DEPTH(FEET) = 4.11 TRAVEL TIME(MIN.) = 8.77
Tc(MIN.) = 45.06
SUBAREA AREA(ACRES) = 60.63 SUBAREA RUNOFF(CFS) = 15.51
EFFECTIVE AREA(ACRES) = 527.77 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 527.8 PEAK FLOW RATE(CFS) = 156.09
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.04 FLOW VELOCITY(FEET/SEC.) = 3.19
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 8748.00 FEET.

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FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2868.10 DOWNSTREAM(FEET) = 2781.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 2951.00 CHANNEL SLOPE = 0.0294
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.721
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 123.11 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 168.35
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.58
AVERAGE FLOW DEPTH(FEET) = 3.17 TRAVEL TIME(MIN.) = 8.81
Tc(MIN.) = 53.87
SUBAREA AREA(ACRES) = 123.11 SUBAREA RUNOFF(CFS) = 24.50
EFFECTIVE AREA(ACRES) = 650.88 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 650.9 PEAK FLOW RATE(CFS) = 156.09
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 5.47

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LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 11699.00 FEET.

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*****
FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2781.28 DOWNSTREAM(FEET) = 2725.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 2630.56 CHANNEL SLOPE = 0.0213
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.678
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 186.62 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 171.05
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.96
AVERAGE FLOW DEPTH(FEET) = 3.39 TRAVEL TIME(MIN.) = 8.84
Tc(MIN.) = 62.71
SUBAREA AREA(ACRES) = 186.62 SUBAREA RUNOFF(CFS) = 29.87
EFFECTIVE AREA(ACRES) = 837.50 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 837.5 PEAK FLOW RATE(CFS) = 156.09
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.28 FLOW VELOCITY(FEET/SEC.) = 4.85
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 14329.56 FEET.

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FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2725.20 DOWNSTREAM(FEET) = 2581.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 2890.52 CHANNEL SLOPE = 0.0496
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.654
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 112.07 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 163.87
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.73
AVERAGE FLOW DEPTH(FEET) = 2.85 TRAVEL TIME(MIN.) = 7.16
Tc(MIN.) = 69.87
SUBAREA AREA(ACRES) = 112.07 SUBAREA RUNOFF(CFS) = 15.56
EFFECTIVE AREA(ACRES) = 949.57 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 949.6 PEAK FLOW RATE(CFS) = 156.09

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NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.80 FLOW VELOCITY(FEET/SEC.) = 6.66  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 17220.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.72 DOWNSTREAM(FEET) = 2367.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2877.15 CHANNEL SLOPE = 0.0744  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.634

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.21	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 164.85

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.86

AVERAGE FLOW DEPTH(FEET) = 2.64 TRAVEL TIME(MIN.) = 6.10

Tc(MIN.) = 75.97

SUBAREA AREA(ACRES) = 145.21 SUBAREA RUNOFF(CFS) = 17.52

EFFECTIVE AREA(ACRES) = 1094.78 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1094.8 PEAK FLOW RATE(CFS) = 156.09

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.59 FLOW VELOCITY(FEET/SEC.) = 7.75  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 20097.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10110.00 TO NODE 10111.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2367.59 DOWNSTREAM(FEET) = 2075.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2802.04 CHANNEL SLOPE = 0.1041  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.617

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.01	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 173.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.02

AVERAGE FLOW DEPTH(FEET) = 2.54 TRAVEL TIME(MIN.) = 5.18

Tc(MIN.) = 81.15

SUBAREA AREA(ACRES) = 339.01 SUBAREA RUNOFF(CFS) = 35.70  
EFFECTIVE AREA(ACRES) = 1433.79 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1433.8 PEAK FLOW RATE(CFS) = 156.09  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.43 FLOW VELOCITY(FEET/SEC.) = 8.80  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10111.00 = 22899.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10111.00 TO NODE 10112.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2075.82 DOWNSTREAM(FEET) = 2004.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3782.59 CHANNEL SLOPE = 0.0190  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.581

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	265.32	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 165.70

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.71

AVERAGE FLOW DEPTH(FEET) = 3.42 TRAVEL TIME(MIN.) = 13.37

Tc(MIN.) = 94.52

SUBAREA AREA(ACRES) = 265.32 SUBAREA RUNOFF(CFS) = 19.20

EFFECTIVE AREA(ACRES) = 1699.11 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1699.1 PEAK FLOW RATE(CFS) = 156.09

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.35 FLOW VELOCITY(FEET/SEC.) = 4.65  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.00 = 26681.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10112.00 TO NODE 10112.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2004.03 DOWNSTREAM(FEET) = 1982.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1479.53 CHANNEL SLOPE = 0.0149  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.571

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	307.63	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 165.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.31  
AVERAGE FLOW DEPTH(FEET) = 3.58 TRAVEL TIME(MIN.) = 5.72  
Tc(MIN.) = 100.25  
SUBAREA AREA(ACRES) = 307.63 SUBAREA RUNOFF(CFS) = 19.67  
EFFECTIVE AREA(ACRES) = 2006.74 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2006.7 PEAK FLOW RATE(CFS) = 156.09  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.50 FLOW VELOCITY(FEET/SEC.) = 4.24  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.50 = 28161.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1982.04 DOWNSTREAM(FEET) = 1925.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3416.13 CHANNEL SLOPE = 0.0165  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	127.40	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 158.96  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.42  
AVERAGE FLOW DEPTH(FEET) = 3.46 TRAVEL TIME(MIN.) = 12.87  
Tc(MIN.) = 113.12  
SUBAREA AREA(ACRES) = 127.40 SUBAREA RUNOFF(CFS) = 5.74  
EFFECTIVE AREA(ACRES) = 2134.14 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2134.1 PEAK FLOW RATE(CFS) = 156.09  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.44 FLOW VELOCITY(FEET/SEC.) = 4.40  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 2134.1 TC(MIN.) = 113.12  
EFFECTIVE AREA(ACRES) = 2134.14 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 156.09

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S2.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.320
- 2) 10.00; 2.134
- 3) 15.00; 1.454
- 4) 20.00; 1.252
- 5) 25.00; 1.079
- 6) 30.00; 0.948
- 7) 40.00; 0.828
- 8) 50.00; 0.744
- 9) 60.00; 0.688
- 10) 90.00; 0.590
- 11) 120.00; 0.540
- 12) 180.00; 0.464
- 13) 360.00; 0.361
- 14) 1440.00; 0.164

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10200.00 TO NODE 10201.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 301.66  
ELEVATION DATA: UPSTREAM(FEET) = 3087.44 DOWNSTREAM(FEET) = 3031.53

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.705  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.204

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.09 0.50 1.000 0 9.71  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.67  
TOTAL AREA(ACRES) = 1.09 PEAK FLOW RATE(CFS) = 1.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10201.00 TO NODE 10202.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3031.53 DOWNSTREAM(FEET) = 2903.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 538.03 CHANNEL SLOPE = 0.2382  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.926

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 4.06 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.92  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 1.82  
Tc(MIN.) = 11.53  
SUBAREA AREA(ACRES) = 4.06 SUBAREA RUNOFF(CFS) = 5.21  
EFFECTIVE AREA(ACRES) = 5.15 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 6.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.64 FLOW VELOCITY(FEET/SEC.) = 5.45  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10202.00 = 839.69 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10202.00 TO NODE 10203.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2903.38 DOWNSTREAM(FEET) = 2639.65  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1124.98 CHANNEL SLOPE = 0.2344  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.587  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.52  
 AVERAGE FLOW DEPTH(FEET) = 1.04 TRAVEL TIME(MIN.) = 2.49  
 Tc(MIN.) = 14.02  
 SUBAREA AREA(ACRES) = 36.13 SUBAREA RUNOFF(CFS) = 35.35  
 EFFECTIVE AREA(ACRES) = 41.28 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 41.3 PEAK FLOW RATE(CFS) = 40.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.26 FLOW VELOCITY(FEET/SEC.) = 8.53  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10203.00 = 1964.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10203.00 TO NODE 10204.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2639.65 DOWNSTREAM(FEET) = 2444.90  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.75 CHANNEL SLOPE = 0.1026  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.309  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.14	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.95  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.92  
 AVERAGE FLOW DEPTH(FEET) = 1.71 TRAVEL TIME(MIN.) = 4.57  
 Tc(MIN.) = 18.59  
 SUBAREA AREA(ACRES) = 56.14 SUBAREA RUNOFF(CFS) = 40.86  
 EFFECTIVE AREA(ACRES) = 97.42 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 70.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.81 FLOW VELOCITY(FEET/SEC.) = 7.19  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10204.00 = 3862.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10204.00 TO NODE 10205.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 2444.90 DOWNSTREAM(FEET) = 2245.64  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1973.02 CHANNEL SLOPE = 0.1010  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.169  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	264.47	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 150.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.62  
 AVERAGE FLOW DEPTH(FEET) = 2.42 TRAVEL TIME(MIN.) = 3.82  
 Tc(MIN.) = 22.41  
 SUBAREA AREA(ACRES) = 264.47 SUBAREA RUNOFF(CFS) = 159.12  
 EFFECTIVE AREA(ACRES) = 361.89 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 361.9 PEAK FLOW RATE(CFS) = 217.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 9.44  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10205.00 = 5835.44 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10205.00 TO NODE 10206.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2245.64 DOWNSTREAM(FEET) = 2157.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1870.92 CHANNEL SLOPE = 0.0469  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.039  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	255.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 279.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.55  
 AVERAGE FLOW DEPTH(FEET) = 3.51 TRAVEL TIME(MIN.) = 4.13  
 Tc(MIN.) = 26.54  
 SUBAREA AREA(ACRES) = 255.55 SUBAREA RUNOFF(CFS) = 123.86  
 EFFECTIVE AREA(ACRES) = 617.44 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 617.4 PEAK FLOW RATE(CFS) = 299.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.61 FLOW VELOCITY(FEET/SEC.) = 7.67  
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.00 = 7706.36 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10206.00 TO NODE 10206.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2157.91 DOWNSTREAM(FEET) = 2119.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1453.59 CHANNEL SLOPE = 0.0266  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.944  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 141.47 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 327.51  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.35  
AVERAGE FLOW DEPTH(FEET) = 4.15 TRAVEL TIME(MIN.) = 3.82  
Tc(MIN.) = 30.35  
SUBAREA AREA(ACRES) = 141.47 SUBAREA RUNOFF(CFS) = 56.47  
EFFECTIVE AREA(ACRES) = 758.91 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 758.9 PEAK FLOW RATE(CFS) = 302.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.03 FLOW VELOCITY(FEET/SEC.) = 6.21  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10206.50 = 9159.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2119.30 DOWNSTREAM(FEET) = 2093.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2020.48 CHANNEL SLOPE = 0.0129  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.860  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 105.39 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 320.01  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.81  
AVERAGE FLOW DEPTH(FEET) = 4.71 TRAVEL TIME(MIN.) = 7.00  
Tc(MIN.) = 37.36  
SUBAREA AREA(ACRES) = 105.39 SUBAREA RUNOFF(CFS) = 34.10  
EFFECTIVE AREA(ACRES) = 864.30 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 864.3 PEAK FLOW RATE(CFS) = 302.95

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.61 FLOW VELOCITY(FEET/SEC.) = 4.75  
LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10220.00 = 11180.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10206.50 TO NODE 10220.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 37.36  
RAINFALL INTENSITY(INCH/HR) = 0.86  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 864.30  
TOTAL STREAM AREA(ACRES) = 864.30  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 302.95

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10210.00 TO NODE 10211.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 890.82  
ELEVATION DATA: UPSTREAM(FEET) = 2966.08 DOWNSTREAM(FEET) = 2867.74

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.601  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.389

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 7.25 0.50 1.000 0 16.60  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 5.80  
TOTAL AREA(ACRES) = 7.25 PEAK FLOW RATE(CFS) = 5.80

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10211.00 TO NODE 10212.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2867.74 DOWNSTREAM(FEET) = 2763.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1682.06 CHANNEL SLOPE = 0.0618  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.130  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 33.02 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.35  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.05

AVERAGE FLOW DEPTH (FEET) = 1.12 TRAVEL TIME (MIN.) = 6.93  
Tc (MIN.) = 23.53  
SUBAREA AREA (ACRES) = 33.02 SUBAREA RUNOFF (CFS) = 18.71  
EFFECTIVE AREA (ACRES) = 40.27 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 40.3 PEAK FLOW RATE (CFS) = 22.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.30 FLOW VELOCITY (FEET/SEC.) = 4.49  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10212.00 = 2572.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10212.00 TO NODE 10213.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2763.75 DOWNSTREAM (FEET) = 2662.20  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1206.59 CHANNEL SLOPE = 0.0842  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.027

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 71.89 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 39.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.79  
AVERAGE FLOW DEPTH (FEET) = 1.52 TRAVEL TIME (MIN.) = 3.47  
Tc (MIN.) = 27.00  
SUBAREA AREA (ACRES) = 71.89 SUBAREA RUNOFF (CFS) = 34.06  
EFFECTIVE AREA (ACRES) = 112.16 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 112.2 PEAK FLOW RATE (CFS) = 53.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.69 FLOW VELOCITY (FEET/SEC.) = 6.19  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10213.00 = 3779.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10213.00 TO NODE 10214.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2662.20 DOWNSTREAM (FEET) = 2520.73  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1783.17 CHANNEL SLOPE = 0.0793  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.932

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 182.61 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 88.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.90  
AVERAGE FLOW DEPTH (FEET) = 2.07 TRAVEL TIME (MIN.) = 4.31  
Tc (MIN.) = 31.31  
SUBAREA AREA (ACRES) = 182.61 SUBAREA RUNOFF (CFS) = 71.01  
EFFECTIVE AREA (ACRES) = 294.77 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 294.8 PEAK FLOW RATE (CFS) = 114.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.28 FLOW VELOCITY (FEET/SEC.) = 7.36  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10214.00 = 5562.64 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10214.00 TO NODE 10215.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2520.73 DOWNSTREAM (FEET) = 2270.71  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2774.20 CHANNEL SLOPE = 0.0901  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.864

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 156.94 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 140.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.12  
AVERAGE FLOW DEPTH (FEET) = 2.40 TRAVEL TIME (MIN.) = 5.69  
Tc (MIN.) = 37.00  
SUBAREA AREA (ACRES) = 156.94 SUBAREA RUNOFF (CFS) = 51.38  
EFFECTIVE AREA (ACRES) = 451.71 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 451.7 PEAK FLOW RATE (CFS) = 147.88

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.45 FLOW VELOCITY (FEET/SEC.) = 8.20  
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10215.00 = 8336.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10215.00 TO NODE 10216.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2270.71 DOWNSTREAM (FEET) = 2151.20  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2019.75 CHANNEL SLOPE = 0.0592  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.814

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 130.62 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 166.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.21  
 AVERAGE FLOW DEPTH(FEET) = 2.77 TRAVEL TIME(MIN.) = 4.67  
 Tc(MIN.) = 41.67  
 SUBAREA AREA(ACRES) = 130.62 SUBAREA RUNOFF(CFS) = 36.89  
 EFFECTIVE AREA(ACRES) = 582.33 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 582.3 PEAK FLOW RATE(CFS) = 164.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.76 FLOW VELOCITY(FEET/SEC.) = 7.21  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.00 = 10356.59 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10216.00 TO NODE 10216.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2151.20 DOWNSTREAM(FEET) = 2120.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1242.42 CHANNEL SLOPE = 0.0246  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.781

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.25	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 170.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.24  
 AVERAGE FLOW DEPTH(FEET) = 3.30 TRAVEL TIME(MIN.) = 3.96  
 Tc(MIN.) = 45.62  
 SUBAREA AREA(ACRES) = 51.25 SUBAREA RUNOFF(CFS) = 12.94  
 EFFECTIVE AREA(ACRES) = 633.58 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 633.6 PEAK FLOW RATE(CFS) = 164.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.25 FLOW VELOCITY(FEET/SEC.) = 5.18  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10216.50 = 11599.01 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2120.63 DOWNSTREAM(FEET) = 2093.25  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1301.06 CHANNEL SLOPE = 0.0210  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.744  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.16	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 167.32  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.91  
 AVERAGE FLOW DEPTH(FEET) = 3.37 TRAVEL TIME(MIN.) = 4.41  
 Tc(MIN.) = 50.04  
 SUBAREA AREA(ACRES) = 26.16 SUBAREA RUNOFF(CFS) = 5.73  
 EFFECTIVE AREA(ACRES) = 659.74 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 659.7 PEAK FLOW RATE(CFS) = 164.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.35 FLOW VELOCITY(FEET/SEC.) = 4.89  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10216.50 TO NODE 10220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 50.04  
 RAINFALL INTENSITY(INCH/HR) = 0.74  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 659.74  
 TOTAL STREAM AREA(ACRES) = 659.74  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 164.45

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	302.95	37.36	0.860	0.50( 0.50)	1.00	864.3	10200.00
2	164.45	50.04	0.744	0.50( 0.50)	1.00	659.7	10210.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	467.40	37.36	0.860	0.50( 0.50)	1.00	1356.9	10200.00
2	369.72	50.04	0.744	0.50( 0.50)	1.00	1524.0	10210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 467.40 Tc(MIN.) = 37.36  
 EFFECTIVE AREA(ACRES) = 1356.86 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1524.0  
 LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10220.00 = 12900.07 FEET.

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FLOW PROCESS FROM NODE 10220.00 TO NODE 10221.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2093.25 DOWNSTREAM(FEET) = 1965.76
CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.11 CHANNEL SLOPE = 0.0430
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.801
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 104.45 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 481.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.36
AVERAGE FLOW DEPTH(FEET) = 4.38 TRAVEL TIME(MIN.) = 5.91
Tc(MIN.) = 43.27
SUBAREA AREA(ACRES) = 104.45 SUBAREA RUNOFF(CFS) = 28.23
EFFECTIVE AREA(ACRES) = 1461.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1628.5 PEAK FLOW RATE(CFS) = 467.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.33 FLOW VELOCITY(FEET/SEC.) = 8.31
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.00 = 15866.18 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10221.00 TO NODE 10221.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1965.76 DOWNSTREAM(FEET) = 1950.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1346.48 CHANNEL SLOPE = 0.0117
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.764
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 169.50 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 487.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.15
AVERAGE FLOW DEPTH(FEET) = 5.62 TRAVEL TIME(MIN.) = 4.36
Tc(MIN.) = 47.63
SUBAREA AREA(ACRES) = 169.50 SUBAREA RUNOFF(CFS) = 40.23
EFFECTIVE AREA(ACRES) = 1630.81 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1798.0 PEAK FLOW RATE(CFS) = 467.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.53 FLOW VELOCITY(FEET/SEC.) = 5.10
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10221.50 = 17212.66 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1950.00 DOWNSTREAM(FEET) = 1925.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 1849.80 CHANNEL SLOPE = 0.0131
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.725
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 43.12 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 471.76
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.32
AVERAGE FLOW DEPTH(FEET) = 5.43 TRAVEL TIME(MIN.) = 5.79
Tc(MIN.) = 53.42
SUBAREA AREA(ACRES) = 43.12 SUBAREA RUNOFF(CFS) = 8.72
EFFECTIVE AREA(ACRES) = 1673.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1841.1 PEAK FLOW RATE(CFS) = 467.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.41 FLOW VELOCITY(FEET/SEC.) = 5.32
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 1841.1 TC(MIN.) = 53.42
EFFECTIVE AREA(ACRES) = 1673.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 467.40

\*\* PEAK FLOW RATE TABLE \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 467.40 53.42 0.725 0.50( 0.50) 1.00 1673.9 10200.00
2 369.72 67.09 0.665 0.50( 0.50) 1.00 1841.1 10210.00

END OF RATIONAL METHOD ANALYSIS





ELEVATION DATA: UPSTREAM(FEET) = 3797.25 DOWNSTREAM(FEET) = 3447.07  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1908.89 CHANNEL SLOPE = 0.1834  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.595  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.83	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.12  
 AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 4.47  
 Tc(MIN.) = 13.98  
 SUBAREA AREA(ACRES) = 32.83 SUBAREA RUNOFF(CFS) = 32.36  
 EFFECTIVE AREA(ACRES) = 40.06 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 39.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.31 FLOW VELOCITY(FEET/SEC.) = 7.70  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10303.00 = 2850.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10303.00 TO NODE 10304.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3447.07 DOWNSTREAM(FEET) = 3228.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.05 CHANNEL SLOPE = 0.1140  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.318  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.51	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 61.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.22  
 AVERAGE FLOW DEPTH(FEET) = 1.69 TRAVEL TIME(MIN.) = 4.43  
 Tc(MIN.) = 18.41  
 SUBAREA AREA(ACRES) = 60.51 SUBAREA RUNOFF(CFS) = 44.55  
 EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 74.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.81 FLOW VELOCITY(FEET/SEC.) = 7.53  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10304.00 = 4768.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10304.00 TO NODE 10305.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 3228.48 DOWNSTREAM(FEET) = 3118.37  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1679.40 CHANNEL SLOPE = 0.0656  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.166  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.56	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 109.05  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.77  
 AVERAGE FLOW DEPTH(FEET) = 2.32 TRAVEL TIME(MIN.) = 4.13  
 Tc(MIN.) = 22.54  
 SUBAREA AREA(ACRES) = 116.56 SUBAREA RUNOFF(CFS) = 69.80  
 EFFECTIVE AREA(ACRES) = 217.13 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 217.1 PEAK FLOW RATE(CFS) = 130.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.48 FLOW VELOCITY(FEET/SEC.) = 7.07  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10305.00 = 6448.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10305.00 TO NODE 10306.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3118.37 DOWNSTREAM(FEET) = 2807.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2853.67 CHANNEL SLOPE = 0.1088  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.008  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	189.23	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 173.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.16  
 AVERAGE FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 5.19  
 Tc(MIN.) = 27.73  
 SUBAREA AREA(ACRES) = 189.23 SUBAREA RUNOFF(CFS) = 86.55  
 EFFECTIVE AREA(ACRES) = 406.36 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 406.4 PEAK FLOW RATE(CFS) = 185.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.58 FLOW VELOCITY(FEET/SEC.) = 9.34  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10306.00 = 9301.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10306.00 TO NODE 10307.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2807.99 DOWNSTREAM(FEET) = 2591.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2848.03 CHANNEL SLOPE = 0.0759  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.912  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 416.51 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 263.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.90  
AVERAGE FLOW DEPTH(FEET) = 3.14 TRAVEL TIME(MIN.) = 5.33  
Tc(MIN.) = 33.07  
SUBAREA AREA(ACRES) = 416.51 SUBAREA RUNOFF(CFS) = 154.44  
EFFECTIVE AREA(ACRES) = 822.87 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 822.9 PEAK FLOW RATE(CFS) = 305.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.32 FLOW VELOCITY(FEET/SEC.) = 9.22  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10307.00 = 12149.90 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10307.00 TO NODE 10308.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2591.87 DOWNSTREAM(FEET) = 2516.62  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.06 CHANNEL SLOPE = 0.0263  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.825  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 320.49 0.50 0.986 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 353.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.44  
AVERAGE FLOW DEPTH(FEET) = 4.28 TRAVEL TIME(MIN.) = 7.41  
Tc(MIN.) = 40.48  
SUBAREA AREA(ACRES) = 320.49 SUBAREA RUNOFF(CFS) = 95.70  
EFFECTIVE AREA(ACRES) = 1143.36 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1143.4 PEAK FLOW RATE(CFS) = 336.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.20 FLOW VELOCITY(FEET/SEC.) = 6.36  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.00 = 15011.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10308.00 TO NODE 10308.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2516.62 DOWNSTREAM(FEET) = 2462.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.32 CHANNEL SLOPE = 0.0288  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.786  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 191.88 0.50 0.966 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.966  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 362.35  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.70  
AVERAGE FLOW DEPTH(FEET) = 4.24 TRAVEL TIME(MIN.) = 4.70  
Tc(MIN.) = 45.17  
SUBAREA AREA(ACRES) = 191.88 SUBAREA RUNOFF(CFS) = 52.21  
EFFECTIVE AREA(ACRES) = 1335.24 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1335.2 PEAK FLOW RATE(CFS) = 347.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.18 FLOW VELOCITY(FEET/SEC.) = 6.62  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10308.50 = 16901.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10308.50 TO NODE 10309.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2462.25 DOWNSTREAM(FEET) = 2409.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1874.33 CHANNEL SLOPE = 0.0279  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.746  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.14 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 357.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.61  
AVERAGE FLOW DEPTH(FEET) = 4.25 TRAVEL TIME(MIN.) = 4.72  
Tc(MIN.) = 49.90  
SUBAREA AREA(ACRES) = 90.14 SUBAREA RUNOFF(CFS) = 19.93  
EFFECTIVE AREA(ACRES) = 1425.38 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 1425.4 PEAK FLOW RATE(CFS) = 347.84

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.21 FLOW VELOCITY(FEET/SEC.) = 6.55  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10309.00 = 18775.61 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2409.87 DOWNSTREAM(FEET) = 2330.13  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2576.20 CHANNEL SLOPE = 0.0310  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.710

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.83	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 355.78

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.85

AVERAGE FLOW DEPTH(FEET) = 4.16 TRAVEL TIME(MIN.) = 6.27

Tc(MIN.) = 56.17

SUBAREA AREA(ACRES) = 83.83 SUBAREA RUNOFF(CFS) = 15.86

EFFECTIVE AREA(ACRES) = 1509.21 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 1509.2 PEAK FLOW RATE(CFS) = 347.84

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.12 FLOW VELOCITY(FEET/SEC.) = 6.82

LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10309.00 TO NODE 10330.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 56.17

RAINFALL INTENSITY(INCH/HR) = 0.71

AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.99

EFFECTIVE STREAM AREA(ACRES) = 1509.21

TOTAL STREAM AREA(ACRES) = 1509.21

PEAK FLOW RATE(CFS) AT CONFLUENCE = 347.84

\*\*\*\*\*

FLOW PROCESS FROM NODE 10320.00 TO NODE 10321.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.56

ELEVATION DATA: UPSTREAM(FEET) = 3374.80 DOWNSTREAM(FEET) = 3300.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.959

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.387

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	-	2.24	0.50	1.000	0	8.96

NATURAL FAIR COVER

"CHAPARRAL,BROADLEAF" - 2.24 0.50 1.000 0 8.96

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 3.80

TOTAL AREA(ACRES) = 2.24 PEAK FLOW RATE(CFS) = 3.80

\*\*\*\*\*

FLOW PROCESS FROM NODE 10321.00 TO NODE 10322.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3300.24 DOWNSTREAM(FEET) = 3187.21

CHANNEL LENGTH THRU SUBAREA(FEET) = 581.07 CHANNEL SLOPE = 0.1945

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.025

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.01	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.26

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.17

AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 1.87

Tc(MIN.) = 10.83

SUBAREA AREA(ACRES) = 5.01 SUBAREA RUNOFF(CFS) = 6.88

EFFECTIVE AREA(ACRES) = 7.25 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 7.2 PEAK FLOW RATE(CFS) = 9.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.77 FLOW VELOCITY(FEET/SEC.) = 5.55

LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10322.00 = 871.63 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10322.00 TO NODE 10323.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3187.21 DOWNSTREAM(FEET) = 3108.86

CHANNEL LENGTH THRU SUBAREA(FEET) = 977.98 CHANNEL SLOPE = 0.0801

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.584

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

USER-DEFINED - 30.37 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.06  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.05  
AVERAGE FLOW DEPTH (FEET) = 1.29 TRAVEL TIME (MIN.) = 3.23  
Tc (MIN.) = 14.06  
SUBAREA AREA (ACRES) = 30.37 SUBAREA RUNOFF (CFS) = 29.63  
EFFECTIVE AREA (ACRES) = 37.62 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 37.6 PEAK FLOW RATE (CFS) = 36.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.48 FLOW VELOCITY (FEET/SEC.) = 5.55  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10323.00 = 1849.61 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10323.00 TO NODE 10324.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 3108.86 DOWNSTREAM (FEET) = 2923.03  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1924.11 CHANNEL SLOPE = 0.0966  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.303

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 68.88 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 61.78  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.78  
AVERAGE FLOW DEPTH (FEET) = 1.74 TRAVEL TIME (MIN.) = 4.73  
Tc (MIN.) = 18.79  
SUBAREA AREA (ACRES) = 68.88 SUBAREA RUNOFF (CFS) = 49.76  
EFFECTIVE AREA (ACRES) = 106.50 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 106.5 PEAK FLOW RATE (CFS) = 76.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.89 FLOW VELOCITY (FEET/SEC.) = 7.14  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10324.00 = 3773.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10324.00 TO NODE 10325.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2923.03 DOWNSTREAM (FEET) = 2675.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2788.58 CHANNEL SLOPE = 0.0889  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.086  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 146.19 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 115.87  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.70  
AVERAGE FLOW DEPTH (FEET) = 2.24 TRAVEL TIME (MIN.) = 6.04  
Tc (MIN.) = 24.83  
SUBAREA AREA (ACRES) = 146.19 SUBAREA RUNOFF (CFS) = 77.08  
EFFECTIVE AREA (ACRES) = 252.69 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 252.7 PEAK FLOW RATE (CFS) = 133.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.36 FLOW VELOCITY (FEET/SEC.) = 7.96  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10325.00 = 6562.30 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10325.00 TO NODE 10326.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2675.11 DOWNSTREAM (FEET) = 2541.92  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2862.28 CHANNEL SLOPE = 0.0465  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.928

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 321.78 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 195.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.88  
AVERAGE FLOW DEPTH (FEET) = 3.08 TRAVEL TIME (MIN.) = 6.93  
Tc (MIN.) = 31.76  
SUBAREA AREA (ACRES) = 321.78 SUBAREA RUNOFF (CFS) = 123.85  
EFFECTIVE AREA (ACRES) = 574.47 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 574.5 PEAK FLOW RATE (CFS) = 221.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.22 FLOW VELOCITY (FEET/SEC.) = 7.09  
LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.00 = 9424.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10326.00 TO NODE 10326.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2541.92 DOWNSTREAM (FEET) = 2438.80  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2617.40 CHANNEL SLOPE = 0.0394  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.852  
 SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	187.06	0.50	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 250.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.86  
 AVERAGE FLOW DEPTH (FEET) = 3.49 TRAVEL TIME (MIN.) = 6.36  
 Tc (MIN.) = 38.12  
 SUBAREA AREA (ACRES) = 187.06 SUBAREA RUNOFF (CFS) = 59.16  
 EFFECTIVE AREA (ACRES) = 761.53 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 761.5 PEAK FLOW RATE (CFS) = 240.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.44 FLOW VELOCITY (FEET/SEC.) = 6.80  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10326.50 = 12041.98 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10326.50 TO NODE 10327.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2438.80 DOWNSTREAM (FEET) = 2414.64  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1181.79 CHANNEL SLOPE = 0.0204  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.814  
 SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.27	0.50	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 252.46  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.38  
 AVERAGE FLOW DEPTH (FEET) = 3.95 TRAVEL TIME (MIN.) = 3.66  
 Tc (MIN.) = 41.78  
 SUBAREA AREA (ACRES) = 82.27 SUBAREA RUNOFF (CFS) = 23.24  
 EFFECTIVE AREA (ACRES) = 843.80 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) = 240.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.89 FLOW VELOCITY (FEET/SEC.) = 5.32  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.00 = 13223.77 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10327.00 TO NODE 10327.50 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2414.64 DOWNSTREAM (FEET) = 2389.73

CHANNEL LENGTH THRU SUBAREA (FEET) = 2431.92 CHANNEL SLOPE = 0.0102  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.737  
 SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	243.69	0.50	0.997	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 267.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.21  
 AVERAGE FLOW DEPTH (FEET) = 4.60 TRAVEL TIME (MIN.) = 9.62  
 Tc (MIN.) = 51.40  
 SUBAREA AREA (ACRES) = 243.69 SUBAREA RUNOFF (CFS) = 52.30  
 EFFECTIVE AREA (ACRES) = 1087.49 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1087.5 PEAK FLOW RATE (CFS) = 240.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.42 FLOW VELOCITY (FEET/SEC.) = 4.11  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10327.50 = 15655.69 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2389.73 DOWNSTREAM (FEET) = 2330.13  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1944.59 CHANNEL SLOPE = 0.0306  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.708  
 SUBAREA LOSS RATE DATA (AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.36	0.50	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 247.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.23  
 AVERAGE FLOW DEPTH (FEET) = 3.64 TRAVEL TIME (MIN.) = 5.20  
 Tc (MIN.) = 56.59  
 SUBAREA AREA (ACRES) = 69.36 SUBAREA RUNOFF (CFS) = 12.98  
 EFFECTIVE AREA (ACRES) = 1156.85 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1156.8 PEAK FLOW RATE (CFS) = 240.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.60 FLOW VELOCITY (FEET/SEC.) = 6.20  
 LONGEST FLOWPATH FROM NODE 10320.00 TO NODE 10330.00 = 17600.28 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10327.50 TO NODE 10330.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 56.59  
RAINFALL INTENSITY(INCH/HR) = 0.71  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 1156.85  
TOTAL STREAM AREA(ACRES) = 1156.85  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 240.84

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	347.84	56.17	0.710	0.50( 0.50)	0.99	1509.2	10300.00
2	240.84	56.59	0.708	0.50( 0.50)	1.00	1156.8	10320.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.68	56.17	0.710	0.50( 0.50)	1.00	2657.3	10300.00
2	584.79	56.59	0.708	0.50( 0.50)	1.00	2666.1	10320.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 588.68 Tc(MIN.) = 56.17  
EFFECTIVE AREA(ACRES) = 2657.32 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2666.1  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10330.00 = 21351.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10330.00 TO NODE 10331.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2330.13 DOWNSTREAM(FEET) = 2041.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3034.53 CHANNEL SLOPE = 0.0951  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.688  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	70.23	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 594.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.87  
AVERAGE FLOW DEPTH(FEET) = 4.09 TRAVEL TIME(MIN.) = 4.26  
Tc(MIN.) = 60.43  
SUBAREA AREA(ACRES) = 70.23 SUBAREA RUNOFF(CFS) = 11.84

EFFECTIVE AREA(ACRES) = 2727.55 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2736.3 PEAK FLOW RATE(CFS) = 588.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.07 FLOW VELOCITY(FEET/SEC.) = 11.84  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10331.00 = 24386.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2041.66 DOWNSTREAM(FEET) = 1739.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3264.87 CHANNEL SLOPE = 0.0924  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.672

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	104.94	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 596.82  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.75  
AVERAGE FLOW DEPTH(FEET) = 4.12 TRAVEL TIME(MIN.) = 4.63  
Tc(MIN.) = 65.06  
SUBAREA AREA(ACRES) = 104.94 SUBAREA RUNOFF(CFS) = 16.27  
EFFECTIVE AREA(ACRES) = 2832.49 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2841.2 PEAK FLOW RATE(CFS) = 588.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.09 FLOW VELOCITY(FEET/SEC.) = 11.72  
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S1.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	156.09	113.12	0.50( 0.50)	1.00	2134.1	10100.00

TOTAL AREA(ACRES) = 2134.1

```

*****
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 3 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: S2.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR)      (ACRES)      NODE
1           467.40  53.42  0.50( 0.50)  1.00    1673.9  10200.00
2           369.72  67.09  0.50( 0.50)  1.00    1841.1  10210.00
TOTAL AREA (ACRES) =      1841.1
*****
FLOW PROCESS FROM NODE 10221.50 TO NODE 10222.00 IS CODE = 14.0
-----
>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<
=====
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR)      (ACRES)      NODE
1           467.40  53.42  0.50( 0.50)  1.00    1673.9  10200.00
2           369.72  67.09  0.50( 0.50)  1.00    1841.1  10210.00
TOTAL AREA (ACRES) =      1841.1
*****
FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           467.40  53.42  0.726  0.50( 0.50)  1.00    1673.9  10200.00
2           369.72  67.09  0.666  0.50( 0.50)  1.00    1841.1  10210.00
LONGEST FLOWPATH FROM NODE 10210.00 TO NODE 10222.00 = 19062.46 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           156.09  113.12  0.552  0.50( 0.50)  1.00    2134.1  10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           623.49  53.42  0.726  0.50( 0.50)  1.00    2681.8  10200.00
2           525.80  67.09  0.666  0.50( 0.50)  1.00    3106.9  10210.00
3           272.76  113.12  0.552  0.50( 0.50)  1.00    3975.2  10100.00
TOTAL AREA (ACRES) =      3975.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      623.49  Tc(MIN.) = 53.422
EFFECTIVE AREA(ACRES) = 2681.83  AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA (ACRES) =      3975.2

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LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.
*****
FLOW PROCESS FROM NODE 10222.00 TO NODE 10332.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1925.82  DOWNSTREAM(FEET) = 1739.96
CHANNEL LENGTH THRU SUBAREA(FEET) = 1475.92  CHANNEL SLOPE = 0.1259
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.716
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS
LAND USE              GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED          -      19.92  0.50  1.000  -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 625.42
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.37
AVERAGE FLOW DEPTH(FEET) = 3.95  TRAVEL TIME(MIN.) = 1.84
Tc(MIN.) = 55.26
SUBAREA AREA(ACRES) = 19.92  SUBAREA RUNOFF(CFS) = 3.86
EFFECTIVE AREA(ACRES) = 2701.75  AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3995.2  PEAK FLOW RATE(CFS) = 623.49
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.95  FLOW VELOCITY(FEET/SEC.) = 13.34
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.
*****
FLOW PROCESS FROM NODE 10331.00 TO NODE 10332.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           623.49  55.26  0.716  0.50( 0.50)  1.00    2701.7  10200.00
2           525.80  69.01  0.660  0.50( 0.50)  1.00    3126.8  10210.00
3           272.76  115.38  0.549  0.50( 0.50)  1.00    3995.2  10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           588.68  65.06  0.672  0.50( 0.50)  1.00    2832.5  10300.00
2           584.79  65.50  0.671  0.50( 0.50)  1.00    2841.2  10320.00
LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10332.00 = 27651.21 FEET.

** PEAK FLOW RATE TABLE **
STREAM      Q      Tc      Intensity  Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS) (MIN.) (INCH/HR) (INCH/HR)      (ACRES)      NODE
1           1212.17  55.26  0.716  0.50( 0.50)  1.00    5107.7  10200.00

```



2	1142.56	65.06	0.672	0.50 ( 0.50)	1.00	5837.1	10300.00
3	1135.57	65.50	0.671	0.50 ( 0.50)	1.00	5859.4	10320.00
4	1071.75	69.01	0.660	0.50 ( 0.50)	1.00	5968.0	10210.00
5	443.75	115.38	0.549	0.50 ( 0.50)	1.00	6836.4	10100.00
TOTAL AREA (ACRES) =			6836.4				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1212.17 Tc (MIN.) = 55.262  
EFFECTIVE AREA (ACRES) = 5107.70 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 6836.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10332.00 = 33053.44 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 6836.4 TC (MIN.) = 55.26  
EFFECTIVE AREA (ACRES) = 5107.70 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.998  
PEAK FLOW RATE (CFS) = 1212.17

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1212.17	55.26	0.716	0.50 ( 0.50)	1.00	5107.7	10200.00
2	1142.56	65.06	0.672	0.50 ( 0.50)	1.00	5837.1	10300.00
3	1135.57	65.50	0.671	0.50 ( 0.50)	1.00	5859.4	10320.00
4	1071.75	69.01	0.660	0.50 ( 0.50)	1.00	5968.0	10210.00
5	443.75	115.38	0.549	0.50 ( 0.50)	1.00	6836.4	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S4.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.289
- 2) 10.00; 2.117
- 3) 15.00; 1.447
- 4) 20.00; 1.246
- 5) 25.00; 1.074
- 6) 30.00; 0.944
- 7) 40.00; 0.825
- 8) 50.00; 0.741
- 9) 60.00; 0.684
- 10) 90.00; 0.586
- 11) 120.00; 0.536
- 12) 180.00; 0.459
- 13) 360.00; 0.357
- 14) 1440.00; 0.162

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE	CROSSFALL / SIDE	STREET-FALL: IN- / SIDE	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	STREET-FALL: OUT-/PARK- / SIDE	HEIGHT (FT)	WIP HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150			

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10400.00 TO NODE 10401.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 950.42  
ELEVATION DATA: UPSTREAM(FEET) = 2648.70 DOWNSTREAM(FEET) = 2536.15

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.799  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.375  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.89 0.50 1.000 0 16.80  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.64  
TOTAL AREA(ACRES) = 5.89 PEAK FLOW RATE(CFS) = 4.64

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10401.00 TO NODE 10402.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2536.15 DOWNSTREAM(FEET) = 2504.36  
CHANNEL LENGTH THRU SUBAREA(FEET) = 934.06 CHANNEL SLOPE = 0.0340  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.172  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 17.57 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.99  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.90  
AVERAGE FLOW DEPTH(FEET) = 1.07 TRAVEL TIME(MIN.) = 5.36  
Tc(MIN.) = 22.16  
SUBAREA AREA(ACRES) = 17.57 SUBAREA RUNOFF(CFS) = 10.62  
EFFECTIVE AREA(ACRES) = 23.46 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 23.5 PEAK FLOW RATE(CFS) = 14.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.22 FLOW VELOCITY(FEET/SEC.) = 3.19  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.00 = 1884.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10402.00 TO NODE 10402.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2504.36 DOWNSTREAM(FEET) = 2462.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.55 CHANNEL SLOPE = 0.0439  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.049

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	56.74	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.24

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.15

AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 3.82

Tc(MIN.) = 25.98

SUBAREA AREA(ACRES) = 56.74 SUBAREA RUNOFF(CFS) = 28.00

EFFECTIVE AREA(ACRES) = 80.20 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 80.2 PEAK FLOW RATE(CFS) = 39.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 4.50

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.50 = 2836.03 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10402.50 TO NODE 10403.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2462.54 DOWNSTREAM(FEET) = 2433.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 967.41 CHANNEL SLOPE = 0.0299  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.949

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.01	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.36

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.21

AVERAGE FLOW DEPTH(FEET) = 2.06 TRAVEL TIME(MIN.) = 3.83

Tc(MIN.) = 29.81

SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 27.47

EFFECTIVE AREA(ACRES) = 148.21 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 148.2 PEAK FLOW RATE(CFS) = 59.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.15 FLOW VELOCITY(FEET/SEC.) = 4.33

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10403.00 = 3803.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10403.00 TO NODE 10404.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2433.59 DOWNSTREAM(FEET) = 2239.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.12 CHANNEL SLOPE = 0.0662  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.860

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	301.25	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 108.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.78

AVERAGE FLOW DEPTH(FEET) = 2.31 TRAVEL TIME(MIN.) = 7.21

Tc(MIN.) = 37.02

SUBAREA AREA(ACRES) = 301.25 SUBAREA RUNOFF(CFS) = 97.67

EFFECTIVE AREA(ACRES) = 449.46 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 449.5 PEAK FLOW RATE(CFS) = 145.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.58 FLOW VELOCITY(FEET/SEC.) = 7.29

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10404.00 = 6737.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10404.00 TO NODE 10405.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2239.33 DOWNSTREAM(FEET) = 2128.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2862.32 CHANNEL SLOPE = 0.0386  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.785

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	152.68	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 165.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.15

AVERAGE FLOW DEPTH(FEET) = 2.99 TRAVEL TIME(MIN.) = 7.76

Tc(MIN.) = 44.78

SUBAREA AREA(ACRES) = 152.68 SUBAREA RUNOFF(CFS) = 39.12

EFFECTIVE AREA(ACRES) = 602.14 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 602.1 PEAK FLOW RATE(CFS) = 154.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.92 FLOW VELOCITY(FEET/SEC.) = 6.04

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10405.00 = 9599.88 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2128.80 DOWNSTREAM(FEET) = 1759.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.12 CHANNEL SLOPE = 0.1878  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.760

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 139.70 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 170.62  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.20  
AVERAGE FLOW DEPTH(FEET) = 2.25 TRAVEL TIME(MIN.) = 2.93  
Tc(MIN.) = 47.70  
SUBAREA AREA(ACRES) = 139.70 SUBAREA RUNOFF(CFS) = 32.70  
EFFECTIVE AREA(ACRES) = 741.84 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 741.8 PEAK FLOW RATE(CFS) = 173.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.27 FLOW VELOCITY(FEET/SEC.) = 11.24  
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10420.00 = 11566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10405.00 TO NODE 10420.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 47.70  
RAINFALL INTENSITY(INCH/HR) = 0.76  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 741.84  
TOTAL STREAM AREA(ACRES) = 741.84  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 173.65

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10410.00 TO NODE 10411.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 413.10  
ELEVATION DATA: UPSTREAM(FEET) = 3217.26 DOWNSTREAM(FEET) = 3058.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.517  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.230  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 3.06 0.50 1.000 0 9.52  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.76  
TOTAL AREA(ACRES) = 3.06 PEAK FLOW RATE(CFS) = 4.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10411.00 TO NODE 10412.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3058.86 DOWNSTREAM(FEET) = 2879.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 512.18 CHANNEL SLOPE = 0.3495  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.008

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 4.24 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.57  
AVERAGE FLOW DEPTH(FEET) = 0.62 TRAVEL TIME(MIN.) = 1.30  
Tc(MIN.) = 10.82  
SUBAREA AREA(ACRES) = 4.24 SUBAREA RUNOFF(CFS) = 5.75  
EFFECTIVE AREA(ACRES) = 7.30 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.3 PEAK FLOW RATE(CFS) = 9.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.69 FLOW VELOCITY(FEET/SEC.) = 6.94  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10412.00 = 925.28 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10412.00 TO NODE 10413.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2879.84 DOWNSTREAM(FEET) = 2644.97  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.24 CHANNEL SLOPE = 0.1208  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.403

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.95 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.14  
AVERAGE FLOW DEPTH(FEET) = 1.27 TRAVEL TIME(MIN.) = 5.28

Tc(MIN.) = 16.09  
SUBAREA AREA(ACRES) = 47.95 SUBAREA RUNOFF(CFS) = 38.96  
EFFECTIVE AREA(ACRES) = 55.25 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 55.2 PEAK FLOW RATE(CFS) = 44.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 6.80  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10413.00 = 2869.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10413.00 TO NODE 10414.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2644.97 DOWNSTREAM(FEET) = 2550.42  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2019.61 CHANNEL SLOPE = 0.0468  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.177

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	151.60	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 91.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.70

AVERAGE FLOW DEPTH(FEET) = 2.31 TRAVEL TIME(MIN.) = 5.90

Tc(MIN.) = 22.00

SUBAREA AREA(ACRES) = 151.60 SUBAREA RUNOFF(CFS) = 92.38

EFFECTIVE AREA(ACRES) = 206.85 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 206.9 PEAK FLOW RATE(CFS) = 126.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.61 FLOW VELOCITY(FEET/SEC.) = 6.18  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10414.00 = 4889.13 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10414.00 TO NODE 10415.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2550.42 DOWNSTREAM(FEET) = 2391.31  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.76 CHANNEL SLOPE = 0.0830  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.052

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	206.03	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 177.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.32  
AVERAGE FLOW DEPTH(FEET) = 2.67 TRAVEL TIME(MIN.) = 3.84  
Tc(MIN.) = 25.84  
SUBAREA AREA(ACRES) = 206.03 SUBAREA RUNOFF(CFS) = 102.36  
EFFECTIVE AREA(ACRES) = 412.88 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 412.9 PEAK FLOW RATE(CFS) = 205.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.81 FLOW VELOCITY(FEET/SEC.) = 8.65  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10415.00 = 6805.89 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10415.00 TO NODE 10416.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2391.31 DOWNSTREAM(FEET) = 2092.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2843.10 CHANNEL SLOPE = 0.1052  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	122.38	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 229.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.72

AVERAGE FLOW DEPTH(FEET) = 2.80 TRAVEL TIME(MIN.) = 4.87

Tc(MIN.) = 30.71

SUBAREA AREA(ACRES) = 122.38 SUBAREA RUNOFF(CFS) = 47.95

EFFECTIVE AREA(ACRES) = 535.26 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 535.3 PEAK FLOW RATE(CFS) = 209.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.71 FLOW VELOCITY(FEET/SEC.) = 9.51  
LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10416.00 = 9648.99 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2092.16 DOWNSTREAM(FEET) = 1759.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2151.95 CHANNEL SLOPE = 0.1546  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.897

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	59.94	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 220.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.14  
 AVERAGE FLOW DEPTH(FEET) = 2.57 TRAVEL TIME(MIN.) = 3.22  
 Tc(MIN.) = 33.93  
 SUBAREA AREA(ACRES) = 59.94 SUBAREA RUNOFF(CFS) = 21.42  
 EFFECTIVE AREA(ACRES) = 595.20 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 595.2 PEAK FLOW RATE(CFS) = 212.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.54 FLOW VELOCITY(FEET/SEC.) = 11.01  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10416.00 TO NODE 10420.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 33.93  
 RAINFALL INTENSITY(INCH/HR) = 0.90  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 595.20  
 TOTAL STREAM AREA(ACRES) = 595.20  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 212.68

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	173.65	47.70	0.760	0.50( 0.50)	1.00	741.8	10400.00
2	212.68	33.93	0.897	0.50( 0.50)	1.00	595.2	10410.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	386.33	33.93	0.897	0.50( 0.50)	1.00	1122.8	10410.00
2	312.97	47.70	0.760	0.50( 0.50)	1.00	1337.0	10400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 386.33 Tc(MIN.) = 33.93  
 EFFECTIVE AREA(ACRES) = 1122.84 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1337.0  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10420.00 = 11800.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1759.52 DOWNSTREAM(FEET) = 1688.35  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2477.21 CHANNEL SLOPE = 0.0287  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.825

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.64	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 396.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84  
 AVERAGE FLOW DEPTH(FEET) = 4.40 TRAVEL TIME(MIN.) = 6.03  
 Tc(MIN.) = 39.96  
 SUBAREA AREA(ACRES) = 72.64 SUBAREA RUNOFF(CFS) = 21.26  
 EFFECTIVE AREA(ACRES) = 1195.48 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1409.7 PEAK FLOW RATE(CFS) = 386.33  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.35 FLOW VELOCITY(FEET/SEC.) = 6.80  
 LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 10

-----  
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S3.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1212.17	55.26	0.50( 0.50)	1.00	5107.7	10200.00
2	1142.56	65.06	0.50( 0.50)	1.00	5837.1	10300.00
3	1135.57	65.50	0.50( 0.50)	1.00	5859.4	10320.00
4	1071.75	69.01	0.50( 0.50)	1.00	5968.0	10210.00
5	443.75	115.38	0.50( 0.50)	1.00	6836.4	10100.00
TOTAL AREA(ACRES) =		6836.4				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10332.00 TO NODE 10332.00 IS CODE = 14.0

-----  
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
 =====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1212.17	55.26	0.50( 0.50)	1.00	5107.7	10200.00

2	1142.56	65.06	0.50	( 0.50)	1.00	5837.1	10300.00
3	1135.57	65.50	0.50	( 0.50)	1.00	5859.4	10320.00
4	1071.75	69.01	0.50	( 0.50)	1.00	5968.0	10210.00
5	443.75	115.38	0.50	( 0.50)	1.00	6836.4	10100.00

TOTAL AREA (ACRES) = 6836.4

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10332.00 TO NODE 10507.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1739.96 DOWNSTREAM(FEET) = 1688.35  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2238.93 CHANNEL SLOPE = 0.0231  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.686

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1217.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.35

AVERAGE FLOW DEPTH(FEET) = 6.97 TRAVEL TIME(MIN.) = 4.47

Tc(MIN.) = 59.73

SUBAREA AREA(ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 10.33

EFFECTIVE AREA(ACRES) = 5169.63 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 6898.3 PEAK FLOW RATE(CFS) = 1212.17

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.96 FLOW VELOCITY(FEET/SEC.) = 8.34

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\*\*\*\* MAIN STREAM CONFLUENCE DATA \*\*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1212.17	59.73	0.686	0.50( 0.50)	1.00	5169.6	10200.00
2	1142.56	69.60	0.653	0.50( 0.50)	1.00	5899.1	10300.00
3	1135.57	70.04	0.651	0.50( 0.50)	1.00	5921.3	10320.00
4	1071.75	73.62	0.640	0.50( 0.50)	1.00	6030.0	10210.00
5	443.75	121.13	0.535	0.50( 0.50)	1.00	6898.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	386.33	39.96	0.825	0.50( 0.50)	1.00	1195.5	10410.00
2	312.97	54.06	0.718	0.50( 0.50)	1.00	1409.7	10400.00

LONGEST FLOWPATH FROM NODE 10410.00 TO NODE 10507.00 = 14278.15 FEET.

\*\*\*\*\* PEAK FLOW RATE TABLE \*\*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1598.49	39.96	0.825	0.50( 0.50)	1.00	4654.3	10410.00
2	1525.14	54.06	0.718	0.50( 0.50)	1.00	6088.9	10400.00
3	1478.69	59.73	0.686	0.50( 0.50)	1.00	6579.3	10200.00
4	1361.79	69.60	0.653	0.50( 0.50)	1.00	7308.7	10300.00
5	1352.71	70.04	0.651	0.50( 0.50)	1.00	7331.0	10320.00
6	1272.08	73.62	0.640	0.50( 0.50)	1.00	7439.6	10210.00
7	493.14	121.13	0.535	0.50( 0.50)	1.00	8308.0	10100.00

TOTAL AREA(ACRES) = 8308.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1598.49 Tc(MIN.) = 39.964

EFFECTIVE AREA(ACRES) = 4654.31 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 8308.0

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8308.0 TC(MIN.) = 39.96

EFFECTIVE AREA(ACRES) = 4654.31 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.999

PEAK FLOW RATE(CFS) = 1598.49

\*\*\*\*\* PEAK FLOW RATE TABLE \*\*\*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1598.49	39.96	0.825	0.50( 0.50)	1.00	4654.3	10410.00
2	1525.14	54.06	0.718	0.50( 0.50)	1.00	6088.9	10400.00
3	1478.69	59.73	0.686	0.50( 0.50)	1.00	6579.3	10200.00
4	1361.79	69.60	0.653	0.50( 0.50)	1.00	7308.7	10300.00
5	1352.71	70.04	0.651	0.50( 0.50)	1.00	7331.0	10320.00
6	1272.08	73.62	0.640	0.50( 0.50)	1.00	7439.6	10210.00
7	493.14	121.13	0.535	0.50( 0.50)	1.00	8308.0	10100.00

=====

END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S5.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.289
- 2) 10.00; 2.117
- 3) 15.00; 1.447
- 4) 20.00; 1.246
- 5) 25.00; 1.074
- 6) 30.00; 0.944
- 7) 40.00; 0.825
- 8) 50.00; 0.741
- 9) 60.00; 0.684
- 10) 90.00; 0.586
- 11) 120.00; 0.536
- 12) 180.00; 0.459
- 13) 360.00; 0.357
- 14) 1440.00; 0.162

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE	CROSSFALL / SIDE	STREET-FALL: IN- / SIDE	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018	0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10500.00 TO NODE 10501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 295.64  
ELEVATION DATA: UPSTREAM(FEET) = 3108.31 DOWNSTREAM(FEET) = 3060.24

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.565  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.922  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
RESIDENTIAL  
"1 DWELLING/ACRE" - 1.54 0.50 0.910 0 6.57  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910  
SUBAREA RUNOFF(CFS) = 3.42  
TOTAL AREA(ACRES) = 1.54 PEAK FLOW RATE(CFS) = 3.42

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10501.00 TO NODE 10502.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3060.24 DOWNSTREAM(FEET) = 2942.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 690.48 CHANNEL SLOPE = 0.1703  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.424  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.27 0.50 0.943 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.943  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.41  
AVERAGE FLOW DEPTH(FEET) = 0.81 TRAVEL TIME(MIN.) = 2.13  
Tc(MIN.) = 8.69  
SUBAREA AREA(ACRES) = 8.27 SUBAREA RUNOFF(CFS) = 14.53  
EFFECTIVE AREA(ACRES) = 9.81 AREA-AVERAGED Fm(INCH/HR) = 0.47  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
TOTAL AREA(ACRES) = 9.8 PEAK FLOW RATE(CFS) = 17.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.97 FLOW VELOCITY(FEET/SEC.) = 6.09  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10502.00 = 986.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10502.00 TO NODE 10503.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====



ELEVATION DATA: UPSTREAM(FEET) = 2942.64 DOWNSTREAM(FEET) = 2815.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 957.31 CHANNEL SLOPE = 0.1331  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.956  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 18.91 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.75  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.36  
AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 2.51  
Tc(MIN.) = 11.20  
SUBAREA AREA(ACRES) = 18.91 SUBAREA RUNOFF(CFS) = 24.78  
EFFECTIVE AREA(ACRES) = 28.72 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 28.7 PEAK FLOW RATE(CFS) = 37.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.37 FLOW VELOCITY(FEET/SEC.) = 6.75  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10503.00 = 1943.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10503.00 TO NODE 10504.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2815.24 DOWNSTREAM(FEET) = 2202.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2096.20 CHANNEL SLOPE = 0.2923  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.520  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 75.49 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.21  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.73  
AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 3.25  
Tc(MIN.) = 14.45  
SUBAREA AREA(ACRES) = 75.49 SUBAREA RUNOFF(CFS) = 69.31  
EFFECTIVE AREA(ACRES) = 104.21 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 104.2 PEAK FLOW RATE(CFS) = 95.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.67 FLOW VELOCITY(FEET/SEC.) = 11.50  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10504.00 = 4039.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10504.00 TO NODE 10505.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 2202.44 DOWNSTREAM(FEET) = 1969.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.32 CHANNEL SLOPE = 0.0834  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.248  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 278.21 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 190.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.50  
AVERAGE FLOW DEPTH(FEET) = 2.73 TRAVEL TIME(MIN.) = 5.49  
Tc(MIN.) = 19.94  
SUBAREA AREA(ACRES) = 278.21 SUBAREA RUNOFF(CFS) = 187.34  
EFFECTIVE AREA(ACRES) = 382.42 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 382.4 PEAK FLOW RATE(CFS) = 257.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.06 FLOW VELOCITY(FEET/SEC.) = 9.16  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10505.00 = 6839.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10505.00 TO NODE 10506.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1969.00 DOWNSTREAM(FEET) = 1759.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2892.99 CHANNEL SLOPE = 0.0725  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.071  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 323.47 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 341.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.33  
AVERAGE FLOW DEPTH(FEET) = 3.49 TRAVEL TIME(MIN.) = 5.17  
Tc(MIN.) = 25.11  
SUBAREA AREA(ACRES) = 323.47 SUBAREA RUNOFF(CFS) = 166.23  
EFFECTIVE AREA(ACRES) = 705.89 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 705.9 PEAK FLOW RATE(CFS) = 363.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.57 FLOW VELOCITY(FEET/SEC.) = 9.48  
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10506.00 = 9732.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1759.23 DOWNSTREAM(FEET) = 1688.35  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2597.28 CHANNEL SLOPE = 0.0273  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.926

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.34	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 403.76

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.75

AVERAGE FLOW DEPTH (FEET) = 4.47 TRAVEL TIME (MIN.) = 6.42

Tc (MIN.) = 31.52

SUBAREA AREA (ACRES) = 212.34 SUBAREA RUNOFF (CFS) = 81.35

EFFECTIVE AREA (ACRES) = 918.23 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 918.2 PEAK FLOW RATE (CFS) = 363.02

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.29 FLOW VELOCITY (FEET/SEC.) = 6.57

LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 918.2 TC (MIN.) = 31.52

EFFECTIVE AREA (ACRES) = 918.23 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.999

PEAK FLOW RATE (CFS) = 363.02

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S6.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.244
- 2) 10.00; 2.093
- 3) 15.00; 1.437
- 4) 20.00; 1.237
- 5) 25.00; 1.067
- 6) 30.00; 0.940
- 7) 40.00; 0.819
- 8) 50.00; 0.735
- 9) 60.00; 0.679
- 10) 90.00; 0.580
- 11) 120.00; 0.529
- 12) 180.00; 0.453
- 13) 360.00; 0.351
- 14) 1440.00; 0.159

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10600.00 TO NODE 10601.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 312.13  
ELEVATION DATA: UPSTREAM(FEET) = 3250.51 DOWNSTREAM(FEET) = 3126.78

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.451  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.450  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.47 0.50 1.000 0 8.45  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.33  
TOTAL AREA(ACRES) = 2.47 PEAK FLOW RATE(CFS) = 4.33

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10601.00 TO NODE 10602.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3126.78 DOWNSTREAM(FEET) = 2951.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.40 CHANNEL SLOPE = 0.2828  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.081  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.58 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.30  
AVERAGE FLOW DEPTH(FEET) = 0.69 TRAVEL TIME(MIN.) = 1.64  
Tc(MIN.) = 10.09  
SUBAREA AREA(ACRES) = 6.58 SUBAREA RUNOFF(CFS) = 9.36  
EFFECTIVE AREA(ACRES) = 9.05 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.1 PEAK FLOW RATE(CFS) = 12.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.79 FLOW VELOCITY(FEET/SEC.) = 6.87  
LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10602.00 = 932.53 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10602.00 TO NODE 10603.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2951.30 DOWNSTREAM(FEET) = 2641.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1930.18 CHANNEL SLOPE = 0.1606  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.512  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.78	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42  
 AVERAGE FLOW DEPTH(FEET) = 1.37 TRAVEL TIME(MIN.) = 4.34  
 Tc(MIN.) = 14.43  
 SUBAREA AREA(ACRES) = 60.78 SUBAREA RUNOFF(CFS) = 55.33  
 EFFECTIVE AREA(ACRES) = 69.83 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.8 PEAK FLOW RATE(CFS) = 63.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.60 FLOW VELOCITY(FEET/SEC.) = 8.28  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10603.00 = 2862.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10603.00 TO NODE 10604.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2641.28 DOWNSTREAM(FEET) = 2318.61  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1966.90 CHANNEL SLOPE = 0.1640  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.315  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.78	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 88.88  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.03  
 AVERAGE FLOW DEPTH(FEET) = 1.81 TRAVEL TIME(MIN.) = 3.63  
 Tc(MIN.) = 18.06  
 SUBAREA AREA(ACRES) = 68.78 SUBAREA RUNOFF(CFS) = 50.41  
 EFFECTIVE AREA(ACRES) = 138.61 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 138.6 PEAK FLOW RATE(CFS) = 101.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 9.36  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10604.00 = 4829.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10604.00 TO NODE 10605.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2318.61 DOWNSTREAM(FEET) = 1983.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2601.81 CHANNEL SLOPE = 0.1286  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.148  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	178.16	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 153.74  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.49  
 AVERAGE FLOW DEPTH(FEET) = 2.32 TRAVEL TIME(MIN.) = 4.57  
 Tc(MIN.) = 22.63  
 SUBAREA AREA(ACRES) = 178.16 SUBAREA RUNOFF(CFS) = 103.80  
 EFFECTIVE AREA(ACRES) = 316.77 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 316.8 PEAK FLOW RATE(CFS) = 184.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.49 FLOW VELOCITY(FEET/SEC.) = 9.92  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10605.00 = 7431.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1983.94 DOWNSTREAM(FEET) = 1655.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2439.06 CHANNEL SLOPE = 0.1348  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.027  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.31	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 199.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.31  
 AVERAGE FLOW DEPTH(FEET) = 2.54 TRAVEL TIME(MIN.) = 3.94  
 Tc(MIN.) = 26.57  
 SUBAREA AREA(ACRES) = 61.31 SUBAREA RUNOFF(CFS) = 29.07  
 EFFECTIVE AREA(ACRES) = 378.08 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 378.1 PEAK FLOW RATE(CFS) = 184.56  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.47 FLOW VELOCITY(FEET/SEC.) = 10.11  
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S4.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1598.49	39.96	0.50 ( 0.50)	1.00	4654.3	10410.00
2	1525.14	54.06	0.50 ( 0.50)	1.00	6088.9	10400.00
3	1478.69	59.73	0.50 ( 0.50)	1.00	6579.3	10200.00
4	1361.79	69.60	0.50 ( 0.50)	1.00	7308.7	10300.00
5	1352.71	70.04	0.50 ( 0.50)	1.00	7331.0	10320.00
6	1272.08	73.62	0.50 ( 0.50)	1.00	7439.6	10210.00
7	493.14	121.13	0.50 ( 0.50)	1.00	8308.0	10100.00
TOTAL AREA (ACRES) =						8308.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S5.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	363.02	31.52	0.50 ( 0.50)	1.00	918.2	10500.00
TOTAL AREA (ACRES) =						918.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	363.02	31.52	0.50 ( 0.50)	1.00	918.2	10500.00
TOTAL AREA (ACRES) =						918.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10420.00 TO NODE 10507.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	363.02	31.52	0.922	0.50 ( 0.50)	1.00	918.2	10500.00
LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 12330.22 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1598.49	39.96	0.819	0.50 ( 0.50)	1.00	4654.3	10410.00
2	1525.14	54.06	0.712	0.50 ( 0.50)	1.00	6088.9	10400.00
3	1478.69	59.73	0.681	0.50 ( 0.50)	1.00	6579.3	10200.00
4	1361.79	69.60	0.647	0.50 ( 0.50)	1.00	7308.7	10300.00
5	1352.71	70.04	0.646	0.50 ( 0.50)	1.00	7331.0	10320.00
6	1272.08	73.62	0.634	0.50 ( 0.50)	1.00	7439.6	10210.00
7	493.14	121.13	0.528	0.50 ( 0.50)	1.00	8308.0	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1961.52	31.52	0.922	0.50 ( 0.50)	1.00	4589.6	10500.00
2	1873.60	39.96	0.819	0.50 ( 0.50)	1.00	5572.5	10410.00
3	1707.96	54.06	0.712	0.50 ( 0.50)	1.00	7007.1	10400.00
4	1634.19	59.73	0.681	0.50 ( 0.50)	1.00	7497.5	10200.00
5	1488.73	69.60	0.647	0.50 ( 0.50)	1.00	8227.0	10300.00
6	1478.39	70.04	0.646	0.50 ( 0.50)	1.00	8249.2	10320.00
7	1387.58	73.62	0.634	0.50 ( 0.50)	1.00	8357.9	10210.00
8	516.98	121.13	0.528	0.50 ( 0.50)	1.00	9226.2	10100.00
TOTAL AREA (ACRES) = 9226.2							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1961.52 Tc (MIN.) = 31.523  
EFFECTIVE AREA (ACRES) = 4589.56 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 9226.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10507.00 = 35292.37 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10507.00 TO NODE 10620.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1688.35 DOWNSTREAM (FEET) = 1655.24  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2570.61 CHANNEL SLOPE = 0.0129  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.853  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.74	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1974.82  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.58  
AVERAGE FLOW DEPTH (FEET) = 9.32 TRAVEL TIME (MIN.) = 5.65  
Tc (MIN.) = 37.18  
SUBAREA AREA (ACRES) = 83.74 SUBAREA RUNOFF (CFS) = 26.60  
EFFECTIVE AREA (ACRES) = 4673.30 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 9310.0 PEAK FLOW RATE (CFS) = 1961.52

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.30 FLOW VELOCITY(FEET/SEC.) = 7.56  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10605.00 TO NODE 10620.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1961.52	37.18	0.853	0.50( 0.50)	1.00	4673.3	10500.00
2	1873.60	45.69	0.771	0.50( 0.50)	1.00	5656.3	10410.00
3	1707.96	59.92	0.679	0.50( 0.50)	1.00	7090.8	10400.00
4	1634.19	65.65	0.660	0.50( 0.50)	1.00	7581.3	10200.00
5	1488.73	75.66	0.627	0.50( 0.50)	1.00	8310.7	10300.00
6	1478.39	76.12	0.626	0.50( 0.50)	1.00	8332.9	10320.00
7	1387.58	79.79	0.614	0.50( 0.50)	1.00	8441.6	10210.00
8	516.98	129.04	0.518	0.50( 0.50)	1.00	9310.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	184.56	26.57	1.027	0.50( 0.50)	1.00	378.1	10600.00

LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10620.00 = 9870.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2146.08	26.57	1.027	0.50( 0.50)	1.00	3718.6	10600.00
2	2085.17	37.18	0.853	0.50( 0.50)	1.00	5051.4	10500.00
3	1968.55	45.69	0.771	0.50( 0.50)	1.00	6034.4	10410.00
4	1770.75	59.92	0.679	0.50( 0.50)	1.00	7468.9	10400.00
5	1690.30	65.65	0.660	0.50( 0.50)	1.00	7959.4	10200.00
6	1533.26	75.66	0.627	0.50( 0.50)	1.00	8688.8	10300.00
7	1522.39	76.12	0.626	0.50( 0.50)	1.00	8711.0	10320.00
8	1427.34	79.79	0.614	0.50( 0.50)	1.00	8819.7	10210.00
9	523.06	129.04	0.518	0.50( 0.50)	1.00	9688.1	10100.00

TOTAL AREA (ACRES) = 9688.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2146.08 Tc(MIN.) = 26.575  
EFFECTIVE AREA(ACRES) = 3718.60 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9688.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10620.00 = 37862.98 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10620.00 TO NODE 10621.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1655.24 DOWNSTREAM(FEET) = 1584.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2294.47 CHANNEL SLOPE = 0.0307  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.939

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	342.43	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2213.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.80  
AVERAGE FLOW DEPTH(FEET) = 8.27 TRAVEL TIME(MIN.) = 3.54  
Tc(MIN.) = 30.12  
SUBAREA AREA(ACRES) = 342.43 SUBAREA RUNOFF(CFS) = 135.10  
EFFECTIVE AREA(ACRES) = 4061.03 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10030.5 PEAK FLOW RATE(CFS) = 2146.08  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.17 FLOW VELOCITY(FEET/SEC.) = 10.71  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10621.00 = 40157.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1584.84 DOWNSTREAM(FEET) = 1443.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2923.79 CHANNEL SLOPE = 0.0482  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.892

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	160.90	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2174.47  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.72  
AVERAGE FLOW DEPTH(FEET) = 7.55 TRAVEL TIME(MIN.) = 3.83  
Tc(MIN.) = 33.95  
SUBAREA AREA(ACRES) = 160.90 SUBAREA RUNOFF(CFS) = 56.77  
EFFECTIVE AREA(ACRES) = 4221.93 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10191.4 PEAK FLOW RATE(CFS) = 2146.08  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.51 FLOW VELOCITY(FEET/SEC.) = 12.68  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10621.00 TO NODE 10640.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
-----

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 33.95  
RAINFALL INTENSITY(INCH/HR) = 0.89  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 4221.93  
TOTAL STREAM AREA(ACRES) = 10191.39  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2146.08

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10630.00 TO NODE 10631.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----

INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.79  
ELEVATION DATA: UPSTREAM(FEET) = 3257.00 DOWNSTREAM(FEET) = 3147.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.430  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.454  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.25 0.50 1.000 0 8.43  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.20  
TOTAL AREA(ACRES) = 1.25 PEAK FLOW RATE(CFS) = 2.20

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10631.00 TO NODE 10632.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 3147.13 DOWNSTREAM(FEET) = 2774.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 640.96 CHANNEL SLOPE = 0.5817  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.119  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 4.75 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.32  
AVERAGE FLOW DEPTH(FEET) = 0.51 TRAVEL TIME(MIN.) = 1.46  
Tc(MIN.) = 9.89  
SUBAREA AREA(ACRES) = 4.75 SUBAREA RUNOFF(CFS) = 6.92

EFFECTIVE AREA(ACRES) = 6.00 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.0 PEAK FLOW RATE(CFS) = 8.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.60 FLOW VELOCITY(FEET/SEC.) = 8.15  
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10632.00 = 939.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10632.00 TO NODE 10633.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2774.29 DOWNSTREAM(FEET) = 2004.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.65 CHANNEL SLOPE = 0.4039  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.737  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 79.75 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.23  
AVERAGE FLOW DEPTH(FEET) = 1.26 TRAVEL TIME(MIN.) = 2.83  
Tc(MIN.) = 12.72  
SUBAREA AREA(ACRES) = 79.75 SUBAREA RUNOFF(CFS) = 88.75  
EFFECTIVE AREA(ACRES) = 85.75 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 85.8 PEAK FLOW RATE(CFS) = 95.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.57 FLOW VELOCITY(FEET/SEC.) = 12.92  
LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10633.00 = 2845.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10633.00 TO NODE 10634.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 2004.58 DOWNSTREAM(FEET) = 1714.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1868.05 CHANNEL SLOPE = 0.1550  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.405  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 124.45 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 146.27  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.06  
AVERAGE FLOW DEPTH(FEET) = 2.20 TRAVEL TIME(MIN.) = 3.10

Tc(MIN.) = 15.81  
 SUBAREA AREA(ACRES) = 124.45 SUBAREA RUNOFF(CFS) = 101.29  
 EFFECTIVE AREA(ACRES) = 210.20 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 210.2 PEAK FLOW RATE(CFS) = 171.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.34 FLOW VELOCITY(FEET/SEC.) = 10.44  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10634.00 = 4713.45 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1714.99 DOWNSTREAM(FEET) = 1443.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1685.34 CHANNEL SLOPE = 0.1609  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.301

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	42.00	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 186.21

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.84

AVERAGE FLOW DEPTH(FEET) = 2.39 TRAVEL TIME(MIN.) = 2.59

Tc(MIN.) = 18.40

SUBAREA AREA(ACRES) = 42.00 SUBAREA RUNOFF(CFS) = 30.27

EFFECTIVE AREA(ACRES) = 252.20 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 252.2 PEAK FLOW RATE(CFS) = 181.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.38 FLOW VELOCITY(FEET/SEC.) = 10.73  
 LONGEST FLOWPATH FROM NODE 10630.00 TO NODE 10640.00 = 6398.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10634.00 TO NODE 10640.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 18.40

RAINFALL INTENSITY(INCH/HR) = 1.30

AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 252.20

TOTAL STREAM AREA(ACRES) = 252.20

PEAK FLOW RATE(CFS) AT CONFLUENCE = 181.73

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2146.08	33.95	0.892	0.50( 0.50)	1.00	4221.9	10600.00
1	2085.17	44.61	0.780	0.50( 0.50)	1.00	5554.7	10500.00
1	1968.55	53.24	0.717	0.50( 0.50)	1.00	6537.7	10410.00
1	1770.75	67.68	0.654	0.50( 0.50)	1.00	7972.3	10400.00
1	1690.30	73.50	0.634	0.50( 0.50)	1.00	8462.7	10200.00
1	1533.26	83.71	0.601	0.50( 0.50)	1.00	9192.1	10300.00
1	1522.39	84.17	0.599	0.50( 0.50)	1.00	9214.3	10320.00
1	1427.34	87.99	0.587	0.50( 0.50)	1.00	9323.0	10210.00
1	523.06	139.58	0.504	0.50( 0.50)	1.00	10191.4	10100.00
2	181.73	18.40	1.301	0.50( 0.50)	1.00	252.2	10630.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2327.81	18.40	1.301	0.50( 0.50)	1.00	2541.0	10630.00
2	2235.06	33.95	0.892	0.50( 0.50)	1.00	4474.1	10600.00
3	2148.74	44.61	0.780	0.50( 0.50)	1.00	5806.9	10500.00
4	2017.73	53.24	0.717	0.50( 0.50)	1.00	6789.9	10410.00
5	1805.59	67.68	0.654	0.50( 0.50)	1.00	8224.5	10400.00
6	1720.76	73.50	0.634	0.50( 0.50)	1.00	8714.9	10200.00
7	1556.08	83.71	0.601	0.50( 0.50)	1.00	9444.3	10300.00
8	1544.87	84.17	0.599	0.50( 0.50)	1.00	9466.5	10320.00
9	1446.95	87.99	0.587	0.50( 0.50)	1.00	9575.2	10210.00
10	523.97	139.58	0.504	0.50( 0.50)	1.00	10443.6	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 2327.81 Tc(MIN.) = 18.40  
 EFFECTIVE AREA(ACRES) = 2540.97 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10443.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10640.00 = 43081.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1443.87 DOWNSTREAM(FEET) = 1320.32  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.45 CHANNEL SLOPE = 0.0548  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.198

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	94.37	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2357.43

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.63

AVERAGE FLOW DEPTH(FEET) = 7.59 TRAVEL TIME(MIN.) = 2.76

Tc(MIN.) = 21.16



SUBAREA AREA(ACRES) = 94.37      SUBAREA RUNOFF(CFS) = 59.23  
 EFFECTIVE AREA(ACRES) = 2635.34      AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50      AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 10538.0      PEAK FLOW RATE(CFS) = 2327.81  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.56      FLOW VELOCITY(FEET/SEC.) = 13.58  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10538.0      TC(MIN.) = 21.16  
 EFFECTIVE AREA(ACRES) = 2635.34      AREA-AVERAGED Fm(INCH/HR)= 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50      AREA-AVERAGED Ap = 0.999  
 PEAK FLOW RATE(CFS) = 2327.81

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2327.81	21.16	1.198	0.50( 0.50)	1.00	2635.3	10630.00
2	2235.06	36.74	0.858	0.50( 0.50)	1.00	4568.5	10600.00
3	2148.74	47.43	0.757	0.50( 0.50)	1.00	5901.3	10500.00
4	2017.73	56.10	0.701	0.50( 0.50)	1.00	6884.3	10410.00
5	1805.59	70.62	0.644	0.50( 0.50)	1.00	8318.8	10400.00
6	1720.76	76.48	0.625	0.50( 0.50)	1.00	8809.3	10200.00
7	1556.08	86.77	0.591	0.50( 0.50)	1.00	9538.7	10300.00
8	1544.87	87.24	0.589	0.50( 0.50)	1.00	9560.9	10320.00
9	1446.95	91.11	0.578	0.50( 0.50)	1.00	9669.6	10210.00
10	523.97	143.59	0.499	0.50( 0.50)	1.00	10538.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S7.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--

=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.244
- 2) 10.00; 2.093
- 3) 15.00; 1.437
- 4) 20.00; 1.237
- 5) 25.00; 1.067
- 6) 30.00; 0.940
- 7) 40.00; 0.819
- 8) 50.00; 0.735
- 9) 60.00; 0.679
- 10) 90.00; 0.580
- 11) 120.00; 0.529
- 12) 180.00; 0.453
- 13) 360.00; 0.351
- 14) 1440.00; 0.159

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10700.00 TO NODE 10701.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 281.18  
ELEVATION DATA: UPSTREAM(FEET) = 3512.68 DOWNSTREAM(FEET) = 3444.33

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.938  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.337  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 1.30 0.50 1.000 0 8.94  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.15  
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 2.15

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10701.00 TO NODE 10702.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3444.33 DOWNSTREAM(FEET) = 3246.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 700.05 CHANNEL SLOPE = 0.2823  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.965  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.49 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.73  
AVERAGE FLOW DEPTH(FEET) = 0.61 TRAVEL TIME(MIN.) = 2.04  
Tc(MIN.) = 10.97  
SUBAREA AREA(ACRES) = 6.49 SUBAREA RUNOFF(CFS) = 8.56  
EFFECTIVE AREA(ACRES) = 7.79 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) = 10.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.73 FLOW VELOCITY(FEET/SEC.) = 6.47  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10702.00 = 981.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10702.00 TO NODE 10703.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3246.68 DOWNSTREAM(FEET) = 3075.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1893.56 CHANNEL SLOPE = 0.0906  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.353

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.98	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.81

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.14

AVERAGE FLOW DEPTH(FEET) = 1.22 TRAVEL TIME(MIN.) = 6.14

Tc(MIN.) = 17.11

SUBAREA AREA(ACRES) = 31.98 SUBAREA RUNOFF(CFS) = 24.53

EFFECTIVE AREA(ACRES) = 39.77 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 39.8 PEAK FLOW RATE(CFS) = 30.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 5.55

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.00 = 2874.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10703.00 TO NODE 10703.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3075.14 DOWNSTREAM(FEET) = 2952.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2060.61 CHANNEL SLOPE = 0.0597  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.107

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.58	0.50	0.872	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.11

AVERAGE FLOW DEPTH(FEET) = 1.64 TRAVEL TIME(MIN.) = 6.72

Tc(MIN.) = 23.83

SUBAREA AREA(ACRES) = 34.58 SUBAREA RUNOFF(CFS) = 20.87

EFFECTIVE AREA(ACRES) = 74.35 AREA-AVERAGED Fm(INCH/HR) = 0.47

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 74.4 PEAK FLOW RATE(CFS) = 42.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.66 FLOW VELOCITY(FEET/SEC.) = 5.16

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.50 = 4935.40 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10703.50 TO NODE 10704.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2952.03 DOWNSTREAM(FEET) = 2895.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 930.70 CHANNEL SLOPE = 0.0606  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.024

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.69	0.50	0.951	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.951

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.40

AVERAGE FLOW DEPTH(FEET) = 1.76 TRAVEL TIME(MIN.) = 2.87

Tc(MIN.) = 26.70

SUBAREA AREA(ACRES) = 30.69 SUBAREA RUNOFF(CFS) = 15.14

EFFECTIVE AREA(ACRES) = 105.04 AREA-AVERAGED Fm(INCH/HR) = 0.47

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94

TOTAL AREA(ACRES) = 105.0 PEAK FLOW RATE(CFS) = 52.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.78 FLOW VELOCITY(FEET/SEC.) = 5.47

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10704.00 = 5866.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2895.59 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2585.44 CHANNEL SLOPE = 0.1217  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.916

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	199.40	0.50	0.977	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.13

AVERAGE FLOW DEPTH(FEET) = 1.93 TRAVEL TIME(MIN.) = 5.30

Tc(MIN.) = 32.00

SUBAREA AREA(ACRES) = 199.40 SUBAREA RUNOFF(CFS) = 76.64

EFFECTIVE AREA(ACRES) = 304.44 AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 304.4 PEAK FLOW RATE(CFS) = 118.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.13 FLOW VELOCITY(FEET/SEC.) = 8.70

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10704.00 TO NODE 10720.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 32.00  
RAINFALL INTENSITY(INCH/HR) = 0.92  
AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.97  
EFFECTIVE STREAM AREA(ACRES) = 304.44  
TOTAL STREAM AREA(ACRES) = 304.44  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 118.60

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10710.00 TO NODE 10711.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.64  
ELEVATION DATA: UPSTREAM(FEET) = 3389.13 DOWNSTREAM(FEET) = 3276.30

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.438  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.904  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
PUBLIC PARK - 7.76 0.50 0.981 0 11.44  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.981  
SUBAREA RUNOFF(CFS) = 9.87  
TOTAL AREA(ACRES) = 7.76 PEAK FLOW RATE(CFS) = 9.87

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10711.00 TO NODE 10712.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3276.30 DOWNSTREAM(FEET) = 3152.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 950.69 CHANNEL SLOPE = 0.1305  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.542  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 22.39 0.50 0.988 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.988  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.74  
AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 2.76  
Tc(MIN.) = 14.20  
SUBAREA AREA(ACRES) = 22.39 SUBAREA RUNOFF(CFS) = 21.11  
EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 30.1 PEAK FLOW RATE(CFS) = 28.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 6.26  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10712.00 = 1894.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10712.00 TO NODE 10713.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3152.26 DOWNSTREAM(FEET) = 2879.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.77 CHANNEL SLOPE = 0.1431  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.292  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 42.59 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.21  
AVERAGE FLOW DEPTH(FEET) = 1.42 TRAVEL TIME(MIN.) = 4.41  
Tc(MIN.) = 18.61  
SUBAREA AREA(ACRES) = 42.59 SUBAREA RUNOFF(CFS) = 30.37  
EFFECTIVE AREA(ACRES) = 72.74 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 72.7 PEAK FLOW RATE(CFS) = 52.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.52 FLOW VELOCITY(FEET/SEC.) = 7.50  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10713.00 = 3804.10 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2879.03 DOWNSTREAM(FEET) = 2581.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2621.96 CHANNEL SLOPE = 0.1136  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.098  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 156.72 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 94.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.00  
AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 5.46  
Tc(MIN.) = 24.08

SUBAREA AREA (ACRES) = 156.72 SUBAREA RUNOFF (CFS) = 84.37  
EFFECTIVE AREA (ACRES) = 229.46 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 229.5 PEAK FLOW RATE (CFS) = 123.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.19 FLOW VELOCITY (FEET/SEC.) = 8.58  
LONGEST FLOWPATH FROM NODE 10710.00 TO NODE 10720.00 = 6426.06 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10713.00 TO NODE 10720.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 24.08  
RAINFALL INTENSITY (INCH/HR) = 1.10  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 229.46  
TOTAL STREAM AREA (ACRES) = 229.46  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 123.71

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	118.60	32.00	0.916	0.50 (0.48)	0.97	304.4	10700.00
2	123.71	24.08	1.098	0.50 (0.50)	1.00	229.5	10710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	242.31	24.08	1.098	0.50 (0.49)	0.98	458.5	10710.00
2	204.61	32.00	0.916	0.50 (0.49)	0.98	533.9	10700.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 242.31 Tc (MIN.) = 24.08  
EFFECTIVE AREA (ACRES) = 458.52 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 533.9  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.00 = 8451.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10720.00 TO NODE 10720.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2581.07 DOWNSTREAM (FEET) = 2523.48  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1699.13 CHANNEL SLOPE = 0.0339  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.982

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.31	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 267.53  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.60  
AVERAGE FLOW DEPTH (FEET) = 3.67 TRAVEL TIME (MIN.) = 4.29  
Tc (MIN.) = 28.37  
SUBAREA AREA (ACRES) = 116.31 SUBAREA RUNOFF (CFS) = 50.38  
EFFECTIVE AREA (ACRES) = 574.83 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 650.2 PEAK FLOW RATE (CFS) = 252.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.60 FLOW VELOCITY (FEET/SEC.) = 6.51  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10720.50 = 10150.67 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10720.50 TO NODE 10721.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2523.48 DOWNSTREAM (FEET) = 2488.66  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1575.08 CHANNEL SLOPE = 0.0221  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.903  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/  
LAND USE SCS SOIL  
GROUP AREA  
(ACRES) Fp  
(INCH/HR) Ap  
(DECIMAL) SCS  
CN  
USER-DEFINED - 82.28 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 267.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.63  
AVERAGE FLOW DEPTH (FEET) = 3.98 TRAVEL TIME (MIN.) = 4.66  
Tc (MIN.) = 33.02  
SUBAREA AREA (ACRES) = 82.28 SUBAREA RUNOFF (CFS) = 29.86  
EFFECTIVE AREA (ACRES) = 657.11 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 732.5 PEAK FLOW RATE (CFS) = 252.76  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.90 FLOW VELOCITY (FEET/SEC.) = 5.55  
LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.00 = 11725.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10721.00 TO NODE 10721.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2488.66 DOWNSTREAM (FEET) = 2453.35

CHANNEL LENGTH THRU SUBAREA (FEET) = 2032.11 CHANNEL SLOPE = 0.0174  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.825  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	259.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 290.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.25  
 AVERAGE FLOW DEPTH (FEET) = 4.30 TRAVEL TIME (MIN.) = 6.45  
 Tc (MIN.) = 39.48  
 SUBAREA AREA (ACRES) = 259.52 SUBAREA RUNOFF (CFS) = 75.93  
 EFFECTIVE AREA (ACRES) = 916.63 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 992.0 PEAK FLOW RATE (CFS) = 271.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.19 FLOW VELOCITY (FEET/SEC.) = 5.16  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10721.50 = 13757.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10721.50 TO NODE 10722.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2453.35 DOWNSTREAM (FEET) = 2384.52  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1842.37 CHANNEL SLOPE = 0.0374  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.787  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	229.78	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 301.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.06  
 AVERAGE FLOW DEPTH (FEET) = 3.77 TRAVEL TIME (MIN.) = 4.35  
 Tc (MIN.) = 43.83  
 SUBAREA AREA (ACRES) = 229.78 SUBAREA RUNOFF (CFS) = 59.28  
 EFFECTIVE AREA (ACRES) = 1146.41 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1221.8 PEAK FLOW RATE (CFS) = 299.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.76 FLOW VELOCITY (FEET/SEC.) = 7.05  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10722.00 = 15600.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10722.00 TO NODE 10723.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2384.52 DOWNSTREAM (FEET) = 1925.64  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3780.37 CHANNEL SLOPE = 0.1214  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.740  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	308.58	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 332.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.25  
 AVERAGE FLOW DEPTH (FEET) = 3.14 TRAVEL TIME (MIN.) = 5.60  
 Tc (MIN.) = 49.43  
 SUBAREA AREA (ACRES) = 308.58 SUBAREA RUNOFF (CFS) = 66.54  
 EFFECTIVE AREA (ACRES) = 1454.99 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 1530.4 PEAK FLOW RATE (CFS) = 317.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.09 FLOW VELOCITY (FEET/SEC.) = 11.12  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10723.00 = 19380.60 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1925.64 DOWNSTREAM (FEET) = 1320.32  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3826.73 CHANNEL SLOPE = 0.1582  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.710  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.11	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 358.48  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.66  
 AVERAGE FLOW DEPTH (FEET) = 3.07 TRAVEL TIME (MIN.) = 5.04  
 Tc (MIN.) = 54.47  
 SUBAREA AREA (ACRES) = 434.11 SUBAREA RUNOFF (CFS) = 81.96  
 EFFECTIVE AREA (ACRES) = 1889.10 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1964.5 PEAK FLOW RATE (CFS) = 360.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 3.08 FLOW VELOCITY (FEET/SEC.) = 12.68  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

\*\*\*\*\*

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 1964.5 TC (MIN.) = 54.47  
 EFFECTIVE AREA (ACRES) = 1889.10 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.996  
PEAK FLOW RATE (CFS) = 360.41

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	360.41	54.47	0.710	0.50 ( 0.50)	1.00	1889.1	10710.00
2	298.79	63.81	0.666	0.50 ( 0.50)	0.99	1964.5	10700.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Analysis prepared by:

-----  
FILE NAME: S8.DAT  
TIME/DATE OF STUDY: 10:29 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.145
- 2) 10.00; 2.038
- 3) 15.00; 1.415
- 4) 20.00; 1.217
- 5) 25.00; 1.052
- 6) 30.00; 0.929
- 7) 40.00; 0.807
- 8) 50.00; 0.724
- 9) 60.00; 0.666
- 10) 90.00; 0.567
- 11) 120.00; 0.515
- 12) 180.00; 0.439
- 13) 360.00; 0.338
- 14) 1440.00; 0.152

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10800.00 TO NODE 10801.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.93  
ELEVATION DATA: UPSTREAM(FEET) = 2617.19 DOWNSTREAM(FEET) = 2506.15

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.540  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.583  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 0.83 0.50 1.000 0 7.54  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.56  
TOTAL AREA(ACRES) = 0.83 PEAK FLOW RATE(CFS) = 1.56

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10801.00 TO NODE 10802.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2506.15 DOWNSTREAM(FEET) = 2237.54  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.01 CHANNEL SLOPE = 0.3968  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 5.30 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.62  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.31  
AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 1.79  
Tc(MIN.) = 9.33  
SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 8.05  
EFFECTIVE AREA(ACRES) = 6.13 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 9.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 7.14  
LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10802.00 = 925.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10802.00 TO NODE 10803.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====



ELEVATION DATA: UPSTREAM(FEET) = 2237.54 DOWNSTREAM(FEET) = 1920.11  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 954.74 CHANNEL SLOPE = 0.3325  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.879  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.25 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.18  
 AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 1.95  
 Tc(MIN.) = 11.27  
 SUBAREA AREA(ACRES) = 18.25 SUBAREA RUNOFF(CFS) = 22.65  
 EFFECTIVE AREA(ACRES) = 24.38 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 24.4 PEAK FLOW RATE(CFS) = 30.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 9.02  
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10803.00 = 1880.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 1920.11 DOWNSTREAM(FEET) = 1289.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2201.18 CHANNEL SLOPE = 0.2865  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.434  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 78.99 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.27  
 AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 3.57  
 Tc(MIN.) = 14.85  
 SUBAREA AREA(ACRES) = 78.99 SUBAREA RUNOFF(CFS) = 66.40  
 EFFECTIVE AREA(ACRES) = 103.37 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 103.4 PEAK FLOW RATE(CFS) = 86.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 11.11  
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S6.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2327.81	21.16	0.50( 0.50)	1.00	2635.3	10630.00
2	2235.06	36.74	0.50( 0.50)	1.00	4568.5	10600.00
3	2148.74	47.43	0.50( 0.50)	1.00	5901.3	10500.00
4	2017.73	56.10	0.50( 0.50)	1.00	6884.3	10410.00
5	1805.59	70.62	0.50( 0.50)	1.00	8318.8	10400.00
6	1720.76	76.48	0.50( 0.50)	1.00	8809.3	10200.00
7	1556.08	86.77	0.50( 0.50)	1.00	9538.7	10300.00
8	1544.87	87.24	0.50( 0.50)	1.00	9560.9	10320.00
9	1446.95	91.11	0.50( 0.50)	1.00	9669.6	10210.00
10	523.97	143.59	0.50( 0.50)	1.00	10538.0	10100.00
TOTAL AREA(ACRES) = 10538.0						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: S7.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	360.41	54.47	0.50( 0.50)	1.00	1889.1	10710.00
2	298.79	63.81	0.50( 0.50)	0.99	1964.5	10700.00
TOTAL AREA(ACRES) = 1964.5						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10723.00 TO NODE 10724.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	360.41	54.47	0.50( 0.50)	1.00	1889.1	10710.00
2	298.79	63.81	0.50( 0.50)	0.99	1964.5	10700.00
TOTAL AREA(ACRES) = 1964.5						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10640.00 TO NODE 10724.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 360.41 54.47 0.698 0.50( 0.50) 1.00 1889.1 10710.00  
 2 298.79 63.81 0.653 0.50( 0.50) 0.99 1964.5 10700.00  
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10724.00 = 23207.33 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2327.81	21.16	1.179	0.50( 0.50)	1.00	2635.3	10630.00
2	2235.06	36.74	0.847	0.50( 0.50)	1.00	4568.5	10600.00
3	2148.74	47.43	0.745	0.50( 0.50)	1.00	5901.3	10500.00
4	2017.73	56.10	0.689	0.50( 0.50)	1.00	6884.3	10410.00
5	1805.59	70.62	0.631	0.50( 0.50)	1.00	8318.8	10400.00
6	1720.76	76.48	0.612	0.50( 0.50)	1.00	8809.3	10200.00
7	1556.08	86.77	0.578	0.50( 0.50)	1.00	9538.7	10300.00
8	1544.87	87.24	0.576	0.50( 0.50)	1.00	9560.9	10320.00
9	1446.95	91.11	0.565	0.50( 0.50)	1.00	9669.6	10210.00
10	523.97	143.59	0.485	0.50( 0.50)	1.00	10538.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2688.23	21.16	1.179	0.50( 0.50)	1.00	3369.3	10630.00
2	2595.48	36.74	0.847	0.50( 0.50)	1.00	5842.7	10600.00
3	2509.15	47.43	0.745	0.50( 0.50)	1.00	7546.4	10500.00
4	2402.84	54.47	0.698	0.50( 0.50)	1.00	8588.0	10710.00
5	2367.36	56.10	0.689	0.50( 0.50)	1.00	8786.5	10410.00
6	2203.84	63.81	0.653	0.50( 0.50)	1.00	9610.7	10700.00
7	2061.35	70.62	0.631	0.50( 0.50)	1.00	10283.3	10400.00
8	1939.47	76.48	0.612	0.50( 0.50)	1.00	10773.7	10200.00
9	1709.79	86.77	0.578	0.50( 0.50)	1.00	11503.2	10300.00
10	1695.59	87.24	0.576	0.50( 0.50)	1.00	11525.4	10320.00
11	1576.55	91.11	0.565	0.50( 0.50)	1.00	11634.1	10210.00
12	529.13	143.59	0.485	0.50( 0.50)	1.00	12502.4	10100.00

TOTAL AREA (ACRES) = 12502.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2688.23 Tc(MIN.) = 21.161  
 EFFECTIVE AREA(ACRES) = 3369.27 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12502.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10724.00 = 45335.69 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10724.00 TO NODE 10820.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1320.32 DOWNSTREAM(FEET) = 1289.38  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1341.06 CHANNEL SLOPE = 0.0231  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.106  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 47.66 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2701.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.19  
 AVERAGE FLOW DEPTH(FEET) = 9.40 TRAVEL TIME(MIN.) = 2.19  
 Tc(MIN.) = 23.36  
 SUBAREA AREA(ACRES) = 47.66 SUBAREA RUNOFF(CFS) = 26.00  
 EFFECTIVE AREA(ACRES) = 3416.93 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 12550.1 PEAK FLOW RATE(CFS) = 2688.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.38 FLOW VELOCITY(FEET/SEC.) = 10.18  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10820.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2688.23	23.36	1.106	0.50( 0.50)	1.00	3416.9	10630.00
2	2595.48	38.95	0.820	0.50( 0.50)	1.00	5890.4	10600.00
3	2509.15	49.67	0.727	0.50( 0.50)	1.00	7594.0	10500.00
4	2402.84	56.72	0.685	0.50( 0.50)	1.00	8635.7	10710.00
5	2367.36	58.37	0.675	0.50( 0.50)	1.00	8834.2	10410.00
6	2203.84	66.12	0.646	0.50( 0.50)	1.00	9658.3	10700.00
7	2061.35	72.97	0.623	0.50( 0.50)	1.00	10331.0	10400.00
8	1939.47	78.87	0.604	0.50( 0.50)	1.00	10821.4	10200.00
9	1709.79	89.23	0.570	0.50( 0.50)	1.00	11550.8	10300.00
10	1695.59	89.70	0.568	0.50( 0.50)	1.00	11573.1	10320.00
11	1576.55	93.62	0.561	0.50( 0.50)	1.00	11681.7	10210.00
12	529.13	146.89	0.481	0.50( 0.50)	1.00	12550.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	86.90	14.85	1.434	0.50( 0.50)	1.00	103.4	10800.00

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10820.00 = 4081.86 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2719.09	14.85	1.434	0.50( 0.50)	1.00	2275.3	10800.00
2	2744.61	23.36	1.106	0.50( 0.50)	1.00	3520.3	10630.00
3	2625.21	38.95	0.820	0.50( 0.50)	1.00	5993.7	10600.00
4	2530.23	49.67	0.727	0.50( 0.50)	1.00	7697.4	10500.00
5	2420.03	56.72	0.685	0.50( 0.50)	1.00	8739.1	10710.00
6	2383.67	58.37	0.675	0.50( 0.50)	1.00	8937.6	10410.00
7	2217.39	66.12	0.646	0.50( 0.50)	1.00	9761.7	10700.00
8	2072.79	72.97	0.623	0.50( 0.50)	1.00	10434.3	10400.00
9	1949.10	78.87	0.604	0.50( 0.50)	1.00	10924.8	10200.00
10	1716.24	89.23	0.570	0.50( 0.50)	1.00	11654.2	10300.00

11 1701.90 89.70 0.568 0.50( 0.50) 1.00 11676.4 10320.00  
12 1582.18 93.62 0.561 0.50( 0.50) 1.00 11785.1 10210.00  
13 529.13 146.89 0.481 0.50( 0.50) 1.00 12653.5 10100.00  
TOTAL AREA(ACRES) = 12653.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2744.61 Tc(MIN.) = 23.355  
EFFECTIVE AREA(ACRES) = 3520.30 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12653.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10820.00 = 46676.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1289.38 DOWNSTREAM(FEET) = 1208.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2450.84 CHANNEL SLOPE = 0.0332  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.007

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	147.19	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 2778.20  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.75  
AVERAGE FLOW DEPTH(FEET) = 8.88 TRAVEL TIME(MIN.) = 3.47  
Tc(MIN.) = 26.83  
SUBAREA AREA(ACRES) = 147.19 SUBAREA RUNOFF(CFS) = 67.13  
EFFECTIVE AREA(ACRES) = 3667.49 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12800.7 PEAK FLOW RATE(CFS) = 2744.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.83 FLOW VELOCITY(FEET/SEC.) = 11.73  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10820.00 TO NODE 10840.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 26.83  
RAINFALL INTENSITY(INCH/HR) = 1.01  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 3667.49  
TOTAL STREAM AREA(ACRES) = 12800.66  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2744.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10830.00 TO NODE 10831.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.89  
ELEVATION DATA: UPSTREAM(FEET) = 3249.56 DOWNSTREAM(FEET) = 3166.67

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.939  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.273  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	0.88	0.50	1.000	0	8.94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 1.40  
TOTAL AREA(ACRES) = 0.88 PEAK FLOW RATE(CFS) = 1.40

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10831.00 TO NODE 10832.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3166.67 DOWNSTREAM(FEET) = 2954.84  
CHANNEL LENGTH THRU SUBAREA(FEET) = 677.65 CHANNEL SLOPE = 0.3126  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.889

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	2.82	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.00  
AVERAGE FLOW DEPTH(FEET) = 0.46 TRAVEL TIME(MIN.) = 2.26  
Tc(MIN.) = 11.20  
SUBAREA AREA(ACRES) = 2.82 SUBAREA RUNOFF(CFS) = 3.52  
EFFECTIVE AREA(ACRES) = 3.70 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 4.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.53 FLOW VELOCITY(FEET/SEC.) = 5.50  
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10832.00 = 977.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10832.00 TO NODE 10833.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 2954.84 DOWNSTREAM(FEET) = 2765.08
CHANNEL LENGTH THRU SUBAREA(FEET) = 951.35 CHANNEL SLOPE = 0.1995
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.591
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 29.25 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.16
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.63
AVERAGE FLOW DEPTH(FEET) = 0.98 TRAVEL TIME(MIN.) = 2.39
Tc(MIN.) = 13.59
SUBAREA AREA(ACRES) = 29.25 SUBAREA RUNOFF(CFS) = 28.70
EFFECTIVE AREA(ACRES) = 32.95 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 33.0 PEAK FLOW RATE(CFS) = 32.34

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 7.57
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10833.00 = 1928.89 FEET.

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FLOW PROCESS FROM NODE 10833.00 TO NODE 10834.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 2765.08 DOWNSTREAM(FEET) = 2446.09
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.29 CHANNEL SLOPE = 0.1628
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.314
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 80.66 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.08
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.25
AVERAGE FLOW DEPTH(FEET) = 1.58 TRAVEL TIME(MIN.) = 3.96
Tc(MIN.) = 17.55
SUBAREA AREA(ACRES) = 80.66 SUBAREA RUNOFF(CFS) = 59.08
EFFECTIVE AREA(ACRES) = 113.61 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 113.6 PEAK FLOW RATE(CFS) = 83.21

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 8.88
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10834.00 = 3888.18 FEET.

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FLOW PROCESS FROM NODE 10834.00 TO NODE 10835.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2446.09 DOWNSTREAM(FEET) = 1797.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 2083.04 CHANNEL SLOPE = 0.3113
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.210
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 196.68 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 146.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.04
AVERAGE FLOW DEPTH(FEET) = 1.93 TRAVEL TIME(MIN.) = 2.66
Tc(MIN.) = 20.21
SUBAREA AREA(ACRES) = 196.68 SUBAREA RUNOFF(CFS) = 125.63
EFFECTIVE AREA(ACRES) = 310.29 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 310.3 PEAK FLOW RATE(CFS) = 198.21

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.17 FLOW VELOCITY(FEET/SEC.) = 14.04
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10835.00 = 5971.22 FEET.

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FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1797.70 DOWNSTREAM(FEET) = 1208.07
CHANNEL LENGTH THRU SUBAREA(FEET) = 3213.25 CHANNEL SLOPE = 0.1835
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.066
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 218.82 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 254.10
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.27
AVERAGE FLOW DEPTH(FEET) = 2.63 TRAVEL TIME(MIN.) = 4.36
Tc(MIN.) = 24.58
SUBAREA AREA(ACRES) = 218.82 SUBAREA RUNOFF(CFS) = 111.41
EFFECTIVE AREA(ACRES) = 529.11 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 529.1 PEAK FLOW RATE(CFS) = 269.39

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.68 FLOW VELOCITY(FEET/SEC.) = 12.48
LONGEST FLOWPATH FROM NODE 10830.00 TO NODE 10840.00 = 9184.47 FEET.

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FLOW PROCESS FROM NODE 10835.00 TO NODE 10840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 24.58
RAINFALL INTENSITY(INCH/HR) = 1.07
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 529.11
TOTAL STREAM AREA(ACRES) = 529.11
PEAK FLOW RATE(CFS) AT CONFLUENCE = 269.39

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 18 rows of data for streams 1 and 2.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 14 rows of data for streams 1 through 14.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3007.25 Tc(MIN.) = 24.58
EFFECTIVE AREA(ACRES) = 3867.19 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13329.8
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10840.00 = 49127.59 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10840.00 TO NODE 10841.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1208.07 DOWNSTREAM(FEET) = 1119.03
CHANNEL LENGTH THRU SUBAREA(FEET) = 3050.12 CHANNEL SLOPE = 0.0292
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.953

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 222.84 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3052.73
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.47
AVERAGE FLOW DEPTH(FEET) = 9.42 TRAVEL TIME(MIN.) = 4.43
Tc(MIN.) = 29.01
SUBAREA AREA(ACRES) = 222.84 SUBAREA RUNOFF(CFS) = 90.89
EFFECTIVE AREA(ACRES) = 4090.03 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 13552.6 PEAK FLOW RATE(CFS) = 3007.25
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.36 FLOW VELOCITY(FEET/SEC.) = 11.43
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10841.00 = 52177.71 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1119.03 DOWNSTREAM(FEET) = 1087.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.14 CHANNEL SLOPE = 0.0238
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.916

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 265.26 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3056.88
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.63
AVERAGE FLOW DEPTH(FEET) = 9.79 TRAVEL TIME(MIN.) = 2.07
Tc(MIN.) = 31.08
SUBAREA AREA(ACRES) = 265.26 SUBAREA RUNOFF(CFS) = 99.23
EFFECTIVE AREA(ACRES) = 4355.29 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 13817.9 PEAK FLOW RATE (CFS) = 3007.25  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 9.73 FLOW VELOCITY (FEET/SEC.) = 10.59  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10841.00 TO NODE 10860.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 31.08  
RAINFALL INTENSITY (INCH/HR) = 0.92  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 4355.29  
TOTAL STREAM AREA (ACRES) = 13817.87  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 3007.25

\*\*\*\*\*

FLOW PROCESS FROM NODE 10850.00 TO NODE 10851.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 311.88  
ELEVATION DATA: UPSTREAM (FEET) = 3029.66 DOWNSTREAM (FEET) = 2922.38

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.691  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.328  
SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	2.73	0.50	1.000	0	8.69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 4.49  
TOTAL AREA (ACRES) = 2.73 PEAK FLOW RATE (CFS) = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 10851.00 TO NODE 10852.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2922.38 DOWNSTREAM (FEET) = 2684.61  
CHANNEL LENGTH THRU SUBAREA (FEET) = 687.05 CHANNEL SLOPE = 0.3461  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.982  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/  
LAND USE

SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.11	0.50	1.000

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.91  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.52  
AVERAGE FLOW DEPTH (FEET) = 0.64 TRAVEL TIME (MIN.) = 1.76  
Tc (MIN.) = 10.45  
SUBAREA AREA (ACRES) = 5.11 SUBAREA RUNOFF (CFS) = 6.82  
EFFECTIVE AREA (ACRES) = 7.84 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 10.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.70 FLOW VELOCITY (FEET/SEC.) = 7.02  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10852.00 = 998.93 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10852.00 TO NODE 10853.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2684.61 DOWNSTREAM (FEET) = 2306.25  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1924.58 CHANNEL SLOPE = 0.1966  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.469  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.02	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 37.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.79  
AVERAGE FLOW DEPTH (FEET) = 1.27 TRAVEL TIME (MIN.) = 4.12  
Tc (MIN.) = 14.57  
SUBAREA AREA (ACRES) = 60.02 SUBAREA RUNOFF (CFS) = 52.33  
EFFECTIVE AREA (ACRES) = 67.86 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 67.9 PEAK FLOW RATE (CFS) = 59.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.50 FLOW VELOCITY (FEET/SEC.) = 8.76  
LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10853.00 = 2923.51 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10853.00 TO NODE 10854.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2306.25 DOWNSTREAM (FEET) = 1555.12  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3225.53 CHANNEL SLOPE = 0.2329  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.248  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 235.82 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 139.19  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.56  
 AVERAGE FLOW DEPTH (FEET) = 2.00 TRAVEL TIME (MIN.) = 4.65  
 Tc (MIN.) = 19.22  
 SUBAREA AREA (ACRES) = 235.82 SUBAREA RUNOFF (CFS) = 158.69  
 EFFECTIVE AREA (ACRES) = 303.68 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 303.7 PEAK FLOW RATE (CFS) = 204.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.31 FLOW VELOCITY (FEET/SEC.) = 12.72  
 LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10854.00 = 6149.04 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 51

>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1555.12 DOWNSTREAM (FEET) = 1087.70  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3294.22 CHANNEL SLOPE = 0.1419  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.083  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 247.64 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 269.57  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.31  
 AVERAGE FLOW DEPTH (FEET) = 2.82 TRAVEL TIME (MIN.) = 4.85  
 Tc (MIN.) = 24.07  
 SUBAREA AREA (ACRES) = 247.64 SUBAREA RUNOFF (CFS) = 129.81  
 EFFECTIVE AREA (ACRES) = 551.32 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 551.3 PEAK FLOW RATE (CFS) = 289.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.89 FLOW VELOCITY (FEET/SEC.) = 11.50  
 LONGEST FLOWPATH FROM NODE 10850.00 TO NODE 10860.00 = 9443.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10854.00 TO NODE 10860.00 IS CODE = 1

>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<<  
 >>>> AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 24.07  
 RAINFALL INTENSITY (INCH/HR) = 1.08  
 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 551.32  
 TOTAL STREAM AREA (ACRES) = 551.32  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 289.00

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2988.48	24.81	1.058	0.50 ( 0.50)	1.00	3304.9	10800.00
1	3007.25	31.08	0.916	0.50 ( 0.50)	1.00	4355.3	10830.00
1	2985.94	33.34	0.888	0.50 ( 0.50)	1.00	4684.7	10630.00
1	2761.56	49.11	0.731	0.50 ( 0.50)	1.00	7158.1	10600.00
1	2627.92	59.95	0.666	0.50 ( 0.50)	1.00	8861.8	10500.00
1	2498.49	67.13	0.642	0.50 ( 0.50)	1.00	9903.5	10710.00
1	2459.52	68.82	0.637	0.50 ( 0.50)	1.00	10102.0	10410.00
1	2280.95	76.77	0.611	0.50 ( 0.50)	1.00	10926.1	10700.00
1	2125.50	83.80	0.587	0.50 ( 0.50)	1.00	11598.7	10400.00
1	1992.44	89.88	0.567	0.50 ( 0.50)	1.00	12089.2	10200.00
1	1745.45	100.60	0.549	0.50 ( 0.50)	1.00	12818.6	10300.00
1	1730.72	101.11	0.548	0.50 ( 0.50)	1.00	12840.8	10320.00
1	1607.71	105.23	0.541	0.50 ( 0.50)	1.00	12949.5	10210.00
1	529.13	162.22	0.462	0.50 ( 0.50)	1.00	13817.9	10100.00
2	289.00	24.07	1.083	0.50 ( 0.50)	1.00	551.3	10850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3277.48	24.07	1.083	0.50 ( 0.50)	1.00	3757.3	10850.00
2	3265.31	24.81	1.058	0.50 ( 0.50)	1.00	3856.3	10800.00
3	3213.50	31.08	0.916	0.50 ( 0.50)	1.00	4906.6	10830.00
4	3178.48	33.34	0.888	0.50 ( 0.50)	1.00	5236.0	10630.00
5	2876.26	49.11	0.731	0.50 ( 0.50)	1.00	7709.5	10600.00
6	2710.33	59.95	0.666	0.50 ( 0.50)	1.00	9413.1	10500.00
7	2569.07	67.13	0.642	0.50 ( 0.50)	1.00	10454.8	10710.00
8	2527.35	68.82	0.637	0.50 ( 0.50)	1.00	10653.3	10410.00
9	2335.76	76.77	0.611	0.50 ( 0.50)	1.00	11477.4	10700.00
10	2168.79	83.80	0.587	0.50 ( 0.50)	1.00	12150.1	10400.00
11	2025.78	89.88	0.567	0.50 ( 0.50)	1.00	12640.5	10200.00
12	1769.48	100.60	0.549	0.50 ( 0.50)	1.00	13369.9	10300.00
13	1754.31	101.11	0.548	0.50 ( 0.50)	1.00	13392.1	10320.00
14	1627.75	105.23	0.541	0.50 ( 0.50)	1.00	13500.8	10210.00
15	529.13	162.22	0.462	0.50 ( 0.50)	1.00	14369.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 3277.48 Tc (MIN.) = 24.07  
 EFFECTIVE AREA (ACRES) = 3757.33 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 14369.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10860.00 = 53495.85 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====  
ELEVATION DATA: UPSTREAM(FEET) = 1087.70 DOWNSTREAM(FEET) = 961.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4791.22 CHANNEL SLOPE = 0.0264  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.915

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	402.51	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3352.78

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.32

AVERAGE FLOW DEPTH(FEET) = 9.94 TRAVEL TIME(MIN.) = 7.05

Tc(MIN.) = 31.13

SUBAREA AREA(ACRES) = 402.51 SUBAREA RUNOFF(CFS) = 150.36

EFFECTIVE AREA(ACRES) = 4159.84 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 14771.7 PEAK FLOW RATE(CFS) = 3277.48

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.85 FLOW VELOCITY(FEET/SEC.) = 11.25

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 14771.7 TC(MIN.) = 31.13

EFFECTIVE AREA(ACRES) = 4159.84 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.999

PEAK FLOW RATE(CFS) = 3277.48

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3277.48	31.13	0.915	0.50( 0.50)	1.00	4159.8	10850.00
2	3265.31	31.88	0.906	0.50( 0.50)	1.00	4258.8	10800.00
3	3213.50	38.17	0.829	0.50( 0.50)	1.00	5309.1	10830.00
4	3178.48	40.46	0.803	0.50( 0.50)	1.00	5638.5	10630.00
5	2876.26	56.42	0.687	0.50( 0.50)	1.00	8112.0	10600.00
6	2710.33	67.37	0.642	0.50( 0.50)	1.00	9815.6	10500.00
7	2569.07	74.66	0.618	0.50( 0.50)	1.00	10857.3	10710.00
8	2527.35	76.37	0.612	0.50( 0.50)	1.00	11055.8	10410.00
9	2335.76	84.48	0.585	0.50( 0.50)	1.00	11879.9	10700.00
10	2168.79	91.66	0.564	0.50( 0.50)	1.00	12552.6	10400.00
11	2025.78	97.88	0.553	0.50( 0.50)	1.00	13043.0	10200.00
12	1769.48	108.88	0.534	0.50( 0.50)	1.00	13772.4	10300.00
13	1754.31	109.39	0.533	0.50( 0.50)	1.00	13794.7	10320.00
14	1627.75	113.68	0.526	0.50( 0.50)	1.00	13903.3	10210.00
15	529.13	173.41	0.447	0.50( 0.50)	1.00	14771.7	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S9.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.145
- 2) 10.00; 2.038
- 3) 15.00; 1.415
- 4) 20.00; 1.217
- 5) 25.00; 1.052
- 6) 30.00; 0.929
- 7) 40.00; 0.807
- 8) 50.00; 0.724
- 9) 60.00; 0.666
- 10) 90.00; 0.567
- 11) 120.00; 0.515
- 12) 180.00; 0.439
- 13) 360.00; 0.338
- 14) 1440.00; 0.152

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETS MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10900.00 TO NODE 10901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 305.17  
ELEVATION DATA: UPSTREAM(FEET) = 3291.76 DOWNSTREAM(FEET) = 3104.08

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.671  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.554  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.19	0.50	1.000	0	7.67

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.20  
TOTAL AREA (ACRES) = 1.19 PEAK FLOW RATE (CFS) = 2.20

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10901.00 TO NODE 10902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3104.08 DOWNSTREAM(FEET) = 2877.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 666.71 CHANNEL SLOPE = 0.3398  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.110  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	2.53	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.04  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.55  
AVERAGE FLOW DEPTH(FEET) = 0.49 TRAVEL TIME(MIN.) = 2.00  
Tc(MIN.) = 9.67  
SUBAREA AREA(ACRES) = 2.53 SUBAREA RUNOFF(CFS) = 3.67  
EFFECTIVE AREA(ACRES) = 3.72 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.7 PEAK FLOW RATE(CFS) = 5.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.55 FLOW VELOCITY(FEET/SEC.) = 5.89  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10902.00 = 971.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10902.00 TO NODE 10903.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2877.50 DOWNSTREAM(FEET) = 2643.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.39 CHANNEL SLOPE = 0.1219  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.401  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.43	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.86  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.63  
 AVERAGE FLOW DEPTH(FEET) = 1.11 TRAVEL TIME(MIN.) = 5.67  
 Tc(MIN.) = 15.35  
 SUBAREA AREA(ACRES) = 36.43 SUBAREA RUNOFF(CFS) = 29.54  
 EFFECTIVE AREA(ACRES) = 40.15 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 40.2 PEAK FLOW RATE(CFS) = 32.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 6.28  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10903.00 = 2888.27 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10903.00 TO NODE 10904.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 2643.95 DOWNSTREAM(FEET) = 2373.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.90 CHANNEL SLOPE = 0.1400  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.246  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	129.07	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.21  
 AVERAGE FLOW DEPTH(FEET) = 1.76 TRAVEL TIME(MIN.) = 3.92  
 Tc(MIN.) = 19.27  
 SUBAREA AREA(ACRES) = 129.07 SUBAREA RUNOFF(CFS) = 86.64  
 EFFECTIVE AREA(ACRES) = 169.22 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 169.2 PEAK FLOW RATE(CFS) = 113.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.04 FLOW VELOCITY(FEET/SEC.) = 9.08  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10904.00 = 4820.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10904.00 TO NODE 10905.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 2373.49 DOWNSTREAM(FEET) = 1817.76  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2764.66 CHANNEL SLOPE = 0.2010  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.104  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.70	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 145.65  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.06  
 AVERAGE FLOW DEPTH(FEET) = 2.10 TRAVEL TIME(MIN.) = 4.17  
 Tc(MIN.) = 23.43  
 SUBAREA AREA(ACRES) = 117.70 SUBAREA RUNOFF(CFS) = 63.93  
 EFFECTIVE AREA(ACRES) = 286.92 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 286.9 PEAK FLOW RATE(CFS) = 155.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.15 FLOW VELOCITY(FEET/SEC.) = 11.25  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10905.00 = 7584.83 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10905.00 TO NODE 10906.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1817.76 DOWNSTREAM(FEET) = 1387.73  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2799.36 CHANNEL SLOPE = 0.1536  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.989  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	363.93	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 236.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.27  
 AVERAGE FLOW DEPTH(FEET) = 2.64 TRAVEL TIME(MIN.) = 4.14  
 Tc(MIN.) = 27.57  
 SUBAREA AREA(ACRES) = 363.93 SUBAREA RUNOFF(CFS) = 160.01  
 EFFECTIVE AREA(ACRES) = 650.85 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 650.8 PEAK FLOW RATE(CFS) = 286.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.84 FLOW VELOCITY(FEET/SEC.) = 11.82  
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10906.00 = 10384.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1387.73 DOWNSTREAM(FEET) = 1113.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2484.63 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.911

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 56.85 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 296.66  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.55  
AVERAGE FLOW DEPTH(FEET) = 3.06 TRAVEL TIME(MIN.) = 3.93  
Tc(MIN.) = 31.50  
SUBAREA AREA(ACRES) = 56.85 SUBAREA RUNOFF(CFS) = 21.00  
EFFECTIVE AREA(ACRES) = 707.70 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 707.7 PEAK FLOW RATE(CFS) = 286.16  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.02 FLOW VELOCITY(FEET/SEC.) = 10.47  
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10920.00 = 12868.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10906.00 TO NODE 10920.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 31.50  
RAINFALL INTENSITY(INCH/HR) = 0.91  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 707.70  
TOTAL STREAM AREA(ACRES) = 707.70  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 286.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10910.00 TO NODE 10911.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 287.29  
ELEVATION DATA: UPSTREAM(FEET) = 3119.43 DOWNSTREAM(FEET) = 3044.59

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.891  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.283  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 1.91 0.50 1.000 0 8.89  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.07  
TOTAL AREA(ACRES) = 1.91 PEAK FLOW RATE(CFS) = 3.07

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10911.00 TO NODE 10912.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3044.59 DOWNSTREAM(FEET) = 2980.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 627.50 CHANNEL SLOPE = 0.1015  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.834

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 4.16 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.81  
AVERAGE FLOW DEPTH(FEET) = 0.70 TRAVEL TIME(MIN.) = 2.75  
Tc(MIN.) = 11.64  
SUBAREA AREA(ACRES) = 4.16 SUBAREA RUNOFF(CFS) = 4.99  
EFFECTIVE AREA(ACRES) = 6.07 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.1 PEAK FLOW RATE(CFS) = 7.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.78 FLOW VELOCITY(FEET/SEC.) = 4.04  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10912.00 = 914.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10912.00 TO NODE 10913.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2980.93 DOWNSTREAM(FEET) = 2876.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 984.99 CHANNEL SLOPE = 0.1065  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.432

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 22.86 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.09

AVERAGE FLOW DEPTH (FEET) = 1.06 TRAVEL TIME (MIN.) = 3.22  
Tc (MIN.) = 14.86  
SUBAREA AREA (ACRES) = 22.86 SUBAREA RUNOFF (CFS) = 19.18  
EFFECTIVE AREA (ACRES) = 28.93 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 28.9 PEAK FLOW RATE (CFS) = 24.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.20 FLOW VELOCITY (FEET/SEC.) = 5.59  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10913.00 = 1899.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10913.00 TO NODE 10914.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2876.01 DOWNSTREAM (FEET) = 2832.29  
CHANNEL LENGTH THRU SUBAREA (FEET) = 939.99 CHANNEL SLOPE = 0.0465  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.289

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 53.02 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.73  
AVERAGE FLOW DEPTH (FEET) = 1.74 TRAVEL TIME (MIN.) = 3.31  
Tc (MIN.) = 18.18  
SUBAREA AREA (ACRES) = 53.02 SUBAREA RUNOFF (CFS) = 37.65  
EFFECTIVE AREA (ACRES) = 81.95 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 81.9 PEAK FLOW RATE (CFS) = 58.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 5.07  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10914.00 = 2839.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10914.00 TO NODE 10915.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2832.29 DOWNSTREAM (FEET) = 2769.58  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1006.52 CHANNEL SLOPE = 0.0623  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.189

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.80 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 86.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.25  
AVERAGE FLOW DEPTH (FEET) = 2.15 TRAVEL TIME (MIN.) = 2.69  
Tc (MIN.) = 20.86  
SUBAREA AREA (ACRES) = 90.80 SUBAREA RUNOFF (CFS) = 56.25  
EFFECTIVE AREA (ACRES) = 172.75 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 172.8 PEAK FLOW RATE (CFS) = 107.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.32 FLOW VELOCITY (FEET/SEC.) = 6.60  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10915.00 = 3846.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10915.00 TO NODE 10916.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2769.58 DOWNSTREAM (FEET) = 2453.21  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3003.36 CHANNEL SLOPE = 0.1053  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.020

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 311.96 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 180.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.17  
AVERAGE FLOW DEPTH (FEET) = 2.56 TRAVEL TIME (MIN.) = 5.46  
Tc (MIN.) = 26.32  
SUBAREA AREA (ACRES) = 311.96 SUBAREA RUNOFF (CFS) = 145.81  
EFFECTIVE AREA (ACRES) = 484.71 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 484.7 PEAK FLOW RATE (CFS) = 226.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.79 FLOW VELOCITY (FEET/SEC.) = 9.71  
LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10916.00 = 6849.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10916.00 TO NODE 10917.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2453.21 DOWNSTREAM (FEET) = 1787.18  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2846.14 CHANNEL SLOPE = 0.2340  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.935

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 238.62 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 273.24  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.73  
 AVERAGE FLOW DEPTH(FEET) = 2.58 TRAVEL TIME(MIN.) = 3.46  
 Tc(MIN.) = 29.77  
 SUBAREA AREA(ACRES) = 238.62 SUBAREA RUNOFF(CFS) = 93.28  
 EFFECTIVE AREA(ACRES) = 723.33 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 723.3 PEAK FLOW RATE(CFS) = 282.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.61 FLOW VELOCITY(FEET/SEC.) = 13.81  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10917.00 = 9695.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10917.00 TO NODE 10918.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1787.18 DOWNSTREAM(FEET) = 1279.22  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2918.23 CHANNEL SLOPE = 0.1741  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.885

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	150.63	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 308.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.62  
 AVERAGE FLOW DEPTH(FEET) = 2.86 TRAVEL TIME(MIN.) = 3.85  
 Tc(MIN.) = 33.63  
 SUBAREA AREA(ACRES) = 150.63 SUBAREA RUNOFF(CFS) = 52.13  
 EFFECTIVE AREA(ACRES) = 873.96 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 874.0 PEAK FLOW RATE(CFS) = 302.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.83 FLOW VELOCITY(FEET/SEC.) = 12.56  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10918.00 = 12614.02 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1279.22 DOWNSTREAM(FEET) = 1113.60  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1664.50 CHANNEL SLOPE = 0.0995  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.852

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	60.16	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 311.97  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.29  
 AVERAGE FLOW DEPTH(FEET) = 3.18 TRAVEL TIME(MIN.) = 2.70  
 Tc(MIN.) = 36.32  
 SUBAREA AREA(ACRES) = 60.16 SUBAREA RUNOFF(CFS) = 19.04  
 EFFECTIVE AREA(ACRES) = 934.12 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 934.1 PEAK FLOW RATE(CFS) = 302.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.15 FLOW VELOCITY(FEET/SEC.) = 10.19  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10918.00 TO NODE 10920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

CONFLUENCE DATA \*\*  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 36.32  
 RAINFALL INTENSITY(INCH/HR) = 0.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 934.12  
 TOTAL STREAM AREA(ACRES) = 934.12  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 302.45

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	286.16	31.50	0.911	0.50( 0.50)	1.00	707.7	10900.00
2	302.45	36.32	0.852	0.50( 0.50)	1.00	934.1	10910.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	31.50	0.911	0.50( 0.50)	1.00	1517.7	10900.00
2	547.57	36.32	0.852	0.50( 0.50)	1.00	1641.8	10910.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 588.61 Tc(MIN.) = 31.50  
 EFFECTIVE AREA(ACRES) = 1517.73 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1641.8  
 LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10920.00 = 14278.52 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====  
ELEVATION DATA: UPSTREAM(FEET) = 1113.60 DOWNSTREAM(FEET) = 961.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2282.16 CHANNEL SLOPE = 0.0668  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.867

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	185.67	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 619.23

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.52

AVERAGE FLOW DEPTH(FEET) = 4.43 TRAVEL TIME(MIN.) = 3.62

Tc(MIN.) = 35.12

SUBAREA AREA(ACRES) = 185.67 SUBAREA RUNOFF(CFS) = 61.23

EFFECTIVE AREA(ACRES) = 1703.40 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1827.5 PEAK FLOW RATE(CFS) = 588.61

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.35 FLOW VELOCITY(FEET/SEC.) = 10.39

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1827.5 TC(MIN.) = 35.12

EFFECTIVE AREA(ACRES) = 1703.40 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 588.61

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	35.12	0.867	0.50( 0.50)	1.00	1703.4	10900.00
2	547.57	40.02	0.807	0.50( 0.50)	1.00	1827.5	10910.00

=====  
END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

FILE NAME: S10.DAT
TIME/DATE OF STUDY: 10:30 04/01/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.065
2) 10.00; 1.994
3) 15.00; 1.398
4) 20.00; 1.201
5) 25.00; 1.039
6) 30.00; 0.920
7) 40.00; 0.798
8) 50.00; 0.714
9) 60.00; 0.656
10) 90.00; 0.556
11) 120.00; 0.503
12) 180.00; 0.428
13) 360.00; 0.327
14) 1440.00; 0.147

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE/ WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), GUTTER LIP (FT), GUTTER GEOMETRIES HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 11000.00 TO NODE 11001.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 362.38
ELEVATION DATA: UPSTREAM(FEET) = 2528.19 DOWNSTREAM(FEET) = 2375.55

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.863
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.238
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"OPEN BRUSH" - 2.03 0.50 1.000 0 8.86
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 3.17
TOTAL AREA(ACRES) = 2.03 PEAK FLOW RATE(CFS) = 3.17

\*\*\*\*\*

FLOW PROCESS FROM NODE 11001.00 TO NODE 11002.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2375.55 DOWNSTREAM(FEET) = 2005.09
CHANNEL LENGTH THRU SUBAREA(FEET) = 575.45 CHANNEL SLOPE = 0.6438
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.976
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 3.14 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.26
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.44
AVERAGE FLOW DEPTH(FEET) = 0.49 TRAVEL TIME(MIN.) = 1.29
Tc(MIN.) = 10.15
SUBAREA AREA(ACRES) = 3.14 SUBAREA RUNOFF(CFS) = 4.17
EFFECTIVE AREA(ACRES) = 5.17 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 5.2 PEAK FLOW RATE(CFS) = 6.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.54 FLOW VELOCITY(FEET/SEC.) = 7.94
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11002.00 = 937.83 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11002.00 TO NODE 11003.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

\*\*\*\*\*

ELEVATION DATA: UPSTREAM(FEET) = 2005.09 DOWNSTREAM(FEET) = 1450.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.43 CHANNEL SLOPE = 0.5763  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.775

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.53	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.50

AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 1.69

Tc(MIN.) = 11.84

SUBAREA AREA(ACRES) = 16.53 SUBAREA RUNOFF(CFS) = 18.96

EFFECTIVE AREA(ACRES) = 21.70 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) = 24.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.89 FLOW VELOCITY(FEET/SEC.) = 10.52

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11003.00 = 1900.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1450.44 DOWNSTREAM(FEET) = 939.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1351.71 CHANNEL SLOPE = 0.3779  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.509

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.99	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 39.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.12

AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 2.23

Tc(MIN.) = 14.07

SUBAREA AREA(ACRES) = 30.99 SUBAREA RUNOFF(CFS) = 28.15

EFFECTIVE AREA(ACRES) = 52.69 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 52.7 PEAK FLOW RATE(CFS) = 47.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.23 FLOW VELOCITY(FEET/SEC.) = 10.62

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S8.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3277.48	31.13	0.50( 0.50)	1.00	4159.8	10850.00
2	3265.31	31.88	0.50( 0.50)	1.00	4258.8	10800.00
3	3213.50	38.17	0.50( 0.50)	1.00	5309.1	10830.00
4	3178.48	40.46	0.50( 0.50)	1.00	5638.5	10630.00
5	2876.26	56.42	0.50( 0.50)	1.00	8112.0	10600.00
6	2710.33	67.37	0.50( 0.50)	1.00	9815.6	10500.00
7	2569.07	74.66	0.50( 0.50)	1.00	10857.3	10710.00
8	2527.35	76.37	0.50( 0.50)	1.00	11055.8	10410.00
9	2335.76	84.48	0.50( 0.50)	1.00	11879.9	10700.00
10	2168.79	91.66	0.50( 0.50)	1.00	12552.6	10400.00
11	2025.78	97.88	0.50( 0.50)	1.00	13043.0	10200.00
12	1769.48	108.88	0.50( 0.50)	1.00	13772.4	10300.00
13	1754.31	109.39	0.50( 0.50)	1.00	13794.7	10320.00
14	1627.75	113.68	0.50( 0.50)	1.00	13903.3	10210.00
15	529.13	173.41	0.50( 0.50)	1.00	14771.7	10100.00

TOTAL AREA(ACRES) = 14771.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: S9.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	35.12	0.50( 0.50)	1.00	1703.4	10900.00
2	547.57	40.02	0.50( 0.50)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10920.00 TO NODE 10921.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	35.12	0.50( 0.50)	1.00	1703.4	10900.00
2	547.57	40.02	0.50( 0.50)	1.00	1827.5	10910.00

TOTAL AREA(ACRES) = 1827.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10860.00 TO NODE 10921.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<



=====  
**\*\* MAIN STREAM CONFLUENCE DATA \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	588.61	35.12	0.858	0.50 ( 0.50)	1.00	1703.4	10900.00
2	547.57	40.02	0.798	0.50 ( 0.50)	1.00	1827.5	10910.00

LONGEST FLOWPATH FROM NODE 10910.00 TO NODE 10921.00 = 16560.68 FEET.

**\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3277.48	31.13	0.906	0.50 ( 0.50)	1.00	4159.8	10850.00
2	3265.31	31.88	0.897	0.50 ( 0.50)	1.00	4258.8	10800.00
3	3213.50	38.17	0.820	0.50 ( 0.50)	1.00	5309.1	10830.00
4	3178.48	40.46	0.794	0.50 ( 0.50)	1.00	5638.5	10630.00
5	2876.26	56.42	0.677	0.50 ( 0.50)	1.00	8112.0	10600.00
6	2710.33	67.37	0.631	0.50 ( 0.50)	1.00	9815.6	10500.00
7	2569.07	74.66	0.607	0.50 ( 0.50)	1.00	10857.3	10710.00
8	2527.35	76.37	0.601	0.50 ( 0.50)	1.00	11055.8	10410.00
9	2335.76	84.48	0.574	0.50 ( 0.50)	1.00	11879.9	10700.00
10	2168.79	91.66	0.553	0.50 ( 0.50)	1.00	12552.6	10400.00
11	2025.78	97.88	0.542	0.50 ( 0.50)	1.00	13043.0	10200.00
12	1769.48	108.88	0.523	0.50 ( 0.50)	1.00	13772.4	10300.00
13	1754.31	109.39	0.522	0.50 ( 0.50)	1.00	13794.7	10320.00
14	1627.75	113.68	0.514	0.50 ( 0.50)	1.00	13903.3	10210.00
15	529.13	173.41	0.436	0.50 ( 0.50)	1.00	14771.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

**\*\* PEAK FLOW RATE TABLE \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3866.09	31.13	0.906	0.50 ( 0.50)	1.00	5669.7	10850.00
2	3853.92	31.88	0.897	0.50 ( 0.50)	1.00	5805.1	10800.00
3	3827.27	35.12	0.858	0.50 ( 0.50)	1.00	6502.5	10900.00
4	3776.51	38.17	0.820	0.50 ( 0.50)	1.00	7089.9	10830.00
5	3732.82	40.02	0.798	0.50 ( 0.50)	1.00	7402.3	10910.00
6	3719.23	40.46	0.794	0.50 ( 0.50)	1.00	7466.0	10630.00
7	3201.00	56.42	0.677	0.50 ( 0.50)	1.00	9939.5	10600.00
8	2951.73	67.37	0.631	0.50 ( 0.50)	1.00	11643.1	10500.00
9	2765.77	74.66	0.607	0.50 ( 0.50)	1.00	12684.8	10710.00
10	2713.58	76.37	0.601	0.50 ( 0.50)	1.00	12883.3	10410.00
11	2472.22	84.48	0.574	0.50 ( 0.50)	1.00	13707.4	10700.00
12	2266.04	91.66	0.553	0.50 ( 0.50)	1.00	14380.1	10400.00
13	2102.82	97.88	0.542	0.50 ( 0.50)	1.00	14870.5	10200.00
14	1810.77	108.88	0.523	0.50 ( 0.50)	1.00	15599.9	10300.00
15	1793.94	109.39	0.522	0.50 ( 0.50)	1.00	15622.1	10320.00
16	1653.43	113.68	0.514	0.50 ( 0.50)	1.00	15730.8	10210.00
17	529.13	173.41	0.436	0.50 ( 0.50)	1.00	16599.2	10100.00

TOTAL AREA (ACRES) = 16599.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3866.09 Tc (MIN.) = 31.126  
 EFFECTIVE AREA (ACRES) = 5669.74 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 16599.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10921.00 = 58287.07 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10921.00 TO NODE 11020.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 -----

ELEVATION DATA: UPSTREAM (FEET) = 961.06 DOWNSTREAM (FEET) = 939.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 601.65 CHANNEL SLOPE = 0.0356  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.898

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 18.29 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3869.36  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.04  
 AVERAGE FLOW DEPTH (FEET) = 9.26 TRAVEL TIME (MIN.) = 0.67  
 Tc (MIN.) = 31.79  
 SUBAREA AREA (ACRES) = 18.29 SUBAREA RUNOFF (CFS) = 6.55  
 EFFECTIVE AREA (ACRES) = 5688.03 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 16617.5 PEAK FLOW RATE (CFS) = 3866.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.26 FLOW VELOCITY (FEET/SEC.) = 15.04  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11003.00 TO NODE 11020.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<  
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**\*\* MAIN STREAM CONFLUENCE DATA \*\***

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3866.09	31.79	0.898	0.50 ( 0.50)	1.00	5688.0	10850.00
2	3853.92	32.54	0.889	0.50 ( 0.50)	1.00	5823.4	10800.00
3	3827.27	35.78	0.849	0.50 ( 0.50)	1.00	6520.8	10900.00
4	3776.51	38.84	0.812	0.50 ( 0.50)	1.00	7108.2	10830.00
5	3732.82	40.69	0.792	0.50 ( 0.50)	1.00	7420.6	10910.00
6	3719.23	41.13	0.789	0.50 ( 0.50)	1.00	7484.3	10630.00
7	3201.00	57.12	0.673	0.50 ( 0.50)	1.00	9957.8	10600.00
8	2951.73	68.08	0.629	0.50 ( 0.50)	1.00	11661.4	10500.00
9	2765.77	75.38	0.605	0.50 ( 0.50)	1.00	12703.1	10710.00
10	2713.58	77.10	0.599	0.50 ( 0.50)	1.00	12901.6	10410.00
11	2472.22	85.23	0.572	0.50 ( 0.50)	1.00	13725.7	10700.00
12	2266.04	92.42	0.552	0.50 ( 0.50)	1.00	14398.3	10400.00
13	2102.82	98.65	0.541	0.50 ( 0.50)	1.00	14888.8	10200.00
14	1810.77	109.68	0.521	0.50 ( 0.50)	1.00	15618.2	10300.00
15	1793.94	110.20	0.520	0.50 ( 0.50)	1.00	15640.4	10320.00
16	1653.43	114.50	0.513	0.50 ( 0.50)	1.00	15749.1	10210.00
17	529.13	174.50	0.435	0.50 ( 0.50)	1.00	16617.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	47.86	14.07	1.509	0.50 ( 0.50)	1.00	52.7	11000.00

LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11020.00 = 3251.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3913.94	14.07	1.509	0.50 ( 0.50)	1.00	2569.2	11000.00
2	3884.96	31.79	0.898	0.50 ( 0.50)	1.00	5740.7	10850.00
3	3872.36	32.54	0.889	0.50 ( 0.50)	1.00	5876.1	10800.00
4	3843.83	35.78	0.849	0.50 ( 0.50)	1.00	6573.5	10900.00
5	3791.30	38.84	0.812	0.50 ( 0.50)	1.00	7160.9	10830.00
6	3746.67	40.69	0.792	0.50 ( 0.50)	1.00	7473.3	10910.00
7	3732.90	41.13	0.789	0.50 ( 0.50)	1.00	7537.0	10630.00
8	3209.18	57.12	0.673	0.50 ( 0.50)	1.00	10010.4	10600.00
9	2957.84	68.08	0.629	0.50 ( 0.50)	1.00	11714.1	10500.00
10	2770.73	75.38	0.605	0.50 ( 0.50)	1.00	12755.8	10710.00
11	2718.26	77.10	0.599	0.50 ( 0.50)	1.00	12954.3	10410.00
12	2475.62	85.23	0.572	0.50 ( 0.50)	1.00	13778.4	10700.00
13	2268.48	92.42	0.552	0.50 ( 0.50)	1.00	14451.0	10400.00
14	2104.74	98.65	0.541	0.50 ( 0.50)	1.00	14941.5	10200.00
15	1811.77	109.68	0.521	0.50 ( 0.50)	1.00	15670.9	10300.00
16	1794.89	110.20	0.520	0.50 ( 0.50)	1.00	15693.1	10320.00
17	1654.02	114.50	0.513	0.50 ( 0.50)	1.00	15801.8	10210.00
18	529.13	174.50	0.435	0.50 ( 0.50)	1.00	16670.2	10100.00

TOTAL AREA (ACRES) = 16670.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 3913.94 Tc (MIN.) = 14.066  
EFFECTIVE AREA (ACRES) = 2569.17 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16670.2  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11020.00 = 58888.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11020.00 TO NODE 11021.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 939.63 DOWNSTREAM (FEET) = 865.22

CHANNEL LENGTH THRU SUBAREA (FEET) = 2876.19 CHANNEL SLOPE = 0.0259

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.294

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	191.02	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3982.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 13.44

AVERAGE FLOW DEPTH (FEET) = 9.94 TRAVEL TIME (MIN.) = 3.57

Tc (MIN.) = 17.63

SUBAREA AREA (ACRES) = 191.02 SUBAREA RUNOFF (CFS) = 136.52  
EFFECTIVE AREA (ACRES) = 2760.19 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16861.2 PEAK FLOW RATE (CFS) = 3913.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 9.88 FLOW VELOCITY (FEET/SEC.) = 13.38

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11021.00 = 61764.91 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11021.00 TO NODE 11022.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 865.22 DOWNSTREAM (FEET) = 752.60

CHANNEL LENGTH THRU SUBAREA (FEET) = 2892.47 CHANNEL SLOPE = 0.0389

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.178

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	320.06	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 4011.70

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.70

AVERAGE FLOW DEPTH (FEET) = 9.23 TRAVEL TIME (MIN.) = 3.07

Tc (MIN.) = 20.70

SUBAREA AREA (ACRES) = 320.06 SUBAREA RUNOFF (CFS) = 195.31

EFFECTIVE AREA (ACRES) = 3080.25 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 17181.2 PEAK FLOW RATE (CFS) = 3913.94

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 9.14 FLOW VELOCITY (FEET/SEC.) = 15.60

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11022.00 = 64657.38 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11022.00 TO NODE 11023.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 752.60 DOWNSTREAM (FEET) = 737.50

CHANNEL LENGTH THRU SUBAREA (FEET) = 1864.15 CHANNEL SLOPE = 0.0081

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.062

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	226.98	0.50	0.986	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.986

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3972.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.69  
 AVERAGE FLOW DEPTH(FEET) = 12.34 TRAVEL TIME(MIN.) = 3.57  
 Tc(MIN.) = 24.28  
 SUBAREA AREA(ACRES) = 226.98 SUBAREA RUNOFF(CFS) = 116.28  
 EFFECTIVE AREA(ACRES) = 3307.23 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 17408.2 PEAK FLOW RATE(CFS) = 3913.94  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.27 FLOW VELOCITY(FEET/SEC.) = 8.66  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11023.00 = 66521.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 737.50 DOWNSTREAM(FEET) = 678.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2632.50 CHANNEL SLOPE = 0.0222  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.974

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 124.84 0.50 0.992 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3940.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.67  
 AVERAGE FLOW DEPTH(FEET) = 10.18 TRAVEL TIME(MIN.) = 3.46  
 Tc(MIN.) = 27.74  
 SUBAREA AREA(ACRES) = 124.84 SUBAREA RUNOFF(CFS) = 53.66  
 EFFECTIVE AREA(ACRES) = 3432.07 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 17533.1 PEAK FLOW RATE(CFS) = 3913.94  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 10.16 FLOW VELOCITY(FEET/SEC.) = 12.64  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 17533.1 TC(MIN.) = 27.74  
 EFFECTIVE AREA(ACRES) = 3432.07 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.998  
 PEAK FLOW RATE(CFS) = 3913.94

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3913.94	27.74	0.974	0.50( 0.50)	1.00	3432.1	11000.00
2	3884.96	45.52	0.752	0.50( 0.50)	1.00	6603.6	10850.00
3	3872.36	46.28	0.745	0.50( 0.50)	1.00	6739.0	10800.00
4	3843.83	49.55	0.718	0.50( 0.50)	1.00	7436.4	10900.00

5	3791.30	52.66	0.699	0.50( 0.50)	1.00	8023.8	10830.00
6	3746.67	54.55	0.688	0.50( 0.50)	1.00	8336.2	10910.00
7	3732.90	55.01	0.685	0.50( 0.50)	1.00	8399.9	10630.00
8	3209.18	71.54	0.618	0.50( 0.50)	1.00	10873.3	10600.00
9	2957.84	82.80	0.580	0.50( 0.50)	1.00	12577.0	10500.00
10	2770.73	90.35	0.555	0.50( 0.50)	1.00	13618.7	10710.00
11	2718.26	92.13	0.552	0.50( 0.50)	1.00	13817.2	10410.00
12	2475.62	100.62	0.537	0.50( 0.50)	1.00	14641.3	10700.00
13	2268.48	108.15	0.524	0.50( 0.50)	1.00	15313.9	10400.00
14	2104.74	114.69	0.512	0.50( 0.50)	1.00	15804.4	10200.00
15	1811.77	126.33	0.495	0.50( 0.50)	1.00	16533.8	10300.00
16	1794.89	126.88	0.494	0.50( 0.50)	1.00	16556.0	10320.00
17	1654.02	131.54	0.489	0.50( 0.50)	1.00	16664.7	10210.00
18	529.13	197.15	0.418	0.50( 0.50)	1.00	17533.1	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S11.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.065
- 2) 10.00; 1.994
- 3) 15.00; 1.398
- 4) 20.00; 1.201
- 5) 25.00; 1.039
- 6) 30.00; 0.920
- 7) 40.00; 0.798
- 8) 50.00; 0.714
- 9) 60.00; 0.656
- 10) 90.00; 0.556
- 11) 120.00; 0.503
- 12) 180.00; 0.428
- 13) 360.00; 0.327
- 14) 1440.00; 0.147

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11101.00 TO NODE 11102.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 920.30  
ELEVATION DATA: UPSTREAM(FEET) = 4391.58 DOWNSTREAM(FEET) = 4080.28

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.444  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.583  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" - 2.68 0.50 1.000 0 13.44  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.61  
TOTAL AREA(ACRES) = 2.68 PEAK FLOW RATE(CFS) = 2.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11102.00 TO NODE 11103.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 4080.28 DOWNSTREAM(FEET) = 3876.52  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.85 CHANNEL SLOPE = 0.2123  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.366  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 39.96 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.24  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.73  
AVERAGE FLOW DEPTH(FEET) = 0.95 TRAVEL TIME(MIN.) = 2.38  
Tc(MIN.) = 15.82  
SUBAREA AREA(ACRES) = 39.96 SUBAREA RUNOFF(CFS) = 31.12  
EFFECTIVE AREA(ACRES) = 42.64 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 42.6 PEAK FLOW RATE(CFS) = 33.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 7.78  
LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11103.00 = 1880.15 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11103.00 TO NODE 11104.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3876.52 DOWNSTREAM(FEET) = 3625.86  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1902.80 CHANNEL SLOPE = 0.1317  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.199  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	75.64	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.46  
 AVERAGE FLOW DEPTH(FEET) = 1.60 TRAVEL TIME(MIN.) = 4.25  
 Tc(MIN.) = 20.07  
 SUBAREA AREA(ACRES) = 75.64 SUBAREA RUNOFF(CFS) = 47.54  
 EFFECTIVE AREA(ACRES) = 118.28 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 118.3 PEAK FLOW RATE(CFS) = 74.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.77 FLOW VELOCITY(FEET/SEC.) = 7.95  
 LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11104.00 = 3782.95 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11104.00 TO NODE 11105.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 3625.86 DOWNSTREAM(FEET) = 3222.66  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2898.91 CHANNEL SLOPE = 0.1391  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.030  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	167.73	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.54  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.09  
 AVERAGE FLOW DEPTH(FEET) = 2.05 TRAVEL TIME(MIN.) = 5.32  
 Tc(MIN.) = 25.39  
 SUBAREA AREA(ACRES) = 167.73 SUBAREA RUNOFF(CFS) = 79.94  
 EFFECTIVE AREA(ACRES) = 286.01 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 286.0 PEAK FLOW RATE(CFS) = 136.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.19 FLOW VELOCITY(FEET/SEC.) = 9.45  
 LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11105.00 = 6681.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 3222.66 DOWNSTREAM(FEET) = 2952.48  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2480.35 CHANNEL SLOPE = 0.1089  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.924  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	252.33	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 184.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.33  
 AVERAGE FLOW DEPTH(FEET) = 2.57 TRAVEL TIME(MIN.) = 4.43  
 Tc(MIN.) = 29.82  
 SUBAREA AREA(ACRES) = 252.33 SUBAREA RUNOFF(CFS) = 96.31  
 EFFECTIVE AREA(ACRES) = 538.34 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 538.3 PEAK FLOW RATE(CFS) = 205.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.68 FLOW VELOCITY(FEET/SEC.) = 9.57  
 LONGEST FLOWPATH FROM NODE 11101.00 TO NODE 11121.00 = 9162.21 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11105.00 TO NODE 11121.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 29.82  
 RAINFALL INTENSITY(INCH/HR) = 0.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 538.34  
 TOTAL STREAM AREA(ACRES) = 538.34  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 205.48

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11111.00 TO NODE 11112.00 IS CODE = 21

-----  
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 329.73  
 ELEVATION DATA: UPSTREAM(FEET) = 4094.14 DOWNSTREAM(FEET) = 3956.68

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.552  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.304  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						

"CHAPARRAL,BROADLEAF" - 1.49 0.50 1.000 0 8.55  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.42  
TOTAL AREA(ACRES) = 1.49 PEAK FLOW RATE(CFS) = 2.42

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11112.00 TO NODE 11113.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3956.68 DOWNSTREAM(FEET) = 3752.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 665.35 CHANNEL SLOPE = 0.3066  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.73  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.40  
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 1.73  
Tc(MIN.) = 10.29  
SUBAREA AREA(ACRES) = 9.55 SUBAREA RUNOFF(CFS) = 12.55  
EFFECTIVE AREA(ACRES) = 11.04 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 11.0 PEAK FLOW RATE(CFS) = 14.50

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.81 FLOW VELOCITY(FEET/SEC.) = 7.31  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11113.00 = 995.08 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11113.00 TO NODE 11114.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3752.68 DOWNSTREAM(FEET) = 3541.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 955.83 CHANNEL SLOPE = 0.2209  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.712  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.09	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.67  
AVERAGE FLOW DEPTH(FEET) = 1.12 TRAVEL TIME(MIN.) = 2.08  
Tc(MIN.) = 12.36  
SUBAREA AREA(ACRES) = 26.09 SUBAREA RUNOFF(CFS) = 28.46

EFFECTIVE AREA(ACRES) = 37.13 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 37.1 PEAK FLOW RATE(CFS) = 40.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.27 FLOW VELOCITY(FEET/SEC.) = 8.35  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11114.00 = 1950.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11114.00 TO NODE 11115.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3541.57 DOWNSTREAM(FEET) = 3320.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1889.90 CHANNEL SLOPE = 0.1172  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.330  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.22  
AVERAGE FLOW DEPTH(FEET) = 1.66 TRAVEL TIME(MIN.) = 4.36  
Tc(MIN.) = 16.72  
SUBAREA AREA(ACRES) = 51.13 SUBAREA RUNOFF(CFS) = 38.19  
EFFECTIVE AREA(ACRES) = 88.26 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 88.3 PEAK FLOW RATE(CFS) = 65.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.72 FLOW VELOCITY(FEET/SEC.) = 7.42  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11115.00 = 3840.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11115.00 TO NODE 11116.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3320.00 DOWNSTREAM(FEET) = 3162.36  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.45 CHANNEL SLOPE = 0.0837  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.174  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	193.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 124.92  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.66  
AVERAGE FLOW DEPTH(FEET) = 2.33 TRAVEL TIME(MIN.) = 4.10

Tc(MIN.) = 20.82  
SUBAREA AREA(ACRES) = 193.52 SUBAREA RUNOFF(CFS) = 117.42  
EFFECTIVE AREA(ACRES) = 281.78 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 281.8 PEAK FLOW RATE(CFS) = 170.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.62 FLOW VELOCITY(FEET/SEC.) = 8.29  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11116.00 = 5724.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11116.00 TO NODE 11117.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3162.36 DOWNSTREAM(FEET) = 3062.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1903.90 CHANNEL SLOPE = 0.0524  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.034

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.47	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 198.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.21  
AVERAGE FLOW DEPTH(FEET) = 3.03 TRAVEL TIME(MIN.) = 4.40  
Tc(MIN.) = 25.22  
SUBAREA AREA(ACRES) = 112.47 SUBAREA RUNOFF(CFS) = 54.00  
EFFECTIVE AREA(ACRES) = 394.25 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 394.2 PEAK FLOW RATE(CFS) = 189.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.97 FLOW VELOCITY(FEET/SEC.) = 7.14  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11117.00 = 7628.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3062.66 DOWNSTREAM(FEET) = 2952.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1878.40 CHANNEL SLOPE = 0.0587  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.935

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.63	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 199.40

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.53  
AVERAGE FLOW DEPTH(FEET) = 2.97 TRAVEL TIME(MIN.) = 4.16  
Tc(MIN.) = 29.38  
SUBAREA AREA(ACRES) = 51.63 SUBAREA RUNOFF(CFS) = 20.19  
EFFECTIVE AREA(ACRES) = 445.88 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 445.9 PEAK FLOW RATE(CFS) = 189.29  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.91 FLOW VELOCITY(FEET/SEC.) = 7.44  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11117.00 TO NODE 11121.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 29.38  
RAINFALL INTENSITY(INCH/HR) = 0.93  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 445.88  
TOTAL STREAM AREA(ACRES) = 445.88  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 189.29

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	205.48	29.82	0.924	0.50( 0.50)	1.00	538.3	11101.00
2	189.29	29.38	0.935	0.50( 0.50)	1.00	445.9	11111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.77	29.38	0.935	0.50( 0.50)	1.00	976.3	11111.00
2	390.22	29.82	0.924	0.50( 0.50)	1.00	984.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 394.77 Tc(MIN.) = 29.38  
EFFECTIVE AREA(ACRES) = 976.29 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 984.2  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11121.00 = 9506.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11121.00 TO NODE 11122.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2952.48 DOWNSTREAM(FEET) = 2639.37
CHANNEL LENGTH THRU SUBAREA(FEET) = 2687.92 CHANNEL SLOPE = 0.1165
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.881
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 170.98 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 424.09
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.76
AVERAGE FLOW DEPTH(FEET) = 3.47 TRAVEL TIME(MIN.) = 3.81
Tc(MIN.) = 33.19
SUBAREA AREA(ACRES) = 170.98 SUBAREA RUNOFF(CFS) = 58.61
EFFECTIVE AREA(ACRES) = 1147.27 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1155.2 PEAK FLOW RATE(CFS) = 394.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.38 FLOW VELOCITY(FEET/SEC.) = 11.55
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11122.00 = 12194.48 FEET.

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*****
FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2639.37 DOWNSTREAM(FEET) = 1954.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 3696.53 CHANNEL SLOPE = 0.1854
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.827
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 114.61 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 411.63
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.91
AVERAGE FLOW DEPTH(FEET) = 3.14 TRAVEL TIME(MIN.) = 4.43
Tc(MIN.) = 37.62
SUBAREA AREA(ACRES) = 114.61 SUBAREA RUNOFF(CFS) = 33.72
EFFECTIVE AREA(ACRES) = 1261.88 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1269.8 PEAK FLOW RATE(CFS) = 394.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 13.76
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

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*****
FLOW PROCESS FROM NODE 11122.00 TO NODE 11141.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 37.62
RAINFALL INTENSITY(INCH/HR) = 0.83
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 1261.88
TOTAL STREAM AREA(ACRES) = 1269.81
PEAK FLOW RATE(CFS) AT CONFLUENCE = 394.77

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*****
FLOW PROCESS FROM NODE 11130.00 TO NODE 11131.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 259.85
ELEVATION DATA: UPSTREAM(FEET) = 3923.93 DOWNSTREAM(FEET) = 3765.35

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.204
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.593
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" - 1.27 0.50 1.000 0 7.20
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 2.39
TOTAL AREA(ACRES) = 1.27 PEAK FLOW RATE(CFS) = 2.39

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*****
FLOW PROCESS FROM NODE 11131.00 TO NODE 11132.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3765.35 DOWNSTREAM(FEET) = 3414.86
CHANNEL LENGTH THRU SUBAREA(FEET) = 674.05 CHANNEL SLOPE = 0.5200
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.271
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 6.52 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.62
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.48
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 1.50
Tc(MIN.) = 8.71
SUBAREA AREA(ACRES) = 6.52 SUBAREA RUNOFF(CFS) = 10.39

```



EFFECTIVE AREA (ACRES) = 7.79 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 12.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.70 FLOW VELOCITY (FEET/SEC.) = 8.52  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11132.00 = 933.90 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11132.00 TO NODE 11133.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3414.86 DOWNSTREAM (FEET) = 2699.51  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1813.44 CHANNEL SLOPE = 0.3945  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.792

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	41.63	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 36.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.12  
AVERAGE FLOW DEPTH (FEET) = 1.10 TRAVEL TIME (MIN.) = 2.99  
Tc (MIN.) = 11.69

SUBAREA AREA (ACRES) = 41.63 SUBAREA RUNOFF (CFS) = 48.41  
EFFECTIVE AREA (ACRES) = 49.42 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 49.4 PEAK FLOW RATE (CFS) = 57.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.30 FLOW VELOCITY (FEET/SEC.) = 11.30  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11133.00 = 2747.34 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11133.00 TO NODE 11134.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2699.51 DOWNSTREAM (FEET) = 2464.06  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1053.33 CHANNEL SLOPE = 0.2235  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.604

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	142.85	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 128.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.13  
AVERAGE FLOW DEPTH (FEET) = 1.96 TRAVEL TIME (MIN.) = 1.58

Tc (MIN.) = 13.27  
SUBAREA AREA (ACRES) = 142.85 SUBAREA RUNOFF (CFS) = 141.92  
EFFECTIVE AREA (ACRES) = 192.27 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 192.3 PEAK FLOW RATE (CFS) = 191.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.28 FLOW VELOCITY (FEET/SEC.) = 12.29  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11134.00 = 3800.67 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2464.06 DOWNSTREAM (FEET) = 1954.20  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1291.98 CHANNEL SLOPE = 0.3946  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.438

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	24.58	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 201.39  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.43  
AVERAGE FLOW DEPTH (FEET) = 2.09 TRAVEL TIME (MIN.) = 1.40  
Tc (MIN.) = 14.67

SUBAREA AREA (ACRES) = 24.58 SUBAREA RUNOFF (CFS) = 20.74  
EFFECTIVE AREA (ACRES) = 216.85 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 216.9 PEAK FLOW RATE (CFS) = 191.02  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.04 FLOW VELOCITY (FEET/SEC.) = 15.27  
LONGEST FLOWPATH FROM NODE 11130.00 TO NODE 11141.00 = 5092.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11134.00 TO NODE 11141.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 14.67  
RAINFALL INTENSITY (INCH/HR) = 1.44  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 216.85  
TOTAL STREAM AREA (ACRES) = 216.85  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 191.02

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	394.77	37.62	0.827	0.50 ( 0.50)	1.00	1261.9	11111.00
1	390.30	38.08	0.821	0.50 ( 0.50)	1.00	1269.8	11101.00
2	191.02	14.67	1.438	0.50 ( 0.50)	1.00	216.9	11130.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	1.438	0.50 ( 0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.827	0.50 ( 0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.821	0.50 ( 0.50)	1.00	1486.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 585.79 Tc(MIN.) = 14.67  
EFFECTIVE AREA(ACRES) = 708.84 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1486.7  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11141.00 = 15891.01 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1486.7 TC(MIN.) = 14.67  
EFFECTIVE AREA(ACRES) = 708.84 AREA-AVERAGED Fm(INCH/HR)= 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 585.79

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	1.438	0.50 ( 0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.827	0.50 ( 0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.821	0.50 ( 0.50)	1.00	1486.7	11101.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S12.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.065
- 2) 10.00; 1.994
- 3) 15.00; 1.398
- 4) 20.00; 1.201
- 5) 25.00; 1.039
- 6) 30.00; 0.920
- 7) 40.00; 0.798
- 8) 50.00; 0.714
- 9) 60.00; 0.656
- 10) 90.00; 0.556
- 11) 120.00; 0.503
- 12) 180.00; 0.428
- 13) 360.00; 0.327
- 14) 1440.00; 0.147

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE	CROSSFALL / SIDE	STREET-FALL / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018	0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11220.00 TO NODE 11221.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 762.39  
ELEVATION DATA: UPSTREAM(FEET) = 3797.72 DOWNSTREAM(FEET) = 3296.86

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.919  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.885  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 5.02 0.50 1.000 0 10.92  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.25  
TOTAL AREA(ACRES) = 5.02 PEAK FLOW RATE(CFS) = 6.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11221.00 TO NODE 11223.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3296.86 DOWNSTREAM(FEET) = 2738.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 912.82 CHANNEL SLOPE = 0.6112  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.708  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 26.44 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.67  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.27  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 1.48  
Tc(MIN.) = 12.40  
SUBAREA AREA(ACRES) = 26.44 SUBAREA RUNOFF(CFS) = 28.74  
EFFECTIVE AREA(ACRES) = 31.46 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 31.5 PEAK FLOW RATE(CFS) = 34.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.99 FLOW VELOCITY(FEET/SEC.) = 11.70  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11223.00 = 1675.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11223.00 TO NODE 11224.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2738.96 DOWNSTREAM(FEET) = 2370.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 959.79 CHANNEL SLOPE = 0.3843  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.548

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.44	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.90  
AVERAGE FLOW DEPTH(FEET) = 1.43 TRAVEL TIME(MIN.) = 1.34  
Tc(MIN.) = 13.74  
SUBAREA AREA(ACRES) = 82.44 SUBAREA RUNOFF(CFS) = 77.71  
EFFECTIVE AREA(ACRES) = 113.90 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 113.9 PEAK FLOW RATE(CFS) = 107.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.65 FLOW VELOCITY(FEET/SEC.) = 13.10  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11224.00 = 2635.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2370.12 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.40 CHANNEL SLOPE = 0.2591  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.324

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.93	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 130.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.81  
AVERAGE FLOW DEPTH(FEET) = 1.92 TRAVEL TIME(MIN.) = 3.14  
Tc(MIN.) = 16.88  
SUBAREA AREA(ACRES) = 61.93 SUBAREA RUNOFF(CFS) = 45.91  
EFFECTIVE AREA(ACRES) = 175.83 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 175.8 PEAK FLOW RATE(CFS) = 130.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 11.81  
LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<

PEAK FLOWRATE TABLE FILE NAME: S11.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	0.50( 0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.50( 0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.50( 0.50)	1.00	1486.7	11101.00

TOTAL AREA(ACRES) = 1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11141.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	585.79	14.67	0.50( 0.50)	1.00	708.8	11130.00
2	461.37	37.62	0.50( 0.50)	1.00	1478.7	11111.00
3	455.75	38.08	0.50( 0.50)	1.00	1486.7	11101.00

TOTAL AREA(ACRES) = 1486.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11141.00 TO NODE 11231.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1954.20 DOWNSTREAM(FEET) = 1794.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1435.64 CHANNEL SLOPE = 0.1116  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.337

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	89.78	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 619.61  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.75  
AVERAGE FLOW DEPTH(FEET) = 4.03 TRAVEL TIME(MIN.) = 1.88  
Tc(MIN.) = 16.54  
SUBAREA AREA(ACRES) = 89.78 SUBAREA RUNOFF(CFS) = 67.63  
EFFECTIVE AREA(ACRES) = 798.62 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1576.4 PEAK FLOW RATE(CFS) = 601.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.99 FLOW VELOCITY(FEET/SEC.) = 12.63

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11224.00 TO NODE 11231.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	601.59	16.54	1.337	0.50( 0.50)	1.00	798.6	11130.00
2	461.37	39.63	0.803	0.50( 0.50)	1.00	1568.5	11111.00
3	455.75	40.09	0.797	0.50( 0.50)	1.00	1576.4	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	130.34	16.88	1.324	0.50( 0.50)	1.00	175.8	11220.00

LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11231.00 = 4858.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	731.39	16.54	1.337	0.50( 0.50)	1.00	970.9	11130.00
2	729.88	16.88	1.324	0.50( 0.50)	1.00	985.7	11220.00
3	509.21	39.63	0.803	0.50( 0.50)	1.00	1744.3	11111.00
4	502.75	40.09	0.797	0.50( 0.50)	1.00	1752.3	11101.00

TOTAL AREA (ACRES) = 1752.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 731.39 Tc(MIN.) = 16.544  
EFFECTIVE AREA(ACRES) = 970.93 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1752.3  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11231.00 = 17326.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1794.01 DOWNSTREAM(FEET) = 1680.94

CHANNEL LENGTH THRU SUBAREA(FEET) = 1933.84 CHANNEL SLOPE = 0.0585

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.216

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	59.78	0.50	1.000	-	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 750.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.48

AVERAGE FLOW DEPTH(FEET) = 4.89 TRAVEL TIME(MIN.) = 3.07

Tc(MIN.) = 19.62

SUBAREA AREA(ACRES) = 59.78 SUBAREA RUNOFF(CFS) = 38.51

EFFECTIVE AREA(ACRES) = 1030.71 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1812.1 PEAK FLOW RATE(CFS) = 731.39

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.84 FLOW VELOCITY(FEET/SEC.) = 10.41

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11231.00 TO NODE 11241.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 19.62

RAINFALL INTENSITY(INCH/HR) = 1.22

AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 1030.71

TOTAL STREAM AREA(ACRES) = 1812.05

PEAK FLOW RATE(CFS) AT CONFLUENCE = 731.39

\*\*\*\*\*

FLOW PROCESS FROM NODE 11201.00 TO NODE 11202.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 986.34

ELEVATION DATA: UPSTREAM(FEET) = 3383.22 DOWNSTREAM(FEET) = 3248.87

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.343

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.834

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
PUBLIC PARK	-	8.54	0.50	1.000	0	11.34

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 10.25

TOTAL AREA(ACRES) = 8.54 PEAK FLOW RATE(CFS) = 10.25

\*\*\*\*\*

FLOW PROCESS FROM NODE 11202.00 TO NODE 11203.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3248.87 DOWNSTREAM(FEET) = 3198.08

CHANNEL LENGTH THRU SUBAREA(FEET) = 922.69 CHANNEL SLOPE = 0.0550

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.396  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 24.42 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.30  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.15  
 AVERAGE FLOW DEPTH (FEET) = 1.28 TRAVEL TIME (MIN.) = 3.71  
 Tc (MIN.) = 15.05  
 SUBAREA AREA (ACRES) = 24.42 SUBAREA RUNOFF (CFS) = 19.69  
 EFFECTIVE AREA (ACRES) = 32.96 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 33.0 PEAK FLOW RATE (CFS) = 26.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.41 FLOW VELOCITY (FEET/SEC.) = 4.46  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11203.00 = 1909.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11203.00 TO NODE 11204.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3198.08 DOWNSTREAM (FEET) = 3062.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1941.08 CHANNEL SLOPE = 0.0699  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.164  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.67 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 37.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.30  
 AVERAGE FLOW DEPTH (FEET) = 1.54 TRAVEL TIME (MIN.) = 6.10  
 Tc (MIN.) = 21.15  
 SUBAREA AREA (ACRES) = 37.67 SUBAREA RUNOFF (CFS) = 22.49  
 EFFECTIVE AREA (ACRES) = 70.63 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 70.6 PEAK FLOW RATE (CFS) = 42.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.61 FLOW VELOCITY (FEET/SEC.) = 5.46  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11204.00 = 3850.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3062.48 DOWNSTREAM (FEET) = 2940.56  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1916.73 CHANNEL SLOPE = 0.0636

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.992  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 34.87 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 49.92  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.48  
 AVERAGE FLOW DEPTH (FEET) = 1.74 TRAVEL TIME (MIN.) = 5.83  
 Tc (MIN.) = 26.98  
 SUBAREA AREA (ACRES) = 34.87 SUBAREA RUNOFF (CFS) = 15.43  
 EFFECTIVE AREA (ACRES) = 105.50 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 105.5 PEAK FLOW RATE (CFS) = 46.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.70 FLOW VELOCITY (FEET/SEC.) = 5.41  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11205.00 = 5766.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11205.00 TO NODE 11206.00 IS CODE = 51

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 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2940.56 DOWNSTREAM (FEET) = 2581.93  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2865.58 CHANNEL SLOPE = 0.1252  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.877  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 56.17 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 56.23  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.28  
 AVERAGE FLOW DEPTH (FEET) = 1.61 TRAVEL TIME (MIN.) = 6.56  
 Tc (MIN.) = 33.54  
 SUBAREA AREA (ACRES) = 56.17 SUBAREA RUNOFF (CFS) = 19.04  
 EFFECTIVE AREA (ACRES) = 161.67 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 161.7 PEAK FLOW RATE (CFS) = 54.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.59 FLOW VELOCITY (FEET/SEC.) = 7.23  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11206.00 = 8632.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11206.00 TO NODE 11207.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2581.93 DOWNSTREAM(FEET) = 2317.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1985.44 CHANNEL SLOPE = 0.1333  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.834  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 546.87 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 137.04  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.36  
 AVERAGE FLOW DEPTH(FEET) = 2.21 TRAVEL TIME(MIN.) = 3.54  
 Tc(MIN.) = 37.08  
 SUBAREA AREA(ACRES) = 546.87 SUBAREA RUNOFF(CFS) = 164.10  
 EFFECTIVE AREA(ACRES) = 708.54 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 708.5 PEAK FLOW RATE(CFS) = 212.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.61 FLOW VELOCITY(FEET/SEC.) = 10.43  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11207.00 = 10617.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 2317.20 DOWNSTREAM(FEET) = 1680.94  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 4085.95 CHANNEL SLOPE = 0.1557  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.773  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 389.75 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 260.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.62  
 AVERAGE FLOW DEPTH(FEET) = 2.73 TRAVEL TIME(MIN.) = 5.86  
 Tc(MIN.) = 42.94  
 SUBAREA AREA(ACRES) = 389.75 SUBAREA RUNOFF(CFS) = 95.79  
 EFFECTIVE AREA(ACRES) = 1098.29 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 1098.3 PEAK FLOW RATE(CFS) = 269.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 11.71  
 LONGEST FLOWPATH FROM NODE 11201.00 TO NODE 11241.00 = 14703.81 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11207.00 TO NODE 11241.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 -----

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 42.94  
 RAINFALL INTENSITY(INCH/HR) = 0.77  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1098.29  
 TOTAL STREAM AREA(ACRES) = 1098.29  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 269.93

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	731.39	19.62	1.216	0.50( 0.50)	1.00	1030.7	11130.00
1	729.88	19.96	1.203	0.50( 0.50)	1.00	1045.5	11220.00
1	509.21	43.00	0.773	0.50( 0.50)	1.00	1804.1	11111.00
1	502.75	43.48	0.769	0.50( 0.50)	1.00	1812.1	11101.00
2	269.93	42.94	0.773	0.50( 0.50)	1.00	1098.3	11201.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1001.32	19.62	1.216	0.50( 0.50)	1.00	1532.5	11130.00
2	999.81	19.96	1.203	0.50( 0.50)	1.00	1555.9	11220.00
3	779.74	42.94	0.773	0.50( 0.50)	1.00	2900.4	11201.00
4	778.63	43.00	0.773	0.50( 0.50)	1.00	2902.4	11111.00
5	768.24	43.48	0.769	0.50( 0.50)	1.00	2910.3	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1001.32 Tc(MIN.) = 19.62  
 EFFECTIVE AREA(ACRES) = 1532.48 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 2910.3  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11241.00 = 19260.49 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11241.00 TO NODE 11242.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 -----

ELEVATION DATA: UPSTREAM(FEET) = 1680.94 DOWNSTREAM(FEET) = 1521.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1795.61 CHANNEL SLOPE = 0.0890  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.141  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 198.62 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1058.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.37  
 AVERAGE FLOW DEPTH(FEET) = 5.14 TRAVEL TIME(MIN.) = 2.24  
 Tc(MIN.) = 21.86  
 SUBAREA AREA(ACRES) = 198.62 SUBAREA RUNOFF(CFS) = 114.52  
 EFFECTIVE AREA(ACRES) = 1731.10 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3109.0 PEAK FLOW RATE(CFS) = 1001.32  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.03 FLOW VELOCITY(FEET/SEC.) = 13.19  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11242.00 = 21056.10 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1521.21 DOWNSTREAM(FEET) = 1343.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2223.33 CHANNEL SLOPE = 0.0797  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.047

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	95.39	0.50	1.000	-	12.11

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1024.78  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.74  
 AVERAGE FLOW DEPTH(FEET) = 5.18 TRAVEL TIME(MIN.) = 2.91  
 Tc(MIN.) = 24.76  
 SUBAREA AREA(ACRES) = 95.39 SUBAREA RUNOFF(CFS) = 46.91  
 EFFECTIVE AREA(ACRES) = 1826.49 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 3204.3 PEAK FLOW RATE(CFS) = 1001.32  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.14 FLOW VELOCITY(FEET/SEC.) = 12.65  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11242.00 TO NODE 11261.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.76  
 RAINFALL INTENSITY(INCH/HR) = 1.05  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 1826.49

TOTAL STREAM AREA(ACRES) = 3204.35  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1001.32

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11250.00 TO NODE 11251.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 982.50  
 ELEVATION DATA: UPSTREAM(FEET) = 3806.44 DOWNSTREAM(FEET) = 3168.25

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.112  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.742  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	-	5.91	0.50	1.000	0	12.11

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 6.61  
 TOTAL AREA(ACRES) = 5.91 PEAK FLOW RATE(CFS) = 6.61

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11251.00 TO NODE 11252.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3168.25 DOWNSTREAM(FEET) = 2683.24  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 925.62 CHANNEL SLOPE = 0.5240  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.530

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
USER-DEFINED	-	13.73	0.50	1.000	-	13.89

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.67  
 AVERAGE FLOW DEPTH(FEET) = 0.71 TRAVEL TIME(MIN.) = 1.78  
 Tc(MIN.) = 13.89  
 SUBAREA AREA(ACRES) = 13.73 SUBAREA RUNOFF(CFS) = 12.73  
 EFFECTIVE AREA(ACRES) = 19.64 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 19.6 PEAK FLOW RATE(CFS) = 18.21

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 9.39  
 LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11252.00 = 1908.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11252.00 TO NODE 11253.00 IS CODE = 51



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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2683.24 DOWNSTREAM(FEET) = 2334.26
CHANNEL LENGTH THRU SUBAREA(FEET) = 944.66 CHANNEL SLOPE = 0.3694
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.380
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 55.67 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.28
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.07
AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 1.56
Tc(MIN.) = 15.46
SUBAREA AREA(ACRES) = 55.67 SUBAREA RUNOFF(CFS) = 44.08
EFFECTIVE AREA(ACRES) = 75.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 75.3 PEAK FLOW RATE(CFS) = 59.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.34 FLOW VELOCITY(FEET/SEC.) = 11.10
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11253.00 = 2852.78 FEET.

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FLOW PROCESS FROM NODE 11253.00 TO NODE 11254.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2334.26 DOWNSTREAM(FEET) = 1768.11
CHANNEL LENGTH THRU SUBAREA(FEET) = 2293.59 CHANNEL SLOPE = 0.2468
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.246
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 165.43 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 115.39
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.25
AVERAGE FLOW DEPTH(FEET) = 1.85 TRAVEL TIME(MIN.) = 3.40
Tc(MIN.) = 18.85
SUBAREA AREA(ACRES) = 165.43 SUBAREA RUNOFF(CFS) = 111.06
EFFECTIVE AREA(ACRES) = 240.74 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 240.7 PEAK FLOW RATE(CFS) = 161.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.10 FLOW VELOCITY(FEET/SEC.) = 12.27
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11254.00 = 5146.37 FEET.

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FLOW PROCESS FROM NODE 11254.00 TO NODE 11255.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1768.11 DOWNSTREAM(FEET) = 1506.97
CHANNEL LENGTH THRU SUBAREA(FEET) = 1897.59 CHANNEL SLOPE = 0.1376
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.142
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 194.55 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 217.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.63
AVERAGE FLOW DEPTH(FEET) = 2.61 TRAVEL TIME(MIN.) = 2.98
Tc(MIN.) = 21.83
SUBAREA AREA(ACRES) = 194.55 SUBAREA RUNOFF(CFS) = 112.33
EFFECTIVE AREA(ACRES) = 435.29 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 435.3 PEAK FLOW RATE(CFS) = 251.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.76 FLOW VELOCITY(FEET/SEC.) = 11.01
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11255.00 = 7043.96 FEET.

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FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1506.97 DOWNSTREAM(FEET) = 1343.95
CHANNEL LENGTH THRU SUBAREA(FEET) = 882.10 CHANNEL SLOPE = 0.1848
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.104
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 137.86 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 288.80
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.72
AVERAGE FLOW DEPTH(FEET) = 2.75 TRAVEL TIME(MIN.) = 1.16
Tc(MIN.) = 22.99
SUBAREA AREA(ACRES) = 137.86 SUBAREA RUNOFF(CFS) = 74.95
EFFECTIVE AREA(ACRES) = 573.15 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 573.1 PEAK FLOW RATE(CFS) = 311.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.83 FLOW VELOCITY(FEET/SEC.) = 12.94
LONGEST FLOWPATH FROM NODE 11250.00 TO NODE 11261.00 = 7926.06 FEET.

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FLOW PROCESS FROM NODE 11255.00 TO NODE 11261.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 22.99
RAINFALL INTENSITY(INCH/HR) = 1.10
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 573.15
TOTAL STREAM AREA(ACRES) = 573.15
PEAK FLOW RATE(CFS) AT CONFLUENCE = 311.60

\*\* CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 8 rows of data.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 6 rows of data.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1312.92 Tc(MIN.) = 22.99
EFFECTIVE AREA(ACRES) = 2268.42 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3777.5
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11261.00 = 23279.43 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1343.95 DOWNSTREAM(FEET) = 1299.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 889.38 CHANNEL SLOPE = 0.0503
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.062

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 79.65 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1333.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.45
AVERAGE FLOW DEPTH(FEET) = 6.23 TRAVEL TIME(MIN.) = 1.29
Tc(MIN.) = 24.28
SUBAREA AREA(ACRES) = 79.65 SUBAREA RUNOFF(CFS) = 40.29
EFFECTIVE AREA(ACRES) = 2348.07 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3857.1 PEAK FLOW RATE(CFS) = 1312.92
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.20 FLOW VELOCITY(FEET/SEC.) = 11.39
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11310.00 = 24168.81 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3857.1 TC(MIN.) = 24.28
EFFECTIVE AREA(ACRES) = 2348.07 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000
PEAK FLOW RATE(CFS) = 1312.92

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 6 rows of data.

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S13.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.065
- 2) 10.00; 1.994
- 3) 15.00; 1.398
- 4) 20.00; 1.201
- 5) 25.00; 1.039
- 6) 30.00; 0.920
- 7) 40.00; 0.798
- 8) 50.00; 0.714
- 9) 60.00; 0.656
- 10) 90.00; 0.556
- 11) 120.00; 0.503
- 12) 180.00; 0.428
- 13) 360.00; 0.327
- 14) 1440.00; 0.147

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11300.00 TO NODE 11301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 455.90  
ELEVATION DATA: UPSTREAM(FEET) = 3394.67 DOWNSTREAM(FEET) = 3247.06

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.240  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.965

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.53 0.50 1.000 0 10.24  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.34  
TOTAL AREA (ACRES) = 2.53 PEAK FLOW RATE (CFS) = 3.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.00 TO NODE 11301.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3247.06 DOWNSTREAM(FEET) = 3150.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 468.69 CHANNEL SLOPE = 0.2059  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.801

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN

USER-DEFINED - 10.95 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.66  
AVERAGE FLOW DEPTH(FEET) = 0.76 TRAVEL TIME(MIN.) = 1.38  
Tc(MIN.) = 11.62

SUBAREA AREA (ACRES) = 10.95 SUBAREA RUNOFF (CFS) = 12.82  
EFFECTIVE AREA (ACRES) = 13.48 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 13.5 PEAK FLOW RATE (CFS) = 15.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 6.42  
LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11301.50 = 924.59 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11301.50 TO NODE 11302.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3150.57 DOWNSTREAM(FEET) = 2840.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 982.20 CHANNEL SLOPE = 0.3162  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.557

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.59	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.36

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.01

AVERAGE FLOW DEPTH(FEET) = 0.92 TRAVEL TIME(MIN.) = 2.04

Tc(MIN.) = 13.66

SUBAREA AREA(ACRES) = 9.59 SUBAREA RUNOFF(CFS) = 9.12

EFFECTIVE AREA(ACRES) = 23.07 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 23.1 PEAK FLOW RATE(CFS) = 21.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 8.13

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11302.00 = 1906.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11302.00 TO NODE 11303.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.04 DOWNSTREAM(FEET) = 2177.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.03 CHANNEL SLOPE = 0.3460  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.331

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.31	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.64

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.55

AVERAGE FLOW DEPTH(FEET) = 1.30 TRAVEL TIME(MIN.) = 3.03

Tc(MIN.) = 16.69

SUBAREA AREA(ACRES) = 84.31 SUBAREA RUNOFF(CFS) = 63.07

EFFECTIVE AREA(ACRES) = 107.38 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.4 PEAK FLOW RATE(CFS) = 80.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.51 FLOW VELOCITY(FEET/SEC.) = 11.69

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11303.00 = 3822.82 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11303.00 TO NODE 11304.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2177.16 DOWNSTREAM(FEET) = 1612.27  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2472.34 CHANNEL SLOPE = 0.2285  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.185

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	99.61	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.83

AVERAGE FLOW DEPTH(FEET) = 1.85 TRAVEL TIME(MIN.) = 3.80

Tc(MIN.) = 20.49

SUBAREA AREA(ACRES) = 99.61 SUBAREA RUNOFF(CFS) = 61.39

EFFECTIVE AREA(ACRES) = 206.99 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.0 PEAK FLOW RATE(CFS) = 127.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.95 FLOW VELOCITY(FEET/SEC.) = 11.20

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11304.00 = 6295.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1612.27 DOWNSTREAM(FEET) = 1222.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2432.96 CHANNEL SLOPE = 0.1604  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.054

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.86	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 141.03

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.06

AVERAGE FLOW DEPTH(FEET) = 2.16 TRAVEL TIME(MIN.) = 4.03

Tc(MIN.) = 24.53

SUBAREA AREA(ACRES) = 53.86 SUBAREA RUNOFF(CFS) = 26.86

EFFECTIVE AREA(ACRES) = 260.85 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 260.8 PEAK FLOW RATE(CFS) = 130.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.10 FLOW VELOCITY(FEET/SEC.) = 9.88

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 10

=====  
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S12.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1312.92	24.28	0.50 ( 0.50)	1.00	2348.1	11250.00
2	1283.18	26.07	0.50 ( 0.50)	1.00	2479.3	11130.00
3	1276.43	26.41	0.50 ( 0.50)	1.00	2502.7	11220.00
4	896.76	49.87	0.50 ( 0.50)	1.00	3847.2	11201.00
5	895.37	49.94	0.50 ( 0.50)	1.00	3849.2	11111.00
6	882.85	50.43	0.50 ( 0.50)	1.00	3857.1	11101.00

TOTAL AREA (ACRES) = 3857.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11261.00 TO NODE 11310.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1312.92	24.28	0.50 ( 0.50)	1.00	2348.1	11250.00
2	1283.18	26.07	0.50 ( 0.50)	1.00	2479.3	11130.00
3	1276.43	26.41	0.50 ( 0.50)	1.00	2502.7	11220.00
4	896.76	49.87	0.50 ( 0.50)	1.00	3847.2	11201.00
5	895.37	49.94	0.50 ( 0.50)	1.00	3849.2	11111.00
6	882.85	50.43	0.50 ( 0.50)	1.00	3857.1	11101.00

TOTAL AREA (ACRES) = 3857.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11310.00 TO NODE 11320.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 1299.17 DOWNSTREAM (FEET) = 1222.10

CHANNEL LENGTH THRU SUBAREA (FEET) = 1694.05 CHANNEL SLOPE = 0.0455

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.995

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.22	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1331.45

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.02

AVERAGE FLOW DEPTH (FEET) = 6.34 TRAVEL TIME (MIN.) = 2.56

Tc (MIN.) = 26.84

SUBAREA AREA (ACRES) = 83.22 SUBAREA RUNOFF (CFS) = 37.07

EFFECTIVE AREA (ACRES) = 2431.29 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 3940.4 PEAK FLOW RATE (CFS) = 1312.92

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 6.31 FLOW VELOCITY (FEET/SEC.) = 10.98

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11304.00 TO NODE 11320.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1312.92	26.84	0.995	0.50 ( 0.50)	1.00	2431.3	11250.00
2	1283.18	28.65	0.952	0.50 ( 0.50)	1.00	2562.5	11130.00
3	1276.43	28.99	0.944	0.50 ( 0.50)	1.00	2585.9	11220.00
4	896.76	52.70	0.698	0.50 ( 0.50)	1.00	3930.4	11201.00
5	895.37	52.76	0.698	0.50 ( 0.50)	1.00	3932.4	11111.00
6	882.85	53.27	0.695	0.50 ( 0.50)	1.00	3940.4	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	130.10	24.53	1.054	0.50 ( 0.50)	1.00	260.8	11300.00

LONGEST FLOWPATH FROM NODE 11300.00 TO NODE 11320.00 = 8728.12 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1443.01	24.53	1.054	0.50 ( 0.50)	1.00	2482.4	11300.00
2	1429.12	26.84	0.995	0.50 ( 0.50)	1.00	2692.1	11250.00
3	1389.30	28.65	0.952	0.50 ( 0.50)	1.00	2823.4	11130.00
4	1380.62	28.99	0.944	0.50 ( 0.50)	1.00	2846.8	11220.00
5	943.28	52.70	0.698	0.50 ( 0.50)	1.00	4191.3	11201.00
6	941.80	52.76	0.698	0.50 ( 0.50)	1.00	4193.3	11111.00
7	928.59	53.27	0.695	0.50 ( 0.50)	1.00	4201.2	11101.00

TOTAL AREA (ACRES) = 4201.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1443.01 Tc (MIN.) = 24.526

EFFECTIVE AREA (ACRES) = 2482.41 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 4201.2

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11320.00 = 25862.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 1222.10  DOWNSTREAM(FEET) = 1092.58
CHANNEL LENGTH THRU SUBAREA(FEET) = 3157.19  CHANNEL SLOPE = 0.0410
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.936
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA      Fp      Ap      SCS
LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED      -      328.55   0.50     1.000     -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1507.48
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.93
AVERAGE FLOW DEPTH(FEET) = 6.78  TRAVEL TIME(MIN.) = 4.81
Tc(MIN.) = 29.34
SUBAREA AREA(ACRES) = 328.55      SUBAREA RUNOFF(CFS) = 128.78
EFFECTIVE AREA(ACRES) = 2810.96   AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 4529.8       PEAK FLOW RATE(CFS) = 1443.01
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.67  FLOW VELOCITY(FEET/SEC.) = 10.81
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

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FLOW PROCESS FROM NODE 11320.00 TO NODE 11340.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 29.34
RAINFALL INTENSITY(INCH/HR) = 0.94
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 2810.96
TOTAL STREAM AREA(ACRES) = 4529.77
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1443.01

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*****
FLOW PROCESS FROM NODE 11330.00 TO NODE 11331.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 299.83
ELEVATION DATA: UPSTREAM(FEET) = 3270.16  DOWNSTREAM(FEET) = 3123.64

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.975
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.428
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA      Fp      Ap      SCS  Tc
LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
NATURAL FAIR COVER

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"CHAPARRAL,NARROWLEAF" - 1.69 0.50 1.000 0 7.98
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 2.93
TOTAL AREA(ACRES) = 1.69  PEAK FLOW RATE(CFS) = 2.93

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*****
FLOW PROCESS FROM NODE 11331.00 TO NODE 11332.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 3123.64  DOWNSTREAM(FEET) = 2903.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 710.41  CHANNEL SLOPE = 0.3104
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.012
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA      Fp      Ap      SCS
LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED      -      5.82     0.50     1.000     -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.92
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.10
AVERAGE FLOW DEPTH(FEET) = 0.62  TRAVEL TIME(MIN.) = 1.94
Tc(MIN.) = 9.92
SUBAREA AREA(ACRES) = 5.82      SUBAREA RUNOFF(CFS) = 7.92
EFFECTIVE AREA(ACRES) = 7.51   AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 7.5       PEAK FLOW RATE(CFS) = 10.22

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.71  FLOW VELOCITY(FEET/SEC.) = 6.71
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11332.00 = 1010.24 FEET.

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*****
FLOW PROCESS FROM NODE 11332.00 TO NODE 11333.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 2903.10  DOWNSTREAM(FEET) = 2718.89
CHANNEL LENGTH THRU SUBAREA(FEET) = 843.93  CHANNEL SLOPE = 0.2183
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.746
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/  SCS SOIL  AREA      Fp      Ap      SCS
LAND USE          GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED      -      9.66     0.50     1.000     -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.65
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.51
AVERAGE FLOW DEPTH(FEET) = 0.90  TRAVEL TIME(MIN.) = 2.16
Tc(MIN.) = 12.08
SUBAREA AREA(ACRES) = 9.66      SUBAREA RUNOFF(CFS) = 10.83

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EFFECTIVE AREA (ACRES) = 17.17 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 17.2 PEAK FLOW RATE (CFS) = 19.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.97 FLOW VELOCITY (FEET/SEC.) = 6.88  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11333.00 = 1854.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11333.00 TO NODE 11334.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	2718.89	DOWNSTREAM (FEET) =	2364.84
CHANNEL LENGTH THRU SUBAREA (FEET) =	1084.60	CHANNEL SLOPE =	0.3264
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	1.493		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.67	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 24.47

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.50

AVERAGE FLOW DEPTH (FEET) = 0.98 TRAVEL TIME (MIN.) = 2.13

Tc (MIN.) = 14.20

SUBAREA AREA (ACRES) = 11.67 SUBAREA RUNOFF (CFS) = 10.43

EFFECTIVE AREA (ACRES) = 28.84 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 28.8 PEAK FLOW RATE (CFS) = 25.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.00 FLOW VELOCITY (FEET/SEC.) = 8.65  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11334.00 = 2938.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11334.00 TO NODE 11335.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	2364.84	DOWNSTREAM (FEET) =	1729.46
CHANNEL LENGTH THRU SUBAREA (FEET) =	1963.08	CHANNEL SLOPE =	0.3237
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	1.309		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	102.74	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 63.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.76

AVERAGE FLOW DEPTH (FEET) = 1.40 TRAVEL TIME (MIN.) = 3.04

Tc (MIN.) = 17.25  
SUBAREA AREA (ACRES) = 102.74 SUBAREA RUNOFF (CFS) = 74.83  
EFFECTIVE AREA (ACRES) = 131.58 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 131.6 PEAK FLOW RATE (CFS) = 95.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.64 FLOW VELOCITY (FEET/SEC.) = 11.91  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11335.00 = 4901.85 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	1729.46	DOWNSTREAM (FEET) =	1092.58
CHANNEL LENGTH THRU SUBAREA (FEET) =	2702.07	CHANNEL SLOPE =	0.2357
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	1.161		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.38	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 122.75

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.28

AVERAGE FLOW DEPTH (FEET) = 1.90 TRAVEL TIME (MIN.) = 3.99

Tc (MIN.) = 21.24

SUBAREA AREA (ACRES) = 90.38 SUBAREA RUNOFF (CFS) = 53.74

EFFECTIVE AREA (ACRES) = 221.96 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 222.0 PEAK FLOW RATE (CFS) = 131.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 11.48  
LONGEST FLOWPATH FROM NODE 11330.00 TO NODE 11340.00 = 7603.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11335.00 TO NODE 11340.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS =	2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:	
TIME OF CONCENTRATION (MIN.) =	21.24
RAINFALL INTENSITY (INCH/HR) =	1.16
AREA-AVERAGED Fm (INCH/HR) =	0.50
AREA-AVERAGED Fp (INCH/HR) =	0.50
AREA-AVERAGED Ap =	1.00
EFFECTIVE STREAM AREA (ACRES) =	221.96
TOTAL STREAM AREA (ACRES) =	221.96
PEAK FLOW RATE (CFS) AT CONFLUENCE =	131.98

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1443.01	29.34	0.936	0.50( 0.50)	1.00	2811.0	11300.00
1	1429.12	31.67	0.900	0.50( 0.50)	1.00	3020.7	11250.00
1	1389.30	33.51	0.877	0.50( 0.50)	1.00	3151.9	11130.00
1	1380.62	33.86	0.873	0.50( 0.50)	1.00	3175.3	11220.00
1	943.28	58.07	0.667	0.50( 0.50)	1.00	4519.8	11201.00
1	941.80	58.15	0.667	0.50( 0.50)	1.00	4521.8	11111.00
1	928.59	58.67	0.664	0.50( 0.50)	1.00	4529.8	11101.00
2	131.98	21.24	1.161	0.50( 0.50)	1.00	222.0	11330.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1574.99	21.24	1.161	0.50( 0.50)	1.00	2256.8	11330.00
2	1530.02	29.34	0.936	0.50( 0.50)	1.00	3032.9	11300.00
3	1508.91	31.67	0.900	0.50( 0.50)	1.00	3242.6	11250.00
4	1464.61	33.51	0.877	0.50( 0.50)	1.00	3373.9	11130.00
5	1455.07	33.86	0.873	0.50( 0.50)	1.00	3397.3	11220.00
6	976.63	58.07	0.667	0.50( 0.50)	1.00	4741.8	11201.00
7	975.08	58.15	0.667	0.50( 0.50)	1.00	4743.8	11111.00
8	961.25	58.67	0.664	0.50( 0.50)	1.00	4751.7	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1574.99 Tc(MIN.) = 21.24  
EFFECTIVE AREA(ACRES) = 2256.80 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4751.7  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11340.00 = 29020.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11340.00 TO NODE 11341.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1092.58 DOWNSTREAM(FEET) = 1055.49  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.69 CHANNEL SLOPE = 0.0259  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.078  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1589.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.32  
AVERAGE FLOW DEPTH(FEET) = 7.54 TRAVEL TIME(MIN.) = 2.56  
Tc(MIN.) = 23.80  
SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 28.36  
EFFECTIVE AREA(ACRES) = 2311.35 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4806.3 PEAK FLOW RATE(CFS) = 1574.99

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.51 FLOW VELOCITY(FEET/SEC.) = 9.30  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11341.00 = 30452.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11341.00 TO NODE 11342.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1055.49 DOWNSTREAM(FEET) = 1017.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.89 CHANNEL SLOPE = 0.0406  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.034  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	119.96	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1603.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.06  
AVERAGE FLOW DEPTH(FEET) = 6.95 TRAVEL TIME(MIN.) = 1.42  
Tc(MIN.) = 25.22  
SUBAREA AREA(ACRES) = 119.96 SUBAREA RUNOFF(CFS) = 57.59  
EFFECTIVE AREA(ACRES) = 2431.31 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4926.2 PEAK FLOW RATE(CFS) = 1574.99  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 6.91 FLOW VELOCITY(FEET/SEC.) = 11.00  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11342.00 = 31396.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1017.16 DOWNSTREAM(FEET) = 957.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1557.63 CHANNEL SLOPE = 0.0383  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	85.25	0.50	0.990	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.990  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1593.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.80  
AVERAGE FLOW DEPTH(FEET) = 7.01 TRAVEL TIME(MIN.) = 2.40  
Tc(MIN.) = 27.63



SUBAREA AREA (ACRES) = 85.25 SUBAREA RUNOFF (CFS) = 36.92  
EFFECTIVE AREA (ACRES) = 2516.56 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 5011.5 PEAK FLOW RATE (CFS) = 1574.99  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 6.98 FLOW VELOCITY (FEET/SEC.) = 10.76  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11342.00 TO NODE 11360.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
-----

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 27.63  
RAINFALL INTENSITY (INCH/HR) = 0.98  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 2516.56  
TOTAL STREAM AREA (ACRES) = 5011.49  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 1574.99

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11350.00 TO NODE 11351.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----

INITIAL SUBAREA FLOW-LENGTH (FEET) = 950.54  
ELEVATION DATA: UPSTREAM (FEET) = 2805.98 DOWNSTREAM (FEET) = 2583.16

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 14.655  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.439  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" - 5.40 0.50 1.000 0 14.66  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 4.56  
TOTAL AREA (ACRES) = 5.40 PEAK FLOW RATE (CFS) = 4.56

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11351.00 TO NODE 11352.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 2583.16 DOWNSTREAM (FEET) = 2403.73  
CHANNEL LENGTH THRU SUBAREA (FEET) = 956.57 CHANNEL SLOPE = 0.1876  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.298  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 15.56 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 10.16  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.53  
AVERAGE FLOW DEPTH (FEET) = 0.78 TRAVEL TIME (MIN.) = 2.88  
Tc (MIN.) = 17.54  
SUBAREA AREA (ACRES) = 15.56 SUBAREA RUNOFF (CFS) = 11.17  
EFFECTIVE AREA (ACRES) = 20.96 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 21.0 PEAK FLOW RATE (CFS) = 15.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.91 FLOW VELOCITY (FEET/SEC.) = 6.12  
LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11352.00 = 1907.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11352.00 TO NODE 11353.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 2403.73 DOWNSTREAM (FEET) = 1786.74  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1933.85 CHANNEL SLOPE = 0.3190  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.169  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 74.05 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 37.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.36  
AVERAGE FLOW DEPTH (FEET) = 1.15 TRAVEL TIME (MIN.) = 3.44  
Tc (MIN.) = 20.98  
SUBAREA AREA (ACRES) = 74.05 SUBAREA RUNOFF (CFS) = 44.58  
EFFECTIVE AREA (ACRES) = 95.01 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 95.0 PEAK FLOW RATE (CFS) = 57.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.35 FLOW VELOCITY (FEET/SEC.) = 10.41  
LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11353.00 = 3840.96 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11353.00 TO NODE 11354.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 1786.74 DOWNSTREAM (FEET) = 1308.39  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2073.35 CHANNEL SLOPE = 0.2307

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.052  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 41.22 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 67.46  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.60  
AVERAGE FLOW DEPTH (FEET) = 1.53 TRAVEL TIME (MIN.) = 3.60  
Tc (MIN.) = 24.58  
SUBAREA AREA (ACRES) = 41.22 SUBAREA RUNOFF (CFS) = 20.49  
EFFECTIVE AREA (ACRES) = 136.23 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 136.2 PEAK FLOW RATE (CFS) = 67.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.53 FLOW VELOCITY (FEET/SEC.) = 9.63  
LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11354.00 = 5914.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1308.39 DOWNSTREAM (FEET) = 957.53  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2455.49 CHANNEL SLOPE = 0.1429  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.941  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 201.53 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 107.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.03  
AVERAGE FLOW DEPTH (FEET) = 2.00 TRAVEL TIME (MIN.) = 4.53  
Tc (MIN.) = 29.12  
SUBAREA AREA (ACRES) = 201.53 SUBAREA RUNOFF (CFS) = 79.95  
EFFECTIVE AREA (ACRES) = 337.76 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 337.8 PEAK FLOW RATE (CFS) = 133.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.16 FLOW VELOCITY (FEET/SEC.) = 9.54  
LONGEST FLOWPATH FROM NODE 11350.00 TO NODE 11360.00 = 8369.80 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11354.00 TO NODE 11360.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 29.12  
RAINFALL INTENSITY (INCH/HR) = 0.94  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 337.76  
TOTAL STREAM AREA (ACRES) = 337.76  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 133.99

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1574.99	27.63	0.976	0.50 ( 0.50)	1.00	2516.6	11330.00
1	1530.02	35.78	0.849	0.50 ( 0.50)	1.00	3292.7	11300.00
1	1508.91	38.13	0.821	0.50 ( 0.50)	1.00	3502.4	11250.00
1	1464.61	40.02	0.798	0.50 ( 0.50)	1.00	3633.6	11130.00
1	1455.07	40.39	0.795	0.50 ( 0.50)	1.00	3657.1	11220.00
1	976.63	65.28	0.638	0.50 ( 0.50)	1.00	5001.5	11201.00
1	975.08	65.36	0.638	0.50 ( 0.50)	1.00	5003.6	11111.00
1	961.25	65.91	0.636	0.50 ( 0.50)	1.00	5011.5	11101.00
2	133.99	29.12	0.941	0.50 ( 0.50)	1.00	337.8	11350.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	27.63	0.976	0.50 ( 0.50)	1.00	2837.0	11330.00
2	1700.76	29.12	0.941	0.50 ( 0.50)	1.00	2996.1	11350.00
3	1636.19	35.78	0.849	0.50 ( 0.50)	1.00	3630.4	11300.00
4	1606.36	38.13	0.821	0.50 ( 0.50)	1.00	3840.2	11250.00
5	1555.07	40.02	0.798	0.50 ( 0.50)	1.00	3971.4	11130.00
6	1544.59	40.39	0.795	0.50 ( 0.50)	1.00	3994.8	11220.00
7	1018.64	65.28	0.638	0.50 ( 0.50)	1.00	5339.3	11201.00
8	1017.01	65.36	0.638	0.50 ( 0.50)	1.00	5341.3	11111.00
9	1002.62	65.91	0.636	0.50 ( 0.50)	1.00	5349.2	11101.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 1708.98 Tc (MIN.) = 27.63  
EFFECTIVE AREA (ACRES) = 2837.05 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 5349.2  
LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11360.00 = 32954.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11360.00 TO NODE 11361.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 957.53 DOWNSTREAM (FEET) = 847.62  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2937.03 CHANNEL SLOPE = 0.0374  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.894

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 176.74 0.50 0.977 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1741.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.95  
 AVERAGE FLOW DEPTH(FEET) = 7.28 TRAVEL TIME(MIN.) = 4.47  
 Tc(MIN.) = 32.10  
 SUBAREA AREA(ACRES) = 176.74 SUBAREA RUNOFF(CFS) = 64.53  
 EFFECTIVE AREA(ACRES) = 3013.79 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5526.0 PEAK FLOW RATE(CFS) = 1708.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.23 FLOW VELOCITY(FEET/SEC.) = 10.90  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11361.00 = 35891.29 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11361.00 TO NODE 11362.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 847.62 DOWNSTREAM(FEET) = 738.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3869.90 CHANNEL SLOPE = 0.0283  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.815

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 429.50 0.50 0.995 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1770.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.89  
 AVERAGE FLOW DEPTH(FEET) = 7.72 TRAVEL TIME(MIN.) = 6.52  
 Tc(MIN.) = 38.62  
 SUBAREA AREA(ACRES) = 429.50 SUBAREA RUNOFF(CFS) = 122.59  
 EFFECTIVE AREA(ACRES) = 3443.29 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5955.5 PEAK FLOW RATE(CFS) = 1708.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 7.62 FLOW VELOCITY(FEET/SEC.) = 9.81  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11362.00 = 39761.19 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 738.28 DOWNSTREAM(FEET) = 678.93

CHANNEL LENGTH THRU SUBAREA(FEET) = 2987.23 CHANNEL SLOPE = 0.0199  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.761  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 125.97 0.50 0.991 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.991  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1724.03  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.61  
 AVERAGE FLOW DEPTH(FEET) = 8.17 TRAVEL TIME(MIN.) = 5.78  
 Tc(MIN.) = 44.40  
 SUBAREA AREA(ACRES) = 125.97 SUBAREA RUNOFF(CFS) = 30.08  
 EFFECTIVE AREA(ACRES) = 3569.26 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6081.5 PEAK FLOW RATE(CFS) = 1708.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.14 FLOW VELOCITY(FEET/SEC.) = 8.59  
 LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.  
 -----

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 6081.5 TC(MIN.) = 44.40  
 EFFECTIVE AREA(ACRES) = 3569.26 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.998  
 PEAK FLOW RATE(CFS) = 1708.98

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.761	0.50( 0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.748	0.50( 0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.698	0.50( 0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.684	0.50( 0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.672	0.50( 0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.670	0.50( 0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.575	0.50( 0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.574	0.50( 0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.572	0.50( 0.50)	1.00	6081.5	11101.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S14.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 3.028
- 2) 10.00; 1.974
- 3) 15.00; 1.389
- 4) 20.00; 1.193
- 5) 25.00; 1.033
- 6) 30.00; 0.916
- 7) 40.00; 0.793
- 8) 50.00; 0.710
- 9) 60.00; 0.651
- 10) 90.00; 0.551
- 11) 120.00; 0.497
- 12) 180.00; 0.423
- 13) 360.00; 0.322
- 14) 1440.00; 0.144

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREET MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.00 TO NODE 11401.50 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 313.41  
ELEVATION DATA: UPSTREAM(FEET) = 3384.11 DOWNSTREAM(FEET) = 3232.76

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.137  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.367  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.25 0.50 1.000 0 8.14  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 3.78  
TOTAL AREA(ACRES) = 2.25 PEAK FLOW RATE(CFS) = 3.78

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11401.50 TO NODE 11402.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3232.76 DOWNSTREAM(FEET) = 3001.05  
CHANNEL LENGTH THRU SUBAREA(FEET) = 620.75 CHANNEL SLOPE = 0.3733  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.074  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 11.39 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.89  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.45  
AVERAGE FLOW DEPTH(FEET) = 0.73 TRAVEL TIME(MIN.) = 1.39  
Tc(MIN.) = 9.53  
SUBAREA AREA(ACRES) = 11.39 SUBAREA RUNOFF(CFS) = 16.13  
EFFECTIVE AREA(ACRES) = 13.64 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.6 PEAK FLOW RATE(CFS) = 19.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.87 FLOW VELOCITY(FEET/SEC.) = 8.42  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11402.00 = 934.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11402.00 TO NODE 11403.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3001.05 DOWNSTREAM(FEET) = 2787.96  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.99 CHANNEL SLOPE = 0.2213  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.795

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.43	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.77

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.01

AVERAGE FLOW DEPTH(FEET) = 1.20 TRAVEL TIME(MIN.) = 2.00

Tc(MIN.) = 11.53

SUBAREA AREA(ACRES) = 26.43 SUBAREA RUNOFF(CFS) = 30.80

EFFECTIVE AREA(ACRES) = 40.07 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 40.1 PEAK FLOW RATE(CFS) = 46.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 8.60

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11403.00 = 1897.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11403.00 TO NODE 11404.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2787.96 DOWNSTREAM(FEET) = 2518.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1956.80 CHANNEL SLOPE = 0.1376  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.367

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	67.85	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.11

AVERAGE FLOW DEPTH(FEET) = 1.74 TRAVEL TIME(MIN.) = 4.02

Tc(MIN.) = 15.55

SUBAREA AREA(ACRES) = 67.85 SUBAREA RUNOFF(CFS) = 52.95

EFFECTIVE AREA(ACRES) = 107.92 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 107.9 PEAK FLOW RATE(CFS) = 84.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.83 FLOW VELOCITY(FEET/SEC.) = 8.35

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11404.00 = 3853.95 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11404.00 TO NODE 11405.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2518.71 DOWNSTREAM(FEET) = 2304.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1944.99 CHANNEL SLOPE = 0.1101  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.213

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.61	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.24

AVERAGE FLOW DEPTH(FEET) = 2.11 TRAVEL TIME(MIN.) = 3.93

Tc(MIN.) = 19.48

SUBAREA AREA(ACRES) = 80.61 SUBAREA RUNOFF(CFS) = 51.73

EFFECTIVE AREA(ACRES) = 188.53 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 188.5 PEAK FLOW RATE(CFS) = 120.98

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.19 FLOW VELOCITY(FEET/SEC.) = 8.43

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11405.00 = 5798.94 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11405.00 TO NODE 11406.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2304.57 DOWNSTREAM(FEET) = 1888.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3280.59 CHANNEL SLOPE = 0.1270  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.025

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	111.04	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 147.30

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.33

AVERAGE FLOW DEPTH(FEET) = 2.29 TRAVEL TIME(MIN.) = 5.86

Tc(MIN.) = 25.34

SUBAREA AREA(ACRES) = 111.04 SUBAREA RUNOFF(CFS) = 52.44

EFFECTIVE AREA(ACRES) = 299.57 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 299.6 PEAK FLOW RATE(CFS) = 141.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.26 FLOW VELOCITY(FEET/SEC.) = 9.22

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11406.00 = 9079.53 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11406.00 TO NODE 11407.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1888.00 DOWNSTREAM(FEET) = 1539.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2842.33 CHANNEL SLOPE = 0.1226  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.912  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 141.19 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 167.69  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.52  
AVERAGE FLOW DEPTH(FEET) = 2.42 TRAVEL TIME(MIN.) = 4.98  
Tc(MIN.) = 30.32  
SUBAREA AREA(ACRES) = 141.19 SUBAREA RUNOFF(CFS) = 52.34  
EFFECTIVE AREA(ACRES) = 440.76 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 440.8 PEAK FLOW RATE(CFS) = 163.38

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.40 FLOW VELOCITY(FEET/SEC.) = 9.45  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11407.00 = 11921.86 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11407.00 TO NODE 11408.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1539.46 DOWNSTREAM(FEET) = 1268.36  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2859.01 CHANNEL SLOPE = 0.0948  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.846  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 158.63 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 188.10  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.88  
AVERAGE FLOW DEPTH(FEET) = 2.66 TRAVEL TIME(MIN.) = 5.37  
Tc(MIN.) = 35.69  
SUBAREA AREA(ACRES) = 158.63 SUBAREA RUNOFF(CFS) = 49.37  
EFFECTIVE AREA(ACRES) = 599.39 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 599.4 PEAK FLOW RATE(CFS) = 186.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.64 FLOW VELOCITY(FEET/SEC.) = 8.89  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11408.00 = 14780.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11408.00 TO NODE 11409.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1268.36 DOWNSTREAM(FEET) = 1109.80  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2883.36 CHANNEL SLOPE = 0.0550  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.775  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 208.66 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.48  
AVERAGE FLOW DEPTH(FEET) = 3.08 TRAVEL TIME(MIN.) = 6.43  
Tc(MIN.) = 42.12  
SUBAREA AREA(ACRES) = 208.66 SUBAREA RUNOFF(CFS) = 51.69  
EFFECTIVE AREA(ACRES) = 808.05 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 808.1 PEAK FLOW RATE(CFS) = 200.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.01 FLOW VELOCITY(FEET/SEC.) = 7.36  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.00 = 17664.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11409.00 TO NODE 11409.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 1109.80 DOWNSTREAM(FEET) = 953.45  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2734.25 CHANNEL SLOPE = 0.0572  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.725  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 97.66 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 210.07  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.57  
AVERAGE FLOW DEPTH(FEET) = 3.04 TRAVEL TIME(MIN.) = 6.02  
Tc(MIN.) = 48.13  
SUBAREA AREA(ACRES) = 97.66 SUBAREA RUNOFF(CFS) = 19.80  
EFFECTIVE AREA(ACRES) = 905.71 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 905.7 PEAK FLOW RATE(CFS) = 200.16

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.99 FLOW VELOCITY(FEET/SEC.) = 7.47  
LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11409.50 = 20398.48 FEET.

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FLOW PROCESS FROM NODE 11409.50 TO NODE 11410.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 953.45 DOWNSTREAM(FEET) = 914.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1100.66 CHANNEL SLOPE = 0.0357  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.704

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	130.64	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.35

AVERAGE FLOW DEPTH(FEET) = 3.34 TRAVEL TIME(MIN.) = 2.89

Tc(MIN.) = 51.02

SUBAREA AREA(ACRES) = 130.64 SUBAREA RUNOFF(CFS) = 23.96

EFFECTIVE AREA(ACRES) = 1036.35 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1036.4 PEAK FLOW RATE(CFS) = 200.16

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.26 FLOW VELOCITY(FEET/SEC.) = 6.27

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11410.00 = 21499.14 FEET.

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FLOW PROCESS FROM NODE 11410.00 TO NODE 11411.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 914.20 DOWNSTREAM(FEET) = 740.43  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3015.96 CHANNEL SLOPE = 0.0576  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.665

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	299.66	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 222.48

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.71

AVERAGE FLOW DEPTH(FEET) = 3.10 TRAVEL TIME(MIN.) = 6.52

Tc(MIN.) = 57.55

SUBAREA AREA(ACRES) = 299.66 SUBAREA RUNOFF(CFS) = 44.57

EFFECTIVE AREA(ACRES) = 1336.01 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1336.0 PEAK FLOW RATE(CFS) = 200.16

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.99 FLOW VELOCITY(FEET/SEC.) = 7.48

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11411.00 = 24515.10 FEET.

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FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 740.43 DOWNSTREAM(FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1605.97 CHANNEL SLOPE = 0.0553  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.647

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	70.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 204.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42

AVERAGE FLOW DEPTH(FEET) = 3.03 TRAVEL TIME(MIN.) = 3.61

Tc(MIN.) = 61.15

SUBAREA AREA(ACRES) = 70.41 SUBAREA RUNOFF(CFS) = 9.31

EFFECTIVE AREA(ACRES) = 1406.42 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1406.4 PEAK FLOW RATE(CFS) = 200.16

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.01 FLOW VELOCITY(FEET/SEC.) = 7.37

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

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FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1<<<<

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FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2<<<<

PEAK FLOWRATE TABLE FILE NAME: S10.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3913.94	27.74	0.50( 0.50)	1.00	3432.1	11000.00
2	3884.96	45.52	0.50( 0.50)	1.00	6603.6	10850.00
3	3872.36	46.28	0.50( 0.50)	1.00	6739.0	10800.00
4	3843.83	49.55	0.50( 0.50)	1.00	7436.4	10900.00
5	3791.30	52.66	0.50( 0.50)	1.00	8023.8	10830.00

6	3746.67	54.55	0.50	(0.50)	1.00	8336.2	10910.00
7	3732.90	55.01	0.50	(0.50)	1.00	8399.9	10630.00
8	3209.18	71.54	0.50	(0.50)	1.00	10873.3	10600.00
9	2957.84	82.80	0.50	(0.50)	1.00	12577.0	10500.00
10	2770.73	90.35	0.50	(0.50)	1.00	13618.7	10710.00
11	2718.26	92.13	0.50	(0.50)	1.00	13817.2	10410.00
12	2475.62	100.62	0.50	(0.50)	1.00	14641.3	10700.00
13	2268.48	108.15	0.50	(0.50)	1.00	15313.9	10400.00
14	2104.74	114.69	0.50	(0.50)	1.00	15804.4	10200.00
15	1811.77	126.33	0.50	(0.50)	1.00	16533.8	10300.00
16	1794.89	126.88	0.50	(0.50)	1.00	16556.0	10320.00
17	1654.02	131.54	0.50	(0.50)	1.00	16664.7	10210.00
18	529.13	197.15	0.50	(0.50)	1.00	17533.1	10100.00

TOTAL AREA (ACRES) = 17533.1

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FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S13.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.50 (0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.50 (0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.50 (0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.50 (0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.50 (0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.50 (0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.50 (0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.50 (0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.50 (0.50)	1.00	6081.5	11101.00

TOTAL AREA (ACRES) = 6081.5

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FLOW PROCESS FROM NODE 11362.00 TO NODE 11363.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.50 (0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.50 (0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.50 (0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.50 (0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.50 (0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.50 (0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.50 (0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.50 (0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.50 (0.50)	1.00	6081.5	11101.00

TOTAL AREA (ACRES) = 6081.5

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FLOW PROCESS FROM NODE 11023.00 TO NODE 11363.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1708.98	44.40	0.756	0.50 (0.50)	1.00	3569.3	11330.00
2	1700.76	45.91	0.744	0.50 (0.50)	1.00	3728.3	11350.00
3	1636.19	52.75	0.694	0.50 (0.50)	1.00	4362.6	11300.00
4	1606.36	55.19	0.679	0.50 (0.50)	1.00	4572.4	11250.00
5	1555.07	57.22	0.667	0.50 (0.50)	1.00	4703.6	11130.00
6	1544.59	57.62	0.665	0.50 (0.50)	1.00	4727.0	11220.00
7	1018.64	84.42	0.570	0.50 (0.50)	1.00	6071.5	11201.00
8	1017.01	84.51	0.569	0.50 (0.50)	1.00	6073.5	11111.00
9	1002.62	85.12	0.567	0.50 (0.50)	1.00	6081.5	11101.00

LONGEST FLOWPATH FROM NODE 11111.00 TO NODE 11363.00 = 42748.42 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3913.94	27.74	0.969	0.50 (0.50)	1.00	3432.1	11000.00
2	3884.96	45.52	0.747	0.50 (0.50)	1.00	6603.6	10850.00
3	3872.36	46.28	0.741	0.50 (0.50)	1.00	6739.0	10800.00
4	3843.83	49.55	0.714	0.50 (0.50)	1.00	7436.4	10900.00
5	3791.30	52.66	0.694	0.50 (0.50)	1.00	8023.8	10830.00
6	3746.67	54.55	0.683	0.50 (0.50)	1.00	8336.2	10910.00
7	3732.90	55.01	0.680	0.50 (0.50)	1.00	8399.9	10630.00
8	3209.18	71.54	0.613	0.50 (0.50)	1.00	10873.3	10600.00
9	2957.84	82.80	0.575	0.50 (0.50)	1.00	12577.0	10500.00
10	2770.73	90.35	0.550	0.50 (0.50)	1.00	13618.7	10710.00
11	2718.26	92.13	0.547	0.50 (0.50)	1.00	13817.2	10410.00
12	2475.62	100.62	0.532	0.50 (0.50)	1.00	14641.3	10700.00
13	2268.48	108.15	0.518	0.50 (0.50)	1.00	15313.9	10400.00
14	2104.74	114.69	0.507	0.50 (0.50)	1.00	15804.4	10200.00
15	1811.77	126.33	0.489	0.50 (0.50)	1.00	16533.8	10300.00
16	1794.89	126.88	0.489	0.50 (0.50)	1.00	16556.0	10320.00
17	1654.02	131.54	0.483	0.50 (0.50)	1.00	16664.7	10210.00
18	529.13	197.15	0.413	0.50 (0.50)	1.00	17533.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5622.92	27.74	0.969	0.50 (0.50)	1.00	5662.0	11000.00
2	5595.77	44.40	0.756	0.50 (0.50)	1.00	9972.6	11330.00
3	5587.83	45.52	0.747	0.50 (0.50)	1.00	10291.1	10850.00
4	5579.25	45.91	0.744	0.50 (0.50)	1.00	10401.4	11350.00
5	5569.65	46.28	0.741	0.50 (0.50)	1.00	10501.4	10800.00
6	5510.24	49.55	0.714	0.50 (0.50)	1.00	11502.2	10900.00
7	5428.40	52.66	0.694	0.50 (0.50)	1.00	12377.5	10830.00
8	5425.23	52.75	0.694	0.50 (0.50)	1.00	12402.3	11300.00
9	5360.80	54.55	0.683	0.50 (0.50)	1.00	12854.0	10910.00
10	5341.46	55.01	0.680	0.50 (0.50)	1.00	12956.8	10630.00
11	5333.59	55.19	0.679	0.50 (0.50)	1.00	12999.1	11250.00
12	5217.87	57.22	0.667	0.50 (0.50)	1.00	13434.6	11130.00
13	5194.69	57.62	0.665	0.50 (0.50)	1.00	13518.0	11220.00
14	4480.67	71.54	0.613	0.50 (0.50)	1.00	16298.5	10600.00
15	4008.30	82.80	0.575	0.50 (0.50)	1.00	18567.2	10500.00



16	3936.27	84.42	0.570	0.50	( 0.50)	1.00	18872.3	11201.00
17	3932.48	84.51	0.569	0.50	( 0.50)	1.00	18886.4	11111.00
18	3902.79	85.12	0.567	0.50	( 0.50)	1.00	18979.5	11101.00
19	3523.56	90.35	0.550	0.50	( 0.50)	1.00	19700.1	10710.00
20	3423.61	92.13	0.547	0.50	( 0.50)	1.00	19898.6	10410.00
21	2954.64	100.62	0.532	0.50	( 0.50)	1.00	20722.8	10700.00
22	2546.79	108.15	0.518	0.50	( 0.50)	1.00	21395.4	10400.00
23	2208.84	114.69	0.507	0.50	( 0.50)	1.00	21885.8	10200.00
24	1821.51	126.33	0.489	0.50	( 0.50)	1.00	22615.3	10300.00
25	1804.62	126.88	0.489	0.50	( 0.50)	1.00	22637.5	10320.00
26	1663.64	131.54	0.483	0.50	( 0.50)	1.00	22746.2	10210.00
27	537.36	197.15	0.413	0.50	( 0.50)	1.00	23614.5	10100.00

TOTAL AREA (ACRES) = 23614.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5622.92 Tc (MIN.) = 27.740  
EFFECTIVE AREA (ACRES) = 5661.99 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 23614.5  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11363.00 = 69154.02 FEET.

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FLOW PROCESS FROM NODE 11363.00 TO NODE 11431.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 678.93 DOWNSTREAM (FEET) = 651.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2069.94 CHANNEL SLOPE = 0.0132  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.907

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	165.16	0.50	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5653.24  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.38  
AVERAGE FLOW DEPTH (FEET) = 12.87 TRAVEL TIME (MIN.) = 3.03  
Tc (MIN.) = 30.77  
SUBAREA AREA (ACRES) = 165.16 SUBAREA RUNOFF (CFS) = 60.62  
EFFECTIVE AREA (ACRES) = 5827.15 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 23779.7 PEAK FLOW RATE (CFS) = 5622.92  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 12.84 FLOW VELOCITY (FEET/SEC.) = 11.37  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

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FLOW PROCESS FROM NODE 11411.00 TO NODE 11431.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5622.92	30.77	0.907	0.50 ( 0.50)	1.00	5827.1	11000.00
2	5595.77	47.44	0.731	0.50 ( 0.50)	1.00	10137.7	11330.00
3	5587.83	48.56	0.722	0.50 ( 0.50)	1.00	10456.2	10850.00
4	5579.25	48.95	0.719	0.50 ( 0.50)	1.00	10566.6	11350.00
5	5569.65	49.32	0.716	0.50 ( 0.50)	1.00	10666.6	10800.00
6	5510.24	52.60	0.695	0.50 ( 0.50)	1.00	11667.4	10900.00
7	5428.40	55.72	0.676	0.50 ( 0.50)	1.00	12542.7	10830.00
8	5425.23	55.82	0.676	0.50 ( 0.50)	1.00	12567.5	11300.00
9	5360.80	57.62	0.665	0.50 ( 0.50)	1.00	13019.2	10910.00
10	5341.46	58.08	0.662	0.50 ( 0.50)	1.00	13122.0	10630.00
11	5333.59	58.26	0.661	0.50 ( 0.50)	1.00	13164.2	11250.00
12	5217.87	60.31	0.650	0.50 ( 0.50)	1.00	13599.8	11130.00
13	5194.69	60.72	0.649	0.50 ( 0.50)	1.00	13683.2	11220.00
14	4480.67	74.75	0.602	0.50 ( 0.50)	1.00	16463.6	10600.00
15	4008.30	86.10	0.564	0.50 ( 0.50)	1.00	18732.3	10500.00
16	3936.27	87.74	0.559	0.50 ( 0.50)	1.00	19037.5	11201.00
17	3932.48	87.82	0.558	0.50 ( 0.50)	1.00	19051.5	11111.00
18	3902.79	88.45	0.556	0.50 ( 0.50)	1.00	19144.7	11101.00
19	3523.56	93.75	0.544	0.50 ( 0.50)	1.00	19865.3	10710.00
20	3423.61	95.56	0.541	0.50 ( 0.50)	1.00	20063.8	10410.00
21	2954.64	104.18	0.525	0.50 ( 0.50)	1.00	20887.9	10700.00
22	2546.79	111.85	0.512	0.50 ( 0.50)	1.00	21560.6	10400.00
23	2208.84	118.52	0.500	0.50 ( 0.50)	1.00	22051.0	10200.00
24	1821.51	130.35	0.484	0.50 ( 0.50)	1.00	22780.4	10300.00
25	1804.62	130.91	0.484	0.50 ( 0.50)	1.00	22802.6	10320.00
26	1663.64	135.65	0.478	0.50 ( 0.50)	1.00	22911.3	10210.00
27	537.36	202.60	0.410	0.50 ( 0.50)	1.00	23779.7	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	200.16	61.15	0.647	0.50 ( 0.50)	1.00	1406.4	11401.00

LONGEST FLOWPATH FROM NODE 11401.00 TO NODE 11431.00 = 26121.07 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	30.77	0.907	0.50 ( 0.50)	1.00	6534.8	11000.00
2	5795.93	47.44	0.731	0.50 ( 0.50)	1.00	11228.7	11330.00
3	5788.00	48.56	0.722	0.50 ( 0.50)	1.00	11573.0	10850.00
4	5779.42	48.95	0.719	0.50 ( 0.50)	1.00	11692.3	11350.00
5	5769.81	49.32	0.716	0.50 ( 0.50)	1.00	11800.8	10800.00
6	5710.40	52.60	0.695	0.50 ( 0.50)	1.00	12877.1	10900.00
7	5628.57	55.72	0.676	0.50 ( 0.50)	1.00	13824.1	10830.00
8	5625.39	55.82	0.676	0.50 ( 0.50)	1.00	13851.1	11300.00
9	5560.96	57.62	0.665	0.50 ( 0.50)	1.00	14344.4	10910.00
10	5541.62	58.08	0.662	0.50 ( 0.50)	1.00	14457.7	10630.00
11	5533.75	58.26	0.661	0.50 ( 0.50)	1.00	14504.1	11250.00
12	5418.03	60.31	0.650	0.50 ( 0.50)	1.00	14986.8	11130.00
13	5394.85	60.72	0.649	0.50 ( 0.50)	1.00	15079.5	11220.00
14	5372.52	61.15	0.647	0.50 ( 0.50)	1.00	15176.6	11401.00
15	4619.12	74.75	0.602	0.50 ( 0.50)	1.00	17870.1	10600.00
16	4095.19	86.10	0.564	0.50 ( 0.50)	1.00	20138.8	10500.00
17	4015.74	87.74	0.559	0.50 ( 0.50)	1.00	20443.9	11201.00

18	4011.55	87.82	0.558	0.50	( 0.50)	1.00	20458.0	11111.00
19	3979.02	88.45	0.556	0.50	( 0.50)	1.00	20551.1	11101.00
20	3583.55	93.75	0.544	0.50	( 0.50)	1.00	21271.7	10710.00
21	3479.17	95.56	0.541	0.50	( 0.50)	1.00	21470.2	10410.00
22	2989.06	104.18	0.525	0.50	( 0.50)	1.00	22294.3	10700.00
23	2562.41	111.85	0.512	0.50	( 0.50)	1.00	22967.0	10400.00
24	2208.84	118.52	0.500	0.50	( 0.50)	1.00	23457.4	10200.00
25	1821.50	130.35	0.484	0.50	( 0.50)	1.00	24186.8	10300.00
26	1804.62	130.91	0.484	0.50	( 0.50)	1.00	24209.1	10320.00
27	1663.63	135.65	0.478	0.50	( 0.50)	1.00	24317.7	10210.00
28	537.36	202.60	0.410	0.50	( 0.50)	1.00	25186.1	10100.00

TOTAL AREA (ACRES) = 25186.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5823.09 Tc (MIN.) = 30.770  
EFFECTIVE AREA (ACRES) = 6534.80 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25186.1  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11431.00 = 71223.96 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 25186.1 TC (MIN.) = 30.77  
EFFECTIVE AREA (ACRES) = 6534.80 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.998  
PEAK FLOW RATE (CFS) = 5823.09

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	30.77	0.907	0.50 ( 0.50)	1.00	6534.8	11000.00
2	5795.93	47.44	0.731	0.50 ( 0.50)	1.00	11228.7	11330.00
3	5788.00	48.56	0.722	0.50 ( 0.50)	1.00	11573.0	10850.00
4	5779.42	48.95	0.719	0.50 ( 0.50)	1.00	11692.3	11350.00
5	5769.81	49.32	0.716	0.50 ( 0.50)	1.00	11800.8	10800.00
6	5710.40	52.60	0.695	0.50 ( 0.50)	1.00	12877.1	10900.00
7	5628.57	55.72	0.676	0.50 ( 0.50)	1.00	13824.1	10830.00
8	5625.39	55.82	0.676	0.50 ( 0.50)	1.00	13851.1	11300.00
9	5560.96	57.62	0.665	0.50 ( 0.50)	1.00	14344.4	10910.00
10	5541.62	58.08	0.662	0.50 ( 0.50)	1.00	14457.7	10630.00
11	5533.75	58.26	0.661	0.50 ( 0.50)	1.00	14504.1	11250.00
12	5418.03	60.31	0.650	0.50 ( 0.50)	1.00	14986.8	11130.00
13	5394.85	60.72	0.649	0.50 ( 0.50)	1.00	15079.5	11220.00
14	5372.52	61.15	0.647	0.50 ( 0.50)	1.00	15176.6	11401.00
15	4619.12	74.75	0.602	0.50 ( 0.50)	1.00	17870.1	10600.00
16	4095.19	86.10	0.564	0.50 ( 0.50)	1.00	20138.8	10500.00
17	4015.74	87.74	0.559	0.50 ( 0.50)	1.00	20443.9	11201.00
18	4011.55	87.82	0.558	0.50 ( 0.50)	1.00	20458.0	11111.00
19	3979.02	88.45	0.556	0.50 ( 0.50)	1.00	20551.1	11101.00
20	3583.55	93.75	0.544	0.50 ( 0.50)	1.00	21271.7	10710.00
21	3479.17	95.56	0.541	0.50 ( 0.50)	1.00	21470.2	10410.00
22	2989.06	104.18	0.525	0.50 ( 0.50)	1.00	22294.3	10700.00
23	2562.41	111.85	0.512	0.50 ( 0.50)	1.00	22967.0	10400.00
24	2208.84	118.52	0.500	0.50 ( 0.50)	1.00	23457.4	10200.00
25	1821.50	130.35	0.484	0.50 ( 0.50)	1.00	24186.8	10300.00
26	1804.62	130.91	0.484	0.50 ( 0.50)	1.00	24209.1	10320.00
27	1663.63	135.65	0.478	0.50 ( 0.50)	1.00	24317.7	10210.00
28	537.36	202.60	0.410	0.50 ( 0.50)	1.00	25186.1	10100.00

=====

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S15.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.911
- 2) 10.00; 1.910
- 3) 15.00; 1.364
- 4) 20.00; 1.170
- 5) 25.00; 1.015
- 6) 30.00; 0.904
- 7) 40.00; 0.780
- 8) 50.00; 0.696
- 9) 60.00; 0.637
- 10) 90.00; 0.536
- 11) 120.00; 0.480
- 12) 180.00; 0.407
- 13) 360.00; 0.307
- 14) 1440.00; 0.137

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE	CROSSFALL / SIDE	STREET-FALL: IN- / SIDE	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	STREETS: LIP (FT)	STREETS: HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018	0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11500.00 TO NODE 11501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 352.85  
ELEVATION DATA: UPSTREAM(FEET) = 1891.25 DOWNSTREAM(FEET) = 1665.22

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.064  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.298  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.58	0.50	1.000	0	8.06

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.56  
TOTAL AREA(ACRES) = 1.58 PEAK FLOW RATE(CFS) = 2.56

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11501.00 TO NODE 11502.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1665.22 DOWNSTREAM(FEET) = 1423.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 627.67 CHANNEL SLOPE = 0.3849  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.983  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	6.84	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.66  
AVERAGE FLOW DEPTH(FEET) = 0.60 TRAVEL TIME(MIN.) = 1.57  
Tc(MIN.) = 9.63  
SUBAREA AREA(ACRES) = 6.84 SUBAREA RUNOFF(CFS) = 9.13  
EFFECTIVE AREA(ACRES) = 8.42 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.4 PEAK FLOW RATE(CFS) = 11.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.71 FLOW VELOCITY(FEET/SEC.) = 7.38  
LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11502.00 = 980.52 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11502.00 TO NODE 11503.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1423.64 DOWNSTREAM(FEET) = 1258.86  
CHANNEL LENGTH THRU SUBAREA(FEET) = 937.16 CHANNEL SLOPE = 0.1758  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.702

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.16	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.57

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.89

AVERAGE FLOW DEPTH(FEET) = 1.13 TRAVEL TIME(MIN.) = 2.27

Tc(MIN.) = 11.90

SUBAREA AREA(ACRES) = 28.16 SUBAREA RUNOFF(CFS) = 30.47

EFFECTIVE AREA(ACRES) = 36.58 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 39.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 7.61

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11503.00 = 1917.68 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11503.00 TO NODE 11504.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1258.86 DOWNSTREAM(FEET) = 1009.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.29 CHANNEL SLOPE = 0.1298  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.323

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	69.67	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 65.54

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.71

AVERAGE FLOW DEPTH(FEET) = 1.68 TRAVEL TIME(MIN.) = 4.16

Tc(MIN.) = 16.06

SUBAREA AREA(ACRES) = 69.67 SUBAREA RUNOFF(CFS) = 51.58

EFFECTIVE AREA(ACRES) = 106.25 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 106.2 PEAK FLOW RATE(CFS) = 78.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.81 FLOW VELOCITY(FEET/SEC.) = 8.05

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11504.00 = 3841.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1009.04 DOWNSTREAM(FEET) = 593.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2817.91 CHANNEL SLOPE = 0.1475  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.128

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	65.12	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 97.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.87

AVERAGE FLOW DEPTH(FEET) = 1.91 TRAVEL TIME(MIN.) = 5.29

Tc(MIN.) = 21.35

SUBAREA AREA(ACRES) = 65.12 SUBAREA RUNOFF(CFS) = 36.80

EFFECTIVE AREA(ACRES) = 171.37 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.4 PEAK FLOW RATE(CFS) = 96.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.90 FLOW VELOCITY(FEET/SEC.) = 8.90

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 10

-----  
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S14.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	30.77	0.50( 0.50)	1.00	6534.8	11000.00
2	5795.93	47.44	0.50( 0.50)	1.00	11228.7	11330.00
3	5788.00	48.56	0.50( 0.50)	1.00	11573.0	10850.00
4	5710.40	52.60	0.50( 0.50)	1.00	12877.1	10900.00
5	5628.57	55.72	0.50( 0.50)	1.00	13824.1	10830.00
6	5560.96	57.62	0.50( 0.50)	1.00	14344.4	10910.00
7	5418.03	60.31	0.50( 0.50)	1.00	14986.8	11130.00
8	4619.12	74.75	0.50( 0.50)	1.00	17870.1	10600.00
9	4095.19	86.10	0.50( 0.50)	1.00	20138.8	10500.00
10	4015.74	87.74	0.50( 0.50)	1.00	20443.9	11201.00
11	3979.02	88.45	0.50( 0.50)	1.00	20551.1	11101.00
12	3583.55	93.75	0.50( 0.50)	1.00	21271.7	10710.00
13	3479.17	95.56	0.50( 0.50)	1.00	21470.2	10410.00
14	2989.06	104.18	0.50( 0.50)	1.00	22294.3	10700.00
15	2562.41	111.85	0.50( 0.50)	1.00	22967.0	10400.00
16	2208.84	118.52	0.50( 0.50)	1.00	23457.4	10200.00
17	1821.50	130.35	0.50( 0.50)	1.00	24186.8	10300.00

18 1804.62 130.91 0.50( 0.50) 1.00 24209.1 10320.00  
 19 1663.63 135.65 0.50( 0.50) 1.00 24317.7 10210.00  
 20 537.36 202.60 0.50( 0.50) 1.00 25186.1 10100.00  
 TOTAL AREA(ACRES) = 25186.1

\*\*\*\*\*

FLOW PROCESS FROM NODE 11431.00 TO NODE 11431.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	30.77	0.50( 0.50)	1.00	6534.8	11000.00
2	5795.93	47.44	0.50( 0.50)	1.00	11228.7	11330.00
3	5788.00	48.56	0.50( 0.50)	1.00	11573.0	10850.00
4	5710.40	52.60	0.50( 0.50)	1.00	12877.1	10900.00
5	5628.57	55.72	0.50( 0.50)	1.00	13824.1	10830.00
6	5560.96	57.62	0.50( 0.50)	1.00	14344.4	10910.00
7	5418.03	60.31	0.50( 0.50)	1.00	14986.8	11130.00
8	4619.12	74.75	0.50( 0.50)	1.00	17870.1	10600.00
9	4095.19	86.10	0.50( 0.50)	1.00	20138.8	10500.00
10	4015.74	87.74	0.50( 0.50)	1.00	20443.9	11201.00
11	3979.02	88.45	0.50( 0.50)	1.00	20551.1	11101.00
12	3583.55	93.75	0.50( 0.50)	1.00	21271.7	10710.00
13	3479.17	95.56	0.50( 0.50)	1.00	21470.2	10410.00
14	2989.06	104.18	0.50( 0.50)	1.00	22294.3	10700.00
15	2562.41	111.85	0.50( 0.50)	1.00	22967.0	10400.00
16	2208.84	118.52	0.50( 0.50)	1.00	23457.4	10200.00
17	1821.50	130.35	0.50( 0.50)	1.00	24186.8	10300.00
18	1804.62	130.91	0.50( 0.50)	1.00	24209.1	10320.00
19	1663.63	135.65	0.50( 0.50)	1.00	24317.7	10210.00
20	537.36	202.60	0.50( 0.50)	1.00	25186.1	10100.00
TOTAL AREA(ACRES) = 25186.1						

\*\*\*\*\*

FLOW PROCESS FROM NODE 11431.00 TO NODE 11520.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM( FEET ) = 651.70 DOWNSTREAM( FEET ) = 593.37  
 CHANNEL LENGTH THRU SUBAREA( FEET ) = 2004.08 CHANNEL SLOPE = 0.0291  
 CHANNEL BASE( FEET ) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET ) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY( INCH/HR ) = 0.868  
 SUBAREA LOSS RATE DATA( AMC II ):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 54.88 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR ) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW( CFS ) = 5832.16  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY( FEET/SEC. ) = 15.45  
 AVERAGE FLOW DEPTH( FEET ) = 11.22 TRAVEL TIME( MIN. ) = 2.16  
 Tc( MIN. ) = 32.93  
 SUBAREA AREA( ACRES ) = 54.88 SUBAREA RUNOFF( CFS ) = 18.15

EFFECTIVE AREA( ACRES ) = 6589.68 AREA-AVERAGED Fm( INCH/HR ) = 0.50  
 AREA-AVERAGED Fp( INCH/HR ) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA( ACRES ) = 25241.0 PEAK FLOW RATE( CFS ) = 5823.09  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH( FEET ) = 11.21 FLOW VELOCITY( FEET/SEC. ) = 15.44

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

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FLOW PROCESS FROM NODE 11504.00 TO NODE 11520.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5823.09	32.93	0.868	0.50( 0.50)	1.00	6589.7	11000.00
2	5795.93	49.60	0.699	0.50( 0.50)	1.00	11283.5	11330.00
3	5788.00	50.73	0.692	0.50( 0.50)	1.00	11627.9	10850.00
4	5710.40	54.77	0.668	0.50( 0.50)	1.00	12931.9	10900.00
5	5628.57	57.90	0.649	0.50( 0.50)	1.00	13879.0	10830.00
6	5560.96	59.81	0.638	0.50( 0.50)	1.00	14399.2	10910.00
7	5418.03	62.51	0.629	0.50( 0.50)	1.00	15041.6	11130.00
8	4619.12	77.04	0.580	0.50( 0.50)	1.00	17924.9	10600.00
9	4095.19	88.46	0.541	0.50( 0.50)	1.00	20193.6	10500.00
10	4015.74	90.11	0.536	0.50( 0.50)	1.00	20498.8	11201.00
11	3979.02	90.83	0.534	0.50( 0.50)	1.00	20606.0	11101.00
12	3583.55	96.19	0.524	0.50( 0.50)	1.00	21326.6	10710.00
13	3479.17	98.02	0.521	0.50( 0.50)	1.00	21525.1	10410.00
14	2989.06	106.74	0.505	0.50( 0.50)	1.00	22349.2	10700.00
15	2562.41	114.50	0.490	0.50( 0.50)	1.00	23021.9	10400.00
16	2208.84	121.28	0.478	0.50( 0.50)	1.00	23512.3	10200.00
17	1821.50	133.24	0.464	0.50( 0.50)	1.00	24241.7	10300.00
18	1804.62	133.80	0.463	0.50( 0.50)	1.00	24263.9	10320.00
19	1663.63	138.60	0.457	0.50( 0.50)	1.00	24372.6	10210.00
20	537.36	206.53	0.392	0.50( 0.50)	1.00	25241.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	96.83	21.35	1.128	0.50( 0.50)	1.00	171.4	11500.00

LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11520.00 = 6659.88 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5919.92	21.35	1.128	0.50( 0.50)	1.00	4444.2	11500.00
2	5879.76	32.93	0.868	0.50( 0.50)	1.00	6761.0	11000.00
3	5826.65	49.60	0.699	0.50( 0.50)	1.00	11454.9	11330.00
4	5817.54	50.73	0.692	0.50( 0.50)	1.00	11799.3	10850.00
5	5736.26	54.77	0.668	0.50( 0.50)	1.00	13103.3	10900.00
6	5651.58	57.90	0.649	0.50( 0.50)	1.00	14050.3	10830.00
7	5582.23	59.81	0.638	0.50( 0.50)	1.00	14570.6	10910.00
8	5437.83	62.51	0.629	0.50( 0.50)	1.00	15213.0	11130.00
9	4631.37	77.04	0.580	0.50( 0.50)	1.00	18096.3	10600.00

10	4101.50	88.46	0.541	0.50	( 0.50)	1.00	20365.0	10500.00
11	4021.23	90.11	0.536	0.50	( 0.50)	1.00	20670.2	11201.00
12	3984.31	90.83	0.534	0.50	( 0.50)	1.00	20777.3	11101.00
13	3587.28	96.19	0.524	0.50	( 0.50)	1.00	21498.0	10710.00
14	3482.38	98.02	0.521	0.50	( 0.50)	1.00	21696.5	10410.00
15	2989.76	106.74	0.505	0.50	( 0.50)	1.00	22520.6	10700.00
16	2562.41	114.50	0.490	0.50	( 0.50)	1.00	23193.2	10400.00
17	2208.84	121.28	0.478	0.50	( 0.50)	1.00	23683.7	10200.00
18	1821.50	133.24	0.464	0.50	( 0.50)	1.00	24413.1	10300.00
19	1804.62	133.80	0.463	0.50	( 0.50)	1.00	24435.3	10320.00
20	1663.63	138.60	0.457	0.50	( 0.50)	1.00	24544.0	10210.00
21	537.36	206.53	0.392	0.50	( 0.50)	1.00	25412.4	10100.00

TOTAL AREA (ACRES) = 25412.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 5919.92 Tc (MIN.) = 21.354  
EFFECTIVE AREA (ACRES) = 4444.21 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25412.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11520.00 = 73228.04 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 593.37 DOWNSTREAM (FEET) = 577.77  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1515.75 CHANNEL SLOPE = 0.0103  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.065

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.60	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5945.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.42  
AVERAGE FLOW DEPTH (FEET) = 12.63 TRAVEL TIME (MIN.) = 2.03  
Tc (MIN.) = 23.39  
SUBAREA AREA (ACRES) = 100.60 SUBAREA RUNOFF (CFS) = 51.14  
EFFECTIVE AREA (ACRES) = 4544.81 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 25513.0 PEAK FLOW RATE (CFS) = 5919.92  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 12.61 FLOW VELOCITY (FEET/SEC.) = 12.42  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11520.00 TO NODE 11540.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

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TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 23.39  
RAINFALL INTENSITY (INCH/HR) = 1.06  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 4544.81  
TOTAL STREAM AREA (ACRES) = 25512.96  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 5919.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11530.00 TO NODE 11531.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 278.68  
ELEVATION DATA: UPSTREAM (FEET) = 1593.31 DOWNSTREAM (FEET) = 1523.14

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.844  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141  
SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	1.18	0.50	1.000	0	8.84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 1.74  
TOTAL AREA (ACRES) = 1.18 PEAK FLOW RATE (CFS) = 1.74

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11531.00 TO NODE 11532.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1523.14 DOWNSTREAM (FEET) = 1297.56  
CHANNEL LENGTH THRU SUBAREA (FEET) = 698.37 CHANNEL SLOPE = 0.3230  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.829

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.32	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.13  
AVERAGE FLOW DEPTH (FEET) = 0.61 TRAVEL TIME (MIN.) = 1.90  
Tc (MIN.) = 10.74  
SUBAREA AREA (ACRES) = 8.32 SUBAREA RUNOFF (CFS) = 9.95  
EFFECTIVE AREA (ACRES) = 9.50 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 9.5 PEAK FLOW RATE (CFS) = 11.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 6.97  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11532.00 = 977.05 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11532.00 TO NODE 11533.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1297.56 DOWNSTREAM(FEET) = 1134.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 962.17 CHANNEL SLOPE = 0.1693  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.551  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 18.50 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.30  
AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 2.54  
Tc(MIN.) = 13.29  
SUBAREA AREA(ACRES) = 18.50 SUBAREA RUNOFF(CFS) = 17.50  
EFFECTIVE AREA(ACRES) = 28.00 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 28.0 PEAK FLOW RATE(CFS) = 26.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.14 FLOW VELOCITY(FEET/SEC.) = 6.77  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11533.00 = 1939.22 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11533.00 TO NODE 11534.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1134.68 DOWNSTREAM(FEET) = 1002.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 956.78 CHANNEL SLOPE = 0.1379  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.352  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 98.44 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.85  
AVERAGE FLOW DEPTH(FEET) = 1.65 TRAVEL TIME(MIN.) = 2.03  
Tc(MIN.) = 15.32  
SUBAREA AREA(ACRES) = 98.44 SUBAREA RUNOFF(CFS) = 75.43  
EFFECTIVE AREA(ACRES) = 126.44 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 126.4 PEAK FLOW RATE(CFS) = 96.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 8.69  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11534.00 = 2896.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11534.00 TO NODE 11535.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1002.72 DOWNSTREAM(FEET) = 816.20  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2160.78 CHANNEL SLOPE = 0.0863  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.176  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 134.87 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.08  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.95  
AVERAGE FLOW DEPTH(FEET) = 2.41 TRAVEL TIME(MIN.) = 4.53  
Tc(MIN.) = 19.85  
SUBAREA AREA(ACRES) = 134.87 SUBAREA RUNOFF(CFS) = 82.02  
EFFECTIVE AREA(ACRES) = 261.31 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 261.3 PEAK FLOW RATE(CFS) = 158.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.54 FLOW VELOCITY(FEET/SEC.) = 8.24  
LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11535.00 = 5056.78 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 816.20 DOWNSTREAM(FEET) = 577.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3109.20 CHANNEL SLOPE = 0.0767  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.987  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 78.24 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.08  
AVERAGE FLOW DEPTH(FEET) = 2.70 TRAVEL TIME(MIN.) = 6.42  
Tc(MIN.) = 26.27  
SUBAREA AREA(ACRES) = 78.24 SUBAREA RUNOFF(CFS) = 34.27

EFFECTIVE AREA (ACRES) = 339.55 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 339.5 PEAK FLOW RATE (CFS) = 158.91  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.59 FLOW VELOCITY (FEET/SEC.) = 7.89  
 LONGEST FLOWPATH FROM NODE 11530.00 TO NODE 11540.00 = 8165.98 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11535.00 TO NODE 11540.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION (MIN.) = 26.27  
 RAINFALL INTENSITY (INCH/HR) = 0.99  
 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA (ACRES) = 339.55  
 TOTAL STREAM AREA (ACRES) = 339.55  
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 158.91

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5919.92	23.39	1.065	0.50 ( 0.50)	1.00	4544.8	11500.00
1	5879.76	34.97	0.842	0.50 ( 0.50)	1.00	6861.6	11000.00
1	5826.65	51.64	0.686	0.50 ( 0.50)	1.00	11555.5	11330.00
1	5817.54	52.77	0.680	0.50 ( 0.50)	1.00	11899.9	10850.00
1	5736.26	56.82	0.656	0.50 ( 0.50)	1.00	13203.9	10900.00
1	5651.58	59.96	0.637	0.50 ( 0.50)	1.00	14150.9	10830.00
1	5582.23	61.87	0.631	0.50 ( 0.50)	1.00	14671.2	10910.00
1	5437.83	64.59	0.622	0.50 ( 0.50)	1.00	15313.6	11130.00
1	4631.37	79.20	0.572	0.50 ( 0.50)	1.00	18196.9	10600.00
1	4101.50	90.69	0.535	0.50 ( 0.50)	1.00	20465.6	10500.00
1	4021.23	92.35	0.532	0.50 ( 0.50)	1.00	20770.8	11201.00
1	3984.31	93.07	0.530	0.50 ( 0.50)	1.00	20877.9	11101.00
1	3587.28	98.50	0.520	0.50 ( 0.50)	1.00	21598.6	10710.00
1	3482.38	100.34	0.517	0.50 ( 0.50)	1.00	21797.1	10410.00
1	2989.76	109.15	0.500	0.50 ( 0.50)	1.00	22621.2	10700.00
1	2562.41	117.01	0.486	0.50 ( 0.50)	1.00	23293.8	10400.00
1	2208.84	123.88	0.475	0.50 ( 0.50)	1.00	23784.3	10200.00
1	1821.50	135.97	0.461	0.50 ( 0.50)	1.00	24513.7	10300.00
1	1804.62	136.54	0.460	0.50 ( 0.50)	1.00	24535.9	10320.00
1	1663.63	141.40	0.454	0.50 ( 0.50)	1.00	24644.6	10210.00
1	537.36	210.23	0.390	0.50 ( 0.50)	1.00	25513.0	10100.00
2	158.91	26.27	0.987	0.50 ( 0.50)	1.00	339.5	11530.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5919.92	23.39	1.065	0.50 ( 0.50)	1.00	4544.8	11500.00
2	158.91	26.27	0.987	0.50 ( 0.50)	1.00	339.5	11530.00

1	6078.83	23.39	1.065	0.50 ( 0.50)	1.00	4847.2	11500.00
2	6068.85	26.27	0.987	0.50 ( 0.50)	1.00	5460.1	11530.00
3	5991.48	34.97	0.842	0.50 ( 0.50)	1.00	7201.2	11000.00
4	5887.41	51.64	0.686	0.50 ( 0.50)	1.00	11895.1	11330.00
5	5876.13	52.77	0.680	0.50 ( 0.50)	1.00	12239.4	10850.00
6	5787.04	56.82	0.656	0.50 ( 0.50)	1.00	13543.5	10900.00
7	5696.32	59.96	0.637	0.50 ( 0.50)	1.00	14490.5	10830.00
8	5624.84	61.87	0.631	0.50 ( 0.50)	1.00	15010.8	10910.00
9	5477.45	64.59	0.622	0.50 ( 0.50)	1.00	15653.2	11130.00
10	4654.93	79.20	0.572	0.50 ( 0.50)	1.00	18536.5	10600.00
11	4112.77	90.69	0.535	0.50 ( 0.50)	1.00	20805.2	10500.00
12	4031.49	92.35	0.532	0.50 ( 0.50)	1.00	21110.3	11201.00
13	3994.12	93.07	0.530	0.50 ( 0.50)	1.00	21217.5	11101.00
14	3593.79	98.50	0.520	0.50 ( 0.50)	1.00	21938.1	10710.00
15	3487.77	100.34	0.517	0.50 ( 0.50)	1.00	22136.6	10410.00
16	2989.78	109.15	0.500	0.50 ( 0.50)	1.00	22960.7	10700.00
17	2562.41	117.01	0.486	0.50 ( 0.50)	1.00	23633.4	10400.00
18	2208.84	123.88	0.475	0.50 ( 0.50)	1.00	24123.8	10200.00
19	1821.50	135.97	0.461	0.50 ( 0.50)	1.00	24853.2	10300.00
20	1804.61	136.54	0.460	0.50 ( 0.50)	1.00	24875.5	10320.00
21	1663.63	141.40	0.454	0.50 ( 0.50)	1.00	24984.1	10210.00
22	537.36	210.23	0.390	0.50 ( 0.50)	1.00	25852.5	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 6078.83 Tc (MIN.) = 23.39  
 EFFECTIVE AREA (ACRES) = 4847.15 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 25852.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11540.00 = 74743.79 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11540.00 TO NODE 11541.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 577.77 DOWNSTREAM (FEET) = 556.39  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2053.36 CHANNEL SLOPE = 0.0104  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.991

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	389.46	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 6164.83  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.60  
 AVERAGE FLOW DEPTH (FEET) = 12.77 TRAVEL TIME (MIN.) = 2.72  
 Tc (MIN.) = 26.10  
 SUBAREA AREA (ACRES) = 389.46 SUBAREA RUNOFF (CFS) = 171.87  
 EFFECTIVE AREA (ACRES) = 5236.61 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 26242.0 PEAK FLOW RATE (CFS) = 6078.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:



DEPTH(FEET) = 12.71 FLOW VELOCITY(FEET/SEC.) = 12.55  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11541.00 = 76797.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11541.00 TO NODE 11542.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 556.39 DOWNSTREAM(FEET) = 523.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3267.94 CHANNEL SLOPE = 0.0101  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.898

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	330.30	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6138.01

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.46

AVERAGE FLOW DEPTH(FEET) = 12.81 TRAVEL TIME(MIN.) = 4.37

Tc(MIN.) = 30.47

SUBAREA AREA(ACRES) = 330.30 SUBAREA RUNOFF(CFS) = 118.29

EFFECTIVE AREA(ACRES) = 5566.91 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 26572.3 PEAK FLOW RATE(CFS) = 6078.83

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 12.77 FLOW VELOCITY(FEET/SEC.) = 12.43

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11542.00 = 80065.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11542.00 TO NODE 11543.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 523.29 DOWNSTREAM(FEET) = 493.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2857.94 CHANNEL SLOPE = 0.0104  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.851

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	285.11	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6123.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.57

AVERAGE FLOW DEPTH(FEET) = 12.75 TRAVEL TIME(MIN.) = 3.79

Tc(MIN.) = 34.26

SUBAREA AREA(ACRES) = 285.11 SUBAREA RUNOFF(CFS) = 90.04

EFFECTIVE AREA(ACRES) = 5852.02 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 26857.4 PEAK FLOW RATE(CFS) = 6078.83

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 12.71 FLOW VELOCITY(FEET/SEC.) = 12.54

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11543.00 = 82923.02 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11543.00 TO NODE 11544.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 493.61 DOWNSTREAM(FEET) = 480.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1963.01 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.813

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	303.63	0.50	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6122.52

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.73

AVERAGE FLOW DEPTH(FEET) = 13.79 TRAVEL TIME(MIN.) = 3.05

Tc(MIN.) = 37.31

SUBAREA AREA(ACRES) = 303.63 SUBAREA RUNOFF(CFS) = 87.34

EFFECTIVE AREA(ACRES) = 6155.65 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 27161.0 PEAK FLOW RATE(CFS) = 6078.83

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 13.75 FLOW VELOCITY(FEET/SEC.) = 10.72

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11544.00 = 84886.03 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11544.00 TO NODE 11545.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 480.21 DOWNSTREAM(FEET) = 456.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1914.49 CHANNEL SLOPE = 0.0122  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.784

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	184.16	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6102.32

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.33

AVERAGE FLOW DEPTH(FEET) = 12.35 TRAVEL TIME(MIN.) = 2.39

Tc(MIN.) = 39.71  
 SUBAREA AREA(ACRES) = 184.16 SUBAREA RUNOFF(CFS) = 46.98  
 EFFECTIVE AREA(ACRES) = 6339.81 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 27345.2 PEAK FLOW RATE(CFS) = 6078.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 12.34 FLOW VELOCITY(FEET/SEC.) = 13.31  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11545.00 = 86800.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 456.90 DOWNSTREAM(FEET) = 436.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2322.79 CHANNEL SLOPE = 0.0089  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.755

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	151.95	0.50	0.844	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.844  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6101.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.85  
 AVERAGE FLOW DEPTH(FEET) = 13.10 TRAVEL TIME(MIN.) = 3.27  
 Tc(MIN.) = 42.97  
 SUBAREA AREA(ACRES) = 151.95 SUBAREA RUNOFF(CFS) = 45.52  
 EFFECTIVE AREA(ACRES) = 6491.76 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 27497.1 PEAK FLOW RATE(CFS) = 6078.83  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.08 FLOW VELOCITY(FEET/SEC.) = 11.84  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)	=	27497.1	TC(MIN.)	=	42.97
EFFECTIVE AREA(ACRES)	=	6491.76	AREA-AVERAGED Fm(INCH/HR)	=	0.50
AREA-AVERAGED Fp(INCH/HR)	=	0.50	AREA-AVERAGED Ap	=	0.995
PEAK FLOW RATE(CFS)	=	6078.83			

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6078.83	42.97	0.755	0.50( 0.50)	0.99	6491.8	11500.00
2	6068.85	45.87	0.731	0.50( 0.50)	0.99	7104.8	11530.00
3	5991.48	54.64	0.669	0.50( 0.50)	1.00	8845.8	11000.00
4	5887.41	71.41	0.599	0.50( 0.50)	1.00	13539.7	11330.00
5	5876.13	72.55	0.595	0.50( 0.50)	1.00	13884.0	10850.00
6	5787.04	76.68	0.581	0.50( 0.50)	1.00	15188.1	10900.00
7	5696.32	79.89	0.570	0.50( 0.50)	1.00	16135.1	10830.00

8	5624.84	81.88	0.563	0.50( 0.50)	1.00	16655.4	10910.00
9	5477.45	84.72	0.554	0.50( 0.50)	1.00	17297.8	11130.00
10	4654.93	100.18	0.517	0.50( 0.50)	1.00	20181.1	10600.00
11	4112.77	112.33	0.494	0.50( 0.50)	1.00	22449.8	10500.00
12	4031.49	114.10	0.491	0.50( 0.50)	1.00	22754.9	11201.00
13	3994.12	114.87	0.490	0.50( 0.50)	1.00	22862.1	11101.00
14	3593.79	120.88	0.479	0.50( 0.50)	1.00	23582.7	10710.00
15	3487.77	122.89	0.476	0.50( 0.50)	1.00	23781.2	10410.00
16	2989.78	132.58	0.465	0.50( 0.50)	1.00	24605.4	10700.00
17	2562.41	141.37	0.454	0.50( 0.50)	1.00	25278.0	10400.00
18	2208.84	149.16	0.445	0.50( 0.50)	1.00	25768.4	10200.00
19	1821.50	162.51	0.428	0.50( 0.50)	1.00	26497.8	10300.00
20	1804.61	163.13	0.428	0.50( 0.50)	1.00	26520.1	10320.00
21	1663.63	168.53	0.421	0.50( 0.50)	1.00	26628.8	10210.00
22	537.36	246.21	0.370	0.50( 0.50)	1.00	27497.1	10100.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S16.DAT  
TIME/DATE OF STUDY: 10:30 04/01/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.911
- 2) 10.00; 1.910
- 3) 15.00; 1.364
- 4) 20.00; 1.170
- 5) 25.00; 1.015
- 6) 30.00; 0.904
- 7) 40.00; 0.780
- 8) 50.00; 0.696
- 9) 60.00; 0.637
- 10) 90.00; 0.536
- 11) 120.00; 0.480
- 12) 180.00; 0.407
- 13) 360.00; 0.307
- 14) 1440.00; 0.137

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11600.00 TO NODE 11601.00 IS CODE = 21  
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 390.21  
ELEVATION DATA: UPSTREAM(FEET) = 3061.08 DOWNSTREAM(FEET) = 2962.88

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.897

SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	1.79	0.50	1.000	0	10.12

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.25  
TOTAL AREA(ACRES) = 1.79 PEAK FLOW RATE(CFS) = 2.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11601.00 TO NODE 11602.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.88 DOWNSTREAM(FEET) = 2839.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 548.33 CHANNEL SLOPE = 0.2252  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.694

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	4.88	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.92  
AVERAGE FLOW DEPTH(FEET) = 0.58 TRAVEL TIME(MIN.) = 1.86

Tc(MIN.) = 11.98  
SUBAREA AREA(ACRES) = 4.88 SUBAREA RUNOFF(CFS) = 5.24  
EFFECTIVE AREA(ACRES) = 6.67 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 7.17

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 5.47  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11602.00 = 938.54 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11602.00 TO NODE 11603.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2839.39 DOWNSTREAM(FEET) = 2697.55  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.87 CHANNEL SLOPE = 0.1452  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.396

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.42	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.02

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.97

AVERAGE FLOW DEPTH(FEET) = 1.06 TRAVEL TIME(MIN.) = 2.73

Tc(MIN.) = 14.71

SUBAREA AREA(ACRES) = 31.42 SUBAREA RUNOFF(CFS) = 25.34

EFFECTIVE AREA(ACRES) = 38.09 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 38.1 PEAK FLOW RATE(CFS) = 30.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.24 FLOW VELOCITY(FEET/SEC.) = 6.65

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11603.00 = 1915.41 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11603.00 TO NODE 11604.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2697.55 DOWNSTREAM(FEET) = 2598.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1887.15 CHANNEL SLOPE = 0.0523  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.145

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.03	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.82

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.17

AVERAGE FLOW DEPTH(FEET) = 1.83 TRAVEL TIME(MIN.) = 6.09

Tc(MIN.) = 20.79

SUBAREA AREA(ACRES) = 72.03 SUBAREA RUNOFF(CFS) = 41.83

EFFECTIVE AREA(ACRES) = 110.12 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 63.95

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.98 FLOW VELOCITY(FEET/SEC.) = 5.43

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11604.00 = 3802.56 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11604.00 TO NODE 11605.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2598.90 DOWNSTREAM(FEET) = 2464.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2488.89 CHANNEL SLOPE = 0.0541  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.952

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.28	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 83.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.88

AVERAGE FLOW DEPTH(FEET) = 2.18 TRAVEL TIME(MIN.) = 7.05

Tc(MIN.) = 27.84

SUBAREA AREA(ACRES) = 96.28 SUBAREA RUNOFF(CFS) = 39.14

EFFECTIVE AREA(ACRES) = 206.40 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 206.4 PEAK FLOW RATE(CFS) = 83.91

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.18 FLOW VELOCITY(FEET/SEC.) = 5.89

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11605.00 = 6291.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11605.00 TO NODE 11606.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2464.25 DOWNSTREAM(FEET) = 2359.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1936.71 CHANNEL SLOPE = 0.0538  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.869

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	266.26	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 128.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.53

AVERAGE FLOW DEPTH(FEET) = 2.56 TRAVEL TIME(MIN.) = 4.94

Tc(MIN.) = 32.78

SUBAREA AREA(ACRES) = 266.26 SUBAREA RUNOFF(CFS) = 88.49

EFFECTIVE AREA(ACRES) = 472.66 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 472.7 PEAK FLOW RATE(CFS) = 157.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.76 FLOW VELOCITY(FEET/SEC.) = 6.88

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11606.00 = 8228.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11606.00 TO NODE 11607.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2359.99 DOWNSTREAM(FEET) = 1905.15  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3829.49 CHANNEL SLOPE = 0.1188  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.786  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 132.44 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 174.16  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.48  
AVERAGE FLOW DEPTH(FEET) = 2.47 TRAVEL TIME(MIN.) = 6.73  
Tc(MIN.) = 39.52  
SUBAREA AREA(ACRES) = 132.44 SUBAREA RUNOFF(CFS) = 34.07  
EFFECTIVE AREA(ACRES) = 605.10 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 605.1 PEAK FLOW RATE(CFS) = 157.09  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.38 FLOW VELOCITY(FEET/SEC.) = 9.26  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11607.00 = 12057.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11607.00 TO NODE 11608.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1905.15 DOWNSTREAM(FEET) = 1717.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1095.02 CHANNEL SLOPE = 0.1710  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 76.91 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 166.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.76  
AVERAGE FLOW DEPTH(FEET) = 2.27 TRAVEL TIME(MIN.) = 1.70  
Tc(MIN.) = 41.21  
SUBAREA AREA(ACRES) = 76.91 SUBAREA RUNOFF(CFS) = 18.66  
EFFECTIVE AREA(ACRES) = 682.01 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 682.0 PEAK FLOW RATE(CFS) = 165.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.26 FLOW VELOCITY(FEET/SEC.) = 10.77  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11608.00 = 13152.67 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11608.00 TO NODE 11609.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1717.92 DOWNSTREAM(FEET) = 1516.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1480.24 CHANNEL SLOPE = 0.1362  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.750  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 328.91 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 202.44  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.37  
AVERAGE FLOW DEPTH(FEET) = 2.55 TRAVEL TIME(MIN.) = 2.38  
Tc(MIN.) = 43.59  
SUBAREA AREA(ACRES) = 328.91 SUBAREA RUNOFF(CFS) = 73.89  
EFFECTIVE AREA(ACRES) = 1010.92 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1010.9 PEAK FLOW RATE(CFS) = 227.11

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.66 FLOW VELOCITY(FEET/SEC.) = 10.70  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11609.00 = 14632.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11609.00 TO NODE 11610.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1516.24 DOWNSTREAM(FEET) = 1332.01  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.38 CHANNEL SLOPE = 0.0957  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.722  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 355.16 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 262.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.71  
AVERAGE FLOW DEPTH(FEET) = 3.00 TRAVEL TIME(MIN.) = 3.31  
Tc(MIN.) = 46.90  
SUBAREA AREA(ACRES) = 355.16 SUBAREA RUNOFF(CFS) = 70.91  
EFFECTIVE AREA(ACRES) = 1366.08 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1366.1 PEAK FLOW RATE(CFS) = 272.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.05 FLOW VELOCITY(FEET/SEC.) = 9.79  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11610.00 = 16558.29 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11610.00 TO NODE 11611.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1332.01 DOWNSTREAM(FEET) = 1105.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2901.03 CHANNEL SLOPE = 0.0781  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.683

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	234.59	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 292.11

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.23

AVERAGE FLOW DEPTH(FEET) = 3.25 TRAVEL TIME(MIN.) = 5.24

Tc(MIN.) = 52.13

SUBAREA AREA(ACRES) = 234.59 SUBAREA RUNOFF(CFS) = 38.68

EFFECTIVE AREA(ACRES) = 1600.67 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1600.7 PEAK FLOW RATE(CFS) = 272.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.16 FLOW VELOCITY(FEET/SEC.) = 9.09

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11611.00 = 19459.32 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11611.00 TO NODE 11612.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1105.34 DOWNSTREAM(FEET) = 1030.47  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1982.46 CHANNEL SLOPE = 0.0378  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.656

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.67	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 287.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.01

AVERAGE FLOW DEPTH(FEET) = 3.70 TRAVEL TIME(MIN.) = 4.71

Tc(MIN.) = 56.85

SUBAREA AREA(ACRES) = 212.67 SUBAREA RUNOFF(CFS) = 29.74

EFFECTIVE AREA(ACRES) = 1813.34 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1813.3 PEAK FLOW RATE(CFS) = 272.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.63 FLOW VELOCITY(FEET/SEC.) = 6.91

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11612.00 = 21441.78 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1030.47 DOWNSTREAM(FEET) = 870.22  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3051.86 CHANNEL SLOPE = 0.0525  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	465.36	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 299.18

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.01

AVERAGE FLOW DEPTH(FEET) = 3.53 TRAVEL TIME(MIN.) = 6.35

Tc(MIN.) = 63.20

SUBAREA AREA(ACRES) = 465.36 SUBAREA RUNOFF(CFS) = 52.78

EFFECTIVE AREA(ACRES) = 2278.70 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2278.7 PEAK FLOW RATE(CFS) = 272.75

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.41 FLOW VELOCITY(FEET/SEC.) = 7.83

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

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FLOW PROCESS FROM NODE 11612.00 TO NODE 11630.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 63.20

RAINFALL INTENSITY(INCH/HR) = 0.63

AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA(ACRES) = 2278.70

TOTAL STREAM AREA(ACRES) = 2278.70

PEAK FLOW RATE(CFS) AT CONFLUENCE = 272.75

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FLOW PROCESS FROM NODE 11620.00 TO NODE 11621.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 266.64  
ELEVATION DATA: UPSTREAM (FEET) = 2567.03 DOWNSTREAM (FEET) = 2486.90

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.387

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.233

SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER						
"CHAPARRAL, BROADLEAF"	-	0.69	0.50	1.000	0	8.39

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF (CFS) = 1.08

TOTAL AREA (ACRES) = 0.69 PEAK FLOW RATE (CFS) = 1.08

\*\*\*\*\*

FLOW PROCESS FROM NODE 11621.00 TO NODE 11622.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2486.90 DOWNSTREAM (FEET) = 2424.91  
CHANNEL LENGTH THRU SUBAREA (FEET) = 712.48 CHANNEL SLOPE = 0.0870

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.660

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.63	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 3.02

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.04

AVERAGE FLOW DEPTH (FEET) = 0.58 TRAVEL TIME (MIN.) = 3.90

Tc (MIN.) = 12.29

SUBAREA AREA (ACRES) = 3.63 SUBAREA RUNOFF (CFS) = 3.79

EFFECTIVE AREA (ACRES) = 4.32 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 4.3 PEAK FLOW RATE (CFS) = 4.51

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.67 FLOW VELOCITY (FEET/SEC.) = 3.38

LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11622.00 = 979.12 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11622.00 TO NODE 11623.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2424.91 DOWNSTREAM (FEET) = 2351.48  
CHANNEL LENGTH THRU SUBAREA (FEET) = 977.46 CHANNEL SLOPE = 0.0751

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.305

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.42	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9.42

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.85

AVERAGE FLOW DEPTH (FEET) = 0.90 TRAVEL TIME (MIN.) = 4.23

Tc (MIN.) = 16.52

SUBAREA AREA (ACRES) = 13.42 SUBAREA RUNOFF (CFS) = 9.72

EFFECTIVE AREA (ACRES) = 17.74 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 17.7 PEAK FLOW RATE (CFS) = 12.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.01 FLOW VELOCITY (FEET/SEC.) = 4.18

LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11623.00 = 1956.58 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11623.00 TO NODE 11624.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2351.48 DOWNSTREAM (FEET) = 2317.87

CHANNEL LENGTH THRU SUBAREA (FEET) = 947.96 CHANNEL SLOPE = 0.0355

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.133

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.02	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 17.44

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.39

AVERAGE FLOW DEPTH (FEET) = 1.31 TRAVEL TIME (MIN.) = 4.66

Tc (MIN.) = 21.18

SUBAREA AREA (ACRES) = 16.02 SUBAREA RUNOFF (CFS) = 9.13

EFFECTIVE AREA (ACRES) = 33.76 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 33.8 PEAK FLOW RATE (CFS) = 19.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 3.49

LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.00 = 2904.54 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11624.00 TO NODE 11624.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2317.87 DOWNSTREAM (FEET) = 2292.33

CHANNEL LENGTH THRU SUBAREA (FEET) = 758.23 CHANNEL SLOPE = 0.0337

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.028  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.93	0.50	0.984	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.984  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 27.20  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.72  
 AVERAGE FLOW DEPTH (FEET) = 1.56 TRAVEL TIME (MIN.) = 3.40  
 Tc (MIN.) = 24.58  
 SUBAREA AREA (ACRES) = 32.93 SUBAREA RUNOFF (CFS) = 15.88  
 EFFECTIVE AREA (ACRES) = 66.69 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 66.7 PEAK FLOW RATE (CFS) = 31.92

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.66 FLOW VELOCITY (FEET/SEC.) = 3.87  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11624.50 = 3662.77 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11624.50 TO NODE 11625.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2292.33 DOWNSTREAM (FEET) = 2256.59  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1098.98 CHANNEL SLOPE = 0.0325  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.924  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	48.16	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 41.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.07  
 AVERAGE FLOW DEPTH (FEET) = 1.84 TRAVEL TIME (MIN.) = 4.50  
 Tc (MIN.) = 29.08  
 SUBAREA AREA (ACRES) = 48.16 SUBAREA RUNOFF (CFS) = 18.39  
 EFFECTIVE AREA (ACRES) = 114.85 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 114.9 PEAK FLOW RATE (CFS) = 44.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.88 FLOW VELOCITY (FEET/SEC.) = 4.15  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11625.00 = 4761.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11625.00 TO NODE 11626.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2256.59 DOWNSTREAM (FEET) = 2104.66  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2056.93 CHANNEL SLOPE = 0.0739  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.850  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	212.15	0.50	0.950	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.950  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 80.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.54  
 AVERAGE FLOW DEPTH (FEET) = 2.02 TRAVEL TIME (MIN.) = 5.24  
 Tc (MIN.) = 34.32  
 SUBAREA AREA (ACRES) = 212.15 SUBAREA RUNOFF (CFS) = 71.65  
 EFFECTIVE AREA (ACRES) = 327.00 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 327.0 PEAK FLOW RATE (CFS) = 108.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.26 FLOW VELOCITY (FEET/SEC.) = 7.05  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11626.00 = 6818.68 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11626.00 TO NODE 11627.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2104.66 DOWNSTREAM (FEET) = 1837.03  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2716.08 CHANNEL SLOPE = 0.0985  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.782  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	147.74	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 126.87  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.16  
 AVERAGE FLOW DEPTH (FEET) = 2.28 TRAVEL TIME (MIN.) = 5.55  
 Tc (MIN.) = 39.86  
 SUBAREA AREA (ACRES) = 147.74 SUBAREA RUNOFF (CFS) = 37.43  
 EFFECTIVE AREA (ACRES) = 474.74 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 474.7 PEAK FLOW RATE (CFS) = 125.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 2.26 FLOW VELOCITY (FEET/SEC.) = 8.15  
 LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11627.00 = 9534.76 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11627.00 TO NODE 11628.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<



>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1837.03 DOWNSTREAM(FEET) = 1393.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2077.86 CHANNEL SLOPE = 0.2132  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.756  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	202.44	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 148.56  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.36  
AVERAGE FLOW DEPTH(FEET) = 2.09 TRAVEL TIME(MIN.) = 3.05  
Tc(MIN.) = 42.91  
SUBAREA AREA(ACRES) = 202.44 SUBAREA RUNOFF(CFS) = 46.52  
EFFECTIVE AREA(ACRES) = 677.18 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 677.2 PEAK FLOW RATE(CFS) = 160.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.15 FLOW VELOCITY(FEET/SEC.) = 11.60  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11628.00 = 11612.62 FEET.

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FLOW PROCESS FROM NODE 11628.00 TO NODE 11629.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1393.93 DOWNSTREAM(FEET) = 1201.61  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2844.34 CHANNEL SLOPE = 0.0676  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.704  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	141.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 173.61  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.69  
AVERAGE FLOW DEPTH(FEET) = 2.74 TRAVEL TIME(MIN.) = 6.17  
Tc(MIN.) = 49.08  
SUBAREA AREA(ACRES) = 141.55 SUBAREA RUNOFF(CFS) = 25.93  
EFFECTIVE AREA(ACRES) = 818.73 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 818.7 PEAK FLOW RATE(CFS) = 160.63  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.67 FLOW VELOCITY(FEET/SEC.) = 7.54  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11629.00 = 14456.96 FEET.

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FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1201.61 DOWNSTREAM(FEET) = 870.22  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3807.89 CHANNEL SLOPE = 0.0870  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.657  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	106.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 168.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.36  
AVERAGE FLOW DEPTH(FEET) = 2.59 TRAVEL TIME(MIN.) = 7.59  
Tc(MIN.) = 56.67  
SUBAREA AREA(ACRES) = 106.41 SUBAREA RUNOFF(CFS) = 14.98  
EFFECTIVE AREA(ACRES) = 925.14 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 925.1 PEAK FLOW RATE(CFS) = 160.63  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.54 FLOW VELOCITY(FEET/SEC.) = 8.28  
LONGEST FLOWPATH FROM NODE 11620.00 TO NODE 11630.00 = 18264.85 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11629.00 TO NODE 11630.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION(MIN.) = 56.67  
RAINFALL INTENSITY(INCH/HR) = 0.66  
AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 925.14  
TOTAL STREAM AREA(ACRES) = 925.14  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 160.63

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	272.75	63.20	0.626	0.50( 0.50)	1.00	2278.7	11600.00
2	160.63	56.67	0.657	0.50( 0.49)	0.99	925.1	11620.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	433.38	56.67	0.657	0.50 ( 0.50)	1.00	2968.4 11620.00
2	403.31	63.20	0.626	0.50 ( 0.50)	1.00	3203.8 11600.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 433.38 Tc (MIN.) = 56.67  
EFFECTIVE AREA (ACRES) = 2968.45 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 3203.8  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11630.00 = 24493.64 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 3203.8 TC (MIN.) = 56.67  
EFFECTIVE AREA (ACRES) = 2968.45 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.996  
PEAK FLOW RATE (CFS) = 433.38

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	433.38	56.67	0.657	0.50 ( 0.50)	1.00	2968.4	11620.00
2	403.31	63.20	0.626	0.50 ( 0.50)	1.00	3203.8	11600.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S17.DAT  
TIME/DATE OF STUDY: 10:37 04/01/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

---\*TIME-OF-CONCENTRATION MODEL\*---

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1) 5.00; 2.911  
2) 10.00; 1.910  
3) 15.00; 1.364  
4) 20.00; 1.170  
5) 25.00; 1.015  
6) 30.00; 0.904  
7) 40.00; 0.780  
8) 50.00; 0.696  
9) 60.00; 0.637  
10) 90.00; 0.536  
11) 120.00; 0.480  
12) 180.00; 0.407  
13) 360.00; 0.307  
14) 1440.00; 0.137

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING  
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR  
NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n)  
=== =====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0313 0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11701.00 TO NODE 11702.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 291.79  
ELEVATION DATA: UPSTREAM(FEET) = 1581.05 DOWNSTREAM(FEET) = 1496.25

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.753  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.160  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 2.72 0.50 1.000 0 8.75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.06  
TOTAL AREA(ACRES) = 2.72 PEAK FLOW RATE(CFS) = 4.06

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11702.00 TO NODE 11703.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1496.25 DOWNSTREAM(FEET) = 1254.33  
CHANNEL LENGTH THRU SUBAREA(FEET) = 563.54 CHANNEL SLOPE = 0.4293  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.914  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 10.12 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.52  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.67  
AVERAGE FLOW DEPTH(FEET) = 0.68 TRAVEL TIME(MIN.) = 1.22  
Tc(MIN.) = 9.98  
SUBAREA AREA(ACRES) = 10.12 SUBAREA RUNOFF(CFS) = 12.88  
EFFECTIVE AREA(ACRES) = 12.84 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 12.8 PEAK FLOW RATE(CFS) = 16.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.80 FLOW VELOCITY(FEET/SEC.) = 8.55  
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11703.00 = 855.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11703.00 TO NODE 11704.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1254.33 DOWNSTREAM(FEET) = 1143.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.91 CHANNEL SLOPE = 0.1076  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.586

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.71

AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 2.99

Tc(MIN.) = 12.97

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 21.02

EFFECTIVE AREA(ACRES) = 34.36 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 34.4 PEAK FLOW RATE(CFS) = 33.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.36 FLOW VELOCITY(FEET/SEC.) = 6.04

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11704.00 = 1881.24 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11704.00 TO NODE 11705.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1143.91 DOWNSTREAM(FEET) = 804.90  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1952.20 CHANNEL SLOPE = 0.1737  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.286

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.19	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.44

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.04

AVERAGE FLOW DEPTH(FEET) = 1.46 TRAVEL TIME(MIN.) = 4.05

Tc(MIN.) = 17.02

SUBAREA AREA(ACRES) = 50.19 SUBAREA RUNOFF(CFS) = 35.49

EFFECTIVE AREA(ACRES) = 84.55 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 84.6 PEAK FLOW RATE(CFS) = 59.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.54 FLOW VELOCITY(FEET/SEC.) = 8.36

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11705.00 = 3833.44 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 804.90 DOWNSTREAM(FEET) = 725.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1056.71 CHANNEL SLOPE = 0.0753  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.176

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	15.89	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.62

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.25

AVERAGE FLOW DEPTH(FEET) = 1.86 TRAVEL TIME(MIN.) = 2.82

Tc(MIN.) = 19.83

SUBAREA AREA(ACRES) = 15.89 SUBAREA RUNOFF(CFS) = 9.67

EFFECTIVE AREA(ACRES) = 100.44 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 100.4 PEAK FLOW RATE(CFS) = 61.13

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.82 FLOW VELOCITY(FEET/SEC.) = 6.16

LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 10

-----  
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S16.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	433.38	56.67	0.50( 0.50)	1.00	2968.4	11620.00
2	403.31	63.20	0.50( 0.50)	1.00	3203.8	11600.00
TOTAL AREA(ACRES) =			3203.8			

\*\*\*\*\*

FLOW PROCESS FROM NODE 11630.00 TO NODE 11630.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	433.38	56.67	0.50( 0.50)	1.00	2968.4	11620.00
2	403.31	63.20	0.50( 0.50)	1.00	3203.8	11600.00
TOTAL AREA(ACRES) =			3203.8			

\*\*\*\*\*

FLOW PROCESS FROM NODE 11630.00 TO NODE 11721.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 870.22 DOWNSTREAM(FEET) = 725.34
CHANNEL LENGTH THRU SUBAREA(FEET) = 3507.54 CHANNEL SLOPE = 0.0413
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.624

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 213.50 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 445.26
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.08
AVERAGE FLOW DEPTH(FEET) = 4.28 TRAVEL TIME(MIN.) = 7.23
Tc(MIN.) = 63.90
SUBAREA AREA(ACRES) = 213.50 SUBAREA RUNOFF(CFS) = 23.76
EFFECTIVE AREA(ACRES) = 3181.95 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3417.3 PEAK FLOW RATE(CFS) = 433.38
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.24 FLOW VELOCITY(FEET/SEC.) = 8.02
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11705.00 TO NODE 11721.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 433.38 63.90 0.624 0.50( 0.50) 1.00 3181.9 11620.00
2 403.31 70.58 0.601 0.50( 0.50) 1.00 3417.3 11600.00
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 61.13 19.83 1.176 0.50( 0.50) 1.00 100.4 11701.00
LONGEST FLOWPATH FROM NODE 11701.00 TO NODE 11721.00 = 4890.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 494.51 19.83 1.176 0.50( 0.50) 1.00 1088.1 11701.00
2 444.56 63.90 0.624 0.50( 0.50) 1.00 3282.4 11620.00
3 412.46 70.58 0.601 0.50( 0.50) 1.00 3517.8 11600.00
TOTAL AREA(ACRES) = 3517.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 494.51 Tc(MIN.) = 19.834
EFFECTIVE AREA(ACRES) = 1088.07 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3517.8
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11721.00 = 28001.18 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11721.00 TO NODE 11722.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 725.34 DOWNSTREAM(FEET) = 657.70
CHANNEL LENGTH THRU SUBAREA(FEET) = 1845.27 CHANNEL SLOPE = 0.0367
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.057

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 185.10 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 540.91
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.10
AVERAGE FLOW DEPTH(FEET) = 4.72 TRAVEL TIME(MIN.) = 3.80
Tc(MIN.) = 23.63
SUBAREA AREA(ACRES) = 185.10 SUBAREA RUNOFF(CFS) = 92.83
EFFECTIVE AREA(ACRES) = 1273.17 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3702.9 PEAK FLOW RATE(CFS) = 640.06

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.02 FLOW VELOCITY(FEET/SEC.) = 8.46
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11722.00 = 29846.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11722.00 TO NODE 11723.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 657.70 DOWNSTREAM(FEET) = 609.57
CHANNEL LENGTH THRU SUBAREA(FEET) = 1967.44 CHANNEL SLOPE = 0.0245
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.947

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 273.16 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 695.08
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42
AVERAGE FLOW DEPTH(FEET) = 5.59 TRAVEL TIME(MIN.) = 4.42
Tc(MIN.) = 28.05

SUBAREA AREA(ACRES) = 273.16 SUBAREA RUNOFF(CFS) = 109.92  
EFFECTIVE AREA(ACRES) = 1546.33 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3976.0 PEAK FLOW RATE(CFS) = 640.06  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.42 FLOW VELOCITY(FEET/SEC.) = 7.26  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11723.00 = 31813.89 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11723.00 TO NODE 11724.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 609.57 DOWNSTREAM(FEET) = 546.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2808.53 CHANNEL SLOPE = 0.0224  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.846

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	159.72	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 664.97

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.09

AVERAGE FLOW DEPTH(FEET) = 5.59 TRAVEL TIME(MIN.) = 6.60

Tc(MIN.) = 34.65

SUBAREA AREA(ACRES) = 159.72 SUBAREA RUNOFF(CFS) = 49.76

EFFECTIVE AREA(ACRES) = 1706.05 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 4135.8 PEAK FLOW RATE(CFS) = 640.06

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.51 FLOW VELOCITY(FEET/SEC.) = 7.02  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11724.00 = 34622.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11724.00 TO NODE 11725.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 546.77 DOWNSTREAM(FEET) = 483.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.33 CHANNEL SLOPE = 0.0216  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.766

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.67	0.50	0.917	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.917

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 658.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.99  
AVERAGE FLOW DEPTH(FEET) = 5.60 TRAVEL TIME(MIN.) = 6.97  
Tc(MIN.) = 41.61

SUBAREA AREA(ACRES) = 134.67 SUBAREA RUNOFF(CFS) = 37.30  
EFFECTIVE AREA(ACRES) = 1840.72 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 4270.4 PEAK FLOW RATE(CFS) = 640.06  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.55 FLOW VELOCITY(FEET/SEC.) = 6.93  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11725.00 = 37543.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 483.75 DOWNSTREAM(FEET) = 436.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2685.66 CHANNEL SLOPE = 0.0177  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.708

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.44	0.50	0.986	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.986

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 651.83

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.47

AVERAGE FLOW DEPTH(FEET) = 5.80 TRAVEL TIME(MIN.) = 6.92

Tc(MIN.) = 48.53

SUBAREA AREA(ACRES) = 121.44 SUBAREA RUNOFF(CFS) = 23.51

EFFECTIVE AREA(ACRES) = 1962.16 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 4391.9 PEAK FLOW RATE(CFS) = 640.06

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.76 FLOW VELOCITY(FEET/SEC.) = 6.44  
LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 4391.9 TC(MIN.) = 48.53  
EFFECTIVE AREA(ACRES) = 1962.16 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.992  
PEAK FLOW RATE(CFS) = 640.06

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	640.06	48.53	0.708	0.50( 0.50)	0.99	1962.2	11701.00
2	444.56	95.33	0.526	0.50( 0.50)	0.99	4156.5	11620.00
3	412.46	102.61	0.512	0.50( 0.50)	0.99	4391.9	11600.00

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S18.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

1)	5.00;	2.889
2)	10.00;	1.897
3)	15.00;	1.359
4)	20.00;	1.165
5)	25.00;	1.012
6)	30.00;	0.902
7)	40.00;	0.777
8)	50.00;	0.694
9)	60.00;	0.634
10)	90.00;	0.533
11)	120.00;	0.477
12)	180.00;	0.404
13)	360.00;	0.304
14)	1440.00;	0.135

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11801.00 TO NODE 11802.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 970.31  
ELEVATION DATA: UPSTREAM(FEET) = 834.89 DOWNSTREAM(FEET) = 727.50

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 17.170  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.275

SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
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NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	-	7.24	0.50	1.000	0	17.17

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
SUBAREA RUNOFF(CFS) = 5.05  
TOTAL AREA(ACRES) = 7.24 PEAK FLOW RATE(CFS) = 5.05

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11802.00 TO NODE 11803.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 727.50 DOWNSTREAM(FEET) = 674.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 968.10 CHANNEL SLOPE = 0.0551  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.114

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
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USER-DEFINED	-	22.08	0.50	1.000	-
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SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.59  
AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 4.50  
 $T_c$ (MIN.) = 21.67  
SUBAREA AREA(ACRES) = 22.08 SUBAREA RUNOFF(CFS) = 12.20  
EFFECTIVE AREA(ACRES) = 29.32 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.50  
AREA-AVERAGED  $F_p$ (INCH/HR) = 0.50 AREA-AVERAGED  $A_p$  = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 16.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 3.93  
LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11803.00 = 1938.41 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11803.00 TO NODE 11804.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 674.12 DOWNSTREAM(FEET) = 554.40  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.27 CHANNEL SLOPE = 0.0642  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.57  
 AVERAGE FLOW DEPTH(FEET) = 1.30 TRAVEL TIME(MIN.) = 6.80  
 Tc(MIN.) = 28.47  
 SUBAREA AREA(ACRES) = 35.55 SUBAREA RUNOFF(CFS) = 13.93  
 EFFECTIVE AREA(ACRES) = 64.87 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 64.9 PEAK FLOW RATE(CFS) = 25.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.35 FLOW VELOCITY(FEET/SEC.) = 4.67  
 LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11804.00 = 3802.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 554.40 DOWNSTREAM(FEET) = 423.93  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1767.25 CHANNEL SLOPE = 0.0738  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.850

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	36.70	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.19  
 AVERAGE FLOW DEPTH(FEET) = 1.42 TRAVEL TIME(MIN.) = 5.68  
 Tc(MIN.) = 34.15  
 SUBAREA AREA(ACRES) = 36.70 SUBAREA RUNOFF(CFS) = 11.56  
 EFFECTIVE AREA(ACRES) = 101.57 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 101.6 PEAK FLOW RATE(CFS) = 31.99

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.43 FLOW VELOCITY(FEET/SEC.) = 5.20  
 LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2<<<<<

PEAK FLOWRATE TABLE FILE NAME: S15.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6078.83	42.97	0.50( 0.50)	0.99	6491.8	11500.00
2	6068.85	45.87	0.50( 0.50)	0.99	7104.8	11530.00
3	5991.48	54.64	0.50( 0.50)	1.00	8845.8	11000.00
4	5887.41	71.41	0.50( 0.50)	1.00	13539.7	11330.00
5	5876.13	72.55	0.50( 0.50)	1.00	13884.0	10850.00
6	5787.04	76.68	0.50( 0.50)	1.00	15188.1	10900.00
7	5696.32	79.89	0.50( 0.50)	1.00	16135.1	10830.00
8	5624.84	81.88	0.50( 0.50)	1.00	16655.4	10910.00
9	5477.45	84.72	0.50( 0.50)	1.00	17297.8	11130.00
10	4654.93	100.18	0.50( 0.50)	1.00	20181.1	10600.00
11	4112.77	112.33	0.50( 0.50)	1.00	22449.8	10500.00
12	4031.49	114.10	0.50( 0.50)	1.00	22754.9	11201.00
13	3593.79	120.88	0.50( 0.50)	1.00	23582.7	10710.00
14	3487.77	122.89	0.50( 0.50)	1.00	23781.2	10410.00
15	2989.78	132.58	0.50( 0.50)	1.00	24605.4	10700.00
16	2562.41	141.37	0.50( 0.50)	1.00	25278.0	10400.00
17	2208.84	149.16	0.50( 0.50)	1.00	25768.4	10200.00
18	1821.50	162.51	0.50( 0.50)	1.00	26497.8	10300.00
19	1663.63	168.53	0.50( 0.50)	1.00	26628.8	10210.00
20	537.36	246.21	0.50( 0.50)	1.00	27497.1	10100.00
TOTAL AREA(ACRES) =						27497.1

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3<<<<<

PEAK FLOWRATE TABLE FILE NAME: S17.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	640.06	48.53	0.50( 0.50)	0.99	1962.2	11701.00
2	444.56	95.33	0.50( 0.50)	0.99	4156.5	11620.00
3	412.46	102.61	0.50( 0.50)	0.99	4391.9	11600.00
TOTAL AREA(ACRES) =						4391.9

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11725.00 TO NODE 11726.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	640.06	48.53	0.50( 0.50)	0.99	1962.2	11701.00
2	444.56	95.33	0.50( 0.50)	0.99	4156.5	11620.00



3 412.46 102.61 0.50( 0.50) 0.99 4391.9 11600.00  
TOTAL AREA(ACRES) = 4391.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11545.00 TO NODE 11726.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	640.06	48.53	0.706	0.50( 0.50)	0.99	1962.2	11701.00
2	444.56	95.33	0.523	0.50( 0.50)	0.99	4156.5	11620.00
3	412.46	102.61	0.509	0.50( 0.50)	0.99	4391.9	11600.00

LONGEST FLOWPATH FROM NODE 11600.00 TO NODE 11726.00 = 40229.41 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6078.83	42.97	0.752	0.50( 0.50)	0.99	6491.8	11500.00
2	6068.85	45.87	0.728	0.50( 0.50)	0.99	7104.8	11530.00
3	5991.48	54.64	0.666	0.50( 0.50)	1.00	8845.8	11000.00
4	5887.41	71.41	0.596	0.50( 0.50)	1.00	13539.7	11330.00
5	5876.13	72.55	0.592	0.50( 0.50)	1.00	13884.0	10850.00
6	5787.04	76.68	0.578	0.50( 0.50)	1.00	15188.1	10900.00
7	5696.32	79.89	0.567	0.50( 0.50)	1.00	16135.1	10830.00
8	5624.84	81.88	0.560	0.50( 0.50)	1.00	16655.4	10910.00
9	5477.45	84.72	0.551	0.50( 0.50)	1.00	17297.8	11130.00
10	4654.93	100.18	0.514	0.50( 0.50)	1.00	20181.1	10600.00
11	4112.77	112.33	0.491	0.50( 0.50)	1.00	22449.8	10500.00
12	4031.49	114.10	0.488	0.50( 0.50)	1.00	22754.9	11201.00
13	3593.79	120.88	0.476	0.50( 0.50)	1.00	23582.7	10710.00
14	3487.77	122.89	0.473	0.50( 0.50)	1.00	23781.2	10410.00
15	2989.78	132.58	0.462	0.50( 0.50)	1.00	24605.4	10700.00
16	2562.41	141.37	0.451	0.50( 0.50)	1.00	25278.0	10400.00
17	2208.84	149.16	0.442	0.50( 0.50)	1.00	25768.4	10200.00
18	1821.50	162.51	0.425	0.50( 0.50)	1.00	26497.8	10300.00
19	1663.63	168.53	0.418	0.50( 0.50)	1.00	26628.8	10210.00
20	537.36	246.21	0.367	0.50( 0.50)	1.00	27497.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6718.89	42.97	0.752	0.50( 0.50)	0.99	8229.2	11500.00
2	6708.91	45.87	0.728	0.50( 0.50)	0.99	8959.1	11530.00
3	6685.41	48.53	0.706	0.50( 0.50)	0.99	9595.9	11701.00
4	6606.02	54.64	0.666	0.50( 0.50)	0.99	11094.4	11000.00
5	6431.89	71.41	0.596	0.50( 0.50)	1.00	16574.7	11330.00
6	6415.86	72.55	0.592	0.50( 0.50)	1.00	16972.3	10850.00
7	6309.51	76.68	0.578	0.50( 0.50)	1.00	18470.2	10900.00
8	6205.37	79.89	0.567	0.50( 0.50)	1.00	19567.8	10830.00
9	6125.60	81.88	0.560	0.50( 0.50)	1.00	20181.0	10910.00
10	5966.31	84.72	0.551	0.50( 0.50)	1.00	20956.9	11130.00
11	5357.48	95.33	0.523	0.50( 0.50)	1.00	23433.2	11620.00
12	5078.11	100.18	0.514	0.50( 0.50)	1.00	24494.3	10600.00
13	4958.99	102.61	0.509	0.50( 0.50)	1.00	25026.6	11600.00

14	4205.04	112.33	0.491	0.50( 0.50)	1.00	26841.6	10500.00
15	4123.14	114.10	0.488	0.50( 0.50)	1.00	27146.8	11201.00
16	3683.17	120.88	0.476	0.50( 0.50)	1.00	27974.6	10710.00
17	3576.69	122.89	0.473	0.50( 0.50)	1.00	28173.1	10410.00
18	3076.49	132.58	0.462	0.50( 0.50)	1.00	28997.2	10700.00
19	2647.11	141.37	0.451	0.50( 0.50)	1.00	29669.9	10400.00
20	2291.75	149.16	0.442	0.50( 0.50)	1.00	30160.3	10200.00
21	1901.37	162.51	0.425	0.50( 0.50)	1.00	30889.7	10300.00
22	1742.13	168.53	0.418	0.50( 0.50)	1.00	31020.6	10210.00
23	606.32	246.21	0.367	0.50( 0.50)	1.00	31889.0	10100.00

TOTAL AREA(ACRES) = 31889.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6718.89 Tc(MIN.) = 42.975  
EFFECTIVE AREA(ACRES) = 8229.24 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 31889.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11726.00 = 89123.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11726.00 TO NODE 11821.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 436.21 DOWNSTREAM(FEET) = 423.93  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1621.39 CHANNEL SLOPE = 0.0076  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.733  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 59.69 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6725.14  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.43  
AVERAGE FLOW DEPTH(FEET) = 14.00 TRAVEL TIME(MIN.) = 2.36  
Tc(MIN.) = 45.34  
SUBAREA AREA(ACRES) = 59.69 SUBAREA RUNOFF(CFS) = 12.49  
EFFECTIVE AREA(ACRES) = 8288.93 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 31948.7 PEAK FLOW RATE(CFS) = 6718.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 14.00 FLOW VELOCITY(FEET/SEC.) = 11.42  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11804.00 TO NODE 11821.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	6718.89	45.34	0.733	0.50( 0.50)	0.99	8288.9 11500.00
2	6708.91	48.23	0.709	0.50( 0.50)	0.99	9018.8 11530.00
3	6685.41	50.90	0.689	0.50( 0.50)	0.99	9655.5 11701.00
4	6606.02	57.02	0.652	0.50( 0.50)	0.99	11154.1 11000.00
5	6431.89	73.80	0.588	0.50( 0.50)	1.00	16634.4 11330.00
6	6415.86	74.94	0.584	0.50( 0.50)	1.00	17032.0 10850.00
7	6309.51	79.08	0.570	0.50( 0.50)	1.00	18529.9 10900.00
8	6205.37	82.30	0.559	0.50( 0.50)	1.00	19627.5 10830.00
9	6125.60	84.30	0.552	0.50( 0.50)	1.00	20240.7 10910.00
10	5966.31	87.16	0.543	0.50( 0.50)	1.00	21016.6 11130.00
11	5357.48	97.83	0.518	0.50( 0.50)	1.00	23492.8 11620.00
12	5078.11	102.71	0.509	0.50( 0.50)	1.00	24554.0 10600.00
13	4958.99	105.16	0.505	0.50( 0.50)	1.00	25086.2 11600.00
14	4205.04	114.99	0.486	0.50( 0.50)	1.00	26901.3 10500.00
15	4123.14	116.77	0.483	0.50( 0.50)	1.00	27206.5 11201.00
16	3683.17	123.63	0.473	0.50( 0.50)	1.00	28034.3 10710.00
17	3576.69	125.66	0.470	0.50( 0.50)	1.00	28232.8 10410.00
18	3076.49	135.46	0.458	0.50( 0.50)	1.00	29056.9 10700.00
19	2647.11	144.36	0.447	0.50( 0.50)	1.00	29729.5 10400.00
20	2291.75	152.26	0.438	0.50( 0.50)	1.00	30220.0 10200.00
21	1901.37	165.75	0.421	0.50( 0.50)	1.00	30949.4 10300.00
22	1742.13	171.84	0.414	0.50( 0.50)	1.00	31080.3 10210.00
23	606.32	250.53	0.365	0.50( 0.50)	1.00	31948.7 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.99	34.15	0.850	0.50( 0.50)	1.00	101.6	11801.00

LONGEST FLOWPATH FROM NODE 11801.00 TO NODE 11821.00 = 5569.93 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6750.88	34.15	0.850	0.50( 0.50)	0.99	6344.1	11801.00
2	6740.14	45.34	0.733	0.50( 0.50)	0.99	8390.5	11500.00
3	6727.97	48.23	0.709	0.50( 0.50)	0.99	9120.4	11530.00
4	6702.63	50.90	0.689	0.50( 0.50)	0.99	9757.1	11701.00
5	6619.89	57.02	0.652	0.50( 0.50)	0.99	11255.7	11000.00
6	6439.87	73.80	0.588	0.50( 0.50)	1.00	16735.9	11330.00
7	6423.50	74.94	0.584	0.50( 0.50)	1.00	17133.6	10850.00
8	6315.86	79.08	0.570	0.50( 0.50)	1.00	18631.5	10900.00
9	6210.74	82.30	0.559	0.50( 0.50)	1.00	19729.0	10830.00
10	6130.35	84.30	0.552	0.50( 0.50)	1.00	20342.3	10910.00
11	5970.19	87.16	0.543	0.50( 0.50)	1.00	21118.2	11130.00
12	5359.14	97.83	0.518	0.50( 0.50)	1.00	23594.4	11620.00
13	5078.93	102.71	0.509	0.50( 0.50)	1.00	24655.6	10600.00
14	4959.40	105.16	0.505	0.50( 0.50)	1.00	25187.8	11600.00
15	4205.04	114.99	0.486	0.50( 0.50)	1.00	27002.9	10500.00
16	4123.14	116.77	0.483	0.50( 0.50)	1.00	27308.1	11201.00
17	3683.17	123.63	0.473	0.50( 0.50)	1.00	28135.9	10710.00
18	3576.69	125.66	0.470	0.50( 0.50)	1.00	28334.4	10410.00
19	3076.48	135.46	0.458	0.50( 0.50)	1.00	29158.5	10700.00
20	2647.10	144.36	0.447	0.50( 0.50)	1.00	29831.1	10400.00
21	2291.75	152.26	0.438	0.50( 0.50)	1.00	30321.6	10200.00
22	1901.37	165.75	0.421	0.50( 0.50)	1.00	31051.0	10300.00
23	1742.13	171.84	0.414	0.50( 0.50)	1.00	31181.9	10210.00

24 606.32 250.53 0.365 0.50( 0.50) 1.00 32050.3 10100.00  
TOTAL AREA(ACRES) = 32050.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6750.88 Tc(MIN.) = 34.146  
EFFECTIVE AREA(ACRES) = 6344.14 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 32050.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11821.00 = 90744.70 FEET.

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FLOW PROCESS FROM NODE 11821.00 TO NODE 11822.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 423.93 DOWNSTREAM(FEET) = 402.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1912.90 CHANNEL SLOPE = 0.0113  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	201.91	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6779.96

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.29

AVERAGE FLOW DEPTH(FEET) = 13.04 TRAVEL TIME(MIN.) = 2.40

Tc(MIN.) = 36.55

SUBAREA AREA(ACRES) = 201.91 SUBAREA RUNOFF(CFS) = 58.15

EFFECTIVE AREA(ACRES) = 6546.05 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 32252.2 PEAK FLOW RATE(CFS) = 6750.88

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 13.02 FLOW VELOCITY(FEET/SEC.) = 13.27

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11822.00 = 92657.60 FEET.

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FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 402.38 DOWNSTREAM(FEET) = 380.74  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2380.10 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.780

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6765.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.25  
 AVERAGE FLOW DEPTH(FEET) = 13.57 TRAVEL TIME(MIN.) = 3.24  
 Tc(MIN.) = 39.78  
 SUBAREA AREA(ACRES) = 116.13 SUBAREA RUNOFF(CFS) = 29.21  
 EFFECTIVE AREA(ACRES) = 6662.18 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 32368.3 PEAK FLOW RATE(CFS) = 6750.88  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.55 FLOW VELOCITY(FEET/SEC.) = 12.25  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11822.00 TO NODE 11841.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 39.78  
 RAINFALL INTENSITY(INCH/HR) = 0.78  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99  
 EFFECTIVE STREAM AREA(ACRES) = 6662.18  
 TOTAL STREAM AREA(ACRES) = 32368.29  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 6750.88

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FLOW PROCESS FROM NODE 11831.00 TO NODE 11832.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 248.20  
 ELEVATION DATA: UPSTREAM(FEET) = 1353.30 DOWNSTREAM(FEET) = 1280.02

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.179  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.258  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.76	0.50	1.000	0	8.18

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 1.20  
 TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 1.20

\*\*\*\*\*

FLOW PROCESS FROM NODE 11832.00 TO NODE 11833.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1280.02 DOWNSTREAM(FEET) = 1070.08  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 686.67 CHANNEL SLOPE = 0.3057  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.869

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	5.95	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.51  
 AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 2.08  
 Tc(MIN.) = 10.26  
 SUBAREA AREA(ACRES) = 5.95 SUBAREA RUNOFF(CFS) = 7.33  
 EFFECTIVE AREA(ACRES) = 6.71 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 6.7 PEAK FLOW RATE(CFS) = 8.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.66 FLOW VELOCITY(FEET/SEC.) = 6.31  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11833.00 = 934.87 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11833.00 TO NODE 11834.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1070.08 DOWNSTREAM(FEET) = 913.56  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 977.36 CHANNEL SLOPE = 0.1601  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.585  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.21	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.15  
 AVERAGE FLOW DEPTH(FEET) = 1.03 TRAVEL TIME(MIN.) = 2.65  
 Tc(MIN.) = 12.90  
 SUBAREA AREA(ACRES) = 23.21 SUBAREA RUNOFF(CFS) = 22.65  
 EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 29.9 PEAK FLOW RATE(CFS) = 29.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.19 FLOW VELOCITY(FEET/SEC.) = 6.82  
 LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11834.00 = 1912.23 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 11834.00 TO NODE 11835.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

=====

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 913.56 DOWNSTREAM(FEET) = 727.99  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1875.63 CHANNEL SLOPE = 0.0989  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.257  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.73	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.57  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.61  
AVERAGE FLOW DEPTH(FEET) = 1.66 TRAVEL TIME(MIN.) = 4.73  
Tc(MIN.) = 17.63  
SUBAREA AREA(ACRES) = 73.73 SUBAREA RUNOFF(CFS) = 50.22  
EFFECTIVE AREA(ACRES) = 103.65 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 103.7 PEAK FLOW RATE(CFS) = 70.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.83 FLOW VELOCITY(FEET/SEC.) = 7.06  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11835.00 = 3787.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11835.00 TO NODE 11836.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 727.99 DOWNSTREAM(FEET) = 611.39  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.64 CHANNEL SLOPE = 0.0615  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.086  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	93.31	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 95.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.37  
AVERAGE FLOW DEPTH(FEET) = 2.23 TRAVEL TIME(MIN.) = 4.96  
Tc(MIN.) = 22.59  
SUBAREA AREA(ACRES) = 93.31 SUBAREA RUNOFF(CFS) = 49.17  
EFFECTIVE AREA(ACRES) = 196.96 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 197.0 PEAK FLOW RATE(CFS) = 103.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.31 FLOW VELOCITY(FEET/SEC.) = 6.50  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11836.00 = 5684.50 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11836.00 TO NODE 11837.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 611.39 DOWNSTREAM(FEET) = 508.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2178.15 CHANNEL SLOPE = 0.0472  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.935  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.92	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.23  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.16  
AVERAGE FLOW DEPTH(FEET) = 2.58 TRAVEL TIME(MIN.) = 5.89  
Tc(MIN.) = 28.48  
SUBAREA AREA(ACRES) = 98.92 SUBAREA RUNOFF(CFS) = 38.75  
EFFECTIVE AREA(ACRES) = 295.88 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 295.9 PEAK FLOW RATE(CFS) = 115.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.52 FLOW VELOCITY(FEET/SEC.) = 6.07  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11837.00 = 7862.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11837.00 TO NODE 11838.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 508.59 DOWNSTREAM(FEET) = 448.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1942.91 CHANNEL SLOPE = 0.0309  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.845  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.71	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 128.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.32  
AVERAGE FLOW DEPTH(FEET) = 2.84 TRAVEL TIME(MIN.) = 6.09  
Tc(MIN.) = 34.57  
SUBAREA AREA(ACRES) = 79.71 SUBAREA RUNOFF(CFS) = 24.73  
EFFECTIVE AREA(ACRES) = 375.59 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 375.6 PEAK FLOW RATE(CFS) = 116.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.74 FLOW VELOCITY(FEET/SEC.) = 5.19  
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.00 = 9805.56 FEET.

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FLOW PROCESS FROM NODE 11838.00 TO NODE 11838.50 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 448.50 DOWNSTREAM(FEET) = 420.79
CHANNEL LENGTH THRU SUBAREA(FEET) = 917.65 CHANNEL SLOPE = 0.0302
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.808
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.57 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.31
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.20
AVERAGE FLOW DEPTH(FEET) = 2.79 TRAVEL TIME(MIN.) = 2.94
Tc(MIN.) = 37.51
SUBAREA AREA(ACRES) = 34.57 SUBAREA RUNOFF(CFS) = 9.58
EFFECTIVE AREA(ACRES) = 410.16 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 410.2 PEAK FLOW RATE(CFS) = 116.52
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.75 FLOW VELOCITY(FEET/SEC.) = 5.14
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11838.50 = 10723.21 FEET.

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*****
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 420.79 DOWNSTREAM(FEET) = 380.74
CHANNEL LENGTH THRU SUBAREA(FEET) = 1615.83 CHANNEL SLOPE = 0.0248
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 21.54 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 118.95
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.80
AVERAGE FLOW DEPTH(FEET) = 2.87 TRAVEL TIME(MIN.) = 5.61
Tc(MIN.) = 43.12
SUBAREA AREA(ACRES) = 21.54 SUBAREA RUNOFF(CFS) = 4.86
EFFECTIVE AREA(ACRES) = 431.70 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 431.7 PEAK FLOW RATE(CFS) = 116.52
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.85 FLOW VELOCITY(FEET/SEC.) = 4.78
LONGEST FLOWPATH FROM NODE 11831.00 TO NODE 11841.00 = 12339.04 FEET.
*****
FLOW PROCESS FROM NODE 11838.50 TO NODE 11841.00 IS CODE = 1
-----

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 43.12
RAINFALL INTENSITY(INCH/HR) = 0.75
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 431.70
TOTAL STREAM AREA(ACRES) = 431.70
PEAK FLOW RATE(CFS) AT CONFLUENCE = 116.52

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\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6750.88	39.78	0.780	0.50( 0.50)	0.99	6662.2	11801.00
1	6740.14	50.98	0.688	0.50( 0.50)	0.99	8708.5	11500.00
1	6727.97	53.88	0.671	0.50( 0.50)	0.99	9438.4	11530.00
1	6702.63	56.55	0.655	0.50( 0.50)	0.99	10075.2	11701.00
1	6619.89	62.68	0.625	0.50( 0.50)	1.00	11573.7	11000.00
1	6439.87	79.51	0.568	0.50( 0.50)	1.00	17054.0	11330.00
1	6423.50	80.65	0.564	0.50( 0.50)	1.00	17451.6	10850.00
1	6315.86	84.82	0.550	0.50( 0.50)	1.00	18949.5	10900.00
1	6210.74	88.06	0.540	0.50( 0.50)	1.00	20047.1	10830.00
1	6130.35	90.07	0.533	0.50( 0.50)	1.00	20660.3	10910.00
1	5970.19	92.98	0.527	0.50( 0.50)	1.00	21436.2	11130.00
1	5359.14	103.81	0.507	0.50( 0.50)	1.00	23912.5	11620.00
1	5078.93	108.77	0.498	0.50( 0.50)	1.00	24973.6	10600.00
1	4959.40	111.25	0.493	0.50( 0.50)	1.00	25505.9	11600.00
1	4205.04	121.34	0.475	0.50( 0.50)	1.00	27320.9	10500.00
1	4123.14	123.15	0.473	0.50( 0.50)	1.00	27626.1	11201.00
1	3683.17	130.19	0.465	0.50( 0.50)	1.00	28453.9	10710.00
1	3576.69	132.27	0.462	0.50( 0.50)	1.00	28652.4	10410.00
1	3076.48	142.32	0.450	0.50( 0.50)	1.00	29476.5	10700.00
1	2647.10	151.49	0.439	0.50( 0.50)	1.00	30149.2	10400.00
1	2291.75	159.65	0.429	0.50( 0.50)	1.00	30639.6	10200.00
1	1901.37	173.49	0.412	0.50( 0.50)	1.00	31369.0	10300.00
1	1742.13	179.76	0.404	0.50( 0.50)	1.00	31499.9	10210.00
1	606.32	260.83	0.359	0.50( 0.50)	1.00	32368.3	10100.00
2	116.52	43.12	0.751	0.50( 0.50)	1.00	431.7	11831.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	39.78	0.780	0.50( 0.50)	0.99	7060.5	11801.00
2	6864.20	43.12	0.751	0.50( 0.50)	0.99	7703.5	11831.00

3	6827.41	50.98	0.688	0.50	( 0.50)	0.99	9140.2	11500.00
4	6807.16	53.88	0.671	0.50	( 0.50)	0.99	9870.1	11530.00
5	6774.38	56.55	0.655	0.50	( 0.50)	0.99	10506.9	11701.00
6	6677.83	62.68	0.625	0.50	( 0.50)	1.00	12005.4	11000.00
7	6471.50	79.51	0.568	0.50	( 0.50)	1.00	17485.7	11330.00
8	6453.34	80.65	0.564	0.50	( 0.50)	1.00	17883.3	10850.00
9	6339.19	84.82	0.550	0.50	( 0.50)	1.00	19381.2	10900.00
10	6228.99	88.06	0.540	0.50	( 0.50)	1.00	20478.8	10830.00
11	6145.52	90.07	0.533	0.50	( 0.50)	1.00	21092.0	10910.00
12	5982.84	92.98	0.527	0.50	( 0.50)	1.00	21867.9	11130.00
13	5362.41	103.81	0.507	0.50	( 0.50)	1.00	24344.2	11620.00
14	5078.93	108.77	0.498	0.50	( 0.50)	1.00	25405.3	10600.00
15	4959.40	111.25	0.493	0.50	( 0.50)	1.00	25937.6	11600.00
16	4205.04	121.34	0.475	0.50	( 0.50)	1.00	27752.6	10500.00
17	4123.14	123.15	0.473	0.50	( 0.50)	1.00	28057.8	11201.00
18	3683.17	130.19	0.465	0.50	( 0.50)	1.00	28885.6	10710.00
19	3576.69	132.27	0.462	0.50	( 0.50)	1.00	29084.1	10410.00
20	3076.48	142.32	0.450	0.50	( 0.50)	1.00	29908.2	10700.00
21	2647.10	151.49	0.439	0.50	( 0.50)	1.00	30580.9	10400.00
22	2291.75	159.65	0.429	0.50	( 0.50)	1.00	31071.3	10200.00
23	1901.37	173.49	0.412	0.50	( 0.50)	1.00	31800.7	10300.00
24	1742.13	179.76	0.404	0.50	( 0.50)	1.00	31931.6	10210.00
25	606.32	260.83	0.359	0.50	( 0.50)	1.00	32800.0	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6867.40 Tc(MIN.) = 39.78  
EFFECTIVE AREA(ACRES) = 7060.49 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 32800.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11841.00 = 95037.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 380.74 DOWNSTREAM(FEET) = 347.47  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2830.43 CHANNEL SLOPE = 0.0118  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.750

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.59	0.50	0.997	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6880.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.55  
AVERAGE FLOW DEPTH(FEET) = 13.01 TRAVEL TIME(MIN.) = 3.48  
Tc(MIN.) = 43.27  
SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 26.36  
EFFECTIVE AREA(ACRES) = 7177.08 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 32916.6 PEAK FLOW RATE(CFS) = 6867.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 13.00 FLOW VELOCITY(FEET/SEC.) = 13.55  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 32916.6 TC(MIN.) = 43.27  
EFFECTIVE AREA(ACRES) = 7177.08 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.995  
PEAK FLOW RATE(CFS) = 6867.40

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	43.27	0.750	0.50( 0.50)	0.99	7177.1	11801.00
2	6864.20	46.60	0.722	0.50( 0.50)	0.99	7820.1	11831.00
3	6827.41	54.47	0.667	0.50( 0.50)	0.99	9256.8	11500.00
4	6807.16	57.37	0.650	0.50( 0.50)	0.99	9986.7	11530.00
5	6774.38	60.04	0.634	0.50( 0.50)	0.99	10623.4	11701.00
6	6677.83	66.19	0.613	0.50( 0.50)	1.00	12122.0	11000.00
7	6471.50	83.04	0.556	0.50( 0.50)	1.00	17602.3	11330.00
8	6453.34	84.19	0.553	0.50( 0.50)	1.00	17999.9	10850.00
9	6339.19	88.37	0.538	0.50( 0.50)	1.00	19497.8	10900.00
10	6228.99	91.63	0.530	0.50( 0.50)	1.00	20595.4	10830.00
11	6145.52	93.65	0.526	0.50( 0.50)	1.00	21208.6	10910.00
12	5982.84	96.58	0.521	0.50( 0.50)	1.00	21984.5	11130.00
13	5362.41	107.51	0.500	0.50( 0.50)	1.00	24460.7	11620.00
14	5078.93	112.52	0.491	0.50( 0.50)	1.00	25521.9	10600.00
15	4959.40	115.03	0.486	0.50( 0.50)	1.00	26054.1	11600.00
16	4205.04	125.28	0.471	0.50( 0.50)	1.00	27869.2	10500.00
17	4123.14	127.11	0.468	0.50( 0.50)	1.00	28174.4	11201.00
18	3683.17	134.26	0.460	0.50( 0.50)	1.00	29002.2	10710.00
19	3576.69	136.37	0.457	0.50( 0.50)	1.00	29200.7	10410.00
20	3076.48	146.58	0.445	0.50( 0.50)	1.00	30024.8	10700.00
21	2647.10	155.91	0.433	0.50( 0.50)	1.00	30697.4	10400.00
22	2291.75	164.23	0.423	0.50( 0.50)	1.00	31187.9	10200.00
23	1901.37	178.29	0.406	0.50( 0.50)	1.00	31917.3	10300.00
24	1742.13	184.66	0.401	0.50( 0.50)	1.00	32048.2	10210.00
25	606.32	267.22	0.356	0.50( 0.50)	1.00	32916.6	10100.00

-----  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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92707

-----  
FILE NAME: S19.DAT  
TIME/DATE OF STUDY: 11:00 07/17/2018  
=====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.749
- 2) 10.00; 1.820
- 3) 15.00; 1.328
- 4) 20.00; 1.137
- 5) 25.00; 0.990
- 6) 30.00; 0.887
- 7) 40.00; 0.760
- 8) 50.00; 0.677
- 9) 60.00; 0.617
- 10) 90.00; 0.514
- 11) 120.00; 0.456
- 12) 180.00; 0.384
- 13) 360.00; 0.286
- 14) 1200.00; 0.126

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11900.00 TO NODE 11901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 295.79  
ELEVATION DATA: UPSTREAM (FEET) = 2369.48 DOWNSTREAM (FEET) = 2332.92

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 7.203  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.340

SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL ".4 DWELLING/ACRE"	-	1.62	0.50	0.999	0	7.20

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
SUBAREA RUNOFF (CFS) = 2.68  
TOTAL AREA (ACRES) = 1.62 PEAK FLOW RATE (CFS) = 2.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11901.00 TO NODE 11902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 2332.92 DOWNSTREAM (FEET) = 2297.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 664.26 CHANNEL SLOPE = 0.0530  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.757

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.35	0.50	0.906	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.906  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.22  
AVERAGE FLOW DEPTH (FEET) = 0.89 TRAVEL TIME (MIN.) = 3.44  
Tc (MIN.) = 10.64  
SUBAREA AREA (ACRES) = 8.35 SUBAREA RUNOFF (CFS) = 9.80  
EFFECTIVE AREA (ACRES) = 9.97 AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.92  
TOTAL AREA (ACRES) = 10.0 PEAK FLOW RATE (CFS) = 11.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.04 FLOW VELOCITY (FEET/SEC.) = 3.57  
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.00 = 960.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11902.00 TO NODE 11902.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2297.70 DOWNSTREAM(FEET) = 2263.40  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 928.77 CHANNEL SLOPE = 0.0369  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.356  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.48	0.50	0.904	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.95  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.80  
 AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 4.07  
 Tc(MIN.) = 14.71  
 SUBAREA AREA(ACRES) = 34.48 SUBAREA RUNOFF(CFS) = 28.06  
 EFFECTIVE AREA(ACRES) = 44.45 AREA-AVERAGED Fm(INCH/HR) = 0.45  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.91  
 TOTAL AREA(ACRES) = 44.5 PEAK FLOW RATE(CFS) = 36.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.71 FLOW VELOCITY(FEET/SEC.) = 4.13  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11902.50 = 1888.82 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11902.50 TO NODE 11903.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2263.40 DOWNSTREAM(FEET) = 2252.14  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 895.50 CHANNEL SLOPE = 0.0126  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.142  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.65	0.50	0.958	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.89  
 AVERAGE FLOW DEPTH(FEET) = 2.23 TRAVEL TIME(MIN.) = 5.17  
 Tc(MIN.) = 19.88  
 SUBAREA AREA(ACRES) = 23.65 SUBAREA RUNOFF(CFS) = 14.10  
 EFFECTIVE AREA(ACRES) = 68.10 AREA-AVERAGED Fm(INCH/HR) = 0.46  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
 TOTAL AREA(ACRES) = 68.1 PEAK FLOW RATE(CFS) = 41.60

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.20 FLOW VELOCITY(FEET/SEC.) = 2.86  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11903.00 = 2784.32 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11903.00 TO NODE 11904.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM(FEET) = 2252.14 DOWNSTREAM(FEET) = 2186.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1924.35 CHANNEL SLOPE = 0.0343  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.948  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.53	0.50	0.961	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.961  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.14  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.49  
 AVERAGE FLOW DEPTH(FEET) = 2.04 TRAVEL TIME(MIN.) = 7.15  
 Tc(MIN.) = 27.03  
 SUBAREA AREA(ACRES) = 68.53 SUBAREA RUNOFF(CFS) = 28.84  
 EFFECTIVE AREA(ACRES) = 136.63 AREA-AVERAGED Fm(INCH/HR) = 0.47  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA(ACRES) = 136.6 PEAK FLOW RATE(CFS) = 58.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.07 FLOW VELOCITY(FEET/SEC.) = 4.55  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11904.00 = 4708.67 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11904.00 TO NODE 11905.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2186.04 DOWNSTREAM(FEET) = 1957.34  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.87 CHANNEL SLOPE = 0.1187  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.871  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	63.15	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.14  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.53  
 AVERAGE FLOW DEPTH(FEET) = 1.75 TRAVEL TIME(MIN.) = 4.27  
 Tc(MIN.) = 31.29  
 SUBAREA AREA(ACRES) = 63.15 SUBAREA RUNOFF(CFS) = 21.05  
 EFFECTIVE AREA(ACRES) = 199.78 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 199.8 PEAK FLOW RATE(CFS) = 70.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.76 FLOW VELOCITY(FEET/SEC.) = 7.56  
 LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11905.00 = 6635.54 FEET.

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 FLOW PROCESS FROM NODE 11905.00 TO NODE 11906.00 IS CODE = 51



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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1957.34 DOWNSTREAM(FEET) = 1244.16
CHANNEL LENGTH THRU SUBAREA(FEET) = 2498.96 CHANNEL SLOPE = 0.2854
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.822
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 84.87 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.95
AVERAGE FLOW DEPTH(FEET) = 1.58 TRAVEL TIME(MIN.) = 3.81
Tc(MIN.) = 35.10
SUBAREA AREA(ACRES) = 84.87 SUBAREA RUNOFF(CFS) = 24.60
EFFECTIVE AREA(ACRES) = 284.65 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 284.6 PEAK FLOW RATE(CFS) = 86.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.61 FLOW VELOCITY(FEET/SEC.) = 11.02
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11906.00 = 9134.50 FEET.

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FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1244.16 DOWNSTREAM(FEET) = 873.95
CHANNEL LENGTH THRU SUBAREA(FEET) = 3370.75 CHANNEL SLOPE = 0.1098
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.744
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 199.43 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 107.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.20
AVERAGE FLOW DEPTH(FEET) = 2.10 TRAVEL TIME(MIN.) = 6.85
Tc(MIN.) = 41.95
SUBAREA AREA(ACRES) = 199.43 SUBAREA RUNOFF(CFS) = 43.72
EFFECTIVE AREA(ACRES) = 484.08 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98
TOTAL AREA(ACRES) = 484.1 PEAK FLOW RATE(CFS) = 109.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.11 FLOW VELOCITY(FEET/SEC.) = 8.22
LONGEST FLOWPATH FROM NODE 11900.00 TO NODE 11920.00 = 12505.25 FEET.

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FLOW PROCESS FROM NODE 11906.00 TO NODE 11920.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 41.95
RAINFALL INTENSITY(INCH/HR) = 0.74
AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.98
EFFECTIVE STREAM AREA(ACRES) = 484.08
TOTAL STREAM AREA(ACRES) = 484.08
PEAK FLOW RATE(CFS) AT CONFLUENCE = 109.62

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FLOW PROCESS FROM NODE 11910.00 TO NODE 11911.00 IS CODE = 21
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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 517.62
ELEVATION DATA: UPSTREAM(FEET) = 2531.88 DOWNSTREAM(FEET) = 2441.33

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.185
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.605
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 3.46 0.50 1.000 0 12.19
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 3.44
TOTAL AREA(ACRES) = 3.46 PEAK FLOW RATE(CFS) = 3.44

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FLOW PROCESS FROM NODE 11911.00 TO NODE 11912.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2441.33 DOWNSTREAM(FEET) = 2382.20
CHANNEL LENGTH THRU SUBAREA(FEET) = 397.30 CHANNEL SLOPE = 0.1488
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.458
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 5.79 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.43
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 1.49

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Tc(MIN.) = 13.68  
SUBAREA AREA(ACRES) = 5.79 SUBAREA RUNOFF(CFS) = 4.99  
EFFECTIVE AREA(ACRES) = 9.25 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 9.2 PEAK FLOW RATE(CFS) = 7.97

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.74 FLOW VELOCITY(FEET/SEC.) = 4.79  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11912.00 = 914.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11912.00 TO NODE 11913.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2382.20 DOWNSTREAM(FEET) = 2263.77  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1891.47 CHANNEL SLOPE = 0.0626  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.117

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	54.30	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.41  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.51  
AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 6.99  
Tc(MIN.) = 20.67  
SUBAREA AREA(ACRES) = 54.30 SUBAREA RUNOFF(CFS) = 30.16  
EFFECTIVE AREA(ACRES) = 63.55 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 63.5 PEAK FLOW RATE(CFS) = 35.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.53 FLOW VELOCITY(FEET/SEC.) = 5.02  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11913.00 = 2806.39 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11913.00 TO NODE 11914.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2263.77 DOWNSTREAM(FEET) = 1845.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1957.31 CHANNEL SLOPE = 0.2138  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.006

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	65.14	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.20

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.64  
AVERAGE FLOW DEPTH(FEET) = 1.39 TRAVEL TIME(MIN.) = 3.77  
Tc(MIN.) = 24.44  
SUBAREA AREA(ACRES) = 65.14 SUBAREA RUNOFF(CFS) = 29.68  
EFFECTIVE AREA(ACRES) = 128.69 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 128.7 PEAK FLOW RATE(CFS) = 58.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.47 FLOW VELOCITY(FEET/SEC.) = 9.05  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11914.00 = 4763.70 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11914.00 TO NODE 11915.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1845.23 DOWNSTREAM(FEET) = 1557.21  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1686.78 CHANNEL SLOPE = 0.1708  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	78.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.04  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.79  
AVERAGE FLOW DEPTH(FEET) = 1.68 TRAVEL TIME(MIN.) = 3.20  
Tc(MIN.) = 27.64  
SUBAREA AREA(ACRES) = 78.52 SUBAREA RUNOFF(CFS) = 30.77  
EFFECTIVE AREA(ACRES) = 207.21 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 207.2 PEAK FLOW RATE(CFS) = 81.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.73 FLOW VELOCITY(FEET/SEC.) = 8.99  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11915.00 = 6450.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11915.00 TO NODE 11916.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1557.21 DOWNSTREAM(FEET) = 1403.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1909.39 CHANNEL SLOPE = 0.0806  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.859

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	70.48	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 92.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.99  
 AVERAGE FLOW DEPTH(FEET) = 2.10 TRAVEL TIME(MIN.) = 4.55  
 Tc(MIN.) = 32.19  
 SUBAREA AREA(ACRES) = 70.48 SUBAREA RUNOFF(CFS) = 22.77  
 EFFECTIVE AREA(ACRES) = 277.69 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 277.7 PEAK FLOW RATE(CFS) = 89.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.07 FLOW VELOCITY(FEET/SEC.) = 6.96  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11916.00 = 8359.87 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11916.00 TO NODE 11917.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1403.38 DOWNSTREAM(FEET) = 1079.99  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1945.82 CHANNEL SLOPE = 0.1662  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.817

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	232.20	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.90  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.84  
 AVERAGE FLOW DEPTH(FEET) = 2.04 TRAVEL TIME(MIN.) = 3.29  
 Tc(MIN.) = 35.48  
 SUBAREA AREA(ACRES) = 232.20 SUBAREA RUNOFF(CFS) = 66.28  
 EFFECTIVE AREA(ACRES) = 509.89 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 509.9 PEAK FLOW RATE(CFS) = 145.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.17 FLOW VELOCITY(FEET/SEC.) = 10.29  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11917.00 = 10305.69 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1079.99 DOWNSTREAM(FEET) = 873.95  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2563.91 CHANNEL SLOPE = 0.0804  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.753

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	232.20	0.50	1.000	-

USER-DEFINED - 110.82 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 158.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.01  
 AVERAGE FLOW DEPTH(FEET) = 2.57 TRAVEL TIME(MIN.) = 5.34  
 Tc(MIN.) = 40.82  
 SUBAREA AREA(ACRES) = 110.82 SUBAREA RUNOFF(CFS) = 25.23  
 EFFECTIVE AREA(ACRES) = 620.71 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 620.7 PEAK FLOW RATE(CFS) = 145.54  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.49 FLOW VELOCITY(FEET/SEC.) = 7.82  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11917.00 TO NODE 11920.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 40.82  
 RAINFALL INTENSITY(INCH/HR) = 0.75  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 620.71  
 TOTAL STREAM AREA(ACRES) = 620.71  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 145.54

\*\* CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	109.62	41.95	0.744	0.50( 0.49)	0.98	484.1	11900.00
2	145.54	40.82	0.753	0.50( 0.50)	1.00	620.7	11910.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	255.16	40.82	0.753	0.50( 0.50)	0.99	1091.7	11910.00
2	249.76	41.95	0.744	0.50( 0.50)	0.99	1104.8	11900.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 255.16 Tc(MIN.) = 40.82  
 EFFECTIVE AREA(ACRES) = 1091.74 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 1104.8  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11920.00 = 12869.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11920.00 TO NODE 11921.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 873.95 DOWNSTREAM(FEET) = 827.94
CHANNEL LENGTH THRU SUBAREA(FEET) = 1417.25 CHANNEL SLOPE = 0.0325
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.723
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 107.47 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 265.93
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.49
AVERAGE FLOW DEPTH(FEET) = 3.70 TRAVEL TIME(MIN.) = 3.64
Tc(MIN.) = 44.46
SUBAREA AREA(ACRES) = 107.47 SUBAREA RUNOFF(CFS) = 21.55
EFFECTIVE AREA(ACRES) = 1199.21 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 1212.3 PEAK FLOW RATE(CFS) = 255.16
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.64 FLOW VELOCITY(FEET/SEC.) = 6.41
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11921.00 = 14286.85 FEET.

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FLOW PROCESS FROM NODE 11921.00 TO NODE 11922.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 827.94 DOWNSTREAM(FEET) = 753.55
CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.43 CHANNEL SLOPE = 0.0394
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.686
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 344.27 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 284.01
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.10
AVERAGE FLOW DEPTH(FEET) = 3.65 TRAVEL TIME(MIN.) = 4.43
Tc(MIN.) = 48.89
SUBAREA AREA(ACRES) = 344.27 SUBAREA RUNOFF(CFS) = 57.63
EFFECTIVE AREA(ACRES) = 1543.48 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1556.5 PEAK FLOW RATE(CFS) = 261.80

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.54 FLOW VELOCITY(FEET/SEC.) = 6.95
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11922.00 = 16173.28 FEET.

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*****
FLOW PROCESS FROM NODE 11922.00 TO NODE 11923.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 753.55 DOWNSTREAM(FEET) = 641.58
CHANNEL LENGTH THRU SUBAREA(FEET) = 2860.88 CHANNEL SLOPE = 0.0391
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.643
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 165.18 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 272.40
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.99
AVERAGE FLOW DEPTH(FEET) = 3.60 TRAVEL TIME(MIN.) = 6.82
Tc(MIN.) = 55.71
SUBAREA AREA(ACRES) = 165.18 SUBAREA RUNOFF(CFS) = 21.19
EFFECTIVE AREA(ACRES) = 1708.66 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1721.7 PEAK FLOW RATE(CFS) = 261.80
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.55 FLOW VELOCITY(FEET/SEC.) = 6.92
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11923.00 = 19034.16 FEET.

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FLOW PROCESS FROM NODE 11923.00 TO NODE 11924.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 641.58 DOWNSTREAM(FEET) = 579.89
CHANNEL LENGTH THRU SUBAREA(FEET) = 1844.02 CHANNEL SLOPE = 0.0335
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.616
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 433.73 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 284.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.66
AVERAGE FLOW DEPTH(FEET) = 3.77 TRAVEL TIME(MIN.) = 4.61
Tc(MIN.) = 60.32
SUBAREA AREA(ACRES) = 433.73 SUBAREA RUNOFF(CFS) = 45.16
EFFECTIVE AREA(ACRES) = 2142.39 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 2155.4 PEAK FLOW RATE(CFS) = 261.80
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.65 FLOW VELOCITY(FEET/SEC.) = 6.54  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11924.00 = 20878.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11924.00 TO NODE 11925.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 579.89 DOWNSTREAM(FEET) = 494.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2756.15 CHANNEL SLOPE = 0.0311  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.591

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	265.42	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 272.70

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.43

AVERAGE FLOW DEPTH(FEET) = 3.76 TRAVEL TIME(MIN.) = 7.14

Tc(MIN.) = 67.46

SUBAREA AREA(ACRES) = 265.42 SUBAREA RUNOFF(CFS) = 21.78

EFFECTIVE AREA(ACRES) = 2407.81 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2420.9 PEAK FLOW RATE(CFS) = 261.80

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.70 FLOW VELOCITY(FEET/SEC.) = 6.36

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11925.00 = 23634.33 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11925.00 TO NODE 11926.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 494.12 DOWNSTREAM(FEET) = 458.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1922.70 CHANNEL SLOPE = 0.0186  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.570

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	97.46	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 264.88

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.25

AVERAGE FLOW DEPTH(FEET) = 4.10 TRAVEL TIME(MIN.) = 6.10

Tc(MIN.) = 73.56

SUBAREA AREA(ACRES) = 97.46 SUBAREA RUNOFF(CFS) = 6.16

EFFECTIVE AREA(ACRES) = 2505.27 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2518.3 PEAK FLOW RATE(CFS) = 261.80  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.08 FLOW VELOCITY(FEET/SEC.) = 5.25

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11926.00 = 25557.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11926.00 TO NODE 11927.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 458.40 DOWNSTREAM(FEET) = 399.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2170.13 CHANNEL SLOPE = 0.0274  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.83	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 263.00

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.06

AVERAGE FLOW DEPTH(FEET) = 3.80 TRAVEL TIME(MIN.) = 5.96

Tc(MIN.) = 79.53

SUBAREA AREA(ACRES) = 53.83 SUBAREA RUNOFF(CFS) = 2.41

EFFECTIVE AREA(ACRES) = 2559.10 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2572.1 PEAK FLOW RATE(CFS) = 261.80

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.79 FLOW VELOCITY(FEET/SEC.) = 6.06

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610401U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.60	29.88	0.50( 0.50)	1.00	621.9	40120.00
2	252.78	32.04	0.50( 0.50)	1.00	652.1	40100.00
TOTAL AREA(ACRES) =		652.1				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	261.80	79.53	0.550	0.50 ( 0.50)	1.00	2559.1	11910.00
2	250.56	81.03	0.545	0.50 ( 0.50)	1.00	2572.1	11900.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	262.60	29.88	0.889	0.50 ( 0.50)	1.00	621.9	40120.00
2	252.78	32.04	0.861	0.50 ( 0.50)	1.00	652.1	40100.00

LONGEST FLOWPATH FROM NODE 40100.00 TO NODE 11927.00 = 10245.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	524.39	29.88	0.889	0.50 ( 0.50)	1.00	1583.5	40120.00
2	514.58	32.04	0.861	0.50 ( 0.50)	1.00	1683.2	40100.00
3	296.65	79.53	0.550	0.50 ( 0.50)	1.00	3211.2	11910.00
4	281.81	81.03	0.545	0.50 ( 0.50)	1.00	3224.2	11900.00

TOTAL AREA (ACRES) = 3224.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 524.39 Tc (MIN.) = 29.883  
EFFECTIVE AREA (ACRES) = 1583.52 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 3224.2  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.00 = 27727.16 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.00 TO NODE 11927.50 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 399.00 DOWNSTREAM (FEET) = 384.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 986.26 CHANNEL SLOPE = 0.0152  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 524.39  
FLOW VELOCITY (FEET/SEC.) = 5.79 FLOW DEPTH (FEET) = 5.50  
TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 32.72  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610402U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.72	14.69	0.50	0.50 ( 0.50)	1.00	33.3	40200.00

TOTAL AREA (ACRES) = 33.3

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.50 TO NODE 11927.50 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	524.39	32.72	0.852	0.50 ( 0.50)	1.00	1583.5	40120.00
2	514.58	34.90	0.825	0.50 ( 0.50)	1.00	1683.2	40100.00
3	296.65	82.80	0.539	0.50 ( 0.50)	1.00	3211.2	11910.00
4	281.81	84.34	0.533	0.50 ( 0.50)	1.00	3224.2	11900.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.72	14.69	1.358	0.50 ( 0.50)	1.00	33.3	40200.00

LONGEST FLOWPATH FROM NODE 40200.00 TO NODE 11927.50 = 1999.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	550.11	14.69	1.358	0.50 ( 0.50)	1.00	744.2	40200.00
2	534.95	32.72	0.852	0.50 ( 0.50)	1.00	1616.8	40120.00
3	524.30	34.90	0.825	0.50 ( 0.50)	1.00	1716.5	40100.00
4	297.81	82.80	0.539	0.50 ( 0.50)	1.00	3244.5	11910.00
5	282.81	84.34	0.533	0.50 ( 0.50)	1.00	3257.5	11900.00

TOTAL AREA (ACRES) = 3257.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 550.11 Tc (MIN.) = 14.691  
EFFECTIVE AREA (ACRES) = 744.21 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 3257.5  
LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11927.50 = 28713.42 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 11927.50 TO NODE 11928.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 384.00 DOWNSTREAM (FEET) = 359.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 647.19 CHANNEL SLOPE = 0.0386  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.291  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ LAND USE      SCS SOIL GROUP      AREA (ACRES)      Fp (INCH/HR)      Ap (DECIMAL)      SCS CN

USER-DEFINED - 78.01 0.50 0.984 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 578.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.41  
 AVERAGE FLOW DEPTH (FEET) = 4.79 TRAVEL TIME (MIN.) = 1.28  
 Tc (MIN.) = 15.97  
 SUBAREA AREA (ACRES) = 78.01 SUBAREA RUNOFF (CFS) = 56.07  
 EFFECTIVE AREA (ACRES) = 822.22 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3335.5 PEAK FLOW RATE (CFS) = 586.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.81 FLOW VELOCITY (FEET/SEC.) = 8.44  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11928.00 = 29360.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 51  
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>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVEL TIME THRU SUBAREA (EXISTING ELEMENT) <<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 359.00 DOWNSTREAM (FEET) = 341.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1322.66 CHANNEL SLOPE = 0.0131  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.141

SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 8.18 0.50 0.890 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 588.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.64  
 AVERAGE FLOW DEPTH (FEET) = 5.90 TRAVEL TIME (MIN.) = 3.91  
 Tc (MIN.) = 19.88  
 SUBAREA AREA (ACRES) = 8.18 SUBAREA RUNOFF (CFS) = 5.13  
 EFFECTIVE AREA (ACRES) = 830.40 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 3343.7 PEAK FLOW RATE (CFS) = 586.20  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.89 FLOW VELOCITY (FEET/SEC.) = 5.63  
 LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 10  
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>>>> MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<  
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\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11841.00 TO NODE 11527.00 IS CODE = 12  
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>>>> CLEAR MEMORY BANK # 1 <<<<<  
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\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 1 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S18.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	43.27	0.50 ( 0.50)	0.99	7177.1	11801.00
2	6864.20	46.60	0.50 ( 0.50)	0.99	7820.1	11831.00
3	6827.41	54.47	0.50 ( 0.50)	0.99	9256.8	11500.00
4	6774.38	60.04	0.50 ( 0.50)	0.99	10623.4	11701.00
5	6677.83	66.19	0.50 ( 0.50)	1.00	12122.0	11000.00
6	6471.50	83.04	0.50 ( 0.50)	1.00	17602.3	11330.00
7	6339.19	88.37	0.50 ( 0.50)	1.00	19497.8	10900.00
8	6228.99	91.63	0.50 ( 0.50)	1.00	20595.4	10830.00
9	5982.84	96.58	0.50 ( 0.50)	1.00	21984.5	11130.00
10	5362.41	107.51	0.50 ( 0.50)	1.00	24460.7	11620.00
11	5078.93	112.52	0.50 ( 0.50)	1.00	25521.9	10600.00
12	4959.40	115.03	0.50 ( 0.50)	1.00	26054.1	11600.00
13	4205.04	125.28	0.50 ( 0.50)	1.00	27869.2	10500.00
14	3683.17	134.26	0.50 ( 0.50)	1.00	29002.2	10710.00
15	3076.48	146.58	0.50 ( 0.50)	1.00	30024.8	10700.00
16	2647.10	155.91	0.50 ( 0.50)	1.00	30697.4	10400.00
17	2291.75	164.23	0.50 ( 0.50)	1.00	31187.9	10200.00
18	1901.37	178.29	0.50 ( 0.50)	1.00	31917.3	10300.00
19	1742.13	184.66	0.50 ( 0.50)	1.00	32048.2	10210.00
20	606.32	267.22	0.50 ( 0.50)	1.00	32916.6	10100.00
TOTAL AREA (ACRES) =		32916.6				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 12  
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>>>> CLEAR MEMORY BANK # 2 <<<<<  
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\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

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 FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 15.1  
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>>>> DEFINE MEMORY BANK # 2 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S25.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	82.28	0.50 ( 0.49)	0.99	5725.3	12500.00
2	1840.62	100.98	0.50 ( 0.49)	0.99	7457.8	12300.00
3	1831.53	103.77	0.50 ( 0.49)	0.99	7808.6	12330.00
4	1786.78	113.56	0.50 ( 0.49)	0.98	8943.7	12410.00
5	1724.80	122.42	0.50 ( 0.49)	0.98	9877.4	12400.00
6	1698.50	124.28	0.50 ( 0.49)	0.98	10032.3	12211.00
7	1550.96	132.89	0.50 ( 0.49)	0.98	10708.4	12201.00
8	1387.41	141.42	0.50 ( 0.49)	0.98	11230.5	12111.00
9	1286.30	147.09	0.50 ( 0.49)	0.98	11586.7	12231.00
10	1154.92	155.75	0.50 ( 0.49)	0.98	12067.4	12261.00

11	1139.24	156.89	0.50 ( 0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.50 ( 0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.50 ( 0.49)	0.98	13237.1	12000.00

TOTAL AREA (ACRES) = 13237.1

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FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	82.28	0.50 ( 0.49)	0.99	5725.3	12500.00
2	1840.62	100.98	0.50 ( 0.49)	0.99	7457.8	12300.00
3	1831.53	103.77	0.50 ( 0.49)	0.99	7808.6	12330.00
4	1786.78	113.56	0.50 ( 0.49)	0.98	8943.7	12410.00
5	1724.80	122.42	0.50 ( 0.49)	0.98	9877.4	12400.00
6	1698.50	124.28	0.50 ( 0.49)	0.98	10032.3	12211.00
7	1550.96	132.89	0.50 ( 0.49)	0.98	10708.4	12201.00
8	1387.41	141.42	0.50 ( 0.49)	0.98	11230.5	12111.00
9	1286.30	147.09	0.50 ( 0.49)	0.98	11586.7	12231.00
10	1154.92	155.75	0.50 ( 0.49)	0.98	12067.4	12261.00
11	1139.24	156.89	0.50 ( 0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.50 ( 0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.50 ( 0.49)	0.98	13237.1	12000.00

TOTAL AREA (ACRES) = 13237.1

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FLOW PROCESS FROM NODE 11841.00 TO NODE 12527.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	82.28	0.541	0.50 ( 0.49)	0.99	5725.3	12500.00
2	1840.62	100.98	0.493	0.50 ( 0.49)	0.99	7457.8	12300.00
3	1831.53	103.77	0.487	0.50 ( 0.49)	0.99	7808.6	12330.00
4	1786.78	113.56	0.468	0.50 ( 0.49)	0.98	8943.7	12410.00
5	1724.80	122.42	0.453	0.50 ( 0.49)	0.98	9877.4	12400.00
6	1698.50	124.28	0.451	0.50 ( 0.49)	0.98	10032.3	12211.00
7	1550.96	132.89	0.441	0.50 ( 0.49)	0.98	10708.4	12201.00
8	1387.41	141.42	0.430	0.50 ( 0.49)	0.98	11230.5	12111.00
9	1286.30	147.09	0.423	0.50 ( 0.49)	0.98	11586.7	12231.00
10	1154.92	155.75	0.413	0.50 ( 0.49)	0.98	12067.4	12261.00
11	1139.24	156.89	0.412	0.50 ( 0.49)	0.98	12112.7	12101.10
12	822.15	184.49	0.382	0.50 ( 0.49)	0.98	13109.5	12010.00
13	621.30	203.50	0.371	0.50 ( 0.49)	0.98	13237.1	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6867.40	43.27	0.733	0.50 ( 0.50)	0.99	7177.1	11801.00
2	6864.20	46.60	0.705	0.50 ( 0.50)	0.99	7820.1	11831.00

3	6827.41	54.47	0.650	0.50 ( 0.50)	0.99	9256.8	11500.00
4	6774.38	60.04	0.617	0.50 ( 0.50)	0.99	10623.4	11701.00
5	6677.83	66.19	0.596	0.50 ( 0.50)	1.00	12122.0	11000.00
6	6471.50	83.04	0.538	0.50 ( 0.50)	1.00	17602.3	11330.00
7	6339.19	88.37	0.520	0.50 ( 0.50)	1.00	19497.8	10900.00
8	6228.99	91.63	0.511	0.50 ( 0.50)	1.00	20595.4	10830.00
9	5982.84	96.58	0.501	0.50 ( 0.50)	1.00	21984.5	11130.00
10	5362.41	107.51	0.480	0.50 ( 0.50)	1.00	24460.7	11620.00
11	5078.93	112.52	0.470	0.50 ( 0.50)	1.00	25521.9	10600.00
12	4959.40	115.03	0.466	0.50 ( 0.50)	1.00	26054.1	11600.00
13	4205.04	125.28	0.450	0.50 ( 0.50)	1.00	27869.2	10500.00
14	3683.17	134.26	0.439	0.50 ( 0.50)	1.00	29002.2	10710.00
15	3076.48	146.58	0.424	0.50 ( 0.50)	1.00	30024.8	10700.00
16	2647.10	155.91	0.413	0.50 ( 0.50)	1.00	30697.4	10400.00
17	2291.75	164.23	0.403	0.50 ( 0.50)	1.00	31187.9	10200.00
18	1901.37	178.29	0.386	0.50 ( 0.50)	1.00	31917.3	10300.00
19	1742.13	184.66	0.381	0.50 ( 0.50)	1.00	32048.2	10210.00
20	606.32	267.22	0.337	0.50 ( 0.50)	1.00	32916.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8760.71	43.27	0.733	0.50 ( 0.50)	0.99	10187.8	11801.00
2	8757.51	46.60	0.705	0.50 ( 0.50)	0.99	11062.9	11831.00
3	8720.72	54.47	0.650	0.50 ( 0.50)	0.99	13047.0	11500.00
4	8667.69	60.04	0.617	0.50 ( 0.50)	0.99	14801.6	11701.00
5	8571.14	66.19	0.596	0.50 ( 0.50)	0.99	16727.9	11000.00
6	8374.21	82.28	0.541	0.50 ( 0.50)	0.99	23078.0	12500.00
7	8362.65	83.04	0.538	0.50 ( 0.50)	0.99	23398.7	11330.00
8	8215.32	88.37	0.520	0.50 ( 0.50)	0.99	25787.9	10900.00
9	8095.94	91.63	0.511	0.50 ( 0.50)	0.99	27187.4	10830.00
10	7835.84	96.58	0.501	0.50 ( 0.50)	0.99	29034.9	11130.00
11	7573.86	100.98	0.493	0.50 ( 0.50)	0.99	30438.4	12300.00
12	7406.40	103.77	0.487	0.50 ( 0.50)	0.99	31421.3	12330.00
13	7176.82	107.51	0.480	0.50 ( 0.50)	0.99	32703.5	11620.00
14	6870.45	112.52	0.470	0.50 ( 0.50)	0.99	34345.6	10600.00
15	6816.35	113.56	0.468	0.50 ( 0.50)	0.99	34685.5	12410.00
16	6735.89	115.03	0.466	0.50 ( 0.50)	0.99	35152.9	11600.00
17	6139.97	122.42	0.453	0.50 ( 0.50)	0.99	37241.1	12400.00
18	5977.28	124.28	0.451	0.50 ( 0.50)	0.99	37724.1	12211.00
19	5886.38	125.28	0.450	0.50 ( 0.50)	0.99	37980.2	10500.00
20	5313.74	132.89	0.441	0.50 ( 0.50)	0.99	39537.8	12201.00
21	5207.87	134.26	0.439	0.50 ( 0.50)	0.99	39794.4	10710.00
22	4718.02	141.42	0.430	0.50 ( 0.50)	0.99	40826.9	12111.00
23	4371.84	146.58	0.424	0.50 ( 0.50)	0.99	41579.6	10700.00
24	4339.40	147.09	0.423	0.50 ( 0.50)	0.99	41648.1	12231.00
25	3808.99	155.75	0.413	0.50 ( 0.50)	0.99	42753.9	12261.00
26	3799.93	155.91	0.413	0.50 ( 0.50)	0.99	42770.9	10400.00
27	3744.30	156.89	0.412	0.50 ( 0.50)	0.99	42868.2	12101.10
28	3346.67	164.23	0.403	0.50 ( 0.50)	0.99	43565.7	10200.00
29	2794.70	178.29	0.386	0.50 ( 0.50)	0.99	44803.0	10300.00
30	2568.61	184.49	0.382	0.50 ( 0.50)	0.99	45154.1	12010.00
31	2562.44	184.66	0.381	0.50 ( 0.50)	0.99	45158.9	10210.00
32	2104.24	203.50	0.371	0.50 ( 0.50)	0.99	45483.5	12000.00
33	1169.56	267.22	0.337	0.50 ( 0.50)	0.99	46153.7	10100.00

TOTAL AREA (ACRES) = 46153.7



COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 8760.71 Tc(MIN.) = 43.265  
 EFFECTIVE AREA(ACRES) = 10187.79 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 46153.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12527.00 = 97868.13 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12527.00 TO NODE 11929.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 347.47 DOWNSTREAM(FEET) = 341.63  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 532.38 CHANNEL SLOPE = 0.0110  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.728

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.37	0.50	0.987	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.987  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8762.22  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.03  
 AVERAGE FLOW DEPTH(FEET) = 14.43 TRAVEL TIME(MIN.) = 0.63  
 Tc(MIN.) = 43.90  
 SUBAREA AREA(ACRES) = 14.37 SUBAREA RUNOFF(CFS) = 3.03  
 EFFECTIVE AREA(ACRES) = 10202.16 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 46168.0 PEAK FLOW RATE(CFS) = 8760.71  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 14.43 FLOW VELOCITY(FEET/SEC.) = 14.02  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 11928.00 TO NODE 11929.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8760.71	43.90	0.728	0.50( 0.50)	0.99	10202.2	11801.00
2	8757.51	47.23	0.700	0.50( 0.50)	0.99	11077.2	11831.00
3	8720.72	55.10	0.646	0.50( 0.50)	0.99	13061.4	11500.00
4	8667.69	60.68	0.615	0.50( 0.50)	0.99	14815.9	11701.00
5	8571.14	66.83	0.594	0.50( 0.50)	0.99	16742.3	11000.00
6	8374.21	82.91	0.538	0.50( 0.50)	0.99	23092.4	12500.00
7	8362.65	83.68	0.536	0.50( 0.50)	0.99	23413.0	11330.00
8	8215.32	89.02	0.517	0.50( 0.50)	0.99	25802.3	10900.00
9	8095.94	92.28	0.510	0.50( 0.50)	0.99	27201.7	10830.00
10	7835.84	97.23	0.500	0.50( 0.50)	0.99	29049.3	11130.00
11	7573.86	101.64	0.492	0.50( 0.50)	0.99	30452.8	12300.00

12	7406.40	104.43	0.486	0.50( 0.50)	0.99	31435.7	12330.00
13	7176.82	108.18	0.479	0.50( 0.50)	0.99	32717.9	11620.00
14	6870.45	113.19	0.469	0.50( 0.50)	0.99	34359.9	10600.00
15	6816.35	114.23	0.467	0.50( 0.50)	0.99	34699.9	12410.00
16	6735.89	115.71	0.464	0.50( 0.50)	0.99	35167.3	11600.00
17	6139.97	123.11	0.452	0.50( 0.50)	0.99	37255.4	12400.00
18	5977.28	124.97	0.450	0.50( 0.50)	0.99	37738.5	12211.00
19	5886.38	125.98	0.449	0.50( 0.50)	0.99	37994.6	10500.00
20	5313.74	133.60	0.440	0.50( 0.50)	0.99	39552.2	12201.00
21	5207.87	134.98	0.438	0.50( 0.50)	0.99	39808.8	10710.00
22	4718.02	142.16	0.429	0.50( 0.50)	0.99	40841.3	12111.00
23	4371.84	147.33	0.423	0.50( 0.50)	0.99	41593.9	10700.00
24	4339.40	147.84	0.423	0.50( 0.50)	0.99	41662.5	12231.00
25	3808.99	156.53	0.412	0.50( 0.50)	0.99	42768.3	12261.00
26	3799.93	156.69	0.412	0.50( 0.50)	0.99	42785.2	10400.00
27	3744.30	157.67	0.411	0.50( 0.50)	0.99	42882.6	12101.10
28	3346.67	165.03	0.402	0.50( 0.50)	0.99	43580.1	10200.00
29	2794.70	179.14	0.385	0.50( 0.50)	0.99	44817.4	10300.00
30	2568.61	185.35	0.381	0.50( 0.50)	0.99	45168.5	12010.00
31	2562.44	185.52	0.381	0.50( 0.50)	0.99	45173.2	10210.00
32	2104.24	204.40	0.371	0.50( 0.50)	0.99	45497.8	12000.00
33	1169.56	268.26	0.336	0.50( 0.50)	0.99	46168.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	586.20	19.88	1.141	0.50( 0.50)	1.00	830.4	40200.00
2	534.95	38.03	0.785	0.50( 0.50)	1.00	1703.0	40120.00
3	524.30	40.23	0.758	0.50( 0.50)	1.00	1802.7	40100.00
4	297.81	88.95	0.518	0.50( 0.50)	1.00	3330.7	11910.00
5	282.81	90.57	0.513	0.50( 0.50)	1.00	3343.7	11900.00

LONGEST FLOWPATH FROM NODE 11910.00 TO NODE 11929.00 = 30683.27 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	1.141	0.50( 0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.785	0.50( 0.50)	0.99	10540.5	40120.00
3	9285.02	40.23	0.758	0.50( 0.50)	0.99	11152.6	40100.00
4	9267.97	43.90	0.728	0.50( 0.50)	0.99	12119.8	11801.00
5	9249.27	47.23	0.700	0.50( 0.50)	0.99	13099.5	11831.00
6	9175.90	55.10	0.646	0.50( 0.50)	0.99	15330.4	11500.00
7	9096.95	60.68	0.615	0.50( 0.50)	0.99	17259.8	11701.00
8	8971.81	66.83	0.594	0.50( 0.50)	0.99	19379.0	11000.00
9	8700.08	82.91	0.538	0.50( 0.50)	0.99	26233.8	12500.00
10	8684.95	83.68	0.536	0.50( 0.50)	0.99	26578.4	11330.00
11	8514.89	88.95	0.518	0.50( 0.50)	0.99	29104.3	11910.00
12	8512.53	89.02	0.517	0.50( 0.50)	0.99	29133.5	10900.00
13	8441.27	90.57	0.513	0.50( 0.50)	0.99	29812.6	11900.00
14	8312.88	92.28	0.510	0.50( 0.50)	0.99	30545.5	10830.00
15	7865.37	97.23	0.500	0.50( 0.50)	0.99	32393.0	11130.00
16	7602.89	101.64	0.492	0.50( 0.50)	0.99	33796.5	12300.00
17	7435.11	104.43	0.486	0.50( 0.50)	0.99	34779.4	12330.00
18	7205.10	108.18	0.479	0.50( 0.50)	0.99	36061.6	11620.00
19	6898.16	113.19	0.469	0.50( 0.50)	0.99	37703.6	10600.00
20	6843.93	114.23	0.467	0.50( 0.50)	0.99	38043.6	12410.00
21	6763.31	115.71	0.464	0.50( 0.50)	0.99	38511.0	11600.00

22	6166.68	123.11	0.452	0.50	( 0.50)	0.99	40599.1	12400.00
23	6003.86	124.97	0.450	0.50	( 0.50)	0.99	41082.2	12211.00
24	5912.89	125.98	0.449	0.50	( 0.50)	0.99	41338.3	10500.00
25	5339.70	133.60	0.440	0.50	( 0.50)	0.99	42895.9	12201.00
26	5233.73	134.98	0.438	0.50	( 0.50)	0.99	43152.5	10710.00
27	4743.38	142.16	0.429	0.50	( 0.50)	0.99	44185.0	12111.00
28	4396.83	147.33	0.423	0.50	( 0.50)	0.99	44937.7	10700.00
29	4364.36	147.84	0.423	0.50	( 0.50)	0.99	45006.2	12231.00
30	3833.33	156.53	0.412	0.50	( 0.50)	0.99	46112.0	12261.00
31	3824.26	156.69	0.412	0.50	( 0.50)	0.99	46129.0	10400.00
32	3768.56	157.67	0.411	0.50	( 0.50)	0.99	46226.3	12101.10
33	3370.40	165.03	0.402	0.50	( 0.50)	0.99	46923.8	10200.00
34	2817.44	179.14	0.385	0.50	( 0.50)	0.99	48161.1	10300.00
35	2591.11	185.35	0.381	0.50	( 0.50)	0.99	48512.2	12010.00
36	2584.94	185.52	0.381	0.50	( 0.50)	0.99	48517.0	10210.00
37	2126.14	204.40	0.371	0.50	( 0.50)	0.99	48841.6	12000.00
38	1189.40	268.26	0.336	0.50	( 0.50)	0.99	49511.8	10100.00

TOTAL AREA (ACRES) = 49511.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 9346.91 Tc (MIN.) = 19.884  
EFFECTIVE AREA (ACRES) = 5451.46 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49511.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 11929.00 = 98400.52 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 49511.8 TC (MIN.) = 19.88  
EFFECTIVE AREA (ACRES) = 5451.46 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.993  
PEAK FLOW RATE (CFS) = 9346.91

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	1.141	0.50 ( 0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.785	0.50 ( 0.50)	0.99	10540.5	40120.00
3	9285.02	40.23	0.758	0.50 ( 0.50)	0.99	11152.6	40100.00
4	9267.97	43.90	0.728	0.50 ( 0.50)	0.99	12119.8	11801.00
5	9249.27	47.23	0.700	0.50 ( 0.50)	0.99	13099.5	11831.00
6	9175.90	55.10	0.646	0.50 ( 0.50)	0.99	15330.4	11500.00
7	9096.95	60.68	0.615	0.50 ( 0.50)	0.99	17259.8	11701.00
8	8971.81	66.83	0.594	0.50 ( 0.50)	0.99	19379.0	11000.00
9	8700.08	82.91	0.538	0.50 ( 0.50)	0.99	26233.8	12500.00
10	8684.95	83.68	0.536	0.50 ( 0.50)	0.99	26578.4	11330.00
11	8514.89	88.95	0.518	0.50 ( 0.50)	0.99	29104.3	11910.00
12	8512.53	89.02	0.517	0.50 ( 0.50)	0.99	29133.5	10900.00
13	8441.27	90.57	0.513	0.50 ( 0.50)	0.99	29812.6	11900.00
14	8312.88	92.28	0.510	0.50 ( 0.50)	0.99	30545.5	10830.00
15	7865.37	97.23	0.500	0.50 ( 0.50)	0.99	32393.0	11130.00
16	7602.89	101.64	0.492	0.50 ( 0.50)	0.99	33796.5	12300.00
17	7435.11	104.43	0.486	0.50 ( 0.50)	0.99	34779.4	12330.00
18	7205.10	108.18	0.479	0.50 ( 0.50)	0.99	36061.6	11620.00
19	6898.16	113.19	0.469	0.50 ( 0.50)	0.99	37703.6	10600.00
20	6843.93	114.23	0.467	0.50 ( 0.50)	0.99	38043.6	12410.00
21	6763.31	115.71	0.464	0.50 ( 0.50)	0.99	38511.0	11600.00
22	6166.68	123.11	0.452	0.50 ( 0.50)	0.99	40599.1	12400.00
23	6003.86	124.97	0.450	0.50 ( 0.50)	0.99	41082.2	12211.00

24	5912.89	125.98	0.449	0.50	( 0.50)	0.99	41338.3	10500.00
25	5339.70	133.60	0.440	0.50	( 0.50)	0.99	42895.9	12201.00
26	5233.73	134.98	0.438	0.50	( 0.50)	0.99	43152.5	10710.00
27	4743.38	142.16	0.429	0.50	( 0.50)	0.99	44185.0	12111.00
28	4396.83	147.33	0.423	0.50	( 0.50)	0.99	44937.7	10700.00
29	4364.36	147.84	0.423	0.50	( 0.50)	0.99	45006.2	12231.00
30	3833.33	156.53	0.412	0.50	( 0.50)	0.99	46112.0	12261.00
31	3824.26	156.69	0.412	0.50	( 0.50)	0.99	46129.0	10400.00
32	3768.56	157.67	0.411	0.50	( 0.50)	0.99	46226.3	12101.10
33	3370.40	165.03	0.402	0.50	( 0.50)	0.99	46923.8	10200.00
34	2817.44	179.14	0.385	0.50	( 0.50)	0.99	48161.1	10300.00
35	2591.11	185.35	0.381	0.50	( 0.50)	0.99	48512.2	12010.00
36	2584.94	185.52	0.381	0.50	( 0.50)	0.99	48517.0	10210.00
37	2126.14	204.40	0.371	0.50	( 0.50)	0.99	48841.6	12000.00
38	1189.40	268.26	0.336	0.50	( 0.50)	0.99	49511.8	10100.00

=====  
END OF RATIONAL METHOD ANALYSIS  
=====

\*\*\*\*\*  
 RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
 (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
 (c) Copyright 1983-2010 Advanced Engineering Software (aes)  
 Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
 FILE NAME: S20.DAT  
 TIME/DATE OF STUDY: 14:04 04/03/2013  
 =====

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
 =====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
 SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
 NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.503
- 2) 10.00; 1.686
- 3) 15.00; 1.273
- 4) 20.00; 1.087
- 5) 25.00; 0.952
- 6) 30.00; 0.860
- 7) 40.00; 0.731
- 8) 50.00; 0.649
- 9) 60.00; 0.586
- 10) 90.00; 0.482
- 11) 120.00; 0.421
- 12) 180.00; 0.350
- 13) 360.00; 0.253
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
 as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
 OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12000.00 TO NODE 12001.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 965.01  
 ELEVATION DATA: UPSTREAM(FEET) = 4506.20 DOWNSTREAM(FEET) = 4179.61

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.700  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.380  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	9.03	0.50	1.000	0	13.70

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 7.15  
 TOTAL AREA(ACRES) = 9.03 PEAK FLOW RATE(CFS) = 7.15

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12001.00 TO NODE 12002.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4179.61 DOWNSTREAM(FEET) = 3849.51  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 976.60 CHANNEL SLOPE = 0.3380  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.240  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.82	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.45  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 2.19  
 Tc(MIN.) = 15.89  
 SUBAREA AREA(ACRES) = 18.82 SUBAREA RUNOFF(CFS) = 12.53  
 EFFECTIVE AREA(ACRES) = 27.85 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 27.8 PEAK FLOW RATE(CFS) = 18.54

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 7.98  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12002.00 = 1941.61 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12002.00 TO NODE 12003.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3849.51 DOWNSTREAM(FEET) = 3265.69  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1892.03 CHANNEL SLOPE = 0.3086  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.113  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	68.96	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.26  
 AVERAGE FLOW DEPTH(FEET) = 1.16 TRAVEL TIME(MIN.) = 3.41  
 Tc(MIN.) = 19.29  
 SUBAREA AREA(ACRES) = 68.96 SUBAREA RUNOFF(CFS) = 38.05  
 EFFECTIVE AREA(ACRES) = 96.81 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 96.8 PEAK FLOW RATE(CFS) = 53.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.32 FLOW VELOCITY(FEET/SEC.) = 10.15  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12003.00 = 3833.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3265.69 DOWNSTREAM(FEET) = 2427.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3118.62 CHANNEL SLOPE = 0.2688  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.988  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	328.28	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 126.11  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.90  
 AVERAGE FLOW DEPTH(FEET) = 1.88 TRAVEL TIME(MIN.) = 4.37  
 Tc(MIN.) = 23.66  
 SUBAREA AREA(ACRES) = 328.28 SUBAREA RUNOFF(CFS) = 144.17  
 EFFECTIVE AREA(ACRES) = 425.09 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 425.1 PEAK FLOW RATE(CFS) = 186.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.18 FLOW VELOCITY(FEET/SEC.) = 13.13  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12003.00 TO NODE 12020.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 23.66  
 RAINFALL INTENSITY(INCH/HR) = 0.99  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 425.09  
 TOTAL STREAM AREA(ACRES) = 425.09  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 186.68

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12010.00 TO NODE 12011.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 264.80  
 ELEVATION DATA: UPSTREAM(FEET) = 4208.12 DOWNSTREAM(FEET) = 4068.13

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.470  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.099  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	2.06	0.50	1.000	0	7.47

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 2.96  
 TOTAL AREA(ACRES) = 2.06 PEAK FLOW RATE(CFS) = 2.96

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12011.00 TO NODE 12012.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4068.13 DOWNSTREAM(FEET) = 3694.92  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 654.45 CHANNEL SLOPE = 0.5703  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.851  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.98	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.17  
 AVERAGE FLOW DEPTH(FEET) = 0.50 TRAVEL TIME(MIN.) = 1.52  
 Tc(MIN.) = 8.99  
 SUBAREA AREA(ACRES) = 3.98 SUBAREA RUNOFF(CFS) = 4.84  
 EFFECTIVE AREA(ACRES) = 6.04 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 6.0 PEAK FLOW RATE (CFS) = 7.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 0.56 FLOW VELOCITY (FEET/SEC.) = 7.76  
LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12012.00 = 919.25 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12012.00 TO NODE 12013.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3694.92 DOWNSTREAM (FEET) = 3415.55

CHANNEL LENGTH THRU SUBAREA (FEET) = 981.94 CHANNEL SLOPE = 0.2845

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.602

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.56	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 25.08

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.07

AVERAGE FLOW DEPTH (FEET) = 1.02 TRAVEL TIME (MIN.) = 2.03

Tc (MIN.) = 11.02

SUBAREA AREA (ACRES) = 35.56 SUBAREA RUNOFF (CFS) = 35.26

EFFECTIVE AREA (ACRES) = 41.60 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 41.6 PEAK FLOW RATE (CFS) = 41.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.22 FLOW VELOCITY (FEET/SEC.) = 9.18

LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12013.00 = 1901.19 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12013.00 TO NODE 12014.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 3415.55 DOWNSTREAM (FEET) = 2756.62

CHANNEL LENGTH THRU SUBAREA (FEET) = 1926.68 CHANNEL SLOPE = 0.3420

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.365

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	72.40	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 69.65

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.21

AVERAGE FLOW DEPTH (FEET) = 1.44 TRAVEL TIME (MIN.) = 2.86

Tc (MIN.) = 13.88

SUBAREA AREA (ACRES) = 72.40 SUBAREA RUNOFF (CFS) = 56.37

EFFECTIVE AREA (ACRES) = 114.00 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 114.0 PEAK FLOW RATE (CFS) = 88.75

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.57 FLOW VELOCITY (FEET/SEC.) = 11.93

LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12014.00 = 3827.87 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 2756.62 DOWNSTREAM (FEET) = 2427.28

CHANNEL LENGTH THRU SUBAREA (FEET) = 1697.28 CHANNEL SLOPE = 0.1940

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.215

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	121.96	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 128.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.57

AVERAGE FLOW DEPTH (FEET) = 2.01 TRAVEL TIME (MIN.) = 2.68

Tc (MIN.) = 16.56

SUBAREA AREA (ACRES) = 121.96 SUBAREA RUNOFF (CFS) = 78.46

EFFECTIVE AREA (ACRES) = 235.96 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA (ACRES) = 236.0 PEAK FLOW RATE (CFS) = 151.80

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.14 FLOW VELOCITY (FEET/SEC.) = 11.04

LONGEST FLOWPATH FROM NODE 12010.00 TO NODE 12020.00 = 5525.15 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12014.00 TO NODE 12020.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 16.56

RAINFALL INTENSITY (INCH/HR) = 1.22

AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50

AREA-AVERAGED Ap = 1.00

EFFECTIVE STREAM AREA (ACRES) = 235.96

TOTAL STREAM AREA (ACRES) = 235.96

PEAK FLOW RATE (CFS) AT CONFLUENCE = 151.80

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 186.68 23.66 0.988 0.50( 0.50) 1.00 425.1 12000.00  
2 151.80 16.56 1.215 0.50( 0.50) 1.00 236.0 12010.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	338.48	16.56	1.215	0.50( 0.50)	1.00	533.5	12010.00
2	290.30	23.66	0.988	0.50( 0.50)	1.00	661.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 338.48 Tc(MIN.) = 16.56  
EFFECTIVE AREA(ACRES) = 533.45 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 661.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12020.00 = 6952.26 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12020.00 TO NODE 12021.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2427.28 DOWNSTREAM(FEET) = 2056.25  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2698.04 CHANNEL SLOPE = 0.1375  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.084

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	376.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 437.41

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.63

AVERAGE FLOW DEPTH(FEET) = 3.40 TRAVEL TIME(MIN.) = 3.56

Tc(MIN.) = 20.12

SUBAREA AREA(ACRES) = 376.13 SUBAREA RUNOFF(CFS) = 197.55

EFFECTIVE AREA(ACRES) = 909.58 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1037.2 PEAK FLOW RATE(CFS) = 477.72

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.51 FLOW VELOCITY(FEET/SEC.) = 12.91

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12021.00 = 9650.30 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12021.00 TO NODE 12022.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2056.25 DOWNSTREAM(FEET) = 1864.68  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2552.86 CHANNEL SLOPE = 0.0750  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.976

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	347.45	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 552.25

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.66

AVERAGE FLOW DEPTH(FEET) = 4.16 TRAVEL TIME(MIN.) = 3.99

Tc(MIN.) = 24.11

SUBAREA AREA(ACRES) = 347.45 SUBAREA RUNOFF(CFS) = 148.79

EFFECTIVE AREA(ACRES) = 1257.03 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1384.6 PEAK FLOW RATE(CFS) = 538.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.12 FLOW VELOCITY(FEET/SEC.) = 10.60

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12022.00 = 12203.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12022.00 TO NODE 12023.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1864.68 DOWNSTREAM(FEET) = 1710.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1886.57 CHANNEL SLOPE = 0.0816  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.917

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	280.70	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 590.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.20

AVERAGE FLOW DEPTH(FEET) = 4.19 TRAVEL TIME(MIN.) = 2.81

Tc(MIN.) = 26.92

SUBAREA AREA(ACRES) = 280.70 SUBAREA RUNOFF(CFS) = 105.23

EFFECTIVE AREA(ACRES) = 1537.73 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1665.3 PEAK FLOW RATE(CFS) = 576.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.16 FLOW VELOCITY(FEET/SEC.) = 11.13

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12023.00 = 14089.73 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1710.75 DOWNSTREAM(FEET) = 1672.60

CHANNEL LENGTH THRU SUBAREA (FEET) = 1944.87    CHANNEL SLOPE = 0.0196  
 CHANNEL BASE (FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060    MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.837  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/    SCS SOIL    AREA    Fp    Ap    SCS  
   LAND USE    GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED    -    248.35    0.50    1.000    -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 614.07  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.62  
 AVERAGE FLOW DEPTH (FEET) = 5.56    TRAVEL TIME (MIN.) = 4.89  
 Tc (MIN.) = 31.81  
 SUBAREA AREA (ACRES) = 248.35    SUBAREA RUNOFF (CFS) = 75.20  
 EFFECTIVE AREA (ACRES) = 1786.08    AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50    AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1913.7    PEAK FLOW RATE (CFS) = 576.45  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.43    FLOW VELOCITY (FEET/SEC.) = 6.52  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12024.00 = 16034.60 FEET.

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 1913.7    TC (MIN.) = 31.81  
 EFFECTIVE AREA (ACRES) = 1786.08    AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50    AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 576.45

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	576.45	31.81	0.837	0.50 (0.50)	1.00	1786.1	12010.00
2	449.73	39.85	0.733	0.50 (0.50)	1.00	1913.7	12000.00

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 END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S21.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.503
- 2) 10.00; 1.686
- 3) 15.00; 1.273
- 4) 20.00; 1.087
- 5) 25.00; 0.952
- 6) 30.00; 0.860
- 7) 40.00; 0.731
- 8) 50.00; 0.649
- 9) 60.00; 0.586
- 10) 90.00; 0.482
- 11) 120.00; 0.421
- 12) 180.00; 0.350
- 13) 360.00; 0.253
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	HEIGHT LIP (FT)	GUTTER-GEOMETRIES HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<<

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PEAK FLOWRATE TABLE FILE NAME: S20.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	576.45	31.81	0.50 ( 0.50)	1.00	1786.1	12010.00
2	449.73	39.85	0.50 ( 0.50)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =		1913.7				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12023.00 TO NODE 12024.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	576.45	31.81	0.50 ( 0.50)	1.00	1786.1	12010.00
2	449.73	39.85	0.50 ( 0.50)	1.00	1913.7	12000.00
TOTAL AREA (ACRES) =		1913.7				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1672.60 DOWNSTREAM(FEET) = 1636.82

CHANNEL LENGTH THRU SUBAREA(FEET) = 780.49 CHANNEL SLOPE = 0.0458

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.818

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	93.19	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 589.78

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.01

AVERAGE FLOW DEPTH(FEET) = 4.67 TRAVEL TIME(MIN.) = 1.44

Tc(MIN.) = 33.26

SUBAREA AREA(ACRES) = 93.19 SUBAREA RUNOFF(CFS) = 26.65

EFFECTIVE AREA(ACRES) = 1879.27 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 2006.9 PEAK FLOW RATE(CFS) = 576.45

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.63 FLOW VELOCITY(FEET/SEC.) = 8.97

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

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FLOW PROCESS FROM NODE 12024.00 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 33.26
RAINFALL INTENSITY(INCH/HR) = 0.82
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 1879.27
TOTAL STREAM AREA(ACRES) = 2006.87
PEAK FLOW RATE(CFS) AT CONFLUENCE = 576.45

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FLOW PROCESS FROM NODE 12101.10 TO NODE 12101.20 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 847.57
ELEVATION DATA: UPSTREAM(FEET) = 3435.00 DOWNSTREAM(FEET) = 2774.23

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.008
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.603
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,NARROWLEAF" - 6.56 0.50 1.000 0 11.01
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 6.51
TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 6.51

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FLOW PROCESS FROM NODE 12101.20 TO NODE 12101.30 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2774.23 DOWNSTREAM(FEET) = 2097.09
CHANNEL LENGTH THRU SUBAREA(FEET) = 1205.19 CHANNEL SLOPE = 0.5619
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.437
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 34.88 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.31
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.02
AVERAGE FLOW DEPTH(FEET) = 0.84 TRAVEL TIME(MIN.) = 2.01
Tc(MIN.) = 13.01

SUBAREA AREA(ACRES) = 34.88 SUBAREA RUNOFF(CFS) = 29.41
EFFECTIVE AREA(ACRES) = 41.44 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 41.4 PEAK FLOW RATE(CFS) = 34.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.01 FLOW VELOCITY(FEET/SEC.) = 11.38
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12101.30 = 2052.76 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2097.09 DOWNSTREAM(FEET) = 1636.82
CHANNEL LENGTH THRU SUBAREA(FEET) = 1553.74 CHANNEL SLOPE = 0.2962
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.250
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 56.40 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.95
AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 2.60
Tc(MIN.) = 15.62
SUBAREA AREA(ACRES) = 56.40 SUBAREA RUNOFF(CFS) = 38.06
EFFECTIVE AREA(ACRES) = 97.84 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 97.8 PEAK FLOW RATE(CFS) = 66.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.45 FLOW VELOCITY(FEET/SEC.) = 10.52
LONGEST FLOWPATH FROM NODE 12101.10 TO NODE 12102.00 = 3606.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12101.30 TO NODE 12102.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 15.62
RAINFALL INTENSITY(INCH/HR) = 1.25
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 97.84
TOTAL STREAM AREA(ACRES) = 97.84
PEAK FLOW RATE(CFS) AT CONFLUENCE = 66.03

\*\* CONFLUENCE DATA \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	576.45	33.26	0.818	0.50( 0.50)	1.00	1879.3 12010.00
1	449.73	41.39	0.720	0.50( 0.50)	1.00	2006.9 12000.00
2	66.03	15.62	1.250	0.50( 0.50)	1.00	97.8 12101.10

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	642.48	15.62	1.250	0.50( 0.50)	1.00	980.4	12101.10
2	604.43	33.26	0.818	0.50( 0.50)	1.00	1977.1	12010.00
3	469.06	41.39	0.720	0.50( 0.50)	1.00	2104.7	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 642.48 Tc(MIN.) = 15.62  
EFFECTIVE AREA(ACRES) = 980.36 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2104.7  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12102.00 = 16815.09 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12102.00 TO NODE 12103.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1636.82 DOWNSTREAM(FEET) = 1558.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2049.75 CHANNEL SLOPE = 0.0382  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.104  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	116.59	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 674.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.71  
AVERAGE FLOW DEPTH(FEET) = 5.08 TRAVEL TIME(MIN.) = 3.92  
Tc(MIN.) = 19.54  
SUBAREA AREA(ACRES) = 116.59 SUBAREA RUNOFF(CFS) = 63.38  
EFFECTIVE AREA(ACRES) = 1096.95 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2221.3 PEAK FLOW RATE(CFS) = 642.48  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.99 FLOW VELOCITY(FEET/SEC.) = 8.59  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12103.00 = 18864.84 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12103.00 TO NODE 12104.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1558.46 DOWNSTREAM(FEET) = 1453.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1971.34 CHANNEL SLOPE = 0.0531  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.011

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	355.30	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 724.25  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.02  
AVERAGE FLOW DEPTH(FEET) = 4.91 TRAVEL TIME(MIN.) = 3.28  
Tc(MIN.) = 22.82  
SUBAREA AREA(ACRES) = 355.30 SUBAREA RUNOFF(CFS) = 163.32  
EFFECTIVE AREA(ACRES) = 1452.25 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2576.6 PEAK FLOW RATE(CFS) = 667.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.76 FLOW VELOCITY(FEET/SEC.) = 9.83  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12104.00 = 20836.18 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12104.00 TO NODE 12105.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1453.87 DOWNSTREAM(FEET) = 1369.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1885.63 CHANNEL SLOPE = 0.0446  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.930  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	200.37	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 706.36  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.33  
AVERAGE FLOW DEPTH(FEET) = 5.02 TRAVEL TIME(MIN.) = 3.37  
Tc(MIN.) = 26.18  
SUBAREA AREA(ACRES) = 200.37 SUBAREA RUNOFF(CFS) = 77.55  
EFFECTIVE AREA(ACRES) = 1652.62 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2777.0 PEAK FLOW RATE(CFS) = 667.57  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.92 FLOW VELOCITY(FEET/SEC.) = 9.20  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12105.00 = 22721.81 FEET.

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FLOW PROCESS FROM NODE 12105.00 TO NODE 12106.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 1369.72  DOWNSTREAM(FEET) = 1298.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 1910.12  CHANNEL SLOPE = 0.0374
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.864
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap   SCS
    LAND USE         GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED         -      339.52    0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 723.12
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.78
AVERAGE FLOW DEPTH(FEET) = 5.24  TRAVEL TIME(MIN.) = 3.62
Tc(MIN.) = 29.81
SUBAREA AREA(ACRES) = 339.52      SUBAREA RUNOFF(CFS) = 111.02
EFFECTIVE AREA(ACRES) = 1992.14  AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3116.5      PEAK FLOW RATE(CFS) = 667.57
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.08  FLOW VELOCITY(FEET/SEC.) = 8.61
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12106.00 = 24631.93 FEET.

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FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1298.29  DOWNSTREAM(FEET) = 1215.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 2982.44  CHANNEL SLOPE = 0.0277
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.780
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap   SCS
    LAND USE         GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED         -      164.97    0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 688.34
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.75
AVERAGE FLOW DEPTH(FEET) = 5.44  TRAVEL TIME(MIN.) = 6.42
Tc(MIN.) = 36.23
SUBAREA AREA(ACRES) = 164.97      SUBAREA RUNOFF(CFS) = 41.50
EFFECTIVE AREA(ACRES) = 2157.11  AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3281.5      PEAK FLOW RATE(CFS) = 667.57
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 5.38  FLOW VELOCITY(FEET/SEC.) = 7.70

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LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

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FLOW PROCESS FROM NODE 12106.00 TO NODE 12121.00 IS CODE = 1

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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 36.23
RAINFALL INTENSITY(INCH/HR) = 0.78
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 2157.11
TOTAL STREAM AREA(ACRES) = 3281.46
PEAK FLOW RATE(CFS) AT CONFLUENCE = 667.57

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FLOW PROCESS FROM NODE 12111.00 TO NODE 12112.00 IS CODE = 21

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>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

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>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
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INITIAL SUBAREA FLOW-LENGTH(FEET) = 939.51
ELEVATION DATA: UPSTREAM(FEET) = 3108.05  DOWNSTREAM(FEET) = 2753.95

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Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.265
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.416
SUBAREA Tc AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap   SCS  Tc
    LAND USE         GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  -      8.25    0.50      1.000     0  13.27
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 6.80
TOTAL AREA(ACRES) = 8.25  PEAK FLOW RATE(CFS) = 6.80

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FLOW PROCESS FROM NODE 12112.00 TO NODE 12113.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
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ELEVATION DATA: UPSTREAM(FEET) = 2753.95  DOWNSTREAM(FEET) = 2458.45
CHANNEL LENGTH THRU SUBAREA(FEET) = 945.14  CHANNEL SLOPE = 0.3127
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.255
SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/   SCS SOIL  AREA      Fp        Ap   SCS
    LAND USE         GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN
USER-DEFINED         -      16.51    0.50      1.000     -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.42

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TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.06  
AVERAGE FLOW DEPTH (FEET) = 0.77 TRAVEL TIME (MIN.) = 2.23  
Tc (MIN.) = 15.50  
SUBAREA AREA (ACRES) = 16.51 SUBAREA RUNOFF (CFS) = 11.21  
EFFECTIVE AREA (ACRES) = 24.76 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) = 16.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.86 FLOW VELOCITY (FEET/SEC.) = 7.62  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12113.00 = 1884.65 FEET.

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FLOW PROCESS FROM NODE 12113.00 TO NODE 12114.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) =	2458.45	DOWNSTREAM (FEET) =	1823.37
CHANNEL LENGTH THRU SUBAREA (FEET) =	1903.76	CHANNEL SLOPE =	0.3336
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	1.127		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	57.98	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 33.24  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.23  
AVERAGE FLOW DEPTH (FEET) = 1.10 TRAVEL TIME (MIN.) = 3.44  
Tc (MIN.) = 18.94  
SUBAREA AREA (ACRES) = 57.98 SUBAREA RUNOFF (CFS) = 32.69  
EFFECTIVE AREA (ACRES) = 82.74 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 82.7 PEAK FLOW RATE (CFS) = 46.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.24 FLOW VELOCITY (FEET/SEC.) = 10.10  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12114.00 = 3788.41 FEET.

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FLOW PROCESS FROM NODE 12114.00 TO NODE 12115.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	1823.37	DOWNSTREAM (FEET) =	1500.53
CHANNEL LENGTH THRU SUBAREA (FEET) =	1685.04	CHANNEL SLOPE =	0.1916
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	1.034		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.07	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 76.49  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.25  
AVERAGE FLOW DEPTH (FEET) = 1.66 TRAVEL TIME (MIN.) = 3.04  
Tc (MIN.) = 21.97  
SUBAREA AREA (ACRES) = 124.07 SUBAREA RUNOFF (CFS) = 59.58  
EFFECTIVE AREA (ACRES) = 206.81 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 99.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.83 FLOW VELOCITY (FEET/SEC.) = 9.84  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12115.00 = 5473.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) =	1500.53	DOWNSTREAM (FEET) =	1215.72
CHANNEL LENGTH THRU SUBAREA (FEET) =	1875.45	CHANNEL SLOPE =	0.1519
CHANNEL BASE (FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH (FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) =	0.946		

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	62.55	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 111.87  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 9.31  
AVERAGE FLOW DEPTH (FEET) = 2.00 TRAVEL TIME (MIN.) = 3.36  
Tc (MIN.) = 25.33  
SUBAREA AREA (ACRES) = 62.55 SUBAREA RUNOFF (CFS) = 25.09  
EFFECTIVE AREA (ACRES) = 269.36 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 269.4 PEAK FLOW RATE (CFS) = 108.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.97 FLOW VELOCITY (FEET/SEC.) = 9.25  
LONGEST FLOWPATH FROM NODE 12111.00 TO NODE 12121.00 = 7348.90 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12115.00 TO NODE 12121.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 25.33  
RAINFALL INTENSITY (INCH/HR) = 0.95  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 269.36

TOTAL STREAM AREA(ACRES) = 269.36  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 108.05

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	667.57	36.23	0.780	0.50( 0.50)	1.00	2157.1	12101.10
1	604.43	54.46	0.621	0.50( 0.50)	1.00	3153.9	12010.00
1	469.06	64.02	0.572	0.50( 0.50)	1.00	3281.5	12000.00
2	108.05	25.33	0.946	0.50( 0.50)	1.00	269.4	12111.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	775.62	25.33	0.946	0.50( 0.50)	1.00	1777.7	12111.00
2	735.32	36.23	0.780	0.50( 0.50)	1.00	2426.5	12101.10
3	633.69	54.46	0.621	0.50( 0.50)	1.00	3423.2	12010.00
4	486.47	64.02	0.572	0.50( 0.50)	1.00	3550.8	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 775.62 Tc(MIN.) = 25.33  
EFFECTIVE AREA(ACRES) = 1777.69 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3550.8  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12121.00 = 27614.37 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12121.00 TO NODE 12241.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1215.72 DOWNSTREAM(FEET) = 1122.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3397.13 CHANNEL SLOPE = 0.0275  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.829

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	136.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 795.83

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.02

AVERAGE FLOW DEPTH(FEET) = 5.75 TRAVEL TIME(MIN.) = 7.06

Tc(MIN.) = 32.39

SUBAREA AREA(ACRES) = 136.41 SUBAREA RUNOFF(CFS) = 40.39

EFFECTIVE AREA(ACRES) = 1914.10 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 3687.2 PEAK FLOW RATE(CFS) = 775.62

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.70 FLOW VELOCITY(FEET/SEC.) = 7.97

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3687.2 TC(MIN.) = 32.39  
EFFECTIVE AREA(ACRES) = 1914.10 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000  
PEAK FLOW RATE(CFS) = 775.62

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	775.62	32.39	0.829	0.50( 0.50)	1.00	1914.1	12111.00
2	735.32	43.40	0.703	0.50( 0.50)	1.00	2562.9	12101.10
3	633.69	61.93	0.579	0.50( 0.50)	1.00	3559.6	12010.00
4	486.47	72.00	0.544	0.50( 0.50)	1.00	3687.2	12000.00

=====  
END OF RATIONAL METHOD ANALYSIS  
=====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S22.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.503
- 2) 10.00; 1.686
- 3) 15.00; 1.273
- 4) 20.00; 1.087
- 5) 25.00; 0.952
- 6) 30.00; 0.860
- 7) 40.00; 0.731
- 8) 50.00; 0.649
- 9) 60.00; 0.586
- 10) 90.00; 0.482
- 11) 120.00; 0.421
- 12) 180.00; 0.350
- 13) 360.00; 0.253
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12201.00 TO NODE 12202.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 926.94  
ELEVATION DATA: UPSTREAM(FEET) = 3077.00 DOWNSTREAM(FEET) = 2740.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.295  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.414  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	-	5.74	0.50	1.000	0	13.29

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.72  
TOTAL AREA(ACRES) = 5.74 PEAK FLOW RATE(CFS) = 4.72

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12202.00 TO NODE 12203.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2740.64 DOWNSTREAM(FEET) = 2551.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 832.53 CHANNEL SLOPE = 0.2271  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.251  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.85	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.12  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.07  
AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 2.28  
Tc(MIN.) = 15.58  
SUBAREA AREA(ACRES) = 18.85 SUBAREA RUNOFF(CFS) = 12.75  
EFFECTIVE AREA(ACRES) = 24.59 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 24.6 PEAK FLOW RATE(CFS) = 16.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 6.77  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12203.00 = 1759.47 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12203.00 TO NODE 12204.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2551.60 DOWNSTREAM(FEET) = 2151.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2056.86 CHANNEL SLOPE = 0.1944  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.090

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	83.93	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 39.10

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.88

AVERAGE FLOW DEPTH(FEET) = 1.29 TRAVEL TIME(MIN.) = 4.35

Tc(MIN.) = 19.93

SUBAREA AREA(ACRES) = 83.93 SUBAREA RUNOFF(CFS) = 44.52

EFFECTIVE AREA(ACRES) = 108.52 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 108.5 PEAK FLOW RATE(CFS) = 57.56

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.49 FLOW VELOCITY(FEET/SEC.) = 8.64

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12204.00 = 3816.33 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12204.00 TO NODE 12205.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2151.76 DOWNSTREAM(FEET) = 1788.16  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2363.99 CHANNEL SLOPE = 0.1538  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.971

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	182.26	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 96.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.02

AVERAGE FLOW DEPTH(FEET) = 1.89 TRAVEL TIME(MIN.) = 4.37

Tc(MIN.) = 24.30

SUBAREA AREA(ACRES) = 182.26 SUBAREA RUNOFF(CFS) = 77.21

EFFECTIVE AREA(ACRES) = 290.78 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 290.8 PEAK FLOW RATE(CFS) = 123.18

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.07 FLOW VELOCITY(FEET/SEC.) = 9.58

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12205.00 = 6180.32 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12205.00 TO NODE 12206.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1788.16 DOWNSTREAM(FEET) = 1385.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2825.33 CHANNEL SLOPE = 0.1424  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.876

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	153.05	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 149.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.77

AVERAGE FLOW DEPTH(FEET) = 2.26 TRAVEL TIME(MIN.) = 4.82

Tc(MIN.) = 29.12

SUBAREA AREA(ACRES) = 153.05 SUBAREA RUNOFF(CFS) = 51.79

EFFECTIVE AREA(ACRES) = 443.83 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 443.8 PEAK FLOW RATE(CFS) = 150.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.26 FLOW VELOCITY(FEET/SEC.) = 9.79

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12206.00 = 9005.65 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1385.78 DOWNSTREAM(FEET) = 1006.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3579.23 CHANNEL SLOPE = 0.1061  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.786

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	132.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 167.29

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.99

AVERAGE FLOW DEPTH(FEET) = 2.49 TRAVEL TIME(MIN.) = 6.63

Tc(MIN.) = 35.75

SUBAREA AREA(ACRES) = 132.52 SUBAREA RUNOFF(CFS) = 34.06

EFFECTIVE AREA(ACRES) = 576.35 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 576.4 PEAK FLOW RATE(CFS) = 150.20

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.39 FLOW VELOCITY(FEET/SEC.) = 8.76

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12206.00 TO NODE 12221.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 35.75
RAINFALL INTENSITY(INCH/HR) = 0.79
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 576.35
TOTAL STREAM AREA(ACRES) = 576.35
PEAK FLOW RATE(CFS) AT CONFLUENCE = 150.20

\*\*\*\*\*

FLOW PROCESS FROM NODE 12211.00 TO NODE 12212.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 733.41
ELEVATION DATA: UPSTREAM(FEET) = 1669.93 DOWNSTREAM(FEET) = 1536.26

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.893
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.364
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"GRASS" - 8.90 0.50 1.000 0 13.89
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 6.92
TOTAL AREA(ACRES) = 8.90 PEAK FLOW RATE(CFS) = 6.92

\*\*\*\*\*

FLOW PROCESS FROM NODE 12212.00 TO NODE 12213.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1536.26 DOWNSTREAM(FEET) = 1416.02
CHANNEL LENGTH THRU SUBAREA(FEET) = 1253.05 CHANNEL SLOPE = 0.0960
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.141
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 17.91 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.14
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.49
AVERAGE FLOW DEPTH(FEET) = 0.95 TRAVEL TIME(MIN.) = 4.65
Tc(MIN.) = 18.54

SUBAREA AREA(ACRES) = 17.91 SUBAREA RUNOFF(CFS) = 10.33
EFFECTIVE AREA(ACRES) = 26.81 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 26.8 PEAK FLOW RATE(CFS) = 15.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.04 FLOW VELOCITY(FEET/SEC.) = 4.76
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12213.00 = 1986.46 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12213.00 TO NODE 12214.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1416.02 DOWNSTREAM(FEET) = 1234.66
CHANNEL LENGTH THRU SUBAREA(FEET) = 1877.62 CHANNEL SLOPE = 0.0966
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.990
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 125.19 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.41
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.19
AVERAGE FLOW DEPTH(FEET) = 1.53 TRAVEL TIME(MIN.) = 5.05
Tc(MIN.) = 23.59
SUBAREA AREA(ACRES) = 125.19 SUBAREA RUNOFF(CFS) = 55.18
EFFECTIVE AREA(ACRES) = 152.00 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 152.0 PEAK FLOW RATE(CFS) = 67.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.80 FLOW VELOCITY(FEET/SEC.) = 6.93
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12214.00 = 3864.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1234.66 DOWNSTREAM(FEET) = 1006.12
CHANNEL LENGTH THRU SUBAREA(FEET) = 2510.91 CHANNEL SLOPE = 0.0910
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.881
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 339.35 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 125.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.91



AVERAGE FLOW DEPTH (FEET) = 2.30 TRAVEL TIME (MIN.) = 5.29  
Tc (MIN.) = 28.88  
SUBAREA AREA (ACRES) = 339.35 SUBAREA RUNOFF (CFS) = 116.17  
EFFECTIVE AREA (ACRES) = 491.35 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 491.4 PEAK FLOW RATE (CFS) = 168.20

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.57 FLOW VELOCITY (FEET/SEC.) = 8.51  
LONGEST FLOWPATH FROM NODE 12211.00 TO NODE 12221.00 = 6374.99 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12214.00 TO NODE 12221.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 28.88  
RAINFALL INTENSITY (INCH/HR) = 0.88  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 491.35  
TOTAL STREAM AREA (ACRES) = 491.35  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 168.20

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	150.20	35.75	0.786	0.50 (0.50)	1.00	576.4	12201.00
2	168.20	28.88	0.881	0.50 (0.50)	1.00	491.4	12211.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	318.40	28.88	0.881	0.50 (0.50)	1.00	957.0	12211.00
2	276.49	35.75	0.786	0.50 (0.50)	1.00	1067.7	12201.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 318.40 Tc (MIN.) = 28.88  
EFFECTIVE AREA (ACRES) = 956.95 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1067.7  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12221.00 = 12584.88 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 1006.12 DOWNSTREAM (FEET) = 897.69  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2362.84 CHANNEL SLOPE = 0.0459

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.810

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 127.60 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 336.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.84  
AVERAGE FLOW DEPTH (FEET) = 3.78 TRAVEL TIME (MIN.) = 5.02  
Tc (MIN.) = 33.91  
SUBAREA AREA (ACRES) = 127.60 SUBAREA RUNOFF (CFS) = 35.53  
EFFECTIVE AREA (ACRES) = 1084.55 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1195.3 PEAK FLOW RATE (CFS) = 318.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 3.71 FLOW VELOCITY (FEET/SEC.) = 7.73  
LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 10

-----  
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12231.00 TO NODE 12231.50 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH (FEET) = 553.71  
ELEVATION DATA: UPSTREAM (FEET) = 2687.04 DOWNSTREAM (FEET) = 2470.68

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.660  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.632  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" - 3.48 0.50 1.000 0 10.66  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 3.54  
TOTAL AREA (ACRES) = 3.48 PEAK FLOW RATE (CFS) = 3.54

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12231.50 TO NODE 12232.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 2470.68 DOWNSTREAM (FEET) = 2375.54

CHANNEL LENGTH THRU SUBAREA (FEET) = 410.38 CHANNEL SLOPE = 0.2318  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.535  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	12.43	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.88  
 AVERAGE FLOW DEPTH (FEET) = 0.73 TRAVEL TIME (MIN.) = 1.16  
 Tc (MIN.) = 11.82  
 SUBAREA AREA (ACRES) = 12.43 SUBAREA RUNOFF (CFS) = 11.58  
 EFFECTIVE AREA (ACRES) = 15.91 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 14.82

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 0.87 FLOW VELOCITY (FEET/SEC.) = 6.58  
 LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12232.00 = 964.09 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12232.00 TO NODE 12233.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2375.54 DOWNSTREAM (FEET) = 2252.99  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 939.16 CHANNEL SLOPE = 0.1305  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.314  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.65	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 21.31  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.83  
 AVERAGE FLOW DEPTH (FEET) = 1.10 TRAVEL TIME (MIN.) = 2.68  
 Tc (MIN.) = 14.51  
 SUBAREA AREA (ACRES) = 17.65 SUBAREA RUNOFF (CFS) = 12.92  
 EFFECTIVE AREA (ACRES) = 33.56 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 33.6 PEAK FLOW RATE (CFS) = 24.58

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.16 FLOW VELOCITY (FEET/SEC.) = 6.04  
 LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12233.00 = 1903.25 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12233.00 TO NODE 12234.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2252.99 DOWNSTREAM (FEET) = 2163.07  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 976.53 CHANNEL SLOPE = 0.0921  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.183  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.54	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 30.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.57  
 AVERAGE FLOW DEPTH (FEET) = 1.35 TRAVEL TIME (MIN.) = 2.92  
 Tc (MIN.) = 17.43  
 SUBAREA AREA (ACRES) = 19.54 SUBAREA RUNOFF (CFS) = 12.00  
 EFFECTIVE AREA (ACRES) = 53.10 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 53.1 PEAK FLOW RATE (CFS) = 32.61

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.38 FLOW VELOCITY (FEET/SEC.) = 5.68  
 LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12234.00 = 2879.78 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12234.00 TO NODE 12235.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 2163.07 DOWNSTREAM (FEET) = 2018.08  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1909.65 CHANNEL SLOPE = 0.0759  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.005  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	51.14	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 44.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.68  
 AVERAGE FLOW DEPTH (FEET) = 1.61 TRAVEL TIME (MIN.) = 5.60  
 Tc (MIN.) = 23.03  
 SUBAREA AREA (ACRES) = 51.14 SUBAREA RUNOFF (CFS) = 23.24  
 EFFECTIVE AREA (ACRES) = 104.24 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 104.2 PEAK FLOW RATE (CFS) = 47.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 1.65 FLOW VELOCITY (FEET/SEC.) = 5.79  
 LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12235.00 = 4789.43 FEET.

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FLOW PROCESS FROM NODE 12235.00 TO NODE 12236.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2018.08  DOWNSTREAM(FEET) = 1607.89
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.94  CHANNEL SLOPE = 0.2162
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.924
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED       -       47.44    0.50    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.42
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.99
AVERAGE FLOW DEPTH(FEET) = 1.45  TRAVEL TIME(MIN.) = 3.52
Tc(MIN.) = 26.55
SUBAREA AREA(ACRES) = 47.44      SUBAREA RUNOFF(CFS) = 18.07
EFFECTIVE AREA(ACRES) = 151.68   AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 151.7        PEAK FLOW RATE(CFS) = 57.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.46  FLOW VELOCITY(FEET/SEC.) = 9.01
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12236.00 = 6686.37 FEET.

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*****
FLOW PROCESS FROM NODE 12236.00 TO NODE 12237.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1607.89  DOWNSTREAM(FEET) = 1326.23
CHANNEL LENGTH THRU SUBAREA(FEET) = 2213.20  CHANNEL SLOPE = 0.1273
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.844
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED       -       87.00    0.50    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.25
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.81
AVERAGE FLOW DEPTH(FEET) = 1.74  TRAVEL TIME(MIN.) = 4.73
Tc(MIN.) = 31.27
SUBAREA AREA(ACRES) = 87.00      SUBAREA RUNOFF(CFS) = 26.89
EFFECTIVE AREA(ACRES) = 238.68   AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 238.7        PEAK FLOW RATE(CFS) = 73.76

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.77  FLOW VELOCITY(FEET/SEC.) = 7.87
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12237.00 = 8899.57 FEET.

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FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 1326.23  DOWNSTREAM(FEET) = 1122.29
CHANNEL LENGTH THRU SUBAREA(FEET) = 2236.51  CHANNEL SLOPE = 0.0912
CHANNEL BASE(FEET) = 0.00  "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060  MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.776
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA      Fp      Ap      SCS
LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL) CN
USER-DEFINED       -       81.83    0.50    1.000    -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 83.95
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.15
AVERAGE FLOW DEPTH(FEET) = 1.98  TRAVEL TIME(MIN.) = 5.22
Tc(MIN.) = 36.49
SUBAREA AREA(ACRES) = 81.83      SUBAREA RUNOFF(CFS) = 20.33
EFFECTIVE AREA(ACRES) = 320.51   AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 320.5        PEAK FLOW RATE(CFS) = 79.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.94  FLOW VELOCITY(FEET/SEC.) = 7.09
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.

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*****
FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 10

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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2<<<<
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*****
FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 3<<<<
=====
PEAK FLOWRATE TABLE FILE NAME: S21.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER
NUMBER      (CFS)    (MIN.)  (INCH/HR)    (ACRES)  NODE
1           775.62   32.39   0.50( 0.50) 1.00    1914.1  12111.00
2           735.32   43.40   0.50( 0.50) 1.00    2562.9  12101.10
3           633.69   61.93   0.50( 0.50) 1.00    3559.6  12010.00
4           486.47   72.00   0.50( 0.50) 1.00    3687.2  12000.00
TOTAL AREA(ACRES) = 3687.2

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*****
FLOW PROCESS FROM NODE 12241.00 TO NODE 12241.00 IS CODE = 14.0

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>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<
=====
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
STREAM      Q      Tc      Fp(Fm)      Ap      Ae      HEADWATER

```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(ACRES)	NODE
1	775.62	32.39	0.50 ( 0.50)	1.00	1914.1 12111.00
2	735.32	43.40	0.50 ( 0.50)	1.00	2562.9 12101.10
3	633.69	61.93	0.50 ( 0.50)	1.00	3559.6 12010.00
4	486.47	72.00	0.50 ( 0.50)	1.00	3687.2 12000.00
TOTAL AREA (ACRES) =			3687.2		

\*\*\*\*\*

FLOW PROCESS FROM NODE 12237.00 TO NODE 12241.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	775.62	32.39	0.829	0.50 ( 0.50)	1.00	1914.1	12111.00
2	735.32	43.40	0.703	0.50 ( 0.50)	1.00	2562.9	12101.10
3	633.69	61.93	0.579	0.50 ( 0.50)	1.00	3559.6	12010.00
4	486.47	72.00	0.544	0.50 ( 0.50)	1.00	3687.2	12000.00
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.							

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	79.64	36.49	0.776	0.50 ( 0.50)	1.00	320.5	12231.00
LONGEST FLOWPATH FROM NODE 12231.00 TO NODE 12241.00 = 11136.08 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	855.26	32.39	0.829	0.50 ( 0.50)	1.00	2198.6	12111.00
2	840.24	36.49	0.776	0.50 ( 0.50)	1.00	2476.5	12231.00
3	793.87	43.40	0.703	0.50 ( 0.50)	1.00	2883.4	12101.10
4	656.51	61.93	0.579	0.50 ( 0.50)	1.00	3880.1	12010.00
5	499.22	72.00	0.544	0.50 ( 0.50)	1.00	4007.7	12000.00
TOTAL AREA (ACRES) =			4007.7				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 855.26 Tc(MIN.) = 32.386  
EFFECTIVE AREA(ACRES) = 2198.57 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 4007.7  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12241.00 = 31011.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12241.00 TO NODE 12242.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1122.29 DOWNSTREAM(FEET) = 1062.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2053.03 CHANNEL SLOPE = 0.0291  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.777  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
USER-DEFINED	-	249.96	0.50	0.995	-

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	219.09	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 882.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.41  
AVERAGE FLOW DEPTH(FEET) = 5.92 TRAVEL TIME(MIN.) = 4.07  
Tc(MIN.) = 36.46  
SUBAREA AREA(ACRES) = 219.09 SUBAREA RUNOFF(CFS) = 54.52  
EFFECTIVE AREA(ACRES) = 2417.66 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4226.8 PEAK FLOW RATE(CFS) = 855.26  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.85 FLOW VELOCITY(FEET/SEC.) = 8.34  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12242.00 = 33064.53 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12242.00 TO NODE 12243.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1062.50 DOWNSTREAM(FEET) = 998.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1931.30 CHANNEL SLOPE = 0.0331  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.730  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
USER-DEFINED	-	249.96	0.50	0.995	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 881.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.82  
AVERAGE FLOW DEPTH(FEET) = 5.77 TRAVEL TIME(MIN.) = 3.65  
Tc(MIN.) = 40.10  
SUBAREA AREA(ACRES) = 249.96 SUBAREA RUNOFF(CFS) = 52.29  
EFFECTIVE AREA(ACRES) = 2667.62 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4476.8 PEAK FLOW RATE(CFS) = 855.26  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.70 FLOW VELOCITY(FEET/SEC.) = 8.76  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12243.00 = 34995.83 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12243.00 TO NODE 12244.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 998.53 DOWNSTREAM(FEET) = 926.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1863.28 CHANNEL SLOPE = 0.0389  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.703  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 166.97 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 870.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.34  
 AVERAGE FLOW DEPTH(FEET) = 5.57 TRAVEL TIME(MIN.) = 3.32  
 Tc(MIN.) = 43.43  
 SUBAREA AREA(ACRES) = 166.97 SUBAREA RUNOFF(CFS) = 30.46  
 EFFECTIVE AREA(ACRES) = 2834.59 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4643.8 PEAK FLOW RATE(CFS) = 855.26  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.54 FLOW VELOCITY(FEET/SEC.) = 9.30  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12244.00 = 36859.11 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12244.00 TO NODE 12251.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 926.00 DOWNSTREAM(FEET) = 897.69  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1665.37 CHANNEL SLOPE = 0.0170  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.670  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 83.41 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 861.62  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84  
 AVERAGE FLOW DEPTH(FEET) = 6.48 TRAVEL TIME(MIN.) = 4.06  
 Tc(MIN.) = 47.49  
 SUBAREA AREA(ACRES) = 83.41 SUBAREA RUNOFF(CFS) = 12.72  
 EFFECTIVE AREA(ACRES) = 2918.00 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 4727.2 PEAK FLOW RATE(CFS) = 855.26  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.47 FLOW VELOCITY(FEET/SEC.) = 6.82  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12221.00 TO NODE 12251.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	855.26	47.49	0.670	0.50( 0.50)	1.00	2918.0	12111.00
2	840.24	51.67	0.638	0.50( 0.50)	1.00	3195.9	12231.00
3	793.87	58.81	0.594	0.50( 0.50)	1.00	3602.8	12101.10
4	656.51	78.13	0.523	0.50( 0.50)	1.00	4599.6	12010.00
5	499.22	89.38	0.484	0.50( 0.50)	1.00	4727.2	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	318.40	33.91	0.810	0.50( 0.50)	1.00	1084.6	12211.00
2	276.49	40.97	0.723	0.50( 0.50)	1.00	1195.3	12201.00

LONGEST FLOWPATH FROM NODE 12201.00 TO NODE 12251.00 = 14947.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1173.66	33.91	0.810	0.50( 0.50)	1.00	3168.0	12211.00
2	1131.75	40.97	0.723	0.50( 0.50)	1.00	3712.9	12201.00
3	1065.44	47.49	0.670	0.50( 0.50)	1.00	4113.3	12111.00
4	1011.81	51.67	0.638	0.50( 0.50)	1.00	4391.2	12231.00
5	909.64	58.81	0.594	0.50( 0.50)	1.00	4798.1	12101.10
6	685.00	78.13	0.523	0.50( 0.50)	1.00	5794.9	12010.00
7	499.21	89.38	0.484	0.50( 0.50)	1.00	5922.5	12000.00

TOTAL AREA(ACRES) = 5922.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1173.66 Tc(MIN.) = 33.907  
 EFFECTIVE AREA(ACRES) = 3168.01 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 5922.5  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12251.00 = 38524.48 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 897.69 DOWNSTREAM(FEET) = 846.91  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2133.08 CHANNEL SLOPE = 0.0238  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.755  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 85.79 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1183.49  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.39  
 AVERAGE FLOW DEPTH(FEET) = 6.86 TRAVEL TIME(MIN.) = 4.24  
 Tc(MIN.) = 38.14

SUBAREA AREA (ACRES) = 85.79 SUBAREA RUNOFF (CFS) = 19.67  
EFFECTIVE AREA (ACRES) = 3253.80 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 6008.3 PEAK FLOW RATE (CFS) = 1173.66  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 6.84 FLOW VELOCITY (FEET/SEC.) = 8.36  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12251.00 TO NODE 12281.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
-----

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 38.14  
RAINFALL INTENSITY (INCH/HR) = 0.75  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 3253.80  
TOTAL STREAM AREA (ACRES) = 6008.26  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 1173.66

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12261.00 TO NODE 12261.50 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----

INITIAL SUBAREA FLOW-LENGTH (FEET) = 378.71  
ELEVATION DATA: UPSTREAM (FEET) = 2264.27 DOWNSTREAM (FEET) = 2072.51

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 8.694  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.899  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" - 2.96 0.50 1.000 0 8.69  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 3.73  
TOTAL AREA (ACRES) = 2.96 PEAK FLOW RATE (CFS) = 3.73

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12261.50 TO NODE 12262.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 2072.51 DOWNSTREAM (FEET) = 1875.51  
CHANNEL LENGTH THRU SUBAREA (FEET) = 609.41 CHANNEL SLOPE = 0.3233  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.666  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 9.89 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 8.93  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.55  
AVERAGE FLOW DEPTH (FEET) = 0.67 TRAVEL TIME (MIN.) = 1.55  
Tc (MIN.) = 10.24  
SUBAREA AREA (ACRES) = 9.89 SUBAREA RUNOFF (CFS) = 10.37  
EFFECTIVE AREA (ACRES) = 12.85 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 12.9 PEAK FLOW RATE (CFS) = 13.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.78 FLOW VELOCITY (FEET/SEC.) = 7.33  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12262.00 = 988.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12262.00 TO NODE 12263.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 1875.51 DOWNSTREAM (FEET) = 1686.10  
CHANNEL LENGTH THRU SUBAREA (FEET) = 967.89 CHANNEL SLOPE = 0.1957  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.473

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 22.00 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 23.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.92  
AVERAGE FLOW DEPTH (FEET) = 1.06 TRAVEL TIME (MIN.) = 2.33  
Tc (MIN.) = 12.58  
SUBAREA AREA (ACRES) = 22.00 SUBAREA RUNOFF (CFS) = 19.27  
EFFECTIVE AREA (ACRES) = 34.85 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 34.8 PEAK FLOW RATE (CFS) = 30.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.17 FLOW VELOCITY (FEET/SEC.) = 7.41  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12263.00 = 1956.01 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12263.00 TO NODE 12264.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 1686.10 DOWNSTREAM (FEET) = 1572.93  
CHANNEL LENGTH THRU SUBAREA (FEET) = 944.28 CHANNEL SLOPE = 0.1198

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.280  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.72	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.11  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.72  
AVERAGE FLOW DEPTH (FEET) = 1.46 TRAVEL TIME (MIN.) = 2.34  
Tc (MIN.) = 14.92  
SUBAREA AREA (ACRES) = 35.72 SUBAREA RUNOFF (CFS) = 25.07  
EFFECTIVE AREA (ACRES) = 70.57 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 70.6 PEAK FLOW RATE (CFS) = 49.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.54 FLOW VELOCITY (FEET/SEC.) = 6.98  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12264.00 = 2900.29 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12264.00 TO NODE 12265.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1572.93 DOWNSTREAM (FEET) = 1506.41  
CHANNEL LENGTH THRU SUBAREA (FEET) = 569.03 CHANNEL SLOPE = 0.1169  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.228  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.21	0.50	0.886	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.886  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 64.79  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.37  
AVERAGE FLOW DEPTH (FEET) = 1.71 TRAVEL TIME (MIN.) = 1.29  
Tc (MIN.) = 16.20  
SUBAREA AREA (ACRES) = 43.21 SUBAREA RUNOFF (CFS) = 30.53  
EFFECTIVE AREA (ACRES) = 113.78 AREA-AVERAGED Fm (INCH/HR) = 0.48  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 113.8 PEAK FLOW RATE (CFS) = 76.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.83 FLOW VELOCITY (FEET/SEC.) = 7.67  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12265.00 = 3469.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12265.00 TO NODE 12266.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 1506.41 DOWNSTREAM (FEET) = 1311.17  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2121.93 CHANNEL SLOPE = 0.0920  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.064  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.55	0.50	0.710	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.710  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 103.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.60  
AVERAGE FLOW DEPTH (FEET) = 2.13 TRAVEL TIME (MIN.) = 4.65  
Tc (MIN.) = 20.86  
SUBAREA AREA (ACRES) = 84.55 SUBAREA RUNOFF (CFS) = 53.93  
EFFECTIVE AREA (ACRES) = 198.33 AREA-AVERAGED Fm (INCH/HR) = 0.43  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.85  
TOTAL AREA (ACRES) = 198.3 PEAK FLOW RATE (CFS) = 113.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.21 FLOW VELOCITY (FEET/SEC.) = 7.77  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12266.00 = 5591.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12266.00 TO NODE 12267.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1311.17 DOWNSTREAM (FEET) = 1232.47  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1555.18 CHANNEL SLOPE = 0.0506  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.960  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	160.37	0.50	0.633	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 160.30  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.76  
AVERAGE FLOW DEPTH (FEET) = 2.81 TRAVEL TIME (MIN.) = 3.84  
Tc (MIN.) = 24.69  
SUBAREA AREA (ACRES) = 160.37 SUBAREA RUNOFF (CFS) = 92.90  
EFFECTIVE AREA (ACRES) = 358.70 AREA-AVERAGED Fm (INCH/HR) = 0.38  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.75  
TOTAL AREA (ACRES) = 358.7 PEAK FLOW RATE (CFS) = 188.27

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.99 FLOW VELOCITY (FEET/SEC.) = 7.03  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12267.00 = 7146.43 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12267.00 TO NODE 12268.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1232.47 DOWNSTREAM(FEET) = 1141.79  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2111.19 CHANNEL SLOPE = 0.0430  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.862

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	100.65	0.50	0.970	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.970  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 205.37  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.75  
AVERAGE FLOW DEPTH(FEET) = 3.18 TRAVEL TIME(MIN.) = 5.21  
Tc(MIN.) = 29.91  
SUBAREA AREA(ACRES) = 100.65 SUBAREA RUNOFF(CFS) = 34.11  
EFFECTIVE AREA(ACRES) = 459.35 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 459.4 PEAK FLOW RATE(CFS) = 190.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.09 FLOW VELOCITY(FEET/SEC.) = 6.63  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12268.00 = 9257.62 FEET.

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FLOW PROCESS FROM NODE 12268.00 TO NODE 12269.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1141.79 DOWNSTREAM(FEET) = 1115.83  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1295.17 CHANNEL SLOPE = 0.0200  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.807

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	103.26	0.50	0.838	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 208.58  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.09  
AVERAGE FLOW DEPTH(FEET) = 3.70 TRAVEL TIME(MIN.) = 4.24  
Tc(MIN.) = 34.15  
SUBAREA AREA(ACRES) = 103.26 SUBAREA RUNOFF(CFS) = 36.00  
EFFECTIVE AREA(ACRES) = 562.61 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 562.6 PEAK FLOW RATE(CFS) = 203.74

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.66 FLOW VELOCITY(FEET/SEC.) = 5.07  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.00 = 10552.79 FEET.

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FLOW PROCESS FROM NODE 12269.00 TO NODE 12269.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1115.83 DOWNSTREAM(FEET) = 1100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1137.63 CHANNEL SLOPE = 0.0139  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.752

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	50.20	0.50	0.708	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 212.72  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.46  
AVERAGE FLOW DEPTH(FEET) = 3.99 TRAVEL TIME(MIN.) = 4.25  
Tc(MIN.) = 38.39  
SUBAREA AREA(ACRES) = 50.20 SUBAREA RUNOFF(CFS) = 17.96  
EFFECTIVE AREA(ACRES) = 612.81 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 612.8 PEAK FLOW RATE(CFS) = 203.74

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.92 FLOW VELOCITY(FEET/SEC.) = 4.42  
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12269.50 = 11690.42 FEET.

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FLOW PROCESS FROM NODE 12269.50 TO NODE 12270.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1100.00 DOWNSTREAM(FEET) = 1091.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1219.38 CHANNEL SLOPE = 0.0073  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.697

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	98.30	0.50	0.583	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 221.68  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.55  
AVERAGE FLOW DEPTH(FEET) = 4.57 TRAVEL TIME(MIN.) = 5.73  
Tc(MIN.) = 44.13  
SUBAREA AREA(ACRES) = 98.30 SUBAREA RUNOFF(CFS) = 35.88  
EFFECTIVE AREA(ACRES) = 711.11 AREA-AVERAGED Fm(INCH/HR) = 0.39  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.77  
TOTAL AREA(ACRES) = 711.1 PEAK FLOW RATE(CFS) = 203.74

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 4.42 FLOW VELOCITY(FEET/SEC.) = 3.48



LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12270.00 = 12909.80 FEET.

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FLOW PROCESS FROM NODE 12270.00 TO NODE 12271.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1091.06 DOWNSTREAM(FEET) = 962.23
CHANNEL LENGTH THRU SUBAREA(FEET) = 1995.19 CHANNEL SLOPE = 0.0646
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.663
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 181.93 0.50 0.746 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.746
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 227.51
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.08
AVERAGE FLOW DEPTH(FEET) = 3.06 TRAVEL TIME(MIN.) = 4.12
Tc(MIN.) = 48.24
SUBAREA AREA(ACRES) = 181.93 SUBAREA RUNOFF(CFS) = 47.53
EFFECTIVE AREA(ACRES) = 893.04 AREA-AVERAGED Fm(INCH/HR) = 0.38
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.76
TOTAL AREA(ACRES) = 893.0 PEAK FLOW RATE(CFS) = 225.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.05 FLOW VELOCITY(FEET/SEC.) = 8.06
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12271.00 = 14904.99 FEET.

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FLOW PROCESS FROM NODE 12271.00 TO NODE 12272.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 962.23 DOWNSTREAM(FEET) = 917.38
CHANNEL LENGTH THRU SUBAREA(FEET) = 1613.85 CHANNEL SLOPE = 0.0278
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.632
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 181.79 0.50 0.910 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.910
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 240.13
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.96
AVERAGE FLOW DEPTH(FEET) = 3.66 TRAVEL TIME(MIN.) = 4.51
Tc(MIN.) = 52.76
SUBAREA AREA(ACRES) = 181.79 SUBAREA RUNOFF(CFS) = 28.87
EFFECTIVE AREA(ACRES) = 1074.83 AREA-AVERAGED Fm(INCH/HR) = 0.39
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.79
TOTAL AREA(ACRES) = 1074.8 PEAK FLOW RATE(CFS) = 229.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.60 FLOW VELOCITY(FEET/SEC.) = 5.90
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12272.00 = 16518.84 FEET.

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FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 917.38 DOWNSTREAM(FEET) = 846.91
CHANNEL LENGTH THRU SUBAREA(FEET) = 3182.34 CHANNEL SLOPE = 0.0221
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.577
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 79.99 0.50 0.948 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.948
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 232.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.43
AVERAGE FLOW DEPTH(FEET) = 3.78 TRAVEL TIME(MIN.) = 9.77
Tc(MIN.) = 62.52
SUBAREA AREA(ACRES) = 79.99 SUBAREA RUNOFF(CFS) = 7.42
EFFECTIVE AREA(ACRES) = 1154.82 AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80
TOTAL AREA(ACRES) = 1154.8 PEAK FLOW RATE(CFS) = 229.00
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.76 FLOW VELOCITY(FEET/SEC.) = 5.41
LONGEST FLOWPATH FROM NODE 12261.00 TO NODE 12281.00 = 19701.18 FEET.

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FLOW PROCESS FROM NODE 12272.00 TO NODE 12281.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 62.52
RAINFALL INTENSITY(INCH/HR) = 0.58
AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.80
EFFECTIVE STREAM AREA(ACRES) = 1154.82
TOTAL STREAM AREA(ACRES) = 1154.82
PEAK FLOW RATE(CFS) AT CONFLUENCE = 229.00

\*\* CONFLUENCE DATA \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 1173.66 38.14 0.755 0.50( 0.50) 1.00 3253.8 12211.00
1 1131.75 45.25 0.688 0.50( 0.50) 1.00 3798.7 12201.00
1 1065.44 51.83 0.637 0.50( 0.50) 1.00 4199.1 12111.00

1	1011.81	56.07	0.611	0.50	( 0.50)	1.00	4477.0	12231.00
1	909.64	63.33	0.574	0.50	( 0.50)	1.00	4883.9	12101.10
1	685.00	82.99	0.506	0.50	( 0.50)	1.00	5880.7	12010.00
1	499.21	94.64	0.473	0.50	( 0.50)	1.00	6008.3	12000.00
2	229.00	62.52	0.577	0.50	( 0.40)	0.80	1154.8	12261.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1402.66	38.14	0.755	0.50 ( 0.48)	0.96	3958.3	12211.00
2	1360.75	45.25	0.688	0.50 ( 0.48)	0.96	4634.4	12201.00
3	1294.45	51.83	0.637	0.50 ( 0.48)	0.96	5156.5	12111.00
4	1240.81	56.07	0.611	0.50 ( 0.48)	0.96	5512.6	12231.00
5	1150.04	62.52	0.577	0.50 ( 0.48)	0.96	5993.4	12261.00
6	1135.01	63.33	0.574	0.50 ( 0.48)	0.96	6038.7	12101.10
7	822.15	82.99	0.506	0.50 ( 0.48)	0.97	7035.5	12010.00
8	621.31	94.64	0.473	0.50 ( 0.48)	0.97	7163.1	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1402.66 Tc(MIN.) = 38.14  
EFFECTIVE AREA(ACRES) = 3958.32 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7163.1  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12281.00 = 40657.56 FEET.

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FLOW PROCESS FROM NODE 12281.00 TO NODE 12282.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 846.91 DOWNSTREAM(FEET) = 835.60  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1561.00 CHANNEL SLOPE = 0.0072  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.708

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	267.56	0.50	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1435.74  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.64  
AVERAGE FLOW DEPTH(FEET) = 9.21 TRAVEL TIME(MIN.) = 4.61  
Tc(MIN.) = 42.76  
SUBAREA AREA(ACRES) = 267.56 SUBAREA RUNOFF(CFS) = 66.15  
EFFECTIVE AREA(ACRES) = 4225.88 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 7430.6 PEAK FLOW RATE(CFS) = 1402.66  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 9.14 FLOW VELOCITY(FEET/SEC.) = 5.60  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12282.00 = 42218.56 FEET.

=====  
END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 7430.6 TC(MIN.) = 42.76  
EFFECTIVE AREA(ACRES) = 4225.88 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.958  
PEAK FLOW RATE(CFS) = 1402.66

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1402.66	42.76	0.708	0.50 ( 0.48)	0.96	4225.9	12211.00
2	1360.75	49.90	0.650	0.50 ( 0.48)	0.96	4902.0	12201.00
3	1294.45	56.55	0.608	0.50 ( 0.48)	0.96	5424.0	12111.00
4	1240.81	60.84	0.583	0.50 ( 0.48)	0.96	5780.2	12231.00
5	1150.04	67.38	0.560	0.50 ( 0.48)	0.96	6260.9	12261.00
6	1135.01	68.21	0.558	0.50 ( 0.48)	0.96	6306.3	12101.10
7	822.15	88.28	0.488	0.50 ( 0.48)	0.96	7303.0	12010.00
8	621.31	100.32	0.461	0.50 ( 0.48)	0.96	7430.6	12000.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S23.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.503
- 2) 10.00; 1.686
- 3) 15.00; 1.273
- 4) 20.00; 1.087
- 5) 25.00; 0.952
- 6) 30.00; 0.860
- 7) 40.00; 0.731
- 8) 50.00; 0.649
- 9) 60.00; 0.586
- 10) 90.00; 0.482
- 11) 120.00; 0.421
- 12) 180.00; 0.350
- 13) 360.00; 0.253
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12300.00 TO NODE 12301.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 924.36  
ELEVATION DATA: UPSTREAM(FEET) = 1712.53 DOWNSTREAM(FEET) = 1490.12

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.417  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.321  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"GRASS" - 6.66 0.50 1.000 0 14.42  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.92  
TOTAL AREA(ACRES) = 6.66 PEAK FLOW RATE(CFS) = 4.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12301.00 TO NODE 12302.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1490.12 DOWNSTREAM(FEET) = 1117.78  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1564.45 CHANNEL SLOPE = 0.2380  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.153  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 39.97 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.85  
AVERAGE FLOW DEPTH(FEET) = 0.90 TRAVEL TIME(MIN.) = 3.80  
Tc(MIN.) = 18.22  
SUBAREA AREA(ACRES) = 39.97 SUBAREA RUNOFF(CFS) = 23.49  
EFFECTIVE AREA(ACRES) = 46.63 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 46.6 PEAK FLOW RATE(CFS) = 27.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.09 FLOW VELOCITY(FEET/SEC.) = 7.74  
LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12302.00 = 2488.81 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1117.78 DOWNSTREAM(FEET) = 780.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2216.41 CHANNEL SLOPE = 0.1520  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.996

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.51 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.17  
 AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 5.15  
 Tc(MIN.) = 23.37  
 SUBAREA AREA(ACRES) = 51.51 SUBAREA RUNOFF(CFS) = 22.98  
 EFFECTIVE AREA(ACRES) = 98.14 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 98.1 PEAK FLOW RATE(CFS) = 43.79

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 7.38  
 LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: S22.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1402.66	42.76	0.50( 0.48)	0.96	4225.9	12211.00
2	1360.75	49.90	0.50( 0.48)	0.96	4902.0	12201.00
3	1294.45	56.55	0.50( 0.48)	0.96	5424.0	12111.00
4	1240.81	60.84	0.50( 0.48)	0.96	5780.2	12231.00
5	1150.04	67.38	0.50( 0.48)	0.96	6260.9	12261.00
6	1135.01	68.21	0.50( 0.48)	0.96	6306.3	12101.10
7	822.15	88.28	0.50( 0.48)	0.96	7303.0	12010.00
8	621.31	100.32	0.50( 0.48)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =						7430.6

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12282.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1402.66	42.76	0.50( 0.48)	0.96	4225.9	12211.00
2	1360.75	49.90	0.50( 0.48)	0.96	4902.0	12201.00
3	1294.45	56.55	0.50( 0.48)	0.96	5424.0	12111.00
4	1240.81	60.84	0.50( 0.48)	0.96	5780.2	12231.00
5	1150.04	67.38	0.50( 0.48)	0.96	6260.9	12261.00
6	1135.01	68.21	0.50( 0.48)	0.96	6306.3	12101.10
7	822.15	88.28	0.50( 0.48)	0.96	7303.0	12010.00
8	621.31	100.32	0.50( 0.48)	0.96	7430.6	12000.00

1	1402.66	42.76	0.50( 0.48)	0.96	4225.9	12211.00
2	1360.75	49.90	0.50( 0.48)	0.96	4902.0	12201.00
3	1294.45	56.55	0.50( 0.48)	0.96	5424.0	12111.00
4	1240.81	60.84	0.50( 0.48)	0.96	5780.2	12231.00
5	1150.04	67.38	0.50( 0.48)	0.96	6260.9	12261.00
6	1135.01	68.21	0.50( 0.48)	0.96	6306.3	12101.10
7	822.15	88.28	0.50( 0.48)	0.96	7303.0	12010.00
8	621.31	100.32	0.50( 0.48)	0.96	7430.6	12000.00
TOTAL AREA(ACRES) =						7430.6

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12282.00 TO NODE 12320.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 835.60 DOWNSTREAM(FEET) = 780.80  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1568.10 CHANNEL SLOPE = 0.0349  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.687

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 51.15 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1406.96  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.12  
 AVERAGE FLOW DEPTH(FEET) = 6.81 TRAVEL TIME(MIN.) = 2.58  
 Tc(MIN.) = 45.34  
 SUBAREA AREA(ACRES) = 51.15 SUBAREA RUNOFF(CFS) = 8.61  
 EFFECTIVE AREA(ACRES) = 4277.03 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 7481.8 PEAK FLOW RATE(CFS) = 1402.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 6.80 FLOW VELOCITY(FEET/SEC.) = 10.11  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12302.00 TO NODE 12320.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1402.66	45.34	0.687	0.50( 0.48)	0.96	4277.0	12211.00
2	1360.75	52.51	0.633	0.50( 0.48)	0.96	4953.1	12201.00
3	1294.45	59.19	0.591	0.50( 0.48)	0.96	5475.2	12111.00
4	1240.81	63.50	0.574	0.50( 0.48)	0.96	5831.4	12231.00
5	1150.04	70.10	0.551	0.50( 0.48)	0.96	6312.1	12261.00
6	1135.01	70.94	0.548	0.50( 0.48)	0.96	6357.4	12101.10
7	822.15	91.23	0.479	0.50( 0.48)	0.96	7354.2	12010.00
8	621.31	103.48	0.455	0.50( 0.48)	0.96	7481.8	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.79	23.37	0.996	0.50 ( 0.50)	1.00	98.1	12300.00

LONGEST FLOWPATH FROM NODE 12300.00 TO NODE 12320.00 = 4705.22 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.45	23.37	0.996	0.50 ( 0.48)	0.96	2302.9	12300.00
2	1419.18	45.34	0.687	0.50 ( 0.48)	0.96	4375.2	12211.00
3	1372.50	52.51	0.633	0.50 ( 0.48)	0.96	5051.3	12201.00
4	1302.48	59.19	0.591	0.50 ( 0.48)	0.96	5573.3	12111.00
5	1247.32	63.50	0.574	0.50 ( 0.48)	0.96	5929.5	12231.00
6	1154.52	70.10	0.551	0.50 ( 0.48)	0.96	6410.2	12261.00
7	1139.24	70.94	0.548	0.50 ( 0.48)	0.96	6455.6	12101.10
8	822.15	91.23	0.479	0.50 ( 0.48)	0.96	7452.3	12010.00
9	621.31	103.48	0.455	0.50 ( 0.48)	0.96	7579.9	12000.00
TOTAL AREA (ACRES) =		7579.9					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1446.45 Tc(MIN.) = 23.373  
EFFECTIVE AREA(ACRES) = 2302.90 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 7579.9  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12320.00 = 43786.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12320.00 TO NODE 12321.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 780.80 DOWNSTREAM(FEET) = 761.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2102.41 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.878  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.82	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1477.20  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.18  
AVERAGE FLOW DEPTH(FEET) = 8.92 TRAVEL TIME(MIN.) = 5.67  
Tc(MIN.) = 29.04  
SUBAREA AREA(ACRES) = 180.82 SUBAREA RUNOFF(CFS) = 61.43  
EFFECTIVE AREA(ACRES) = 2483.72 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 7760.8 PEAK FLOW RATE(CFS) = 1446.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.85 FLOW VELOCITY(FEET/SEC.) = 6.15

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12321.00 = 45889.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12321.00 TO NODE 12322.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 761.66 DOWNSTREAM(FEET) = 710.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1916.13 CHANNEL SLOPE = 0.0268  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.828  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	217.17	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1478.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.27  
AVERAGE FLOW DEPTH(FEET) = 7.29 TRAVEL TIME(MIN.) = 3.44  
Tc(MIN.) = 32.48  
SUBAREA AREA(ACRES) = 217.17 SUBAREA RUNOFF(CFS) = 64.06  
EFFECTIVE AREA(ACRES) = 2700.89 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 7977.9 PEAK FLOW RATE(CFS) = 1446.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.23 FLOW VELOCITY(FEET/SEC.) = 9.22  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12322.00 = 47805.20 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 710.30 DOWNSTREAM(FEET) = 678.19  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1977.07 CHANNEL SLOPE = 0.0162  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.773  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	194.67	0.50	0.999	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1470.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.68  
AVERAGE FLOW DEPTH(FEET) = 7.99 TRAVEL TIME(MIN.) = 4.29  
Tc(MIN.) = 36.78  
SUBAREA AREA(ACRES) = 194.67 SUBAREA RUNOFF(CFS) = 47.81  
EFFECTIVE AREA(ACRES) = 2895.56 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA (ACRES) = 8172.6 PEAK FLOW RATE(CFS) = 1446.45

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.95 FLOW VELOCITY(FEET/SEC.) = 7.64  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12322.00 TO NODE 12340.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 36.78

RAINFALL INTENSITY(INCH/HR) = 0.77

AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 2895.56

TOTAL STREAM AREA(ACRES) = 8172.59

PEAK FLOW RATE(CFS) AT CONFLUENCE = 1446.45

\*\*\*\*\*

FLOW PROCESS FROM NODE 12330.00 TO NODE 12331.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 994.42

ELEVATION DATA: UPSTREAM(FEET) = 1754.00 DOWNSTREAM(FEET) = 1530.30

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.046

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.271

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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NATURAL FAIR COVER

"GRASS"	-	3.33	0.50	1.000	0	15.05
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 2.31

TOTAL AREA(ACRES) = 3.33 PEAK FLOW RATE(CFS) = 2.31

\*\*\*\*\*

FLOW PROCESS FROM NODE 12331.00 TO NODE 12332.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1530.30 DOWNSTREAM(FEET) = 1412.81

CHANNEL LENGTH THRU SUBAREA(FEET) = 946.66 CHANNEL SLOPE = 0.1241

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.149

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED - 28.08 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.55

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78

AVERAGE FLOW DEPTH(FEET) = 0.86 TRAVEL TIME(MIN.) = 3.30

Tc(MIN.) = 18.34

SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 16.39

EFFECTIVE AREA(ACRES) = 31.41 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 31.4 PEAK FLOW RATE(CFS) = 18.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.06 FLOW VELOCITY(FEET/SEC.) = 5.48

LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12332.00 = 1941.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12332.00 TO NODE 12333.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1412.81 DOWNSTREAM(FEET) = 1235.19

CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.37 CHANNEL SLOPE = 0.0907

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.969

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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USER-DEFINED	-	44.96	0.50	1.000	-
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.92

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.43

AVERAGE FLOW DEPTH(FEET) = 1.31 TRAVEL TIME(MIN.) = 6.02

Tc(MIN.) = 24.36

SUBAREA AREA(ACRES) = 44.96 SUBAREA RUNOFF(CFS) = 18.98

EFFECTIVE AREA(ACRES) = 76.37 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 76.4 PEAK FLOW RATE(CFS) = 32.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 5.61

LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12333.00 = 3900.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12333.00 TO NODE 12334.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1235.19 DOWNSTREAM(FEET) = 1013.96

CHANNEL LENGTH THRU SUBAREA(FEET) = 1921.81 CHANNEL SLOPE = 0.1151

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.871

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 30.50 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.35  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.36  
 AVERAGE FLOW DEPTH(FEET) = 1.40 TRAVEL TIME(MIN.) = 5.04  
 Tc(MIN.) = 29.40  
 SUBAREA AREA(ACRES) = 30.50 SUBAREA RUNOFF(CFS) = 10.18  
 EFFECTIVE AREA(ACRES) = 106.87 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 106.9 PEAK FLOW RATE(CFS) = 35.68

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.37 FLOW VELOCITY(FEET/SEC.) = 6.33  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12334.00 = 5822.26 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12334.00 TO NODE 12335.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 1013.96 DOWNSTREAM(FEET) = 809.84  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2029.80 CHANNEL SLOPE = 0.1006  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.803

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 145.82 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 55.60  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.72  
 AVERAGE FLOW DEPTH(FEET) = 1.66 TRAVEL TIME(MIN.) = 5.03  
 Tc(MIN.) = 34.43  
 SUBAREA AREA(ACRES) = 145.82 SUBAREA RUNOFF(CFS) = 39.72  
 EFFECTIVE AREA(ACRES) = 252.69 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 252.7 PEAK FLOW RATE(CFS) = 68.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.80 FLOW VELOCITY(FEET/SEC.) = 7.06  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12335.00 = 7852.06 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 809.84 DOWNSTREAM(FEET) = 678.19  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1905.44 CHANNEL SLOPE = 0.0691  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.737  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 50.71 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.26  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.26  
 AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 5.07  
 Tc(MIN.) = 39.50  
 SUBAREA AREA(ACRES) = 50.71 SUBAREA RUNOFF(CFS) = 10.83  
 EFFECTIVE AREA(ACRES) = 303.40 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 303.4 PEAK FLOW RATE(CFS) = 68.84  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 6.14  
 LONGEST FLOWPATH FROM NODE 12330.00 TO NODE 12340.00 = 9757.50 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12335.00 TO NODE 12340.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
 TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 39.50  
 RAINFALL INTENSITY(INCH/HR) = 0.74  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 303.40  
 TOTAL STREAM AREA(ACRES) = 303.40  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 68.84

\*\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.45	36.78	0.773	0.50( 0.48)	0.97	2895.6	12300.00
1	1419.18	58.85	0.593	0.50( 0.48)	0.96	4967.8	12211.00
1	1372.50	66.14	0.565	0.50( 0.48)	0.96	5643.9	12201.00
1	1302.48	73.00	0.541	0.50( 0.48)	0.96	6166.0	12111.00
1	1247.32	77.47	0.525	0.50( 0.48)	0.96	6522.2	12231.00
1	1154.52	84.35	0.502	0.50( 0.48)	0.96	7002.9	12261.00
1	1139.24	85.22	0.499	0.50( 0.48)	0.96	7048.2	12101.10
1	822.15	106.74	0.448	0.50( 0.48)	0.97	8045.0	12010.00
1	621.31	120.13	0.421	0.50( 0.48)	0.97	8172.6	12000.00
2	68.84	39.50	0.737	0.50( 0.50)	1.00	303.4	12330.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1446.45	36.78	0.773	0.50( 0.48)	0.97	2895.6	12300.00
1	1419.18	58.85	0.593	0.50( 0.48)	0.96	4967.8	12211.00
1	1372.50	66.14	0.565	0.50( 0.48)	0.96	5643.9	12201.00
1	1302.48	73.00	0.541	0.50( 0.48)	0.96	6166.0	12111.00
1	1247.32	77.47	0.525	0.50( 0.48)	0.96	6522.2	12231.00
1	1154.52	84.35	0.502	0.50( 0.48)	0.96	7002.9	12261.00
1	1139.24	85.22	0.499	0.50( 0.48)	0.96	7048.2	12101.10
1	822.15	106.74	0.448	0.50( 0.48)	0.97	8045.0	12010.00
1	621.31	120.13	0.421	0.50( 0.48)	0.97	8172.6	12000.00
2	68.84	39.50	0.737	0.50( 0.50)	1.00	303.4	12330.00

1	1515.28	36.78	0.773	0.50	( 0.49)	0.97	3178.0	12300.00
2	1511.92	39.50	0.737	0.50	( 0.49)	0.97	3454.7	12330.00
3	1446.18	58.85	0.593	0.50	( 0.48)	0.97	5271.2	12211.00
4	1391.21	66.14	0.565	0.50	( 0.48)	0.97	5947.3	12201.00
5	1314.30	73.00	0.541	0.50	( 0.48)	0.96	6469.4	12111.00
6	1254.63	77.47	0.525	0.50	( 0.48)	0.96	6825.6	12231.00
7	1154.93	84.35	0.502	0.50	( 0.48)	0.96	7306.3	12261.00
8	1139.24	85.22	0.499	0.50	( 0.48)	0.96	7351.6	12101.10
9	822.15	106.74	0.448	0.50	( 0.48)	0.97	8348.4	12010.00
10	621.31	120.13	0.421	0.50	( 0.48)	0.97	8476.0	12000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1515.28 Tc(MIN.) = 36.78  
EFFECTIVE AREA(ACRES) = 3178.03 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 8476.0  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12340.00 = 49782.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12340.00 TO NODE 12341.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 678.19 DOWNSTREAM(FEET) = 630.21

CHANNEL LENGTH THRU SUBAREA(FEET) = 2827.23 CHANNEL SLOPE = 0.0170

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.709

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	317.33	0.50	0.999	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.999

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1545.15

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.90

AVERAGE FLOW DEPTH(FEET) = 8.07 TRAVEL TIME(MIN.) = 5.97

Tc(MIN.) = 42.74

SUBAREA AREA(ACRES) = 317.33 SUBAREA RUNOFF(CFS) = 59.64

EFFECTIVE AREA(ACRES) = 3495.36 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 8793.3 PEAK FLOW RATE(CFS) = 1515.28

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.02 FLOW VELOCITY(FEET/SEC.) = 7.86

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12341.00 = 52609.50 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12341.00 TO NODE 12342.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 630.21 DOWNSTREAM(FEET) = 601.66

CHANNEL LENGTH THRU SUBAREA(FEET) = 2006.47 CHANNEL SLOPE = 0.0142

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.671

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	124.13	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1524.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.37

AVERAGE FLOW DEPTH(FEET) = 8.31 TRAVEL TIME(MIN.) = 4.54

Tc(MIN.) = 47.28

SUBAREA AREA(ACRES) = 124.13 SUBAREA RUNOFF(CFS) = 19.11

EFFECTIVE AREA(ACRES) = 3619.49 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 8917.5 PEAK FLOW RATE(CFS) = 1515.28

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.28 FLOW VELOCITY(FEET/SEC.) = 7.36

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12342.00 = 54615.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 601.66 DOWNSTREAM(FEET) = 572.29

CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.49 CHANNEL SLOPE = 0.0156

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.640

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	96.92	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1521.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.62

AVERAGE FLOW DEPTH(FEET) = 8.16 TRAVEL TIME(MIN.) = 4.12

Tc(MIN.) = 51.40

SUBAREA AREA(ACRES) = 96.92 SUBAREA RUNOFF(CFS) = 12.21

EFFECTIVE AREA(ACRES) = 3716.41 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98

TOTAL AREA(ACRES) = 9014.4 PEAK FLOW RATE(CFS) = 1515.28

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 8.15 FLOW VELOCITY(FEET/SEC.) = 7.61

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9014.4 TC(MIN.) = 51.40

EFFECTIVE AREA(ACRES) = 3716.41 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.975

PEAK FLOW RATE(CFS) = 1515.28



\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1515.28	51.40	0.640	0.50 ( 0.49)	0.98	3716.4	12300.00
2	1511.92	54.14	0.623	0.50 ( 0.49)	0.97	3993.1	12330.00
3	1446.18	73.67	0.539	0.50 ( 0.48)	0.97	5809.6	12211.00
4	1391.21	81.12	0.513	0.50 ( 0.48)	0.97	6485.7	12201.00
5	1314.30	88.19	0.488	0.50 ( 0.48)	0.97	7007.8	12111.00
6	1254.63	92.85	0.476	0.50 ( 0.48)	0.97	7363.9	12231.00
7	1154.93	100.04	0.462	0.50 ( 0.48)	0.97	7844.7	12261.00
8	1139.24	100.97	0.460	0.50 ( 0.48)	0.97	7890.0	12101.10
9	822.15	123.83	0.416	0.50 ( 0.49)	0.97	8886.8	12010.00
10	621.31	138.46	0.399	0.50 ( 0.49)	0.97	9014.4	12000.00

=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S24.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.503
- 2) 10.00; 1.686
- 3) 15.00; 1.273
- 4) 20.00; 1.087
- 5) 25.00; 0.952
- 6) 30.00; 0.860
- 7) 40.00; 0.731
- 8) 50.00; 0.649
- 9) 60.00; 0.586
- 10) 90.00; 0.482
- 11) 120.00; 0.421
- 12) 180.00; 0.350
- 13) 360.00; 0.253
- 14) 1440.00; 0.110

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	STREET-CROSSFALL: IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES: LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12400.00 TO NODE 12401.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 981.52  
ELEVATION DATA: UPSTREAM(FEET) = 2579.17 DOWNSTREAM(FEET) = 2249.14

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.811  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.371  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN Tc (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" - 8.82 0.50 1.000 0 13.81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.91  
TOTAL AREA (ACRES) = 8.82 PEAK FLOW RATE (CFS) = 6.91

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12401.00 TO NODE 12402.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2249.14 DOWNSTREAM(FEET) = 2103.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 975.11 CHANNEL SLOPE = 0.1490  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.219  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ LAND USE SCS SOIL GROUP AREA (ACRES) Fp (INCH/HR) Ap (DECIMAL) SCS CN  
USER-DEFINED - 46.29 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.95  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.18  
AVERAGE FLOW DEPTH(FEET) = 1.09 TRAVEL TIME(MIN.) = 2.63  
Tc(MIN.) = 16.44  
SUBAREA AREA(ACRES) = 46.29 SUBAREA RUNOFF(CFS) = 29.96  
EFFECTIVE AREA(ACRES) = 55.11 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 55.1 PEAK FLOW RATE(CFS) = 35.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.31 FLOW VELOCITY(FEET/SEC.) = 6.96  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12402.00 = 1956.63 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12402.00 TO NODE 12403.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2103.89 DOWNSTREAM(FEET) = 1771.34  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1880.50 CHANNEL SLOPE = 0.1768  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.078

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	54.97	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.01

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.07

AVERAGE FLOW DEPTH(FEET) = 1.44 TRAVEL TIME(MIN.) = 3.88

Tc(MIN.) = 20.33

SUBAREA AREA(ACRES) = 54.97 SUBAREA RUNOFF(CFS) = 28.60

EFFECTIVE AREA(ACRES) = 110.08 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 110.1 PEAK FLOW RATE(CFS) = 57.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.51 FLOW VELOCITY(FEET/SEC.) = 8.33

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12403.00 = 3837.13 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12403.00 TO NODE 12404.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1771.34 DOWNSTREAM(FEET) = 1462.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2888.53 CHANNEL SLOPE = 0.1070  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.920

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.02	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 80.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.54

AVERAGE FLOW DEPTH(FEET) = 1.89 TRAVEL TIME(MIN.) = 6.39

Tc(MIN.) = 26.71

SUBAREA AREA(ACRES) = 123.02 SUBAREA RUNOFF(CFS) = 46.53

EFFECTIVE AREA(ACRES) = 233.10 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 233.1 PEAK FLOW RATE(CFS) = 88.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.96 FLOW VELOCITY(FEET/SEC.) = 7.68

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12404.00 = 6725.66 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12404.00 TO NODE 12405.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1462.30 DOWNSTREAM(FEET) = 1308.28  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1925.25 CHANNEL SLOPE = 0.0800  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.847

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	241.71	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 126.03

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.54

AVERAGE FLOW DEPTH(FEET) = 2.36 TRAVEL TIME(MIN.) = 4.26

Tc(MIN.) = 30.97

SUBAREA AREA(ACRES) = 241.71 SUBAREA RUNOFF(CFS) = 75.55

EFFECTIVE AREA(ACRES) = 474.81 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 474.8 PEAK FLOW RATE(CFS) = 148.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.51 FLOW VELOCITY(FEET/SEC.) = 7.87

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12405.00 = 8650.91 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12405.00 TO NODE 12406.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1308.28 DOWNSTREAM(FEET) = 1154.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1923.41 CHANNEL SLOPE = 0.0802  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.797

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	238.96	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 180.41

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.26

AVERAGE FLOW DEPTH(FEET) = 2.70 TRAVEL TIME(MIN.) = 3.88

Tc(MIN.) = 34.85

SUBAREA AREA(ACRES) = 238.96 SUBAREA RUNOFF(CFS) = 63.92

EFFECTIVE AREA(ACRES) = 713.77 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 713.8 PEAK FLOW RATE(CFS) = 190.94

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.76 FLOW VELOCITY(FEET/SEC.) = 8.37

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12406.00 = 10574.32 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1154.02 DOWNSTREAM(FEET) = 1073.11  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1607.69 CHANNEL SLOPE = 0.0503  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.749

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.02	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.43  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.09  
AVERAGE FLOW DEPTH(FEET) = 3.05 TRAVEL TIME(MIN.) = 3.78  
Tc(MIN.) = 38.63  
SUBAREA AREA(ACRES) = 58.02 SUBAREA RUNOFF(CFS) = 12.97  
EFFECTIVE AREA(ACRES) = 771.79 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 771.8 PEAK FLOW RATE(CFS) = 190.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.01 FLOW VELOCITY(FEET/SEC.) = 7.03  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

-----  
FLOW PROCESS FROM NODE 12406.00 TO NODE 12420.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 38.63  
RAINFALL INTENSITY(INCH/HR) = 0.75  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA(ACRES) = 771.79  
TOTAL STREAM AREA(ACRES) = 771.79  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 190.94

-----  
FLOW PROCESS FROM NODE 12410.00 TO NODE 12411.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 966.15  
ELEVATION DATA: UPSTREAM(FEET) = 2215.42 DOWNSTREAM(FEET) = 1909.05

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.886  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.365  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	8.99	0.50	1.000	0	13.89

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 7.00  
TOTAL AREA(ACRES) = 8.99 PEAK FLOW RATE(CFS) = 7.00

-----  
FLOW PROCESS FROM NODE 12411.00 TO NODE 12412.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1909.05 DOWNSTREAM(FEET) = 1794.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.59 CHANNEL SLOPE = 0.1215  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.197

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.56	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.99  
AVERAGE FLOW DEPTH(FEET) = 0.93 TRAVEL TIME(MIN.) = 3.15  
Tc(MIN.) = 17.04  
SUBAREA AREA(ACRES) = 18.56 SUBAREA RUNOFF(CFS) = 11.64  
EFFECTIVE AREA(ACRES) = 27.55 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 27.5 PEAK FLOW RATE(CFS) = 17.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 5.38  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12412.00 = 1909.74 FEET.

-----  
FLOW PROCESS FROM NODE 12412.00 TO NODE 12413.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 1794.38 DOWNSTREAM(FEET) = 1649.76  
CHANNEL LENGTH THRU SUBAREA(FEET) = 926.82 CHANNEL SLOPE = 0.1560  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.106

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.09	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.67  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.27

AVERAGE FLOW DEPTH (FEET) = 1.07 TRAVEL TIME (MIN.) = 2.46  
Tc (MIN.) = 19.50  
SUBAREA AREA (ACRES) = 16.09 SUBAREA RUNOFF (CFS) = 8.77  
EFFECTIVE AREA (ACRES) = 43.64 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 43.6 PEAK FLOW RATE (CFS) = 23.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.11 FLOW VELOCITY (FEET/SEC.) = 6.42  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12413.00 = 2836.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12413.00 TO NODE 12414.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 1649.76 DOWNSTREAM (FEET) = 1365.78  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1906.16 CHANNEL SLOPE = 0.1490  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.980

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 75.14 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 40.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.14  
AVERAGE FLOW DEPTH (FEET) = 1.37 TRAVEL TIME (MIN.) = 4.45  
Tc (MIN.) = 23.95  
SUBAREA AREA (ACRES) = 75.14 SUBAREA RUNOFF (CFS) = 32.48  
EFFECTIVE AREA (ACRES) = 118.78 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 118.8 PEAK FLOW RATE (CFS) = 51.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.50 FLOW VELOCITY (FEET/SEC.) = 7.62  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12414.00 = 4742.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 1365.78 DOWNSTREAM (FEET) = 1073.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 3038.90 CHANNEL SLOPE = 0.0963  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.846

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 151.43 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 75.09  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.13  
AVERAGE FLOW DEPTH (FEET) = 1.87 TRAVEL TIME (MIN.) = 7.11  
Tc (MIN.) = 31.05  
SUBAREA AREA (ACRES) = 151.43 SUBAREA RUNOFF (CFS) = 47.18  
EFFECTIVE AREA (ACRES) = 270.21 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 270.2 PEAK FLOW RATE (CFS) = 84.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.96 FLOW VELOCITY (FEET/SEC.) = 7.32  
LONGEST FLOWPATH FROM NODE 12410.00 TO NODE 12420.00 = 7781.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12414.00 TO NODE 12420.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
TIME OF CONCENTRATION (MIN.) = 31.05  
RAINFALL INTENSITY (INCH/HR) = 0.85  
AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 1.00  
EFFECTIVE STREAM AREA (ACRES) = 270.21  
TOTAL STREAM AREA (ACRES) = 270.21  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 84.19

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	190.94	38.63	0.749	0.50 (0.50)	1.00	771.8	12400.00
2	84.19	31.05	0.846	0.50 (0.50)	1.00	270.2	12410.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	275.14	31.05	0.846	0.50 (0.50)	1.00	890.6	12410.00
2	251.37	38.63	0.749	0.50 (0.50)	1.00	1042.0	12400.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE (CFS) = 275.14 Tc (MIN.) = 31.05  
EFFECTIVE AREA (ACRES) = 890.62 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 1042.0  
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12420.00 = 12182.01 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12420.00 TO NODE 12421.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

```

ELEVATION DATA: UPSTREAM(FEET) = 1073.11 DOWNSTREAM(FEET) = 1005.32
CHANNEL LENGTH THRU SUBAREA(FEET) = 2235.12 CHANNEL SLOPE = 0.0303
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.773
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 218.57 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 301.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.53
AVERAGE FLOW DEPTH(FEET) = 3.93 TRAVEL TIME(MIN.) = 5.70
Tc(MIN.) = 36.76
SUBAREA AREA(ACRES) = 218.57 SUBAREA RUNOFF(CFS) = 53.63
EFFECTIVE AREA(ACRES) = 1109.19 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1260.6 PEAK FLOW RATE(CFS) = 275.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.79 FLOW VELOCITY(FEET/SEC.) = 6.39
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12421.00 = 14417.13 FEET.

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*****
FLOW PROCESS FROM NODE 12421.00 TO NODE 12422.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 1005.32 DOWNSTREAM(FEET) = 879.13
CHANNEL LENGTH THRU SUBAREA(FEET) = 2800.31 CHANNEL SLOPE = 0.0451
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.707
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 241.55 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 297.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.54
AVERAGE FLOW DEPTH(FEET) = 3.63 TRAVEL TIME(MIN.) = 6.19
Tc(MIN.) = 42.95
SUBAREA AREA(ACRES) = 241.55 SUBAREA RUNOFF(CFS) = 44.92
EFFECTIVE AREA(ACRES) = 1350.74 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1502.1 PEAK FLOW RATE(CFS) = 275.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.52 FLOW VELOCITY(FEET/SEC.) = 7.40
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12422.00 = 17217.44 FEET.

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*****
FLOW PROCESS FROM NODE 12422.00 TO NODE 12423.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 879.13 DOWNSTREAM(FEET) = 815.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 1918.90 CHANNEL SLOPE = 0.0333
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.668
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 151.63 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 286.57
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.68
AVERAGE FLOW DEPTH(FEET) = 3.78 TRAVEL TIME(MIN.) = 4.79
Tc(MIN.) = 47.73
SUBAREA AREA(ACRES) = 151.63 SUBAREA RUNOFF(CFS) = 22.84
EFFECTIVE AREA(ACRES) = 1502.37 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1653.8 PEAK FLOW RATE(CFS) = 275.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.73 FLOW VELOCITY(FEET/SEC.) = 6.61
LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12423.00 = 19136.34 FEET.

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*****
FLOW PROCESS FROM NODE 12423.00 TO NODE 12424.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 815.17 DOWNSTREAM(FEET) = 696.54
CHANNEL LENGTH THRU SUBAREA(FEET) = 2870.82 CHANNEL SLOPE = 0.0413
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.621
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 122.40 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 281.82
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.20
AVERAGE FLOW DEPTH(FEET) = 3.61 TRAVEL TIME(MIN.) = 6.64
Tc(MIN.) = 54.38
SUBAREA AREA(ACRES) = 122.40 SUBAREA RUNOFF(CFS) = 13.35
EFFECTIVE AREA(ACRES) = 1624.77 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1776.2 PEAK FLOW RATE(CFS) = 275.14
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 3.58 FLOW VELOCITY(FEET/SEC.) = 7.17

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LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12424.00 = 22007.16 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 696.54 DOWNSTREAM(FEET) = 572.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3680.45 CHANNEL SLOPE = 0.0338  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.574

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.54	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 278.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.66

AVERAGE FLOW DEPTH(FEET) = 3.73 TRAVEL TIME(MIN.) = 9.22

Tc(MIN.) = 63.59

SUBAREA AREA(ACRES) = 96.54 SUBAREA RUNOFF(CFS) = 6.37

EFFECTIVE AREA(ACRES) = 1721.31 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1872.7 PEAK FLOW RATE(CFS) = 275.14

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.72 FLOW VELOCITY(FEET/SEC.) = 6.63

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1872.7 TC(MIN.) = 63.59

EFFECTIVE AREA(ACRES) = 1721.31 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.000

PEAK FLOW RATE(CFS) = 275.14

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	275.14	63.59	0.574	0.50( 0.50)	1.00	1721.3	12410.00
2	251.37	72.00	0.544	0.50( 0.50)	1.00	1872.7	12400.00

=====

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2010 Advanced Engineering Software (aes)  
Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

-----  
FILE NAME: S25.DAT  
TIME/DATE OF STUDY: 14:04 04/03/2013  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.757
- 2) 10.00; 1.825
- 3) 15.00; 1.329
- 4) 20.00; 1.138
- 5) 25.00; 0.991
- 6) 30.00; 0.887
- 7) 40.00; 0.761
- 8) 50.00; 0.678
- 9) 60.00; 0.618
- 10) 90.00; 0.515
- 11) 120.00; 0.458
- 12) 180.00; 0.385
- 13) 360.00; 0.287
- 14) 1440.00; 0.126

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150	

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12500.00 TO NODE 12501.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 927.04  
ELEVATION DATA: UPSTREAM(FEET) = 1638.22 DOWNSTREAM(FEET) = 1356.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.770  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.451

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 8.89 0.50 1.000 0 13.77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 7.61  
TOTAL AREA(ACRES) = 8.89 PEAK FLOW RATE(CFS) = 7.61

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12501.00 TO NODE 12502.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1356.00 DOWNSTREAM(FEET) = 1203.37  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1004.73 CHANNEL SLOPE = 0.1519  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.265

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 24.30 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.74  
AVERAGE FLOW DEPTH(FEET) = 0.96 TRAVEL TIME(MIN.) = 2.92  
Tc(MIN.) = 16.69  
SUBAREA AREA(ACRES) = 24.30 SUBAREA RUNOFF(CFS) = 16.72  
EFFECTIVE AREA(ACRES) = 33.19 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.2 PEAK FLOW RATE(CFS) = 22.84

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.10 FLOW VELOCITY(FEET/SEC.) = 6.28  
LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12502.00 = 1931.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12502.00 TO NODE 12503.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====



ELEVATION DATA: UPSTREAM(FEET) = 1203.37 DOWNSTREAM(FEET) = 987.23  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1884.62 CHANNEL SLOPE = 0.1147  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.099

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	90.42	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.76

AVERAGE FLOW DEPTH(FEET) = 1.53 TRAVEL TIME(MIN.) = 4.65

Tc(MIN.) = 21.34

SUBAREA AREA(ACRES) = 90.42 SUBAREA RUNOFF(CFS) = 48.74

EFFECTIVE AREA(ACRES) = 123.61 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 123.6 PEAK FLOW RATE(CFS) = 66.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.74 FLOW VELOCITY(FEET/SEC.) = 7.36

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12503.00 = 3816.39 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12503.00 TO NODE 12504.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 987.23 DOWNSTREAM(FEET) = 870.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1478.57 CHANNEL SLOPE = 0.0792  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.993

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	84.07	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 85.31

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.82

AVERAGE FLOW DEPTH(FEET) = 2.04 TRAVEL TIME(MIN.) = 3.61

Tc(MIN.) = 24.95

SUBAREA AREA(ACRES) = 84.07 SUBAREA RUNOFF(CFS) = 37.28

EFFECTIVE AREA(ACRES) = 207.68 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 207.7 PEAK FLOW RATE(CFS) = 92.09

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.10 FLOW VELOCITY(FEET/SEC.) = 6.95

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12504.00 = 5294.96 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12504.00 TO NODE 12505.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 870.07 DOWNSTREAM(FEET) = 729.02  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1915.52 CHANNEL SLOPE = 0.0736  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.898

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	79.84	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.39

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.02

AVERAGE FLOW DEPTH(FEET) = 2.25 TRAVEL TIME(MIN.) = 4.55

Tc(MIN.) = 29.50

SUBAREA AREA(ACRES) = 79.84 SUBAREA RUNOFF(CFS) = 28.57

EFFECTIVE AREA(ACRES) = 287.52 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 287.5 PEAK FLOW RATE(CFS) = 102.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.22 FLOW VELOCITY(FEET/SEC.) = 6.94

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12505.00 = 7210.48 FEET.

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FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 729.02 DOWNSTREAM(FEET) = 549.92  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2961.35 CHANNEL SLOPE = 0.0605  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.800

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	78.77	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 113.54

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.62

AVERAGE FLOW DEPTH(FEET) = 2.39 TRAVEL TIME(MIN.) = 7.45

Tc(MIN.) = 36.95

SUBAREA AREA(ACRES) = 78.77 SUBAREA RUNOFF(CFS) = 21.23

EFFECTIVE AREA(ACRES) = 366.29 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 366.3 PEAK FLOW RATE(CFS) = 102.89

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.30 FLOW VELOCITY(FEET/SEC.) = 6.48

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

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FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S23.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1515.28	51.40	0.50 ( 0.49)	0.98	3716.4	12300.00
2	1511.92	54.14	0.50 ( 0.49)	0.97	3993.1	12330.00
3	1446.18	73.67	0.50 ( 0.48)	0.97	5809.6	12211.00
4	1391.21	81.12	0.50 ( 0.48)	0.97	6485.7	12201.00
5	1314.30	88.19	0.50 ( 0.48)	0.97	7007.8	12111.00
6	1254.63	92.85	0.50 ( 0.48)	0.97	7363.9	12231.00
7	1154.93	100.04	0.50 ( 0.48)	0.97	7844.7	12261.00
8	1139.24	100.97	0.50 ( 0.48)	0.97	7890.0	12101.10
9	822.15	123.83	0.50 ( 0.49)	0.97	8886.8	12010.00
10	621.31	138.46	0.50 ( 0.49)	0.97	9014.4	12000.00

TOTAL AREA (ACRES) = 9014.4

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FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S24.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	275.14	63.59	0.50 ( 0.50)	1.00	1721.3	12410.00
2	251.37	72.00	0.50 ( 0.50)	1.00	1872.7	12400.00

TOTAL AREA (ACRES) = 1872.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 12424.00 TO NODE 12425.00 IS CODE = 14.0

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	275.14	63.59	0.50 ( 0.50)	1.00	1721.3	12410.00
2	251.37	72.00	0.50 ( 0.50)	1.00	1872.7	12400.00

TOTAL AREA (ACRES) = 1872.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 12342.00 TO NODE 12425.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	275.14	63.59	0.605	0.50 ( 0.50)	1.00	1721.3	12410.00
2	251.37	72.00	0.577	0.50 ( 0.50)	1.00	1872.7	12400.00

LONGEST FLOWPATH FROM NODE 12400.00 TO NODE 12425.00 = 25687.61 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1515.28	51.40	0.670	0.50 ( 0.49)	0.98	3716.4	12300.00
2	1511.92	54.14	0.653	0.50 ( 0.49)	0.97	3993.1	12330.00
3	1446.18	73.67	0.571	0.50 ( 0.48)	0.97	5809.6	12211.00
4	1391.21	81.12	0.545	0.50 ( 0.48)	0.97	6485.7	12201.00
5	1314.30	88.19	0.521	0.50 ( 0.48)	0.97	7007.8	12111.00
6	1254.63	92.85	0.510	0.50 ( 0.48)	0.97	7363.9	12231.00
7	1154.93	100.04	0.496	0.50 ( 0.48)	0.97	7844.7	12261.00
8	1139.24	100.97	0.494	0.50 ( 0.48)	0.97	7890.0	12101.10
9	822.15	123.83	0.453	0.50 ( 0.49)	0.97	8886.8	12010.00
10	621.31	138.46	0.435	0.50 ( 0.49)	0.97	9014.4	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1790.42	51.40	0.670	0.50 ( 0.49)	0.98	5107.8	12300.00
2	1787.05	54.14	0.653	0.50 ( 0.49)	0.98	5458.5	12330.00
3	1755.23	63.59	0.605	0.50 ( 0.49)	0.98	6593.7	12410.00
4	1703.15	72.00	0.577	0.50 ( 0.49)	0.98	7527.4	12400.00
5	1678.83	73.67	0.571	0.50 ( 0.49)	0.98	7682.3	12211.00
6	1540.13	81.12	0.545	0.50 ( 0.49)	0.98	8358.4	12201.00
7	1383.81	88.19	0.521	0.50 ( 0.49)	0.97	8880.5	12111.00
8	1285.82	92.85	0.510	0.50 ( 0.49)	0.97	9236.6	12231.00
9	1154.92	100.04	0.496	0.50 ( 0.49)	0.97	9717.3	12261.00
10	1139.24	100.97	0.494	0.50 ( 0.49)	0.97	9762.7	12101.10
11	822.15	123.83	0.453	0.50 ( 0.49)	0.98	10759.5	12010.00
12	621.30	138.46	0.435	0.50 ( 0.49)	0.98	10887.1	12000.00

TOTAL AREA (ACRES) = 10887.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1790.42 Tc (MIN.) = 51.403  
EFFECTIVE AREA (ACRES) = 5107.76 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 10887.1  
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12425.00 = 56500.46 FEET.

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FLOW PROCESS FROM NODE 12425.00 TO NODE 12520.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 572.29 DOWNSTREAM (FEET) = 549.92  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1724.25 CHANNEL SLOPE = 0.0130  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.646  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 117.96 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1798.17  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.42  
 AVERAGE FLOW DEPTH(FEET) = 8.99 TRAVEL TIME(MIN.) = 3.88  
 Tc(MIN.) = 55.28  
 SUBAREA AREA(ACRES) = 117.96 SUBAREA RUNOFF(CFS) = 15.51  
 EFFECTIVE AREA(ACRES) = 5225.72 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 11005.0 PEAK FLOW RATE(CFS) = 1790.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 8.98 FLOW VELOCITY(FEET/SEC.) = 7.41  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

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 FLOW PROCESS FROM NODE 12505.00 TO NODE 12520.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1790.42	55.28	0.646	0.50( 0.49)	0.98	5225.7	12300.00
2	1787.05	58.02	0.630	0.50( 0.49)	0.98	5576.5	12330.00
3	1755.23	67.49	0.592	0.50( 0.49)	0.98	6711.7	12410.00
4	1703.15	75.93	0.563	0.50( 0.49)	0.98	7645.4	12400.00
5	1678.83	77.61	0.557	0.50( 0.49)	0.98	7800.3	12211.00
6	1540.13	85.15	0.532	0.50( 0.49)	0.98	8476.3	12201.00
7	1383.81	92.33	0.511	0.50( 0.49)	0.97	8998.4	12111.00
8	1285.82	97.06	0.502	0.50( 0.49)	0.97	9354.6	12231.00
9	1154.92	104.36	0.488	0.50( 0.49)	0.97	9835.3	12261.00
10	1139.24	105.31	0.486	0.50( 0.49)	0.97	9880.7	12101.10
11	822.15	128.54	0.447	0.50( 0.49)	0.98	10877.4	12010.00
12	621.30	143.51	0.429	0.50( 0.49)	0.98	11005.0	12000.00

LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	102.89	36.95	0.800	0.50( 0.50)	1.00	366.3	12500.00

LONGEST FLOWPATH FROM NODE 12500.00 TO NODE 12520.00 = 10171.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1893.31	36.95	0.800	0.50( 0.49)	0.98	3859.5	12500.00
2	1840.62	55.28	0.646	0.50( 0.49)	0.98	5592.0	12300.00
3	1831.53	58.02	0.630	0.50( 0.49)	0.98	5942.8	12330.00
4	1786.78	67.49	0.592	0.50( 0.49)	0.98	7078.0	12410.00
5	1724.80	75.93	0.563	0.50( 0.49)	0.98	8011.6	12400.00
6	1698.50	77.61	0.557	0.50( 0.49)	0.98	8166.6	12211.00
7	1550.96	85.15	0.532	0.50( 0.49)	0.98	8842.6	12201.00

8	1387.41	92.33	0.511	0.50( 0.49)	0.98	9364.7	12111.00
9	1286.30	97.06	0.502	0.50( 0.49)	0.97	9720.9	12231.00
10	1154.92	104.36	0.488	0.50( 0.49)	0.97	10201.6	12261.00
11	1139.24	105.31	0.486	0.50( 0.49)	0.97	10247.0	12101.10
12	822.15	128.54	0.447	0.50( 0.49)	0.98	11243.7	12010.00
13	621.30	143.51	0.429	0.50( 0.49)	0.98	11371.3	12000.00

TOTAL AREA(ACRES) = 11371.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1893.31 Tc(MIN.) = 36.952  
 EFFECTIVE AREA(ACRES) = 3859.53 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 11371.3  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12520.00 = 58224.71 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12520.00 TO NODE 12521.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 549.92 DOWNSTREAM(FEET) = 525.43  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1934.41 CHANNEL SLOPE = 0.0127  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.751

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 85.91 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1902.99  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.45  
 AVERAGE FLOW DEPTH(FEET) = 9.23 TRAVEL TIME(MIN.) = 4.33  
 Tc(MIN.) = 41.28  
 SUBAREA AREA(ACRES) = 85.91 SUBAREA RUNOFF(CFS) = 19.36  
 EFFECTIVE AREA(ACRES) = 3945.44 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 11457.2 PEAK FLOW RATE(CFS) = 1893.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 9.21 FLOW VELOCITY(FEET/SEC.) = 7.45  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12521.00 = 60159.12 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12521.00 TO NODE 12522.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 525.43 DOWNSTREAM(FEET) = 490.87  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3335.01 CHANNEL SLOPE = 0.0104  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.684  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 539.82 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1938.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.95  
 AVERAGE FLOW DEPTH (FEET) = 9.64 TRAVEL TIME (MIN.) = 8.00  
 Tc (MIN.) = 49.27  
 SUBAREA AREA (ACRES) = 539.82 SUBAREA RUNOFF (CFS) = 89.47  
 EFFECTIVE AREA (ACRES) = 4485.26 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 11997.0 PEAK FLOW RATE (CFS) = 1893.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.56 FLOW VELOCITY (FEET/SEC.) = 6.91  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12522.00 = 63494.13 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12522.00 TO NODE 12523.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 490.87 DOWNSTREAM (FEET) = 467.63  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1961.26 CHANNEL SLOPE = 0.0118  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.655  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 321.58 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1915.80  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.28  
 AVERAGE FLOW DEPTH (FEET) = 9.36 TRAVEL TIME (MIN.) = 4.49  
 Tc (MIN.) = 53.76  
 SUBAREA AREA (ACRES) = 321.58 SUBAREA RUNOFF (CFS) = 44.94  
 EFFECTIVE AREA (ACRES) = 4806.84 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 12318.6 PEAK FLOW RATE (CFS) = 1893.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.32 FLOW VELOCITY (FEET/SEC.) = 7.27  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12523.00 = 65455.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12523.00 TO NODE 12524.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 467.63 DOWNSTREAM (FEET) = 436.35  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2841.85 CHANNEL SLOPE = 0.0110

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.616  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 298.62 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1908.89  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.08  
 AVERAGE FLOW DEPTH (FEET) = 9.48 TRAVEL TIME (MIN.) = 6.69  
 Tc (MIN.) = 60.45  
 SUBAREA AREA (ACRES) = 298.62 SUBAREA RUNOFF (CFS) = 31.13  
 EFFECTIVE AREA (ACRES) = 5105.46 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 12617.2 PEAK FLOW RATE (CFS) = 1893.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 9.45 FLOW VELOCITY (FEET/SEC.) = 7.07  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12524.00 = 68297.24 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12524.00 TO NODE 12525.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 436.35 DOWNSTREAM (FEET) = 415.23  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2812.14 CHANNEL SLOPE = 0.0075  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.590  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 251.20 0.50 0.997 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.997  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1903.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.13  
 AVERAGE FLOW DEPTH (FEET) = 10.17 TRAVEL TIME (MIN.) = 7.65  
 Tc (MIN.) = 68.10  
 SUBAREA AREA (ACRES) = 251.20 SUBAREA RUNOFF (CFS) = 20.63  
 EFFECTIVE AREA (ACRES) = 5356.66 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 12868.4 PEAK FLOW RATE (CFS) = 1893.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 10.15 FLOW VELOCITY (FEET/SEC.) = 6.12  
 LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12525.00 = 71109.38 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12525.00 TO NODE 12526.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 415.23 DOWNSTREAM(FEET) = 380.28
CHANNEL LENGTH THRU SUBAREA(FEET) = 2934.09 CHANNEL SLOPE = 0.0119
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.567

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 247.71 0.50 0.987 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.987
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1901.49
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.28
AVERAGE FLOW DEPTH(FEET) = 9.33 TRAVEL TIME(MIN.) = 6.71
Tc(MIN.) = 74.81
SUBAREA AREA(ACRES) = 247.71 SUBAREA RUNOFF(CFS) = 16.34
EFFECTIVE AREA(ACRES) = 5604.37 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 13116.2 PEAK FLOW RATE(CFS) = 1893.31
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.31 FLOW VELOCITY(FEET/SEC.) = 7.28
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12526.00 = 74043.48 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 12526.00 TO NODE 12527.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 380.28 DOWNSTREAM(FEET) = 347.47
CHANNEL LENGTH THRU SUBAREA(FEET) = 3113.51 CHANNEL SLOPE = 0.0105
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.542

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 120.94 0.50 0.974 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.974
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1896.27
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.95
AVERAGE FLOW DEPTH(FEET) = 9.53 TRAVEL TIME(MIN.) = 7.46
Tc(MIN.) = 82.28
SUBAREA AREA(ACRES) = 120.94 SUBAREA RUNOFF(CFS) = 5.91
EFFECTIVE AREA(ACRES) = 5725.31 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 13237.1 PEAK FLOW RATE(CFS) = 1893.31
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 9.53 FLOW VELOCITY(FEET/SEC.) = 6.95
LONGEST FLOWPATH FROM NODE 12000.00 TO NODE 12527.00 = 77156.98 FEET.

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 13237.1 TC(MIN.) = 82.28
EFFECTIVE AREA(ACRES) = 5725.31 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.988
PEAK FLOW RATE(CFS) = 1893.31

\*\* PEAK FLOW RATE TABLE \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 1893.31 82.28 0.542 0.50( 0.49) 0.99 5725.3 12500.00
2 1840.62 100.98 0.494 0.50( 0.49) 0.99 7457.8 12300.00
3 1831.53 103.77 0.489 0.50( 0.49) 0.99 7808.6 12330.00
4 1786.78 113.56 0.470 0.50( 0.49) 0.98 8943.7 12410.00
5 1724.80 122.42 0.455 0.50( 0.49) 0.98 9877.4 12400.00
6 1698.50 124.28 0.452 0.50( 0.49) 0.98 10032.3 12211.00
7 1550.96 132.89 0.442 0.50( 0.49) 0.98 10708.4 12201.00
8 1387.41 141.42 0.432 0.50( 0.49) 0.98 11230.5 12111.00
9 1286.30 147.09 0.425 0.50( 0.49) 0.98 11586.7 12231.00
10 1154.92 155.75 0.414 0.50( 0.49) 0.98 12067.4 12261.00
11 1139.24 156.89 0.413 0.50( 0.49) 0.98 12112.7 12101.10
12 822.15 184.49 0.383 0.50( 0.49) 0.98 13109.5 12010.00
13 621.30 203.50 0.372 0.50( 0.49) 0.98 13237.1 12000.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Analysis prepared by:

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FILE NAME: S26.DAT  
TIME/DATE OF STUDY: 08:14 09/12/2017  
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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.738
- 2) 10.00; 1.814
- 3) 15.00; 1.325
- 4) 20.00; 1.135
- 5) 25.00; 0.988
- 6) 30.00; 0.885
- 7) 40.00; 0.759
- 8) 50.00; 0.676
- 9) 60.00; 0.615
- 10) 90.00; 0.513
- 11) 120.00; 0.455
- 12) 180.00; 0.383
- 13) 360.00; 0.284
- 14) 1200.00; 0.125

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S19.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	0.50 ( 0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.50 ( 0.50)	0.99	10540.5	40120.00
3	9267.97	43.90	0.50 ( 0.50)	0.99	12119.8	11801.00
4	9175.90	55.10	0.50 ( 0.50)	0.99	15330.4	11500.00
5	9096.95	60.68	0.50 ( 0.50)	0.99	17259.8	11701.00
6	8971.81	66.83	0.50 ( 0.50)	0.99	19379.0	11000.00
7	8700.08	82.91	0.50 ( 0.50)	0.99	26233.8	12500.00
8	8514.89	88.95	0.50 ( 0.50)	0.99	29104.3	11910.00
9	7865.37	97.23	0.50 ( 0.50)	0.99	32393.0	11130.00
10	7205.10	108.18	0.50 ( 0.50)	0.99	36061.6	11620.00
11	6166.68	123.11	0.50 ( 0.50)	0.99	40599.1	12400.00
12	5339.70	133.60	0.50 ( 0.50)	0.99	42895.9	12201.00
13	4743.38	142.16	0.50 ( 0.50)	0.99	44185.0	12111.00
14	4396.83	147.33	0.50 ( 0.50)	0.99	44937.7	10700.00
15	3833.33	156.53	0.50 ( 0.50)	0.99	46112.0	12261.00
16	3370.40	165.03	0.50 ( 0.50)	0.99	46923.8	10200.00
17	2817.44	179.14	0.50 ( 0.50)	0.99	48161.1	10300.00
18	2591.11	185.35	0.50 ( 0.50)	0.99	48512.2	12010.00
19	2126.14	204.40	0.50 ( 0.50)	0.99	48841.6	12000.00
20	1189.40	268.26	0.50 ( 0.50)	0.99	49511.8	10100.00

TOTAL AREA (ACRES) = 49511.8

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FLOW PROCESS FROM NODE 11929.00 TO NODE 11929.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	19.88	0.50 ( 0.50)	0.99	5451.5	40200.00
2	9295.66	38.03	0.50 ( 0.50)	0.99	10540.5	40120.00
3	9267.97	43.90	0.50 ( 0.50)	0.99	12119.8	11801.00
4	9175.90	55.10	0.50 ( 0.50)	0.99	15330.4	11500.00
5	9096.95	60.68	0.50 ( 0.50)	0.99	17259.8	11701.00
6	8971.81	66.83	0.50 ( 0.50)	0.99	19379.0	11000.00
7	8700.08	82.91	0.50 ( 0.50)	0.99	26233.8	12500.00
8	8514.89	88.95	0.50 ( 0.50)	0.99	29104.3	11910.00
9	7865.37	97.23	0.50 ( 0.50)	0.99	32393.0	11130.00
10	7205.10	108.18	0.50 ( 0.50)	0.99	36061.6	11620.00
11	6166.68	123.11	0.50 ( 0.50)	0.99	40599.1	12400.00
12	5339.70	133.60	0.50 ( 0.50)	0.99	42895.9	12201.00
13	4743.38	142.16	0.50 ( 0.50)	0.99	44185.0	12111.00
14	4396.83	147.33	0.50 ( 0.50)	0.99	44937.7	10700.00
15	3833.33	156.53	0.50 ( 0.50)	0.99	46112.0	12261.00
16	3370.40	165.03	0.50 ( 0.50)	0.99	46923.8	10200.00
17	2817.44	179.14	0.50 ( 0.50)	0.99	48161.1	10300.00
18	2591.11	185.35	0.50 ( 0.50)	0.99	48512.2	12010.00

19 2126.14 204.40 0.50( 0.50) 0.99 48841.6 12000.00  
 20 1189.40 268.26 0.50( 0.50) 0.99 49511.8 10100.00  
 TOTAL AREA (ACRES) = 49511.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 11929.00 TO NODE 12601.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 341.63 DOWNSTREAM(FEET) = 325.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1467.93 CHANNEL SLOPE = 0.0113  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.098

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 14.11 0.50 0.992 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.992  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9350.73  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 17.90  
 AVERAGE FLOW DEPTH(FEET) = 13.19 TRAVEL TIME(MIN.) = 1.37

Tc(MIN.) = 21.25  
 SUBAREA AREA(ACRES) = 14.11 SUBAREA RUNOFF(CFS) = 7.65  
 EFFECTIVE AREA(ACRES) = 5465.57 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49525.9 PEAK FLOW RATE(CFS) = 9346.91

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 13.19 FLOW VELOCITY(FEET/SEC.) = 17.90  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	21.25	1.098	0.50( 0.50)	0.99	5465.6	40200.00
2	9295.66	39.39	0.767	0.50( 0.50)	0.99	10554.6	40120.00
3	9267.97	45.27	0.715	0.50( 0.50)	0.99	12134.0	11801.00
4	9175.90	56.47	0.637	0.50( 0.50)	0.99	15344.5	11500.00
5	9096.95	62.05	0.608	0.50( 0.50)	0.99	17273.9	11701.00
6	8971.81	68.21	0.587	0.50( 0.50)	0.99	19393.2	11000.00
7	8700.08	84.31	0.532	0.50( 0.50)	0.99	26247.9	12500.00
8	8514.89	90.35	0.512	0.50( 0.50)	0.99	29118.4	11910.00
9	7865.37	98.66	0.496	0.50( 0.50)	0.99	32407.1	11130.00
10	7205.10	109.64	0.475	0.50( 0.50)	0.99	36075.7	11620.00
11	6166.68	124.63	0.449	0.50( 0.50)	0.99	40613.3	12400.00
12	5339.70	135.18	0.437	0.50( 0.50)	0.99	42910.0	12201.00
13	4743.38	143.78	0.426	0.50( 0.50)	0.99	44199.1	12111.00
14	4396.83	148.98	0.420	0.50( 0.50)	0.99	44951.8	10700.00
15	3833.33	158.24	0.409	0.50( 0.50)	0.99	46126.1	12261.00
16	3370.40	166.80	0.399	0.50( 0.50)	0.99	46937.9	10200.00
17	2817.44	180.98	0.382	0.50( 0.50)	0.99	48175.2	10300.00
18	2591.11	187.23	0.379	0.50( 0.50)	0.99	48526.3	12010.00
19	2126.14	206.38	0.368	0.50( 0.50)	0.99	48855.7	12000.00
20	1189.40	270.55	0.333	0.50( 0.50)	0.99	49525.9	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 9346.91 Tc(MIN.) = 21.25  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5465.57

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 15.1

-----  
 >>>>DEFINE MEMORY BANK # 2 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0610318U.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:  
 STREAM Q Tc Fp(Fm) Ap Ae HEADWATER  
 NUMBER (CFS) (MIN.) (INCH/HR) (ACRES) NODE  
 1 67.20 19.07 0.50( 0.50) 1.00 108.7 31800.00  
 2 60.00 23.05 0.50( 0.50) 1.00 119.0 31810.00  
 TOTAL AREA(ACRES) = 119.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12601.00 TO NODE 12601.00 IS CODE = 11

-----  
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9346.91	21.25	1.098	0.50( 0.50)	0.99	5465.6	40200.00
2	9295.66	39.39	0.767	0.50( 0.50)	0.99	10554.6	40120.00
3	9267.97	45.27	0.715	0.50( 0.50)	0.99	12134.0	11801.00
4	9175.90	56.47	0.637	0.50( 0.50)	0.99	15344.5	11500.00
5	9096.95	62.05	0.608	0.50( 0.50)	0.99	17273.9	11701.00
6	8971.81	68.21	0.587	0.50( 0.50)	0.99	19393.2	11000.00
7	8700.08	84.31	0.532	0.50( 0.50)	0.99	26247.9	12500.00
8	8514.89	90.35	0.512	0.50( 0.50)	0.99	29118.4	11910.00
9	7865.37	98.66	0.496	0.50( 0.50)	0.99	32407.1	11130.00
10	7205.10	109.64	0.475	0.50( 0.50)	0.99	36075.7	11620.00
11	6166.68	124.63	0.449	0.50( 0.50)	0.99	40613.3	12400.00
12	5339.70	135.18	0.437	0.50( 0.50)	0.99	42910.0	12201.00
13	4743.38	143.78	0.426	0.50( 0.50)	0.99	44199.1	12111.00
14	4396.83	148.98	0.420	0.50( 0.50)	0.99	44951.8	10700.00
15	3833.33	158.24	0.409	0.50( 0.50)	0.99	46126.1	12261.00
16	3370.40	166.80	0.399	0.50( 0.50)	0.99	46937.9	10200.00
17	2817.44	180.98	0.382	0.50( 0.50)	0.99	48175.2	10300.00
18	2591.11	187.23	0.379	0.50( 0.50)	0.99	48526.3	12010.00
19	2126.14	206.38	0.368	0.50( 0.50)	0.99	48855.7	12000.00
20	1189.40	270.55	0.333	0.50( 0.50)	0.99	49525.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	67.20	19.07	1.170	0.50( 0.50)	1.00	108.7	31800.00
2	60.00	23.05	1.045	0.50( 0.50)	1.00	119.0	31810.00

LONGEST FLOWPATH FROM NODE 31810.00 TO NODE 12601.00 = 4599.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	9414.11	19.07	1.170	0.50 ( 0.50)	0.99	5014.0 31800.00
2	9410.17	21.25	1.098	0.50 ( 0.50)	0.99	5579.9 40200.00
3	9401.81	23.05	1.045	0.50 ( 0.50)	0.99	6090.8 31810.00
4	9324.99	39.39	0.767	0.50 ( 0.50)	0.99	10673.7 40120.00
5	9291.65	45.27	0.715	0.50 ( 0.50)	0.99	12253.0 11801.00
6	9190.91	56.47	0.637	0.50 ( 0.50)	0.99	15463.5 11500.00
7	9108.82	62.05	0.608	0.50 ( 0.50)	0.99	17392.9 11701.00
8	8981.38	68.21	0.587	0.50 ( 0.50)	0.99	19512.2 11000.00
9	8703.62	84.31	0.532	0.50 ( 0.50)	0.99	26366.9 12500.00
10	8516.23	90.35	0.512	0.50 ( 0.50)	0.99	29237.4 11910.00
11	7865.37	98.66	0.496	0.50 ( 0.50)	0.99	32526.2 11130.00
12	7205.10	109.64	0.475	0.50 ( 0.50)	0.99	36194.7 11620.00
13	6166.68	124.63	0.449	0.50 ( 0.50)	0.99	40732.3 12400.00
14	5339.70	135.18	0.437	0.50 ( 0.50)	0.99	43029.0 12201.00
15	4743.38	143.78	0.426	0.50 ( 0.50)	0.99	44318.2 12111.00
16	4396.83	148.98	0.420	0.50 ( 0.50)	0.99	45070.8 10700.00
17	3833.33	158.24	0.409	0.50 ( 0.50)	0.99	46245.1 12261.00
18	3370.40	166.80	0.399	0.50 ( 0.50)	0.99	47056.9 10200.00
19	2817.44	180.98	0.382	0.50 ( 0.50)	0.99	48294.3 10300.00
20	2591.11	187.23	0.379	0.50 ( 0.50)	0.99	48645.4 12010.00
21	2126.13	206.38	0.368	0.50 ( 0.50)	0.99	48974.7 12000.00
22	1189.40	270.55	0.333	0.50 ( 0.50)	0.99	49644.9 10100.00

TOTAL AREA (ACRES) = 49644.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 9414.11 Tc (MIN.) = 19.072  
EFFECTIVE AREA (ACRES) = 5014.00 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 49644.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12601.00 = 99868.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12601.00 TO NODE 12602.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 325.00 DOWNSTREAM (FEET) = 313.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1377.46 CHANNEL SLOPE = 0.0087  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 9414.11  
FLOW VELOCITY (FEET/SEC.) = 16.25 FLOW DEPTH (FEET) = 13.90  
TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 20.48  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12602.00 = 101245.91 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9414.11	20.48	1.121	0.50 ( 0.50)	0.99	5014.0	31800.00
2	9410.17	22.66	1.057	0.50 ( 0.50)	0.99	5579.9	40200.00
3	9401.81	24.47	1.004	0.50 ( 0.50)	0.99	6090.8	31810.00
4	9324.99	40.81	0.752	0.50 ( 0.50)	0.99	10673.7	40120.00
5	9291.65	46.68	0.704	0.50 ( 0.50)	0.99	12253.0	11801.00
6	9190.91	57.89	0.628	0.50 ( 0.50)	0.99	15463.5	11500.00
7	9108.82	63.48	0.603	0.50 ( 0.50)	0.99	17392.9	11701.00
8	8981.38	69.64	0.582	0.50 ( 0.50)	0.99	19512.2	11000.00

9	8703.62	85.75	0.527	0.50 ( 0.50)	0.99	26366.9	12500.00
10	8516.23	91.80	0.510	0.50 ( 0.50)	0.99	29237.4	11910.00
11	7865.37	100.14	0.493	0.50 ( 0.50)	0.99	32526.2	11130.00
12	7205.10	111.15	0.472	0.50 ( 0.50)	0.99	36194.7	11620.00
13	6166.68	126.20	0.448	0.50 ( 0.50)	0.99	40732.3	12400.00
14	5339.70	136.80	0.435	0.50 ( 0.50)	0.99	43029.0	12201.00
15	4743.38	145.45	0.424	0.50 ( 0.50)	0.99	44318.2	12111.00
16	4396.83	150.69	0.418	0.50 ( 0.50)	0.99	45070.8	10700.00
17	3833.33	160.01	0.407	0.50 ( 0.50)	0.99	46245.1	12261.00
18	3370.40	168.62	0.397	0.50 ( 0.50)	0.99	47056.9	10200.00
19	2817.44	182.89	0.381	0.50 ( 0.50)	0.99	48294.3	10300.00
20	2591.11	189.18	0.378	0.50 ( 0.50)	0.99	48645.4	12010.00
21	2126.13	208.43	0.367	0.50 ( 0.50)	0.99	48974.7	12000.00
22	1189.40	272.92	0.332	0.50 ( 0.50)	0.99	49644.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 9414.11 Tc (MIN.) = 20.48  
AREA-AVERAGED Fm (INCH/HR) = 0.50 AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 5014.00

\*\*\*\*\*

FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 313.00 DOWNSTREAM (FEET) = 310.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 312.40 CHANNEL SLOPE = 0.0096  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 9414.11  
FLOW VELOCITY (FEET/SEC.) = 16.86 FLOW DEPTH (FEET) = 13.64  
TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 20.79  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9414.11	20.79	1.112	0.50 ( 0.50)	0.99	5014.0	31800.00
2	9410.17	22.97	1.048	0.50 ( 0.50)	0.99	5579.9	40200.00
3	9401.81	24.78	0.995	0.50 ( 0.50)	0.99	6090.8	31810.00
4	9324.99	41.12	0.750	0.50 ( 0.50)	0.99	10673.7	40120.00
5	9291.65	46.99	0.701	0.50 ( 0.50)	0.99	12253.0	11801.00
6	9190.91	58.20	0.626	0.50 ( 0.50)	0.99	15463.5	11500.00
7	9108.82	63.79	0.602	0.50 ( 0.50)	0.99	17392.9	11701.00
8	8981.38	69.95	0.581	0.50 ( 0.50)	0.99	19512.2	11000.00
9	8703.62	86.06	0.526	0.50 ( 0.50)	0.99	26366.9	12500.00
10	8516.23	92.12	0.509	0.50 ( 0.50)	0.99	29237.4	11910.00
11	7865.37	100.46	0.493	0.50 ( 0.50)	0.99	32526.2	11130.00
12	7205.10	111.48	0.471	0.50 ( 0.50)	0.99	36194.7	11620.00
13	6166.68	126.54	0.447	0.50 ( 0.50)	0.99	40732.3	12400.00
14	5339.70	137.16	0.434	0.50 ( 0.50)	0.99	43029.0	12201.00
15	4743.38	145.82	0.424	0.50 ( 0.50)	0.99	44318.2	12111.00
16	4396.83	151.06	0.418	0.50 ( 0.50)	0.99	45070.8	10700.00
17	3833.33	160.40	0.407	0.50 ( 0.50)	0.99	46245.1	12261.00
18	3370.40	169.02	0.396	0.50 ( 0.50)	0.99	47056.9	10200.00
19	2817.44	183.31	0.381	0.50 ( 0.50)	0.99	48294.3	10300.00
20	2591.11	189.61	0.378	0.50 ( 0.50)	0.99	48645.4	12010.00
21	2126.13	208.88	0.367	0.50 ( 0.50)	0.99	48974.7	12000.00



22 1189.40 273.44 0.332 0.50( 0.50) 0.99 49644.9 10100.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 9414.11 Tc(MIN.) = 20.79  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5014.00

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12602.00 TO NODE 12603.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610317U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.81	18.17	0.50( 0.50)	1.00	61.8	31700.00
2	35.35	22.85	0.50( 0.50)	1.00	71.3	31710.00
TOTAL AREA(ACRES) =						71.3

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9414.11	20.79	1.112	0.50( 0.50)	0.99	5014.0	31800.00
2	9410.17	22.97	1.048	0.50( 0.50)	0.99	5579.9	40200.00
3	9401.81	24.78	0.995	0.50( 0.50)	0.99	6090.8	31810.00
4	9324.99	41.12	0.750	0.50( 0.50)	0.99	10673.7	40120.00
5	9291.65	46.99	0.701	0.50( 0.50)	0.99	12253.0	11801.00
6	9190.91	58.20	0.626	0.50( 0.50)	0.99	15463.5	11500.00
7	9108.82	63.79	0.602	0.50( 0.50)	0.99	17392.9	11701.00
8	8981.38	69.95	0.581	0.50( 0.50)	0.99	19512.2	11000.00
9	8703.62	86.06	0.526	0.50( 0.50)	0.99	26366.9	12500.00
10	8516.23	92.12	0.509	0.50( 0.50)	0.99	29237.4	11910.00
11	7865.37	100.46	0.493	0.50( 0.50)	0.99	32526.2	11130.00
12	7205.10	111.48	0.471	0.50( 0.50)	0.99	36194.7	11620.00
13	6166.68	126.54	0.447	0.50( 0.50)	0.99	40732.3	12400.00
14	5339.70	137.16	0.434	0.50( 0.50)	0.99	43029.0	12201.00
15	4743.38	145.82	0.424	0.50( 0.50)	0.99	44318.2	12111.00
16	4396.83	151.06	0.418	0.50( 0.50)	0.99	45070.8	10700.00
17	3833.33	160.40	0.407	0.50( 0.50)	0.99	46245.1	12261.00
18	3370.40	169.02	0.396	0.50( 0.50)	0.99	47056.9	10200.00
19	2817.44	183.31	0.381	0.50( 0.50)	0.99	48294.3	10300.00
20	2591.11	189.61	0.378	0.50( 0.50)	0.99	48645.4	12010.00
21	2126.13	208.88	0.367	0.50( 0.50)	0.99	48974.7	12000.00
22	1189.40	273.44	0.332	0.50( 0.50)	0.99	49644.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.81	18.17	1.204	0.50( 0.50)	1.00	61.8	31700.00
2	35.35	22.85	1.051	0.50( 0.50)	1.00	71.3	31710.00

LONGEST FLOWPATH FROM NODE 31710.00 TO NODE 12603.00 = 3633.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9452.92	18.17	1.204	0.50( 0.50)	0.99	4444.5	31700.00
2	9450.98	20.79	1.112	0.50( 0.50)	0.99	5081.1	31800.00
3	9445.75	22.85	1.051	0.50( 0.50)	0.99	5618.9	31710.00
4	9445.29	22.97	1.048	0.50( 0.50)	0.99	5651.2	40200.00
5	9433.53	24.78	0.995	0.50( 0.50)	0.99	6162.1	31810.00
6	9341.00	41.12	0.750	0.50( 0.50)	0.99	10744.9	40120.00
7	9304.52	46.99	0.701	0.50( 0.50)	0.99	12324.2	11801.00
8	9198.97	58.20	0.626	0.50( 0.50)	0.99	15534.8	11500.00
9	9115.35	63.79	0.602	0.50( 0.50)	0.99	17464.2	11701.00
10	8986.57	69.95	0.581	0.50( 0.50)	0.99	19583.5	11000.00
11	8705.30	86.06	0.526	0.50( 0.50)	0.99	26438.2	12500.00
12	8516.79	92.12	0.509	0.50( 0.50)	0.99	29308.7	11910.00
13	7865.37	100.46	0.493	0.50( 0.50)	0.99	32597.4	11130.00
14	7205.10	111.48	0.471	0.50( 0.50)	0.99	36266.0	11620.00
15	6166.68	126.54	0.447	0.50( 0.50)	0.99	40803.6	12400.00
16	5339.70	137.16	0.434	0.50( 0.50)	0.99	43100.3	12201.00
17	4743.38	145.82	0.424	0.50( 0.50)	0.99	44389.4	12111.00
18	4396.83	151.06	0.418	0.50( 0.50)	0.99	45142.1	10700.00
19	3833.33	160.40	0.407	0.50( 0.50)	0.99	46316.4	12261.00
20	3370.40	169.02	0.396	0.50( 0.50)	0.99	47128.2	10200.00
21	2817.44	183.31	0.381	0.50( 0.50)	0.99	48365.5	10300.00
22	2591.11	189.61	0.378	0.50( 0.50)	0.99	48716.6	12010.00
23	2126.13	208.88	0.367	0.50( 0.50)	0.99	49046.0	12000.00
24	1189.40	273.44	0.332	0.50( 0.50)	0.99	49716.2	10100.00

TOTAL AREA(ACRES) = 49716.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9452.92 Tc(MIN.) = 18.175  
 EFFECTIVE AREA(ACRES) = 4444.49 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49716.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610403U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1 93.93 21.90 0.50( 0.48) 0.97 175.0 40300.00  
 TOTAL AREA(ACRES) = 175.0

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12603.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9452.92	18.17	1.204	0.50( 0.50)	0.99	4444.5	31700.00
2	9450.98	20.79	1.112	0.50( 0.50)	0.99	5081.1	31800.00
3	9445.75	22.85	1.051	0.50( 0.50)	0.99	5618.9	31710.00
4	9445.29	22.97	1.048	0.50( 0.50)	0.99	5651.2	40200.00
5	9433.53	24.78	0.995	0.50( 0.50)	0.99	6162.1	31810.00
6	9341.00	41.12	0.750	0.50( 0.50)	0.99	10744.9	40120.00
7	9304.52	46.99	0.701	0.50( 0.50)	0.99	12324.2	11801.00
8	9198.97	58.20	0.626	0.50( 0.50)	0.99	15534.8	11500.00
9	9115.35	63.79	0.602	0.50( 0.50)	0.99	17464.2	11701.00
10	8986.57	69.95	0.581	0.50( 0.50)	0.99	19583.5	11000.00
11	8705.30	86.06	0.526	0.50( 0.50)	0.99	26438.2	12500.00
12	8516.79	92.12	0.509	0.50( 0.50)	0.99	29308.7	11910.00
13	7865.37	100.46	0.493	0.50( 0.50)	0.99	32597.4	11130.00
14	7205.10	111.48	0.471	0.50( 0.50)	0.99	36266.0	11620.00
15	6166.68	126.54	0.447	0.50( 0.50)	0.99	40803.6	12400.00
16	5339.70	137.16	0.434	0.50( 0.50)	0.99	43100.3	12201.00
17	4743.38	145.82	0.424	0.50( 0.50)	0.99	44389.4	12111.00
18	4396.83	151.06	0.418	0.50( 0.50)	0.99	45142.1	10700.00
19	3833.33	160.40	0.407	0.50( 0.50)	0.99	46316.4	12261.00
20	3370.40	169.02	0.396	0.50( 0.50)	0.99	47128.2	10200.00
21	2817.44	183.31	0.381	0.50( 0.50)	0.99	48365.5	10300.00
22	2591.11	189.61	0.378	0.50( 0.50)	0.99	48716.6	12010.00
23	2126.13	208.88	0.367	0.50( 0.50)	0.99	49046.0	12000.00
24	1189.40	273.44	0.332	0.50( 0.50)	0.99	49716.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	93.93	21.90	1.079	0.50( 0.48)	0.97	175.0	40300.00

LONGEST FLOWPATH FROM NODE 40300.00 TO NODE 12603.00 = 5256.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	18.17	1.204	0.50( 0.50)	0.99	4589.8	31700.00
2	9544.92	20.79	1.112	0.50( 0.50)	0.99	5247.3	31800.00
3	9542.10	21.90	1.079	0.50( 0.50)	0.99	5545.8	40300.00
4	9535.29	22.85	1.051	0.50( 0.50)	0.99	5794.0	31710.00
5	9534.26	22.97	1.048	0.50( 0.50)	0.99	5826.2	40200.00
6	9514.13	24.78	0.995	0.50( 0.50)	0.99	6337.1	31810.00
7	9383.04	41.12	0.750	0.50( 0.50)	0.99	10920.0	40120.00
8	9338.89	46.99	0.701	0.50( 0.50)	0.99	12499.3	11801.00
9	9221.52	58.20	0.626	0.50( 0.50)	0.99	15709.8	11500.00
10	9134.15	63.79	0.602	0.50( 0.50)	0.99	17639.3	11701.00
11	9002.07	69.95	0.581	0.50( 0.50)	0.99	19758.5	11000.00

12	8712.17	86.06	0.526	0.50( 0.50)	0.99	26613.2	12500.00
13	8520.90	92.12	0.509	0.50( 0.50)	0.99	29483.7	11910.00
14	7868.07	100.46	0.493	0.50( 0.50)	0.99	32772.5	11130.00
15	7207.68	111.48	0.471	0.50( 0.50)	0.99	36441.0	11620.00
16	6169.13	126.54	0.447	0.50( 0.50)	0.99	40978.6	12400.00
17	5342.08	137.16	0.434	0.50( 0.50)	0.99	43275.3	12201.00
18	4745.70	145.82	0.424	0.50( 0.50)	0.99	44564.5	12111.00
19	4399.12	151.06	0.418	0.50( 0.50)	0.99	45317.1	10700.00
20	3835.56	160.40	0.407	0.50( 0.50)	0.99	46491.5	12261.00
21	3372.57	169.02	0.396	0.50( 0.50)	0.99	47303.2	10200.00
22	2819.53	183.31	0.381	0.50( 0.50)	0.99	48540.6	10300.00
23	2593.18	189.61	0.378	0.50( 0.50)	0.99	48891.7	12010.00
24	2128.15	208.88	0.367	0.50( 0.50)	0.99	49221.0	12000.00
25	1191.22	273.44	0.332	0.50( 0.50)	0.99	49891.2	10100.00

TOTAL AREA(ACRES) = 49891.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 18.175  
 EFFECTIVE AREA(ACRES) = 4589.77 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 49891.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12603.00 = 101558.30 FEET.

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FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 310.00 DOWNSTREAM(FEET) = 307.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 459.69 CHANNEL SLOPE = 0.0065  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 9546.86  
 FLOW VELOCITY(FEET/SEC.) = 14.64 FLOW DEPTH(FEET) = 14.74  
 TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 18.70  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12604.00 = 102017.99 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	18.70	1.184	0.50( 0.50)	0.99	4589.8	31700.00
2	9544.92	21.32	1.096	0.50( 0.50)	0.99	5247.3	31800.00
3	9542.10	22.42	1.064	0.50( 0.50)	0.99	5545.8	40300.00
4	9535.29	23.37	1.036	0.50( 0.50)	0.99	5794.0	31710.00
5	9534.26	23.49	1.032	0.50( 0.50)	0.99	5826.2	40200.00
6	9514.13	25.30	0.982	0.50( 0.50)	0.99	6337.1	31810.00
7	9383.04	41.65	0.745	0.50( 0.50)	0.99	10920.0	40120.00
8	9338.89	47.52	0.697	0.50( 0.50)	0.99	12499.3	11801.00
9	9221.52	58.73	0.623	0.50( 0.50)	0.99	15709.8	11500.00
10	9134.15	64.32	0.600	0.50( 0.50)	0.99	17639.3	11701.00
11	9002.07	70.48	0.579	0.50( 0.50)	0.99	19758.5	11000.00
12	8712.17	86.60	0.525	0.50( 0.50)	0.99	26613.2	12500.00
13	8520.90	92.66	0.508	0.50( 0.50)	0.99	29483.7	11910.00
14	7868.07	101.01	0.492	0.50( 0.50)	0.99	32772.5	11130.00
15	7207.68	112.04	0.470	0.50( 0.50)	0.99	36441.0	11620.00
16	6169.13	127.13	0.446	0.50( 0.50)	0.99	40978.6	12400.00
17	5342.08	137.76	0.434	0.50( 0.50)	0.99	43275.3	12201.00

18	4745.70	146.44	0.423	0.50	( 0.50)	0.99	44564.5	12111.00
19	4399.12	151.70	0.417	0.50	( 0.50)	0.99	45317.1	10700.00
20	3835.56	161.05	0.406	0.50	( 0.50)	0.99	46491.5	12261.00
21	3372.57	169.70	0.395	0.50	( 0.50)	0.99	47303.2	10200.00
22	2819.53	184.02	0.381	0.50	( 0.50)	0.99	48540.6	10300.00
23	2593.18	190.33	0.377	0.50	( 0.50)	0.99	48891.7	12010.00
24	2128.15	209.64	0.367	0.50	( 0.50)	0.99	49221.0	12000.00
25	1191.22	274.32	0.331	0.50	( 0.50)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 18.70  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4589.77

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12603.00 TO NODE 12604.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 307.00 DOWNSTREAM(FEET) = 305.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 427.54 CHANNEL SLOPE = 0.0047  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 9546.86  
 FLOW VELOCITY(FEET/SEC.) = 12.92 FLOW DEPTH(FEET) = 15.70  
 TRAVEL TIME(MIN.) = 0.55 Tc(MIN.) = 19.25  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.00 = 102445.53 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	19.25	1.163	0.50 ( 0.50)	0.99	4589.8	31700.00
2	9544.92	21.87	1.080	0.50 ( 0.50)	0.99	5247.3	31800.00
3	9542.10	22.97	1.048	0.50 ( 0.50)	0.99	5545.8	40300.00
4	9535.29	23.92	1.020	0.50 ( 0.50)	0.99	5794.0	31710.00
5	9534.26	24.05	1.016	0.50 ( 0.50)	0.99	5826.2	40200.00
6	9514.13	25.85	0.970	0.50 ( 0.50)	0.99	6337.1	31810.00
7	9383.04	42.20	0.741	0.50 ( 0.50)	0.99	10920.0	40120.00
8	9338.89	48.08	0.692	0.50 ( 0.50)	0.99	12499.3	11801.00
9	9221.52	59.29	0.619	0.50 ( 0.50)	0.99	15709.8	11500.00
10	9134.15	64.87	0.598	0.50 ( 0.50)	0.99	17639.3	11701.00
11	9002.07	71.04	0.577	0.50 ( 0.50)	0.99	19758.5	11000.00
12	8712.17	87.16	0.523	0.50 ( 0.50)	0.99	26613.2	12500.00
13	8520.90	93.22	0.507	0.50 ( 0.50)	0.99	29483.7	11910.00
14	7868.07	101.59	0.491	0.50 ( 0.50)	0.99	32772.5	11130.00
15	7207.68	112.63	0.469	0.50 ( 0.50)	0.99	36441.0	11620.00
16	6169.13	127.74	0.446	0.50 ( 0.50)	0.99	40978.6	12400.00
17	5342.08	138.40	0.433	0.50 ( 0.50)	0.99	43275.3	12201.00
18	4745.70	147.10	0.422	0.50 ( 0.50)	0.99	44564.5	12111.00
19	4399.12	152.37	0.416	0.50 ( 0.50)	0.99	45317.1	10700.00
20	3835.56	161.75	0.405	0.50 ( 0.50)	0.99	46491.5	12261.00
21	3372.57	170.42	0.394	0.50 ( 0.50)	0.99	47303.2	10200.00

22	2819.53	184.77	0.380	0.50	( 0.50)	0.99	48540.6	10300.00
23	2593.18	191.10	0.377	0.50	( 0.50)	0.99	48891.7	12010.00
24	2128.15	210.44	0.366	0.50	( 0.50)	0.99	49221.0	12000.00
25	1191.22	275.25	0.331	0.50	( 0.50)	0.99	49891.2	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 19.25  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4589.77

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12604.00 TO NODE 12605.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.00 TO NODE 12605.30 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 305.00 DOWNSTREAM(FEET) = 302.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 217.28 CHANNEL SLOPE = 0.0138  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 9546.86  
 FLOW VELOCITY(FEET/SEC.) = 19.38 FLOW DEPTH(FEET) = 12.81  
 TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 19.44  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	19.44	1.156	0.50 ( 0.50)	0.99	4589.8	31700.00
2	9544.92	22.06	1.075	0.50 ( 0.50)	0.99	5247.3	31800.00
3	9542.10	23.16	1.042	0.50 ( 0.50)	0.99	5545.8	40300.00
4	9535.29	24.11	1.014	0.50 ( 0.50)	0.99	5794.0	31710.00
5	9534.26	24.23	1.011	0.50 ( 0.50)	0.99	5826.2	40200.00
6	9514.13	26.04	0.967	0.50 ( 0.50)	0.99	6337.1	31810.00
7	9383.04	42.39	0.739	0.50 ( 0.50)	0.99	10920.0	40120.00
8	9338.89	48.26	0.690	0.50 ( 0.50)	0.99	12499.3	11801.00
9	9221.52	59.48	0.618	0.50 ( 0.50)	0.99	15709.8	11500.00
10	9134.15	65.06	0.598	0.50 ( 0.50)	0.99	17639.3	11701.00
11	9002.07	71.23	0.577	0.50 ( 0.50)	0.99	19758.5	11000.00
12	8712.17	87.35	0.522	0.50 ( 0.50)	0.99	26613.2	12500.00
13	8520.90	93.41	0.506	0.50 ( 0.50)	0.99	29483.7	11910.00
14	7868.07	101.78	0.490	0.50 ( 0.50)	0.99	32772.5	11130.00
15	7207.68	112.83	0.469	0.50 ( 0.50)	0.99	36441.0	11620.00
16	6169.13	127.95	0.445	0.50 ( 0.50)	0.99	40978.6	12400.00
17	5342.08	138.62	0.433	0.50 ( 0.50)	0.99	43275.3	12201.00
18	4745.70	147.32	0.422	0.50 ( 0.50)	0.99	44564.5	12111.00
19	4399.12	152.60	0.416	0.50 ( 0.50)	0.99	45317.1	10700.00
20	3835.56	161.98	0.405	0.50 ( 0.50)	0.99	46491.5	12261.00
21	3372.57	170.66	0.394	0.50 ( 0.50)	0.99	47303.2	10200.00
22	2819.53	185.02	0.380	0.50 ( 0.50)	0.99	48540.6	10300.00
23	2593.18	191.36	0.377	0.50 ( 0.50)	0.99	48891.7	12010.00
24	2128.15	210.72	0.366	0.50 ( 0.50)	0.99	49221.0	12000.00

25 1191.22 275.56 0.330 0.50( 0.50) 0.99 49891.2 10100.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 9546.86 Tc(MIN.) = 19.44  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4589.77

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*MEMORY BANK # 3 IS EMPTY - PROCESS IGNORED.\*\*\*

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610404U.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	220.21	20.90	0.50( 0.50)	0.99	394.9	40430.00
2	216.58	21.42	0.50( 0.50)	0.99	398.7	40440.00
3	203.76	23.10	0.50( 0.50)	0.99	409.8	40400.00
4	203.62	23.12	0.50( 0.50)	0.99	409.8	40420.00
5	202.03	23.33	0.50( 0.50)	0.99	410.5	40410.00
TOTAL AREA(ACRES) =						410.5

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.30 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9546.86	19.44	1.156	0.50( 0.50)	0.99	4589.8	31700.00
2	9544.92	22.06	1.075	0.50( 0.50)	0.99	5247.3	31800.00
3	9542.10	23.16	1.042	0.50( 0.50)	0.99	5545.8	40300.00
4	9535.29	24.11	1.014	0.50( 0.50)	0.99	5794.0	31710.00
5	9534.26	24.23	1.011	0.50( 0.50)	0.99	5826.2	40200.00
6	9514.13	26.04	0.967	0.50( 0.50)	0.99	6337.1	31810.00
7	9383.04	42.39	0.739	0.50( 0.50)	0.99	10920.0	40120.00
8	9338.89	48.26	0.690	0.50( 0.50)	0.99	12499.3	11801.00
9	9221.52	59.48	0.618	0.50( 0.50)	0.99	15709.8	11500.00
10	9134.15	65.06	0.598	0.50( 0.50)	0.99	17639.3	11701.00
11	9002.07	71.23	0.577	0.50( 0.50)	0.99	19758.5	11000.00
12	8712.17	87.35	0.522	0.50( 0.50)	0.99	26613.2	12500.00
13	8520.90	93.41	0.506	0.50( 0.50)	0.99	29483.7	11910.00
14	7868.07	101.78	0.490	0.50( 0.50)	0.99	32772.5	11130.00
15	7207.68	112.83	0.469	0.50( 0.50)	0.99	36441.0	11620.00
16	6169.13	127.95	0.445	0.50( 0.50)	0.99	40978.6	12400.00
17	5342.08	138.62	0.433	0.50( 0.50)	0.99	43275.3	12201.00
18	4745.70	147.32	0.422	0.50( 0.50)	0.99	44564.5	12111.00
19	4399.12	152.60	0.416	0.50( 0.50)	0.99	45317.1	10700.00
20	3835.56	161.98	0.405	0.50( 0.50)	0.99	46491.5	12261.00

21 3372.57 170.66 0.394 0.50( 0.50) 0.99 47303.2 10200.00  
 22 2819.53 185.02 0.380 0.50( 0.50) 0.99 48540.6 10300.00  
 23 2593.18 191.36 0.377 0.50( 0.50) 0.99 48891.7 12010.00  
 24 2128.15 210.72 0.366 0.50( 0.50) 0.99 49221.0 12000.00  
 25 1191.22 275.56 0.330 0.50( 0.50) 0.99 49891.2 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	220.21	20.90	1.109	0.50( 0.50)	0.99	394.9	40430.00
2	216.58	21.42	1.093	0.50( 0.50)	0.99	398.7	40440.00
3	203.76	23.10	1.044	0.50( 0.50)	0.99	409.8	40400.00
4	203.62	23.12	1.043	0.50( 0.50)	0.99	409.8	40420.00
5	202.03	23.33	1.037	0.50( 0.50)	0.99	410.5	40410.00
LONGEST FLOWPATH FROM NODE 40400.00 TO NODE 12605.30 =							7428.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9767.07	19.44	1.156	0.50( 0.50)	0.99	4957.0	31700.00
2	9765.99	20.90	1.109	0.50( 0.50)	0.99	5351.9	40430.00
3	9761.97	21.42	1.093	0.50( 0.50)	0.99	5485.3	40440.00
4	9756.62	22.06	1.075	0.50( 0.50)	0.99	5650.2	31800.00
5	9746.02	23.10	1.044	0.50( 0.50)	0.99	5938.1	40400.00
6	9745.83	23.12	1.043	0.50( 0.50)	0.99	5943.8	40420.00
7	9745.39	23.16	1.042	0.50( 0.50)	0.99	5955.8	40300.00
8	9742.94	23.33	1.037	0.50( 0.50)	0.99	5999.7	40410.00
9	9728.75	24.11	1.014	0.50( 0.50)	0.99	6204.4	31710.00
10	9726.35	24.23	1.011	0.50( 0.50)	0.99	6236.7	40200.00
11	9689.82	26.04	0.967	0.50( 0.50)	0.99	6747.6	31810.00
12	9473.86	42.39	0.739	0.50( 0.50)	0.99	11330.4	40120.00
13	9411.51	48.26	0.690	0.50( 0.50)	0.99	12909.8	11801.00
14	9267.19	59.48	0.618	0.50( 0.50)	0.99	16120.3	11500.00
15	9172.21	65.06	0.598	0.50( 0.50)	0.99	18049.7	11701.00
16	9032.30	71.23	0.577	0.50( 0.50)	0.99	20169.0	11000.00
17	8721.94	87.35	0.522	0.50( 0.50)	0.99	27023.7	12500.00
18	8524.85	93.41	0.506	0.50( 0.50)	0.99	29894.2	11910.00
19	7869.68	101.78	0.490	0.50( 0.50)	0.99	33182.9	11130.00
20	7209.22	112.83	0.469	0.50( 0.50)	0.99	36851.5	11620.00
21	6170.59	127.95	0.445	0.50( 0.50)	0.99	41389.1	12400.00
22	5343.50	138.62	0.433	0.50( 0.50)	0.99	43685.8	12201.00
23	4747.09	147.32	0.422	0.50( 0.50)	0.99	44975.0	12111.00
24	4400.49	152.60	0.416	0.50( 0.50)	0.99	45727.6	10700.00
25	3836.88	161.98	0.405	0.50( 0.50)	0.99	46901.9	12261.00
26	3373.87	170.66	0.394	0.50( 0.50)	0.99	47713.7	10200.00
27	2820.78	185.02	0.380	0.50( 0.50)	0.99	48951.0	10300.00
28	2594.42	191.36	0.377	0.50( 0.50)	0.99	49302.1	12010.00
29	2129.35	210.72	0.366	0.50( 0.50)	0.99	49631.5	12000.00
30	1192.30	275.56	0.330	0.50( 0.50)	0.99	50301.7	10100.00
TOTAL AREA(ACRES) =						50301.7	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9767.07 Tc(MIN.) = 19.437  
 EFFECTIVE AREA(ACRES) = 4957.04 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 50301.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.30 = 102662.81 FEET.

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FLOW PROCESS FROM NODE 12605.30 TO NODE 12605.60 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 302.00 DOWNSTREAM(FEET) = 295.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 738.76 CHANNEL SLOPE = 0.0095
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 9767.07
FLOW VELOCITY(FEET/SEC.) = 16.93 FLOW DEPTH(FEET) = 13.87
TRAVEL TIME(MIN.) = 0.73 Tc(MIN.) = 20.16
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 30 rows of data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 9767.07 Tc(MIN.) = 20.16
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4957.04

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FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<

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FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610405U.DNA
MEMORY BANK # 3 DEFINED AS FOLLOWS:

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 2 rows of data.

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FLOW PROCESS FROM NODE 12605.60 TO NODE 12605.60 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 30 rows of data.

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

Table with 7 columns: STREAM, Q, Tc, Intensity, Fp(Fm), Ap, Ae, HEADWATER. Contains 1 row of data.

NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  
 1 55.77 15.36 1.311 0.50( 0.50) 1.00 76.3 40510.00  
 2 54.01 17.32 1.237 0.50( 0.50) 1.00 81.4 40500.00  
 LONGEST FLOWPATH FROM NODE 40500.00 TO NODE 12605.60 = 4091.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9622.73	15.36	1.311	0.50( 0.50)	0.99	3852.7	40510.00
2	9821.08	17.32	1.237	0.50( 0.50)	0.99	4339.5	40500.00
3	9813.28	20.16	1.130	0.50( 0.50)	0.99	5038.4	31700.00
4	9809.04	21.63	1.087	0.50( 0.50)	0.99	5433.3	40430.00
5	9803.92	22.14	1.072	0.50( 0.50)	0.99	5566.7	40440.00
6	9797.19	22.78	1.053	0.50( 0.50)	0.99	5731.6	31800.00
7	9784.35	23.82	1.023	0.50( 0.50)	0.99	6019.5	40400.00
8	9784.11	23.85	1.022	0.50( 0.50)	0.99	6025.2	40420.00
9	9783.58	23.89	1.021	0.50( 0.50)	0.99	6037.1	40300.00
10	9780.77	24.06	1.016	0.50( 0.50)	0.99	6081.1	40410.00
11	9764.89	24.84	0.993	0.50( 0.50)	0.99	6285.8	31710.00
12	9762.23	24.96	0.989	0.50( 0.50)	0.99	6318.1	40200.00
13	9722.94	26.77	0.952	0.50( 0.50)	0.99	6828.9	31810.00
14	9490.99	43.12	0.733	0.50( 0.50)	0.99	11411.8	40120.00
15	9425.07	49.00	0.684	0.50( 0.50)	0.99	12991.1	11801.00
16	9275.62	60.21	0.614	0.50( 0.50)	0.99	16201.7	11500.00
17	9179.25	65.80	0.595	0.50( 0.50)	0.99	18131.1	11701.00
18	9037.80	71.97	0.574	0.50( 0.50)	0.99	20250.3	11000.00
19	8723.43	88.10	0.519	0.50( 0.50)	0.99	27105.0	12500.00
20	8525.28	94.17	0.505	0.50( 0.50)	0.99	29975.6	11910.00
21	7869.75	102.55	0.489	0.50( 0.50)	0.99	33264.3	11130.00
22	7209.29	113.62	0.467	0.50( 0.50)	0.99	36932.9	11620.00
23	6170.66	128.77	0.444	0.50( 0.50)	0.99	41470.4	12400.00
24	5343.57	139.46	0.432	0.50( 0.50)	0.99	43767.2	12201.00
25	4747.15	148.19	0.421	0.50( 0.50)	0.99	45056.3	12111.00
26	4400.55	153.48	0.415	0.50( 0.50)	0.99	45808.9	10700.00
27	3836.95	162.90	0.404	0.50( 0.50)	0.99	46983.3	12261.00
28	3373.93	171.61	0.393	0.50( 0.50)	0.99	47795.1	10200.00
29	2820.84	186.01	0.380	0.50( 0.50)	0.99	49032.4	10300.00
30	2594.48	192.37	0.376	0.50( 0.50)	0.99	49383.5	12010.00
31	2129.40	211.78	0.366	0.50( 0.50)	0.99	49712.8	12000.00
32	1192.35	276.80	0.330	0.50( 0.50)	0.99	50383.1	10100.00

TOTAL AREA (ACRES) = 50383.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 9821.08 Tc (MIN.) = 17.321  
 EFFECTIVE AREA (ACRES) = 4339.52 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 50383.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12605.60 = 103401.57 FEET.

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FLOW PROCESS FROM NODE 12605.60 TO NODE 12606.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 295.00 DOWNSTREAM (FEET) = 286.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1203.43 CHANNEL SLOPE = 0.0075  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 9821.08  
 FLOW VELOCITY (FEET/SEC.) = 15.51 FLOW DEPTH (FEET) = 14.53  
 TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 18.61  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9622.73	16.66	1.262	0.50( 0.50)	0.99	3852.7	40510.00
2	9821.08	18.61	1.188	0.50( 0.50)	0.99	4339.5	40500.00
3	9813.28	21.46	1.092	0.50( 0.50)	0.99	5038.4	31700.00
4	9809.04	22.92	1.049	0.50( 0.50)	0.99	5433.3	40430.00
5	9803.92	23.44	1.034	0.50( 0.50)	0.99	5566.7	40440.00
6	9797.19	24.08	1.015	0.50( 0.50)	0.99	5731.6	31800.00
7	9784.35	25.12	0.986	0.50( 0.50)	0.99	6019.5	40400.00
8	9784.11	25.14	0.985	0.50( 0.50)	0.99	6025.2	40420.00
9	9783.58	25.18	0.984	0.50( 0.50)	0.99	6037.1	40300.00
10	9780.77	25.35	0.981	0.50( 0.50)	0.99	6081.1	40410.00
11	9764.89	26.13	0.965	0.50( 0.50)	0.99	6285.8	31710.00
12	9762.23	26.26	0.962	0.50( 0.50)	0.99	6318.1	40200.00
13	9722.94	28.06	0.925	0.50( 0.50)	0.99	6828.9	31810.00
14	9490.99	44.42	0.722	0.50( 0.50)	0.99	11411.8	40120.00
15	9425.07	50.30	0.674	0.50( 0.50)	0.99	12991.1	11801.00
16	9275.62	61.53	0.610	0.50( 0.50)	0.99	16201.7	11500.00
17	9179.25	67.12	0.591	0.50( 0.50)	0.99	18131.1	11701.00
18	9037.80	73.29	0.570	0.50( 0.50)	0.99	20250.3	11000.00
19	8723.43	89.43	0.515	0.50( 0.50)	0.99	27105.0	12500.00
20	8525.28	95.51	0.502	0.50( 0.50)	0.99	29975.6	11910.00
21	7869.75	103.92	0.486	0.50( 0.50)	0.99	33264.3	11130.00
22	7209.29	115.01	0.465	0.50( 0.50)	0.99	36932.9	11620.00
23	6170.66	130.22	0.443	0.50( 0.50)	0.99	41470.4	12400.00
24	5343.57	140.97	0.430	0.50( 0.50)	0.99	43767.2	12201.00
25	4747.15	149.74	0.419	0.50( 0.50)	0.99	45056.3	12111.00
26	4400.55	155.06	0.413	0.50( 0.50)	0.99	45808.9	10700.00
27	3836.95	164.53	0.402	0.50( 0.50)	0.99	46983.3	12261.00
28	3373.93	173.30	0.391	0.50( 0.50)	0.99	47795.1	10200.00
29	2820.84	187.78	0.379	0.50( 0.50)	0.99	49032.4	10300.00
30	2594.48	194.17	0.375	0.50( 0.50)	0.99	49383.5	12010.00
31	2129.40	213.68	0.364	0.50( 0.50)	0.99	49712.8	12000.00
32	1192.35	278.99	0.329	0.50( 0.50)	0.99	50383.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 9821.08 Tc (MIN.) = 18.61  
 AREA-AVERAGED Fm (INCH/HR) = 0.50 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 4339.52

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610406U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.15	24.01	0.50	(0.50)	0.99	135.0	40600.00
TOTAL AREA (ACRES) =			135.0				

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9622.73	16.66	1.262	0.50 (0.50)	0.99	3852.7	40510.00
2	9821.08	18.61	1.188	0.50 (0.50)	0.99	4339.5	40500.00
3	9813.28	21.46	1.092	0.50 (0.50)	0.99	5038.4	31700.00
4	9809.04	22.92	1.049	0.50 (0.50)	0.99	5433.3	40430.00
5	9803.92	23.44	1.034	0.50 (0.50)	0.99	5566.7	40440.00
6	9797.19	24.08	1.015	0.50 (0.50)	0.99	5731.6	31800.00
7	9784.35	25.12	0.986	0.50 (0.50)	0.99	6019.5	40400.00
8	9784.11	25.14	0.985	0.50 (0.50)	0.99	6025.2	40420.00
9	9783.58	25.18	0.984	0.50 (0.50)	0.99	6037.1	40300.00
10	9780.77	25.35	0.981	0.50 (0.50)	0.99	6081.1	40410.00
11	9764.89	26.13	0.965	0.50 (0.50)	0.99	6285.8	31710.00
12	9762.23	26.26	0.962	0.50 (0.50)	0.99	6318.1	40200.00
13	9722.94	28.06	0.925	0.50 (0.50)	0.99	6828.9	31810.00
14	9490.99	44.42	0.722	0.50 (0.50)	0.99	11411.8	40120.00
15	9425.07	50.30	0.674	0.50 (0.50)	0.99	12991.1	11801.00
16	9275.62	61.53	0.610	0.50 (0.50)	0.99	16201.7	11500.00
17	9179.25	67.12	0.591	0.50 (0.50)	0.99	18131.1	11701.00
18	9037.80	73.29	0.570	0.50 (0.50)	0.99	20250.3	11000.00
19	8723.43	89.43	0.515	0.50 (0.50)	0.99	27105.0	12500.00
20	8525.28	95.51	0.502	0.50 (0.50)	0.99	29975.6	11910.00
21	7869.75	103.92	0.486	0.50 (0.50)	0.99	33264.3	11130.00
22	7209.29	115.01	0.465	0.50 (0.50)	0.99	36932.9	11620.00
23	6170.66	130.22	0.443	0.50 (0.50)	0.99	41470.4	12400.00
24	5343.57	140.97	0.430	0.50 (0.50)	0.99	43767.2	12201.00
25	4747.15	149.74	0.419	0.50 (0.50)	0.99	45056.3	12111.00
26	4400.55	155.06	0.413	0.50 (0.50)	0.99	45808.9	10700.00
27	3836.95	164.53	0.402	0.50 (0.50)	0.99	46983.3	12261.00
28	3373.93	173.30	0.391	0.50 (0.50)	0.99	47795.1	10200.00
29	2820.84	187.78	0.379	0.50 (0.50)	0.99	49032.4	10300.00
30	2594.48	194.17	0.375	0.50 (0.50)	0.99	49383.5	12010.00
31	2129.40	213.68	0.364	0.50 (0.50)	0.99	49712.8	12000.00
32	1192.35	278.99	0.329	0.50 (0.50)	0.99	50383.1	10100.00
LONGEST FLOWPATH FROM NODE			10100.00 TO NODE 12606.00 = 104605.00 FEET.				

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.15	24.01	1.017	0.50 (0.50)	0.99	135.0	40600.00
LONGEST FLOWPATH FROM NODE			40600.00 TO NODE 12606.00 = 6107.00 FEET.				

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	9685.88	16.66	1.262	0.50 (0.50)	0.99	3946.4	40510.00
2	9884.23	18.61	1.188	0.50 (0.50)	0.99	4444.2	40500.00
3	9876.42	21.46	1.092	0.50 (0.50)	0.99	5159.1	31700.00
4	9872.19	22.92	1.049	0.50 (0.50)	0.99	5562.2	40430.00
5	9867.06	23.44	1.034	0.50 (0.50)	0.99	5698.5	40440.00
6	9861.08	24.01	1.017	0.50 (0.50)	0.99	5848.2	40600.00
7	9860.08	24.08	1.015	0.50 (0.50)	0.99	5866.6	31800.00
8	9843.64	25.12	0.986	0.50 (0.50)	0.99	6154.5	40400.00
9	9843.36	25.14	0.985	0.50 (0.50)	0.99	6160.2	40420.00
10	9842.71	25.18	0.984	0.50 (0.50)	0.99	6172.1	40300.00
11	9839.48	25.35	0.981	0.50 (0.50)	0.99	6216.1	40410.00
12	9821.65	26.13	0.965	0.50 (0.50)	0.99	6420.8	31710.00
13	9818.68	26.26	0.962	0.50 (0.50)	0.99	6453.1	40200.00
14	9774.86	28.06	0.925	0.50 (0.50)	0.99	6963.9	31810.00
15	9518.30	44.42	0.722	0.50 (0.50)	0.99	11546.8	40120.00
16	9446.52	50.30	0.674	0.50 (0.50)	0.99	13126.1	11801.00
17	9289.26	61.53	0.610	0.50 (0.50)	0.99	16336.6	11500.00
18	9190.57	67.12	0.591	0.50 (0.50)	0.99	18266.1	11701.00
19	9046.58	73.29	0.570	0.50 (0.50)	0.99	20385.3	11000.00
20	8725.53	89.43	0.515	0.50 (0.50)	0.99	27240.0	12500.00
21	8525.85	95.51	0.502	0.50 (0.50)	0.99	30110.5	11910.00
22	7870.06	103.92	0.486	0.50 (0.50)	0.99	33399.3	11130.00
23	7209.59	115.01	0.465	0.50 (0.50)	0.99	37067.9	11620.00
24	6170.93	130.22	0.443	0.50 (0.50)	0.99	41605.4	12400.00
25	5343.84	140.97	0.430	0.50 (0.50)	0.99	43902.1	12201.00
26	4747.42	149.74	0.419	0.50 (0.50)	0.99	45191.3	12111.00
27	4400.81	155.06	0.413	0.50 (0.50)	0.99	45943.9	10700.00
28	3837.20	164.53	0.402	0.50 (0.50)	0.99	47118.3	12261.00
29	3374.17	173.30	0.391	0.50 (0.50)	0.99	47930.0	10200.00
30	2821.07	187.78	0.379	0.50 (0.50)	0.99	49167.4	10300.00
31	2594.71	194.17	0.375	0.50 (0.50)	0.99	49518.5	12010.00
32	2129.63	213.68	0.364	0.50 (0.50)	0.99	49847.8	12000.00
33	1192.56	278.99	0.329	0.50 (0.50)	0.99	50518.0	10100.00
TOTAL AREA (ACRES) =			50518.0				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 9884.23 Tc (MIN.) = 18.615  
 EFFECTIVE AREA (ACRES) = 4444.19 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 50518.0  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12606.00 = 104605.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 50518.0 TC (MIN.) = 18.61  
 EFFECTIVE AREA (ACRES) = 4444.19 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.993  
 PEAK FLOW RATE (CFS) = 9884.23

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9685.88	16.66	1.262	0.50 (0.50)	0.99	3946.4	40510.00
2	9884.23	18.61	1.188	0.50 (0.50)	0.99	4444.2	40500.00
3	9876.42	21.46	1.092	0.50 (0.50)	0.99	5159.1	31700.00
4	9872.19	22.92	1.049	0.50 (0.50)	0.99	5562.2	40430.00
5	9867.06	23.44	1.034	0.50 (0.50)	0.99	5698.5	40440.00
6	9861.08	24.01	1.017	0.50 (0.50)	0.99	5848.2	40600.00
7	9860.08	24.08	1.015	0.50 (0.50)	0.99	5866.6	31800.00

8	9843.64	25.12	0.986	0.50	( 0.50)	0.99	6154.5	40400.00
9	9843.36	25.14	0.985	0.50	( 0.50)	0.99	6160.2	40420.00
10	9842.71	25.18	0.984	0.50	( 0.50)	0.99	6172.1	40300.00
11	9839.48	25.35	0.981	0.50	( 0.50)	0.99	6216.1	40410.00
12	9821.65	26.13	0.965	0.50	( 0.50)	0.99	6420.8	31710.00
13	9818.68	26.26	0.962	0.50	( 0.50)	0.99	6453.1	40200.00
14	9774.86	28.06	0.925	0.50	( 0.50)	0.99	6963.9	31810.00
15	9518.30	44.42	0.722	0.50	( 0.50)	0.99	11546.8	40120.00
16	9446.52	50.30	0.674	0.50	( 0.50)	0.99	13126.1	11801.00
17	9289.26	61.53	0.610	0.50	( 0.50)	0.99	16336.6	11500.00
18	9190.57	67.12	0.591	0.50	( 0.50)	0.99	18266.1	11701.00
19	9046.58	73.29	0.570	0.50	( 0.50)	0.99	20385.3	11000.00
20	8725.53	89.43	0.515	0.50	( 0.50)	0.99	27240.0	12500.00
21	8525.85	95.51	0.502	0.50	( 0.50)	0.99	30110.5	11910.00
22	7870.06	103.92	0.486	0.50	( 0.50)	0.99	33399.3	11130.00
23	7209.59	115.01	0.465	0.50	( 0.50)	0.99	37067.9	11620.00
24	6170.93	130.22	0.443	0.50	( 0.50)	0.99	41605.4	12400.00
25	5343.84	140.97	0.430	0.50	( 0.50)	0.99	43902.1	12201.00
26	4747.42	149.74	0.419	0.50	( 0.50)	0.99	45191.3	12111.00
27	4400.81	155.06	0.413	0.50	( 0.50)	0.99	45943.9	10700.00
28	3837.20	164.53	0.402	0.50	( 0.50)	0.99	47118.3	12261.00
29	3374.17	173.30	0.391	0.50	( 0.50)	0.99	47930.0	10200.00
30	2821.07	187.78	0.379	0.50	( 0.50)	0.99	49167.4	10300.00
31	2594.71	194.17	0.375	0.50	( 0.50)	0.99	49518.5	12010.00
32	2129.63	213.68	0.364	0.50	( 0.50)	0.99	49847.8	12000.00
33	1192.56	278.99	0.329	0.50	( 0.50)	0.99	50518.0	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S27.DAT  
TIME/DATE OF STUDY: 08:15 09/12/2017  
=====

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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.710
- 2) 10.00; 1.799
- 3) 15.00; 1.319
- 4) 20.00; 1.129
- 5) 25.00; 0.984
- 6) 30.00; 0.882
- 7) 40.00; 0.756
- 8) 50.00; 0.673
- 9) 60.00; 0.612
- 10) 90.00; 0.509
- 11) 120.00; 0.451
- 12) 180.00; 0.379
- 13) 360.00; 0.281
- 14) 1200.00; 0.123

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO STREET-CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S26.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9884.23	18.61	0.50 ( 0.50)	0.99	4444.2	40500.00
2	9518.30	44.42	0.50 ( 0.50)	0.99	11546.8	40120.00
3	9446.52	50.30	0.50 ( 0.50)	0.99	13126.1	11801.00
4	9289.26	61.53	0.50 ( 0.50)	0.99	16336.6	11500.00
5	9190.57	67.12	0.50 ( 0.50)	0.99	18266.1	11701.00
6	9046.58	73.29	0.50 ( 0.50)	0.99	20385.3	11000.00
7	8725.53	89.43	0.50 ( 0.50)	0.99	27240.0	12500.00
8	8525.85	95.51	0.50 ( 0.50)	0.99	30110.5	11910.00
9	7870.06	103.92	0.50 ( 0.50)	0.99	33399.3	11130.00
10	7209.59	115.01	0.50 ( 0.50)	0.99	37067.9	11620.00
11	6170.93	130.22	0.50 ( 0.50)	0.99	41605.4	12400.00
12	5343.84	140.97	0.50 ( 0.50)	0.99	43902.1	12201.00
13	4747.42	149.74	0.50 ( 0.50)	0.99	45191.3	12111.00
14	4400.81	155.06	0.50 ( 0.50)	0.99	45943.9	10700.00
15	3837.20	164.53	0.50 ( 0.50)	0.99	47118.3	12261.00
16	3374.17	173.30	0.50 ( 0.50)	0.99	47930.0	10200.00
17	2821.07	187.78	0.50 ( 0.50)	0.99	49167.4	10300.00
18	2594.71	194.17	0.50 ( 0.50)	0.99	49518.5	12010.00
19	2129.63	213.68	0.50 ( 0.50)	0.99	49847.8	12000.00
20	1192.56	278.99	0.50 ( 0.50)	0.99	50518.0	10100.00

TOTAL AREA (ACRES) = 50518.0

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FLOW PROCESS FROM NODE 12606.00 TO NODE 12606.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9884.23	18.61	0.50 ( 0.50)	0.99	4444.2	40500.00
2	9518.30	44.42	0.50 ( 0.50)	0.99	11546.8	40120.00
3	9446.52	50.30	0.50 ( 0.50)	0.99	13126.1	11801.00
4	9289.26	61.53	0.50 ( 0.50)	0.99	16336.6	11500.00
5	9190.57	67.12	0.50 ( 0.50)	0.99	18266.1	11701.00
6	9046.58	73.29	0.50 ( 0.50)	0.99	20385.3	11000.00
7	8725.53	89.43	0.50 ( 0.50)	0.99	27240.0	12500.00
8	8525.85	95.51	0.50 ( 0.50)	0.99	30110.5	11910.00
9	7870.06	103.92	0.50 ( 0.50)	0.99	33399.3	11130.00
10	7209.59	115.01	0.50 ( 0.50)	0.99	37067.9	11620.00
11	6170.93	130.22	0.50 ( 0.50)	0.99	41605.4	12400.00
12	5343.84	140.97	0.50 ( 0.50)	0.99	43902.1	12201.00
13	4747.42	149.74	0.50 ( 0.50)	0.99	45191.3	12111.00
14	4400.81	155.06	0.50 ( 0.50)	0.99	45943.9	10700.00
15	3837.20	164.53	0.50 ( 0.50)	0.99	47118.3	12261.00
16	3374.17	173.30	0.50 ( 0.50)	0.99	47930.0	10200.00
17	2821.07	187.78	0.50 ( 0.50)	0.99	49167.4	10300.00
18	2594.71	194.17	0.50 ( 0.50)	0.99	49518.5	12010.00

19 2129.63 213.68 0.50( 0.50) 0.99 49847.8 12000.00  
 20 1192.56 278.99 0.50( 0.50) 0.99 50518.0 10100.00  
 TOTAL AREA (ACRES) = 50518.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12606.00 TO NODE 12701.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 286.00 DOWNSTREAM(FEET) = 276.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.19 CHANNEL SLOPE = 0.0079  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.131

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	7.55	0.50	0.889	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9886.56  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 15.89  
 AVERAGE FLOW DEPTH (FEET) = 14.40 TRAVEL TIME (MIN.) = 1.32  
 Tc (MIN.) = 19.94  
 SUBAREA AREA (ACRES) = 7.55 SUBAREA RUNOFF (CFS) = 4.67  
 EFFECTIVE AREA (ACRES) = 4451.74 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 50525.6 PEAK FLOW RATE (CFS) = 9884.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 14.40 FLOW VELOCITY (FEET/SEC.) = 15.89  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12701.00 = 105865.19 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9884.23	19.94	1.131	0.50( 0.50)	0.99	4451.7	40500.00
2	9518.30	45.76	0.708	0.50( 0.50)	0.99	11554.3	40120.00
3	9446.52	51.64	0.663	0.50( 0.50)	0.99	13133.7	11801.00
4	9289.26	62.87	0.602	0.50( 0.50)	0.99	16344.2	11500.00
5	9190.57	68.46	0.583	0.50( 0.50)	0.99	18273.6	11701.00
6	9046.58	74.64	0.562	0.50( 0.50)	0.99	20392.9	11000.00
7	8725.53	90.80	0.507	0.50( 0.50)	0.99	27247.6	12500.00
8	8525.85	96.88	0.496	0.50( 0.50)	0.99	30118.1	11910.00
9	7870.06	105.32	0.479	0.50( 0.50)	0.99	33406.8	11130.00
10	7209.59	116.44	0.458	0.50( 0.50)	0.99	37075.4	11620.00
11	6170.93	131.71	0.437	0.50( 0.50)	0.99	41613.0	12400.00
12	5343.84	142.51	0.424	0.50( 0.50)	0.99	43909.7	12201.00
13	4747.42	151.33	0.413	0.50( 0.50)	0.99	45198.9	12111.00
14	4400.81	156.68	0.407	0.50( 0.50)	0.99	45951.5	10700.00
15	3837.20	166.21	0.396	0.50( 0.50)	0.99	47125.8	12261.00
16	3374.17	175.03	0.385	0.50( 0.50)	0.99	47937.6	10200.00
17	2821.07	189.59	0.374	0.50( 0.50)	0.99	49174.9	10300.00
18	2594.71	196.02	0.370	0.50( 0.50)	0.99	49526.0	12010.00
19	2129.63	215.62	0.360	0.50( 0.50)	0.99	49855.4	12000.00
20	1192.56	281.23	0.324	0.50( 0.50)	0.99	50525.6	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE (CFS) = 9884.23 Tc (MIN.) = 19.94  
 AREA-AVERAGED Fm (INCH/HR) = 0.50 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 4451.74

\*\*\*\*\*

FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 276.00 DOWNSTREAM(FEET) = 275.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 147.65 CHANNEL SLOPE = 0.0068  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.126

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.49	0.50	0.972	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.972  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9884.66  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 14.97  
 AVERAGE FLOW DEPTH (FEET) = 14.84 TRAVEL TIME (MIN.) = 0.16  
 Tc (MIN.) = 20.10  
 SUBAREA AREA (ACRES) = 1.49 SUBAREA RUNOFF (CFS) = 0.86  
 EFFECTIVE AREA (ACRES) = 4453.23 AREA-AVERAGED Fm (INCH/HR) = 0.50  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 50527.1 PEAK FLOW RATE (CFS) = 9884.23  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 14.83 FLOW VELOCITY (FEET/SEC.) = 14.97  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9884.23	20.10	1.126	0.50( 0.50)	0.99	4453.2	40500.00
2	9518.30	45.92	0.707	0.50( 0.50)	0.99	11555.8	40120.00
3	9446.52	51.81	0.662	0.50( 0.50)	0.99	13135.1	11801.00
4	9289.26	63.04	0.602	0.50( 0.50)	0.99	16345.7	11500.00
5	9190.57	68.63	0.582	0.50( 0.50)	0.99	18275.1	11701.00
6	9046.58	74.81	0.561	0.50( 0.50)	0.99	20394.4	11000.00
7	8725.53	90.97	0.507	0.50( 0.50)	0.99	27249.1	12500.00
8	8525.85	97.05	0.495	0.50( 0.50)	0.99	30119.6	11910.00
9	7870.06	105.49	0.479	0.50( 0.50)	0.99	33408.3	11130.00
10	7209.59	116.62	0.458	0.50( 0.50)	0.99	37076.9	11620.00
11	6170.93	131.89	0.437	0.50( 0.50)	0.99	41614.4	12400.00
12	5343.84	142.70	0.424	0.50( 0.50)	0.99	43911.2	12201.00
13	4747.42	151.53	0.413	0.50( 0.50)	0.99	45200.3	12111.00
14	4400.81	156.88	0.407	0.50( 0.50)	0.99	45953.0	10700.00
15	3837.20	166.42	0.395	0.50( 0.50)	0.99	47127.3	12261.00
16	3374.17	175.24	0.385	0.50( 0.50)	0.99	47939.1	10200.00
17	2821.07	189.81	0.374	0.50( 0.50)	0.99	49176.4	10300.00
18	2594.71	196.25	0.370	0.50( 0.50)	0.99	49527.5	12010.00
19	2129.63	215.86	0.359	0.50( 0.50)	0.99	49856.9	12000.00

20 1192.56 281.51 0.324 0.50( 0.50) 0.99 50527.1 10100.00  
NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 9884.23 Tc(MIN.) = 20.10  
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4453.23

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12701.00 TO NODE 12720.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
-----

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 20.10  
RAINFALL INTENSITY(INCH/HR) = 1.13  
AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99  
EFFECTIVE STREAM AREA(ACRES) = 4453.23  
TOTAL STREAM AREA(ACRES) = 50527.07  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 9884.23

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12710.00 TO NODE 12711.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----

INITIAL SUBAREA FLOW-LENGTH(FEET) = 943.56  
ELEVATION DATA: UPSTREAM(FEET) = 940.78 DOWNSTREAM(FEET) = 657.79

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.910  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.424  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"GRASS" - 6.56 0.50 1.000 0 13.91  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 5.45  
TOTAL AREA(ACRES) = 6.56 PEAK FLOW RATE(CFS) = 5.45

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12711.00 TO NODE 12712.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 657.79 DOWNSTREAM(FEET) = 585.63  
CHANNEL LENGTH THRU SUBAREA(FEET) = 766.00 CHANNEL SLOPE = 0.0942  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.257  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 26.94 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.67  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.70  
AVERAGE FLOW DEPTH(FEET) = 1.02 TRAVEL TIME(MIN.) = 2.71  
Tc(MIN.) = 16.62  
SUBAREA AREA(ACRES) = 26.94 SUBAREA RUNOFF(CFS) = 18.36  
EFFECTIVE AREA(ACRES) = 33.50 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 33.5 PEAK FLOW RATE(CFS) = 22.83

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.20 FLOW VELOCITY(FEET/SEC.) = 5.26  
LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12712.00 = 1709.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12712.00 TO NODE 12713.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 585.63 DOWNSTREAM(FEET) = 463.75  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1025.79 CHANNEL SLOPE = 0.1188  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.148  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 14.73 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.13  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.97  
AVERAGE FLOW DEPTH(FEET) = 1.23 TRAVEL TIME(MIN.) = 2.87  
Tc(MIN.) = 19.49  
SUBAREA AREA(ACRES) = 14.73 SUBAREA RUNOFF(CFS) = 8.59  
EFFECTIVE AREA(ACRES) = 48.23 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 48.2 PEAK FLOW RATE(CFS) = 28.14

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.25 FLOW VELOCITY(FEET/SEC.) = 6.02  
LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12713.00 = 2735.35 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12713.00 TO NODE 12714.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 463.75 DOWNSTREAM(FEET) = 360.30  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1148.54 CHANNEL SLOPE = 0.0901  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.057  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 105.64 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 54.69  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.39  
 AVERAGE FLOW DEPTH(FEET) = 1.69 TRAVEL TIME(MIN.) = 3.00  
 Tc(MIN.) = 22.48  
 SUBAREA AREA(ACRES) = 105.64 SUBAREA RUNOFF(CFS) = 52.93  
 EFFECTIVE AREA(ACRES) = 153.87 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 153.9 PEAK FLOW RATE(CFS) = 77.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.92 FLOW VELOCITY(FEET/SEC.) = 6.99  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12714.00 = 3883.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 51

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 360.30 DOWNSTREAM(FEET) = 275.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1314.99 CHANNEL SLOPE = 0.0649  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.968

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 127.13 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.64  
 AVERAGE FLOW DEPTH(FEET) = 2.28 TRAVEL TIME(MIN.) = 3.30  
 Tc(MIN.) = 25.79  
 SUBAREA AREA(ACRES) = 127.13 SUBAREA RUNOFF(CFS) = 53.52  
 EFFECTIVE AREA(ACRES) = 281.00 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 281.0 PEAK FLOW RATE(CFS) = 118.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.40 FLOW VELOCITY(FEET/SEC.) = 6.85  
 LONGEST FLOWPATH FROM NODE 12710.00 TO NODE 12720.00 = 5198.88 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12714.00 TO NODE 12720.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 25.79  
 RAINFALL INTENSITY(INCH/HR) = 0.97

AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 281.00  
 TOTAL STREAM AREA(ACRES) = 281.00  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 118.30

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9884.23	20.10	1.126	0.50( 0.50)	0.99	4453.2	40500.00
1	9518.30	45.92	0.707	0.50( 0.50)	0.99	11555.8	40120.00
1	9446.52	51.81	0.662	0.50( 0.50)	0.99	13135.1	11801.00
1	9289.26	63.04	0.602	0.50( 0.50)	0.99	16345.7	11500.00
1	9190.57	68.63	0.582	0.50( 0.50)	0.99	18275.1	11701.00
1	9046.58	74.81	0.561	0.50( 0.50)	0.99	20394.4	11000.00
1	8725.53	90.97	0.507	0.50( 0.50)	0.99	27249.1	12500.00
1	8525.85	97.05	0.495	0.50( 0.50)	0.99	30119.6	11910.00
1	7870.06	105.49	0.479	0.50( 0.50)	0.99	33408.3	11130.00
1	7209.59	116.62	0.458	0.50( 0.50)	0.99	37076.9	11620.00
1	6170.93	131.89	0.437	0.50( 0.50)	0.99	41614.4	12400.00
1	5343.84	142.70	0.424	0.50( 0.50)	0.99	43911.2	12201.00
1	4747.42	151.53	0.413	0.50( 0.50)	0.99	45200.3	12111.00
1	4400.81	156.88	0.407	0.50( 0.50)	0.99	45953.0	10700.00
1	3837.20	166.42	0.395	0.50( 0.50)	0.99	47127.3	12261.00
1	3374.17	175.24	0.385	0.50( 0.50)	0.99	47939.1	10200.00
1	2821.07	189.81	0.374	0.50( 0.50)	0.99	49176.4	10300.00
1	2594.71	196.25	0.370	0.50( 0.50)	0.99	49527.5	12010.00
1	2129.63	215.86	0.359	0.50( 0.50)	0.99	49856.9	12000.00
1	1192.56	281.51	0.324	0.50( 0.50)	0.99	50527.1	10100.00
2	118.30	25.79	0.968	0.50( 0.50)	1.00	281.0	12710.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10002.53	20.10	1.126	0.50( 0.50)	0.99	4672.3	40500.00
2	9921.97	25.79	0.968	0.50( 0.50)	0.99	6297.8	12710.00
3	9570.55	45.92	0.707	0.50( 0.50)	0.99	11836.8	40120.00
4	9487.44	51.81	0.662	0.50( 0.50)	0.99	13416.1	11801.00
5	9314.90	63.04	0.602	0.50( 0.50)	0.99	16626.7	11500.00
6	9211.35	68.63	0.582	0.50( 0.50)	0.99	18556.1	11701.00
7	9061.99	74.81	0.561	0.50( 0.50)	0.99	20675.4	11000.00
8	8727.29	90.97	0.507	0.50( 0.50)	0.99	27530.1	12500.00
9	8525.85	97.05	0.495	0.50( 0.50)	0.99	30400.6	11910.00
10	7870.06	105.49	0.479	0.50( 0.50)	0.99	33689.3	11130.00
11	7209.59	116.62	0.458	0.50( 0.50)	0.99	37357.9	11620.00
12	6170.93	131.89	0.437	0.50( 0.50)	0.99	41895.4	12400.00
13	5343.84	142.70	0.424	0.50( 0.50)	0.99	44192.2	12201.00
14	4747.42	151.53	0.413	0.50( 0.50)	0.99	45481.3	12111.00
15	4400.81	156.88	0.407	0.50( 0.50)	0.99	46234.0	10700.00
16	3837.20	166.42	0.395	0.50( 0.50)	0.99	47408.3	12261.00
17	3374.17	175.24	0.385	0.50( 0.50)	0.99	48220.1	10200.00
18	2821.07	189.81	0.374	0.50( 0.50)	0.99	49457.4	10300.00
19	2594.71	196.25	0.370	0.50( 0.50)	0.99	49808.5	12010.00
20	2129.63	215.86	0.359	0.50( 0.50)	0.99	50137.9	12000.00

21 1192.56 281.51 0.324 0.50( 0.50) 0.99 50808.1 10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10002.53 Tc(MIN.) = 20.10
EFFECTIVE AREA(ACRES) = 4672.27 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 50808.1
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*MEMORY BANK # 2 IS EMPTY - PROCESS IGNORED.\*\*\*

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FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610316U.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 78.69 31.05 0.50( 0.49) 0.98 231.4 31600.00
TOTAL AREA(ACRES) = 231.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 10002.53 20.10 1.126 0.50( 0.50) 0.99 4672.3 40500.00
2 9921.97 25.79 0.968 0.50( 0.50) 0.99 6297.8 12710.00
3 9570.55 45.92 0.707 0.50( 0.50) 0.99 11836.8 40120.00
4 9487.44 51.81 0.662 0.50( 0.50) 0.99 13416.1 11801.00
5 9314.90 63.04 0.602 0.50( 0.50) 0.99 16626.7 11500.00
6 9211.35 68.63 0.582 0.50( 0.50) 0.99 18556.1 11701.00
7 9061.99 74.81 0.561 0.50( 0.50) 0.99 20675.4 11000.00
8 8727.29 90.97 0.507 0.50( 0.50) 0.99 27530.1 12500.00
9 8525.85 97.05 0.495 0.50( 0.50) 0.99 30400.6 11910.00
10 7870.06 105.49 0.479 0.50( 0.50) 0.99 33689.3 11130.00
11 7209.59 116.62 0.458 0.50( 0.50) 0.99 37357.9 11620.00
12 6170.93 131.89 0.437 0.50( 0.50) 0.99 41895.4 12400.00
13 5343.84 142.70 0.424 0.50( 0.50) 0.99 44192.2 12201.00
14 4747.42 151.53 0.413 0.50( 0.50) 0.99 45481.3 12111.00
15 4400.81 156.88 0.407 0.50( 0.50) 0.99 46234.0 10700.00
16 3837.20 166.42 0.395 0.50( 0.50) 0.99 47408.3 12261.00
17 3374.17 175.24 0.385 0.50( 0.50) 0.99 48220.1 10200.00
18 2821.07 189.81 0.374 0.50( 0.50) 0.99 49457.4 10300.00
19 2594.71 196.25 0.370 0.50( 0.50) 0.99 49808.5 12010.00
20 2129.63 215.86 0.359 0.50( 0.50) 0.99 50137.9 12000.00
21 1192.56 281.51 0.324 0.50( 0.50) 0.99 50808.1 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 78.69 31.05 0.869 0.50( 0.49) 0.98 231.4 31600.00
LONGEST FLOWPATH FROM NODE 31600.00 TO NODE 12720.00 = 7759.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 10081.21 20.10 1.126 0.50( 0.50) 0.99 4822.1 40500.00
2 10000.65 25.79 0.968 0.50( 0.50) 0.99 6490.0 12710.00
3 9908.74 31.05 0.869 0.50( 0.50) 0.99 7977.9 31600.00
4 9615.40 45.92 0.707 0.50( 0.50) 0.99 12068.2 40120.00
5 9522.91 51.81 0.662 0.50( 0.50) 0.99 13647.5 11801.00
6 9337.75 63.04 0.602 0.50( 0.50) 0.99 16858.1 11500.00
7 9230.19 68.63 0.582 0.50( 0.50) 0.99 18787.5 11701.00
8 9076.39 74.81 0.561 0.50( 0.50) 0.99 20906.8 11000.00
9 8730.39 90.97 0.507 0.50( 0.50) 0.99 27761.5 12500.00
10 8527.50 97.05 0.495 0.50( 0.50) 0.99 30632.0 11910.00
11 7871.65 105.49 0.479 0.50( 0.50) 0.99 33920.7 11130.00
12 7211.10 116.62 0.458 0.50( 0.50) 0.99 37589.3 11620.00
13 6172.38 131.89 0.437 0.50( 0.50) 0.99 42126.8 12400.00
14 5345.24 142.70 0.424 0.50( 0.50) 0.99 44423.6 12201.00
15 4748.79 151.53 0.413 0.50( 0.50) 0.99 45712.7 12111.00
16 4402.16 156.88 0.407 0.50( 0.50) 0.99 46465.4 10700.00
17 3838.51 166.42 0.395 0.50( 0.50) 0.99 47639.7 12261.00
18 3375.45 175.24 0.385 0.50( 0.50) 0.99 48451.5 10200.00
19 2822.31 189.81 0.374 0.50( 0.50) 0.99 49688.8 10300.00
20 2595.94 196.25 0.370 0.50( 0.50) 0.99 50039.9 12010.00
21 2130.83 215.86 0.359 0.50( 0.50) 0.99 50369.2 12000.00
22 1193.63 281.51 0.324 0.50( 0.50) 0.99 51039.5 10100.00
TOTAL AREA(ACRES) = 51039.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10081.21 Tc(MIN.) = 20.101
EFFECTIVE AREA(ACRES) = 4822.06 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51039.5
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.00 = 106012.84 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12720.00 TO NODE 12720.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 258.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 2669.21 CHANNEL SLOPE = 0.0064
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 10081.21
FLOW VELOCITY(FEET/SEC.) = 14.70 FLOW DEPTH(FEET) = 15.12
TRAVEL TIME(MIN.) = 3.03 Tc(MIN.) = 23.13
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10081.21	23.13	1.038	0.50 ( 0.50)	0.99	4822.1	40500.00
2	10000.65	28.82	0.906	0.50 ( 0.50)	0.99	6490.0	12710.00
3	9908.74	34.09	0.830	0.50 ( 0.50)	0.99	7977.9	31600.00
4	9615.40	48.99	0.681	0.50 ( 0.50)	0.99	12068.2	40120.00
5	9522.91	54.88	0.643	0.50 ( 0.50)	0.99	13647.5	11801.00
6	9337.75	66.12	0.591	0.50 ( 0.50)	0.99	16858.1	11500.00
7	9230.19	71.72	0.572	0.50 ( 0.50)	0.99	18787.5	11701.00
8	9076.39	77.92	0.550	0.50 ( 0.50)	0.99	20906.8	11000.00
9	8730.39	94.10	0.501	0.50 ( 0.50)	0.99	27761.5	12500.00
10	8527.50	100.21	0.489	0.50 ( 0.50)	0.99	30632.0	11910.00
11	7871.65	108.71	0.473	0.50 ( 0.50)	0.99	33920.7	11130.00
12	7211.10	119.91	0.451	0.50 ( 0.50)	0.99	37589.3	11620.00
13	6172.38	135.31	0.433	0.50 ( 0.50)	0.99	42126.8	12400.00
14	5345.24	146.25	0.419	0.50 ( 0.50)	0.99	44423.6	12201.00
15	4748.79	155.18	0.409	0.50 ( 0.50)	0.99	45712.7	12111.00
16	4402.16	160.61	0.402	0.50 ( 0.50)	0.99	46465.4	10700.00
17	3838.51	170.27	0.391	0.50 ( 0.50)	0.99	47639.7	12261.00
18	3375.45	179.22	0.380	0.50 ( 0.50)	0.99	48451.5	10200.00
19	2822.31	193.97	0.371	0.50 ( 0.50)	0.99	49688.8	10300.00
20	2595.94	200.50	0.368	0.50 ( 0.50)	0.99	50039.9	12010.00
21	2130.83	220.32	0.357	0.50 ( 0.50)	0.99	50369.2	12000.00
22	1193.63	286.67	0.321	0.50 ( 0.50)	0.99	51039.5	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 10081.21 Tc(MIN.) = 23.13  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4822.06

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610315U.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.20	28.10	0.50 ( 0.41)	0.83	68.1	31500.00
TOTAL AREA(ACRES) = 68.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.50 TO NODE 12720.50 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10081.21	23.13	1.038	0.50 ( 0.50)	0.99	4822.1	40500.00
2	10000.65	28.82	0.906	0.50 ( 0.50)	0.99	6490.0	12710.00

3	9908.74	34.09	0.830	0.50 ( 0.50)	0.99	7977.9	31600.00
4	9615.40	48.99	0.681	0.50 ( 0.50)	0.99	12068.2	40120.00
5	9522.91	54.88	0.643	0.50 ( 0.50)	0.99	13647.5	11801.00
6	9337.75	66.12	0.591	0.50 ( 0.50)	0.99	16858.1	11500.00
7	9230.19	71.72	0.572	0.50 ( 0.50)	0.99	18787.5	11701.00
8	9076.39	77.92	0.550	0.50 ( 0.50)	0.99	20906.8	11000.00
9	8730.39	94.10	0.501	0.50 ( 0.50)	0.99	27761.5	12500.00
10	8527.50	100.21	0.489	0.50 ( 0.50)	0.99	30632.0	11910.00
11	7871.65	108.71	0.473	0.50 ( 0.50)	0.99	33920.7	11130.00
12	7211.10	119.91	0.451	0.50 ( 0.50)	0.99	37589.3	11620.00
13	6172.38	135.31	0.433	0.50 ( 0.50)	0.99	42126.8	12400.00
14	5345.24	146.25	0.419	0.50 ( 0.50)	0.99	44423.6	12201.00
15	4748.79	155.18	0.409	0.50 ( 0.50)	0.99	45712.7	12111.00
16	4402.16	160.61	0.402	0.50 ( 0.50)	0.99	46465.4	10700.00
17	3838.51	170.27	0.391	0.50 ( 0.50)	0.99	47639.7	12261.00
18	3375.45	179.22	0.380	0.50 ( 0.50)	0.99	48451.5	10200.00
19	2822.31	193.97	0.371	0.50 ( 0.50)	0.99	49688.8	10300.00
20	2595.94	200.50	0.368	0.50 ( 0.50)	0.99	50039.9	12010.00
21	2130.83	220.32	0.357	0.50 ( 0.50)	0.99	50369.2	12000.00
22	1193.63	286.67	0.321	0.50 ( 0.50)	0.99	51039.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.20	28.10	0.921	0.50 ( 0.41)	0.83	68.1	31500.00

LONGEST FLOWPATH FROM NODE 31500.00 TO NODE 12720.50 = 4043.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	23.13	1.038	0.50 ( 0.50)	0.99	4878.1	40500.00
2	10042.07	28.10	0.921	0.50 ( 0.50)	0.99	6346.6	31500.00
3	10030.95	28.82	0.906	0.50 ( 0.50)	0.99	6558.1	12710.00
4	9934.38	34.09	0.830	0.50 ( 0.50)	0.99	8046.0	31600.00
5	9631.88	48.99	0.681	0.50 ( 0.50)	0.99	12136.3	40120.00
6	9537.04	54.88	0.643	0.50 ( 0.50)	0.99	13715.6	11801.00
7	9348.67	66.12	0.591	0.50 ( 0.50)	0.99	16926.2	11500.00
8	9239.92	71.72	0.572	0.50 ( 0.50)	0.99	18855.6	11701.00
9	9084.82	77.92	0.550	0.50 ( 0.50)	0.99	20974.8	11000.00
10	8735.79	94.10	0.501	0.50 ( 0.50)	0.99	27829.6	12500.00
11	8532.72	100.21	0.489	0.50 ( 0.50)	0.99	30700.1	11910.00
12	7876.70	108.71	0.473	0.50 ( 0.50)	0.99	33988.8	11130.00
13	7215.92	119.91	0.451	0.50 ( 0.50)	0.99	37657.4	11620.00
14	6177.00	135.31	0.433	0.50 ( 0.50)	0.99	42194.9	12400.00
15	5349.72	146.25	0.419	0.50 ( 0.50)	0.99	44491.7	12201.00
16	4753.15	155.18	0.409	0.50 ( 0.50)	0.99	45780.8	12111.00
17	4406.45	160.61	0.402	0.50 ( 0.50)	0.99	46533.4	10700.00
18	3842.68	170.27	0.391	0.50 ( 0.50)	0.99	47707.8	12261.00
19	3379.51	179.22	0.380	0.50 ( 0.50)	0.99	48519.6	10200.00
20	2826.28	193.97	0.371	0.50 ( 0.50)	0.99	49756.9	10300.00
21	2599.87	200.50	0.368	0.50 ( 0.50)	0.99	50108.0	12010.00
22	2134.64	220.32	0.357	0.50 ( 0.50)	0.99	50437.3	12000.00
23	1197.06	286.67	0.321	0.50 ( 0.50)	0.99	51107.6	10100.00
TOTAL AREA(ACRES) =							51107.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 23.127

EFFECTIVE AREA(ACRES) = 4878.11 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51107.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12720.50 = 108682.05 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12720.50 TO NODE 12721.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 258.00 DOWNSTREAM(FEET) = 256.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 438.77 CHANNEL SLOPE = 0.0046  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.022

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	62.15	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10127.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.98  
 AVERAGE FLOW DEPTH(FEET) = 16.12 TRAVEL TIME(MIN.) = 0.56  
 Tc(MIN.) = 23.69  
 SUBAREA AREA(ACRES) = 62.15 SUBAREA RUNOFF(CFS) = 29.19  
 EFFECTIVE AREA(ACRES) = 4940.26 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51169.7 PEAK FLOW RATE(CFS) = 10112.41  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 16.12 FLOW VELOCITY(FEET/SEC.) = 12.98  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12721.00 = 109120.82 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	23.69	1.022	0.50( 0.50)	0.99	4940.3	40500.00
2	10042.07	28.66	0.909	0.50( 0.50)	0.99	6408.8	31500.00
3	10030.95	29.38	0.895	0.50( 0.50)	0.99	6620.2	12710.00
4	9934.38	34.66	0.823	0.50( 0.50)	0.99	8108.2	31600.00
5	9631.88	49.56	0.677	0.50( 0.50)	0.99	12198.5	40120.00
6	9537.04	55.45	0.640	0.50( 0.50)	0.99	13777.8	11801.00
7	9348.67	66.70	0.589	0.50( 0.50)	0.99	16988.3	11500.00
8	9239.92	72.30	0.570	0.50( 0.50)	0.99	18917.8	11701.00
9	9084.82	78.50	0.548	0.50( 0.50)	0.99	21037.0	11000.00
10	8735.79	94.69	0.500	0.50( 0.50)	0.99	27891.7	12500.00
11	8532.72	100.79	0.488	0.50( 0.50)	0.99	30762.2	11910.00
12	7876.70	109.31	0.472	0.50( 0.50)	0.99	34051.0	11130.00
13	7215.92	120.52	0.450	0.50( 0.50)	0.99	37719.5	11620.00
14	6177.00	135.95	0.432	0.50( 0.50)	0.99	42257.1	12400.00
15	5349.72	146.91	0.419	0.50( 0.50)	0.99	44553.8	12201.00
16	4753.15	155.86	0.408	0.50( 0.50)	0.99	45843.0	12111.00
17	4406.45	161.30	0.401	0.50( 0.50)	0.99	46595.6	10700.00
18	3842.68	170.99	0.390	0.50( 0.50)	0.99	47769.9	12261.00
19	3379.51	179.96	0.379	0.50( 0.50)	0.99	48581.7	10200.00

20	2826.28	194.75	0.371	0.50( 0.50)	0.99	49819.1	10300.00
21	2599.87	201.29	0.367	0.50( 0.50)	0.99	50170.2	12010.00
22	2134.64	221.15	0.357	0.50( 0.50)	0.99	50499.5	12000.00
23	1197.06	287.63	0.320	0.50( 0.50)	0.99	51169.7	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 23.69  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4940.26

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12721.00 TO NODE 12722.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 256.00 DOWNSTREAM(FEET) = 255.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 830.42 CHANNEL SLOPE = 0.0012  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
 CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
 ALLOWABLE DEPTH).  
 AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
 ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.977  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	11.24	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10114.82  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.43  
 AVERAGE FLOW DEPTH(FEET) = 20.00 TRAVEL TIME(MIN.) = 1.64  
 Tc(MIN.) = 25.33  
 SUBAREA AREA(ACRES) = 11.24 SUBAREA RUNOFF(CFS) = 4.83  
 EFFECTIVE AREA(ACRES) = 4951.50 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51180.9 PEAK FLOW RATE(CFS) = 10112.41  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
 CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
 ALLOWABLE DEPTH).  
 AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
 ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 20.00 FLOW VELOCITY(FEET/SEC.) = 8.43

==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	25.33	0.977	0.50 ( 0.50)	0.99	4951.5	40500.00
2	10042.07	30.31	0.878	0.50 ( 0.50)	0.99	6420.0	31500.00
3	10030.95	31.04	0.869	0.50 ( 0.50)	0.99	6631.5	12710.00
4	9934.38	36.33	0.802	0.50 ( 0.50)	0.99	8119.4	31600.00
5	9631.88	51.28	0.665	0.50 ( 0.50)	0.99	12209.7	40120.00
6	9537.04	57.19	0.629	0.50 ( 0.50)	0.99	13789.0	11801.00
7	9348.67	68.47	0.583	0.50 ( 0.50)	0.99	16999.6	11500.00
8	9239.92	74.10	0.564	0.50 ( 0.50)	0.99	18929.0	11701.00
9	9084.82	80.30	0.542	0.50 ( 0.50)	0.99	21048.2	11000.00
10	8735.79	96.51	0.496	0.50 ( 0.50)	0.99	27902.9	12500.00
11	8532.72	102.63	0.485	0.50 ( 0.50)	0.99	30773.5	11910.00
12	7876.70	111.18	0.468	0.50 ( 0.50)	0.99	34062.2	11130.00
13	7215.92	122.43	0.448	0.50 ( 0.50)	0.99	37730.8	11620.00
14	6177.00	137.94	0.429	0.50 ( 0.50)	0.99	42268.3	12400.00
15	5349.72	148.97	0.416	0.50 ( 0.50)	0.99	44565.1	12201.00
16	4753.15	157.98	0.405	0.50 ( 0.50)	0.99	45854.2	12111.00
17	4406.45	163.46	0.399	0.50 ( 0.50)	0.99	46606.8	10700.00
18	3842.68	173.22	0.387	0.50 ( 0.50)	0.99	47781.2	12261.00
19	3379.51	182.27	0.378	0.50 ( 0.50)	0.99	48593.0	10200.00
20	2826.28	197.16	0.370	0.50 ( 0.50)	0.99	49830.3	10300.00
21	2599.87	203.76	0.366	0.50 ( 0.50)	0.99	50181.4	12010.00
22	2134.64	223.74	0.355	0.50 ( 0.50)	0.99	50510.7	12000.00
23	1197.06	290.62	0.319	0.50 ( 0.50)	0.99	51180.9	10100.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 10112.41 Tc(MIN.) = 25.33  
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 4951.50

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: 0610314U.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.88	47.35	0.50 ( 0.50)	0.99	497.2	31400.00
TOTAL AREA(ACRES) = 497.2						

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12722.00 TO NODE 12722.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10112.41	25.33	0.977	0.50 ( 0.50)	0.99	4951.5	40500.00
2	10042.07	30.31	0.878	0.50 ( 0.50)	0.99	6420.0	31500.00
3	10030.95	31.04	0.869	0.50 ( 0.50)	0.99	6631.5	12710.00
4	9934.38	36.33	0.802	0.50 ( 0.50)	0.99	8119.4	31600.00
5	9631.88	51.28	0.665	0.50 ( 0.50)	0.99	12209.7	40120.00
6	9537.04	57.19	0.629	0.50 ( 0.50)	0.99	13789.0	11801.00
7	9348.67	68.47	0.583	0.50 ( 0.50)	0.99	16999.6	11500.00

8	9239.92	74.10	0.564	0.50 ( 0.50)	0.99	18929.0	11701.00
9	9084.82	80.30	0.542	0.50 ( 0.50)	0.99	21048.2	11000.00
10	8735.79	96.51	0.496	0.50 ( 0.50)	0.99	27902.9	12500.00
11	8532.72	102.63	0.485	0.50 ( 0.50)	0.99	30773.5	11910.00
12	7876.70	111.18	0.468	0.50 ( 0.50)	0.99	34062.2	11130.00
13	7215.92	122.43	0.448	0.50 ( 0.50)	0.99	37730.8	11620.00
14	6177.00	137.94	0.429	0.50 ( 0.50)	0.99	42268.3	12400.00
15	5349.72	148.97	0.416	0.50 ( 0.50)	0.99	44565.1	12201.00
16	4753.15	157.98	0.405	0.50 ( 0.50)	0.99	45854.2	12111.00
17	4406.45	163.46	0.399	0.50 ( 0.50)	0.99	46606.8	10700.00
18	3842.68	173.22	0.387	0.50 ( 0.50)	0.99	47781.2	12261.00
19	3379.51	182.27	0.378	0.50 ( 0.50)	0.99	48593.0	10200.00
20	2826.28	197.16	0.370	0.50 ( 0.50)	0.99	49830.3	10300.00
21	2599.87	203.76	0.366	0.50 ( 0.50)	0.99	50181.4	12010.00
22	2134.64	223.74	0.355	0.50 ( 0.50)	0.99	50510.7	12000.00
23	1197.06	290.62	0.319	0.50 ( 0.50)	0.99	51180.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	113.88	47.35	0.695	0.50 ( 0.50)	0.99	497.2	31400.00

LONGEST FLOWPATH FROM NODE 31400.00 TO NODE 12722.00 = 14614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10226.29	25.33	0.977	0.50 ( 0.50)	0.99	5217.5	40500.00
2	10155.95	30.31	0.878	0.50 ( 0.50)	0.99	6738.3	31500.00
3	10144.83	31.04	0.869	0.50 ( 0.50)	0.99	6957.4	12710.00
4	10048.27	36.33	0.802	0.50 ( 0.50)	0.99	8500.9	31600.00
5	9825.33	47.35	0.695	0.50 ( 0.50)	0.99	11631.0	31400.00
6	9728.75	51.28	0.665	0.50 ( 0.50)	0.99	12706.9	40120.00
7	9613.37	57.19	0.629	0.50 ( 0.50)	0.99	14286.2	11801.00
8	9398.62	68.47	0.583	0.50 ( 0.50)	0.99	17496.8	11500.00
9	9278.87	74.10	0.564	0.50 ( 0.50)	0.99	19426.2	11701.00
10	9111.62	80.30	0.542	0.50 ( 0.50)	0.99	21545.4	11000.00
11	8738.55	96.51	0.496	0.50 ( 0.50)	0.99	28400.1	12500.00
12	8535.42	102.63	0.485	0.50 ( 0.50)	0.99	31270.7	11910.00
13	7879.31	111.18	0.468	0.50 ( 0.50)	0.99	34559.4	11130.00
14	7218.42	122.43	0.448	0.50 ( 0.50)	0.99	38228.0	11620.00
15	6179.40	137.94	0.429	0.50 ( 0.50)	0.99	42765.5	12400.00
16	5352.04	148.97	0.416	0.50 ( 0.50)	0.99	45062.3	12201.00
17	4755.41	157.98	0.405	0.50 ( 0.50)	0.99	46351.4	12111.00
18	4408.68	163.46	0.399	0.50 ( 0.50)	0.99	47104.0	10700.00
19	3844.84	173.22	0.387	0.50 ( 0.50)	0.99	48278.4	12261.00
20	3381.61	182.27	0.378	0.50 ( 0.50)	0.99	49090.2	10200.00
21	2828.34	197.16	0.370	0.50 ( 0.50)	0.99	50327.5	10300.00
22	2601.91	203.76	0.366	0.50 ( 0.50)	0.99	50678.6	12010.00
23	2136.62	223.74	0.355	0.50 ( 0.50)	0.99	51007.9	12000.00
24	1198.84	290.62	0.319	0.50 ( 0.50)	0.99	51678.1	10100.00

TOTAL AREA(ACRES) = 51678.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 10226.29 Tc(MIN.) = 25.332  
EFFECTIVE AREA(ACRES) = 5217.51 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 51678.1



LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12722.00 = 109951.24 FEET.

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FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 255.00 DOWNSTREAM(FEET) = 252.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 624.00 CHANNEL SLOPE = 0.0046
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.961

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 62.42 0.50 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10239.24
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.11
AVERAGE FLOW DEPTH(FEET) = 16.13 TRAVEL TIME(MIN.) = 0.79
Tc(MIN.) = 26.12
SUBAREA AREA(ACRES) = 62.42 SUBAREA RUNOFF(CFS) = 25.89
EFFECTIVE AREA(ACRES) = 5279.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 51740.6 PEAK FLOW RATE(CFS) = 10226.29
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 16.13 FLOW VELOCITY(FEET/SEC.) = 13.11
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Contains 22 rows of data.

23 2136.62 224.91 0.355 0.50( 0.50) 0.99 51070.4 12000.00
24 1198.84 291.98 0.318 0.50( 0.50) 0.99 51740.6 10100.00

NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 10226.29 Tc(MIN.) = 26.12
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5279.93

\*\*\*\*\*

FLOW PROCESS FROM NODE 12722.00 TO NODE 12740.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 26.12
RAINFALL INTENSITY(INCH/HR) = 0.96
AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99
EFFECTIVE STREAM AREA(ACRES) = 5279.93
TOTAL STREAM AREA(ACRES) = 51740.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10226.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 12730.00 TO NODE 12731.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 561.54
ELEVATION DATA: UPSTREAM(FEET) = 613.29 DOWNSTREAM(FEET) = 551.75

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.823
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.432
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 6.33 0.50 1.000 0 13.82
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 5.31
TOTAL AREA(ACRES) = 6.33 PEAK FLOW RATE(CFS) = 5.31

\*\*\*\*\*

FLOW PROCESS FROM NODE 12731.00 TO NODE 12732.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 551.75 DOWNSTREAM(FEET) = 494.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 971.91 CHANNEL SLOPE = 0.0590
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 34.62 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.50  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.06  
AVERAGE FLOW DEPTH (FEET) = 1.16 TRAVEL TIME (MIN.) = 3.99  
Tc (MIN.) = 17.82  
SUBAREA AREA (ACRES) = 34.62 SUBAREA RUNOFF (CFS) = 22.18  
EFFECTIVE AREA (ACRES) = 40.95 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 40.9 PEAK FLOW RATE (CFS) = 26.23

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.39 FLOW VELOCITY (FEET/SEC.) = 4.55  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12732.00 = 1533.45 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12732.00 TO NODE 12733.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 494.40 DOWNSTREAM (FEET) = 431.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1156.41 CHANNEL SLOPE = 0.0548  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.080

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	59.52	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 41.81  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.98  
AVERAGE FLOW DEPTH (FEET) = 1.67 TRAVEL TIME (MIN.) = 3.87  
Tc (MIN.) = 21.69  
SUBAREA AREA (ACRES) = 59.52 SUBAREA RUNOFF (CFS) = 31.06  
EFFECTIVE AREA (ACRES) = 100.47 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 100.5 PEAK FLOW RATE (CFS) = 52.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.82 FLOW VELOCITY (FEET/SEC.) = 5.27  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12733.00 = 2689.86 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12733.00 TO NODE 12734.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 431.00 DOWNSTREAM (FEET) = 367.11  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1654.48 CHANNEL SLOPE = 0.0386  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.936

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	64.05	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 65.04  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.87  
AVERAGE FLOW DEPTH (FEET) = 2.11 TRAVEL TIME (MIN.) = 5.66  
Tc (MIN.) = 27.35  
SUBAREA AREA (ACRES) = 64.05 SUBAREA RUNOFF (CFS) = 25.12  
EFFECTIVE AREA (ACRES) = 164.52 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 164.5 PEAK FLOW RATE (CFS) = 64.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.10 FLOW VELOCITY (FEET/SEC.) = 4.86  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12734.00 = 4344.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 367.11 DOWNSTREAM (FEET) = 252.10  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1880.98 CHANNEL SLOPE = 0.0611  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.848

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	26.02	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 68.60  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.87  
AVERAGE FLOW DEPTH (FEET) = 1.97 TRAVEL TIME (MIN.) = 5.34  
Tc (MIN.) = 32.69  
SUBAREA AREA (ACRES) = 26.02 SUBAREA RUNOFF (CFS) = 8.15  
EFFECTIVE AREA (ACRES) = 190.54 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 190.5 PEAK FLOW RATE (CFS) = 64.52  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.93 FLOW VELOCITY (FEET/SEC.) = 5.79  
LONGEST FLOWPATH FROM NODE 12730.00 TO NODE 12740.00 = 6225.32 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12734.00 TO NODE 12740.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 32.69  
 RAINFALL INTENSITY(INCH/HR) = 0.85  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 190.54  
 TOTAL STREAM AREA(ACRES) = 190.54  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 64.52

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10226.29	26.12	0.961	0.50( 0.50)	0.99	5279.9	40500.00
1	10155.95	31.11	0.868	0.50( 0.50)	0.99	6800.8	31500.00
1	10144.83	31.83	0.859	0.50( 0.50)	0.99	7019.8	12710.00
1	10048.27	37.13	0.792	0.50( 0.50)	0.99	8563.3	31600.00
1	9825.33	48.15	0.688	0.50( 0.50)	0.99	11693.4	31400.00
1	9728.75	52.08	0.660	0.50( 0.50)	0.99	12769.3	40120.00
1	9613.37	57.99	0.624	0.50( 0.50)	0.99	14348.6	11801.00
1	9398.62	69.28	0.580	0.50( 0.50)	0.99	17559.2	11500.00
1	9278.87	74.91	0.561	0.50( 0.50)	0.99	19488.6	11701.00
1	9111.62	81.12	0.540	0.50( 0.50)	0.99	21607.9	11000.00
1	8738.55	97.34	0.495	0.50( 0.50)	0.99	28462.6	12500.00
1	8535.42	103.46	0.483	0.50( 0.50)	0.99	31333.1	11910.00
1	7879.31	112.03	0.466	0.50( 0.50)	0.99	34621.8	11130.00
1	7218.42	123.30	0.447	0.50( 0.50)	0.99	38290.4	11620.00
1	6179.40	138.84	0.428	0.50( 0.50)	0.99	42827.9	12400.00
1	5352.04	149.90	0.415	0.50( 0.50)	0.99	45124.7	12201.00
1	4755.41	158.94	0.404	0.50( 0.50)	0.99	46413.8	12111.00
1	4408.68	164.44	0.398	0.50( 0.50)	0.99	47166.5	10700.00
1	3844.84	174.24	0.386	0.50( 0.50)	0.99	48340.8	12261.00
1	3381.61	183.32	0.377	0.50( 0.50)	0.99	49152.6	10200.00
1	2828.34	198.26	0.369	0.50( 0.50)	0.99	50389.9	10300.00
1	2601.91	204.87	0.365	0.50( 0.50)	0.99	50741.0	12010.00
1	2136.62	224.91	0.355	0.50( 0.50)	0.99	51070.4	12000.00
1	1198.84	291.98	0.318	0.50( 0.50)	0.99	51740.6	10100.00
2	64.52	32.69	0.848	0.50( 0.50)	1.00	190.5	12730.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10290.81	26.12	0.961	0.50( 0.50)	0.99	5432.2	40500.00
2	10220.47	31.11	0.868	0.50( 0.50)	0.99	6982.1	31500.00
3	10209.35	31.83	0.859	0.50( 0.50)	0.99	7205.3	12710.00
4	10193.64	32.69	0.848	0.50( 0.50)	0.99	7461.4	12730.00
5	10102.43	37.13	0.792	0.50( 0.50)	0.99	8753.9	31600.00
6	9860.23	48.15	0.688	0.50( 0.50)	0.99	11884.0	31400.00
7	9758.44	52.08	0.660	0.50( 0.50)	0.99	12959.9	40120.00
8	9636.38	57.99	0.624	0.50( 0.50)	0.99	14539.2	11801.00
9	9413.45	69.28	0.580	0.50( 0.50)	0.99	17749.7	11500.00
10	9290.11	74.91	0.561	0.50( 0.50)	0.99	19679.1	11701.00
11	9118.91	81.12	0.540	0.50( 0.50)	0.99	21798.4	11000.00
12	8738.55	97.34	0.495	0.50( 0.50)	0.99	28653.1	12500.00
13	8535.42	103.46	0.483	0.50( 0.50)	0.99	31523.6	11910.00
14	7879.31	112.03	0.466	0.50( 0.50)	0.99	34812.4	11130.00

15	7218.42	123.30	0.447	0.50( 0.50)	0.99	38480.9	11620.00
16	6179.40	138.84	0.428	0.50( 0.50)	0.99	43018.5	12400.00
17	5352.04	149.90	0.415	0.50( 0.50)	0.99	45315.2	12201.00
18	4755.41	158.94	0.404	0.50( 0.50)	0.99	46604.4	12111.00
19	4408.68	164.44	0.398	0.50( 0.50)	0.99	47357.0	10700.00
20	3844.84	174.24	0.386	0.50( 0.50)	0.99	48531.3	12261.00
21	3381.61	183.32	0.377	0.50( 0.50)	0.99	49343.1	10200.00
22	2828.34	198.26	0.369	0.50( 0.50)	0.99	50580.5	10300.00
23	2601.91	204.87	0.365	0.50( 0.50)	0.99	50931.6	12010.00
24	2136.62	224.91	0.355	0.50( 0.50)	0.99	51260.9	12000.00
25	1198.84	291.98	0.318	0.50( 0.50)	0.99	51931.1	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10290.81 Tc(MIN.) = 26.12  
 EFFECTIVE AREA(ACRES) = 5432.19 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 51931.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12740.00 = 110575.24 FEET.

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FLOW PROCESS FROM NODE 12740.00 TO NODE 12741.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 252.10 DOWNSTREAM(FEET) = 247.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 401.47 CHANNEL SLOPE = 0.0127  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 10290.81  
 FLOW VELOCITY(FEET/SEC.) = 19.14 FLOW DEPTH(FEET) = 13.39  
 TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 26.47  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10290.81	26.47	0.954	0.50( 0.50)	0.99	5432.2	40500.00
2	10220.47	31.46	0.864	0.50( 0.50)	0.99	6982.1	31500.00
3	10209.35	32.18	0.855	0.50( 0.50)	0.99	7205.3	12710.00
4	10193.64	33.04	0.844	0.50( 0.50)	0.99	7461.4	12730.00
5	10102.43	37.48	0.788	0.50( 0.50)	0.99	8753.9	31600.00
6	9860.23	48.50	0.685	0.50( 0.50)	0.99	11884.0	31400.00
7	9758.44	52.44	0.658	0.50( 0.50)	0.99	12959.9	40120.00
8	9636.38	58.35	0.622	0.50( 0.50)	0.99	14539.2	11801.00
9	9413.45	69.64	0.579	0.50( 0.50)	0.99	17749.7	11500.00
10	9290.11	75.27	0.560	0.50( 0.50)	0.99	19679.1	11701.00
11	9118.91	81.48	0.538	0.50( 0.50)	0.99	21798.4	11000.00
12	8738.55	97.70	0.494	0.50( 0.50)	0.99	28653.1	12500.00
13	8535.42	103.82	0.482	0.50( 0.50)	0.99	31523.6	11910.00
14	7879.31	112.40	0.466	0.50( 0.50)	0.99	34812.4	11130.00
15	7218.42	123.68	0.447	0.50( 0.50)	0.99	38480.9	11620.00
16	6179.40	139.23	0.428	0.50( 0.50)	0.99	43018.5	12400.00
17	5352.04	150.31	0.415	0.50( 0.50)	0.99	45315.2	12201.00
18	4755.41	159.37	0.404	0.50( 0.50)	0.99	46604.4	12111.00
19	4408.68	164.87	0.397	0.50( 0.50)	0.99	47357.0	10700.00
20	3844.84	174.68	0.385	0.50( 0.50)	0.99	48531.3	12261.00
21	3381.61	183.78	0.377	0.50( 0.50)	0.99	49343.1	10200.00

22	2828.34	198.74	0.369	0.50	( 0.50)	0.99	50580.5	10300.00
23	2601.91	205.37	0.365	0.50	( 0.50)	0.99	50931.6	12010.00
24	2136.62	225.43	0.354	0.50	( 0.50)	0.99	51260.9	12000.00
25	1198.84	292.58	0.318	0.50	( 0.50)	0.99	51931.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 10290.81 Tc(MIN.) = 26.47  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 5432.19

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

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FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610313U.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.25	27.08	0.50( 0.49)	0.97	132.0	31300.00
TOTAL AREA(ACRES) =						132.0

\*\*\*\*\*

FLOW PROCESS FROM NODE 12741.00 TO NODE 12741.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10290.81	26.47	0.954	0.50( 0.50)	0.99	5432.2	40500.00
2	10220.47	31.46	0.864	0.50( 0.50)	0.99	6982.1	31500.00
3	10209.35	32.18	0.855	0.50( 0.50)	0.99	7205.3	12710.00
4	10193.64	33.04	0.844	0.50( 0.50)	0.99	7461.4	12730.00
5	10102.43	37.48	0.788	0.50( 0.50)	0.99	8753.9	31600.00
6	9860.23	48.50	0.685	0.50( 0.50)	0.99	11884.0	31400.00
7	9758.44	52.44	0.658	0.50( 0.50)	0.99	12959.9	40120.00
8	9636.38	58.35	0.622	0.50( 0.50)	0.99	14539.2	11801.00
9	9413.45	69.64	0.579	0.50( 0.50)	0.99	17749.7	11500.00
10	9290.11	75.27	0.560	0.50( 0.50)	0.99	19679.1	11701.00
11	9118.91	81.48	0.538	0.50( 0.50)	0.99	21798.4	11000.00
12	8738.55	97.70	0.494	0.50( 0.50)	0.99	28653.1	12500.00
13	8535.42	103.82	0.482	0.50( 0.50)	0.99	31523.6	11910.00
14	7879.31	112.40	0.466	0.50( 0.50)	0.99	34812.4	11130.00
15	7218.42	123.68	0.447	0.50( 0.50)	0.99	38480.9	11620.00
16	6179.40	139.23	0.428	0.50( 0.50)	0.99	43018.5	12400.00
17	5352.04	150.31	0.415	0.50( 0.50)	0.99	45315.2	12201.00
18	4755.41	159.37	0.404	0.50( 0.50)	0.99	46604.4	12111.00
19	4408.68	164.87	0.397	0.50( 0.50)	0.99	47357.0	10700.00
20	3844.84	174.68	0.385	0.50( 0.50)	0.99	48531.3	12261.00
21	3381.61	183.78	0.377	0.50( 0.50)	0.99	49343.1	10200.00
22	2828.34	198.74	0.369	0.50( 0.50)	0.99	50580.5	10300.00

23	2601.91	205.37	0.365	0.50	( 0.50)	0.99	50931.6	12010.00
24	2136.62	225.43	0.354	0.50	( 0.50)	0.99	51260.9	12000.00
25	1198.84	292.58	0.318	0.50	( 0.50)	0.99	51931.1	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	54.25	27.08	0.942	0.50( 0.49)	0.97	132.0	31300.00
LONGEST FLOWPATH FROM NODE 31300.00 TO NODE 12741.00 = 5775.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	26.47	0.954	0.50( 0.50)	0.99	5561.2	40500.00
2	10336.48	27.08	0.942	0.50( 0.50)	0.99	5753.4	31300.00
3	10265.44	31.46	0.864	0.50( 0.50)	0.99	7114.0	31500.00
4	10253.24	32.18	0.855	0.50( 0.50)	0.99	7337.3	12710.00
5	10236.23	33.04	0.844	0.50( 0.50)	0.99	7593.4	12730.00
6	10138.36	37.48	0.788	0.50( 0.50)	0.99	8885.8	31600.00
7	9883.96	48.50	0.685	0.50( 0.50)	0.99	12015.9	31400.00
8	9778.92	52.44	0.658	0.50( 0.50)	0.99	13091.8	40120.00
9	9652.56	58.35	0.622	0.50( 0.50)	0.99	14671.2	11801.00
10	9424.49	69.64	0.579	0.50( 0.50)	0.99	17881.7	11500.00
11	9298.84	75.27	0.560	0.50( 0.50)	0.99	19811.1	11701.00
12	9125.11	81.48	0.538	0.50( 0.50)	0.99	21930.4	11000.00
13	8740.19	97.70	0.494	0.50( 0.50)	0.99	28785.1	12500.00
14	8537.02	103.82	0.482	0.50( 0.50)	0.99	31655.6	11910.00
15	7880.85	112.40	0.466	0.50( 0.50)	0.99	34944.3	11130.00
16	7219.90	123.68	0.447	0.50( 0.50)	0.99	38612.9	11620.00
17	6180.81	139.23	0.428	0.50( 0.50)	0.99	43150.5	12400.00
18	5353.42	150.31	0.415	0.50( 0.50)	0.99	45447.2	12201.00
19	4756.75	159.37	0.404	0.50( 0.50)	0.99	46736.3	12111.00
20	4409.99	164.87	0.397	0.50( 0.50)	0.99	47489.0	10700.00
21	3846.12	174.68	0.385	0.50( 0.50)	0.99	48663.3	12261.00
22	3382.86	183.78	0.377	0.50( 0.50)	0.99	49475.1	10200.00
23	2829.56	198.74	0.369	0.50( 0.50)	0.99	50712.4	10300.00
24	2603.12	205.37	0.365	0.50( 0.50)	0.99	51063.5	12010.00
25	2137.79	225.43	0.354	0.50( 0.50)	0.99	51392.9	12000.00
26	1199.89	292.58	0.318	0.50( 0.50)	0.99	52063.1	10100.00
TOTAL AREA(ACRES) =						52063.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10345.07 Tc(MIN.) = 26.475  
 EFFECTIVE AREA(ACRES) = 5561.20 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 52063.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12741.00 = 110976.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12741.00 TO NODE 12800.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 247.00 DOWNSTREAM(FEET) = 240.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 819.00 CHANNEL SLOPE = 0.0085  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.937

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	17.31	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 10348.47

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 16.53

AVERAGE FLOW DEPTH (FEET) = 14.45 TRAVEL TIME (MIN.) = 0.83

Tc (MIN.) = 27.30

SUBAREA AREA (ACRES) = 17.31 SUBAREA RUNOFF (CFS) = 6.81

EFFECTIVE AREA (ACRES) = 5578.51 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99

TOTAL AREA (ACRES) = 52080.4 PEAK FLOW RATE (CFS) = 10345.07

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 14.45 FLOW VELOCITY (FEET/SEC.) = 16.52

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	27.30	0.937	0.50 ( 0.50)	0.99	5578.5	40500.00
2	10336.48	27.91	0.925	0.50 ( 0.50)	0.99	5770.7	31300.00
3	10265.44	32.29	0.853	0.50 ( 0.50)	0.99	7131.3	31500.00
4	10253.24	33.01	0.844	0.50 ( 0.50)	0.99	7354.6	12710.00
5	10236.23	33.87	0.833	0.50 ( 0.50)	0.99	7610.7	12730.00
6	10138.36	38.31	0.777	0.50 ( 0.50)	0.99	8903.2	31600.00
7	9883.96	49.34	0.678	0.50 ( 0.50)	0.99	12033.2	31400.00
8	9778.92	53.28	0.653	0.50 ( 0.50)	0.99	13109.1	40120.00
9	9652.56	59.19	0.617	0.50 ( 0.50)	0.99	14688.5	11801.00
10	9424.49	70.48	0.576	0.50 ( 0.50)	0.99	17899.0	11500.00
11	9298.84	76.12	0.557	0.50 ( 0.50)	0.99	19828.4	11701.00
12	9125.11	82.33	0.535	0.50 ( 0.50)	0.99	21947.7	11000.00
13	8740.19	98.56	0.492	0.50 ( 0.50)	0.99	28802.4	12500.00
14	8537.02	104.69	0.481	0.50 ( 0.50)	0.99	31672.9	11910.00
15	7880.85	113.28	0.464	0.50 ( 0.50)	0.99	34961.6	11130.00
16	7219.90	124.59	0.445	0.50 ( 0.50)	0.99	38630.2	11620.00
17	6180.81	140.17	0.427	0.50 ( 0.50)	0.99	43167.8	12400.00
18	5353.42	151.29	0.413	0.50 ( 0.50)	0.99	45464.5	12201.00
19	4756.75	160.37	0.403	0.50 ( 0.50)	0.99	46753.7	12111.00
20	4409.99	165.90	0.396	0.50 ( 0.50)	0.99	47506.3	10700.00
21	3846.12	175.74	0.384	0.50 ( 0.50)	0.99	48680.6	12261.00
22	3382.86	184.87	0.376	0.50 ( 0.50)	0.99	49492.4	10200.00
23	2829.56	199.88	0.368	0.50 ( 0.50)	0.99	50729.8	10300.00
24	2603.12	206.53	0.365	0.50 ( 0.50)	0.99	51080.9	12010.00
25	2137.79	226.66	0.354	0.50 ( 0.50)	0.99	51410.2	12000.00
26	1199.89	293.99	0.317	0.50 ( 0.50)	0.99	52080.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 10345.07 Tc (MIN.) = 27.30

AREA-AVERAGED Fm (INCH/HR) = 0.50 AREA-AVERAGED Fp (INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 5578.51

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 52080.4 TC (MIN.) = 27.30

EFFECTIVE AREA (ACRES) = 5578.51 AREA-AVERAGED Fm (INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.991

PEAK FLOW RATE (CFS) = 10345.07

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	27.30	0.937	0.50 ( 0.50)	0.99	5578.5	40500.00
2	10336.48	27.91	0.925	0.50 ( 0.50)	0.99	5770.7	31300.00
3	10265.44	32.29	0.853	0.50 ( 0.50)	0.99	7131.3	31500.00
4	10253.24	33.01	0.844	0.50 ( 0.50)	0.99	7354.6	12710.00
5	10236.23	33.87	0.833	0.50 ( 0.50)	0.99	7610.7	12730.00
6	10138.36	38.31	0.777	0.50 ( 0.50)	0.99	8903.2	31600.00
7	9883.96	49.34	0.678	0.50 ( 0.50)	0.99	12033.2	31400.00
8	9778.92	53.28	0.653	0.50 ( 0.50)	0.99	13109.1	40120.00
9	9652.56	59.19	0.617	0.50 ( 0.50)	0.99	14688.5	11801.00
10	9424.49	70.48	0.576	0.50 ( 0.50)	0.99	17899.0	11500.00
11	9298.84	76.12	0.557	0.50 ( 0.50)	0.99	19828.4	11701.00
12	9125.11	82.33	0.535	0.50 ( 0.50)	0.99	21947.7	11000.00
13	8740.19	98.56	0.492	0.50 ( 0.50)	0.99	28802.4	12500.00
14	8537.02	104.69	0.481	0.50 ( 0.50)	0.99	31672.9	11910.00
15	7880.85	113.28	0.464	0.50 ( 0.50)	0.99	34961.6	11130.00
16	7219.90	124.59	0.445	0.50 ( 0.50)	0.99	38630.2	11620.00
17	6180.81	140.17	0.427	0.50 ( 0.50)	0.99	43167.8	12400.00
18	5353.42	151.29	0.413	0.50 ( 0.50)	0.99	45464.5	12201.00
19	4756.75	160.37	0.403	0.50 ( 0.50)	0.99	46753.7	12111.00
20	4409.99	165.90	0.396	0.50 ( 0.50)	0.99	47506.3	10700.00
21	3846.12	175.74	0.384	0.50 ( 0.50)	0.99	48680.6	12261.00
22	3382.86	184.87	0.376	0.50 ( 0.50)	0.99	49492.4	10200.00
23	2829.56	199.88	0.368	0.50 ( 0.50)	0.99	50729.8	10300.00
24	2603.12	206.53	0.365	0.50 ( 0.50)	0.99	51080.9	12010.00
25	2137.79	226.66	0.354	0.50 ( 0.50)	0.99	51410.2	12000.00
26	1199.89	293.99	0.317	0.50 ( 0.50)	0.99	52080.4	10100.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

-----  
FILE NAME: S28.DAT  
TIME/DATE OF STUDY: 08:16 09/12/2017  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14  
1) 5.00; 2.712  
2) 10.00; 1.799  
3) 15.00; 1.319  
4) 20.00; 1.129  
5) 25.00; 0.984  
6) 30.00; 0.882  
7) 40.00; 0.756  
8) 50.00; 0.673  
9) 60.00; 0.612  
10) 90.00; 0.509  
11) 120.00; 0.451  
12) 180.00; 0.379  
13) 360.00; 0.281  
14) 1200.00; 0.123

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*  
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING  
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR  
NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n)  
=== =====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610501U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.50 ( 0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.50 ( 0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.50 ( 0.49)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.50 ( 0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.50 ( 0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.50 ( 0.49)	0.98	1063.4	50100.00
TOTAL AREA (ACRES) =		1063.4				

-----  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1063.4 TC (MIN.) = 31.71  
EFFECTIVE AREA (ACRES) = 1027.53 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.981  
PEAK FLOW RATE (CFS) = 366.96

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.860	0.50 ( 0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.837	0.50 ( 0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.796	0.50 ( 0.49)	0.98	1063.4	50100.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International
5 Hutton Centre Drive, Suite 500
Santa Ana, CA
92707

FILE NAME: S29.DAT
TIME/DATE OF STUDY: 08:27 07/16/2018

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.701
2) 10.00; 1.794
3) 15.00; 1.317
4) 20.00; 1.127
5) 25.00; 0.983
6) 30.00; 0.881
7) 40.00; 0.755
8) 50.00; 0.672
9) 60.00; 0.611
10) 90.00; 0.508
11) 120.00; 0.449
12) 180.00; 0.377
13) 360.00; 0.279
14) 1200.00; 0.123

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / OUT- / SIDE / WAY, PARK- / SIDE / WAY, HEIGHT (FT), CURB GUTTER-GEOMETRIES: WIDTH (FT), LIP (FT), HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*
FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S27.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-20.

TOTAL AREA (ACRES) = 52080.4

\*\*\*\*\*
FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S28.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-3.

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*
FLOW PROCESS FROM NODE 12800.00 TO NODE 12800.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

Table with columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp (Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-3.

TOTAL AREA (ACRES) = 1063.4

\*\*\*\*\*

FLOW PROCESS FROM NODE 12740.00 TO NODE 12800.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	366.96	31.71	0.859	0.50( 0.49)	0.98	1027.5	50120.00
2	344.28	33.54	0.836	0.50( 0.49)	0.98	1045.7	50150.00
3	313.44	36.83	0.795	0.50( 0.49)	0.98	1063.4	50100.00

LONGEST FLOWPATH FROM NODE 50150.00 TO NODE 12800.00 = 11349.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10345.07	27.30	0.936	0.50( 0.50)	0.99	5578.5	40500.00
2	10138.36	38.31	0.776	0.50( 0.50)	0.99	8903.2	31600.00
3	9883.96	49.34	0.677	0.50( 0.50)	0.99	12033.2	31400.00
4	9652.56	59.19	0.616	0.50( 0.50)	0.99	14688.5	11801.00
5	9424.49	70.48	0.575	0.50( 0.50)	0.99	17899.0	11500.00
6	9125.11	82.33	0.534	0.50( 0.50)	0.99	21947.7	11000.00
7	8740.19	98.56	0.491	0.50( 0.50)	0.99	28802.4	12500.00
8	8537.02	104.69	0.479	0.50( 0.50)	0.99	31672.9	11910.00
9	7880.85	113.28	0.462	0.50( 0.50)	0.99	34961.6	11130.00
10	7219.90	124.59	0.443	0.50( 0.50)	0.99	38630.2	11620.00
11	6180.81	140.17	0.425	0.50( 0.50)	0.99	43167.8	12400.00
12	5353.42	151.29	0.411	0.50( 0.50)	0.99	45464.5	12201.00
13	4756.75	160.37	0.401	0.50( 0.50)	0.99	46753.7	12111.00
14	4409.99	165.90	0.394	0.50( 0.50)	0.99	47506.3	10700.00
15	3846.12	175.74	0.382	0.50( 0.50)	0.99	48680.6	12261.00
16	3382.86	184.87	0.374	0.50( 0.50)	0.99	49492.4	10200.00
17	2829.56	199.88	0.366	0.50( 0.50)	0.99	50729.8	10300.00
18	2603.12	206.53	0.363	0.50( 0.50)	0.99	51080.9	12010.00
19	2137.79	226.66	0.352	0.50( 0.50)	0.99	51410.2	12000.00
20	1199.89	293.99	0.315	0.50( 0.50)	0.99	52080.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10712.02	27.30	0.936	0.50( 0.49)	0.99	6463.1	40500.00
2	10629.16	31.71	0.859	0.50( 0.50)	0.99	7938.8	50120.00
3	10572.26	33.54	0.836	0.50( 0.50)	0.99	8507.5	50150.00
4	10479.60	36.83	0.795	0.50( 0.50)	0.99	9519.4	50100.00
5	10432.56	38.31	0.776	0.50( 0.50)	0.99	9966.5	31600.00
6	10076.23	49.34	0.677	0.50( 0.50)	0.99	13096.6	31400.00
7	9781.34	59.19	0.616	0.50( 0.50)	0.99	15751.9	11801.00
8	9511.05	70.48	0.575	0.50( 0.50)	0.99	18962.4	11500.00
9	9169.73	82.33	0.534	0.50( 0.50)	0.99	23011.1	11000.00
10	8749.44	98.56	0.491	0.50( 0.50)	0.99	29865.8	12500.00
11	8546.04	104.69	0.479	0.50( 0.50)	0.99	32736.3	11910.00
12	7889.55	113.28	0.462	0.50( 0.50)	0.99	36025.0	11130.00
13	7228.25	124.59	0.443	0.50( 0.50)	0.99	39693.6	11620.00
14	6188.81	140.17	0.425	0.50( 0.50)	0.99	44231.2	12400.00
15	5361.16	151.29	0.411	0.50( 0.50)	0.99	46527.9	12201.00

16	4764.29	160.37	0.401	0.50( 0.50)	0.99	47817.0	12111.00
17	4417.41	165.90	0.394	0.50( 0.50)	0.99	48569.7	10700.00
18	3853.31	175.74	0.382	0.50( 0.50)	0.99	49744.0	12261.00
19	3389.91	184.87	0.374	0.50( 0.50)	0.99	50555.8	10200.00
20	2836.46	199.88	0.366	0.50( 0.50)	0.99	51793.1	10300.00
21	2609.94	206.53	0.363	0.50( 0.50)	0.99	52144.2	12010.00
22	2144.41	226.66	0.352	0.50( 0.50)	0.99	52473.6	12000.00
23	1205.82	293.99	0.315	0.50( 0.50)	0.99	53143.8	10100.00

TOTAL AREA(ACRES) = 53143.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10712.02 Tc(MIN.) = 27.300  
EFFECTIVE AREA(ACRES) = 6463.07 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 53143.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12800.00 = 111795.71 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12800.00 TO NODE 12801.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 234.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1110.96 CHANNEL SLOPE = 0.0054  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10712.02  
FLOW VELOCITY(FEET/SEC.) = 14.04 FLOW DEPTH(FEET) = 15.95  
TRAVEL TIME(MIN.) = 1.32 Tc(MIN.) = 28.62  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

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FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610502U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.02	11.37	0.50( 0.47)	0.94	28.9	50200.00

TOTAL AREA(ACRES) = 28.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 12801.00 TO NODE 12801.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	10712.02	28.62	0.909	0.50 ( 0.49)	0.99	6463.1 40500.00
2	10629.16	33.03	0.843	0.50 ( 0.50)	0.99	7938.8 50120.00
3	10572.26	34.86	0.820	0.50 ( 0.50)	0.99	8507.5 50150.00
4	10479.60	38.15	0.778	0.50 ( 0.50)	0.99	9519.4 50100.00
5	10432.56	39.64	0.760	0.50 ( 0.50)	0.99	9966.5 31600.00
6	10076.23	50.68	0.668	0.50 ( 0.50)	0.99	13096.6 31400.00
7	9781.34	60.54	0.609	0.50 ( 0.50)	0.99	15751.9 11801.00
8	9511.05	71.84	0.570	0.50 ( 0.50)	0.99	18962.4 11500.00
9	9169.73	83.70	0.530	0.50 ( 0.50)	0.99	23011.1 11000.00
10	8749.44	99.95	0.488	0.50 ( 0.50)	0.99	29865.8 12500.00
11	8546.04	106.09	0.476	0.50 ( 0.50)	0.99	32736.3 11910.00
12	7889.55	114.71	0.459	0.50 ( 0.50)	0.99	36025.0 11130.00
13	7228.25	126.04	0.442	0.50 ( 0.50)	0.99	39693.6 11620.00
14	6188.81	141.69	0.423	0.50 ( 0.50)	0.99	44231.2 12400.00
15	5361.16	152.86	0.410	0.50 ( 0.50)	0.99	46527.9 12201.00
16	4764.29	161.99	0.399	0.50 ( 0.50)	0.99	47817.0 12111.00
17	4417.41	167.54	0.392	0.50 ( 0.50)	0.99	48569.7 10700.00
18	3853.31	177.45	0.380	0.50 ( 0.50)	0.99	49744.0 12261.00
19	3389.91	186.63	0.373	0.50 ( 0.50)	0.99	50555.8 10200.00
20	2836.46	201.72	0.365	0.50 ( 0.50)	0.99	51793.1 10300.00
21	2609.94	208.41	0.362	0.50 ( 0.50)	0.99	52144.2 12010.00
22	2144.41	228.63	0.351	0.50 ( 0.50)	0.99	52473.6 12000.00
23	1205.82	296.27	0.314	0.50 ( 0.50)	0.99	53143.8 10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.02	11.37	1.663	0.50 ( 0.47)	0.94	28.9	50200.00

LONGEST FLOWPATH FROM NODE 50200.00 TO NODE 12801.00 = 1426.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10743.05	11.37	1.663	0.50 ( 0.49)	0.99	2596.7	50200.00
2	10723.47	28.62	0.909	0.50 ( 0.49)	0.99	6491.9	40500.00
3	10638.88	33.03	0.843	0.50 ( 0.49)	0.99	7967.7	50120.00
4	10581.39	34.86	0.820	0.50 ( 0.50)	0.99	8536.3	50150.00
5	10487.65	38.15	0.778	0.50 ( 0.50)	0.99	9548.2	50100.00
6	10440.13	39.64	0.760	0.50 ( 0.50)	0.99	9995.4	31600.00
7	10081.41	50.68	0.668	0.50 ( 0.50)	0.99	13125.5	31400.00
8	9785.00	60.54	0.609	0.50 ( 0.50)	0.99	15780.7	11801.00
9	9513.70	71.84	0.570	0.50 ( 0.50)	0.99	18991.3	11500.00
10	9171.32	83.70	0.530	0.50 ( 0.50)	0.99	23039.9	11000.00
11	8750.25	99.95	0.488	0.50 ( 0.50)	0.99	29894.6	12500.00
12	8546.83	106.09	0.476	0.50 ( 0.50)	0.99	32765.2	11910.00
13	7890.31	114.71	0.459	0.50 ( 0.50)	0.99	36053.9	11130.00
14	7228.98	126.04	0.442	0.50 ( 0.50)	0.99	39722.5	11620.00
15	6189.51	141.69	0.423	0.50 ( 0.50)	0.99	44260.0	12400.00
16	5361.84	152.86	0.410	0.50 ( 0.50)	0.99	46556.8	12201.00
17	4764.95	161.99	0.399	0.50 ( 0.50)	0.99	47845.9	12111.00
18	4418.06	167.54	0.392	0.50 ( 0.50)	0.99	48598.5	10700.00
19	3853.94	177.45	0.380	0.50 ( 0.50)	0.99	49772.9	12261.00
20	3390.53	186.63	0.373	0.50 ( 0.50)	0.99	50584.7	10200.00
21	2837.06	201.72	0.365	0.50 ( 0.50)	0.99	51822.0	10300.00
22	2610.54	208.41	0.362	0.50 ( 0.50)	0.99	52173.1	12010.00
23	2144.99	228.63	0.351	0.50 ( 0.50)	0.99	52502.4	12000.00

24 1206.34 296.27 0.314 0.50 ( 0.50) 0.99 53172.6 10100.00  
TOTAL AREA (ACRES) = 53172.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 10743.05 Tc (MIN.) = 11.371  
EFFECTIVE AREA (ACRES) = 2596.72 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 53172.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12801.00 = 112906.67 FEET.

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FLOW PROCESS FROM NODE 12801.00 TO NODE 12901.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 234.00 DOWNSTREAM (FEET) = 216.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2009.32 CHANNEL SLOPE = 0.0090  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 10743.05  
FLOW VELOCITY (FEET/SEC.) = 16.98 FLOW DEPTH (FEET) = 14.52  
TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 13.34  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

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FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610312U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	104.26	38.12	0.50 ( 0.48)	0.96	385.8	31200.00

TOTAL AREA (ACRES) = 385.8

\*\*\*\*\*

FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<

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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10743.05	13.34	1.475	0.50 ( 0.49)	0.99	2596.7	50200.00
2	10723.47	30.59	0.874	0.50 ( 0.49)	0.99	6491.9	40500.00
3	10638.88	35.01	0.818	0.50 ( 0.49)	0.99	7967.7	50120.00
4	10581.39	36.84	0.795	0.50 ( 0.50)	0.99	8536.3	50150.00
5	10487.65	40.14	0.754	0.50 ( 0.50)	0.99	9548.2	50100.00
6	10440.13	41.62	0.742	0.50 ( 0.50)	0.99	9995.4	31600.00
7	10081.41	52.68	0.656	0.50 ( 0.50)	0.99	13125.5	31400.00
8	9785.00	62.56	0.602	0.50 ( 0.50)	0.99	15780.7	11801.00
9	9513.70	73.88	0.563	0.50 ( 0.50)	0.99	18991.3	11500.00
10	9171.32	85.75	0.523	0.50 ( 0.50)	0.99	23039.9	11000.00
11	8750.25	102.03	0.484	0.50 ( 0.50)	0.99	29894.6	12500.00
12	8546.83	108.17	0.472	0.50 ( 0.50)	0.99	32765.2	11910.00

13	7890.31	116.84	0.455	0.50( 0.50)	0.99	36053.9	11130.00
14	7228.98	128.22	0.439	0.50( 0.50)	0.99	39722.5	11620.00
15	6189.51	143.95	0.420	0.50( 0.50)	0.99	44260.0	12400.00
16	5361.84	155.20	0.407	0.50( 0.50)	0.99	46556.8	12201.00
17	4764.95	164.40	0.396	0.50( 0.50)	0.99	47845.9	12111.00
18	4418.06	170.01	0.389	0.50( 0.50)	0.99	48598.5	10700.00
19	3853.94	180.00	0.377	0.50( 0.50)	0.99	49772.9	12261.00
20	3390.53	189.26	0.372	0.50( 0.50)	0.99	50584.7	10200.00
21	2837.06	204.47	0.364	0.50( 0.50)	0.99	51822.0	10300.00
22	2610.54	211.22	0.360	0.50( 0.50)	0.99	52173.1	12010.00
23	2144.99	231.58	0.349	0.50( 0.50)	0.99	52502.4	12000.00
24	1206.34	299.68	0.312	0.50( 0.50)	0.99	53172.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	104.26	38.12	0.779	0.50( 0.48)	0.96	385.8	31200.00

LONGEST FLOWPATH FROM NODE 31200.00 TO NODE 12901.00 = 11169.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10847.31	13.34	1.475	0.50( 0.49)	0.99	2731.8	50200.00
2	10827.73	30.59	0.874	0.50( 0.49)	0.99	6801.6	40500.00
3	10743.15	35.01	0.818	0.50( 0.49)	0.99	8322.0	50120.00
4	10685.65	36.84	0.795	0.50( 0.49)	0.99	8909.2	50150.00
5	10649.27	38.12	0.779	0.50( 0.49)	0.99	9314.9	31200.00
6	10583.31	40.14	0.754	0.50( 0.49)	0.99	9934.0	50100.00
7	10531.51	41.62	0.742	0.50( 0.49)	0.99	10381.2	31600.00
8	10143.04	52.68	0.656	0.50( 0.50)	0.99	13511.3	31400.00
9	9828.11	62.56	0.602	0.50( 0.50)	0.99	16166.5	11801.00
10	9543.34	73.88	0.563	0.50( 0.50)	0.99	19377.0	11500.00
11	9186.83	85.75	0.523	0.50( 0.50)	0.99	23425.7	11000.00
12	8757.76	102.03	0.484	0.50( 0.50)	0.99	30280.4	12500.00
13	8554.16	108.17	0.472	0.50( 0.50)	0.99	33150.9	11910.00
14	7897.38	116.84	0.455	0.50( 0.50)	0.99	36439.7	11130.00
15	7235.79	128.22	0.439	0.50( 0.50)	0.99	40108.2	11620.00
16	6196.03	143.95	0.420	0.50( 0.50)	0.99	44645.8	12400.00
17	5368.15	155.20	0.407	0.50( 0.50)	0.99	46942.5	12201.00
18	4771.09	164.40	0.396	0.50( 0.50)	0.99	48231.7	12111.00
19	4424.09	170.01	0.389	0.50( 0.50)	0.99	48984.3	10700.00
20	3859.79	180.00	0.377	0.50( 0.50)	0.99	50158.7	12261.00
21	3396.30	189.26	0.372	0.50( 0.50)	0.99	50970.4	10200.00
22	2842.70	204.47	0.364	0.50( 0.50)	0.99	52207.8	10300.00
23	2616.13	211.22	0.360	0.50( 0.50)	0.99	52558.9	12010.00
24	2150.41	231.58	0.349	0.50( 0.50)	0.99	52888.2	12000.00
25	1211.18	299.68	0.312	0.50( 0.50)	0.99	53558.4	10100.00

TOTAL AREA (ACRES) = 53558.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10847.31 Tc(MIN.) = 13.343  
EFFECTIVE AREA(ACRES) = 2731.75 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 53558.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 15.1  
-----  
>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610503U.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.23	28.45	0.913	0.50( 0.50)	0.99	366.1	50300.00

TOTAL AREA(ACRES) = 366.1

\*\*\*\*\*  
FLOW PROCESS FROM NODE 12901.00 TO NODE 12901.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10847.31	13.34	1.475	0.50( 0.49)	0.99	2731.8	50200.00
2	10827.73	30.59	0.874	0.50( 0.49)	0.99	6801.6	40500.00
3	10743.15	35.01	0.818	0.50( 0.49)	0.99	8322.0	50120.00
4	10685.65	36.84	0.795	0.50( 0.49)	0.99	8909.2	50150.00
5	10649.27	38.12	0.779	0.50( 0.49)	0.99	9314.9	31200.00
6	10583.31	40.14	0.754	0.50( 0.49)	0.99	9934.0	50100.00
7	10531.51	41.62	0.742	0.50( 0.49)	0.99	10381.2	31600.00
8	10143.04	52.68	0.656	0.50( 0.50)	0.99	13511.3	31400.00
9	9828.11	62.56	0.602	0.50( 0.50)	0.99	16166.5	11801.00
10	9543.34	73.88	0.563	0.50( 0.50)	0.99	19377.0	11500.00
11	9186.83	85.75	0.523	0.50( 0.50)	0.99	23425.7	11000.00
12	8757.76	102.03	0.484	0.50( 0.50)	0.99	30280.4	12500.00
13	8554.16	108.17	0.472	0.50( 0.50)	0.99	33150.9	11910.00
14	7897.38	116.84	0.455	0.50( 0.50)	0.99	36439.7	11130.00
15	7235.79	128.22	0.439	0.50( 0.50)	0.99	40108.2	11620.00
16	6196.03	143.95	0.420	0.50( 0.50)	0.99	44645.8	12400.00
17	5368.15	155.20	0.407	0.50( 0.50)	0.99	46942.5	12201.00
18	4771.09	164.40	0.396	0.50( 0.50)	0.99	48231.7	12111.00
19	4424.09	170.01	0.389	0.50( 0.50)	0.99	48984.3	10700.00
20	3859.79	180.00	0.377	0.50( 0.50)	0.99	50158.7	12261.00
21	3396.30	189.26	0.372	0.50( 0.50)	0.99	50970.4	10200.00
22	2842.70	204.47	0.364	0.50( 0.50)	0.99	52207.8	10300.00
23	2616.13	211.22	0.360	0.50( 0.50)	0.99	52558.9	12010.00
24	2150.41	231.58	0.349	0.50( 0.50)	0.99	52888.2	12000.00
25	1211.18	299.68	0.312	0.50( 0.50)	0.99	53558.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	139.23	28.45	0.913	0.50( 0.50)	0.99	366.1	50300.00

LONGEST FLOWPATH FROM NODE 50300.00 TO NODE 12901.00 = 8614.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10986.54	13.34	1.475	0.50 ( 0.49)	0.99	2903.5	50200.00
2	10969.40	28.45	0.913	0.50 ( 0.49)	0.99	6660.9	50300.00
3	10953.86	30.59	0.874	0.50 ( 0.49)	0.99	7167.7	40500.00
4	10850.66	35.01	0.818	0.50 ( 0.49)	0.99	8688.1	50120.00
5	10785.47	36.84	0.795	0.50 ( 0.49)	0.99	9275.3	50150.00
6	10743.69	38.12	0.779	0.50 ( 0.49)	0.99	9681.0	31200.00
7	10669.42	40.14	0.754	0.50 ( 0.49)	0.99	10300.1	50100.00
8	10613.51	41.62	0.742	0.50 ( 0.49)	0.99	10747.3	31600.00
9	10196.33	52.68	0.656	0.50 ( 0.50)	0.99	13877.4	31400.00
10	9863.54	62.56	0.602	0.50 ( 0.50)	0.99	16532.6	11801.00
11	9565.78	73.88	0.563	0.50 ( 0.50)	0.99	19743.2	11500.00
12	9195.64	85.75	0.523	0.50 ( 0.50)	0.99	23791.8	11000.00
13	8759.04	102.03	0.484	0.50 ( 0.50)	0.99	30646.5	12500.00
14	8555.41	108.17	0.472	0.50 ( 0.50)	0.99	33517.0	11910.00
15	7898.58	116.84	0.455	0.50 ( 0.50)	0.99	36805.8	11130.00
16	7236.96	128.22	0.439	0.50 ( 0.50)	0.99	40474.4	11620.00
17	6197.15	143.95	0.420	0.50 ( 0.50)	0.99	45011.9	12400.00
18	5369.23	155.20	0.407	0.50 ( 0.50)	0.99	47308.6	12201.00
19	4772.14	164.40	0.396	0.50 ( 0.50)	0.99	48597.8	12111.00
20	4425.12	170.01	0.389	0.50 ( 0.50)	0.99	49350.4	10700.00
21	3860.79	180.00	0.377	0.50 ( 0.50)	0.99	50524.8	12261.00
22	3397.28	189.26	0.372	0.50 ( 0.50)	0.99	51336.5	10200.00
23	2843.67	204.47	0.364	0.50 ( 0.50)	0.99	52573.9	10300.00
24	2617.08	211.22	0.360	0.50 ( 0.50)	0.99	52925.0	12010.00
25	2151.33	231.58	0.349	0.50 ( 0.50)	0.99	53254.3	12000.00
26	1212.00	299.68	0.312	0.50 ( 0.50)	0.99	53924.5	10100.00

TOTAL AREA (ACRES) = 53924.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10986.54 Tc(MIN.) = 13.343  
 EFFECTIVE AREA(ACRES) = 2903.50 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 53924.5  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12901.00 = 114915.99 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12901.00 TO NODE 12902.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 216.00 DOWNSTREAM(FEET) = 215.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 122.04 CHANNEL SLOPE = 0.0082  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 10986.54  
 FLOW VELOCITY(FEET/SEC.) = 16.51 FLOW DEPTH(FEET) = 14.90  
 TRAVEL TIME(MIN.) = 0.12 Tc(MIN.) = 13.47  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12902.00 = 115038.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12902.00 TO NODE 12902.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 215.00 DOWNSTREAM(FEET) = 214.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 895.53 CHANNEL SLOPE = 0.0011  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
 CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
 ALLOWABLE DEPTH).  
 AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
 ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 10986.54  
 FLOW VELOCITY(FEET/SEC.) = 9.16 FLOW DEPTH(FEET) = 20.00  
 TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 15.10  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12902.00 TO NODE 12903.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610504U.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	44.57	18.38	0.50 ( 0.49)	0.97	70.7	50400.00

TOTAL AREA (ACRES) = 70.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12903.00 TO NODE 12903.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10986.54	15.10	1.313	0.50 ( 0.49)	0.99	2903.5	50200.00
2	10969.40	30.20	0.878	0.50 ( 0.49)	0.99	6660.9	50300.00
3	10953.86	32.35	0.851	0.50 ( 0.49)	0.99	7167.7	40500.00
4	10850.66	36.79	0.795	0.50 ( 0.49)	0.99	8688.1	50120.00
5	10785.47	38.62	0.772	0.50 ( 0.49)	0.99	9275.3	50150.00
6	10743.69	39.91	0.756	0.50 ( 0.49)	0.99	9681.0	31200.00
7	10669.42	41.94	0.739	0.50 ( 0.49)	0.99	10300.1	50100.00

8	10613.51	43.43	0.726	0.50	( 0.49)	0.99	10747.3	31600.00
9	10196.33	54.56	0.644	0.50	( 0.50)	0.99	13877.4	31400.00
10	9863.54	64.50	0.596	0.50	( 0.50)	0.99	16532.6	11801.00
11	9565.78	75.88	0.556	0.50	( 0.50)	0.99	19743.2	11500.00
12	9195.64	87.83	0.515	0.50	( 0.50)	0.99	23791.8	11000.00
13	8759.04	104.18	0.480	0.50	( 0.50)	0.99	30646.5	12500.00
14	8555.41	110.34	0.468	0.50	( 0.50)	0.99	33517.0	11910.00
15	7898.58	119.05	0.451	0.50	( 0.50)	0.99	36805.8	11130.00
16	7236.96	130.48	0.436	0.50	( 0.50)	0.99	40474.4	11620.00
17	6197.15	146.30	0.417	0.50	( 0.50)	0.99	45011.9	12400.00
18	5369.23	157.63	0.404	0.50	( 0.50)	0.99	47308.6	12201.00
19	4772.14	166.91	0.393	0.50	( 0.50)	0.99	48597.8	12111.00
20	4425.12	172.56	0.386	0.50	( 0.50)	0.99	49350.4	10700.00
21	3860.79	182.64	0.376	0.50	( 0.50)	0.99	50524.8	12261.00
22	3397.28	191.99	0.370	0.50	( 0.50)	0.99	51336.5	10200.00
23	2843.67	207.32	0.362	0.50	( 0.50)	0.99	52573.9	10300.00
24	2617.08	214.13	0.358	0.50	( 0.50)	0.99	52925.0	12010.00
25	2151.33	234.64	0.347	0.50	( 0.50)	0.99	53254.3	12000.00
26	1212.00	303.21	0.310	0.50	( 0.50)	0.99	53924.5	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	44.57	18.38	1.188	0.50 ( 0.49)	0.97	70.7	50400.00

LONGEST FLOWPATH FROM NODE 50400.00 TO NODE 12903.00 = 3607.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11029.66	15.10	1.313	0.50 ( 0.49)	0.99	2961.5	50200.00
2	11027.38	18.38	1.188	0.50 ( 0.49)	0.99	3791.3	50400.00
3	10994.26	30.20	0.878	0.50 ( 0.49)	0.99	6731.5	50300.00
4	10976.99	32.35	0.851	0.50 ( 0.49)	0.99	7238.3	40500.00
5	10870.24	36.79	0.795	0.50 ( 0.49)	0.99	8758.8	50120.00
6	10803.58	38.62	0.772	0.50 ( 0.49)	0.99	9345.9	50150.00
7	10760.77	39.91	0.756	0.50 ( 0.49)	0.99	9751.7	31200.00
8	10685.41	41.94	0.739	0.50 ( 0.49)	0.99	10370.8	50100.00
9	10628.71	43.43	0.726	0.50 ( 0.49)	0.99	10818.0	31600.00
10	10206.29	54.56	0.644	0.50 ( 0.50)	0.99	13948.1	31400.00
11	9870.41	64.50	0.596	0.50 ( 0.50)	0.99	16603.3	11801.00
12	9570.17	75.88	0.556	0.50 ( 0.50)	0.99	19813.8	11500.00
13	9197.42	87.83	0.515	0.50 ( 0.50)	0.99	23862.5	11000.00
14	8759.82	104.18	0.480	0.50 ( 0.50)	0.99	30717.2	12500.00
15	8556.16	110.34	0.468	0.50 ( 0.50)	0.99	33587.7	11910.00
16	7899.31	119.05	0.451	0.50 ( 0.50)	0.99	36876.5	11130.00
17	7237.66	130.48	0.436	0.50 ( 0.50)	0.99	40545.0	11620.00
18	6197.82	146.30	0.417	0.50 ( 0.50)	0.99	45082.6	12400.00
19	5369.88	157.63	0.404	0.50 ( 0.50)	0.99	47379.3	12201.00
20	4772.77	166.91	0.393	0.50 ( 0.50)	0.99	48668.5	12111.00
21	4425.75	172.56	0.386	0.50 ( 0.50)	0.99	49421.1	10700.00
22	3861.39	182.64	0.376	0.50 ( 0.50)	0.99	50595.4	12261.00
23	3397.88	191.99	0.370	0.50 ( 0.50)	0.99	51407.2	10200.00
24	2844.25	207.32	0.362	0.50 ( 0.50)	0.99	52644.6	10300.00
25	2617.66	214.13	0.358	0.50 ( 0.50)	0.99	52995.7	12010.00
26	2151.89	234.64	0.347	0.50 ( 0.50)	0.99	53325.0	12000.00
27	1212.50	303.21	0.310	0.50 ( 0.50)	0.99	53995.2	10100.00

TOTAL AREA (ACRES) = 53995.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 11029.66 Tc (MIN.) = 15.097  
 EFFECTIVE AREA (ACRES) = 2961.54 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA (ACRES) = 53995.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12903.00 = 115933.56 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12903.00 TO NODE 12904.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
 =====  
 ELEVATION DATA: UPSTREAM (FEET) = 214.00 DOWNSTREAM (FEET) = 213.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 767.57 CHANNEL SLOPE = 0.0013  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
 CAPACITY ( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
 ALLOWABLE DEPTH).  
 AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
 ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA (CFS) = 11029.66  
 FLOW VELOCITY (FEET/SEC.) = 9.19 FLOW DEPTH (FEET) = 20.00  
 TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 16.49  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: 0610311U.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.26	33.63	0.50 ( 0.48)	0.97	114.8	31100.00

 TOTAL AREA (ACRES) = 114.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11029.66	16.49	1.260	0.50 ( 0.49)	0.99	2961.5	50200.00

2	11027.38	19.77	1.136	0.50 ( 0.49)	0.99	3791.3	50400.00
3	10994.26	31.60	0.861	0.50 ( 0.49)	0.99	6731.5	50300.00
4	10976.99	33.75	0.834	0.50 ( 0.49)	0.99	7238.3	40500.00
5	10870.24	38.20	0.778	0.50 ( 0.49)	0.99	8758.8	50120.00
6	10803.58	40.04	0.755	0.50 ( 0.49)	0.99	9345.9	50150.00
7	10760.77	41.34	0.744	0.50 ( 0.49)	0.99	9751.7	31200.00
8	10685.41	43.38	0.727	0.50 ( 0.49)	0.99	10370.8	50100.00
9	10628.71	44.88	0.715	0.50 ( 0.49)	0.99	10818.0	31600.00
10	10206.29	56.07	0.635	0.50 ( 0.50)	0.99	13948.1	31400.00
11	9870.41	66.06	0.590	0.50 ( 0.50)	0.99	16603.3	11801.00
12	9570.17	77.47	0.551	0.50 ( 0.50)	0.99	19813.8	11500.00
13	9197.42	89.45	0.510	0.50 ( 0.50)	0.99	23862.5	11000.00
14	8759.82	105.81	0.477	0.50 ( 0.50)	0.99	30717.2	12500.00
15	8556.16	111.98	0.465	0.50 ( 0.50)	0.99	33587.7	11910.00
16	7899.31	120.72	0.448	0.50 ( 0.50)	0.99	36876.5	11130.00
17	7237.66	132.19	0.434	0.50 ( 0.50)	0.99	40545.0	11620.00
18	6197.82	148.08	0.415	0.50 ( 0.50)	0.99	45082.6	12400.00
19	5369.88	159.48	0.402	0.50 ( 0.50)	0.99	47379.3	12201.00
20	4772.77	168.81	0.390	0.50 ( 0.50)	0.99	48668.5	12111.00
21	4425.75	174.50	0.384	0.50 ( 0.50)	0.99	49421.1	10700.00
22	3861.39	184.64	0.374	0.50 ( 0.50)	0.99	50595.4	12261.00
23	3397.88	194.06	0.369	0.50 ( 0.50)	0.99	51407.2	10200.00
24	2844.25	209.48	0.361	0.50 ( 0.50)	0.99	52644.6	10300.00
25	2617.66	216.34	0.357	0.50 ( 0.50)	0.99	52995.7	12010.00
26	2151.89	236.96	0.346	0.50 ( 0.50)	0.99	53325.0	12000.00
27	1212.50	305.89	0.308	0.50 ( 0.50)	0.99	53995.2	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.26	33.63	0.835	0.50 ( 0.48)	0.97	114.8	31100.00

LONGEST FLOWPATH FROM NODE 31100.00 TO NODE 12904.00 = 6503.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	1.260	0.50 ( 0.49)	0.99	3017.8	50200.00
2	11063.64	19.77	1.136	0.50 ( 0.49)	0.99	3858.8	50400.00
3	11030.52	31.60	0.861	0.50 ( 0.49)	0.99	6839.4	50300.00
4	11014.22	33.63	0.835	0.50 ( 0.49)	0.99	7324.8	31100.00
5	11013.10	33.75	0.834	0.50 ( 0.49)	0.99	7353.2	40500.00
6	10900.56	38.20	0.778	0.50 ( 0.49)	0.99	8873.6	50120.00
7	10831.52	40.04	0.755	0.50 ( 0.49)	0.99	9460.8	50150.00
8	10787.60	41.34	0.744	0.50 ( 0.49)	0.99	9866.5	31200.00
9	10710.49	43.38	0.727	0.50 ( 0.49)	0.99	10485.6	50100.00
10	10652.50	44.88	0.715	0.50 ( 0.49)	0.99	10932.8	31600.00
11	10221.87	56.07	0.635	0.50 ( 0.50)	0.99	14062.9	31400.00
12	9881.36	66.06	0.590	0.50 ( 0.50)	0.99	16718.1	11801.00
13	9577.07	77.47	0.551	0.50 ( 0.50)	0.99	19928.6	11500.00
14	9200.08	89.45	0.510	0.50 ( 0.50)	0.99	23977.3	11000.00
15	8761.40	105.81	0.477	0.50 ( 0.50)	0.99	30832.0	12500.00
16	8557.71	111.98	0.465	0.50 ( 0.50)	0.99	33702.5	11910.00
17	7900.80	120.72	0.448	0.50 ( 0.50)	0.99	36991.3	11130.00
18	7239.10	132.19	0.434	0.50 ( 0.50)	0.99	40659.8	11620.00
19	6199.20	148.08	0.415	0.50 ( 0.50)	0.99	45197.4	12400.00
20	5371.21	159.48	0.402	0.50 ( 0.50)	0.99	47494.1	12201.00
21	4774.07	168.81	0.390	0.50 ( 0.50)	0.99	48783.3	12111.00

22	4427.02	174.50	0.384	0.50 ( 0.50)	0.99	49535.9	10700.00
23	3862.64	184.64	0.374	0.50 ( 0.50)	0.99	50710.3	12261.00
24	3399.11	194.06	0.369	0.50 ( 0.50)	0.99	51522.0	10200.00
25	2845.45	209.48	0.361	0.50 ( 0.50)	0.99	52759.4	10300.00
26	2618.85	216.34	0.357	0.50 ( 0.50)	0.99	53110.5	12010.00
27	2153.04	236.96	0.346	0.50 ( 0.50)	0.99	53439.8	12000.00
28	1213.53	305.89	0.308	0.50 ( 0.50)	0.99	54110.0	10100.00

TOTAL AREA (ACRES) = 54110.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 11065.92 Tc (MIN.) = 16.489  
EFFECTIVE AREA (ACRES) = 3017.84 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA (ACRES) = 54110.0  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 12904.00 = 116701.13 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 54110.0 TC (MIN.) = 16.49  
EFFECTIVE AREA (ACRES) = 3017.84 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.987  
PEAK FLOW RATE (CFS) = 11065.92

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	1.260	0.50 ( 0.49)	0.99	3017.8	50200.00
2	11063.64	19.77	1.136	0.50 ( 0.49)	0.99	3858.8	50400.00
3	11030.52	31.60	0.861	0.50 ( 0.49)	0.99	6839.4	50300.00
4	11014.22	33.63	0.835	0.50 ( 0.49)	0.99	7324.8	31100.00
5	11013.10	33.75	0.834	0.50 ( 0.49)	0.99	7353.2	40500.00
6	10900.56	38.20	0.778	0.50 ( 0.49)	0.99	8873.6	50120.00
7	10831.52	40.04	0.755	0.50 ( 0.49)	0.99	9460.8	50150.00
8	10787.60	41.34	0.744	0.50 ( 0.49)	0.99	9866.5	31200.00
9	10710.49	43.38	0.727	0.50 ( 0.49)	0.99	10485.6	50100.00
10	10652.50	44.88	0.715	0.50 ( 0.49)	0.99	10932.8	31600.00
11	10221.87	56.07	0.635	0.50 ( 0.50)	0.99	14062.9	31400.00
12	9881.36	66.06	0.590	0.50 ( 0.50)	0.99	16718.1	11801.00
13	9577.07	77.47	0.551	0.50 ( 0.50)	0.99	19928.6	11500.00
14	9200.08	89.45	0.510	0.50 ( 0.50)	0.99	23977.3	11000.00
15	8761.40	105.81	0.477	0.50 ( 0.50)	0.99	30832.0	12500.00
16	8557.71	111.98	0.465	0.50 ( 0.50)	0.99	33702.5	11910.00
17	7900.80	120.72	0.448	0.50 ( 0.50)	0.99	36991.3	11130.00
18	7239.10	132.19	0.434	0.50 ( 0.50)	0.99	40659.8	11620.00
19	6199.20	148.08	0.415	0.50 ( 0.50)	0.99	45197.4	12400.00
20	5371.21	159.48	0.402	0.50 ( 0.50)	0.99	47494.1	12201.00
21	4774.07	168.81	0.390	0.50 ( 0.50)	0.99	48783.3	12111.00
22	4427.02	174.50	0.384	0.50 ( 0.50)	0.99	49535.9	10700.00
23	3862.64	184.64	0.374	0.50 ( 0.50)	0.99	50710.3	12261.00
24	3399.11	194.06	0.369	0.50 ( 0.50)	0.99	51522.0	10200.00
25	2845.45	209.48	0.361	0.50 ( 0.50)	0.99	52759.4	10300.00
26	2618.85	216.34	0.357	0.50 ( 0.50)	0.99	53110.5	12010.00
27	2153.04	236.96	0.346	0.50 ( 0.50)	0.99	53439.8	12000.00
28	1213.53	305.89	0.308	0.50 ( 0.50)	0.99	54110.0	10100.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*  
\* \* \* \* \*  
\*\*\*\*\*

FILE NAME: S30.DAT  
TIME/DATE OF STUDY: 07:22 07/16/2018

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.184
- 2) 10.00; 1.510
- 3) 15.00; 1.203
- 4) 20.00; 1.023
- 5) 25.00; 0.902
- 6) 30.00; 0.826
- 7) 40.00; 0.693
- 8) 50.00; 0.611
- 9) 60.00; 0.546
- 10) 90.00; 0.439
- 11) 120.00; 0.374
- 12) 180.00; 0.306
- 13) 360.00; 0.211
- 14) 1440.00; 0.088

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)  
\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13000.00 TO NODE 13001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 279.24  
ELEVATION DATA: UPSTREAM(FEET) = 1187.54 DOWNSTREAM(FEET) = 1104.45

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.560  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.704  
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.65	0.50	1.000	0	8.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 0.70  
TOTAL AREA(ACRES) = 0.65 PEAK FLOW RATE(CFS) = 0.70

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13001.00 TO NODE 13002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1104.45 DOWNSTREAM(FEET) = 1034.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 736.73 CHANNEL SLOPE = 0.0945  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.492  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	19.74	0.50	0.968	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 9.70  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.11  
AVERAGE FLOW DEPTH(FEET) = 0.67 TRAVEL TIME(MIN.) = 1.73  
Tc(MIN.) = 10.29  
SUBAREA AREA(ACRES) = 19.74 SUBAREA RUNOFF(CFS) = 17.91  
EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 18.49

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 8.35  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13002.00 = 1015.97 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13002.00 TO NODE 13003.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 1034.82 DOWNSTREAM(FEET) = 986.71  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1305.95 CHANNEL SLOPE = 0.0368  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.316  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 83.90 0.50 0.904 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 51.26  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.59  
AVERAGE FLOW DEPTH(FEET) = 1.50 TRAVEL TIME(MIN.) = 2.87  
Tc(MIN.) = 13.15  
SUBAREA AREA(ACRES) = 83.90 SUBAREA RUNOFF(CFS) = 65.26  
EFFECTIVE AREA(ACRES) = 104.29 AREA-AVERAGED Fm(INCH/HR) = 0.46  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.92  
TOTAL AREA(ACRES) = 104.3 PEAK FLOW RATE(CFS) = 80.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.78 FLOW VELOCITY(FEET/SEC.) = 8.47  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13003.00 = 2321.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13003.00 TO NODE 13004.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 986.71 DOWNSTREAM(FEET) = 939.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1318.54 CHANNEL SLOPE = 0.0361  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.180  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 47.44 0.50 0.871 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.871  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 96.42  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.81  
AVERAGE FLOW DEPTH(FEET) = 1.91 TRAVEL TIME(MIN.) = 2.50  
Tc(MIN.) = 15.65  
SUBAREA AREA(ACRES) = 47.44 SUBAREA RUNOFF(CFS) = 31.77  
EFFECTIVE AREA(ACRES) = 151.73 AREA-AVERAGED Fm(INCH/HR) = 0.45  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.90  
TOTAL AREA(ACRES) = 151.7 PEAK FLOW RATE(CFS) = 99.45

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.93 FLOW VELOCITY(FEET/SEC.) = 8.87  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13004.00 = 3640.46 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 939.06 DOWNSTREAM(FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1954.61 CHANNEL SLOPE = 0.0397  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.058  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 77.87 0.50 0.856 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.56  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.66  
AVERAGE FLOW DEPTH(FEET) = 2.05 TRAVEL TIME(MIN.) = 3.37  
Tc(MIN.) = 19.02  
SUBAREA AREA(ACRES) = 77.87 SUBAREA RUNOFF(CFS) = 44.16  
EFFECTIVE AREA(ACRES) = 229.60 AREA-AVERAGED Fm(INCH/HR) = 0.44  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.89  
TOTAL AREA(ACRES) = 229.6 PEAK FLOW RATE(CFS) = 127.05

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.08 FLOW VELOCITY(FEET/SEC.) = 9.79  
LONGEST FLOWPATH FROM NODE 13000.00 TO NODE 13020.00 = 5595.07 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13004.00 TO NODE 13020.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 19.02  
RAINFALL INTENSITY(INCH/HR) = 1.06  
AREA-AVERAGED Fm(INCH/HR) = 0.44  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.89  
EFFECTIVE STREAM AREA(ACRES) = 229.60  
TOTAL STREAM AREA(ACRES) = 229.60  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 127.05

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13010.00 TO NODE 13011.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 284.64  
ELEVATION DATA: UPSTREAM(FEET) = 1190.91 DOWNSTREAM(FEET) = 1110.50

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.716

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.683  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 0.91 0.50 1.000 0 8.72  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 0.97  
TOTAL AREA (ACRES) = 0.91 PEAK FLOW RATE (CFS) = 0.97

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13011.00 TO NODE 13012.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>(STREET TABLE SECTION # 1 USED)<<<<<  
-----

UPSTREAM ELEVATION (FEET) = 1110.50 DOWNSTREAM ELEVATION (FEET) = 1068.16  
STREET LENGTH (FEET) = 581.12 CURB HEIGHT (INCHES) = 8.0  
STREET HALFWIDTH (FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00  
INSIDE STREET CROSSFALL (DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 5.56  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH (FEET) = 0.27  
HALFSTREET FLOOD WIDTH (FEET) = 6.28  
AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.09  
PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 1.40  
STREET FLOW TRAVEL TIME (MIN.) = 1.90 Tc (MIN.) = 10.62  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.472

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 10.46 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA AREA (ACRES) = 10.46 SUBAREA RUNOFF (CFS) = 9.15  
EFFECTIVE AREA (ACRES) = 11.37 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 11.4 PEAK FLOW RATE (CFS) = 9.94

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH (FEET) = 0.32 HALFSTREET FLOOD WIDTH (FEET) = 8.78  
FLOW VELOCITY (FEET/SEC.) = 5.63 DEPTH\*VELOCITY (FT\*FT/SEC.) = 1.80  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13012.00 = 865.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13012.00 TO NODE 13013.00 IS CODE = 62  
-----

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<  
-----

UPSTREAM ELEVATION (FEET) = 1068.16 DOWNSTREAM ELEVATION (FEET) = 994.58  
STREET LENGTH (FEET) = 1505.98 CURB HEIGHT (INCHES) = 8.0  
STREET HALFWIDTH (FEET) = 30.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00  
INSIDE STREET CROSSFALL (DECIMAL) = 0.018  
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.018

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  
Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0150  
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 22.09  
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  
STREET FLOW DEPTH (FEET) = 0.41  
HALFSTREET FLOOD WIDTH (FEET) = 13.95  
AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.72  
PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 2.36  
STREET FLOW TRAVEL TIME (MIN.) = 4.39 Tc (MIN.) = 15.01

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.203  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 35.49 0.50 0.901 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.901  
SUBAREA AREA (ACRES) = 35.49 SUBAREA RUNOFF (CFS) = 24.02  
EFFECTIVE AREA (ACRES) = 46.86 AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
TOTAL AREA (ACRES) = 46.9 PEAK FLOW RATE (CFS) = 31.21

END OF SUBAREA STREET FLOW HYDRAULICS:  
DEPTH (FEET) = 0.45 HALFSTREET FLOOD WIDTH (FEET) = 16.13  
FLOW VELOCITY (FEET/SEC.) = 6.20 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.79  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13013.00 = 2371.74 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13013.00 TO NODE 13014.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM (FEET) = 994.58 DOWNSTREAM (FEET) = 944.96  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1798.86 CHANNEL SLOPE = 0.0276  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.047

SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 73.31 0.50 0.616 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.616  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 55.59  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.93



AVERAGE FLOW DEPTH (FEET) = 1.64 TRAVEL TIME (MIN.) = 4.33  
Tc (MIN.) = 19.33  
SUBAREA AREA (ACRES) = 73.31 SUBAREA RUNOFF (CFS) = 48.75  
EFFECTIVE AREA (ACRES) = 120.17 AREA-AVERAGED Fm (INCH/HR) = 0.37  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.74  
TOTAL AREA (ACRES) = 120.2 PEAK FLOW RATE (CFS) = 73.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.81 FLOW VELOCITY (FEET/SEC.) = 7.44  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13014.00 = 4170.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 944.96 DOWNSTREAM (FEET) = 861.53  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1519.40 CHANNEL SLOPE = 0.0549  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.979

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.22	0.50	0.810	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 94.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.25

AVERAGE FLOW DEPTH (FEET) = 1.75 TRAVEL TIME (MIN.) = 2.47

Tc (MIN.) = 21.81

SUBAREA AREA (ACRES) = 80.22 SUBAREA RUNOFF (CFS) = 41.45

EFFECTIVE AREA (ACRES) = 200.39 AREA-AVERAGED Fm (INCH/HR) = 0.38

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.77

TOTAL AREA (ACRES) = 200.4 PEAK FLOW RATE (CFS) = 107.52

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 1.84 FLOW VELOCITY (FEET/SEC.) = 10.57

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13014.00 TO NODE 13020.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 21.81

RAINFALL INTENSITY (INCH/HR) = 0.98

AREA-AVERAGED Fm (INCH/HR) = 0.38

AREA-AVERAGED Fp (INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.77

EFFECTIVE STREAM AREA (ACRES) = 200.39

TOTAL STREAM AREA (ACRES) = 200.39

PEAK FLOW RATE (CFS) AT CONFLUENCE = 107.52

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	127.05	19.02	1.058	0.50 ( 0.44)	0.89	229.6	13000.00
2	107.52	21.81	0.979	0.50 ( 0.38)	0.77	200.4	13010.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	233.26	19.02	1.058	0.50 ( 0.42)	0.83	404.4	13000.00
2	218.24	21.81	0.979	0.50 ( 0.42)	0.83	430.0	13010.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 233.26 Tc (MIN.) = 19.02

EFFECTIVE AREA (ACRES) = 404.38 AREA-AVERAGED Fm (INCH/HR) = 0.42

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83

TOTAL AREA (ACRES) = 430.0

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13020.00 = 5690.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13020.00 TO NODE 13021.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 861.53 DOWNSTREAM (FEET) = 843.84  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1274.71 CHANNEL SLOPE = 0.0139  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.981

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	80.78	0.50	0.818	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 254.05

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.85

AVERAGE FLOW DEPTH (FEET) = 3.29 TRAVEL TIME (MIN.) = 2.71

Tc (MIN.) = 21.73

SUBAREA AREA (ACRES) = 80.78 SUBAREA RUNOFF (CFS) = 41.59

EFFECTIVE AREA (ACRES) = 485.16 AREA-AVERAGED Fm (INCH/HR) = 0.42

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83

TOTAL AREA (ACRES) = 510.8 PEAK FLOW RATE (CFS) = 246.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 3.25 FLOW VELOCITY (FEET/SEC.) = 7.77

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13021.00 = 6964.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13021.00 TO NODE 13022.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 843.84 DOWNSTREAM(FEET) = 842.14  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1448.62 CHANNEL SLOPE = 0.0012  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.835

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	124.44	0.50	0.803	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 271.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.16

AVERAGE FLOW DEPTH(FEET) = 5.35 TRAVEL TIME(MIN.) = 7.65

Tc(MIN.) = 29.38

SUBAREA AREA(ACRES) = 124.44 SUBAREA RUNOFF(CFS) = 48.59

EFFECTIVE AREA(ACRES) = 609.60 AREA-AVERAGED Fm(INCH/HR) = 0.41

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83

TOTAL AREA(ACRES) = 635.2 PEAK FLOW RATE(CFS) = 246.78

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.16 FLOW VELOCITY(FEET/SEC.) = 3.09

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13022.00 = 8413.33 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13022.00 TO NODE 13023.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 842.14 DOWNSTREAM(FEET) = 806.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1432.95 CHANNEL SLOPE = 0.0246  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.803

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	324.46	0.50	0.786	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.786

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 306.67

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.18

AVERAGE FLOW DEPTH(FEET) = 3.17 TRAVEL TIME(MIN.) = 2.35

Tc(MIN.) = 31.72

SUBAREA AREA(ACRES) = 324.46 SUBAREA RUNOFF(CFS) = 119.71

EFFECTIVE AREA(ACRES) = 934.06 AREA-AVERAGED Fm(INCH/HR) = 0.41

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 959.7 PEAK FLOW RATE(CFS) = 333.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.27 FLOW VELOCITY(FEET/SEC.) = 10.41

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13023.00 = 9846.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13023.00 TO NODE 13024.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 806.85 DOWNSTREAM(FEET) = 767.07  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.17 CHANNEL SLOPE = 0.0423  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.787

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	367.12	0.50	0.795	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.795

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 398.07

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.32

AVERAGE FLOW DEPTH(FEET) = 3.16 TRAVEL TIME(MIN.) = 1.18

Tc(MIN.) = 32.90

SUBAREA AREA(ACRES) = 367.12 SUBAREA RUNOFF(CFS) = 128.79

EFFECTIVE AREA(ACRES) = 1301.18 AREA-AVERAGED Fm(INCH/HR) = 0.40

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81

TOTAL AREA(ACRES) = 1326.8 PEAK FLOW RATE(CFS) = 449.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.30 FLOW VELOCITY(FEET/SEC.) = 13.75

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13024.00 = 10786.45 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13024.00 TO NODE 13025.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 767.07 DOWNSTREAM(FEET) = 697.38  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3026.62 CHANNEL SLOPE = 0.0230  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.727

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	315.24	0.50	0.867	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 491.03

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.19

AVERAGE FLOW DEPTH(FEET) = 3.83 TRAVEL TIME(MIN.) = 4.51

Tc(MIN.) = 37.41

SUBAREA AREA(ACRES) = 315.24 SUBAREA RUNOFF(CFS) = 83.36

EFFECTIVE AREA(ACRES) = 1616.42 AREA-AVERAGED Fm(INCH/HR) = 0.41

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.82

TOTAL AREA(ACRES) = 1642.0 PEAK FLOW RATE(CFS) = 462.43

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.74 FLOW VELOCITY(FEET/SEC.) = 11.01

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13025.00 = 13813.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 51

=====  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 697.38 DOWNSTREAM(FEET) = 662.66  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2362.69 CHANNEL SLOPE = 0.0147  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.681  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 374.11 0.50 0.748 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.748  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 514.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.57  
AVERAGE FLOW DEPTH(FEET) = 4.23 TRAVEL TIME(MIN.) = 4.12  
Tc(MIN.) = 41.52  
SUBAREA AREA(ACRES) = 374.11 SUBAREA RUNOFF(CFS) = 103.15  
EFFECTIVE AREA(ACRES) = 1990.53 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 2016.1 PEAK FLOW RATE(CFS) = 497.26

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.18 FLOW VELOCITY(FEET/SEC.) = 9.47  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13026.00 = 16175.76 FEET.  
=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 2016.1 TC(MIN.) = 41.52  
EFFECTIVE AREA(ACRES) = 1990.53 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.806  
PEAK FLOW RATE(CFS) = 497.26

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	497.26	41.52	0.681	0.50( 0.40)	0.81	1990.5	13000.00
2	455.27	44.81	0.654	0.50( 0.40)	0.81	2016.1	13010.00

=====  
END OF RATIONAL METHOD ANALYSIS  
=====

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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92707

-----  
FILE NAME: S31.DAT  
TIME/DATE OF STUDY: 07:23 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.184
- 2) 10.00; 1.510
- 3) 15.00; 1.203
- 4) 20.00; 1.023
- 5) 25.00; 0.902
- 6) 30.00; 0.826
- 7) 40.00; 0.693
- 8) 50.00; 0.611
- 9) 60.00; 0.546
- 10) 90.00; 0.439
- 11) 120.00; 0.374
- 12) 180.00; 0.306
- 13) 360.00; 0.211
- 14) 1440.00; 0.088

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13100.00 TO NODE 13101.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 282.58  
ELEVATION DATA: UPSTREAM(FEET) = 1069.66 DOWNSTREAM(FEET) = 969.92

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
 SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 8.312  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.738  
 SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
NATURAL FAIR COVER "OPEN BRUSH"	-	0.94	0.50	1.000	0	8.31

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 SUBAREA RUNOFF(CFS) = 1.05  
 TOTAL AREA(ACRES) = 0.94 PEAK FLOW RATE(CFS) = 1.05

\*\*\*\*\*

FLOW PROCESS FROM NODE 13101.00 TO NODE 13102.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 969.92 DOWNSTREAM(FEET) = 807.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 665.89 CHANNEL SLOPE = 0.2444  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.477  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
USER-DEFINED	-	7.67	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 4.44  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.99  
 AVERAGE FLOW DEPTH(FEET) = 0.54 TRAVEL TIME(MIN.) = 2.23  
 $T_c$ (MIN.) = 10.54  
 SUBAREA AREA(ACRES) = 7.67 SUBAREA RUNOFF(CFS) = 6.74  
 EFFECTIVE AREA(ACRES) = 8.61 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.50  
 AREA-AVERAGED  $F_p$ (INCH/HR) = 0.50 AREA-AVERAGED  $A_p$  = 1.00  
 TOTAL AREA(ACRES) = 8.6 PEAK FLOW RATE(CFS) = 7.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.67 FLOW VELOCITY(FEET/SEC.) = 5.68  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13102.00 = 948.47 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13102.00 TO NODE 13103.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 807.20 DOWNSTREAM(FEET) = 769.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 691.01 CHANNEL SLOPE = 0.0539  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.292

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	20.65	0.50	0.999	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.999  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.83  
AVERAGE FLOW DEPTH(FEET) = 1.14 TRAVEL TIME(MIN.) = 3.01  
Tc(MIN.) = 13.54  
SUBAREA AREA(ACRES) = 20.65 SUBAREA RUNOFF(CFS) = 14.73  
EFFECTIVE AREA(ACRES) = 29.26 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 20.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.29 FLOW VELOCITY(FEET/SEC.) = 4.15  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13103.00 = 1639.48 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 769.94 DOWNSTREAM(FEET) = 693.88  
FLOW LENGTH(FEET) = 1563.10 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 9.4 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.19  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 20.87  
PIPE TRAVEL TIME(MIN.) = 1.84 Tc(MIN.) = 15.38  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13104.00 = 3202.58 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13103.00 TO NODE 13104.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

MAINLINE Tc(MIN.) = 15.38  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.189  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	28.00	0.50	0.750	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.750  
SUBAREA AREA(ACRES) = 28.00 SUBAREA RUNOFF(CFS) = 20.52  
EFFECTIVE AREA(ACRES) = 57.26 AREA-AVERAGED Fm(INCH/HR) = 0.44  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.88  
TOTAL AREA(ACRES) = 57.3 PEAK FLOW RATE(CFS) = 38.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 693.88 DOWNSTREAM(FEET) = 645.69  
FLOW LENGTH(FEET) = 1068.98 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 13.2 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.43  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 38.68  
PIPE TRAVEL TIME(MIN.) = 1.08 Tc(MIN.) = 16.46  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13105.00 = 4271.56 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13104.00 TO NODE 13105.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

MAINLINE Tc(MIN.) = 16.46  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.150  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.28	0.50	0.867	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.867  
SUBAREA AREA(ACRES) = 35.28 SUBAREA RUNOFF(CFS) = 22.75  
EFFECTIVE AREA(ACRES) = 92.54 AREA-AVERAGED Fm(INCH/HR) = 0.44  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.87  
TOTAL AREA(ACRES) = 92.5 PEAK FLOW RATE(CFS) = 59.42

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 645.69 DOWNSTREAM(FEET) = 608.48  
FLOW LENGTH(FEET) = 1127.55 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 18.4 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 16.40  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 59.42  
PIPE TRAVEL TIME(MIN.) = 1.15 Tc(MIN.) = 17.61  
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

MAINLINE Tc(MIN.) = 17.61  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.109  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 37.68 0.50 0.889 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.889  
 SUBAREA AREA (ACRES) = 37.68 SUBAREA RUNOFF (CFS) = 22.53  
 EFFECTIVE AREA (ACRES) = 130.22 AREA-AVERAGED Fm (INCH/HR) = 0.44  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.88  
 TOTAL AREA (ACRES) = 130.2 PEAK FLOW RATE (CFS) = 78.51

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 10  
 -----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S30.DNA  
 MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	497.26	41.52	0.50 ( 0.40)	0.81	1990.5	13000.00
2	455.27	44.81	0.50 ( 0.40)	0.81	2016.1	13010.00
TOTAL AREA (ACRES) = 2016.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13025.00 TO NODE 13026.00 IS CODE = 14.0  
 -----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	497.26	41.52	0.50 ( 0.40)	0.81	1990.5	13000.00
2	455.27	44.81	0.50 ( 0.40)	0.81	2016.1	13010.00
TOTAL AREA (ACRES) = 2016.1						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13026.00 TO NODE 13106.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 662.66 DOWNSTREAM (FEET) = 608.48  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3098.88 CHANNEL SLOPE = 0.0175  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.639

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
LAND USE					
USER-DEFINED	-	75.28	0.50	0.755	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50					

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.755  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 506.10  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.15  
 AVERAGE FLOW DEPTH (FEET) = 4.08 TRAVEL TIME (MIN.) = 5.09  
 Tc (MIN.) = 46.61  
 SUBAREA AREA (ACRES) = 75.28 SUBAREA RUNOFF (CFS) = 17.69  
 EFFECTIVE AREA (ACRES) = 2065.81 AREA-AVERAGED Fm (INCH/HR) = 0.40  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA (ACRES) = 2091.4 PEAK FLOW RATE (CFS) = 497.26  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.05 FLOW VELOCITY (FEET/SEC.) = 10.11

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13105.00 TO NODE 13106.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	497.26	46.61	0.639	0.50 ( 0.40)	0.80	2065.8	13000.00
2	455.27	50.00	0.611	0.50 ( 0.40)	0.80	2091.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	78.51	17.61	1.109	0.50 ( 0.44)	0.88	130.2	13100.00
LONGEST FLOWPATH FROM NODE 13100.00 TO NODE 13106.00 = 5399.11 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	575.77	17.61	1.109	0.50 ( 0.41)	0.81	910.7	13100.00
2	520.65	46.61	0.639	0.50 ( 0.40)	0.81	2196.0	13000.00
3	475.41	50.00	0.611	0.50 ( 0.40)	0.81	2221.6	13010.00
TOTAL AREA (ACRES) = 2221.6							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 575.77 Tc (MIN.) = 17.610

EFFECTIVE AREA (ACRES) = 910.66 AREA-AVERAGED Fm (INCH/HR) = 0.41

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81

TOTAL AREA (ACRES) = 2221.6

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13106.00 = 19274.64 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13106.00 TO NODE 13107.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 608.48 DOWNSTREAM (FEET) = 584.29  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1650.20 CHANNEL SLOPE = 0.0147  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.015  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 190.45 0.50 0.755 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.755  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 630.37  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.05  
 AVERAGE FLOW DEPTH (FEET) = 4.57 TRAVEL TIME (MIN.) = 2.74  
 Tc (MIN.) = 20.35  
 SUBAREA AREA (ACRES) = 190.45 SUBAREA RUNOFF (CFS) = 109.18  
 EFFECTIVE AREA (ACRES) = 1101.11 AREA-AVERAGED Fm (INCH/HR) = 0.40  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80  
 TOTAL AREA (ACRES) = 2412.1 PEAK FLOW RATE (CFS) = 606.90

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.51 FLOW VELOCITY (FEET/SEC.) = 9.96  
 LONGEST FLOWPATH FROM NODE 13101.00 TO NODE 13107.00 = 20924.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13107.00 TO NODE 13108.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 584.29 DOWNSTREAM (FEET) = 563.78  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1061.67 CHANNEL SLOPE = 0.0193  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.977  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 314.12 0.50 0.939 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.939  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 678.63  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 11.34  
 AVERAGE FLOW DEPTH (FEET) = 4.47 TRAVEL TIME (MIN.) = 1.56  
 Tc (MIN.) = 21.91  
 SUBAREA AREA (ACRES) = 314.12 SUBAREA RUNOFF (CFS) = 143.38  
 EFFECTIVE AREA (ACRES) = 1415.23 AREA-AVERAGED Fm (INCH/HR) = 0.42  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 2726.2 PEAK FLOW RATE (CFS) = 712.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.54 FLOW VELOCITY (FEET/SEC.) = 11.51  
 LONGEST FLOWPATH FROM NODE 13101.00 TO NODE 13108.00 = 21986.51 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13108.00 TO NODE 13109.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 563.78 DOWNSTREAM (FEET) = 541.61

CHANNEL LENGTH THRU SUBAREA (FEET) = 1657.28 CHANNEL SLOPE = 0.0134  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.911  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 203.63 0.50 0.785 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.785  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 760.39  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.17  
 AVERAGE FLOW DEPTH (FEET) = 4.99 TRAVEL TIME (MIN.) = 2.72  
 Tc (MIN.) = 24.62  
 SUBAREA AREA (ACRES) = 203.63 SUBAREA RUNOFF (CFS) = 95.02  
 EFFECTIVE AREA (ACRES) = 1618.86 AREA-AVERAGED Fm (INCH/HR) = 0.41  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83  
 TOTAL AREA (ACRES) = 2929.8 PEAK FLOW RATE (CFS) = 724.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.90 FLOW VELOCITY (FEET/SEC.) = 10.05  
 LONGEST FLOWPATH FROM NODE 13101.00 TO NODE 13109.00 = 23643.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13109.00 TO NODE 13110.00 IS CODE = 51

-----  
 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

-----  
 ELEVATION DATA: UPSTREAM (FEET) = 541.61 DOWNSTREAM (FEET) = 509.94  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2016.96 CHANNEL SLOPE = 0.0157  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.861  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 283.06 0.50 0.791 -  
 SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.791  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 783.41  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.90  
 AVERAGE FLOW DEPTH (FEET) = 4.90 TRAVEL TIME (MIN.) = 3.08  
 Tc (MIN.) = 27.71  
 SUBAREA AREA (ACRES) = 283.06 SUBAREA RUNOFF (CFS) = 118.51  
 EFFECTIVE AREA (ACRES) = 1901.92 AREA-AVERAGED Fm (INCH/HR) = 0.41  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.82  
 TOTAL AREA (ACRES) = 3212.9 PEAK FLOW RATE (CFS) = 769.41

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 4.86 FLOW VELOCITY (FEET/SEC.) = 10.84  
 LONGEST FLOWPATH FROM NODE 13101.00 TO NODE 13110.00 = 25660.75 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13110.00 TO NODE 13111.00 IS CODE = 51

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 >>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW <<<<<  
 >>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 509.94 DOWNSTREAM(FEET) = 461.07
CHANNEL LENGTH THRU SUBAREA(FEET) = 3058.95 CHANNEL SLOPE = 0.0160
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.795
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 248.05 0.50 0.783 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.783
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 814.47
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.06
AVERAGE FLOW DEPTH(FEET) = 4.95 TRAVEL TIME(MIN.) = 4.61
Tc(MIN.) = 32.32
SUBAREA AREA(ACRES) = 248.05 SUBAREA RUNOFF(CFS) = 90.08
EFFECTIVE AREA(ACRES) = 2149.97 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.82
TOTAL AREA(ACRES) = 3460.9 PEAK FLOW RATE(CFS) = 769.41
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.85 FLOW VELOCITY(FEET/SEC.) = 10.91
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13111.00 = 28719.70 FEET.

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*****
FLOW PROCESS FROM NODE 13111.00 TO NODE 13112.00 IS CODE = 51
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 461.07 DOWNSTREAM(FEET) = 452.77
CHANNEL LENGTH THRU SUBAREA(FEET) = 1781.78 CHANNEL SLOPE = 0.0047
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.738
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 179.91 0.50 0.694 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.694
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 801.07
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.95
AVERAGE FLOW DEPTH(FEET) = 6.20 TRAVEL TIME(MIN.) = 4.27
Tc(MIN.) = 36.59
SUBAREA AREA(ACRES) = 179.91 SUBAREA RUNOFF(CFS) = 63.34
EFFECTIVE AREA(ACRES) = 2329.88 AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 3640.9 PEAK FLOW RATE(CFS) = 769.41
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 6.11 FLOW VELOCITY(FEET/SEC.) = 6.87
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13112.00 = 30501.48 FEET.

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FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 452.77 DOWNSTREAM(FEET) = 427.51
CHANNEL LENGTH THRU SUBAREA(FEET) = 1625.01 CHANNEL SLOPE = 0.0155
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.705
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 155.96 0.50 0.836 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.836
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 789.56
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.86
AVERAGE FLOW DEPTH(FEET) = 4.92 TRAVEL TIME(MIN.) = 2.49
Tc(MIN.) = 39.09
SUBAREA AREA(ACRES) = 155.96 SUBAREA RUNOFF(CFS) = 40.28
EFFECTIVE AREA(ACRES) = 2485.84 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81
TOTAL AREA(ACRES) = 3796.8 PEAK FLOW RATE(CFS) = 769.41
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 4.87 FLOW VELOCITY(FEET/SEC.) = 10.80
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

```

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-----
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 3796.8 TC(MIN.) = 39.09
EFFECTIVE AREA(ACRES) = 2485.84 AREA-AVERAGED Fm(INCH/HR) = 0.41
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.810
PEAK FLOW RATE(CFS) = 769.41

```

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** PEAK FLOW RATE TABLE **

```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	769.41	39.09	0.705	0.50 ( 0.41)	0.81	2485.8	13100.00
2	520.65	70.06	0.510	0.50 ( 0.40)	0.81	3771.2	13000.00
3	475.41	73.99	0.496	0.50 ( 0.40)	0.81	3796.8	13010.00

```

=====
END OF RATIONAL METHOD ANALYSIS

```



\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S32.DAT  
TIME/DATE OF STUDY: 07:23 07/16/2018  
=====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.184
- 2) 10.00; 1.510
- 3) 15.00; 1.203
- 4) 20.00; 1.023
- 5) 25.00; 0.902
- 6) 30.00; 0.826
- 7) 40.00; 0.693
- 8) 50.00; 0.611
- 9) 60.00; 0.546
- 10) 90.00; 0.439
- 11) 120.00; 0.374
- 12) 180.00; 0.306
- 13) 360.00; 0.211
- 14) 1440.00; 0.088

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE	STREET-CROSSFALL / WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)	
1	30.0	20.0	0.018	0.018	0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13200.00 TO NODE 13201.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 298.57  
ELEVATION DATA: UPSTREAM(FEET) = 1069.04 DOWNSTREAM(FEET) = 1005.76

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
 SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 9.410  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.590  
 SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
NATURAL FAIR COVER						
"OPEN BRUSH"	-	0.67	0.50	1.000	0	9.41

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 SUBAREA RUNOFF(CFS) = 0.66  
 TOTAL AREA(ACRES) = 0.67 PEAK FLOW RATE(CFS) = 0.66

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13201.00 TO NODE 13202.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1005.76 DOWNSTREAM(FEET) = 896.98  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 747.55 CHANNEL SLOPE = 0.1455  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.347  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
USER-DEFINED	-	7.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.85  
 AVERAGE FLOW DEPTH(FEET) = 0.55 TRAVEL TIME(MIN.) = 3.24  
 $T_c$ (MIN.) = 12.65  
 SUBAREA AREA(ACRES) = 7.41 SUBAREA RUNOFF(CFS) = 5.65  
 EFFECTIVE AREA(ACRES) = 8.08 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.50  
 AREA-AVERAGED  $F_p$ (INCH/HR) = 0.50 AREA-AVERAGED  $A_p$  = 1.00  
 TOTAL AREA(ACRES) = 8.1 PEAK FLOW RATE(CFS) = 6.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.68 FLOW VELOCITY(FEET/SEC.) = 4.42  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13202.00 = 1046.12 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 896.98 DOWNSTREAM(FEET) = 840.27  
FLOW LENGTH(FEET) = 1789.59 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 5.7 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.53  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 6.16  
PIPE TRAVEL TIME(MIN.) = 3.50 Tc(MIN.) = 16.15  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13203.00 = 2835.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13202.00 TO NODE 13203.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 16.15  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.162  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 38.89 0.50 0.731 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.731  
SUBAREA AREA(ACRES) = 38.89 SUBAREA RUNOFF(CFS) = 27.87  
EFFECTIVE AREA(ACRES) = 46.97 AREA-AVERAGED Fm(INCH/HR) = 0.39  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.78  
TOTAL AREA(ACRES) = 47.0 PEAK FLOW RATE(CFS) = 32.68

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 840.27 DOWNSTREAM(FEET) = 782.97  
FLOW LENGTH(FEET) = 992.54 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 11.3 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.14  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 32.68  
PIPE TRAVEL TIME(MIN.) = 0.97 Tc(MIN.) = 17.11  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13204.00 = 3828.25 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13203.00 TO NODE 13204.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 17.11  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.127  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 83.09 0.50 0.645 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645  
SUBAREA AREA(ACRES) = 83.09 SUBAREA RUNOFF(CFS) = 60.15

EFFECTIVE AREA(ACRES) = 130.06 AREA-AVERAGED Fm(INCH/HR) = 0.35  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.69  
TOTAL AREA(ACRES) = 130.1 PEAK FLOW RATE(CFS) = 91.36

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 782.97 DOWNSTREAM(FEET) = 692.52  
FLOW LENGTH(FEET) = 2046.57 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 21.9 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 20.28  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 91.36  
PIPE TRAVEL TIME(MIN.) = 1.68 Tc(MIN.) = 18.79  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13205.00 = 5874.82 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13204.00 TO NODE 13205.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN.) = 18.79  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.066  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 88.51 0.50 0.679 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679  
SUBAREA AREA(ACRES) = 88.51 SUBAREA RUNOFF(CFS) = 57.90  
EFFECTIVE AREA(ACRES) = 218.57 AREA-AVERAGED Fm(INCH/HR) = 0.34  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.69  
TOTAL AREA(ACRES) = 218.6 PEAK FLOW RATE(CFS) = 142.17

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13205.00 TO NODE 13206.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 692.52 DOWNSTREAM(FEET) = 605.24  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2704.69 CHANNEL SLOPE = 0.0323  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.915  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 163.73 0.50 0.858 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 178.17  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.93  
AVERAGE FLOW DEPTH(FEET) = 2.74 TRAVEL TIME(MIN.) = 5.68

Tc(MIN.) = 24.47  
SUBAREA AREA(ACRES) = 163.73 SUBAREA RUNOFF(CFS) = 71.55  
EFFECTIVE AREA(ACRES) = 382.30 AREA-AVERAGED Fm(INCH/HR) = 0.38  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.76  
TOTAL AREA(ACRES) = 382.3 PEAK FLOW RATE(CFS) = 183.87

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.77 FLOW VELOCITY(FEET/SEC.) = 8.01  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13206.00 = 8579.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13206.00 TO NODE 13207.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 605.24 DOWNSTREAM(FEET) = 555.41  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2479.15 CHANNEL SLOPE = 0.0201  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 143.41 0.50 0.888 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.888  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 208.19  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.91  
AVERAGE FLOW DEPTH(FEET) = 3.17 TRAVEL TIME(MIN.) = 5.98  
Tc(MIN.) = 30.45  
SUBAREA AREA(ACRES) = 143.41 SUBAREA RUNOFF(CFS) = 48.50  
EFFECTIVE AREA(ACRES) = 525.71 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.80  
TOTAL AREA(ACRES) = 525.7 PEAK FLOW RATE(CFS) = 199.77

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.12 FLOW VELOCITY(FEET/SEC.) = 6.85  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13207.00 = 11058.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 555.41 DOWNSTREAM(FEET) = 505.65  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1734.55 CHANNEL SLOPE = 0.0287  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.772

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 123.56 0.50 0.858 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 218.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.01  
AVERAGE FLOW DEPTH(FEET) = 3.02 TRAVEL TIME(MIN.) = 3.61  
Tc(MIN.) = 34.06  
SUBAREA AREA(ACRES) = 123.56 SUBAREA RUNOFF(CFS) = 38.12  
EFFECTIVE AREA(ACRES) = 649.27 AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 649.3 PEAK FLOW RATE(CFS) = 215.16

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 3.00 FLOW VELOCITY(FEET/SEC.) = 7.96  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13207.00 TO NODE 13220.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 34.06  
RAINFALL INTENSITY(INCH/HR) = 0.77  
AREA-AVERAGED Fm(INCH/HR) = 0.40  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.81  
EFFECTIVE STREAM AREA(ACRES) = 649.27  
TOTAL STREAM AREA(ACRES) = 649.27  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 215.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13210.00 TO NODE 13211.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 314.51  
ELEVATION DATA: UPSTREAM(FEET) = 949.80 DOWNSTREAM(FEET) = 828.64

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.525  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.709  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 1.96 0.50 1.000 0 8.53  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 2.13  
TOTAL AREA(ACRES) = 1.96 PEAK FLOW RATE(CFS) = 2.13

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13211.00 TO NODE 13212.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 828.64 DOWNSTREAM(FEET) = 767.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 652.49 CHANNEL SLOPE = 0.0930

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.429  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.95	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 7.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.90  
AVERAGE FLOW DEPTH (FEET) = 0.78 TRAVEL TIME (MIN.) = 2.79  
Tc (MIN.) = 11.31  
SUBAREA AREA (ACRES) = 11.95 SUBAREA RUNOFF (CFS) = 9.99  
EFFECTIVE AREA (ACRES) = 13.91 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 13.9 PEAK FLOW RATE (CFS) = 11.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.94 FLOW VELOCITY (FEET/SEC.) = 4.43  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13212.00 = 967.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13212.00 TO NODE 13213.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 767.94 DOWNSTREAM (FEET) = 706.43  
CHANNEL LENGTH THRU SUBAREA (FEET) = 967.91 CHANNEL SLOPE = 0.0635  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.204  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	27.07	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 20.29  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.39  
AVERAGE FLOW DEPTH (FEET) = 1.24 TRAVEL TIME (MIN.) = 3.67  
Tc (MIN.) = 14.98  
SUBAREA AREA (ACRES) = 27.07 SUBAREA RUNOFF (CFS) = 17.15  
EFFECTIVE AREA (ACRES) = 40.98 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 41.0 PEAK FLOW RATE (CFS) = 25.96

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.36 FLOW VELOCITY (FEET/SEC.) = 4.67  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13213.00 = 1934.91 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13213.00 TO NODE 13214.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 706.43 DOWNSTREAM (FEET) = 659.31  
CHANNEL LENGTH THRU SUBAREA (FEET) = 948.11 CHANNEL SLOPE = 0.0497  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.076  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.09	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 30.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.45  
AVERAGE FLOW DEPTH (FEET) = 1.52 TRAVEL TIME (MIN.) = 3.55  
Tc (MIN.) = 18.54  
SUBAREA AREA (ACRES) = 18.09 SUBAREA RUNOFF (CFS) = 9.37  
EFFECTIVE AREA (ACRES) = 59.07 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 59.1 PEAK FLOW RATE (CFS) = 30.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.52 FLOW VELOCITY (FEET/SEC.) = 4.44  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13214.00 = 2883.02 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13214.00 TO NODE 13215.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 659.31 DOWNSTREAM (FEET) = 628.91  
CHANNEL LENGTH THRU SUBAREA (FEET) = 970.24 CHANNEL SLOPE = 0.0313  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.963  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	71.42	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 45.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.12  
AVERAGE FLOW DEPTH (FEET) = 1.92 TRAVEL TIME (MIN.) = 3.93  
Tc (MIN.) = 22.46  
SUBAREA AREA (ACRES) = 71.42 SUBAREA RUNOFF (CFS) = 29.77  
EFFECTIVE AREA (ACRES) = 130.49 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 130.5 PEAK FLOW RATE (CFS) = 54.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.05 FLOW VELOCITY (FEET/SEC.) = 4.32  
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13215.00 = 3853.26 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13215.00 TO NODE 13216.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 628.91 DOWNSTREAM(FEET) = 598.39
CHANNEL LENGTH THRU SUBAREA(FEET) = 922.63 CHANNEL SLOPE = 0.0331
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.889

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 36.33 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.76
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.51
AVERAGE FLOW DEPTH(FEET) = 2.12 TRAVEL TIME(MIN.) = 3.41
Tc(MIN.) = 25.87
SUBAREA AREA(ACRES) = 36.33 SUBAREA RUNOFF(CFS) = 12.71
EFFECTIVE AREA(ACRES) = 166.82 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 166.8 PEAK FLOW RATE(CFS) = 58.34

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.09 FLOW VELOCITY(FEET/SEC.) = 4.47
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13216.00 = 4775.89 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13216.00 TO NODE 13217.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 598.39 DOWNSTREAM(FEET) = 568.48
CHANNEL LENGTH THRU SUBAREA(FEET) = 636.40 CHANNEL SLOPE = 0.0470
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.858

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 42.51 0.50 1.000 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 65.19
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.25
AVERAGE FLOW DEPTH(FEET) = 2.03 TRAVEL TIME(MIN.) = 2.02
Tc(MIN.) = 27.89
SUBAREA AREA(ACRES) = 42.51 SUBAREA RUNOFF(CFS) = 13.69
EFFECTIVE AREA(ACRES) = 209.33 AREA-AVERAGED Fm(INCH/HR) = 0.50
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 209.3 PEAK FLOW RATE(CFS) = 67.42

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.06 FLOW VELOCITY(FEET/SEC.) = 5.28
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13217.00 = 5412.29 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 568.48 DOWNSTREAM(FEET) = 505.65
CHANNEL LENGTH THRU SUBAREA(FEET) = 1896.50 CHANNEL SLOPE = 0.0331
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.766

SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 73.24 0.50 0.951 -
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.951
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.03
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.79
AVERAGE FLOW DEPTH(FEET) = 2.31 TRAVEL TIME(MIN.) = 6.60
Tc(MIN.) = 34.48
SUBAREA AREA(ACRES) = 73.24 SUBAREA RUNOFF(CFS) = 19.16
EFFECTIVE AREA(ACRES) = 282.57 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 282.6 PEAK FLOW RATE(CFS) = 69.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 2.22 FLOW VELOCITY(FEET/SEC.) = 4.67
LONGEST FLOWPATH FROM NODE 13210.00 TO NODE 13220.00 = 7308.79 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13217.00 TO NODE 13220.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 34.48
RAINFALL INTENSITY(INCH/HR) = 0.77
AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99
EFFECTIVE STREAM AREA(ACRES) = 282.57
TOTAL STREAM AREA(ACRES) = 282.57
PEAK FLOW RATE(CFS) AT CONFLUENCE = 69.30

\*\* CONFLUENCE DATA \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 215.16 34.06 0.772 0.50( 0.40) 0.81 649.3 13200.00
2 69.30 34.48 0.766 0.50( 0.49) 0.99 282.6 13210.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 284.46 34.06 0.772 0.50( 0.43) 0.86 928.4 13200.00

2 281.20 34.48 0.766 0.50( 0.43) 0.86 931.8 13210.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 284.46 Tc(MIN.) = 34.06  
EFFECTIVE AREA(ACRES) = 928.40 AREA-AVERAGED Fm(INCH/HR) = 0.43  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
TOTAL AREA(ACRES) = 931.8  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13220.00 = 12793.21 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13220.00 TO NODE 13221.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 505.65 DOWNSTREAM(FEET) = 478.94  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1949.14 CHANNEL SLOPE = 0.0137  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.719

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	108.50	0.50	0.637	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 304.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.17  
AVERAGE FLOW DEPTH(FEET) = 3.52 TRAVEL TIME(MIN.) = 3.98  
Tc(MIN.) = 38.04  
SUBAREA AREA(ACRES) = 108.50 SUBAREA RUNOFF(CFS) = 39.10  
EFFECTIVE AREA(ACRES) = 1036.90 AREA-AVERAGED Fm(INCH/HR) = 0.42  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 1040.3 PEAK FLOW RATE(CFS) = 284.46  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.44 FLOW VELOCITY(FEET/SEC.) = 8.03  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13221.00 = 14742.35 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 478.94 DOWNSTREAM(FEET) = 427.51  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2078.70 CHANNEL SLOPE = 0.0247  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.681

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	87.26	0.50	0.699	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 297.48

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 10.15  
AVERAGE FLOW DEPTH(FEET) = 3.13 TRAVEL TIME(MIN.) = 3.41  
Tc(MIN.) = 41.45  
SUBAREA AREA(ACRES) = 87.26 SUBAREA RUNOFF(CFS) = 26.03  
EFFECTIVE AREA(ACRES) = 1124.16 AREA-AVERAGED Fm(INCH/HR) = 0.41  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83  
TOTAL AREA(ACRES) = 1127.6 PEAK FLOW RATE(CFS) = 284.46  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.08 FLOW VELOCITY(FEET/SEC.) = 10.01  
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 = 16821.05 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1127.6 TC(MIN.) = 41.45  
EFFECTIVE AREA(ACRES) = 1124.16 AREA-AVERAGED Fm(INCH/HR) = 0.41  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.827  
PEAK FLOW RATE(CFS) = 284.46

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE	
1	284.46	41.45	0.681	0.50( 0.41)	0.83	1124.2	13200.00
2	281.20	41.90	0.677	0.50( 0.41)	0.83	1127.6	13210.00

END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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Santa Ana, CA  
92707

-----  
FILE NAME: S33.DAT  
TIME/DATE OF STUDY: 08:27 07/16/2018  
=====

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.641
- 2) 10.00; 1.761
- 3) 15.00; 1.304
- 4) 20.00; 1.115
- 5) 25.00; 0.973
- 6) 30.00; 0.875
- 7) 40.00; 0.747
- 8) 50.00; 0.665
- 9) 60.00; 0.603
- 10) 90.00; 0.500
- 11) 120.00; 0.441
- 12) 180.00; 0.369
- 13) 360.00; 0.271
- 14) 1200.00; 0.119

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S31.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	769.41	39.09	0.50 ( 0.41)	0.81	2485.8	13100.00
2	520.65	70.06	0.50 ( 0.40)	0.81	3771.2	13000.00
3	475.41	73.99	0.50 ( 0.40)	0.81	3796.8	13010.00
TOTAL AREA (ACRES) =						3796.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S32.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	284.46	41.45	0.50 ( 0.41)	0.83	1124.2	13200.00
2	281.20	41.90	0.50 ( 0.41)	0.83	1127.6	13210.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13221.00 TO NODE 13222.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	284.46	41.45	0.50 ( 0.41)	0.83	1124.2	13200.00
2	281.20	41.90	0.50 ( 0.41)	0.83	1127.6	13210.00
TOTAL AREA (ACRES) =						1127.6

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13112.00 TO NODE 13222.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	284.46	41.45	0.735	0.50 ( 0.41)	0.83	1124.2	13200.00
2	281.20	41.90	0.731	0.50 ( 0.41)	0.83	1127.6	13210.00
LONGEST FLOWPATH FROM NODE 13200.00 TO NODE 13222.00 =							16821.05 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (INCH/HR)	Ae (ACRES)	HEADWATER NODE
1	769.41	39.09	0.759	0.50 ( 0.41)	0.81	2485.8	13100.00
2	520.65	70.06	0.568	0.50 ( 0.40)	0.81	3771.2	13000.00

3 475.41 73.99 0.555 0.50( 0.40) 0.81 3796.8 13010.00  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1053.87	39.09	0.759	0.50( 0.41)	0.82	3545.8	13100.00
2	1034.86	41.45	0.735	0.50( 0.41)	0.82	3708.2	13200.00
3	1027.99	41.90	0.731	0.50( 0.41)	0.82	3730.4	13210.00
4	657.55	70.06	0.568	0.50( 0.41)	0.81	4898.8	13000.00
5	600.32	73.99	0.555	0.50( 0.41)	0.81	4924.4	13010.00
TOTAL AREA (ACRES) =							4924.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1053.87 Tc(MIN.) = 39.087  
EFFECTIVE AREA(ACRES) = 3545.82 AREA-AVERAGED Fm(INCH/HR) = 0.41  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.82  
TOTAL AREA(ACRES) = 4924.4  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13222.00 = 32126.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13222.00 TO NODE 13223.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 427.51 DOWNSTREAM(FEET) = 416.40  
CHANNEL LENGTH THRU SUBAREA(FEET) = 864.00 CHANNEL SLOPE = 0.0129  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1053.87  
FLOW VELOCITY(FEET/SEC.) = 8.77 FLOW DEPTH(FEET) = 6.33  
TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 40.73  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1063.66	40.73	0.741	0.50( 0.41)	0.82	3545.8	13100.00
2	1047.43	43.11	0.722	0.50( 0.41)	0.82	3708.2	13200.00
3	1041.11	43.55	0.718	0.50( 0.41)	0.82	3730.4	13210.00
4	686.77	71.90	0.562	0.50( 0.41)	0.81	4898.8	13000.00
5	630.34	75.88	0.548	0.50( 0.41)	0.81	4924.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1063.66 Tc(MIN.) = 40.73  
AREA-AVERAGED Fm(INCH/HR) = 0.41 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 3545.82

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610301U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.57	13.18	0.50( 0.50)	1.00	29.3	30100.00
2	20.45	16.00	0.50( 0.50)	1.00	29.7	30110.00
TOTAL AREA(ACRES) =						29.7

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13223.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1063.66	40.73	0.741	0.50( 0.41)	0.82	3545.8	13100.00
2	1047.43	43.11	0.722	0.50( 0.41)	0.82	3708.2	13200.00
3	1041.11	43.55	0.718	0.50( 0.41)	0.82	3730.4	13210.00
4	686.77	71.90	0.562	0.50( 0.41)	0.81	4898.8	13000.00
5	630.34	75.88	0.548	0.50( 0.41)	0.81	4924.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 =							32990.49 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.57	13.18	1.471	0.50( 0.50)	1.00	29.3	30100.00
2	20.45	16.00	1.266	0.50( 0.50)	1.00	29.7	30110.00
LONGEST FLOWPATH FROM NODE 30110.00 TO NODE 13223.00 =							2058.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1089.23	13.18	1.471	0.50( 0.41)	0.82	1176.4	30100.00
2	1084.11	16.00	1.266	0.50( 0.41)	0.82	1422.6	30110.00
3	1070.09	40.73	0.741	0.50( 0.41)	0.82	3575.5	13100.00
4	1053.34	43.11	0.722	0.50( 0.41)	0.82	3737.9	13200.00
5	1046.92	43.55	0.718	0.50( 0.41)	0.82	3760.0	13210.00
6	688.42	71.90	0.562	0.50( 0.41)	0.81	4928.5	13000.00
7	631.63	75.88	0.548	0.50( 0.41)	0.81	4954.1	13010.00
TOTAL AREA(ACRES) =						4954.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1089.23 Tc(MIN.) = 13.176  
EFFECTIVE AREA(ACRES) = 1176.37 AREA-AVERAGED Fm(INCH/HR) = 0.41  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81  
TOTAL AREA(ACRES) = 4954.1  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13223.00 = 32990.49 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13223.00 TO NODE 13224.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 416.40 DOWNSTREAM(FEET) = 410.60



CHANNEL LENGTH THRU SUBAREA(FEET) = 408.51 CHANNEL SLOPE = 0.0142  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1089.23  
 FLOW VELOCITY(FEET/SEC.) = 9.17 FLOW DEPTH(FEET) = 6.29  
 TRAVEL TIME(MIN.) = 0.74 Tc(MIN.) = 13.92  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1089.23	13.92	1.403	0.50 ( 0.41)	0.82	1176.4	30100.00
2	1084.11	16.74	1.238	0.50 ( 0.41)	0.82	1422.6	30110.00
3	1070.09	41.47	0.735	0.50 ( 0.41)	0.82	3575.5	13100.00
4	1053.34	43.85	0.715	0.50 ( 0.41)	0.82	3737.9	13200.00
5	1046.92	44.30	0.712	0.50 ( 0.41)	0.82	3760.0	13210.00
6	688.42	72.74	0.559	0.50 ( 0.41)	0.81	4928.5	13000.00
7	631.63	76.74	0.546	0.50 ( 0.41)	0.81	4954.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1089.23 Tc(MIN.) = 13.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.41 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.82 EFFECTIVE AREA(ACRES) = 1176.37

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610302U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.54	10.99	0.50 ( 0.50)	1.00	11.9	30210.00
2	12.34	11.32	0.50 ( 0.50)	1.00	12.0	30200.00
TOTAL AREA(ACRES) = 12.0						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13224.00 TO NODE 13224.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1089.23	13.92	1.403	0.50 ( 0.41)	0.82	1176.4	30100.00
2	1084.11	16.74	1.238	0.50 ( 0.41)	0.82	1422.6	30110.00
3	1070.09	41.47	0.735	0.50 ( 0.41)	0.82	3575.5	13100.00
4	1053.34	43.85	0.715	0.50 ( 0.41)	0.82	3737.9	13200.00
5	1046.92	44.30	0.712	0.50 ( 0.41)	0.82	3760.0	13210.00
6	688.42	72.74	0.559	0.50 ( 0.41)	0.81	4928.5	13000.00
7	631.63	76.74	0.546	0.50 ( 0.41)	0.81	4954.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12.54	10.99	1.670	0.50 ( 0.50)	1.00	11.9	30210.00
2	12.34	11.32	1.640	0.50 ( 0.50)	1.00	12.0	30200.00
LONGEST FLOWPATH FROM NODE 30200.00 TO NODE 13224.00 = 1209.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1101.78	10.99	1.670	0.50 ( 0.41)	0.82	941.1	30210.00
2	1101.57	11.32	1.640	0.50 ( 0.41)	0.82	969.1	30200.00
3	1099.00	13.92	1.403	0.50 ( 0.41)	0.82	1188.4	30100.00
4	1092.10	16.74	1.238	0.50 ( 0.41)	0.82	1434.7	30110.00
5	1072.63	41.47	0.735	0.50 ( 0.41)	0.82	3587.5	13100.00
6	1055.67	43.85	0.715	0.50 ( 0.41)	0.82	3750.0	13200.00
7	1049.21	44.30	0.712	0.50 ( 0.41)	0.82	3772.1	13210.00
8	689.06	72.74	0.559	0.50 ( 0.41)	0.81	4940.5	13000.00
9	632.12	76.74	0.546	0.50 ( 0.41)	0.81	4966.1	13010.00
TOTAL AREA(ACRES) = 4966.1							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1101.78 Tc(MIN.) = 10.993  
 EFFECTIVE AREA(ACRES) = 941.07 AREA-AVERAGED Fm(INCH/HR) = 0.41  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.81  
 TOTAL AREA(ACRES) = 4966.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13224.00 = 33399.00 FEET.

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FLOW PROCESS FROM NODE 13224.00 TO NODE 13301.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 410.60 DOWNSTREAM(FEET) = 382.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1260.70 CHANNEL SLOPE = 0.0227

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.496

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.66	0.50	0.998	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.998

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1129.45

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.03

AVERAGE FLOW DEPTH(FEET) = 5.84 TRAVEL TIME(MIN.) = 1.90

Tc(MIN.) = 12.90

SUBAREA AREA(ACRES) = 61.66 SUBAREA RUNOFF(CFS) = 55.33

EFFECTIVE AREA(ACRES) = 1002.73 AREA-AVERAGED Fm(INCH/HR) = 0.42

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.83

TOTAL AREA(ACRES) = 5027.8 PEAK FLOW RATE(CFS) = 1101.78

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.79 FLOW VELOCITY(FEET/SEC.) = 10.97  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1101.78	12.90	1.496	0.50 ( 0.42)	0.83	1002.7	30210.00
2	1101.57	13.23	1.466	0.50 ( 0.42)	0.83	1030.8	30200.00
3	1099.00	15.83	1.273	0.50 ( 0.42)	0.83	1250.1	30100.00
4	1092.10	18.66	1.166	0.50 ( 0.41)	0.83	1496.3	30110.00
5	1072.63	43.40	0.719	0.50 ( 0.41)	0.82	3649.2	13100.00
6	1055.67	45.79	0.700	0.50 ( 0.41)	0.82	3811.6	13200.00
7	1049.21	46.24	0.696	0.50 ( 0.41)	0.82	3833.7	13210.00
8	689.06	74.89	0.552	0.50 ( 0.41)	0.82	5002.2	13000.00
9	632.12	78.94	0.538	0.50 ( 0.41)	0.82	5027.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1101.78 Tc(MIN.) = 12.90  
 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.83 EFFECTIVE AREA(ACRES) = 1002.73

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610303U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	78.52	24.03	0.50 ( 0.50)	1.00	166.2	30300.00
TOTAL AREA(ACRES) = 166.2						

\*\*\*\*\*

FLOW PROCESS FROM NODE 13301.00 TO NODE 13301.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1101.78	12.90	1.496	0.50 ( 0.42)	0.83	1002.7	30210.00
2	1101.57	13.23	1.466	0.50 ( 0.42)	0.83	1030.8	30200.00
3	1099.00	15.83	1.273	0.50 ( 0.42)	0.83	1250.1	30100.00
4	1092.10	18.66	1.166	0.50 ( 0.41)	0.83	1496.3	30110.00
5	1072.63	43.40	0.719	0.50 ( 0.41)	0.82	3649.2	13100.00
6	1055.67	45.79	0.700	0.50 ( 0.41)	0.82	3811.6	13200.00
7	1049.21	46.24	0.696	0.50 ( 0.41)	0.82	3833.7	13210.00
8	689.06	74.89	0.552	0.50 ( 0.41)	0.82	5002.2	13000.00
9	632.12	78.94	0.538	0.50 ( 0.41)	0.82	5027.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	78.52	24.03	1.001	0.50 ( 0.50)	1.00	166.2	30300.00

LONGEST FLOWPATH FROM NODE 30300.00 TO NODE 13301.00 = 6391.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1180.30	12.90	1.496	0.50 ( 0.42)	0.85	1092.0	30210.00
2	1180.09	13.23	1.466	0.50 ( 0.42)	0.85	1122.3	30200.00
3	1177.52	15.83	1.273	0.50 ( 0.42)	0.84	1359.6	30100.00
4	1170.62	18.66	1.166	0.50 ( 0.42)	0.84	1625.4	30110.00
5	1166.39	24.03	1.001	0.50 ( 0.42)	0.84	2129.8	30300.00
6	1106.98	43.40	0.719	0.50 ( 0.41)	0.83	3815.4	13100.00
7	1086.95	45.79	0.700	0.50 ( 0.41)	0.83	3977.8	13200.00
8	1079.90	46.24	0.696	0.50 ( 0.41)	0.83	3999.9	13210.00
9	697.17	74.89	0.552	0.50 ( 0.41)	0.82	5168.4	13000.00
10	638.05	78.94	0.538	0.50 ( 0.41)	0.82	5194.0	13010.00
TOTAL AREA(ACRES) = 5194.0							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1180.30 Tc(MIN.) = 12.898  
 EFFECTIVE AREA(ACRES) = 1091.96 AREA-AVERAGED Fm(INCH/HR) = 0.42  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 5194.0

\*\*\*\*\*

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13301.00 = 34659.70 FEET.

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 382.00 DOWNSTREAM(FEET) = 375.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1141.09 CHANNEL SLOPE = 0.0061  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.278

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	9.42	0.50	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000					

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1183.59  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84  
 AVERAGE FLOW DEPTH(FEET) = 7.60 TRAVEL TIME(MIN.) = 2.78  
 Tc(MIN.) = 15.68  
 SUBAREA AREA(ACRES) = 9.42 SUBAREA RUNOFF(CFS) = 6.60  
 EFFECTIVE AREA(ACRES) = 1101.38 AREA-AVERAGED Fm(INCH/HR) = 0.42  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 5203.4 PEAK FLOW RATE(CFS) = 1180.30  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.59 FLOW VELOCITY(FEET/SEC.) = 6.83  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1180.30	15.68	1.278	0.50 ( 0.42)	0.85	1101.4	30210.00
2	1180.09	16.01	1.266	0.50 ( 0.42)	0.85	1131.7	30200.00

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
3	1177.52	18.61	1.168	0.50( 0.42)	0.84	1369.0	30100.00
4	1170.62	21.44	1.074	0.50( 0.42)	0.84	1634.8	30110.00
5	1166.39	26.82	0.937	0.50( 0.42)	0.84	2139.2	30300.00
6	1106.98	46.23	0.696	0.50( 0.41)	0.83	3824.8	13100.00
7	1086.95	48.63	0.676	0.50( 0.41)	0.83	3987.3	13200.00
8	1079.90	49.09	0.672	0.50( 0.41)	0.83	4009.4	13210.00
9	697.17	78.06	0.541	0.50( 0.41)	0.82	5177.8	13000.00
10	638.05	82.18	0.527	0.50( 0.41)	0.82	5203.4	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1180.30 Tc(MIN.) = 15.68  
 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.85 EFFECTIVE AREA(ACRES) = 1101.38

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13301.00 TO NODE 13302.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610214U.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.93	28.49	0.50( 0.50)	1.00	227.7	21400.00

 TOTAL AREA(ACRES) = 227.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13302.00 TO NODE 13302.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1180.30	15.68	1.278	0.50( 0.42)	0.85	1101.4	30210.00
2	1180.09	16.01	1.266	0.50( 0.42)	0.85	1131.7	30200.00
3	1177.52	18.61	1.168	0.50( 0.42)	0.84	1369.0	30100.00
4	1170.62	21.44	1.074	0.50( 0.42)	0.84	1634.8	30110.00
5	1166.39	26.82	0.937	0.50( 0.42)	0.84	2139.2	30300.00
6	1106.98	46.23	0.696	0.50( 0.41)	0.83	3824.8	13100.00
7	1086.95	48.63	0.676	0.50( 0.41)	0.83	3987.3	13200.00
8	1079.90	49.09	0.672	0.50( 0.41)	0.83	4009.4	13210.00
9	697.17	78.06	0.541	0.50( 0.41)	0.82	5177.8	13000.00
10	638.05	82.18	0.527	0.50( 0.41)	0.82	5203.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.93	28.49	0.905	0.50( 0.50)	1.00	227.7	21400.00

LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 13302.00 = 6708.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1263.23	15.68	1.278	0.50( 0.43)	0.86	1226.7	30210.00
2	1263.02	16.01	1.266	0.50( 0.43)	0.86	1259.7	30200.00
3	1260.46	18.61	1.168	0.50( 0.43)	0.86	1517.7	30100.00
4	1253.55	21.44	1.074	0.50( 0.43)	0.86	1806.2	30110.00
5	1249.33	26.82	0.937	0.50( 0.43)	0.85	2353.5	30300.00
6	1244.20	28.49	0.905	0.50( 0.43)	0.85	2512.1	21400.00
7	1147.15	46.23	0.696	0.50( 0.42)	0.84	4052.5	13100.00
8	1123.09	48.63	0.676	0.50( 0.42)	0.84	4214.9	13200.00
9	1115.26	49.09	0.672	0.50( 0.42)	0.84	4237.0	13210.00
10	705.59	78.06	0.541	0.50( 0.42)	0.83	5405.5	13000.00
11	643.58	82.18	0.527	0.50( 0.41)	0.83	5431.1	13010.00

TOTAL AREA(ACRES) = 5431.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1263.23 Tc(MIN.) = 15.679  
 EFFECTIVE AREA(ACRES) = 1226.67 AREA-AVERAGED Fm(INCH/HR) = 0.43  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 5431.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13302.00 = 35800.79 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13302.00 TO NODE 13303.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 375.00 DOWNSTREAM(FEET) = 355.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2193.96 CHANNEL SLOPE = 0.0091  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1263.23  
 FLOW VELOCITY(FEET/SEC.) = 8.06 FLOW DEPTH(FEET) = 7.23  
 TRAVEL TIME(MIN.) = 4.54 Tc(MIN.) = 20.22  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1263.23	20.22	1.109	0.50( 0.43)	0.86	1226.7	30210.00
2	1263.02	20.55	1.099	0.50( 0.43)	0.86	1259.7	30200.00
3	1260.46	23.15	1.026	0.50( 0.43)	0.86	1517.7	30100.00
4	1253.55	25.99	0.954	0.50( 0.43)	0.86	1806.2	30110.00
5	1249.33	31.36	0.858	0.50( 0.43)	0.85	2353.5	30300.00
6	1244.20	33.04	0.836	0.50( 0.43)	0.85	2512.1	21400.00
7	1147.15	50.88	0.660	0.50( 0.42)	0.84	4052.5	13100.00
8	1123.09	53.30	0.645	0.50( 0.42)	0.84	4214.9	13200.00
9	1115.26	53.76	0.642	0.50( 0.42)	0.84	4237.0	13210.00
10	705.59	83.31	0.523	0.50( 0.42)	0.83	5405.5	13000.00
11	643.58	87.55	0.508	0.50( 0.41)	0.83	5431.1	13010.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 1263.23 Tc(MIN.) = 20.22  
 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.86 EFFECTIVE AREA(ACRES) = 1226.67

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*

FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610213U.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.91	17.13	0.50 ( 0.50)	1.00	98.2	21300.00
TOTAL AREA (ACRES) =			98.2			

\*\*\*\*\*

FLOW PROCESS FROM NODE 13303.00 TO NODE 13303.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1263.23	20.22	1.109	0.50 ( 0.43)	0.86	1226.7	30210.00
2	1263.02	20.55	1.099	0.50 ( 0.43)	0.86	1259.7	30200.00
3	1260.46	23.15	1.026	0.50 ( 0.43)	0.86	1517.7	30100.00
4	1253.55	25.99	0.954	0.50 ( 0.43)	0.86	1806.2	30110.00
5	1249.33	31.36	0.858	0.50 ( 0.43)	0.85	2353.5	30300.00
6	1244.20	33.04	0.836	0.50 ( 0.43)	0.85	2512.1	21400.00
7	1147.15	50.88	0.660	0.50 ( 0.42)	0.84	4052.5	13100.00
8	1123.09	53.30	0.645	0.50 ( 0.42)	0.84	4214.9	13200.00
9	1115.26	53.76	0.642	0.50 ( 0.42)	0.84	4237.0	13210.00
10	705.59	83.31	0.523	0.50 ( 0.42)	0.83	5405.5	13000.00
11	643.58	87.55	0.508	0.50 ( 0.41)	0.83	5431.1	13010.00
LONGEST FLOWPATH FROM NODE			13010.00 TO NODE 13303.00 = 37994.75 FEET.				

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	63.91	17.13	1.223	0.50 ( 0.50)	1.00	98.2	21300.00
LONGEST FLOWPATH FROM NODE			21300.00 TO NODE 13303.00 = 2988.00 FEET.				

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1315.55	17.13	1.223	0.50 ( 0.44)	0.88	1137.8	21300.00
2	1317.02	20.22	1.109	0.50 ( 0.44)	0.87	1324.9	30210.00
3	1315.98	20.55	1.099	0.50 ( 0.44)	0.87	1357.9	30200.00
4	1306.89	23.15	1.026	0.50 ( 0.43)	0.87	1615.9	30100.00
5	1293.62	25.99	0.954	0.50 ( 0.43)	0.86	1904.4	30110.00
6	1280.90	31.36	0.858	0.50 ( 0.43)	0.86	2451.7	30300.00
7	1273.89	33.04	0.836	0.50 ( 0.43)	0.86	2610.4	21400.00
8	1161.23	50.88	0.660	0.50 ( 0.42)	0.84	4150.7	13100.00
9	1135.85	53.30	0.645	0.50 ( 0.42)	0.84	4313.1	13200.00
10	1127.76	53.76	0.642	0.50 ( 0.42)	0.84	4335.2	13210.00

11	707.61	83.31	0.523	0.50 ( 0.42)	0.83	5503.7	13000.00
12	644.30	87.55	0.508	0.50 ( 0.42)	0.83	5529.3	13010.00
TOTAL AREA (ACRES) =			5529.3				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1317.02 Tc (MIN.) = 20.216  
EFFECTIVE AREA (ACRES) = 1324.89 AREA-AVERAGED Fm (INCH/HR) = 0.44  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.88  
TOTAL AREA (ACRES) = 5529.3  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13303.00 = 37994.75 FEET.

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FLOW PROCESS FROM NODE 13303.00 TO NODE 13304.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 355.00 DOWNSTREAM (FEET) = 350.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 925.40 CHANNEL SLOPE = 0.0054  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.043

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	13.84	0.50	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) =			0.50		
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =			1.000		
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) =			1320.40		
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) =			6.70		
AVERAGE FLOW DEPTH (FEET) =			8.11 TRAVEL TIME (MIN.) = 2.30		
Tc (MIN.) =			22.52		
SUBAREA AREA (ACRES) =			13.84 SUBAREA RUNOFF (CFS) = 6.77		
EFFECTIVE AREA (ACRES) =			1338.73 AREA-AVERAGED Fm (INCH/HR) = 0.44		
AREA-AVERAGED Fp (INCH/HR) =			0.50 AREA-AVERAGED Ap = 0.87		
TOTAL AREA (ACRES) =			5543.1 PEAK FLOW RATE (CFS) = 1317.02		

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 8.10 FLOW VELOCITY (FEET/SEC.) = 6.70  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1315.55	19.43	1.136	0.50 ( 0.44)	0.88	1151.7	21300.00
2	1317.02	22.52	1.043	0.50 ( 0.44)	0.87	1338.7	30210.00
3	1315.98	22.85	1.034	0.50 ( 0.44)	0.87	1371.7	30200.00
4	1306.89	25.45	0.964	0.50 ( 0.44)	0.87	1629.8	30100.00
5	1293.62	28.30	0.908	0.50 ( 0.43)	0.87	1918.2	30110.00
6	1280.90	33.68	0.828	0.50 ( 0.43)	0.86	2465.6	30300.00
7	1273.89	35.36	0.806	0.50 ( 0.43)	0.86	2624.2	21400.00
8	1161.23	53.25	0.645	0.50 ( 0.42)	0.84	4164.5	13100.00
9	1135.85	55.69	0.630	0.50 ( 0.42)	0.84	4327.0	13200.00
10	1127.76	56.16	0.627	0.50 ( 0.42)	0.84	4349.1	13210.00
11	707.61	86.00	0.514	0.50 ( 0.42)	0.83	5517.5	13000.00
12	644.30	90.30	0.499	0.50 ( 0.42)	0.83	5543.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1317.02 Tc(MIN.) = 22.52  
 AREA-AVERAGED Fm(INCH/HR) = 0.44 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.87 EFFECTIVE AREA(ACRES) = 1338.73

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610304U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	83.29	21.61	0.50( 0.50)	1.00	162.6	30410.00
2	68.16	27.98	0.50( 0.50)	1.00	182.7	30400.00
TOTAL AREA(ACRES) =						182.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13304.00 TO NODE 13304.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1315.55	19.43	1.136	0.50( 0.44)	0.88	1151.7	21300.00
2	1317.02	22.52	1.043	0.50( 0.44)	0.87	1338.7	30210.00
3	1315.98	22.85	1.034	0.50( 0.44)	0.87	1371.7	30200.00
4	1306.89	25.45	0.964	0.50( 0.44)	0.87	1629.8	30100.00
5	1293.62	28.30	0.908	0.50( 0.43)	0.87	1918.2	30110.00
6	1280.90	33.68	0.828	0.50( 0.43)	0.86	2465.6	30300.00
7	1273.89	35.36	0.806	0.50( 0.43)	0.86	2624.2	21400.00
8	1161.23	53.25	0.645	0.50( 0.42)	0.84	4164.5	13100.00
9	1135.85	55.69	0.630	0.50( 0.42)	0.84	4327.0	13200.00
10	1127.76	56.16	0.627	0.50( 0.42)	0.84	4349.1	13210.00
11	707.61	86.00	0.514	0.50( 0.42)	0.83	5517.5	13000.00
12	644.30	90.30	0.499	0.50( 0.42)	0.83	5543.1	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 =							38920.15 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	83.29	21.61	1.069	0.50( 0.50)	1.00	162.6	30410.00
2	68.16	27.98	0.915	0.50( 0.50)	1.00	182.7	30400.00
LONGEST FLOWPATH FROM NODE 30400.00 TO NODE 13304.00 =							5899.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1398.84	19.43	1.136	0.50( 0.45)	0.89	1297.9	21300.00
2	1399.87	21.61	1.069	0.50( 0.44)	0.89	1446.3	30410.00

3	1398.15	22.52	1.043	0.50( 0.44)	0.89	1504.2	30210.00
4	1396.33	22.85	1.034	0.50( 0.44)	0.89	1538.2	30200.00
5	1381.04	25.45	0.964	0.50( 0.44)	0.88	1804.5	30100.00
6	1363.29	27.98	0.915	0.50( 0.44)	0.88	2068.3	30400.00
7	1360.75	28.30	0.908	0.50( 0.44)	0.88	2100.9	30110.00
8	1334.79	33.68	0.828	0.50( 0.44)	0.87	2648.3	30300.00
9	1324.24	35.36	0.806	0.50( 0.43)	0.87	2806.9	21400.00
10	1185.02	53.25	0.645	0.50( 0.42)	0.85	4347.2	13100.00
11	1157.15	55.69	0.630	0.50( 0.42)	0.85	4509.7	13200.00
12	1148.59	56.16	0.627	0.50( 0.42)	0.85	4531.8	13210.00
13	709.83	86.00	0.514	0.50( 0.42)	0.84	5700.2	13000.00
14	644.30	90.30	0.499	0.50( 0.42)	0.84	5725.8	13010.00
TOTAL AREA(ACRES) =						5725.8	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1399.87 Tc(MIN.) = 21.611  
 EFFECTIVE AREA(ACRES) = 1446.33 AREA-AVERAGED Fm(INCH/HR) = 0.44  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.84  
 TOTAL AREA(ACRES) = 5725.8  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13304.00 = 38920.15 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13304.00 TO NODE 13305.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 350.00 DOWNSTREAM(FEET) = 315.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2966.27 CHANNEL SLOPE = 0.0118  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.933  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCSSOIL AREA Fp Ap SCSS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 27.39 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1405.21  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.12  
 AVERAGE FLOW DEPTH(FEET) = 7.17 TRAVEL TIME(MIN.) = 5.42  
 Tc(MIN.) = 27.03  
 SUBAREA AREA(ACRES) = 27.39 SUBAREA RUNOFF(CFS) = 10.67  
 EFFECTIVE AREA(ACRES) = 1473.72 AREA-AVERAGED Fm(INCH/HR) = 0.45  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.89  
 TOTAL AREA(ACRES) = 5753.2 PEAK FLOW RATE(CFS) = 1399.87  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 7.15 FLOW VELOCITY(FEET/SEC.) = 9.12  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1398.84	24.86	0.977	0.50( 0.45)	0.89	1325.3	21300.00
2	1399.87	27.03	0.933	0.50( 0.45)	0.89	1473.7	30410.00
3	1398.15	27.94	0.915	0.50( 0.45)	0.89	1531.6	30210.00

4	1396.33	28.27	0.909	0.50 ( 0.45)	0.89	1565.6	30200.00
5	1381.04	30.89	0.864	0.50 ( 0.44)	0.88	1831.9	30100.00
6	1363.29	33.43	0.831	0.50 ( 0.44)	0.88	2095.7	30400.00
7	1360.75	33.75	0.827	0.50 ( 0.44)	0.88	2128.3	30110.00
8	1334.79	39.17	0.758	0.50 ( 0.44)	0.87	2675.7	30300.00
9	1324.24	40.86	0.740	0.50 ( 0.44)	0.87	2834.3	21400.00
10	1185.02	58.90	0.610	0.50 ( 0.43)	0.85	4374.6	13100.00
11	1157.15	61.38	0.598	0.50 ( 0.42)	0.85	4537.1	13200.00
12	1148.59	61.86	0.597	0.50 ( 0.42)	0.85	4559.2	13210.00
13	709.83	92.43	0.495	0.50 ( 0.42)	0.84	5727.6	13000.00
14	644.30	96.90	0.486	0.50 ( 0.42)	0.84	5753.2	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1399.87 Tc(MIN.) = 27.03  
 AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.89 EFFECTIVE AREA(ACRES) = 1473.72

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610305U.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	219.84	26.73	0.50 ( 0.50)	1.00	537.7	30520.00
2	213.51	28.57	0.50 ( 0.50)	1.00	563.6	30540.00
3	201.19	30.30	0.50 ( 0.50)	1.00	575.3	30510.00
4	186.31	32.28	0.50 ( 0.50)	1.00	582.8	30500.00
TOTAL AREA(ACRES) =						582.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1398.84	24.86	0.977	0.50 ( 0.45)	0.89	1325.3	21300.00
2	1399.87	27.03	0.933	0.50 ( 0.45)	0.89	1473.7	30410.00
3	1398.15	27.94	0.915	0.50 ( 0.45)	0.89	1531.6	30210.00
4	1396.33	28.27	0.909	0.50 ( 0.45)	0.89	1565.6	30200.00
5	1381.04	30.89	0.864	0.50 ( 0.44)	0.88	1831.9	30100.00
6	1363.29	33.43	0.831	0.50 ( 0.44)	0.88	2095.7	30400.00
7	1360.75	33.75	0.827	0.50 ( 0.44)	0.88	2128.3	30110.00
8	1334.79	39.17	0.758	0.50 ( 0.44)	0.87	2675.7	30300.00
9	1324.24	40.86	0.740	0.50 ( 0.44)	0.87	2834.3	21400.00
10	1185.02	58.90	0.610	0.50 ( 0.43)	0.85	4374.6	13100.00
11	1157.15	61.38	0.598	0.50 ( 0.42)	0.85	4537.1	13200.00
12	1148.59	61.86	0.597	0.50 ( 0.42)	0.85	4559.2	13210.00

13	709.83	92.43	0.495	0.50 ( 0.42)	0.84	5727.6	13000.00
14	644.30	96.90	0.486	0.50 ( 0.42)	0.84	5753.2	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	219.84	26.73	0.939	0.50 ( 0.50)	1.00	537.7	30520.00
2	213.51	28.57	0.903	0.50 ( 0.50)	1.00	563.6	30540.00
3	201.19	30.30	0.871	0.50 ( 0.50)	1.00	575.3	30510.00
4	186.31	32.28	0.846	0.50 ( 0.50)	1.00	582.8	30500.00
LONGEST FLOWPATH FROM NODE 30500.00 TO NODE 13305.00 =							9458.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1618.68	24.86	0.977	0.50 ( 0.46)	0.92	1825.3	21300.00
2	1619.57	26.73	0.939	0.50 ( 0.46)	0.92	1990.7	30520.00
3	1618.67	27.03	0.933	0.50 ( 0.46)	0.92	2015.7	30410.00
4	1613.83	27.94	0.915	0.50 ( 0.46)	0.92	2086.3	30210.00
5	1610.86	28.27	0.909	0.50 ( 0.46)	0.92	2125.1	30200.00
6	1608.12	28.57	0.903	0.50 ( 0.46)	0.92	2159.2	30540.00
7	1585.67	30.30	0.871	0.50 ( 0.46)	0.91	2347.3	30510.00
8	1577.79	30.89	0.864	0.50 ( 0.46)	0.91	2409.4	30100.00
9	1557.64	32.28	0.846	0.50 ( 0.45)	0.91	2559.0	30500.00
10	1541.67	33.43	0.831	0.50 ( 0.45)	0.91	2678.5	30400.00
11	1536.92	33.75	0.827	0.50 ( 0.45)	0.90	2711.2	30110.00
12	1473.57	39.17	0.758	0.50 ( 0.45)	0.90	3258.5	30300.00
13	1453.50	40.86	0.740	0.50 ( 0.45)	0.89	3417.1	21400.00
14	1244.10	58.90	0.610	0.50 ( 0.43)	0.87	4957.5	13100.00
15	1210.02	61.38	0.598	0.50 ( 0.43)	0.87	5119.9	13200.00
16	1200.57	61.86	0.597	0.50 ( 0.43)	0.87	5142.0	13210.00
17	709.83	92.43	0.495	0.50 ( 0.43)	0.85	6310.5	13000.00
18	644.30	96.90	0.486	0.50 ( 0.43)	0.85	6336.1	13010.00
TOTAL AREA(ACRES) =						6336.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1619.57 Tc(MIN.) = 26.729  
 EFFECTIVE AREA(ACRES) = 1990.71 AREA-AVERAGED Fm(INCH/HR) = 0.46  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.87  
 TOTAL AREA(ACRES) = 6336.1  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.00 = 41886.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.00 TO NODE 13305.20 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 315.00 DOWNSTREAM(FEET) = 284.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1317.91 CHANNEL SLOPE = 0.0235  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1619.57  
 FLOW VELOCITY(FEET/SEC.) = 12.24 FLOW DEPTH(FEET) = 6.64  
 TRAVEL TIME(MIN.) = 1.79 Tc(MIN.) = 28.52  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1618.68	26.65	0.941	0.50 ( 0.46)	0.92	1825.3	21300.00
2	1619.57	28.52	0.904	0.50 ( 0.46)	0.92	1990.7	30520.00
3	1618.67	28.83	0.898	0.50 ( 0.46)	0.92	2015.7	30410.00
4	1613.83	29.73	0.880	0.50 ( 0.46)	0.92	2086.3	30210.00
5	1610.86	30.07	0.874	0.50 ( 0.46)	0.92	2125.1	30200.00
6	1608.12	30.37	0.870	0.50 ( 0.46)	0.92	2159.2	30540.00
7	1585.67	32.11	0.848	0.50 ( 0.46)	0.91	2347.3	30510.00
8	1577.79	32.70	0.840	0.50 ( 0.46)	0.91	2409.4	30100.00
9	1557.64	34.09	0.823	0.50 ( 0.45)	0.91	2559.0	30500.00
10	1541.67	35.25	0.808	0.50 ( 0.45)	0.91	2678.5	30400.00
11	1536.92	35.57	0.804	0.50 ( 0.45)	0.90	2711.2	30110.00
12	1473.57	41.01	0.739	0.50 ( 0.45)	0.90	3258.5	30300.00
13	1453.50	42.70	0.725	0.50 ( 0.45)	0.89	3417.1	21400.00
14	1244.10	60.82	0.600	0.50 ( 0.43)	0.87	4957.5	13100.00
15	1210.02	63.31	0.592	0.50 ( 0.43)	0.87	5119.9	13200.00
16	1200.57	63.79	0.590	0.50 ( 0.43)	0.87	5142.0	13210.00
17	709.83	94.64	0.491	0.50 ( 0.43)	0.85	6310.5	13000.00
18	644.30	99.16	0.482	0.50 ( 0.43)	0.85	6336.1	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1619.57 Tc(MIN.) = 28.52  
 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.92 EFFECTIVE AREA(ACRES) = 1990.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610306U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.64	20.66	0.50 ( 0.50)	1.00	40.4	30600.00
TOTAL AREA(ACRES) =		40.4				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.20 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1618.68	26.65	0.941	0.50 ( 0.46)	0.92	1825.3	21300.00
2	1619.57	28.52	0.904	0.50 ( 0.46)	0.92	1990.7	30520.00
3	1618.67	28.83	0.898	0.50 ( 0.46)	0.92	2015.7	30410.00
4	1613.83	29.73	0.880	0.50 ( 0.46)	0.92	2086.3	30210.00
5	1610.86	30.07	0.874	0.50 ( 0.46)	0.92	2125.1	30200.00

6	1608.12	30.37	0.870	0.50 ( 0.46)	0.92	2159.2	30540.00
7	1585.67	32.11	0.848	0.50 ( 0.46)	0.91	2347.3	30510.00
8	1577.79	32.70	0.840	0.50 ( 0.46)	0.91	2409.4	30100.00
9	1557.64	34.09	0.823	0.50 ( 0.45)	0.91	2559.0	30500.00
10	1541.67	35.25	0.808	0.50 ( 0.45)	0.91	2678.5	30400.00
11	1536.92	35.57	0.804	0.50 ( 0.45)	0.90	2711.2	30110.00
12	1473.57	41.01	0.739	0.50 ( 0.45)	0.90	3258.5	30300.00
13	1453.50	42.70	0.725	0.50 ( 0.45)	0.89	3417.1	21400.00
14	1244.10	60.82	0.600	0.50 ( 0.43)	0.87	4957.5	13100.00
15	1210.02	63.31	0.592	0.50 ( 0.43)	0.87	5119.9	13200.00
16	1200.57	63.79	0.590	0.50 ( 0.43)	0.87	5142.0	13210.00
17	709.83	94.64	0.491	0.50 ( 0.43)	0.85	6310.5	13000.00
18	644.30	99.16	0.482	0.50 ( 0.43)	0.85	6336.1	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	21.64	20.66	1.096	0.50 ( 0.50)	1.00	40.4	30600.00

LONGEST FLOWPATH FROM NODE 30600.00 TO NODE 13305.20 = 2948.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	20.66	1.096	0.50 ( 0.46)	0.92	1455.6	30600.00
2	1634.67	26.65	0.941	0.50 ( 0.46)	0.92	1865.6	21300.00
3	1634.23	28.52	0.904	0.50 ( 0.46)	0.92	2031.1	30520.00
4	1633.12	28.83	0.898	0.50 ( 0.46)	0.92	2056.0	30410.00
5	1627.63	29.73	0.880	0.50 ( 0.46)	0.92	2126.7	30210.00
6	1624.44	30.07	0.874	0.50 ( 0.46)	0.92	2165.4	30200.00
7	1621.56	30.37	0.870	0.50 ( 0.46)	0.92	2199.5	30540.00
8	1598.30	32.11	0.848	0.50 ( 0.46)	0.91	2387.6	30510.00
9	1590.15	32.70	0.840	0.50 ( 0.46)	0.91	2449.8	30100.00
10	1569.35	34.09	0.823	0.50 ( 0.46)	0.91	2599.4	30500.00
11	1552.84	35.25	0.808	0.50 ( 0.45)	0.91	2718.9	30400.00
12	1547.95	35.57	0.804	0.50 ( 0.45)	0.91	2751.5	30110.00
13	1482.23	41.01	0.739	0.50 ( 0.45)	0.90	3298.8	30300.00
14	1461.66	42.70	0.725	0.50 ( 0.45)	0.89	3457.5	21400.00
15	1247.73	60.82	0.600	0.50 ( 0.43)	0.87	4997.8	13100.00
16	1213.34	63.31	0.592	0.50 ( 0.43)	0.87	5160.3	13200.00
17	1203.83	63.79	0.590	0.50 ( 0.43)	0.87	5182.4	13210.00
18	709.83	94.64	0.491	0.50 ( 0.43)	0.86	6350.8	13000.00
19	644.30	99.16	0.482	0.50 ( 0.43)	0.85	6376.4	13010.00
TOTAL AREA(ACRES) =		6376.4					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1640.32 Tc(MIN.) = 20.665  
 EFFECTIVE AREA(ACRES) = 1455.62 AREA-AVERAGED Fm(INCH/HR) = 0.46  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.85  
 TOTAL AREA(ACRES) = 6376.4  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.20 = 43204.33 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.20 TO NODE 13305.40 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 284.00 DOWNSTREAM(FEET) = 274.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 826.37 CHANNEL SLOPE = 0.0121  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1640.32  
 FLOW VELOCITY(FEET/SEC.) = 9.57 FLOW DEPTH(FEET) = 7.56  
 TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 22.10  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	22.10	1.055	0.50( 0.46)	0.92	1455.6	30600.00
2	1634.67	28.09	0.912	0.50( 0.46)	0.92	1865.6	21300.00
3	1634.23	29.96	0.876	0.50( 0.46)	0.92	2031.1	30520.00
4	1633.12	30.27	0.872	0.50( 0.46)	0.92	2056.0	30410.00
5	1627.63	31.18	0.860	0.50( 0.46)	0.92	2126.7	30210.00
6	1624.44	31.51	0.856	0.50( 0.46)	0.92	2165.4	30200.00
7	1621.56	31.81	0.852	0.50( 0.46)	0.92	2199.5	30540.00
8	1598.30	33.55	0.830	0.50( 0.46)	0.91	2387.6	30510.00
9	1590.15	34.15	0.822	0.50( 0.46)	0.91	2449.8	30100.00
10	1569.35	35.55	0.804	0.50( 0.46)	0.91	2599.4	30500.00
11	1552.84	36.71	0.789	0.50( 0.45)	0.91	2718.9	30400.00
12	1547.95	37.03	0.785	0.50( 0.45)	0.91	2751.5	30110.00
13	1482.23	42.48	0.727	0.50( 0.45)	0.90	3298.8	30300.00
14	1461.66	44.18	0.713	0.50( 0.45)	0.89	3457.5	21400.00
15	1247.73	62.36	0.595	0.50( 0.43)	0.87	4997.8	13100.00
16	1213.34	64.86	0.586	0.50( 0.43)	0.87	5160.3	13200.00
17	1203.83	65.35	0.585	0.50( 0.43)	0.87	5182.4	13210.00
18	709.83	96.41	0.487	0.50( 0.43)	0.86	6350.8	13000.00
19	644.30	100.97	0.478	0.50( 0.43)	0.85	6376.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1640.32 Tc(MIN.) = 22.10  
 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.92 EFFECTIVE AREA(ACRES) = 1455.62

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610307U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.86	20.55	0.50( 0.50)	1.00	98.0	30700.00
TOTAL AREA(ACRES) =		98.0				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.40 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\*\*\*\*  
 \*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1640.32	22.10	1.055	0.50( 0.46)	0.92	1455.6	30600.00
2	1634.67	28.09	0.912	0.50( 0.46)	0.92	1865.6	21300.00
3	1634.23	29.96	0.876	0.50( 0.46)	0.92	2031.1	30520.00
4	1633.12	30.27	0.872	0.50( 0.46)	0.92	2056.0	30410.00
5	1627.63	31.18	0.860	0.50( 0.46)	0.92	2126.7	30210.00
6	1624.44	31.51	0.856	0.50( 0.46)	0.92	2165.4	30200.00
7	1621.56	31.81	0.852	0.50( 0.46)	0.92	2199.5	30540.00
8	1598.30	33.55	0.830	0.50( 0.46)	0.91	2387.6	30510.00
9	1590.15	34.15	0.822	0.50( 0.46)	0.91	2449.8	30100.00
10	1569.35	35.55	0.804	0.50( 0.46)	0.91	2599.4	30500.00
11	1552.84	36.71	0.789	0.50( 0.45)	0.91	2718.9	30400.00
12	1547.95	37.03	0.785	0.50( 0.45)	0.91	2751.5	30110.00
13	1482.23	42.48	0.727	0.50( 0.45)	0.90	3298.8	30300.00
14	1461.66	44.18	0.713	0.50( 0.45)	0.89	3457.5	21400.00
15	1247.73	62.36	0.595	0.50( 0.43)	0.87	4997.8	13100.00
16	1213.34	64.86	0.586	0.50( 0.43)	0.87	5160.3	13200.00
17	1203.83	65.35	0.585	0.50( 0.43)	0.87	5182.4	13210.00
18	709.83	96.41	0.487	0.50( 0.43)	0.86	6350.8	13000.00
19	644.30	100.97	0.478	0.50( 0.43)	0.85	6376.4	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	52.86	20.55	1.099	0.50( 0.50)	1.00	98.0	30700.00

LONGEST FLOWPATH FROM NODE 30700.00 TO NODE 13305.40 = 5192.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	20.55	1.099	0.50( 0.46)	0.93	1451.2	30700.00
2	1689.28	22.10	1.055	0.50( 0.46)	0.93	1553.6	30600.00
3	1671.03	28.09	0.912	0.50( 0.46)	0.93	1963.6	21300.00
4	1667.35	29.96	0.876	0.50( 0.46)	0.93	2129.1	30520.00
5	1665.87	30.27	0.872	0.50( 0.46)	0.93	2154.0	30410.00
6	1659.36	31.18	0.860	0.50( 0.46)	0.92	2224.7	30210.00
7	1655.79	31.51	0.856	0.50( 0.46)	0.92	2263.4	30200.00
8	1652.58	31.81	0.852	0.50( 0.46)	0.92	2297.5	30540.00
9	1627.35	33.55	0.830	0.50( 0.46)	0.92	2485.6	30510.00
10	1618.52	34.15	0.822	0.50( 0.46)	0.92	2547.8	30100.00
11	1596.14	35.55	0.804	0.50( 0.46)	0.91	2697.4	30500.00
12	1578.33	36.71	0.789	0.50( 0.46)	0.91	2816.9	30400.00
13	1573.07	37.03	0.785	0.50( 0.45)	0.91	2849.5	30110.00
14	1502.21	42.48	0.727	0.50( 0.45)	0.90	3396.9	30300.00
15	1480.41	44.18	0.713	0.50( 0.45)	0.90	3555.5	21400.00
16	1256.08	62.36	0.595	0.50( 0.44)	0.87	5095.8	13100.00
17	1220.94	64.86	0.586	0.50( 0.43)	0.87	5258.3	13200.00
18	1211.28	65.35	0.585	0.50( 0.43)	0.87	5280.4	13210.00
19	709.83	96.41	0.487	0.50( 0.43)	0.86	6448.8	13000.00
20	644.30	100.97	0.478	0.50( 0.43)	0.86	6474.4	13010.00
TOTAL AREA(ACRES) =		6474.4					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:



PEAK FLOW RATE(CFS) = 1691.35 Tc(MIN.) = 20.548  
 EFFECTIVE AREA(ACRES) = 1451.16 AREA-AVERAGED Fm(INCH/HR) = 0.46  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 6474.4  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.40 = 44030.70 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.40 TO NODE 13305.60 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
 ELEVATION DATA: UPSTREAM(FEET) = 274.00 DOWNSTREAM(FEET) = 258.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 733.85 CHANNEL SLOPE = 0.0218  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 1691.35  
 FLOW VELOCITY(FEET/SEC.) = 12.03 FLOW DEPTH(FEET) = 6.85  
 TRAVEL TIME(MIN.) = 1.02 Tc(MIN.) = 21.56  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	21.56	1.071	0.50( 0.46)	0.93	1451.2	30700.00
2	1689.28	23.12	1.026	0.50( 0.46)	0.93	1553.6	30600.00
3	1671.03	29.11	0.892	0.50( 0.46)	0.93	1963.6	21300.00
4	1667.35	30.98	0.862	0.50( 0.46)	0.93	2129.1	30520.00
5	1665.87	31.29	0.859	0.50( 0.46)	0.93	2154.0	30410.00
6	1659.36	32.20	0.847	0.50( 0.46)	0.92	2224.7	30210.00
7	1655.79	32.53	0.843	0.50( 0.46)	0.92	2263.4	30200.00
8	1652.58	32.83	0.839	0.50( 0.46)	0.92	2297.5	30540.00
9	1627.35	34.58	0.816	0.50( 0.46)	0.92	2485.6	30510.00
10	1618.52	35.18	0.809	0.50( 0.46)	0.92	2547.8	30100.00
11	1596.14	36.58	0.791	0.50( 0.46)	0.91	2697.4	30500.00
12	1578.33	37.74	0.776	0.50( 0.46)	0.91	2816.9	30400.00
13	1573.07	38.07	0.772	0.50( 0.45)	0.91	2849.5	30110.00
14	1502.21	43.53	0.718	0.50( 0.45)	0.90	3396.9	30300.00
15	1480.41	45.23	0.704	0.50( 0.45)	0.90	3555.5	21400.00
16	1256.08	63.46	0.591	0.50( 0.44)	0.87	5095.8	13100.00
17	1220.94	65.96	0.583	0.50( 0.43)	0.87	5258.3	13200.00
18	1211.28	66.45	0.581	0.50( 0.43)	0.87	5280.4	13210.00
19	709.83	97.67	0.485	0.50( 0.43)	0.86	6448.8	13000.00
20	644.30	102.27	0.476	0.50( 0.43)	0.86	6474.4	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1691.35 Tc(MIN.) = 21.56  
 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA(ACRES) = 1451.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 1 <<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 1 <<<<

PEAK FLOWRATE TABLE FILE NAME: 0610308U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.91	19.53	0.50( 0.50)	1.00	64.8	30800.00
TOTAL AREA(ACRES) = 64.8						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.60 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1691.35	21.56	1.071	0.50( 0.46)	0.93	1451.2	30700.00
2	1689.28	23.12	1.026	0.50( 0.46)	0.93	1553.6	30600.00
3	1671.03	29.11	0.892	0.50( 0.46)	0.93	1963.6	21300.00
4	1667.35	30.98	0.862	0.50( 0.46)	0.93	2129.1	30520.00
5	1665.87	31.29	0.859	0.50( 0.46)	0.93	2154.0	30410.00
6	1659.36	32.20	0.847	0.50( 0.46)	0.92	2224.7	30210.00
7	1655.79	32.53	0.843	0.50( 0.46)	0.92	2263.4	30200.00
8	1652.58	32.83	0.839	0.50( 0.46)	0.92	2297.5	30540.00
9	1627.35	34.58	0.816	0.50( 0.46)	0.92	2485.6	30510.00
10	1618.52	35.18	0.809	0.50( 0.46)	0.92	2547.8	30100.00
11	1596.14	36.58	0.791	0.50( 0.46)	0.91	2697.4	30500.00
12	1578.33	37.74	0.776	0.50( 0.46)	0.91	2816.9	30400.00
13	1573.07	38.07	0.772	0.50( 0.45)	0.91	2849.5	30110.00
14	1502.21	43.53	0.718	0.50( 0.45)	0.90	3396.9	30300.00
15	1480.41	45.23	0.704	0.50( 0.45)	0.90	3555.5	21400.00
16	1256.08	63.46	0.591	0.50( 0.44)	0.87	5095.8	13100.00
17	1220.94	65.96	0.583	0.50( 0.43)	0.87	5258.3	13200.00
18	1211.28	66.45	0.581	0.50( 0.43)	0.87	5280.4	13210.00
19	709.83	97.67	0.485	0.50( 0.43)	0.86	6448.8	13000.00
20	644.30	102.27	0.476	0.50( 0.43)	0.86	6474.4	13010.00
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	36.91	19.53	1.133	0.50( 0.50)	1.00	64.8	30800.00
LONGEST FLOWPATH FROM NODE 30800.00 TO NODE 13305.60 = 4165.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	19.53	1.133	0.50( 0.47)	0.93	1378.9	30800.00
2	1724.62	21.56	1.071	0.50( 0.47)	0.93	1516.0	30700.00
3	1719.98	23.12	1.026	0.50( 0.47)	0.93	1618.4	30600.00
4	1693.91	29.11	0.892	0.50( 0.47)	0.93	2028.5	21300.00
5	1688.48	30.98	0.862	0.50( 0.46)	0.93	2193.9	30520.00
6	1686.78	31.29	0.859	0.50( 0.46)	0.93	2218.9	30410.00
7	1679.59	32.20	0.847	0.50( 0.46)	0.93	2289.5	30210.00
8	1675.76	32.53	0.843	0.50( 0.46)	0.93	2328.3	30200.00
9	1672.33	32.83	0.839	0.50( 0.46)	0.93	2362.4	30540.00

10	1645.79	34.58	0.816	0.50	(0.46)	0.92	2550.4	30510.00
11	1636.52	35.18	0.809	0.50	(0.46)	0.92	2612.6	30100.00
12	1613.09	36.58	0.791	0.50	(0.46)	0.92	2762.2	30500.00
13	1594.42	37.74	0.776	0.50	(0.46)	0.91	2881.7	30400.00
14	1588.91	38.07	0.772	0.50	(0.46)	0.91	2914.4	30110.00
15	1514.91	43.53	0.718	0.50	(0.45)	0.90	3461.7	30300.00
16	1492.30	45.23	0.704	0.50	(0.45)	0.90	3620.3	21400.00
17	1261.39	63.46	0.591	0.50	(0.44)	0.87	5160.7	13100.00
18	1225.74	65.96	0.583	0.50	(0.44)	0.87	5323.1	13200.00
19	1215.98	66.45	0.581	0.50	(0.44)	0.87	5345.2	13210.00
20	709.83	97.67	0.485	0.50	(0.43)	0.86	6513.6	13000.00
21	644.30	102.27	0.476	0.50	(0.43)	0.86	6539.3	13010.00

TOTAL AREA (ACRES) = 6539.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1726.01 Tc (MIN.) = 19.527  
EFFECTIVE AREA (ACRES) = 1378.90 AREA-AVERAGED Fm (INCH/HR) = 0.47  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
TOTAL AREA (ACRES) = 6539.3  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.60 = 44764.55 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.60 TO NODE 13305.80 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
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ELEVATION DATA: UPSTREAM (FEET) = 258.00 DOWNSTREAM (FEET) = 254.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 947.16 CHANNEL SLOPE = 0.0042  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 1726.01  
FLOW VELOCITY (FEET/SEC.) = 6.53 FLOW DEPTH (FEET) = 9.39  
TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 21.95  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	21.95	1.060	0.50 (0.47)	0.93	1378.9	30800.00
2	1724.62	23.98	1.002	0.50 (0.47)	0.93	1516.0	30700.00
3	1719.98	25.54	0.962	0.50 (0.47)	0.93	1618.4	30600.00
4	1693.91	31.54	0.855	0.50 (0.47)	0.93	2028.5	21300.00
5	1688.48	33.41	0.831	0.50 (0.46)	0.93	2193.9	30520.00
6	1686.78	33.72	0.827	0.50 (0.46)	0.93	2218.9	30410.00
7	1679.59	34.63	0.816	0.50 (0.46)	0.93	2289.5	30210.00
8	1675.76	34.97	0.811	0.50 (0.46)	0.93	2328.3	30200.00
9	1672.33	35.27	0.808	0.50 (0.46)	0.93	2362.4	30540.00
10	1645.79	37.03	0.785	0.50 (0.46)	0.92	2550.4	30510.00
11	1636.52	37.63	0.777	0.50 (0.46)	0.92	2612.6	30100.00
12	1613.09	39.04	0.759	0.50 (0.46)	0.92	2762.2	30500.00
13	1594.42	40.20	0.745	0.50 (0.46)	0.91	2881.7	30400.00
14	1588.91	40.53	0.743	0.50 (0.46)	0.91	2914.4	30110.00
15	1514.91	46.03	0.698	0.50 (0.45)	0.90	3461.7	30300.00
16	1492.30	47.74	0.684	0.50 (0.45)	0.90	3620.3	21400.00
17	1261.39	66.07	0.582	0.50 (0.44)	0.87	5160.7	13100.00
18	1225.74	68.59	0.573	0.50 (0.44)	0.87	5323.1	13200.00
19	1215.98	69.09	0.572	0.50 (0.44)	0.87	5345.2	13210.00

20	709.83	100.69	0.479	0.50	(0.43)	0.86	6513.6	13000.00
21	644.30	105.36	0.470	0.50	(0.43)	0.86	6539.3	13010.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE (CFS) = 1726.01 Tc (MIN.) = 21.95  
AREA-AVERAGED Fm (INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.93 EFFECTIVE AREA (ACRES) = 1378.90

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610309U.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.97	18.86	0.50 (0.50)	1.00	65.8	30900.00
2	38.83	18.95	0.50 (0.50)	1.00	65.9	30910.00

TOTAL AREA (ACRES) = 65.9

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13305.80 TO NODE 13305.80 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1726.01	21.95	1.060	0.50 (0.47)	0.93	1378.9	30800.00
2	1724.62	23.98	1.002	0.50 (0.47)	0.93	1516.0	30700.00
3	1719.98	25.54	0.962	0.50 (0.47)	0.93	1618.4	30600.00
4	1693.91	31.54	0.855	0.50 (0.47)	0.93	2028.5	21300.00
5	1688.48	33.41	0.831	0.50 (0.46)	0.93	2193.9	30520.00
6	1686.78	33.72	0.827	0.50 (0.46)	0.93	2218.9	30410.00
7	1679.59	34.63	0.816	0.50 (0.46)	0.93	2289.5	30210.00
8	1675.76	34.97	0.811	0.50 (0.46)	0.93	2328.3	30200.00
9	1672.33	35.27	0.808	0.50 (0.46)	0.93	2362.4	30540.00
10	1645.79	37.03	0.785	0.50 (0.46)	0.92	2550.4	30510.00
11	1636.52	37.63	0.777	0.50 (0.46)	0.92	2612.6	30100.00
12	1613.09	39.04	0.759	0.50 (0.46)	0.92	2762.2	30500.00
13	1594.42	40.20	0.745	0.50 (0.46)	0.91	2881.7	30400.00
14	1588.91	40.53	0.743	0.50 (0.46)	0.91	2914.4	30110.00
15	1514.91	46.03	0.698	0.50 (0.45)	0.90	3461.7	30300.00
16	1492.30	47.74	0.684	0.50 (0.45)	0.90	3620.3	21400.00
17	1261.39	66.07	0.582	0.50 (0.44)	0.87	5160.7	13100.00
18	1225.74	68.59	0.573	0.50 (0.44)	0.87	5323.1	13200.00
19	1215.98	69.09	0.572	0.50 (0.44)	0.87	5345.2	13210.00
20	709.83	100.69	0.479	0.50 (0.43)	0.86	6513.6	13000.00
21	644.30	105.36	0.470	0.50 (0.43)	0.86	6539.3	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	38.97	18.86	1.158	0.50( 0.50)	1.00	65.8	30900.00
2	38.83	18.95	1.155	0.50( 0.50)	1.00	65.9	30910.00

LONGEST FLOWPATH FROM NODE 30900.00 TO NODE 13305.80 = 3403.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	18.86	1.158	0.50( 0.47)	0.94	1251.1	30900.00
2	1764.84	18.95	1.155	0.50( 0.47)	0.94	1256.5	30910.00
3	1759.20	21.95	1.060	0.50( 0.47)	0.94	1444.8	30800.00
4	1754.38	23.98	1.002	0.50( 0.47)	0.94	1581.9	30700.00
5	1747.39	25.54	0.962	0.50( 0.47)	0.93	1684.4	30600.00
6	1714.97	31.54	0.855	0.50( 0.47)	0.93	2094.4	21300.00
7	1708.12	33.41	0.831	0.50( 0.47)	0.93	2259.8	30520.00
8	1706.19	33.72	0.827	0.50( 0.47)	0.93	2284.8	30410.00
9	1698.30	34.63	0.816	0.50( 0.46)	0.93	2355.4	30210.00
10	1694.22	34.97	0.811	0.50( 0.46)	0.93	2394.2	30200.00
11	1690.56	35.27	0.808	0.50( 0.46)	0.93	2428.3	30540.00
12	1662.69	37.03	0.785	0.50( 0.46)	0.92	2616.4	30510.00
13	1652.96	37.63	0.777	0.50( 0.46)	0.92	2678.5	30100.00
14	1628.46	39.04	0.759	0.50( 0.46)	0.92	2828.1	30500.00
15	1608.96	40.20	0.745	0.50( 0.46)	0.91	2947.6	30400.00
16	1603.29	40.53	0.743	0.50( 0.46)	0.91	2980.3	30110.00
17	1526.62	46.03	0.698	0.50( 0.45)	0.90	3527.6	30300.00
18	1503.18	47.74	0.684	0.50( 0.45)	0.90	3686.2	21400.00
19	1266.25	66.07	0.582	0.50( 0.44)	0.87	5226.6	13100.00
20	1230.09	68.59	0.573	0.50( 0.44)	0.87	5389.0	13200.00
21	1220.23	69.09	0.572	0.50( 0.44)	0.87	5411.1	13210.00
22	709.83	100.69	0.479	0.50( 0.43)	0.86	6579.6	13000.00
23	644.30	105.36	0.470	0.50( 0.43)	0.86	6605.2	13010.00

TOTAL AREA (ACRES) = 6605.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1764.98 Tc (MIN.) = 18.863  
 EFFECTIVE AREA (ACRES) = 1251.05 AREA-AVERAGED Fm (INCH/HR) = 0.47  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA (ACRES) = 6605.2  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13305.80 = 45711.71 FEET.

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FLOW PROCESS FROM NODE 13305.80 TO NODE 13306.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 254.00 DOWNSTREAM (FEET) = 245.50  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 583.12 CHANNEL SLOPE = 0.0146  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.123  
 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
LAND USE					
USER-DEFINED	-	68.77	0.50	0.998	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.998

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1784.28  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.48  
 AVERAGE FLOW DEPTH (FEET) = 7.53 TRAVEL TIME (MIN.) = 0.93  
 Tc (MIN.) = 19.79  
 SUBAREA AREA (ACRES) = 68.77 SUBAREA RUNOFF (CFS) = 38.61  
 EFFECTIVE AREA (ACRES) = 1319.82 AREA-AVERAGED Fm (INCH/HR) = 0.47  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 6673.9 PEAK FLOW RATE (CFS) = 1764.98  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 7.50 FLOW VELOCITY (FEET/SEC.) = 10.45  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13306.00 = 46294.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	19.79	1.123	0.50( 0.47)	0.94	1319.8	30900.00
2	1764.84	19.88	1.120	0.50( 0.47)	0.94	1325.2	30910.00
3	1759.20	22.87	1.033	0.50( 0.47)	0.94	1513.6	30800.00
4	1754.38	24.91	0.976	0.50( 0.47)	0.94	1650.7	30700.00
5	1747.39	26.47	0.944	0.50( 0.47)	0.94	1753.1	30600.00
6	1714.97	32.47	0.843	0.50( 0.47)	0.93	2163.1	21300.00
7	1708.12	34.35	0.819	0.50( 0.47)	0.93	2328.6	30520.00
8	1706.19	34.65	0.815	0.50( 0.47)	0.93	2353.6	30410.00
9	1698.30	35.57	0.804	0.50( 0.47)	0.93	2424.2	30210.00
10	1694.22	35.90	0.799	0.50( 0.47)	0.93	2463.0	30200.00
11	1690.56	36.21	0.796	0.50( 0.46)	0.93	2497.1	30540.00
12	1662.69	37.97	0.773	0.50( 0.46)	0.92	2685.1	30510.00
13	1652.96	38.57	0.765	0.50( 0.46)	0.92	2747.3	30100.00
14	1628.46	39.99	0.747	0.50( 0.46)	0.92	2896.9	30500.00
15	1608.96	41.15	0.738	0.50( 0.46)	0.92	3016.4	30400.00
16	1603.29	41.48	0.735	0.50( 0.46)	0.92	3049.0	30110.00
17	1526.62	46.99	0.690	0.50( 0.45)	0.91	3596.4	30300.00
18	1503.18	48.71	0.676	0.50( 0.45)	0.90	3755.0	21400.00
19	1266.25	67.08	0.579	0.50( 0.44)	0.88	5295.3	13100.00
20	1230.09	69.61	0.570	0.50( 0.44)	0.87	5457.8	13200.00
21	1220.23	70.11	0.568	0.50( 0.44)	0.87	5479.9	13210.00
22	709.83	101.86	0.477	0.50( 0.43)	0.86	6648.3	13000.00
23	644.30	106.56	0.467	0.50( 0.43)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1764.98 Tc (MIN.) = 19.79  
 AREA-AVERAGED Fm (INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA (ACRES) = 1319.82

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FLOW PROCESS FROM NODE 13306.00 TO NODE 13307.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 245.50 DOWNSTREAM (FEET) = 220.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1543.21 CHANNEL SLOPE = 0.0165  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 1764.98  
 FLOW VELOCITY (FEET/SEC.) = 10.96 FLOW DEPTH (FEET) = 7.33

TRAVEL TIME(MIN.) = 2.35 Tc(MIN.) = 22.14  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	22.14	1.054	0.50( 0.47)	0.94	1319.8	30900.00
2	1764.84	22.22	1.052	0.50( 0.47)	0.94	1325.2	30910.00
3	1759.20	25.22	0.969	0.50( 0.47)	0.94	1513.6	30800.00
4	1754.38	27.26	0.929	0.50( 0.47)	0.94	1650.7	30700.00
5	1747.39	28.82	0.898	0.50( 0.47)	0.94	1753.1	30600.00
6	1714.97	34.84	0.813	0.50( 0.47)	0.93	2163.1	21300.00
7	1708.12	36.71	0.789	0.50( 0.47)	0.93	2328.6	30520.00
8	1706.19	37.02	0.785	0.50( 0.47)	0.93	2353.6	30410.00
9	1698.30	37.94	0.773	0.50( 0.47)	0.93	2424.2	30210.00
10	1694.22	38.27	0.769	0.50( 0.47)	0.93	2463.0	30200.00
11	1690.56	38.58	0.765	0.50( 0.46)	0.93	2497.1	30540.00
12	1662.69	40.35	0.744	0.50( 0.46)	0.92	2685.1	30510.00
13	1652.96	40.96	0.739	0.50( 0.46)	0.92	2747.3	30100.00
14	1628.46	42.38	0.727	0.50( 0.46)	0.92	2896.9	30500.00
15	1608.96	43.56	0.718	0.50( 0.46)	0.92	3016.4	30400.00
16	1603.29	43.89	0.715	0.50( 0.46)	0.92	3049.0	30110.00
17	1526.62	49.43	0.670	0.50( 0.45)	0.91	3596.4	30300.00
18	1503.18	51.15	0.658	0.50( 0.45)	0.90	3755.0	21400.00
19	1266.25	69.63	0.570	0.50( 0.44)	0.88	5295.3	13100.00
20	1230.09	72.18	0.561	0.50( 0.44)	0.87	5457.8	13200.00
21	1220.23	72.68	0.559	0.50( 0.44)	0.87	5479.9	13210.00
22	709.83	104.81	0.471	0.50( 0.43)	0.86	6648.3	13000.00
23	644.30	109.58	0.461	0.50( 0.43)	0.86	6673.9	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 1764.98 Tc(MIN.) = 22.14  
 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA(ACRES) = 1319.82

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610310U.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.94	24.94	0.50( 0.50)	1.00	97.9	31000.00
TOTAL AREA(ACRES) = 97.9						

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13307.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1764.98	22.14	1.054	0.50( 0.47)	0.94	1319.8	30900.00
2	1764.84	22.22	1.052	0.50( 0.47)	0.94	1325.2	30910.00
3	1759.20	25.22	0.969	0.50( 0.47)	0.94	1513.6	30800.00
4	1754.38	27.26	0.929	0.50( 0.47)	0.94	1650.7	30700.00
5	1747.39	28.82	0.898	0.50( 0.47)	0.94	1753.1	30600.00
6	1714.97	34.84	0.813	0.50( 0.47)	0.93	2163.1	21300.00
7	1708.12	36.71	0.789	0.50( 0.47)	0.93	2328.6	30520.00
8	1706.19	37.02	0.785	0.50( 0.47)	0.93	2353.6	30410.00
9	1698.30	37.94	0.773	0.50( 0.47)	0.93	2424.2	30210.00
10	1694.22	38.27	0.769	0.50( 0.47)	0.93	2463.0	30200.00
11	1690.56	38.58	0.765	0.50( 0.46)	0.93	2497.1	30540.00
12	1662.69	40.35	0.744	0.50( 0.46)	0.92	2685.1	30510.00
13	1652.96	40.96	0.739	0.50( 0.46)	0.92	2747.3	30100.00
14	1628.46	42.38	0.727	0.50( 0.46)	0.92	2896.9	30500.00
15	1608.96	43.56	0.718	0.50( 0.46)	0.92	3016.4	30400.00
16	1603.29	43.89	0.715	0.50( 0.46)	0.92	3049.0	30110.00
17	1526.62	49.43	0.670	0.50( 0.45)	0.91	3596.4	30300.00
18	1503.18	51.15	0.658	0.50( 0.45)	0.90	3755.0	21400.00
19	1266.25	69.63	0.570	0.50( 0.44)	0.88	5295.3	13100.00
20	1230.09	72.18	0.561	0.50( 0.44)	0.87	5457.8	13200.00
21	1220.23	72.68	0.559	0.50( 0.44)	0.87	5479.9	13210.00
22	709.83	104.81	0.471	0.50( 0.43)	0.86	6648.3	13000.00
23	644.30	109.58	0.461	0.50( 0.43)	0.86	6673.9	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.94	24.94	0.975	0.50( 0.50)	1.00	97.9	31000.00

LONGEST FLOWPATH FROM NODE 31000.00 TO NODE 13307.00 = 5162.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1806.92	22.14	1.054	0.50( 0.47)	0.94	1406.7	30900.00
2	1806.78	22.22	1.052	0.50( 0.47)	0.94	1412.5	30910.00
3	1801.68	24.94	0.975	0.50( 0.47)	0.94	1593.6	31000.00
4	1800.60	25.22	0.969	0.50( 0.47)	0.94	1611.5	30800.00
5	1792.26	27.26	0.929	0.50( 0.47)	0.94	1748.6	30700.00
6	1782.58	28.82	0.898	0.50( 0.47)	0.94	1851.0	30600.00
7	1742.66	34.84	0.813	0.50( 0.47)	0.94	2261.0	21300.00
8	1733.70	36.71	0.789	0.50( 0.47)	0.93	2426.5	30520.00
9	1731.41	37.02	0.785	0.50( 0.47)	0.93	2451.4	30410.00
10	1722.50	37.94	0.773	0.50( 0.47)	0.93	2522.1	30210.00
11	1718.04	38.27	0.769	0.50( 0.47)	0.93	2560.8	30200.00
12	1714.03	38.58	0.765	0.50( 0.47)	0.93	2594.9	30540.00
13	1684.30	40.35	0.744	0.50( 0.46)	0.93	2783.0	30510.00
14	1674.14	40.96	0.739	0.50( 0.46)	0.93	2845.2	30100.00
15	1648.61	42.38	0.727	0.50( 0.46)	0.92	2994.8	30500.00
16	1628.25	43.56	0.718	0.50( 0.46)	0.92	3114.3	30400.00
17	1622.35	43.89	0.715	0.50( 0.46)	0.92	3146.9	30110.00
18	1541.67	49.43	0.670	0.50( 0.45)	0.91	3694.2	30300.00
19	1517.19	51.15	0.658	0.50( 0.45)	0.90	3852.9	21400.00
20	1272.51	69.63	0.570	0.50( 0.44)	0.88	5393.2	13100.00
21	1235.58	72.18	0.561	0.50( 0.44)	0.88	5555.7	13200.00

22 1225.56 72.68 0.559 0.50( 0.44) 0.88 5577.8 13210.00  
 23 709.93 104.81 0.471 0.50( 0.43) 0.86 6746.2 13000.00  
 24 644.40 109.58 0.461 0.50( 0.43) 0.86 6771.8 13010.00  
 TOTAL AREA (ACRES) = 6771.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 1806.92 Tc (MIN.) = 22.137  
 EFFECTIVE AREA (ACRES) = 1406.71 AREA-AVERAGED Fm (INCH/HR) = 0.47  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA (ACRES) = 6771.8  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13307.00 = 47838.04 FEET.

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 FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 220.00 DOWNSTREAM (FEET) = 212.00  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 925.62 CHANNEL SLOPE = 0.0086  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 1806.92  
 FLOW VELOCITY (FEET/SEC.) = 8.64 FLOW DEPTH (FEET) = 8.35  
 TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 23.92  
 LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1806.92	23.92	1.004	0.50( 0.47)	0.94	1406.7	30900.00
2	1806.78	24.01	1.001	0.50( 0.47)	0.94	1412.5	30910.00
3	1801.68	26.72	0.939	0.50( 0.47)	0.94	1593.6	31000.00
4	1800.60	27.01	0.934	0.50( 0.47)	0.94	1611.5	30800.00
5	1792.26	29.05	0.894	0.50( 0.47)	0.94	1748.6	30700.00
6	1782.58	30.61	0.867	0.50( 0.47)	0.94	1851.0	30600.00
7	1742.66	36.64	0.790	0.50( 0.47)	0.94	2261.0	21300.00
8	1733.70	38.52	0.766	0.50( 0.47)	0.93	2426.5	30520.00
9	1731.41	38.82	0.762	0.50( 0.47)	0.93	2451.4	30410.00
10	1722.50	39.74	0.750	0.50( 0.47)	0.93	2522.1	30210.00
11	1718.04	40.08	0.746	0.50( 0.47)	0.93	2560.8	30200.00
12	1714.03	40.39	0.744	0.50( 0.47)	0.93	2594.9	30540.00
13	1684.30	42.17	0.729	0.50( 0.46)	0.93	2783.0	30510.00
14	1674.14	42.78	0.724	0.50( 0.46)	0.93	2845.2	30100.00
15	1648.61	44.21	0.712	0.50( 0.46)	0.92	2994.8	30500.00
16	1628.25	45.39	0.703	0.50( 0.46)	0.92	3114.3	30400.00
17	1622.35	45.72	0.700	0.50( 0.46)	0.92	3146.9	30110.00
18	1541.67	51.28	0.657	0.50( 0.45)	0.91	3694.2	30300.00
19	1517.19	53.01	0.646	0.50( 0.45)	0.90	3852.9	21400.00
20	1272.51	71.58	0.563	0.50( 0.44)	0.88	5393.2	13100.00
21	1235.58	74.14	0.554	0.50( 0.44)	0.88	5555.7	13200.00
22	1225.56	74.65	0.553	0.50( 0.44)	0.88	5577.8	13210.00
23	709.93	107.06	0.466	0.50( 0.43)	0.86	6746.2	13000.00
24	644.40	111.89	0.457	0.50( 0.43)	0.86	6771.8	13010.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 1806.92 Tc (MIN.) = 23.92  
 AREA-AVERAGED Fm (INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.94 EFFECTIVE AREA (ACRES) = 1406.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<

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 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610212U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	78.46	43.31	0.50( 0.50)	1.00	342.8	21200.00
TOTAL AREA (ACRES) =		342.8				

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1806.92	23.92	1.004	0.50( 0.47)	0.94	1406.7	30900.00
2	1806.78	24.01	1.001	0.50( 0.47)	0.94	1412.5	30910.00
3	1801.68	26.72	0.939	0.50( 0.47)	0.94	1593.6	31000.00
4	1800.60	27.01	0.934	0.50( 0.47)	0.94	1611.5	30800.00
5	1792.26	29.05	0.894	0.50( 0.47)	0.94	1748.6	30700.00
6	1782.58	30.61	0.867	0.50( 0.47)	0.94	1851.0	30600.00
7	1742.66	36.64	0.790	0.50( 0.47)	0.94	2261.0	21300.00
8	1733.70	38.52	0.766	0.50( 0.47)	0.93	2426.5	30520.00
9	1731.41	38.82	0.762	0.50( 0.47)	0.93	2451.4	30410.00
10	1722.50	39.74	0.750	0.50( 0.47)	0.93	2522.1	30210.00
11	1718.04	40.08	0.746	0.50( 0.47)	0.93	2560.8	30200.00
12	1714.03	40.39	0.744	0.50( 0.47)	0.93	2594.9	30540.00
13	1684.30	42.17	0.729	0.50( 0.46)	0.93	2783.0	30510.00
14	1674.14	42.78	0.724	0.50( 0.46)	0.93	2845.2	30100.00
15	1648.61	44.21	0.712	0.50( 0.46)	0.92	2994.8	30500.00
16	1628.25	45.39	0.703	0.50( 0.46)	0.92	3114.3	30400.00
17	1622.35	45.72	0.700	0.50( 0.46)	0.92	3146.9	30110.00
18	1541.67	51.28	0.657	0.50( 0.45)	0.91	3694.2	30300.00
19	1517.19	53.01	0.646	0.50( 0.45)	0.90	3852.9	21400.00
20	1272.51	71.58	0.563	0.50( 0.44)	0.88	5393.2	13100.00
21	1235.58	74.14	0.554	0.50( 0.44)	0.88	5555.7	13200.00
22	1225.56	74.65	0.553	0.50( 0.44)	0.88	5577.8	13210.00
23	709.93	107.06	0.466	0.50( 0.43)	0.86	6746.2	13000.00
24	644.40	111.89	0.457	0.50( 0.43)	0.86	6771.8	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	78.46	43.31	0.720	0.50( 0.50)	1.00	342.8	21200.00

LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 13308.00 = 11049.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1885.38	23.92	1.004	0.50 ( 0.48)	0.95	1596.1	30900.00
2	1885.24	24.01	1.001	0.50 ( 0.48)	0.95	1602.5	30910.00
3	1880.14	26.72	0.939	0.50 ( 0.47)	0.95	1805.1	31000.00
4	1879.06	27.01	0.934	0.50 ( 0.47)	0.95	1825.3	30800.00
5	1870.72	29.05	0.894	0.50 ( 0.47)	0.95	1978.5	30700.00
6	1861.04	30.61	0.867	0.50 ( 0.47)	0.95	2093.3	30600.00
7	1821.12	36.64	0.790	0.50 ( 0.47)	0.94	2551.0	21300.00
8	1812.15	38.52	0.766	0.50 ( 0.47)	0.94	2731.3	30520.00
9	1809.87	38.82	0.762	0.50 ( 0.47)	0.94	2758.7	30410.00
10	1800.96	39.74	0.750	0.50 ( 0.47)	0.94	2836.7	30210.00
11	1796.49	40.08	0.746	0.50 ( 0.47)	0.94	2878.1	30200.00
12	1792.49	40.39	0.744	0.50 ( 0.47)	0.94	2914.6	30540.00
13	1762.76	42.17	0.729	0.50 ( 0.47)	0.93	3116.8	30510.00
14	1752.59	42.78	0.724	0.50 ( 0.47)	0.93	3183.8	30100.00
15	1743.18	43.31	0.720	0.50 ( 0.47)	0.93	3243.1	21200.00
16	1724.42	44.21	0.712	0.50 ( 0.47)	0.93	3337.6	30500.00
17	1700.61	45.39	0.703	0.50 ( 0.46)	0.93	3457.0	30400.00
18	1693.73	45.72	0.700	0.50 ( 0.46)	0.93	3489.7	30110.00
19	1597.69	51.28	0.657	0.50 ( 0.46)	0.92	4037.0	30300.00
20	1569.37	53.01	0.646	0.50 ( 0.46)	0.91	4195.7	21400.00
21	1295.02	71.58	0.563	0.50 ( 0.44)	0.89	5736.0	13100.00
22	1254.95	74.14	0.554	0.50 ( 0.44)	0.88	5898.4	13200.00
23	1244.32	74.65	0.553	0.50 ( 0.44)	0.88	5920.5	13210.00
24	709.93	107.06	0.466	0.50 ( 0.44)	0.87	7089.0	13000.00
25	644.40	111.89	0.457	0.50 ( 0.44)	0.87	7114.6	13010.00
TOTAL AREA (ACRES) =							7114.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1885.38 Tc(MIN.) = 23.923  
EFFECTIVE AREA(ACRES) = 1596.07 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 7114.6  
LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 10  
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>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S29.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	0.50 ( 0.49)	0.99	3017.8	50200.00
2	11030.52	31.60	0.50 ( 0.49)	0.99	6839.4	50300.00
3	10900.56	38.20	0.50 ( 0.49)	0.99	8873.6	50120.00
4	10221.87	56.07	0.50 ( 0.50)	0.99	14062.9	31400.00
5	9881.36	66.06	0.50 ( 0.50)	0.99	16718.1	11801.00
6	9577.07	77.47	0.50 ( 0.50)	0.99	19928.6	11500.00
7	9200.08	89.45	0.50 ( 0.50)	0.99	23977.3	11000.00
8	8761.40	105.81	0.50 ( 0.50)	0.99	30832.0	12500.00
9	8557.71	111.98	0.50 ( 0.50)	0.99	33702.5	11910.00
10	7900.80	120.72	0.50 ( 0.50)	0.99	36991.3	11130.00
11	7239.10	132.19	0.50 ( 0.50)	0.99	40659.8	11620.00
12	6199.20	148.08	0.50 ( 0.50)	0.99	45197.4	12400.00
13	5371.21	159.48	0.50 ( 0.50)	0.99	47494.1	12201.00
14	4774.07	168.81	0.50 ( 0.50)	0.99	48783.3	12111.00
15	3862.64	184.64	0.50 ( 0.50)	0.99	50710.3	12261.00
16	3399.11	194.06	0.50 ( 0.50)	0.99	51522.0	10200.00
17	2845.45	209.48	0.50 ( 0.50)	0.99	52759.4	10300.00
18	2618.85	216.34	0.50 ( 0.50)	0.99	53110.5	12010.00
19	2153.04	236.96	0.50 ( 0.50)	0.99	53439.8	12000.00
20	1213.53	305.89	0.50 ( 0.50)	0.99	54110.0	10100.00
TOTAL AREA(ACRES) =						54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 12904.00 IS CODE = 14.0

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	16.49	0.50 ( 0.49)	0.99	3017.8	50200.00
2	11030.52	31.60	0.50 ( 0.49)	0.99	6839.4	50300.00
3	10900.56	38.20	0.50 ( 0.49)	0.99	8873.6	50120.00
4	10221.87	56.07	0.50 ( 0.50)	0.99	14062.9	31400.00
5	9881.36	66.06	0.50 ( 0.50)	0.99	16718.1	11801.00
6	9577.07	77.47	0.50 ( 0.50)	0.99	19928.6	11500.00
7	9200.08	89.45	0.50 ( 0.50)	0.99	23977.3	11000.00
8	8761.40	105.81	0.50 ( 0.50)	0.99	30832.0	12500.00
9	8557.71	111.98	0.50 ( 0.50)	0.99	33702.5	11910.00
10	7900.80	120.72	0.50 ( 0.50)	0.99	36991.3	11130.00
11	7239.10	132.19	0.50 ( 0.50)	0.99	40659.8	11620.00
12	6199.20	148.08	0.50 ( 0.50)	0.99	45197.4	12400.00
13	5371.21	159.48	0.50 ( 0.50)	0.99	47494.1	12201.00
14	4774.07	168.81	0.50 ( 0.50)	0.99	48783.3	12111.00
15	3862.64	184.64	0.50 ( 0.50)	0.99	50710.3	12261.00
16	3399.11	194.06	0.50 ( 0.50)	0.99	51522.0	10200.00
17	2845.45	209.48	0.50 ( 0.50)	0.99	52759.4	10300.00
18	2618.85	216.34	0.50 ( 0.50)	0.99	53110.5	12010.00
19	2153.04	236.96	0.50 ( 0.50)	0.99	53439.8	12000.00

20 1213.53 305.89 0.50( 0.50) 0.99 54110.0 10100.00  
TOTAL AREA(ACRES) = 54110.0

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FLOW PROCESS FROM NODE 12904.00 TO NODE 13308.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 212.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1389.52 CHANNEL SLOPE = 0.0007  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 11065.92  
FLOW VELOCITY(FEET/SEC.) = 9.22 FLOW DEPTH(FEET) = 20.00  
TRAVEL TIME(MIN.) = 2.51 Tc(MIN.) = 19.00  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	19.00	1.153	0.50( 0.49)	0.99	3017.8	50200.00
2	11030.52	34.12	0.822	0.50( 0.49)	0.99	6839.4	50300.00
3	10900.56	40.75	0.741	0.50( 0.49)	0.99	8873.6	50120.00
4	10221.87	58.79	0.611	0.50( 0.50)	0.99	14062.9	31400.00
5	9881.36	68.87	0.573	0.50( 0.50)	0.99	16718.1	11801.00
6	9577.07	80.38	0.533	0.50( 0.50)	0.99	19928.6	11500.00
7	9200.08	92.47	0.495	0.50( 0.50)	0.99	23977.3	11000.00
8	8761.40	108.98	0.463	0.50( 0.50)	0.99	30832.0	12500.00
9	8557.71	115.23	0.450	0.50( 0.50)	0.99	33702.5	11910.00
10	7900.80	124.24	0.436	0.50( 0.50)	0.99	36991.3	11130.00
11	7239.10	136.03	0.422	0.50( 0.50)	0.99	40659.8	11620.00
12	6199.20	152.11	0.402	0.50( 0.50)	0.99	45197.4	12400.00
13	5371.21	163.66	0.389	0.50( 0.50)	0.99	47494.1	12201.00
14	4774.07	173.11	0.377	0.50( 0.50)	0.99	48783.3	12111.00
15	3862.64	189.18	0.364	0.50( 0.50)	0.99	50710.3	12261.00
16	3399.11	198.74	0.359	0.50( 0.50)	0.99	51522.0	10200.00
17	2845.45	214.38	0.350	0.50( 0.50)	0.99	52759.4	10300.00
18	2618.85	221.34	0.346	0.50( 0.50)	0.99	53110.5	12010.00
19	2153.04	242.21	0.335	0.50( 0.50)	0.99	53439.8	12000.00
20	1213.53	311.94	0.297	0.50( 0.50)	0.99	54110.0	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 11065.92 Tc(MIN.) = 19.00  
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 3017.84

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FLOW PROCESS FROM NODE 13307.00 TO NODE 13308.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11065.92	19.00	1.153	0.50( 0.49)	0.99	3017.8	50200.00
2	11030.52	34.12	0.822	0.50( 0.49)	0.99	6839.4	50300.00
3	10900.56	40.75	0.741	0.50( 0.49)	0.99	8873.6	50120.00
4	10221.87	58.79	0.611	0.50( 0.50)	0.99	14062.9	31400.00
5	9881.36	68.87	0.573	0.50( 0.50)	0.99	16718.1	11801.00
6	9577.07	80.38	0.533	0.50( 0.50)	0.99	19928.6	11500.00
7	9200.08	92.47	0.495	0.50( 0.50)	0.99	23977.3	11000.00
8	8761.40	108.98	0.463	0.50( 0.50)	0.99	30832.0	12500.00
9	8557.71	115.23	0.450	0.50( 0.50)	0.99	33702.5	11910.00
10	7900.80	124.24	0.436	0.50( 0.50)	0.99	36991.3	11130.00
11	7239.10	136.03	0.422	0.50( 0.50)	0.99	40659.8	11620.00
12	6199.20	152.11	0.402	0.50( 0.50)	0.99	45197.4	12400.00
13	5371.21	163.66	0.389	0.50( 0.50)	0.99	47494.1	12201.00
14	4774.07	173.11	0.377	0.50( 0.50)	0.99	48783.3	12111.00
15	3862.64	189.18	0.364	0.50( 0.50)	0.99	50710.3	12261.00
16	3399.11	198.74	0.359	0.50( 0.50)	0.99	51522.0	10200.00
17	2845.45	214.38	0.350	0.50( 0.50)	0.99	52759.4	10300.00
18	2618.85	221.34	0.346	0.50( 0.50)	0.99	53110.5	12010.00
19	2153.04	242.21	0.335	0.50( 0.50)	0.99	53439.8	12000.00
20	1213.53	311.94	0.297	0.50( 0.50)	0.99	54110.0	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1885.38	23.92	1.004	0.50( 0.48)	0.95	1596.1	30900.00
2	1885.24	24.01	1.001	0.50( 0.48)	0.95	1602.5	30910.00
3	1880.14	26.72	0.939	0.50( 0.47)	0.95	1805.1	31000.00
4	1879.06	27.01	0.934	0.50( 0.47)	0.95	1825.3	30800.00
5	1870.72	29.05	0.894	0.50( 0.47)	0.95	1978.5	30700.00
6	1861.04	30.61	0.867	0.50( 0.47)	0.95	2093.3	30600.00
7	1821.12	36.64	0.790	0.50( 0.47)	0.94	2551.0	21300.00
8	1812.15	38.52	0.766	0.50( 0.47)	0.94	2731.3	30520.00
9	1809.87	38.82	0.762	0.50( 0.47)	0.94	2758.7	30410.00
10	1800.96	39.74	0.750	0.50( 0.47)	0.94	2836.7	30210.00
11	1796.49	40.08	0.746	0.50( 0.47)	0.94	2878.1	30200.00
12	1792.49	40.39	0.744	0.50( 0.47)	0.94	2914.6	30540.00
13	1762.76	42.17	0.729	0.50( 0.47)	0.93	3116.8	30510.00
14	1752.59	42.78	0.724	0.50( 0.47)	0.93	3183.8	30100.00
15	1743.18	43.31	0.720	0.50( 0.47)	0.93	3243.1	21200.00
16	1724.42	44.21	0.712	0.50( 0.47)	0.93	3337.6	30500.00
17	1700.61	45.39	0.703	0.50( 0.46)	0.93	3457.0	30400.00
18	1693.73	45.72	0.700	0.50( 0.46)	0.93	3489.7	30110.00
19	1597.69	51.28	0.657	0.50( 0.46)	0.92	4037.0	30300.00
20	1569.37	53.01	0.646	0.50( 0.46)	0.91	4195.7	21400.00
21	1295.02	71.58	0.563	0.50( 0.44)	0.89	5736.0	13100.00
22	1254.95	74.14	0.554	0.50( 0.44)	0.88	5898.4	13200.00
23	1244.32	74.65	0.553	0.50( 0.44)	0.88	5920.5	13210.00
24	709.93	107.06	0.466	0.50( 0.44)	0.87	7089.0	13000.00
25	644.40	111.89	0.457	0.50( 0.44)	0.87	7114.6	13010.00

LONGEST FLOWPATH FROM NODE 13010.00 TO NODE 13308.00 = 48763.66 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
--------	---	----	-----------	--------	----	----	-----------

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)	(ACRES)	NODE
1	12951.30	19.00	1.153	0.50 ( 0.49)	0.98	4285.5 50200.00
2	12939.77	23.92	1.004	0.50 ( 0.49)	0.98	5858.3 30900.00
3	12939.43	24.01	1.001	0.50 ( 0.49)	0.98	5886.4 30910.00
4	12927.98	26.72	0.939	0.50 ( 0.49)	0.98	6775.2 31000.00
5	12926.23	27.01	0.934	0.50 ( 0.49)	0.98	6867.8 30800.00
6	12913.11	29.05	0.894	0.50 ( 0.49)	0.98	7537.0 30700.00
7	12899.77	30.61	0.867	0.50 ( 0.49)	0.98	8046.5 30600.00
8	12868.35	34.12	0.822	0.50 ( 0.49)	0.98	9198.9 50300.00
9	12802.20	36.64	0.790	0.50 ( 0.49)	0.98	10164.4 21300.00
10	12756.41	38.52	0.766	0.50 ( 0.49)	0.98	10921.0 30520.00
11	12748.13	38.82	0.762	0.50 ( 0.49)	0.98	11042.2 30410.00
12	12721.22	39.74	0.750	0.50 ( 0.49)	0.98	11401.8 30210.00
13	12710.10	40.08	0.746	0.50 ( 0.49)	0.98	11547.5 30200.00
14	12700.10	40.39	0.744	0.50 ( 0.49)	0.98	11677.9 30540.00
15	12687.04	40.75	0.741	0.50 ( 0.49)	0.98	11829.1 50120.00
16	12609.84	42.17	0.729	0.50 ( 0.49)	0.97	12399.3 30510.00
17	12576.78	42.78	0.724	0.50 ( 0.49)	0.97	12641.4 30100.00
18	12547.53	43.31	0.720	0.50 ( 0.49)	0.97	12852.4 21200.00
19	12494.82	44.21	0.712	0.50 ( 0.49)	0.97	13206.4 30500.00
20	12426.56	45.39	0.703	0.50 ( 0.49)	0.97	13665.7 30400.00
21	12407.21	45.72	0.700	0.50 ( 0.49)	0.97	13793.8 30110.00
22	12101.89	51.28	0.657	0.50 ( 0.49)	0.97	15941.2 30300.00
23	12008.43	53.01	0.646	0.50 ( 0.49)	0.97	16597.9 21400.00
24	11705.92	58.79	0.611	0.50 ( 0.48)	0.97	18737.5 31400.00
25	11216.41	68.87	0.573	0.50 ( 0.48)	0.97	22229.4 11801.00
26	11104.77	71.58	0.563	0.50 ( 0.48)	0.96	23209.7 13100.00
27	10996.95	74.14	0.554	0.50 ( 0.48)	0.96	24087.0 13200.00
28	10972.90	74.65	0.553	0.50 ( 0.48)	0.96	24250.6 13210.00
29	10726.92	80.38	0.533	0.50 ( 0.48)	0.96	26055.7 11500.00
30	10150.62	92.47	0.495	0.50 ( 0.48)	0.97	30540.2 11000.00
31	9522.41	107.06	0.466	0.50 ( 0.48)	0.97	37123.0 13000.00
32	9445.24	108.98	0.463	0.50 ( 0.49)	0.97	37931.2 12500.00
33	9311.06	111.89	0.457	0.50 ( 0.49)	0.97	39281.8 13010.00
34	9192.84	115.23	0.450	0.50 ( 0.49)	0.97	40817.1 11910.00
35	8515.52	124.24	0.436	0.50 ( 0.49)	0.97	44105.9 11130.00
36	7833.88	136.03	0.422	0.50 ( 0.49)	0.97	47774.5 11620.00
37	6766.76	152.11	0.402	0.50 ( 0.49)	0.98	52312.0 12400.00
38	5919.24	163.66	0.389	0.50 ( 0.49)	0.98	54608.8 12201.00
39	5306.09	173.11	0.377	0.50 ( 0.49)	0.98	55897.9 12111.00
40	4375.96	189.18	0.364	0.50 ( 0.49)	0.98	57824.9 12261.00
41	3905.08	198.74	0.359	0.50 ( 0.49)	0.98	58636.6 10200.00
42	3339.42	214.38	0.350	0.50 ( 0.49)	0.98	59874.0 10300.00
43	3107.47	221.34	0.346	0.50 ( 0.49)	0.98	60225.1 12010.00
44	2625.64	242.21	0.335	0.50 ( 0.49)	0.98	60554.4 12000.00
45	1632.59	311.94	0.297	0.50 ( 0.49)	0.98	61224.6 10100.00

TOTAL AREA (ACRES) = 61224.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 12951.30 Tc (MIN.) = 19.000  
EFFECTIVE AREA (ACRES) = 4285.50 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 61224.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13308.00 = 118090.66 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 61224.6 TC (MIN.) = 19.00  
EFFECTIVE AREA (ACRES) = 4285.50 AREA-AVERAGED Fm (INCH/HR) = 0.49

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.976  
PEAK FLOW RATE (CFS) = 12951.30

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.00	1.153	0.50 ( 0.49)	0.98	4285.5	50200.00
2	12939.77	23.92	1.004	0.50 ( 0.49)	0.98	5858.3	30900.00
3	12939.43	24.01	1.001	0.50 ( 0.49)	0.98	5886.4	30910.00
4	12927.98	26.72	0.939	0.50 ( 0.49)	0.98	6775.2	31000.00
5	12926.23	27.01	0.934	0.50 ( 0.49)	0.98	6867.8	30800.00
6	12913.11	29.05	0.894	0.50 ( 0.49)	0.98	7537.0	30700.00
7	12899.77	30.61	0.867	0.50 ( 0.49)	0.98	8046.5	30600.00
8	12868.35	34.12	0.822	0.50 ( 0.49)	0.98	9198.9	50300.00
9	12802.20	36.64	0.790	0.50 ( 0.49)	0.98	10164.4	21300.00
10	12756.41	38.52	0.766	0.50 ( 0.49)	0.98	10921.0	30520.00
11	12748.13	38.82	0.762	0.50 ( 0.49)	0.98	11042.2	30410.00
12	12721.22	39.74	0.750	0.50 ( 0.49)	0.98	11401.8	30210.00
13	12710.10	40.08	0.746	0.50 ( 0.49)	0.98	11547.5	30200.00
14	12700.10	40.39	0.744	0.50 ( 0.49)	0.98	11677.9	30540.00
15	12687.04	40.75	0.741	0.50 ( 0.49)	0.98	11829.1	50120.00
16	12609.84	42.17	0.729	0.50 ( 0.49)	0.97	12399.3	30510.00
17	12576.78	42.78	0.724	0.50 ( 0.49)	0.97	12641.4	30100.00
18	12547.53	43.31	0.720	0.50 ( 0.49)	0.97	12852.4	21200.00
19	12494.82	44.21	0.712	0.50 ( 0.49)	0.97	13206.4	30500.00
20	12426.56	45.39	0.703	0.50 ( 0.49)	0.97	13665.7	30400.00
21	12407.21	45.72	0.700	0.50 ( 0.49)	0.97	13793.8	30110.00
22	12101.89	51.28	0.657	0.50 ( 0.49)	0.97	15941.2	30300.00
23	12008.43	53.01	0.646	0.50 ( 0.49)	0.97	16597.9	21400.00
24	11705.92	58.79	0.611	0.50 ( 0.48)	0.97	18737.5	31400.00
25	11216.41	68.87	0.573	0.50 ( 0.48)	0.97	22229.4	11801.00
26	11104.77	71.58	0.563	0.50 ( 0.48)	0.96	23209.7	13100.00
27	10996.95	74.14	0.554	0.50 ( 0.48)	0.96	24087.0	13200.00
28	10972.90	74.65	0.553	0.50 ( 0.48)	0.96	24250.6	13210.00
29	10726.92	80.38	0.533	0.50 ( 0.48)	0.96	26055.7	11500.00
30	10150.62	92.47	0.495	0.50 ( 0.48)	0.97	30540.2	11000.00
31	9522.41	107.06	0.466	0.50 ( 0.48)	0.97	37123.0	13000.00
32	9445.24	108.98	0.463	0.50 ( 0.49)	0.97	37931.2	12500.00
33	9311.06	111.89	0.457	0.50 ( 0.49)	0.97	39281.8	13010.00
34	9192.84	115.23	0.450	0.50 ( 0.49)	0.97	40817.1	11910.00
35	8515.52	124.24	0.436	0.50 ( 0.49)	0.97	44105.9	11130.00
36	7833.88	136.03	0.422	0.50 ( 0.49)	0.97	47774.5	11620.00
37	6766.76	152.11	0.402	0.50 ( 0.49)	0.98	52312.0	12400.00
38	5919.24	163.66	0.389	0.50 ( 0.49)	0.98	54608.8	12201.00
39	5306.09	173.11	0.377	0.50 ( 0.49)	0.98	55897.9	12111.00
40	4375.96	189.18	0.364	0.50 ( 0.49)	0.98	57824.9	12261.00
41	3905.08	198.74	0.359	0.50 ( 0.49)	0.98	58636.6	10200.00
42	3339.42	214.38	0.350	0.50 ( 0.49)	0.98	59874.0	10300.00
43	3107.47	221.34	0.346	0.50 ( 0.49)	0.98	60225.1	12010.00
44	2625.64	242.21	0.335	0.50 ( 0.49)	0.98	60554.4	12000.00
45	1632.59	311.94	0.297	0.50 ( 0.49)	0.98	61224.6	10100.00

END OF RATIONAL METHOD ANALYSIS



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Analysis prepared by:

Michael Baker International  
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Santa Ana, CA  
92707

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FILE NAME: S34.DAT  
TIME/DATE OF STUDY: 07:24 07/16/2018  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.632
- 2) 10.00; 1.756
- 3) 15.00; 1.302
- 4) 20.00; 1.113
- 5) 25.00; 0.972
- 6) 30.00; 0.874
- 7) 40.00; 0.746
- 8) 50.00; 0.664
- 9) 60.00; 0.602
- 10) 90.00; 0.499
- 11) 120.00; 0.439
- 12) 180.00; 0.368
- 13) 360.00; 0.270
- 14) 1200.00; 0.118

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET- / SIDE / WAY	CROSSFALL IN- / OUT- / PARK- (FT)	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S33.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.00	0.50 ( 0.49)	0.98	4285.5	50200.00
2	12868.35	34.12	0.50 ( 0.49)	0.98	9198.9	50300.00
3	12609.84	42.17	0.50 ( 0.49)	0.97	12399.3	30510.00
4	12101.89	51.28	0.50 ( 0.49)	0.97	15941.2	30300.00
5	11705.92	58.79	0.50 ( 0.48)	0.97	18737.5	31400.00
6	11216.41	68.87	0.50 ( 0.48)	0.97	22229.4	11801.00
7	10726.92	80.38	0.50 ( 0.48)	0.96	26055.7	11500.00
8	10150.62	92.47	0.50 ( 0.48)	0.97	30540.2	11000.00
9	9522.41	107.06	0.50 ( 0.48)	0.97	37123.0	13000.00
10	8515.52	124.24	0.50 ( 0.49)	0.97	44105.9	11130.00
11	7833.88	136.03	0.50 ( 0.49)	0.97	47774.5	11620.00
12	6766.76	152.11	0.50 ( 0.49)	0.98	52312.0	12400.00
13	5919.24	163.66	0.50 ( 0.49)	0.98	54608.8	12201.00
14	5306.09	173.11	0.50 ( 0.49)	0.98	55897.9	12111.00
15	4375.96	189.18	0.50 ( 0.49)	0.98	57824.9	12261.00
16	3905.08	198.74	0.50 ( 0.49)	0.98	58636.6	10200.00
17	3339.42	214.38	0.50 ( 0.49)	0.98	59874.0	10300.00
18	3107.47	221.34	0.50 ( 0.49)	0.98	60225.1	12010.00
19	2625.64	242.21	0.50 ( 0.49)	0.98	60554.4	12000.00
20	1632.59	311.94	0.50 ( 0.49)	0.98	61224.6	10100.00

TOTAL AREA (ACRES) = 61224.6

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FLOW PROCESS FROM NODE 13308.00 TO NODE 13308.00 IS CODE = 14.0  
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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.00	0.50 ( 0.49)	0.98	4285.5	50200.00
2	12868.35	34.12	0.50 ( 0.49)	0.98	9198.9	50300.00
3	12609.84	42.17	0.50 ( 0.49)	0.97	12399.3	30510.00
4	12101.89	51.28	0.50 ( 0.49)	0.97	15941.2	30300.00
5	11705.92	58.79	0.50 ( 0.48)	0.97	18737.5	31400.00
6	11216.41	68.87	0.50 ( 0.48)	0.97	22229.4	11801.00
7	10726.92	80.38	0.50 ( 0.48)	0.96	26055.7	11500.00
8	10150.62	92.47	0.50 ( 0.48)	0.97	30540.2	11000.00
9	9522.41	107.06	0.50 ( 0.48)	0.97	37123.0	13000.00
10	8515.52	124.24	0.50 ( 0.49)	0.97	44105.9	11130.00
11	7833.88	136.03	0.50 ( 0.49)	0.97	47774.5	11620.00
12	6766.76	152.11	0.50 ( 0.49)	0.98	52312.0	12400.00
13	5919.24	163.66	0.50 ( 0.49)	0.98	54608.8	12201.00
14	5306.09	173.11	0.50 ( 0.49)	0.98	55897.9	12111.00
15	4375.96	189.18	0.50 ( 0.49)	0.98	57824.9	12261.00
16	3905.08	198.74	0.50 ( 0.49)	0.98	58636.6	10200.00
17	3339.42	214.38	0.50 ( 0.49)	0.98	59874.0	10300.00
18	3107.47	221.34	0.50 ( 0.49)	0.98	60225.1	12010.00

19 2625.64 242.21 0.50( 0.49) 0.98 60554.4 12000.00  
 20 1632.59 311.94 0.50( 0.49) 0.98 61224.6 10100.00  
 TOTAL AREA (ACRES) = 61224.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13308.00 TO NODE 13402.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 212.00 DOWNSTREAM(FEET) = 209.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 623.02 CHANNEL SLOPE = 0.0048  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 12951.30  
 FLOW VELOCITY(FEET/SEC.) = 14.09 FLOW DEPTH(FEET) = 17.50  
 TRAVEL TIME(MIN.) = 0.74 Tc(MIN.) = 19.74  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.74	1.123	0.50( 0.49)	0.98	4285.5	50200.00
2	12868.35	34.85	0.812	0.50( 0.49)	0.98	9198.9	50300.00
3	12609.84	42.91	0.722	0.50( 0.49)	0.97	12399.3	30510.00
4	12101.89	52.03	0.651	0.50( 0.49)	0.97	15941.2	30300.00
5	11705.92	59.54	0.605	0.50( 0.48)	0.97	18737.5	31400.00
6	11216.41	69.63	0.569	0.50( 0.48)	0.97	22229.4	11801.00
7	10726.92	81.15	0.529	0.50( 0.48)	0.96	26055.7	11500.00
8	10150.62	93.25	0.493	0.50( 0.48)	0.97	30540.2	11000.00
9	9522.41	107.86	0.463	0.50( 0.48)	0.97	37123.0	13000.00
10	8515.52	125.06	0.433	0.50( 0.49)	0.97	44105.9	11130.00
11	7833.88	136.86	0.419	0.50( 0.49)	0.97	47774.5	11620.00
12	6766.76	152.98	0.400	0.50( 0.49)	0.98	52312.0	12400.00
13	5919.24	164.55	0.386	0.50( 0.49)	0.98	54608.8	12201.00
14	5306.09	174.03	0.375	0.50( 0.49)	0.98	55897.9	12111.00
15	4375.96	190.14	0.362	0.50( 0.49)	0.98	57824.9	12261.00
16	3905.08	199.74	0.357	0.50( 0.49)	0.98	58636.6	10200.00
17	3339.42	215.41	0.349	0.50( 0.49)	0.98	59874.0	10300.00
18	3107.47	222.39	0.345	0.50( 0.49)	0.98	60225.1	12010.00
19	2625.64	243.30	0.334	0.50( 0.49)	0.98	60554.4	12000.00
20	1632.59	313.18	0.295	0.50( 0.49)	0.98	61224.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 12951.30 Tc(MIN.) = 19.74  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4285.50

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FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610505U.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	72.00	23.45	0.50( 0.49)	0.99	153.2	50500.00
TOTAL AREA(ACRES) = 153.2						

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FLOW PROCESS FROM NODE 13402.00 TO NODE 13402.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	12951.30	19.74	1.123	0.50( 0.49)	0.98	4285.5	50200.00
2	12868.35	34.85	0.812	0.50( 0.49)	0.98	9198.9	50300.00
3	12609.84	42.91	0.722	0.50( 0.49)	0.97	12399.3	30510.00
4	12101.89	52.03	0.651	0.50( 0.49)	0.97	15941.2	30300.00
5	11705.92	59.54	0.605	0.50( 0.48)	0.97	18737.5	31400.00
6	11216.41	69.63	0.569	0.50( 0.48)	0.97	22229.4	11801.00
7	10726.92	81.15	0.529	0.50( 0.48)	0.96	26055.7	11500.00
8	10150.62	93.25	0.493	0.50( 0.48)	0.97	30540.2	11000.00
9	9522.41	107.86	0.463	0.50( 0.48)	0.97	37123.0	13000.00
10	8515.52	125.06	0.433	0.50( 0.49)	0.97	44105.9	11130.00
11	7833.88	136.86	0.419	0.50( 0.49)	0.97	47774.5	11620.00
12	6766.76	152.98	0.400	0.50( 0.49)	0.98	52312.0	12400.00
13	5919.24	164.55	0.386	0.50( 0.49)	0.98	54608.8	12201.00
14	5306.09	174.03	0.375	0.50( 0.49)	0.98	55897.9	12111.00
15	4375.96	190.14	0.362	0.50( 0.49)	0.98	57824.9	12261.00
16	3905.08	199.74	0.357	0.50( 0.49)	0.98	58636.6	10200.00
17	3339.42	215.41	0.349	0.50( 0.49)	0.98	59874.0	10300.00
18	3107.47	222.39	0.345	0.50( 0.49)	0.98	60225.1	12010.00
19	2625.64	243.30	0.334	0.50( 0.49)	0.98	60554.4	12000.00
20	1632.59	313.18	0.295	0.50( 0.49)	0.98	61224.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	72.00	23.45	1.016	0.50( 0.49)	0.99	153.2	50500.00

LONGEST FLOWPATH FROM NODE 50500.00 TO NODE 13402.00 = 6247.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13023.31	19.74	1.123	0.50( 0.49)	0.98	4414.4	50200.00
2	13002.93	23.45	1.016	0.50( 0.49)	0.98	5645.8	50500.00
3	12912.25	34.85	0.812	0.50( 0.49)	0.98	9352.1	50300.00
4	12641.38	42.91	0.722	0.50( 0.49)	0.97	12552.5	30510.00
5	12123.67	52.03	0.651	0.50( 0.49)	0.97	16094.4	30300.00
6	11721.29	59.54	0.605	0.50( 0.48)	0.97	18890.7	31400.00
7	11226.82	69.63	0.569	0.50( 0.48)	0.97	22382.6	11801.00
8	10731.89	81.15	0.529	0.50( 0.48)	0.97	26208.9	11500.00
9	10151.54	93.25	0.493	0.50( 0.48)	0.97	30693.4	11000.00
10	9523.28	107.86	0.463	0.50( 0.48)	0.97	37276.2	13000.00
11	8516.34	125.06	0.433	0.50( 0.49)	0.97	44259.1	11130.00
12	7834.67	136.86	0.419	0.50( 0.49)	0.97	47927.6	11620.00
13	6767.52	152.98	0.400	0.50( 0.49)	0.98	52465.2	12400.00
14	5919.96	164.55	0.386	0.50( 0.49)	0.98	54761.9	12201.00
15	5306.80	174.03	0.375	0.50( 0.49)	0.98	56051.1	12111.00
16	4376.64	190.14	0.362	0.50( 0.49)	0.98	57978.0	12261.00
17	3905.76	199.74	0.357	0.50( 0.49)	0.98	58789.8	10200.00

18 3340.08 215.41 0.349 0.50( 0.49) 0.98 60027.2 10300.00  
 19 3108.12 222.39 0.345 0.50( 0.49) 0.98 60378.3 12010.00  
 20 2626.27 243.30 0.334 0.50( 0.49) 0.98 60707.6 12000.00  
 21 1633.14 313.18 0.295 0.50( 0.49) 0.98 61377.8 10100.00  
 TOTAL AREA(ACRES) = 61377.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13023.31 Tc(MIN.) = 19.737  
 EFFECTIVE AREA(ACRES) = 4414.41 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 61377.8  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13402.00 = 118713.68 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13402.00 TO NODE 13404.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 209.00 DOWNSTREAM(FEET) = 207.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 395.35 CHANNEL SLOPE = 0.0051  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 13023.31  
 FLOW VELOCITY(FEET/SEC.) = 14.38 FLOW DEPTH(FEET) = 17.38  
 TRAVEL TIME(MIN.) = 0.46 Tc(MIN.) = 20.20  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13023.31	20.20	1.107	0.50( 0.49)	0.98	4414.4	50200.00
2	13002.93	23.91	1.003	0.50( 0.49)	0.98	5645.8	50500.00
3	12912.25	35.31	0.806	0.50( 0.49)	0.98	9352.1	50300.00
4	12641.38	43.37	0.718	0.50( 0.49)	0.97	12552.5	30510.00
5	12123.67	52.50	0.649	0.50( 0.49)	0.97	16094.4	30300.00
6	11721.29	60.01	0.602	0.50( 0.48)	0.97	18890.7	31400.00
7	11226.82	70.11	0.567	0.50( 0.48)	0.97	22382.6	11801.00
8	10731.89	81.63	0.528	0.50( 0.48)	0.97	26208.9	11500.00
9	10151.54	93.74	0.492	0.50( 0.48)	0.97	30693.4	11000.00
10	9523.28	108.35	0.462	0.50( 0.48)	0.97	37276.2	13000.00
11	8516.34	125.57	0.432	0.50( 0.49)	0.97	44259.1	11130.00
12	7834.67	137.38	0.418	0.50( 0.49)	0.97	47927.6	11620.00
13	6767.52	153.52	0.399	0.50( 0.49)	0.98	52465.2	12400.00
14	5919.96	165.11	0.386	0.50( 0.49)	0.98	54761.9	12201.00
15	5306.80	174.60	0.374	0.50( 0.49)	0.98	56051.1	12111.00
16	4376.64	190.75	0.362	0.50( 0.49)	0.98	57978.0	12261.00
17	3905.76	200.36	0.357	0.50( 0.49)	0.98	58789.8	10200.00
18	3340.08	216.06	0.348	0.50( 0.49)	0.98	60027.2	10300.00
19	3108.12	223.05	0.345	0.50( 0.49)	0.98	60378.3	12010.00
20	2626.27	243.99	0.333	0.50( 0.49)	0.98	60707.6	12000.00
21	1633.14	313.95	0.295	0.50( 0.49)	0.98	61377.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 13023.31 Tc(MIN.) = 20.20  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4414.41

\*\*\*\*\*

FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610506U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27.99	19.62	0.50( 0.50)	1.00		49.6	50600.00
TOTAL AREA(ACRES) = 49.6							

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13404.00 TO NODE 13404.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13023.31	20.20	1.107	0.50( 0.49)	0.98	4414.4	50200.00
2	13002.93	23.91	1.003	0.50( 0.49)	0.98	5645.8	50500.00
3	12912.25	35.31	0.806	0.50( 0.49)	0.98	9352.1	50300.00
4	12641.38	43.37	0.718	0.50( 0.49)	0.97	12552.5	30510.00
5	12123.67	52.50	0.649	0.50( 0.49)	0.97	16094.4	30300.00
6	11721.29	60.01	0.602	0.50( 0.48)	0.97	18890.7	31400.00
7	11226.82	70.11	0.567	0.50( 0.48)	0.97	22382.6	11801.00
8	10731.89	81.63	0.528	0.50( 0.48)	0.97	26208.9	11500.00
9	10151.54	93.74	0.492	0.50( 0.48)	0.97	30693.4	11000.00
10	9523.28	108.35	0.462	0.50( 0.48)	0.97	37276.2	13000.00
11	8516.34	125.57	0.432	0.50( 0.49)	0.97	44259.1	11130.00
12	7834.67	137.38	0.418	0.50( 0.49)	0.97	47927.6	11620.00
13	6767.52	153.52	0.399	0.50( 0.49)	0.98	52465.2	12400.00
14	5919.96	165.11	0.386	0.50( 0.49)	0.98	54761.9	12201.00
15	5306.80	174.60	0.374	0.50( 0.49)	0.98	56051.1	12111.00
16	4376.64	190.75	0.362	0.50( 0.49)	0.98	57978.0	12261.00
17	3905.76	200.36	0.357	0.50( 0.49)	0.98	58789.8	10200.00
18	3340.08	216.06	0.348	0.50( 0.49)	0.98	60027.2	10300.00
19	3108.12	223.05	0.345	0.50( 0.49)	0.98	60378.3	12010.00
20	2626.27	243.99	0.333	0.50( 0.49)	0.98	60707.6	12000.00
21	1633.14	313.95	0.295	0.50( 0.49)	0.98	61377.8	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	27.99	19.62	1.127	0.50( 0.50)	1.00	49.6	50600.00
LONGEST FLOWPATH FROM NODE 50600.00 TO NODE 13404.00 = 4378.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13051.30	19.62	1.127	0.50( 0.49)	0.98	4339.3	50600.00
2	13050.42	20.20	1.107	0.50( 0.49)	0.98	4464.0	50200.00
3	13025.36	23.91	1.003	0.50( 0.49)	0.98	5695.4	50500.00
4	12925.91	35.31	0.806	0.50( 0.49)	0.98	9401.7	50300.00
5	12651.12	43.37	0.718	0.50( 0.49)	0.97	12602.1	30510.00
6	12130.30	52.50	0.649	0.50( 0.49)	0.97	16143.9	30300.00

7	11725.83	60.01	0.602	0.50 ( 0.48)	0.97	18940.3	31400.00
8	11229.82	70.11	0.567	0.50 ( 0.48)	0.97	22432.2	11801.00
9	10733.12	81.63	0.528	0.50 ( 0.48)	0.97	26258.5	11500.00
10	10151.54	93.74	0.492	0.50 ( 0.48)	0.97	30743.0	11000.00
11	9523.28	108.35	0.462	0.50 ( 0.48)	0.97	37325.8	13000.00
12	8516.34	125.57	0.432	0.50 ( 0.49)	0.97	44308.7	11130.00
13	7834.67	137.38	0.418	0.50 ( 0.49)	0.97	47977.2	11620.00
14	6767.52	153.52	0.399	0.50 ( 0.49)	0.98	52514.8	12400.00
15	5919.96	165.11	0.386	0.50 ( 0.49)	0.98	54811.5	12201.00
16	5306.80	174.60	0.374	0.50 ( 0.49)	0.98	56100.7	12111.00
17	4376.64	190.75	0.362	0.50 ( 0.49)	0.98	58027.6	12261.00
18	3905.76	200.36	0.357	0.50 ( 0.49)	0.98	58839.4	10200.00
19	3340.08	216.06	0.348	0.50 ( 0.49)	0.98	60076.8	10300.00
20	3108.12	223.05	0.345	0.50 ( 0.49)	0.98	60427.9	12010.00
21	2626.27	243.99	0.333	0.50 ( 0.49)	0.98	60757.2	12000.00
22	1633.14	313.95	0.295	0.50 ( 0.49)	0.98	61427.4	10100.00

TOTAL AREA (ACRES) = 61427.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13051.30 Tc(MIN.) = 19.625  
EFFECTIVE AREA(ACRES) = 4339.30 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 61427.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13404.00 = 119109.03 FEET.

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FLOW PROCESS FROM NODE 13404.00 TO NODE 13406.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
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ELEVATION DATA: UPSTREAM(FEET) = 207.00 DOWNSTREAM(FEET) = 195.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.97 CHANNEL SLOPE = 0.0075  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13051.30  
FLOW VELOCITY(FEET/SEC.) = 16.67 FLOW DEPTH(FEET) = 16.16  
TRAVEL TIME(MIN.) = 1.60 Tc(MIN.) = 21.23  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13051.30	21.23	1.078	0.50 ( 0.49)	0.98	4339.3	50600.00
2	13050.42	21.80	1.062	0.50 ( 0.49)	0.98	4464.0	50200.00
3	13025.36	25.51	0.962	0.50 ( 0.49)	0.98	5695.4	50500.00
4	12925.91	36.92	0.785	0.50 ( 0.49)	0.98	9401.7	50300.00
5	12651.12	44.99	0.705	0.50 ( 0.49)	0.97	12602.1	30510.00
6	12130.30	54.13	0.638	0.50 ( 0.49)	0.97	16143.9	30300.00
7	11725.83	61.66	0.596	0.50 ( 0.48)	0.97	18940.3	31400.00
8	11229.82	71.77	0.562	0.50 ( 0.48)	0.97	22432.2	11801.00
9	10733.12	83.31	0.522	0.50 ( 0.48)	0.97	26258.5	11500.00
10	10151.54	95.44	0.488	0.50 ( 0.48)	0.97	30743.0	11000.00
11	9523.28	110.08	0.459	0.50 ( 0.48)	0.97	37325.8	13000.00
12	8516.34	127.35	0.430	0.50 ( 0.49)	0.97	44308.7	11130.00
13	7834.67	139.20	0.416	0.50 ( 0.49)	0.97	47977.2	11620.00
14	6767.52	155.40	0.397	0.50 ( 0.49)	0.98	52514.8	12400.00
15	5919.96	167.06	0.383	0.50 ( 0.49)	0.98	54811.5	12201.00

16	5306.80	176.61	0.372	0.50 ( 0.49)	0.98	56100.7	12111.00
17	4376.64	192.85	0.361	0.50 ( 0.49)	0.98	58027.6	12261.00
18	3905.76	202.52	0.356	0.50 ( 0.49)	0.98	58839.4	10200.00
19	3340.08	218.31	0.347	0.50 ( 0.49)	0.98	60076.8	10300.00
20	3108.12	225.34	0.343	0.50 ( 0.49)	0.98	60427.9	12010.00
21	2626.27	246.38	0.332	0.50 ( 0.49)	0.98	60757.2	12000.00
22	1633.14	316.65	0.294	0.50 ( 0.49)	0.98	61427.4	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 13051.30 Tc(MIN.) = 21.23  
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4339.30

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 1 <<<<<  
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\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610211U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	66.92	14.41	0.50 ( 0.50)	1.00	87.0	21100.00

TOTAL AREA(ACRES) = 87.0

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13406.00 TO NODE 13406.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13051.30	21.23	1.078	0.50 ( 0.49)	0.98	4339.3	50600.00
2	13050.42	21.80	1.062	0.50 ( 0.49)	0.98	4464.0	50200.00
3	13025.36	25.51	0.962	0.50 ( 0.49)	0.98	5695.4	50500.00
4	12925.91	36.92	0.785	0.50 ( 0.49)	0.98	9401.7	50300.00
5	12651.12	44.99	0.705	0.50 ( 0.49)	0.97	12602.1	30510.00
6	12130.30	54.13	0.638	0.50 ( 0.49)	0.97	16143.9	30300.00
7	11725.83	61.66	0.596	0.50 ( 0.48)	0.97	18940.3	31400.00
8	11229.82	71.77	0.562	0.50 ( 0.48)	0.97	22432.2	11801.00
9	10733.12	83.31	0.522	0.50 ( 0.48)	0.97	26258.5	11500.00
10	10151.54	95.44	0.488	0.50 ( 0.48)	0.97	30743.0	11000.00
11	9523.28	110.08	0.459	0.50 ( 0.48)	0.97	37325.8	13000.00
12	8516.34	127.35	0.430	0.50 ( 0.49)	0.97	44308.7	11130.00
13	7834.67	139.20	0.416	0.50 ( 0.49)	0.97	47977.2	11620.00
14	6767.52	155.40	0.397	0.50 ( 0.49)	0.98	52514.8	12400.00
15	5919.96	167.06	0.383	0.50 ( 0.49)	0.98	54811.5	12201.00
16	5306.80	176.61	0.372	0.50 ( 0.49)	0.98	56100.7	12111.00
17	4376.64	192.85	0.361	0.50 ( 0.49)	0.98	58027.6	12261.00
18	3905.76	202.52	0.356	0.50 ( 0.49)	0.98	58839.4	10200.00
19	3340.08	218.31	0.347	0.50 ( 0.49)	0.98	60076.8	10300.00

20 3108.12 225.34 0.343 0.50( 0.49) 0.98 60427.9 12010.00  
 21 2626.27 246.38 0.332 0.50( 0.49) 0.98 60757.2 12000.00  
 22 1633.14 316.65 0.294 0.50( 0.49) 0.98 61427.4 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	66.92	14.41	1.355	0.50( 0.50)	1.00	87.0	21100.00

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 13406.00 = 2859.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13087.25	14.41	1.355	0.50( 0.49)	0.98	3033.6	21100.00
2	13096.56	21.23	1.078	0.50( 0.49)	0.98	4426.3	50600.00
3	13094.42	21.80	1.062	0.50( 0.49)	0.98	4551.0	50200.00
4	13061.50	25.51	0.962	0.50( 0.49)	0.98	5782.4	50500.00
5	12948.23	36.92	0.785	0.50( 0.49)	0.98	9488.7	50300.00
6	12667.15	44.99	0.705	0.50( 0.49)	0.97	12689.1	30510.00
7	12141.11	54.13	0.638	0.50( 0.49)	0.97	16230.9	30300.00
8	11733.36	61.66	0.596	0.50( 0.48)	0.97	19027.3	31400.00
9	11234.62	71.77	0.562	0.50( 0.48)	0.97	22519.2	11801.00
10	10734.82	83.31	0.522	0.50( 0.48)	0.97	26345.5	11500.00
11	10151.54	95.44	0.488	0.50( 0.48)	0.97	30830.0	11000.00
12	9523.28	110.08	0.459	0.50( 0.48)	0.97	37412.8	13000.00
13	8516.34	127.35	0.430	0.50( 0.49)	0.97	44395.7	11130.00
14	7834.67	139.20	0.416	0.50( 0.49)	0.97	48064.2	11620.00
15	6767.52	155.40	0.397	0.50( 0.49)	0.98	52601.8	12400.00
16	5919.96	167.06	0.383	0.50( 0.49)	0.98	54898.5	12201.00
17	5306.80	176.61	0.372	0.50( 0.49)	0.98	56187.7	12111.00
18	4376.64	192.85	0.361	0.50( 0.49)	0.98	58114.6	12261.00
19	3905.76	202.52	0.356	0.50( 0.49)	0.98	58926.4	10200.00
20	3340.08	218.31	0.347	0.50( 0.49)	0.98	60163.8	10300.00
21	3108.12	225.34	0.343	0.50( 0.49)	0.98	60514.9	12010.00
22	2626.27	246.38	0.332	0.50( 0.49)	0.98	60844.2	12000.00
23	1633.14	316.65	0.294	0.50( 0.49)	0.98	61514.4	10100.00

TOTAL AREA(ACRES) = 61514.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13096.56 Tc(MIN.) = 21.227  
 EFFECTIVE AREA(ACRES) = 4426.30 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 61514.4  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13406.00 = 120711.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13406.00 TO NODE 13408.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 195.00 DOWNSTREAM(FEET) = 182.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2458.36 CHANNEL SLOPE = 0.0053  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MAXIMUM'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.999  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	12.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13099.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.64  
 AVERAGE FLOW DEPTH(FEET) = 17.27 TRAVEL TIME(MIN.) = 2.80  
 Tc(MIN.) = 24.03  
 SUBAREA AREA(ACRES) = 12.41 SUBAREA RUNOFF(CFS) = 5.58  
 EFFECTIVE AREA(ACRES) = 4438.71 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 61526.8 PEAK FLOW RATE(CFS) = 13096.56  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 17.27 FLOW VELOCITY(FEET/SEC.) = 14.64  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13087.25	17.21	1.218	0.50( 0.49)	0.98	3046.0	21100.00
2	13096.56	24.03	0.999	0.50( 0.49)	0.98	4438.7	50600.00
3	13094.42	24.60	0.983	0.50( 0.49)	0.98	4563.4	50200.00
4	13061.50	28.31	0.907	0.50( 0.49)	0.98	5794.8	50500.00
5	12948.23	39.73	0.749	0.50( 0.49)	0.98	9501.1	50300.00
6	12667.15	47.81	0.682	0.50( 0.49)	0.98	12701.5	30510.00
7	12141.11	56.98	0.621	0.50( 0.49)	0.97	16243.4	30300.00
8	11733.36	64.54	0.586	0.50( 0.48)	0.97	19039.7	31400.00
9	11234.62	74.68	0.552	0.50( 0.48)	0.97	22531.6	11801.00
10	10734.82	86.25	0.512	0.50( 0.48)	0.97	26357.9	11500.00
11	10151.54	98.43	0.482	0.50( 0.48)	0.97	30842.4	11000.00
12	9523.28	113.12	0.453	0.50( 0.48)	0.97	37425.2	13000.00
13	8516.34	130.47	0.427	0.50( 0.49)	0.97	44408.1	11130.00
14	7834.67	142.39	0.413	0.50( 0.49)	0.97	48076.6	11620.00
15	6767.52	158.71	0.393	0.50( 0.49)	0.98	52614.2	12400.00
16	5919.96	170.48	0.379	0.50( 0.49)	0.98	54910.9	12201.00
17	5306.80	180.12	0.368	0.50( 0.49)	0.98	56200.1	12111.00
18	4376.64	196.53	0.359	0.50( 0.49)	0.98	58127.1	12261.00
19	3905.76	206.31	0.354	0.50( 0.49)	0.98	58938.8	10200.00
20	3340.08	222.25	0.345	0.50( 0.49)	0.98	60176.2	10300.00
21	3108.12	229.35	0.341	0.50( 0.49)	0.98	60527.3	12010.00
22	2626.27	250.56	0.330	0.50( 0.49)	0.98	60856.6	12000.00
23	1633.14	321.35	0.291	0.50( 0.49)	0.98	61526.8	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 13096.56 Tc(MIN.) = 24.03  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4438.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 2 <<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 15.1

=====  
>>>>DEFINE MEMORY BANK # 2 <<<<  
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PEAK FLOWRATE TABLE FILE NAME: 0610507U.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.76	23.93	0.50 (0.50)	0.99	236.8	50700.00
TOTAL AREA (ACRES) =			236.8			

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13408.00 TO NODE 13408.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<  
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\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13087.25	17.21	1.218	0.50 (0.49)	0.98	3046.0	21100.00
2	13096.56	24.03	0.999	0.50 (0.49)	0.98	4438.7	50600.00
3	13094.42	24.60	0.983	0.50 (0.49)	0.98	4563.4	50200.00
4	13061.50	28.31	0.907	0.50 (0.49)	0.98	5794.8	50500.00
5	12948.23	39.73	0.749	0.50 (0.49)	0.98	9501.1	50300.00
6	12667.15	47.81	0.682	0.50 (0.49)	0.98	12701.5	30510.00
7	12141.11	56.98	0.621	0.50 (0.49)	0.97	16243.4	30300.00
8	11733.36	64.54	0.586	0.50 (0.48)	0.97	19039.7	31400.00
9	11234.62	74.68	0.552	0.50 (0.48)	0.97	22531.6	11801.00
10	10734.82	86.25	0.512	0.50 (0.48)	0.97	26357.9	11500.00
11	10151.54	98.43	0.482	0.50 (0.48)	0.97	30842.4	11000.00
12	9523.28	113.12	0.453	0.50 (0.48)	0.97	37425.2	13000.00
13	8516.34	130.47	0.427	0.50 (0.49)	0.97	44408.1	11130.00
14	7834.67	142.39	0.413	0.50 (0.49)	0.97	48076.6	11620.00
15	6767.52	158.71	0.393	0.50 (0.49)	0.98	52614.2	12400.00
16	5919.96	170.48	0.379	0.50 (0.49)	0.98	54910.9	12201.00
17	5306.80	180.12	0.368	0.50 (0.49)	0.98	56200.1	12111.00
18	4376.64	196.53	0.359	0.50 (0.49)	0.98	58127.1	12261.00
19	3905.76	206.31	0.354	0.50 (0.49)	0.98	58938.8	10200.00
20	3340.08	222.25	0.345	0.50 (0.49)	0.98	60176.2	10300.00
21	3108.12	229.35	0.341	0.50 (0.49)	0.98	60527.3	12010.00
22	2626.27	250.56	0.330	0.50 (0.49)	0.98	60856.6	12000.00
23	1633.14	321.35	0.291	0.50 (0.49)	0.98	61526.8	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	107.76	23.93	1.002	0.50 (0.50)	0.99	236.8	50700.00

LONGEST FLOWPATH FROM NODE 50700.00 TO NODE 13408.00 = 7903.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13195.00	17.21	1.218	0.50 (0.49)	0.98	3216.4	21100.00
2	13204.18	23.93	1.002	0.50 (0.49)	0.98	4655.7	50700.00
3	13203.73	24.03	0.999	0.50 (0.49)	0.98	4675.5	50600.00
4	13198.16	24.60	0.983	0.50 (0.49)	0.98	4800.2	50200.00
5	13148.98	28.31	0.907	0.50 (0.49)	0.98	6031.6	50500.00

6	13002.14	39.73	0.749	0.50 (0.49)	0.98	9737.9	50300.00
7	12706.67	47.81	0.682	0.50 (0.49)	0.98	12938.3	30510.00
8	12167.57	56.98	0.621	0.50 (0.49)	0.97	16480.1	30300.00
9	11752.51	64.54	0.586	0.50 (0.48)	0.97	19276.5	31400.00
10	11246.36	74.68	0.552	0.50 (0.48)	0.97	22768.4	11801.00
11	10738.09	86.25	0.512	0.50 (0.48)	0.97	26594.7	11500.00
12	10152.29	98.43	0.482	0.50 (0.48)	0.97	31079.2	11000.00
13	9523.98	113.12	0.453	0.50 (0.48)	0.97	37662.0	13000.00
14	8517.00	130.47	0.427	0.50 (0.49)	0.97	44644.9	11130.00
15	7835.31	142.39	0.413	0.50 (0.49)	0.97	48313.4	11620.00
16	6768.13	158.71	0.393	0.50 (0.49)	0.98	52851.0	12400.00
17	5920.55	170.48	0.379	0.50 (0.49)	0.98	55147.7	12201.00
18	5307.37	180.12	0.368	0.50 (0.49)	0.98	56436.9	12111.00
19	4377.20	196.53	0.359	0.50 (0.49)	0.98	58363.8	12261.00
20	3906.31	206.31	0.354	0.50 (0.49)	0.98	59175.6	10200.00
21	3340.62	222.25	0.345	0.50 (0.49)	0.98	60413.0	10300.00
22	3108.65	229.35	0.341	0.50 (0.49)	0.98	60764.1	12010.00
23	2626.79	250.56	0.330	0.50 (0.49)	0.98	61093.4	12000.00
24	1633.60	321.35	0.291	0.50 (0.49)	0.98	61763.6	10100.00

TOTAL AREA (ACRES) = 61763.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 13204.18 Tc (MIN.) = 23.929  
EFFECTIVE AREA (ACRES) = 4655.70 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 61763.6  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13408.00 = 123169.36 FEET.

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FLOW PROCESS FROM NODE 13408.00 TO NODE 13410.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 182.00 DOWNSTREAM (FEET) = 178.72  
CHANNEL LENGTH THRU SUBAREA (FEET) = 952.73 CHANNEL SLOPE = 0.0034  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.968

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	3.31	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 13204.88  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.49  
AVERAGE FLOW DEPTH (FEET) = 18.77 TRAVEL TIME (MIN.) = 1.27  
Tc (MIN.) = 25.20  
SUBAREA AREA (ACRES) = 3.31 SUBAREA RUNOFF (CFS) = 1.39  
EFFECTIVE AREA (ACRES) = 4659.01 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 61766.9 PEAK FLOW RATE (CFS) = 13204.18  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 18.77 FLOW VELOCITY (FEET/SEC.) = 12.49  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13195.00	18.49	1.170	0.50 ( 0.49)	0.98	3219.7	21100.00
2	13204.18	25.20	0.968	0.50 ( 0.49)	0.98	4659.0	50700.00
3	13203.73	25.30	0.966	0.50 ( 0.49)	0.98	4678.8	50600.00
4	13198.16	25.87	0.955	0.50 ( 0.49)	0.98	4803.5	50200.00
5	13148.98	29.59	0.882	0.50 ( 0.49)	0.98	6034.9	50500.00
6	13002.14	41.00	0.738	0.50 ( 0.49)	0.98	9741.2	50300.00
7	12706.67	49.09	0.671	0.50 ( 0.49)	0.98	12941.6	30510.00
8	12167.57	58.28	0.613	0.50 ( 0.49)	0.97	16483.5	30300.00
9	11752.51	65.84	0.582	0.50 ( 0.48)	0.97	19279.8	31400.00
10	11246.36	76.01	0.547	0.50 ( 0.48)	0.97	22771.7	11801.00
11	10738.09	87.59	0.507	0.50 ( 0.48)	0.97	26598.0	11500.00
12	10152.29	99.78	0.479	0.50 ( 0.48)	0.97	31082.5	11000.00
13	9523.98	114.50	0.450	0.50 ( 0.48)	0.97	37665.3	13000.00
14	8517.00	131.89	0.425	0.50 ( 0.49)	0.97	44648.2	11130.00
15	7835.31	143.83	0.411	0.50 ( 0.49)	0.97	48316.7	11620.00
16	6768.13	160.21	0.391	0.50 ( 0.49)	0.98	52854.3	12400.00
17	5920.55	172.03	0.377	0.50 ( 0.49)	0.98	55151.0	12201.00
18	5307.37	181.72	0.367	0.50 ( 0.49)	0.98	56440.2	12111.00
19	4377.20	198.21	0.358	0.50 ( 0.49)	0.98	58367.1	12261.00
20	3906.31	208.03	0.353	0.50 ( 0.49)	0.98	59178.9	10200.00
21	3340.62	224.04	0.344	0.50 ( 0.49)	0.98	60416.3	10300.00
22	3108.65	231.17	0.340	0.50 ( 0.49)	0.98	60767.4	12010.00
23	2626.79	252.47	0.329	0.50 ( 0.49)	0.98	61096.7	12000.00
24	1633.60	323.50	0.290	0.50 ( 0.49)	0.98	61766.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 13204.18 Tc(MIN.) = 25.20  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 4659.01

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<<  
 =====

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
 =====

PEAK FLOWRATE TABLE FILE NAME: S36.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	23.93	0.50 ( 0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.50 ( 0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.50 ( 0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.50 ( 0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.50 ( 0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.50 ( 0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.50 ( 0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.50 ( 0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.50 ( 0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.50 ( 0.49)	0.99	2727.6	20200.00

11	555.67	59.27	0.50 ( 0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.50 ( 0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.50 ( 0.49)	0.99	2895.7	13600.00
14	113.35	140.26	0.50 ( 0.49)	0.98	3986.0	13510.00
15	59.39	170.09	0.50 ( 0.49)	0.97	4067.7	13500.00

TOTAL AREA(ACRES) = 4067.7

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13410.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<  
 =====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13195.00	18.49	1.170	0.50 ( 0.49)	0.98	3219.7	21100.00
2	13204.18	25.20	0.968	0.50 ( 0.49)	0.98	4659.0	50700.00
3	13203.73	25.30	0.966	0.50 ( 0.49)	0.98	4678.8	50600.00
4	13198.16	25.87	0.955	0.50 ( 0.49)	0.98	4803.5	50200.00
5	13148.98	29.59	0.882	0.50 ( 0.49)	0.98	6034.9	50500.00
6	13002.14	41.00	0.738	0.50 ( 0.49)	0.98	9741.2	50300.00
7	12706.67	49.09	0.671	0.50 ( 0.49)	0.98	12941.6	30510.00
8	12167.57	58.28	0.613	0.50 ( 0.49)	0.97	16483.5	30300.00
9	11752.51	65.84	0.582	0.50 ( 0.48)	0.97	19279.8	31400.00
10	11246.36	76.01	0.547	0.50 ( 0.48)	0.97	22771.7	11801.00
11	10738.09	87.59	0.507	0.50 ( 0.48)	0.97	26598.0	11500.00
12	10152.29	99.78	0.479	0.50 ( 0.48)	0.97	31082.5	11000.00
13	9523.98	114.50	0.450	0.50 ( 0.48)	0.97	37665.3	13000.00
14	8517.00	131.89	0.425	0.50 ( 0.49)	0.97	44648.2	11130.00
15	7835.31	143.83	0.411	0.50 ( 0.49)	0.97	48316.7	11620.00
16	6768.13	160.21	0.391	0.50 ( 0.49)	0.98	52854.3	12400.00
17	5920.55	172.03	0.377	0.50 ( 0.49)	0.98	55151.0	12201.00
18	5307.37	181.72	0.367	0.50 ( 0.49)	0.98	56440.2	12111.00
19	4377.20	198.21	0.358	0.50 ( 0.49)	0.98	58367.1	12261.00
20	3906.31	208.03	0.353	0.50 ( 0.49)	0.98	59178.9	10200.00
21	3340.62	224.04	0.344	0.50 ( 0.49)	0.98	60416.3	10300.00
22	3108.65	231.17	0.340	0.50 ( 0.49)	0.98	60767.4	12010.00
23	2626.79	252.47	0.329	0.50 ( 0.49)	0.98	61096.7	12000.00
24	1633.60	323.50	0.290	0.50 ( 0.49)	0.98	61766.9	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	23.93	1.002	0.50 ( 0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.928	0.50 ( 0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.917	0.50 ( 0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.855	0.50 ( 0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.820	0.50 ( 0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.710	0.50 ( 0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.658	0.50 ( 0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.635	0.50 ( 0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.631	0.50 ( 0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.608	0.50 ( 0.49)	0.99	2727.6	20200.00
11	555.67	59.27	0.607	0.50 ( 0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.595	0.50 ( 0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.574	0.50 ( 0.49)	0.99	2895.7	13600.00

14 113.35 140.26 0.415 0.50( 0.49) 0.98 3986.0 13510.00  
 15 59.39 170.09 0.380 0.50( 0.49) 0.97 4067.7 13500.00  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14068.05	18.49	1.170	0.50( 0.49)	0.98	4102.1	21100.00
2	14075.49	23.93	1.002	0.50( 0.49)	0.98	5528.8	21000.00
3	14074.44	25.20	0.968	0.50( 0.49)	0.98	5869.7	50700.00
4	14073.78	25.30	0.966	0.50( 0.49)	0.98	5894.7	50600.00
5	14066.96	25.87	0.955	0.50( 0.49)	0.98	6050.1	50200.00
6	14045.84	27.24	0.928	0.50( 0.49)	0.98	6577.7	20810.00
7	14035.32	27.83	0.917	0.50( 0.49)	0.98	6810.6	20900.00
8	14001.27	29.59	0.882	0.50( 0.49)	0.98	7492.3	50500.00
9	13965.37	31.47	0.855	0.50( 0.49)	0.98	8212.6	20800.00
10	13907.98	34.25	0.820	0.50( 0.49)	0.98	9259.5	20700.00
11	13762.23	41.00	0.738	0.50( 0.49)	0.98	11798.2	50300.00
12	13607.68	44.42	0.710	0.50( 0.49)	0.98	13325.2	20600.00
13	13398.70	49.09	0.671	0.50( 0.49)	0.98	15390.4	30510.00
14	13274.02	50.96	0.658	0.50( 0.49)	0.98	16195.5	20500.00
15	13003.25	54.75	0.635	0.50( 0.49)	0.98	17766.8	20400.00
16	12956.60	55.38	0.631	0.50( 0.49)	0.97	18022.6	20300.00
17	12739.30	58.28	0.613	0.50( 0.49)	0.97	19196.3	30300.00
18	12683.01	59.07	0.608	0.50( 0.49)	0.97	19504.1	20200.00
19	12669.05	59.27	0.607	0.50( 0.49)	0.97	19580.4	20210.00
20	12468.63	62.10	0.595	0.50( 0.49)	0.97	20682.5	20100.00
21	12218.78	65.84	0.582	0.50( 0.49)	0.97	22133.9	31400.00
22	12077.33	68.14	0.574	0.50( 0.49)	0.97	22963.3	13600.00
23	11649.84	76.01	0.547	0.50( 0.48)	0.97	25786.3	11801.00
24	11089.25	87.59	0.507	0.50( 0.48)	0.97	29787.8	11500.00
25	10448.40	99.78	0.479	0.50( 0.48)	0.97	34456.6	11000.00
26	9753.66	114.50	0.450	0.50( 0.49)	0.97	41261.8	13000.00
27	8668.13	131.89	0.425	0.50( 0.49)	0.97	48507.7	11130.00
28	8152.90	140.26	0.415	0.50( 0.49)	0.97	51203.6	13510.00
29	7942.19	143.83	0.411	0.50( 0.49)	0.97	52312.6	11620.00
30	6845.40	160.21	0.391	0.50( 0.49)	0.98	56895.0	12400.00
31	6118.89	170.09	0.380	0.50( 0.49)	0.98	58842.3	13500.00
32	5979.59	172.03	0.377	0.50( 0.49)	0.98	59218.8	12201.00
33	5364.79	181.72	0.367	0.50( 0.49)	0.98	60507.9	12111.00
34	4433.21	198.21	0.358	0.50( 0.49)	0.98	62434.9	12261.00
35	3961.48	208.03	0.353	0.50( 0.49)	0.98	63246.7	10200.00
36	3394.42	224.04	0.344	0.50( 0.49)	0.98	64484.0	10300.00
37	3161.86	231.17	0.340	0.50( 0.49)	0.98	64835.1	12010.00
38	2678.17	252.47	0.329	0.50( 0.49)	0.98	65164.4	12000.00
39	1678.94	323.50	0.290	0.50( 0.49)	0.98	65834.6	10100.00

TOTAL AREA (ACRES) = 65834.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 14075.49 Tc (MIN.) = 23.929  
 EFFECTIVE AREA (ACRES) = 5528.79 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA (ACRES) = 65834.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13410.00 = 124122.09 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13410.00 TO NODE 13412.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 178.72 DOWNSTREAM (FEET) = 176.93  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 169.78 CHANNEL SLOPE = 0.0105  
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA (CFS) = 14075.49  
 FLOW VELOCITY (FEET/SEC.) = 19.30 FLOW DEPTH (FEET) = 15.59  
 TRAVEL TIME (MIN.) = 0.15 Tc (MIN.) = 24.08  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14068.05	18.63	1.165	0.50( 0.49)	0.98	4102.1	21100.00
2	14075.49	24.08	0.998	0.50( 0.49)	0.98	5528.8	21000.00
3	14074.44	25.35	0.965	0.50( 0.49)	0.98	5869.7	50700.00
4	14073.78	25.44	0.963	0.50( 0.49)	0.98	5894.7	50600.00
5	14066.96	26.01	0.952	0.50( 0.49)	0.98	6050.1	50200.00
6	14045.84	27.39	0.925	0.50( 0.49)	0.98	6577.7	20810.00
7	14035.32	27.98	0.914	0.50( 0.49)	0.98	6810.6	20900.00
8	14001.27	29.73	0.879	0.50( 0.49)	0.98	7492.3	50500.00
9	13965.37	31.62	0.853	0.50( 0.49)	0.98	8212.6	20800.00
10	13907.98	34.40	0.818	0.50( 0.49)	0.98	9259.5	20700.00
11	13762.23	41.15	0.737	0.50( 0.49)	0.98	11798.2	50300.00
12	13607.68	44.57	0.709	0.50( 0.49)	0.98	13325.2	20600.00
13	13398.70	49.24	0.670	0.50( 0.49)	0.98	15390.4	30510.00
14	13274.02	51.11	0.657	0.50( 0.49)	0.98	16195.5	20500.00
15	13003.25	54.90	0.634	0.50( 0.49)	0.98	17766.8	20400.00
16	12956.60	55.53	0.630	0.50( 0.49)	0.97	18022.6	20300.00
17	12739.30	58.43	0.612	0.50( 0.49)	0.97	19196.3	30300.00
18	12683.01	59.22	0.607	0.50( 0.49)	0.97	19504.1	20200.00
19	12669.05	59.42	0.606	0.50( 0.49)	0.97	19580.4	20210.00
20	12468.63	62.25	0.594	0.50( 0.49)	0.97	20682.5	20100.00
21	12218.78	66.00	0.581	0.50( 0.49)	0.97	22133.9	31400.00
22	12077.33	68.29	0.574	0.50( 0.49)	0.97	22963.3	13600.00
23	11649.84	76.16	0.547	0.50( 0.48)	0.97	25786.3	11801.00
24	11089.25	87.75	0.507	0.50( 0.48)	0.97	29787.8	11500.00
25	10448.40	99.94	0.479	0.50( 0.48)	0.97	34456.6	11000.00
26	9753.66	114.66	0.450	0.50( 0.49)	0.97	41261.8	13000.00
27	8668.13	132.05	0.425	0.50( 0.49)	0.97	48507.7	11130.00
28	8152.90	140.42	0.415	0.50( 0.49)	0.97	51203.6	13510.00
29	7942.19	144.00	0.411	0.50( 0.49)	0.97	52312.6	11620.00
30	6845.40	160.38	0.391	0.50( 0.49)	0.98	56895.0	12400.00
31	6118.89	170.27	0.380	0.50( 0.49)	0.98	58842.3	13500.00
32	5979.59	172.21	0.377	0.50( 0.49)	0.98	59218.8	12201.00
33	5364.79	181.90	0.367	0.50( 0.49)	0.98	60507.9	12111.00
34	4433.21	198.40	0.358	0.50( 0.49)	0.98	62434.9	12261.00
35	3961.48	208.23	0.353	0.50( 0.49)	0.98	63246.7	10200.00
36	3394.42	224.25	0.344	0.50( 0.49)	0.98	64484.0	10300.00
37	3161.86	231.39	0.340	0.50( 0.49)	0.98	64835.1	12010.00
38	2678.17	252.69	0.328	0.50( 0.49)	0.98	65164.4	12000.00
39	1678.94	323.75	0.290	0.50( 0.49)	0.98	65834.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 14075.49 Tc (MIN.) = 24.08  
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 5528.79



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FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509101U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	123.72	47.22	0.50	(0.50)	1.00	585.7	10100.00
TOTAL AREA (ACRES) =							585.7

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FLOW PROCESS FROM NODE 13412.00 TO NODE 13412.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14068.05	18.63	1.165	0.50 (0.49)	0.98	4102.1	21100.00
2	14075.49	24.08	0.998	0.50 (0.49)	0.98	5528.8	21000.00
3	14074.44	25.35	0.965	0.50 (0.49)	0.98	5869.7	50700.00
4	14073.78	25.44	0.963	0.50 (0.49)	0.98	5894.7	50600.00
5	14066.96	26.01	0.952	0.50 (0.49)	0.98	6050.1	50200.00
6	14045.84	27.39	0.925	0.50 (0.49)	0.98	6577.7	20810.00
7	14035.32	27.98	0.914	0.50 (0.49)	0.98	6810.6	20900.00
8	14001.27	29.73	0.879	0.50 (0.49)	0.98	7492.3	50500.00
9	13965.37	31.62	0.853	0.50 (0.49)	0.98	8212.6	20800.00
10	13907.98	34.40	0.818	0.50 (0.49)	0.98	9259.5	20700.00
11	13762.23	41.15	0.737	0.50 (0.49)	0.98	11798.2	50300.00
12	13607.68	44.57	0.709	0.50 (0.49)	0.98	13325.2	20600.00
13	13398.70	49.24	0.670	0.50 (0.49)	0.98	15390.4	30510.00
14	13274.02	51.11	0.657	0.50 (0.49)	0.98	16195.5	20500.00
15	13003.25	54.90	0.634	0.50 (0.49)	0.98	17766.8	20400.00
16	12956.60	55.53	0.630	0.50 (0.49)	0.97	18022.6	20300.00
17	12739.30	58.43	0.612	0.50 (0.49)	0.97	19196.3	30300.00
18	12683.01	59.22	0.607	0.50 (0.49)	0.97	19504.1	20200.00
19	12669.05	59.42	0.606	0.50 (0.49)	0.97	19580.4	20210.00
20	12468.63	62.25	0.594	0.50 (0.49)	0.97	20682.5	20100.00
21	12218.78	66.00	0.581	0.50 (0.49)	0.97	22133.9	31400.00
22	12077.33	68.29	0.574	0.50 (0.49)	0.97	22963.3	13600.00
23	11649.84	76.16	0.547	0.50 (0.48)	0.97	25786.3	11801.00
24	11089.25	87.75	0.507	0.50 (0.48)	0.97	29787.8	11500.00
25	10448.40	99.94	0.479	0.50 (0.48)	0.97	34456.6	11000.00
26	9753.66	114.66	0.450	0.50 (0.49)	0.97	41261.8	13000.00
27	8668.13	132.05	0.425	0.50 (0.49)	0.97	48507.7	11130.00
28	8152.90	140.42	0.415	0.50 (0.49)	0.97	51203.6	13510.00
29	7942.19	144.00	0.411	0.50 (0.49)	0.97	52312.6	11620.00
30	6845.40	160.38	0.391	0.50 (0.49)	0.98	56895.0	12400.00

31	6118.89	170.27	0.380	0.50 (0.49)	0.98	58842.3	13500.00
32	5979.59	172.21	0.377	0.50 (0.49)	0.98	59218.8	12201.00
33	5364.79	181.90	0.367	0.50 (0.49)	0.98	60507.9	12111.00
34	4433.21	198.40	0.358	0.50 (0.49)	0.98	62434.9	12261.00
35	3961.48	208.23	0.353	0.50 (0.49)	0.98	63246.7	10200.00
36	3394.42	224.25	0.344	0.50 (0.49)	0.98	64484.0	10300.00
37	3161.86	231.39	0.340	0.50 (0.49)	0.98	64835.1	12010.00
38	2678.17	252.69	0.328	0.50 (0.49)	0.98	65164.4	12000.00
39	1678.94	323.75	0.290	0.50 (0.49)	0.98	65834.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	123.72	47.22	0.687	0.50 (0.50)	1.00	585.7	10100.00
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 14724.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14191.77	18.63	1.165	0.50 (0.49)	0.98	4333.2	21100.00
2	14199.21	24.08	0.998	0.50 (0.49)	0.98	5827.4	21000.00
3	14198.16	25.35	0.965	0.50 (0.49)	0.98	6184.0	50700.00
4	14197.50	25.44	0.963	0.50 (0.49)	0.98	6210.3	50600.00
5	14190.68	26.01	0.952	0.50 (0.49)	0.98	6372.8	50200.00
6	14169.55	27.39	0.925	0.50 (0.49)	0.98	6917.4	20810.00
7	14159.04	27.98	0.914	0.50 (0.49)	0.98	7157.7	20900.00
8	14124.99	29.73	0.879	0.50 (0.49)	0.98	7861.1	50500.00
9	14089.08	31.62	0.853	0.50 (0.49)	0.98	8604.8	20800.00
10	14031.69	34.40	0.818	0.50 (0.49)	0.98	9686.2	20700.00
11	13885.95	41.15	0.737	0.50 (0.49)	0.98	12308.6	50300.00
12	13731.40	44.57	0.709	0.50 (0.49)	0.98	13877.9	20600.00
13	13612.64	47.22	0.687	0.50 (0.49)	0.98	15084.5	10100.00
14	13511.44	49.24	0.670	0.50 (0.49)	0.98	15976.1	30510.00
15	13378.08	51.11	0.657	0.50 (0.49)	0.98	16781.2	20500.00
16	13091.73	54.90	0.634	0.50 (0.49)	0.98	18352.5	20400.00
17	13042.50	55.53	0.630	0.50 (0.49)	0.98	18608.3	20300.00
18	12813.25	58.43	0.612	0.50 (0.49)	0.97	19782.1	30300.00
19	12753.70	59.22	0.607	0.50 (0.49)	0.97	20089.9	20200.00
20	12738.94	59.42	0.606	0.50 (0.49)	0.97	20166.1	20210.00
21	12531.00	62.25	0.594	0.50 (0.49)	0.97	21268.2	20100.00
22	12272.63	66.00	0.581	0.50 (0.49)	0.97	22719.6	31400.00
23	12125.97	68.29	0.574	0.50 (0.49)	0.97	23549.0	13600.00
24	11680.56	76.16	0.547	0.50 (0.48)	0.97	26372.0	11801.00
25	11093.58	87.75	0.507	0.50 (0.48)	0.97	30373.6	11500.00
26	10448.40	99.94	0.479	0.50 (0.48)	0.97	35042.4	11000.00
27	9753.66	114.66	0.450	0.50 (0.49)	0.97	41847.6	13000.00
28	8668.13	132.05	0.425	0.50 (0.49)	0.97	49093.4	11130.00
29	8152.90	140.42	0.415	0.50 (0.49)	0.97	51789.4	13510.00
30	7942.19	144.00	0.411	0.50 (0.49)	0.98	52898.3	11620.00
31	6845.40	160.38	0.391	0.50 (0.49)	0.98	57480.7	12400.00
32	6118.89	170.27	0.380	0.50 (0.49)	0.98	59428.0	13500.00
33	5979.59	172.21	0.377	0.50 (0.49)	0.98	59804.5	12201.00
34	5364.79	181.90	0.367	0.50 (0.49)	0.98	61093.7	12111.00
35	4433.21	198.40	0.358	0.50 (0.49)	0.98	63020.6	12261.00
36	3961.48	208.23	0.353	0.50 (0.49)	0.98	63832.4	10200.00
37	3394.42	224.25	0.344	0.50 (0.49)	0.98	65069.7	10300.00
38	3161.86	231.39	0.340	0.50 (0.49)	0.98	65420.8	12010.00

39 2678.17 252.69 0.328 0.50( 0.49) 0.98 65750.2 12000.00  
40 1678.94 323.75 0.290 0.50( 0.49) 0.98 66420.4 10100.00  
TOTAL AREA (ACRES) = 66420.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 14199.21 Tc (MIN.) = 24.076  
EFFECTIVE AREA (ACRES) = 5827.41 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 66420.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13412.00 = 124291.87 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13412.00 TO NODE 13700.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 176.93 DOWNSTREAM (FEET) = 173.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 260.10 CHANNEL SLOPE = 0.0151  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 14199.21  
FLOW VELOCITY (FEET/SEC.) = 22.14 FLOW DEPTH (FEET) = 14.62  
TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 24.27  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14191.77	18.83	1.157	0.50( 0.49)	0.98	4333.2	21100.00
2	14199.21	24.27	0.993	0.50( 0.49)	0.98	5827.4	21000.00
3	14198.16	25.54	0.961	0.50( 0.49)	0.98	6184.0	50700.00
4	14197.50	25.64	0.959	0.50( 0.49)	0.98	6210.3	50600.00
5	14190.68	26.21	0.948	0.50( 0.49)	0.98	6372.8	50200.00
6	14169.55	27.58	0.921	0.50( 0.49)	0.98	6917.4	20810.00
7	14159.04	28.17	0.910	0.50( 0.49)	0.98	7157.7	20900.00
8	14124.99	29.93	0.875	0.50( 0.49)	0.98	7861.1	50500.00
9	14089.08	31.82	0.851	0.50( 0.49)	0.98	8604.8	20800.00
10	14031.69	34.60	0.815	0.50( 0.49)	0.98	9686.2	20700.00
11	13885.95	41.35	0.735	0.50( 0.49)	0.98	12308.6	50300.00
12	13731.40	44.76	0.707	0.50( 0.49)	0.98	13877.9	20600.00
13	13612.64	47.42	0.685	0.50( 0.49)	0.98	15084.5	10100.00
14	13511.44	49.44	0.669	0.50( 0.49)	0.98	15976.1	30510.00
15	13378.08	51.31	0.656	0.50( 0.49)	0.98	16781.2	20500.00
16	13091.73	55.10	0.632	0.50( 0.49)	0.98	18352.5	20400.00
17	13042.50	55.73	0.628	0.50( 0.49)	0.98	18608.3	20300.00
18	12813.25	58.63	0.610	0.50( 0.49)	0.97	19782.1	30300.00
19	12753.70	59.43	0.606	0.50( 0.49)	0.97	20089.9	20200.00
20	12738.94	59.62	0.604	0.50( 0.49)	0.97	20166.1	20210.00
21	12531.00	62.46	0.594	0.50( 0.49)	0.97	21268.2	20100.00
22	12272.63	66.20	0.581	0.50( 0.49)	0.97	22719.6	31400.00
23	12125.97	68.49	0.573	0.50( 0.49)	0.97	23549.0	13600.00
24	11680.56	76.36	0.546	0.50( 0.48)	0.97	26372.0	11801.00
25	11093.58	87.96	0.506	0.50( 0.48)	0.97	30373.6	11500.00
26	10448.40	100.15	0.479	0.50( 0.48)	0.97	35042.4	11000.00
27	9753.66	114.87	0.449	0.50( 0.49)	0.97	41847.6	13000.00
28	8668.13	132.28	0.424	0.50( 0.49)	0.97	49093.4	11130.00
29	8152.90	140.65	0.415	0.50( 0.49)	0.97	51789.4	13510.00

30 7942.19 144.23 0.410 0.50( 0.49) 0.98 52898.3 11620.00  
31 6845.40 160.62 0.391 0.50( 0.49) 0.98 57480.7 12400.00  
32 6118.89 170.52 0.379 0.50( 0.49) 0.98 59428.0 13500.00  
33 5979.59 172.46 0.377 0.50( 0.49) 0.98 59804.5 12201.00  
34 5364.79 182.15 0.367 0.50( 0.49) 0.98 61093.7 12111.00  
35 4433.21 198.67 0.358 0.50( 0.49) 0.98 63020.6 12261.00  
36 3961.48 208.50 0.352 0.50( 0.49) 0.98 63832.4 10200.00  
37 3394.42 224.53 0.344 0.50( 0.49) 0.98 65069.7 10300.00  
38 3161.86 231.67 0.340 0.50( 0.49) 0.98 65420.8 12010.00  
39 2678.17 252.99 0.328 0.50( 0.49) 0.98 65750.2 12000.00  
40 1678.94 324.08 0.290 0.50( 0.49) 0.98 66420.4 10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 14199.21 Tc (MIN.) = 24.27  
AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 5827.41

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 12

-----  
>>>>CLEAR MEMORY BANK # 2 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<<

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PEAK FLOWRATE TABLE FILE NAME: 0610508U.DNA  
MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	59.14	24.23	0.50( 0.49)	0.99	131.3	50800.00
TOTAL AREA (ACRES) =		131.3				

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 11

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>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14191.77	18.83	1.157	0.50( 0.49)	0.98	4333.2	21100.00
2	14199.21	24.27	0.993	0.50( 0.49)	0.98	5827.4	21000.00
3	14198.16	25.54	0.961	0.50( 0.49)	0.98	6184.0	50700.00
4	14197.50	25.64	0.959	0.50( 0.49)	0.98	6210.3	50600.00
5	14190.68	26.21	0.948	0.50( 0.49)	0.98	6372.8	50200.00
6	14169.55	27.58	0.921	0.50( 0.49)	0.98	6917.4	20810.00
7	14159.04	28.17	0.910	0.50( 0.49)	0.98	7157.7	20900.00
8	14124.99	29.93	0.875	0.50( 0.49)	0.98	7861.1	50500.00
9	14089.08	31.82	0.851	0.50( 0.49)	0.98	8604.8	20800.00
10	14031.69	34.60	0.815	0.50( 0.49)	0.98	9686.2	20700.00
11	13885.95	41.35	0.735	0.50( 0.49)	0.98	12308.6	50300.00
12	13731.40	44.76	0.707	0.50( 0.49)	0.98	13877.9	20600.00
13	13612.64	47.42	0.685	0.50( 0.49)	0.98	15084.5	10100.00
14	13511.44	49.44	0.669	0.50( 0.49)	0.98	15976.1	30510.00
15	13378.08	51.31	0.656	0.50( 0.49)	0.98	16781.2	20500.00

16	13091.73	55.10	0.632	0.50 ( 0.49)	0.98	18352.5	20400.00
17	13042.50	55.73	0.628	0.50 ( 0.49)	0.98	18608.3	20300.00
18	12813.25	58.63	0.610	0.50 ( 0.49)	0.97	19782.1	30300.00
19	12753.70	59.43	0.606	0.50 ( 0.49)	0.97	20089.9	20200.00
20	12738.94	59.62	0.604	0.50 ( 0.49)	0.97	20166.1	20210.00
21	12531.00	62.46	0.594	0.50 ( 0.49)	0.97	21268.2	20100.00
22	12272.63	66.20	0.581	0.50 ( 0.49)	0.97	22719.6	31400.00
23	12125.97	68.49	0.573	0.50 ( 0.49)	0.97	23549.0	13600.00
24	11680.56	76.36	0.546	0.50 ( 0.48)	0.97	26372.0	11801.00
25	11093.58	87.96	0.506	0.50 ( 0.48)	0.97	30373.6	11500.00
26	10448.40	100.15	0.479	0.50 ( 0.48)	0.97	35042.4	11000.00
27	9753.66	114.87	0.449	0.50 ( 0.49)	0.97	41847.6	13000.00
28	8668.13	132.28	0.424	0.50 ( 0.49)	0.97	49093.4	11130.00
29	8152.90	140.65	0.415	0.50 ( 0.49)	0.97	51789.4	13510.00
30	7942.19	144.23	0.410	0.50 ( 0.49)	0.98	52898.3	11620.00
31	6845.40	160.62	0.391	0.50 ( 0.49)	0.98	57480.7	12400.00
32	6118.89	170.52	0.379	0.50 ( 0.49)	0.98	59428.0	13500.00
33	5979.59	172.46	0.377	0.50 ( 0.49)	0.98	59804.5	12201.00
34	5364.79	182.15	0.367	0.50 ( 0.49)	0.98	61093.7	12111.00
35	4433.21	198.67	0.358	0.50 ( 0.49)	0.98	63020.6	12261.00
36	3961.48	208.50	0.352	0.50 ( 0.49)	0.98	63832.4	10200.00
37	3394.42	224.53	0.344	0.50 ( 0.49)	0.98	65069.7	10300.00
38	3161.86	231.67	0.340	0.50 ( 0.49)	0.98	65420.8	12010.00
39	2678.17	252.99	0.328	0.50 ( 0.49)	0.98	65750.2	12000.00
40	1678.94	324.08	0.290	0.50 ( 0.49)	0.98	66420.4	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	59.14	24.23	0.994	0.50 ( 0.49)	0.99	131.3	50800.00

LONGEST FLOWPATH FROM NODE 50800.00 TO NODE 13700.00 = 5946.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14250.91	18.83	1.157	0.50 ( 0.49)	0.98	4435.2	21100.00
2	14258.29	24.23	0.994	0.50 ( 0.49)	0.98	5947.5	50800.00
3	14258.21	24.27	0.993	0.50 ( 0.49)	0.98	5958.7	21000.00
4	14253.47	25.54	0.961	0.50 ( 0.49)	0.98	6315.3	50700.00
5	14252.59	25.64	0.959	0.50 ( 0.49)	0.98	6341.5	50600.00
6	14244.44	26.21	0.948	0.50 ( 0.49)	0.98	6504.1	50200.00
7	14220.13	27.58	0.921	0.50 ( 0.49)	0.98	7048.6	20810.00
8	14208.24	28.17	0.910	0.50 ( 0.49)	0.98	7288.9	20900.00
9	14170.12	29.93	0.875	0.50 ( 0.49)	0.98	7992.4	50500.00
10	14131.29	31.82	0.851	0.50 ( 0.49)	0.98	8736.0	20800.00
11	14069.69	34.60	0.815	0.50 ( 0.49)	0.98	9817.5	20700.00
12	13914.44	41.35	0.735	0.50 ( 0.49)	0.98	12439.9	50300.00
13	13756.57	44.76	0.707	0.50 ( 0.49)	0.98	14009.2	20600.00
14	13635.23	47.42	0.685	0.50 ( 0.49)	0.98	15215.8	10100.00
15	13532.07	49.44	0.669	0.50 ( 0.49)	0.98	16107.4	30510.00
16	13397.21	51.31	0.656	0.50 ( 0.49)	0.98	16912.5	20500.00
17	13108.08	55.10	0.632	0.50 ( 0.49)	0.98	18483.8	20400.00
18	13058.38	55.73	0.628	0.50 ( 0.49)	0.98	18739.6	20300.00
19	12827.00	58.63	0.610	0.50 ( 0.49)	0.97	19913.3	30300.00
20	12766.86	59.43	0.606	0.50 ( 0.49)	0.97	20221.1	20200.00
21	12751.96	59.62	0.604	0.50 ( 0.49)	0.97	20297.4	20210.00
22	12542.75	62.46	0.594	0.50 ( 0.49)	0.97	21399.5	20100.00

23	12282.85	66.20	0.581	0.50 ( 0.49)	0.97	22850.9	31400.00
24	12135.25	68.49	0.573	0.50 ( 0.49)	0.97	23680.3	13600.00
25	11686.64	76.36	0.546	0.50 ( 0.48)	0.97	26503.3	11801.00
26	11094.95	87.96	0.506	0.50 ( 0.48)	0.97	30504.8	11500.00
27	10449.06	100.15	0.479	0.50 ( 0.48)	0.97	35173.6	11000.00
28	9754.27	114.87	0.449	0.50 ( 0.49)	0.97	41978.8	13000.00
29	8668.71	132.28	0.424	0.50 ( 0.49)	0.97	49224.7	11130.00
30	8153.47	140.65	0.415	0.50 ( 0.49)	0.97	51920.6	13510.00
31	7942.75	144.23	0.410	0.50 ( 0.49)	0.98	53029.6	11620.00
32	6845.93	160.62	0.391	0.50 ( 0.49)	0.98	57612.0	12400.00
33	6119.41	170.52	0.379	0.50 ( 0.49)	0.98	59559.3	13500.00
34	5980.10	172.46	0.377	0.50 ( 0.49)	0.98	59935.8	12201.00
35	5365.29	182.15	0.367	0.50 ( 0.49)	0.98	61224.9	12111.00
36	4433.70	198.67	0.358	0.50 ( 0.49)	0.98	63151.9	12261.00
37	3961.96	208.50	0.352	0.50 ( 0.49)	0.98	63963.7	10200.00
38	3394.89	224.53	0.344	0.50 ( 0.49)	0.98	65201.0	10300.00
39	3162.32	231.67	0.340	0.50 ( 0.49)	0.98	65552.1	12010.00
40	2678.62	252.99	0.328	0.50 ( 0.49)	0.98	65881.4	12000.00
41	1679.33	324.08	0.290	0.50 ( 0.49)	0.98	66551.6	10100.00

TOTAL AREA (ACRES) = 66551.6

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE (CFS) = 14258.29 Tc (MIN.) = 24.231  
 EFFECTIVE AREA (ACRES) = 5947.53 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA (ACRES) = 66551.6  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13700.00 = 124551.97 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 66551.6 TC (MIN.) = 24.23  
 EFFECTIVE AREA (ACRES) = 5947.53 AREA-AVERAGED Fm (INCH/HR) = 0.49  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.981  
 PEAK FLOW RATE (CFS) = 14258.29

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14250.91	18.83	1.157	0.50 ( 0.49)	0.98	4435.2	21100.00
2	14258.29	24.23	0.994	0.50 ( 0.49)	0.98	5947.5	50800.00
3	14258.21	24.27	0.993	0.50 ( 0.49)	0.98	5958.7	21000.00
4	14253.47	25.54	0.961	0.50 ( 0.49)	0.98	6315.3	50700.00
5	14252.59	25.64	0.959	0.50 ( 0.49)	0.98	6341.5	50600.00
6	14244.44	26.21	0.948	0.50 ( 0.49)	0.98	6504.1	50200.00
7	14220.13	27.58	0.921	0.50 ( 0.49)	0.98	7048.6	20810.00
8	14208.24	28.17	0.910	0.50 ( 0.49)	0.98	7288.9	20900.00
9	14170.12	29.93	0.875	0.50 ( 0.49)	0.98	7992.4	50500.00
10	14131.29	31.82	0.851	0.50 ( 0.49)	0.98	8736.0	20800.00
11	14069.69	34.60	0.815	0.50 ( 0.49)	0.98	9817.5	20700.00
12	13914.44	41.35	0.735	0.50 ( 0.49)	0.98	12439.9	50300.00
13	13756.57	44.76	0.707	0.50 ( 0.49)	0.98	14009.2	20600.00
14	13635.23	47.42	0.685	0.50 ( 0.49)	0.98	15215.8	10100.00
15	13532.07	49.44	0.669	0.50 ( 0.49)	0.98	16107.4	30510.00
16	13397.21	51.31	0.656	0.50 ( 0.49)	0.98	16912.5	20500.00
17	13108.08	55.10	0.632	0.50 ( 0.49)	0.98	18483.8	20400.00
18	13058.38	55.73	0.628	0.50 ( 0.49)	0.98	18739.6	20300.00
19	12827.00	58.63	0.610	0.50 ( 0.49)	0.97	19913.3	30300.00
20	12766.86	59.43	0.606	0.50 ( 0.49)	0.97	20221.1	20200.00
21	12751.96	59.62	0.604	0.50 ( 0.49)	0.97	20297.4	20210.00

22	12542.75	62.46	0.594	0.50 ( 0.49)	0.97	21399.5	20100.00
23	12282.85	66.20	0.581	0.50 ( 0.49)	0.97	22850.9	31400.00
24	12135.25	68.49	0.573	0.50 ( 0.49)	0.97	23680.3	13600.00
25	11686.64	76.36	0.546	0.50 ( 0.48)	0.97	26503.3	11801.00
26	11094.95	87.96	0.506	0.50 ( 0.48)	0.97	30504.8	11500.00
27	10449.06	100.15	0.479	0.50 ( 0.48)	0.97	35173.6	11000.00
28	9754.27	114.87	0.449	0.50 ( 0.49)	0.97	41978.8	13000.00
29	8668.71	132.28	0.424	0.50 ( 0.49)	0.97	49224.7	11130.00
30	8153.47	140.65	0.415	0.50 ( 0.49)	0.97	51920.6	13510.00
31	7942.75	144.23	0.410	0.50 ( 0.49)	0.98	53029.6	11620.00
32	6845.93	160.62	0.391	0.50 ( 0.49)	0.98	57612.0	12400.00
33	6119.41	170.52	0.379	0.50 ( 0.49)	0.98	59559.3	13500.00
34	5980.10	172.46	0.377	0.50 ( 0.49)	0.98	59935.8	12201.00
35	5365.29	182.15	0.367	0.50 ( 0.49)	0.98	61224.9	12111.00
36	4433.70	198.67	0.358	0.50 ( 0.49)	0.98	63151.9	12261.00
37	3961.96	208.50	0.352	0.50 ( 0.49)	0.98	63963.7	10200.00
38	3394.89	224.53	0.344	0.50 ( 0.49)	0.98	65201.0	10300.00
39	3162.32	231.67	0.340	0.50 ( 0.49)	0.98	65552.1	12010.00
40	2678.62	252.99	0.328	0.50 ( 0.49)	0.98	65881.4	12000.00
41	1679.33	324.08	0.290	0.50 ( 0.49)	0.98	66551.6	10100.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

-----  
FILE NAME: S35.DAT  
TIME/DATE OF STUDY: 07:25 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.184
- 2) 10.00; 1.510
- 3) 15.00; 1.203
- 4) 20.00; 1.023
- 5) 25.00; 0.902
- 6) 30.00; 0.826
- 7) 40.00; 0.693
- 8) 50.00; 0.611
- 9) 60.00; 0.546
- 10) 90.00; 0.439
- 11) 120.00; 0.374
- 12) 180.00; 0.306
- 13) 360.00; 0.211
- 14) 1440.00; 0.088

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13500.00 TO NODE 13500.50 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 548.43  
ELEVATION DATA: UPSTREAM(FEET) = 1183.47 DOWNSTREAM(FEET) = 1065.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.955  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.390

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"OPEN BRUSH" - 5.11 0.50 1.000 0 11.96  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 4.09  
TOTAL AREA(ACRES) = 5.11 PEAK FLOW RATE(CFS) = 4.09

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13500.50 TO NODE 13501.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1033.15  
CHANNEL LENGTH THRU SUBAREA(FEET) = 431.71 CHANNEL SLOPE = 0.0738  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.87 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 7.16  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.56  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 2.02  
Tc(MIN.) = 13.98  
SUBAREA AREA(ACRES) = 8.87 SUBAREA RUNOFF(CFS) = 6.11  
EFFECTIVE AREA(ACRES) = 13.98 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 14.0 PEAK FLOW RATE(CFS) = 9.63

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.91 FLOW VELOCITY(FEET/SEC.) = 3.85  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13501.00 = 980.14 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13501.00 TO NODE 13502.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1033.15 DOWNSTREAM(FEET) = 990.26  
CHANNEL LENGTH THRU SUBAREA(FEET) = 948.63 CHANNEL SLOPE = 0.0452  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.077

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	16.82	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.03  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.51  
AVERAGE FLOW DEPTH(FEET) = 1.15 TRAVEL TIME(MIN.) = 4.51  
Tc(MIN.) = 18.49  
SUBAREA AREA(ACRES) = 16.82 SUBAREA RUNOFF(CFS) = 8.74  
EFFECTIVE AREA(ACRES) = 30.80 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 30.8 PEAK FLOW RATE(CFS) = 16.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.21 FLOW VELOCITY(FEET/SEC.) = 3.64  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13502.00 = 1928.77 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13502.00 TO NODE 13503.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 990.26 DOWNSTREAM(FEET) = 956.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 940.98 CHANNEL SLOPE = 0.0363  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.959

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	46.02	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.55  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.76  
AVERAGE FLOW DEPTH(FEET) = 1.51 TRAVEL TIME(MIN.) = 4.18  
Tc(MIN.) = 22.66  
SUBAREA AREA(ACRES) = 46.02 SUBAREA RUNOFF(CFS) = 18.98  
EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 76.8 PEAK FLOW RATE(CFS) = 31.69

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.63 FLOW VELOCITY(FEET/SEC.) = 3.98  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13503.00 = 2869.75 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13503.00 TO NODE 13504.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 956.06 DOWNSTREAM(FEET) = 889.48  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2131.31 CHANNEL SLOPE = 0.0312  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.805

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	58.46	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 39.77  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.97  
AVERAGE FLOW DEPTH(FEET) = 1.83 TRAVEL TIME(MIN.) = 8.94  
Tc(MIN.) = 31.60  
SUBAREA AREA(ACRES) = 58.46 SUBAREA RUNOFF(CFS) = 16.02  
EFFECTIVE AREA(ACRES) = 135.28 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 135.3 PEAK FLOW RATE(CFS) = 37.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.78 FLOW VELOCITY(FEET/SEC.) = 3.90  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13504.00 = 5001.06 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13504.00 TO NODE 13505.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 889.48 DOWNSTREAM(FEET) = 848.10  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1661.97 CHANNEL SLOPE = 0.0249  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.705

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	49.30	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.65  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.69  
AVERAGE FLOW DEPTH(FEET) = 1.94 TRAVEL TIME(MIN.) = 7.51  
Tc(MIN.) = 39.11  
SUBAREA AREA(ACRES) = 49.30 SUBAREA RUNOFF(CFS) = 9.08  
EFFECTIVE AREA(ACRES) = 184.58 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 184.6 PEAK FLOW RATE(CFS) = 37.08

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.86 FLOW VELOCITY(FEET/SEC.) = 3.58  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.00 = 6663.03 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13505.00 TO NODE 13505.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 848.10 DOWNSTREAM(FEET) = 811.10
CHANNEL LENGTH THRU SUBAREA(FEET) = 1234.61 CHANNEL SLOPE = 0.0300
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.658
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 39.35 0.50 0.811 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.811
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.53
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.95
AVERAGE FLOW DEPTH(FEET) = 1.87 TRAVEL TIME(MIN.) = 5.21
Tc(MIN.) = 44.32
SUBAREA AREA(ACRES) = 39.35 SUBAREA RUNOFF(CFS) = 8.92
EFFECTIVE AREA(ACRES) = 223.93 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 223.9 PEAK FLOW RATE(CFS) = 37.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.79 FLOW VELOCITY(FEET/SEC.) = 3.86
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13505.50 = 7897.64 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13505.50 TO NODE 13506.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 811.10 DOWNSTREAM(FEET) = 781.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1415.98 CHANNEL SLOPE = 0.0213
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.604
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 54.33 0.50 0.738 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 42.81
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.51
AVERAGE FLOW DEPTH(FEET) = 2.02 TRAVEL TIME(MIN.) = 6.73
Tc(MIN.) = 51.05
SUBAREA AREA(ACRES) = 54.33 SUBAREA RUNOFF(CFS) = 11.49
EFFECTIVE AREA(ACRES) = 278.26 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.92
TOTAL AREA(ACRES) = 278.3 PEAK FLOW RATE(CFS) = 37.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.91 FLOW VELOCITY(FEET/SEC.) = 3.38
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.00 = 9313.62 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13506.00 TO NODE 13506.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 781.00 DOWNSTREAM(FEET) = 743.17
CHANNEL LENGTH THRU SUBAREA(FEET) = 1542.62 CHANNEL SLOPE = 0.0245
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.559
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 61.33 0.50 0.783 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.783
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.68
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.68
AVERAGE FLOW DEPTH(FEET) = 1.94 TRAVEL TIME(MIN.) = 6.98
Tc(MIN.) = 58.03
SUBAREA AREA(ACRES) = 61.33 SUBAREA RUNOFF(CFS) = 9.22
EFFECTIVE AREA(ACRES) = 339.59 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.90
TOTAL AREA(ACRES) = 339.6 PEAK FLOW RATE(CFS) = 37.08
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 1.86 FLOW VELOCITY(FEET/SEC.) = 3.58
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13506.50 = 10856.24 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13506.50 TO NODE 13520.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 743.17 DOWNSTREAM(FEET) = 717.04
CHANNEL LENGTH THRU SUBAREA(FEET) = 1370.93 CHANNEL SLOPE = 0.0191
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.528
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 39.86 0.50 0.848 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.848
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.94
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.29
AVERAGE FLOW DEPTH(FEET) = 1.99 TRAVEL TIME(MIN.) = 6.95
Tc(MIN.) = 64.98
SUBAREA AREA(ACRES) = 39.86 SUBAREA RUNOFF(CFS) = 3.73
EFFECTIVE AREA(ACRES) = 379.45 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.89

TOTAL AREA (ACRES) = 379.5 PEAK FLOW RATE (CFS) = 37.08  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.95 FLOW VELOCITY (FEET/SEC.) = 3.25  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13506.00 TO NODE 13520.00 IS CODE = 1

-----  
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

-----  
TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION (MIN.) = 64.98  
RAINFALL INTENSITY (INCH/HR) = 0.53  
AREA-AVERAGED Fm (INCH/HR) = 0.45  
AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.89  
EFFECTIVE STREAM AREA (ACRES) = 379.45  
TOTAL STREAM AREA (ACRES) = 379.45  
PEAK FLOW RATE (CFS) AT CONFLUENCE = 37.08

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13510.00 TO NODE 13511.00 IS CODE = 21

-----  
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

-----  
INITIAL SUBAREA FLOW-LENGTH (FEET) = 903.68  
ELEVATION DATA: UPSTREAM (FEET) = 1216.90 DOWNSTREAM (FEET) = 1022.78

Tc = K \* [(LENGTH\*\* 3.00) / (ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 14.615  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.227  
SUBAREA Tc AND LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"GRASS" - 6.66 0.50 1.000 0 14.62  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF (CFS) = 4.35  
TOTAL AREA (ACRES) = 6.66 PEAK FLOW RATE (CFS) = 4.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13511.00 TO NODE 13512.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 1022.78 DOWNSTREAM (FEET) = 954.27  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1027.63 CHANNEL SLOPE = 0.0667  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.055  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 25.40 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 10.76  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.80  
AVERAGE FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 4.51  
Tc (MIN.) = 19.12  
SUBAREA AREA (ACRES) = 25.40 SUBAREA RUNOFF (CFS) = 12.67  
EFFECTIVE AREA (ACRES) = 32.06 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 32.1 PEAK FLOW RATE (CFS) = 16.00

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.13 FLOW VELOCITY (FEET/SEC.) = 4.20  
LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13512.00 = 1931.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13512.00 TO NODE 13513.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 954.27 DOWNSTREAM (FEET) = 872.45  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1926.42 CHANNEL SLOPE = 0.0425  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.876  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 90.23 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 31.45  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.22  
AVERAGE FLOW DEPTH (FEET) = 1.58 TRAVEL TIME (MIN.) = 7.61  
Tc (MIN.) = 26.73  
SUBAREA AREA (ACRES) = 90.23 SUBAREA RUNOFF (CFS) = 30.49  
EFFECTIVE AREA (ACRES) = 122.29 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 122.3 PEAK FLOW RATE (CFS) = 41.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.75 FLOW VELOCITY (FEET/SEC.) = 4.50  
LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13513.00 = 3857.73 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13513.00 TO NODE 13514.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 872.45 DOWNSTREAM (FEET) = 813.12  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1895.66 CHANNEL SLOPE = 0.0313  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.774



SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 135.65 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.14  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.38  
 AVERAGE FLOW DEPTH(FEET) = 2.10 TRAVEL TIME(MIN.) = 7.21  
 Tc(MIN.) = 33.94  
 SUBAREA AREA(ACRES) = 135.65 SUBAREA RUNOFF(CFS) = 33.37  
 EFFECTIVE AREA(ACRES) = 257.94 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 257.9 PEAK FLOW RATE(CFS) = 63.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.18 FLOW VELOCITY(FEET/SEC.) = 4.46  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13514.00 = 5753.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13514.00 TO NODE 13515.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 813.12 DOWNSTREAM(FEET) = 773.74  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1926.15 CHANNEL SLOPE = 0.0204  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.676

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 109.30 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.95  
 AVERAGE FLOW DEPTH(FEET) = 2.47 TRAVEL TIME(MIN.) = 8.14  
 Tc(MIN.) = 42.08  
 SUBAREA AREA(ACRES) = 109.30 SUBAREA RUNOFF(CFS) = 17.29  
 EFFECTIVE AREA(ACRES) = 367.24 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 367.2 PEAK FLOW RATE(CFS) = 63.46  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.35 FLOW VELOCITY(FEET/SEC.) = 3.82  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13515.00 = 7679.54 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 773.74 DOWNSTREAM(FEET) = 717.04  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2279.49 CHANNEL SLOPE = 0.0249

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.605

SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 231.44 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.52  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.26  
 AVERAGE FLOW DEPTH(FEET) = 2.41 TRAVEL TIME(MIN.) = 8.91  
 Tc(MIN.) = 50.99  
 SUBAREA AREA(ACRES) = 231.44 SUBAREA RUNOFF(CFS) = 21.74  
 EFFECTIVE AREA(ACRES) = 598.68 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 598.7 PEAK FLOW RATE(CFS) = 63.46  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 2.27 FLOW VELOCITY(FEET/SEC.) = 4.10  
 LONGEST FLOWPATH FROM NODE 13510.00 TO NODE 13520.00 = 9959.03 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13515.00 TO NODE 13520.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 50.99  
 RAINFALL INTENSITY(INCH/HR) = 0.60  
 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 598.68  
 TOTAL STREAM AREA(ACRES) = 598.68  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 63.46

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	37.08	64.98	0.528	0.50( 0.45)	0.89	379.5	13500.00
2	63.46	50.99	0.605	0.50( 0.50)	1.00	598.7	13510.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	100.54	50.99	0.605	0.50( 0.48)	0.96	896.4	13510.00
2	54.12	64.98	0.528	0.50( 0.48)	0.96	978.1	13500.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 100.54 Tc(MIN.) = 50.99  
 EFFECTIVE AREA(ACRES) = 896.44 AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 978.1  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.00 = 12227.17 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13520.00 TO NODE 13520.50 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 717.04 DOWNSTREAM (FEET) = 700.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2019.22 CHANNEL SLOPE = 0.0084  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.553

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	193.31	0.50	0.965	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.965

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 106.68

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.22

AVERAGE FLOW DEPTH (FEET) = 2.90 TRAVEL TIME (MIN.) = 7.97

Tc (MIN.) = 58.96

SUBAREA AREA (ACRES) = 193.31 SUBAREA RUNOFF (CFS) = 12.19

EFFECTIVE AREA (ACRES) = 1089.75 AREA-AVERAGED Fm (INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96

TOTAL AREA (ACRES) = 1171.4 PEAK FLOW RATE (CFS) = 100.54

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.84 FLOW VELOCITY (FEET/SEC.) = 4.17

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13520.50 = 14246.39 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13520.50 TO NODE 13521.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 700.00 DOWNSTREAM (FEET) = 661.95  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1622.36 CHANNEL SLOPE = 0.0235  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.534

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	129.79	0.50	0.897	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.897

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 105.53

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.18

AVERAGE FLOW DEPTH (FEET) = 2.39 TRAVEL TIME (MIN.) = 4.37

Tc (MIN.) = 63.33

SUBAREA AREA (ACRES) = 129.79 SUBAREA RUNOFF (CFS) = 9.98

EFFECTIVE AREA (ACRES) = 1219.54 AREA-AVERAGED Fm (INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA (ACRES) = 1301.2 PEAK FLOW RATE (CFS) = 100.54  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 2.35 FLOW VELOCITY (FEET/SEC.) = 6.09  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13521.00 = 15868.75 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13521.00 TO NODE 13522.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 661.95 DOWNSTREAM (FEET) = 632.19  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2746.01 CHANNEL SLOPE = 0.0108  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.499

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	278.60	0.50	0.905	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.905

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 106.48

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.64

AVERAGE FLOW DEPTH (FEET) = 2.77 TRAVEL TIME (MIN.) = 9.87

Tc (MIN.) = 73.20

SUBAREA AREA (ACRES) = 278.60 SUBAREA RUNOFF (CFS) = 11.88

EFFECTIVE AREA (ACRES) = 1498.14 AREA-AVERAGED Fm (INCH/HR) = 0.47

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95

\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;

\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

TOTAL AREA (ACRES) = 1579.8 PEAK FLOW RATE (CFS) = 100.54

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 2.71 FLOW VELOCITY (FEET/SEC.) = 4.58

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13522.00 = 18614.76 FEET.

-----  
END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1579.8 TC (MIN.) = 73.20

EFFECTIVE AREA (ACRES) = 1498.14 AREA-AVERAGED Fm (INCH/HR) = 0.47

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.947

PEAK FLOW RATE (CFS) = 100.54

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	100.54	73.20	0.499	0.50 (0.47)	0.95	1498.1	13510.00
2	54.12	90.88	0.437	0.50 (0.47)	0.94	1579.8	13500.00

-----  
END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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Santa Ana, CA  
92707

-----  
FILE NAME: S36.DAT  
TIME/DATE OF STUDY: 07:25 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.604
- 2) 10.00; 1.741
- 3) 15.00; 1.296
- 4) 20.00; 1.108
- 5) 25.00; 0.968
- 6) 30.00; 0.871
- 7) 40.00; 0.743
- 8) 50.00; 0.660
- 9) 60.00; 0.599
- 10) 90.00; 0.495
- 11) 120.00; 0.435
- 12) 180.00; 0.364
- 13) 360.00; 0.267
- 14) 1200.00; 0.116

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE	PARK- / WAY	HEIGHT (FT)	GUTTER WIDTH (FT)	GUTTER LIP (FT)	GUTTER GEOMETRIES HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018	0.018	0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13600.00 TO NODE 13600.50 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 488.61  
ELEVATION DATA: UPSTREAM(FEET) = 872.12 DOWNSTREAM(FEET) = 744.80

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.995

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.652

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
-------------------------------	----------------	--------------	--------------	--------------	--------	-----------

NATURAL FAIR COVER

"OPEN BRUSH" - 3.39 0.50 1.000 0 11.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

SUBAREA RUNOFF(CFS) = 3.52

TOTAL AREA(ACRES) = 3.39 PEAK FLOW RATE(CFS) = 3.52

\*\*\*\*\*

FLOW PROCESS FROM NODE 13600.50 TO NODE 13601.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 744.80 DOWNSTREAM(FEET) = 707.32

CHANNEL LENGTH THRU SUBAREA(FEET) = 418.30 CHANNEL SLOPE = 0.0896

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.489

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
-------------------------------	----------------	--------------	--------------	--------------	--------

USER-DEFINED - 7.45 0.50 1.000 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.84

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.79

AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 1.84

Tc(MIN.) = 12.83

SUBAREA AREA(ACRES) = 7.45 SUBAREA RUNOFF(CFS) = 6.63

EFFECTIVE AREA(ACRES) = 10.84 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 10.8 PEAK FLOW RATE(CFS) = 9.65

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.88 FLOW VELOCITY(FEET/SEC.) = 4.15

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13601.00 = 906.91 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13601.00 TO NODE 13602.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 707.32 DOWNSTREAM(FEET) = 657.12  
CHANNEL LENGTH THRU SUBAREA(FEET) = 777.60 CHANNEL SLOPE = 0.0646  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.267

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	30.96	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.38

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.41

AVERAGE FLOW DEPTH(FEET) = 1.24 TRAVEL TIME(MIN.) = 2.94

Tc(MIN.) = 15.77

SUBAREA AREA(ACRES) = 30.96 SUBAREA RUNOFF(CFS) = 21.37

EFFECTIVE AREA(ACRES) = 41.80 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 41.8 PEAK FLOW RATE(CFS) = 28.85

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 4.81

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13602.00 = 1684.51 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13602.00 TO NODE 13603.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 657.12 DOWNSTREAM(FEET) = 584.58  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1186.54 CHANNEL SLOPE = 0.0611  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.118

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.36	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.35

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.98

AVERAGE FLOW DEPTH(FEET) = 1.54 TRAVEL TIME(MIN.) = 3.97

Tc(MIN.) = 19.74

SUBAREA AREA(ACRES) = 23.36 SUBAREA RUNOFF(CFS) = 12.98

EFFECTIVE AREA(ACRES) = 65.16 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 65.2 PEAK FLOW RATE(CFS) = 36.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.55 FLOW VELOCITY(FEET/SEC.) = 5.00

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13603.00 = 2871.05 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 584.58 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 860.98 CHANNEL SLOPE = 0.0461  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.029

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.24	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.27

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.64

AVERAGE FLOW DEPTH(FEET) = 1.72 TRAVEL TIME(MIN.) = 3.09

Tc(MIN.) = 22.83

SUBAREA AREA(ACRES) = 21.24 SUBAREA RUNOFF(CFS) = 10.10

EFFECTIVE AREA(ACRES) = 86.40 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 86.4 PEAK FLOW RATE(CFS) = 41.10

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.72 FLOW VELOCITY(FEET/SEC.) = 4.63

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 10

-----  
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 15.1

-----  
>>>>DEFINE MEMORY BANK # 2 <<<<

=====

PEAK FLOWRATE TABLE FILE NAME: S35.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	100.54	73.20	0.50( 0.47)	0.95	1498.1	13510.00
2	54.12	90.88	0.50( 0.47)	0.94	1579.8	13500.00
TOTAL AREA(ACRES) =						1579.8

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13522.00 TO NODE 13522.00 IS CODE = 14.0

-----  
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	100.54	73.20	0.50( 0.47)	0.95	1498.1	13510.00
2	54.12	90.88	0.50( 0.47)	0.94	1579.8	13500.00
TOTAL AREA(ACRES) =						1579.8

```

*****
FLOW PROCESS FROM NODE 13522.00 TO NODE 13523.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 632.19 DOWNSTREAM(FEET) = 561.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1151.68 CHANNEL SLOPE = 0.0618
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 100.54
FLOW VELOCITY(FEET/SEC.) = 8.76 FLOW DEPTH(FEET) = 1.96
TRAVEL TIME(MIN.) = 2.19 Tc(MIN.) = 75.39
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

*****
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 2 <<<<
=====
*****
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 2 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0610201U.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 25.99 15.90 0.50( 0.50) 1.00 37.9 20100.00
TOTAL AREA(ACRES) = 37.9

*****
FLOW PROCESS FROM NODE 13523.00 TO NODE 13523.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<
=====
** MAIN STREAM CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 100.54 75.39 0.546 0.50( 0.47) 0.95 1498.1 13510.00
2 54.12 93.44 0.488 0.50( 0.47) 0.94 1579.8 13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 25.99 15.90 1.262 0.50( 0.50) 1.00 37.9 20100.00
LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 13523.00 = 2767.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 126.53 15.90 1.262 0.50( 0.48) 0.95 353.9 20100.00
2 102.09 75.39 0.546 0.50( 0.47) 0.95 1536.1 13510.00
3 54.12 93.44 0.488 0.50( 0.47) 0.95 1617.8 13500.00

```

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TOTAL AREA(ACRES) = 1617.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 126.53 Tc(MIN.) = 15.903
EFFECTIVE AREA(ACRES) = 353.95 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95
TOTAL AREA(ACRES) = 1617.8
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13523.00 = 19766.44 FEET.

*****
FLOW PROCESS FROM NODE 13523.00 TO NODE 13524.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 561.00 DOWNSTREAM(FEET) = 556.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 238.34 CHANNEL SLOPE = 0.0210
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 126.53
FLOW VELOCITY(FEET/SEC.) = 6.21 FLOW DEPTH(FEET) = 2.61
TRAVEL TIME(MIN.) = 0.64 Tc(MIN.) = 16.54
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 242.50 16.54 1.238 0.50( 0.48) 0.95 353.9 20100.00
2 102.09 76.07 0.543 0.50( 0.47) 0.95 1536.1 13510.00
3 54.12 94.24 0.487 0.50( 0.47) 0.95 1617.8 13500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) = 242.50 Tc(MIN.) = 16.54
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 353.95

*****
FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 12
-----
>>>>CLEAR MEMORY BANK # 2 <<<<
=====
*****
FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 15.1
-----
>>>>DEFINE MEMORY BANK # 2 <<<<
=====
PEAK FLOWRATE TABLE FILE NAME: 0610202U.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:
STREAM Q Tc Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 22.54 14.22 0.50( 0.50) 1.00 29.0 20200.00
2 22.29 14.38 0.50( 0.50) 1.00 29.1 20210.00
TOTAL AREA(ACRES) = 29.1

*****
FLOW PROCESS FROM NODE 13524.00 TO NODE 13524.00 IS CODE = 11
-----
>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<

```

=====  
\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	242.50	16.54	1.238	0.50 ( 0.48)	0.95	353.9	20100.00
2	102.09	76.07	0.543	0.50 ( 0.47)	0.95	1536.1	13510.00
3	54.12	94.24	0.487	0.50 ( 0.47)	0.95	1617.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	22.54	14.22	1.365	0.50 ( 0.50)	1.00	29.0	20200.00
2	22.29	14.38	1.351	0.50 ( 0.50)	1.00	29.1	20210.00

LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 13524.00 = 2247.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	265.04	14.22	1.365	0.50 ( 0.48)	0.96	333.2	20200.00
2	264.42	14.38	1.351	0.50 ( 0.48)	0.96	336.8	20210.00
3	261.83	16.54	1.238	0.50 ( 0.48)	0.96	383.1	20100.00
4	103.22	76.07	0.543	0.50 ( 0.48)	0.95	1565.2	13510.00
5	54.12	94.24	0.487	0.50 ( 0.47)	0.95	1646.9	13500.00

TOTAL AREA (ACRES) = 1646.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 265.04 Tc(MIN.) = 14.219  
EFFECTIVE AREA(ACRES) = 333.18 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 1646.9  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13524.00 = 20004.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13524.00 TO NODE 13620.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----

ELEVATION DATA: UPSTREAM(FEET) = 556.00 DOWNSTREAM(FEET) = 544.91  
CHANNEL LENGTH THRU SUBAREA(FEET) = 672.93 CHANNEL SLOPE = 0.0165  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.264  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 27.94 0.50 0.884 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 275.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.88  
AVERAGE FLOW DEPTH(FEET) = 3.65 TRAVEL TIME(MIN.) = 1.63  
Tc(MIN.) = 15.85  
SUBAREA AREA(ACRES) = 27.94 SUBAREA RUNOFF(CFS) = 20.67  
EFFECTIVE AREA(ACRES) = 361.12 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95

TOTAL AREA(ACRES) = 1674.8 PEAK FLOW RATE(CFS) = 265.04  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.60 FLOW VELOCITY(FEET/SEC.) = 6.82  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	265.04	15.85	1.264	0.50 ( 0.48)	0.95	361.1	20200.00
2	264.42	16.01	1.258	0.50 ( 0.48)	0.95	364.7	20210.00
3	261.83	18.18	1.177	0.50 ( 0.48)	0.95	411.0	20100.00
4	103.22	78.15	0.536	0.50 ( 0.47)	0.95	1593.1	13510.00
5	54.12	96.68	0.482	0.50 ( 0.47)	0.95	1674.8	13500.00

NEW PEAK FLOW RATE DATA ARE:

PEAK FLOW RATE(CFS) = 265.04 Tc(MIN.) = 15.85  
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.95 EFFECTIVE AREA(ACRES) = 361.12

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13603.00 TO NODE 13620.00 IS CODE = 11

-----  
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
-----

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	265.04	15.85	1.264	0.50 ( 0.48)	0.95	361.1	20200.00
2	264.42	16.01	1.258	0.50 ( 0.48)	0.95	364.7	20210.00
3	261.83	18.18	1.177	0.50 ( 0.48)	0.95	411.0	20100.00
4	103.22	78.15	0.536	0.50 ( 0.47)	0.95	1593.1	13510.00
5	54.12	96.68	0.482	0.50 ( 0.47)	0.95	1674.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	41.10	22.83	1.029	0.50 ( 0.50)	1.00	86.4	13600.00

LONGEST FLOWPATH FROM NODE 13600.00 TO NODE 13620.00 = 3732.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	306.14	15.85	1.264	0.50 ( 0.48)	0.96	421.1	20200.00
2	305.52	16.01	1.258	0.50 ( 0.48)	0.96	425.3	20210.00
3	302.92	18.18	1.177	0.50 ( 0.48)	0.96	479.8	20100.00
4	290.61	22.83	1.029	0.50 ( 0.48)	0.96	589.1	13600.00
5	106.01	78.15	0.536	0.50 ( 0.48)	0.95	1679.5	13510.00
6	54.12	96.68	0.482	0.50 ( 0.47)	0.95	1761.2	13500.00

TOTAL AREA(ACRES) = 1761.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 306.14 Tc(MIN.) = 15.848  
EFFECTIVE AREA(ACRES) = 421.09 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 1761.2

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13620.00 = 20677.71 FEET.

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FLOW PROCESS FROM NODE 13620.00 TO NODE 13621.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 544.91 DOWNSTREAM(FEET) = 527.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 868.57 CHANNEL SLOPE = 0.0206
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 306.14
FLOW VELOCITY(FEET/SEC.) = 7.68 FLOW DEPTH(FEET) = 3.64
TRAVEL TIME(MIN.) = 1.88 Tc(MIN.) = 17.73
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-6.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 306.14 Tc(MIN.) = 17.73
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 421.09

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FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

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FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610203U.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13621.00 TO NODE 13621.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE.

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-6.

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-7 and TOTAL AREA(ACRES) = 1788.6.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 323.23 Tc(MIN.) = 17.732
EFFECTIVE AREA(ACRES) = 448.52 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1788.6

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13621.00 = 21546.28 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13621.00 TO NODE 13622.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 527.00 DOWNSTREAM(FEET) = 512.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 56.08 CHANNEL SLOPE = 0.2675
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 323.23
FLOW VELOCITY(FEET/SEC.) = 20.38 FLOW DEPTH(FEET) = 2.30
TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 17.78
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-7.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 323.23 Tc(MIN.) = 17.78
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 448.52

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610204U.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

Table with 7 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1: 1, 24.72, 14.34, 0.50(0.50), 1.00, 32.2, 20400.00. Total Area(ACRES) = 32.2

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13622.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-7 with various flow and area data.

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Row 1: 1, 24.72, 14.34, 1.355, 0.50(0.50), 1.00, 32.2, 20400.00. Longest flowpath = 2281.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-8 with flow and area data.

TOTAL AREA(ACRES) = 1820.8

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 343.23 Tc(MIN.) = 17.778
EFFECTIVE AREA(ACRES) = 480.67 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96
TOTAL AREA(ACRES) = 1820.8
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13622.00 = 21602.36 FEET.

\*\*\*\*\*
FLOW PROCESS FROM NODE 13622.00 TO NODE 13640.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 512.00 DOWNSTREAM(FEET) = 489.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 459.72 CHANNEL SLOPE = 0.0500
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.166

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Row 1: USER-DEFINED, -, 112.88, 0.50, 1.000, -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 377.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.29

AVERAGE FLOW DEPTH(FEET) = 3.34 TRAVEL TIME(MIN.) = 0.68

Tc(MIN.) = 18.46

SUBAREA AREA(ACRES) = 112.88 SUBAREA RUNOFF(CFS) = 67.64

EFFECTIVE AREA(ACRES) = 593.55 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 1933.7 PEAK FLOW RATE(CFS) = 363.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.29 FLOW VELOCITY(FEET/SEC.) = 11.19

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

Table with 8 columns: STREAM NUMBER, Q (CFS), Tc (MIN.), Intensity (INCH/HR), Fp(Fm) (INCH/HR), Ap, Ae (ACRES), HEADWATER NODE. Rows 1-8 with flow and area data.

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 372.51 Tc(MIN.) = 15.56
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 524.83

\*\*\*\*\*
FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 15.1



>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610205U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.85	11.78	0.50 ( 0.50)	1.00	8.1	20500.00
TOTAL AREA (ACRES) =		8.1				

\*\*\*\*\*

FLOW PROCESS FROM NODE 13640.00 TO NODE 13640.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	372.01	15.02	1.295	0.50 ( 0.49)	0.97	510.9	20400.00
2	372.51	15.56	1.275	0.50 ( 0.49)	0.97	524.8	20300.00
3	363.57	18.46	1.166	0.50 ( 0.49)	0.97	593.6	20200.00
4	362.83	18.62	1.160	0.50 ( 0.49)	0.97	597.8	20210.00
5	352.64	20.80	1.086	0.50 ( 0.48)	0.97	652.2	20100.00
6	325.21	25.48	0.959	0.50 ( 0.48)	0.97	761.6	13600.00
7	107.47	81.58	0.524	0.50 ( 0.48)	0.96	1852.0	13510.00
8	54.12	100.76	0.473	0.50 ( 0.48)	0.95	1933.7	13500.00
LONGEST FLOWPATH FROM NODE		13500.00 TO NODE 13640.00 =					22062.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.85	11.78	1.582	0.50 ( 0.50)	1.00	8.1	20500.00
LONGEST FLOWPATH FROM NODE		20500.00 TO NODE 13640.00 =					1025.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	379.86	11.78	1.582	0.50 ( 0.49)	0.97	408.9	20500.00
2	377.78	15.02	1.295	0.50 ( 0.49)	0.97	519.0	20400.00
3	378.12	15.56	1.275	0.50 ( 0.49)	0.97	532.9	20300.00
4	368.40	18.46	1.166	0.50 ( 0.49)	0.97	601.6	20200.00
5	367.61	18.62	1.160	0.50 ( 0.49)	0.97	605.8	20210.00
6	356.88	20.80	1.086	0.50 ( 0.49)	0.97	660.3	20100.00
7	328.54	25.48	0.959	0.50 ( 0.48)	0.97	769.7	13600.00
8	107.64	81.58	0.524	0.50 ( 0.48)	0.96	1860.0	13510.00
9	54.12	100.76	0.473	0.50 ( 0.48)	0.95	1941.7	13500.00
TOTAL AREA (ACRES) =		1941.7					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 379.86 Tc (MIN.) = 11.782  
EFFECTIVE AREA (ACRES) = 408.93 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95  
TOTAL AREA (ACRES) = 1941.7  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13640.00 = 22062.08 FEET.

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FLOW PROCESS FROM NODE 13640.00 TO NODE 13641.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 489.00 DOWNSTREAM (FEET) = 436.89  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2992.90 CHANNEL SLOPE = 0.0174  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.179

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	180.31	0.50	1.000	-
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) =		0.50			
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =		1.000			
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) =		435.21			
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) =		7.87			
AVERAGE FLOW DEPTH (FEET) =		4.29		TRAVEL TIME (MIN.) = 6.34	
Tc (MIN.) =		18.12			
SUBAREA AREA (ACRES) =		180.31	SUBAREA RUNOFF (CFS) =		110.12
EFFECTIVE AREA (ACRES) =		589.24	AREA-AVERAGED Fm (INCH/HR) =		0.49
AREA-AVERAGED Fp (INCH/HR) =		0.50		AREA-AVERAGED Ap = 0.98	
TOTAL AREA (ACRES) =		2122.0	PEAK FLOW RATE (CFS) =		379.86

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 4.08 FLOW VELOCITY (FEET/SEC.) = 7.61  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13641.00 = 25054.98 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	379.86	18.12	1.179	0.50 ( 0.49)	0.98	589.2	20500.00
2	377.78	21.40	1.069	0.50 ( 0.49)	0.98	699.3	20400.00
3	378.12	21.94	1.054	0.50 ( 0.49)	0.98	713.2	20300.00
4	368.40	24.90	0.971	0.50 ( 0.49)	0.98	781.9	20200.00
5	367.61	25.06	0.967	0.50 ( 0.49)	0.98	786.2	20210.00
6	356.88	27.30	0.923	0.50 ( 0.49)	0.98	840.6	20100.00
7	328.54	32.15	0.843	0.50 ( 0.49)	0.97	950.0	13600.00
8	107.64	90.58	0.494	0.50 ( 0.48)	0.96	2040.4	13510.00
9	54.12	111.42	0.452	0.50 ( 0.48)	0.96	2122.0	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 379.86 Tc (MIN.) = 18.12  
AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 589.24

\*\*\*\*\*

FLOW PROCESS FROM NODE 13641.00 TO NODE 13642.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM (FEET) = 436.89 DOWNSTREAM (FEET) = 394.80  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2814.16 CHANNEL SLOPE = 0.0150  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.988

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE            GROUP    (ACRES)    (INCH/HR)    (DECIMAL)    CN  
 USER-DEFINED       -        451.39      0.50        1.000       -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 479.79  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.62  
 AVERAGE FLOW DEPTH(FEET) = 4.58    TRAVEL TIME(MIN.) = 6.15  
 Tc(MIN.) = 24.27  
 SUBAREA AREA(ACRES) = 451.39        SUBAREA RUNOFF(CFS) = 198.34  
 EFFECTIVE AREA(ACRES) = 1040.63    AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50    AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 2573.4        PEAK FLOW RATE(CFS) = 462.25

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.52    FLOW VELOCITY(FEET/SEC.) = 7.54  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13642.00 = 27869.14 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	462.25	30.06	0.870	0.50( 0.50)	0.99	1475.2	20500.00
2	471.67	33.49	0.826	0.50( 0.50)	0.99	1585.3	20400.00
3	465.67	34.05	0.819	0.50( 0.50)	0.99	1599.2	20300.00
4	426.17	37.20	0.779	0.50( 0.49)	0.99	1667.9	20200.00
5	423.86	37.38	0.777	0.50( 0.49)	0.99	1672.1	20210.00
6	391.18	39.75	0.746	0.50( 0.49)	0.99	1726.6	20100.00
7	343.99	44.97	0.702	0.50( 0.49)	0.99	1835.9	13600.00
8	107.64	108.16	0.459	0.50( 0.49)	0.97	2926.3	13510.00
9	54.12	132.25	0.420	0.50( 0.49)	0.97	3008.0	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 462.25    Tc(MIN.) = 24.27  
 AREA-AVERAGED Fm(INCH/HR) = 0.49    AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99    EFFECTIVE AREA(ACRES) = 1040.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13642.00 TO NODE 13643.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 394.80    DOWNSTREAM(FEET) = 342.39  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2913.57    CHANNEL SLOPE = 0.0180  
 CHANNEL BASE(FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040    MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.870

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	434.58	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 534.76  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.38  
 AVERAGE FLOW DEPTH(FEET) = 4.61    TRAVEL TIME(MIN.) = 5.79  
 Tc(MIN.) = 30.06  
 SUBAREA AREA(ACRES) = 434.58        SUBAREA RUNOFF(CFS) = 144.71  
 EFFECTIVE AREA(ACRES) = 1475.21    AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50    AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 3008.0        PEAK FLOW RATE(CFS) = 496.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.48    FLOW VELOCITY(FEET/SEC.) = 8.24  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13643.00 = 30782.71 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	496.22	30.06	0.870	0.50( 0.50)	0.99	1475.2	20500.00
2	471.67	33.49	0.826	0.50( 0.50)	0.99	1585.3	20400.00
3	465.67	34.05	0.819	0.50( 0.50)	0.99	1599.2	20300.00
4	426.17	37.20	0.779	0.50( 0.49)	0.99	1667.9	20200.00
5	423.86	37.38	0.777	0.50( 0.49)	0.99	1672.1	20210.00
6	391.18	39.75	0.746	0.50( 0.49)	0.99	1726.6	20100.00
7	343.99	44.97	0.702	0.50( 0.49)	0.99	1835.9	13600.00
8	107.64	108.16	0.459	0.50( 0.49)	0.97	2926.3	13510.00
9	54.12	132.25	0.420	0.50( 0.49)	0.97	3008.0	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 496.22    Tc(MIN.) = 30.06  
 AREA-AVERAGED Fm(INCH/HR) = 0.50    AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99    EFFECTIVE AREA(ACRES) = 1475.21

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 342.39    DOWNSTREAM(FEET) = 300.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1591.23    CHANNEL SLOPE = 0.0266  
 CHANNEL BASE(FEET) = 0.00    "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040    MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.835

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	109.24	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 512.67  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.62  
 AVERAGE FLOW DEPTH(FEET) = 4.21    TRAVEL TIME(MIN.) = 2.76  
 Tc(MIN.) = 32.82  
 SUBAREA AREA(ACRES) = 109.24        SUBAREA RUNOFF(CFS) = 32.91  
 EFFECTIVE AREA(ACRES) = 1584.45    AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50    AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3117.3        PEAK FLOW RATE(CFS) = 496.22  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.16    FLOW VELOCITY(FEET/SEC.) = 9.55  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	496.22	32.82	0.835	0.50( 0.50)	0.99	1584.4	20500.00

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
2	471.67	36.28	0.791	0.50( 0.50)	0.99	1694.5	20400.00
3	465.67	36.85	0.783	0.50( 0.50)	0.99	1708.4	20300.00
4	426.17	40.06	0.742	0.50( 0.50)	0.99	1777.1	20200.00
5	423.86	40.25	0.741	0.50( 0.50)	0.99	1781.4	20210.00
6	391.18	42.68	0.721	0.50( 0.49)	0.99	1835.8	20100.00
7	343.99	48.00	0.677	0.50( 0.49)	0.99	1945.2	13600.00
8	107.64	112.23	0.451	0.50( 0.49)	0.97	3035.6	13510.00
9	54.12	137.08	0.415	0.50( 0.49)	0.97	3117.3	13500.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 496.22 Tc(MIN.) = 32.82  
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1584.45

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13643.00 TO NODE 13660.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 1 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610206U.DNA  
 MEMORY BANK # 1 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.20	26.56	0.50( 0.50)	1.00	186.0	20600.00
TOTAL AREA(ACRES) = 186.0						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13660.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	496.22	32.82	0.835	0.50( 0.50)	0.99	1584.4	20500.00
2	471.67	36.28	0.791	0.50( 0.50)	0.99	1694.5	20400.00
3	465.67	36.85	0.783	0.50( 0.50)	0.99	1708.4	20300.00
4	426.17	40.06	0.742	0.50( 0.50)	0.99	1777.1	20200.00
5	423.86	40.25	0.741	0.50( 0.50)	0.99	1781.4	20210.00
6	391.18	42.68	0.721	0.50( 0.49)	0.99	1835.8	20100.00
7	343.99	48.00	0.677	0.50( 0.49)	0.99	1945.2	13600.00
8	107.64	112.23	0.451	0.50( 0.49)	0.97	3035.6	13510.00
9	54.12	137.08	0.415	0.50( 0.49)	0.97	3117.3	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.							

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.20	26.56	0.938	0.50( 0.50)	1.00	186.0	20600.00
LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 13660.00 = 6967.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	569.42	26.56	0.938	0.50( 0.50)	0.99	1468.4	20600.00
2	552.22	32.82	0.835	0.50( 0.50)	0.99	1770.5	20500.00
3	520.26	36.28	0.791	0.50( 0.50)	0.99	1880.5	20400.00
4	513.05	36.85	0.783	0.50( 0.50)	0.99	1894.4	20300.00
5	466.70	40.06	0.742	0.50( 0.50)	0.99	1963.2	20200.00
6	464.14	40.25	0.741	0.50( 0.50)	0.99	1967.4	20210.00
7	428.08	42.68	0.721	0.50( 0.50)	0.99	2021.9	20100.00
8	373.50	48.00	0.677	0.50( 0.49)	0.99	2131.2	13600.00
9	107.64	112.23	0.451	0.50( 0.49)	0.97	3221.6	13510.00
10	54.12	137.08	0.415	0.50( 0.49)	0.97	3303.3	13500.00
TOTAL AREA(ACRES) = 3303.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 569.42 Tc(MIN.) = 26.562  
 EFFECTIVE AREA(ACRES) = 1468.44 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 3303.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13660.00 = 32373.94 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 300.00 DOWNSTREAM(FEET) = 288.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 933.89 CHANNEL SLOPE = 0.0128  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.898  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	61.43	0.50	1.000	-

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 580.41  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.55  
 AVERAGE FLOW DEPTH(FEET) = 5.06 TRAVEL TIME(MIN.) = 2.06  
 Tc(MIN.) = 28.62  
 SUBAREA AREA(ACRES) = 61.43 SUBAREA RUNOFF(CFS) = 21.98  
 EFFECTIVE AREA(ACRES) = 1529.87 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3364.7 PEAK FLOW RATE(CFS) = 569.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 5.02 FLOW VELOCITY(FEET/SEC.) = 7.52  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	569.42	28.62	0.898	0.50( 0.50)	0.99	1529.9	20600.00
2	552.22	34.90	0.808	0.50( 0.50)	0.99	1831.9	20500.00
3	520.26	38.39	0.764	0.50( 0.50)	0.99	1942.0	20400.00

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
4	513.05	38.97	0.756	0.50 ( 0.50)	0.99	1955.9	20300.00
5	466.70	42.23	0.724	0.50 ( 0.50)	0.99	2024.6	20200.00
6	464.14	42.42	0.723	0.50 ( 0.50)	0.99	2028.8	20210.00
7	428.08	44.90	0.702	0.50 ( 0.50)	0.99	2083.3	20100.00
8	373.50	50.29	0.658	0.50 ( 0.49)	0.99	2192.6	13600.00
9	107.64	115.37	0.444	0.50 ( 0.49)	0.98	3283.0	13510.00
10	54.12	140.82	0.410	0.50 ( 0.49)	0.97	3364.7	13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 569.42 Tc(MIN.) = 28.62  
AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1529.87

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13660.00 TO NODE 13680.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610207U.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	108.52	18.83	0.50 ( 0.46)	0.92		174.5	20700.00

TOTAL AREA(ACRES) = 174.5

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13680.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	569.42	28.62	0.898	0.50 ( 0.50)	0.99	1529.9	20600.00
2	552.22	34.90	0.808	0.50 ( 0.50)	0.99	1831.9	20500.00
3	520.26	38.39	0.764	0.50 ( 0.50)	0.99	1942.0	20400.00
4	513.05	38.97	0.756	0.50 ( 0.50)	0.99	1955.9	20300.00
5	466.70	42.23	0.724	0.50 ( 0.50)	0.99	2024.6	20200.00
6	464.14	42.42	0.723	0.50 ( 0.50)	0.99	2028.8	20210.00
7	428.08	44.90	0.702	0.50 ( 0.50)	0.99	2083.3	20100.00
8	373.50	50.29	0.658	0.50 ( 0.49)	0.99	2192.6	13600.00
9	107.64	115.37	0.444	0.50 ( 0.49)	0.98	3283.0	13510.00
10	54.12	140.82	0.410	0.50 ( 0.49)	0.97	3364.7	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	108.52	18.83	1.152	0.50 ( 0.46)	0.92	174.5	20700.00

LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 13680.00 = 6221.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	677.94	18.83	1.152	0.50 ( 0.49)	0.98	1181.1	20700.00
2	637.96	28.62	0.898	0.50 ( 0.49)	0.99	1704.4	20600.00
3	606.70	34.90	0.808	0.50 ( 0.49)	0.99	2006.4	20500.00
4	567.70	38.39	0.764	0.50 ( 0.49)	0.99	2116.5	20400.00
5	559.32	38.97	0.756	0.50 ( 0.49)	0.99	2130.4	20300.00
6	507.99	42.23	0.724	0.50 ( 0.49)	0.99	2199.1	20200.00
7	505.18	42.42	0.723	0.50 ( 0.49)	0.99	2203.3	20210.00
8	465.89	44.90	0.702	0.50 ( 0.49)	0.99	2257.8	20100.00
9	404.37	50.29	0.658	0.50 ( 0.49)	0.98	2367.1	13600.00
10	112.98	115.37	0.444	0.50 ( 0.49)	0.97	3457.5	13510.00
11	59.06	140.82	0.410	0.50 ( 0.49)	0.97	3539.2	13500.00

TOTAL AREA(ACRES) = 3539.2

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 677.94 Tc(MIN.) = 18.833  
EFFECTIVE AREA(ACRES) = 1181.12 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 3539.2  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13680.00 = 33307.83 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 288.00 DOWNSTREAM(FEET) = 242.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2860.77 CHANNEL SLOPE = 0.0161  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.986  
SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.53	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 702.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.61  
AVERAGE FLOW DEPTH(FEET) = 5.21 TRAVEL TIME(MIN.) = 5.53  
Tc(MIN.) = 24.37  
SUBAREA AREA(ACRES) = 112.53 SUBAREA RUNOFF(CFS) = 49.17  
EFFECTIVE AREA(ACRES) = 1293.65 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 3651.8 PEAK FLOW RATE(CFS) = 677.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 5.15 FLOW VELOCITY(FEET/SEC.) = 8.54  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	677.94	24.37	0.986	0.50 ( 0.49)	0.99	1293.6	20700.00
2	637.96	34.26	0.816	0.50 ( 0.49)	0.99	1816.9	20600.00

3	606.70	40.61	0.738	0.50	(0.49)	0.99	2118.9	20500.00
4	567.70	44.21	0.708	0.50	(0.49)	0.99	2229.0	20400.00
5	559.32	44.80	0.703	0.50	(0.49)	0.99	2242.9	20300.00
6	507.99	48.21	0.675	0.50	(0.49)	0.99	2311.6	20200.00
7	505.18	48.40	0.673	0.50	(0.49)	0.99	2315.9	20210.00
8	465.89	51.00	0.654	0.50	(0.49)	0.99	2370.3	20100.00
9	404.37	56.62	0.620	0.50	(0.49)	0.98	2479.7	13600.00
10	112.98	124.11	0.430	0.50	(0.49)	0.97	3570.1	13510.00
11	59.06	151.12	0.398	0.50	(0.49)	0.97	3651.8	13500.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 677.94 Tc(MIN.) = 24.37  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1293.65

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13680.00 TO NODE 13682.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610208U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	104.54	17.48	0.50 (0.50)	0.99	164.7	20810.00
2	94.29	21.65	0.50 (0.50)	0.99	185.8	20800.00
TOTAL AREA(ACRES) = 185.8						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	677.94	24.37	0.986	0.50 (0.49)	0.99	1293.6	20700.00
2	637.96	34.26	0.816	0.50 (0.49)	0.99	1816.9	20600.00
3	606.70	40.61	0.738	0.50 (0.49)	0.99	2118.9	20500.00
4	567.70	44.21	0.708	0.50 (0.49)	0.99	2229.0	20400.00
5	559.32	44.80	0.703	0.50 (0.49)	0.99	2242.9	20300.00
6	507.99	48.21	0.675	0.50 (0.49)	0.99	2311.6	20200.00
7	505.18	48.40	0.673	0.50 (0.49)	0.99	2315.9	20210.00
8	465.89	51.00	0.654	0.50 (0.49)	0.99	2370.3	20100.00
9	404.37	56.62	0.620	0.50 (0.49)	0.98	2479.7	13600.00
10	112.98	124.11	0.430	0.50 (0.49)	0.97	3570.1	13510.00
11	59.06	151.12	0.398	0.50 (0.49)	0.97	3651.8	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	104.54	17.48	1.203	0.50	(0.50)	0.99	164.7	20810.00
2	94.29	21.65	1.062	0.50	(0.50)	0.99	185.8	20800.00

LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 13682.00 = 5285.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	782.48	17.48	1.203	0.50 (0.49)	0.99	1092.6	20810.00
2	772.23	21.65	1.062	0.50 (0.49)	0.99	1335.1	20800.00
3	759.50	24.37	0.986	0.50 (0.49)	0.99	1479.5	20700.00
4	691.24	34.26	0.816	0.50 (0.49)	0.99	2002.7	20600.00
5	646.85	40.61	0.738	0.50 (0.49)	0.99	2304.8	20500.00
6	602.86	44.21	0.708	0.50 (0.49)	0.99	2414.8	20400.00
7	593.67	44.80	0.703	0.50 (0.49)	0.99	2428.7	20300.00
8	537.59	48.21	0.675	0.50 (0.49)	0.99	2497.4	20200.00
9	534.52	48.40	0.673	0.50 (0.49)	0.99	2501.7	20210.00
10	492.00	51.00	0.654	0.50 (0.49)	0.99	2556.1	20100.00
11	424.75	56.62	0.620	0.50 (0.49)	0.99	2665.5	13600.00
12	113.35	124.11	0.430	0.50 (0.49)	0.97	3755.9	13510.00
13	59.39	151.12	0.398	0.50 (0.49)	0.97	3837.6	13500.00
TOTAL AREA(ACRES) = 3837.6							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 782.48 Tc(MIN.) = 17.478  
 EFFECTIVE AREA(ACRES) = 1092.60 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 3837.6  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.00 = 36168.60 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.00 TO NODE 13682.50 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 242.00 DOWNSTREAM(FEET) = 230.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 660.20 CHANNEL SLOPE = 0.0182  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 782.48  
 FLOW VELOCITY(FEET/SEC.) = 9.27 FLOW DEPTH(FEET) = 5.31  
 TRAVEL TIME(MIN.) = 1.19 Tc(MIN.) = 18.67  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	782.48	18.67	1.158	0.50 (0.49)	0.99	1092.6	20810.00
2	772.23	22.84	1.029	0.50 (0.49)	0.99	1335.1	20800.00
3	759.50	25.56	0.957	0.50 (0.49)	0.99	1479.5	20700.00
4	691.24	35.48	0.801	0.50 (0.49)	0.99	2002.7	20600.00
5	646.85	41.85	0.728	0.50 (0.49)	0.99	2304.8	20500.00
6	602.86	45.47	0.698	0.50 (0.49)	0.99	2414.8	20400.00
7	593.67	46.07	0.693	0.50 (0.49)	0.99	2428.7	20300.00
8	537.59	49.52	0.664	0.50 (0.49)	0.99	2497.4	20200.00
9	534.52	49.71	0.662	0.50 (0.49)	0.99	2501.7	20210.00
10	492.00	52.33	0.646	0.50 (0.49)	0.99	2556.1	20100.00
11	424.75	58.01	0.611	0.50 (0.49)	0.99	2665.5	13600.00

12 113.35 126.03 0.428 0.50( 0.49) 0.97 3755.9 13510.00  
 13 59.39 153.38 0.395 0.50( 0.49) 0.97 3837.6 13500.00  
 NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 782.48 Tc(MIN.) = 18.67  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1092.60

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 12  
 -----  
 >>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610209U.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.89	19.26	0.50( 0.50)	1.00	76.8	20900.00
TOTAL AREA(ACRES) = 76.8						

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13682.50 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	782.48	18.67	1.158	0.50( 0.49)	0.99	1092.6	20810.00
2	772.23	22.84	1.029	0.50( 0.49)	0.99	1335.1	20800.00
3	759.50	25.56	0.957	0.50( 0.49)	0.99	1479.5	20700.00
4	691.24	35.48	0.801	0.50( 0.49)	0.99	2002.7	20600.00
5	646.85	41.85	0.728	0.50( 0.49)	0.99	2304.8	20500.00
6	602.86	45.47	0.698	0.50( 0.49)	0.99	2414.8	20400.00
7	593.67	46.07	0.693	0.50( 0.49)	0.99	2428.7	20300.00
8	537.59	49.52	0.664	0.50( 0.49)	0.99	2497.4	20200.00
9	534.52	49.71	0.662	0.50( 0.49)	0.99	2501.7	20210.00
10	492.00	52.33	0.646	0.50( 0.49)	0.99	2556.1	20100.00
11	424.75	58.01	0.611	0.50( 0.49)	0.99	2665.5	13600.00
12	113.35	126.03	0.428	0.50( 0.49)	0.97	3755.9	13510.00
13	59.39	153.38	0.395	0.50( 0.49)	0.97	3837.6	13500.00
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.							

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	43.89	19.26	1.136	0.50( 0.50)	1.00	76.8	20900.00
LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 13682.50 = 4089.00 FEET.							

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	826.37	22.58	1.036	0.50( 0.49)	0.99	1229.3	20810.00

1	826.37	18.67	1.158	0.50( 0.49)	0.99	1167.0	20810.00
2	824.92	19.26	1.136	0.50( 0.49)	0.99	1203.7	20900.00
3	808.70	22.84	1.029	0.50( 0.49)	0.99	1411.9	20800.00
4	791.04	25.56	0.957	0.50( 0.49)	0.99	1556.2	20700.00
5	711.99	35.48	0.801	0.50( 0.49)	0.99	2079.5	20600.00
6	662.55	41.85	0.728	0.50( 0.49)	0.99	2381.5	20500.00
7	616.48	45.47	0.698	0.50( 0.49)	0.99	2491.6	20400.00
8	606.95	46.07	0.693	0.50( 0.49)	0.99	2505.5	20300.00
9	548.90	49.52	0.664	0.50( 0.49)	0.99	2574.2	20200.00
10	545.72	49.71	0.662	0.50( 0.49)	0.99	2578.4	20210.00
11	502.05	52.33	0.646	0.50( 0.49)	0.99	2632.9	20100.00
12	432.41	58.01	0.611	0.50( 0.49)	0.99	2742.2	13600.00
13	113.35	126.03	0.428	0.50( 0.49)	0.97	3832.6	13510.00
14	59.39	153.38	0.395	0.50( 0.49)	0.97	3914.3	13500.00
TOTAL AREA(ACRES) = 3914.3							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 826.37 Tc(MIN.) = 18.665  
 EFFECTIVE AREA(ACRES) = 1167.00 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3914.3  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13682.50 = 36828.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13682.50 TO NODE 13683.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 230.00 DOWNSTREAM(FEET) = 208.53  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1866.20 CHANNEL SLOPE = 0.0115  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.036  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SC5 SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 62.32 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 841.40  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.95  
 AVERAGE FLOW DEPTH(FEET) = 5.94 TRAVEL TIME(MIN.) = 3.91  
 Tc(MIN.) = 22.58  
 SUBAREA AREA(ACRES) = 62.32 SUBAREA RUNOFF(CFS) = 30.04  
 EFFECTIVE AREA(ACRES) = 1229.32 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 3976.6 PEAK FLOW RATE(CFS) = 826.37  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 5.90 FLOW VELOCITY(FEET/SEC.) = 7.91  
 LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13683.00 = 38695.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	826.37	22.58	1.036	0.50( 0.49)	0.99	1229.3	20810.00

2	824.92	23.17	1.019	0.50	( 0.49)	0.99	1266.0	20900.00
3	808.70	26.78	0.934	0.50	( 0.49)	0.99	1474.2	20800.00
4	791.04	29.52	0.880	0.50	( 0.49)	0.99	1618.5	20700.00
5	711.99	39.55	0.749	0.50	( 0.49)	0.99	2141.8	20600.00
6	662.55	46.00	0.693	0.50	( 0.50)	0.99	2443.8	20500.00
7	616.48	49.69	0.663	0.50	( 0.49)	0.99	2553.9	20400.00
8	606.95	50.31	0.658	0.50	( 0.49)	0.99	2567.8	20300.00
9	548.90	53.87	0.636	0.50	( 0.49)	0.99	2636.5	20200.00
10	545.72	54.06	0.635	0.50	( 0.49)	0.99	2640.8	20210.00
11	502.05	56.78	0.619	0.50	( 0.49)	0.99	2695.2	20100.00
12	432.41	62.62	0.590	0.50	( 0.49)	0.99	2804.6	13600.00
13	113.35	132.50	0.420	0.50	( 0.49)	0.98	3894.9	13510.00
14	59.39	160.99	0.386	0.50	( 0.49)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 826.37 Tc(MIN.) = 22.58  
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1229.32

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13683.00 TO NODE 13684.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 208.53 DOWNSTREAM(FEET) = 200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 166.32 CHANNEL SLOPE = 0.0513  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 826.37  
FLOW VELOCITY(FEET/SEC.) = 13.86 FLOW DEPTH(FEET) = 4.46  
TRAVEL TIME(MIN.) = 0.20 Tc(MIN.) = 22.78  
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	826.37	22.78	1.030	0.50( 0.49)	0.99	1229.3	20810.00
2	824.92	23.37	1.014	0.50( 0.49)	0.99	1266.0	20900.00
3	808.70	26.98	0.930	0.50( 0.49)	0.99	1474.2	20800.00
4	791.04	29.73	0.876	0.50( 0.49)	0.99	1618.5	20700.00
5	711.99	39.76	0.746	0.50( 0.49)	0.99	2141.8	20600.00
6	662.55	46.21	0.691	0.50( 0.50)	0.99	2443.8	20500.00
7	616.48	49.91	0.661	0.50( 0.49)	0.99	2553.9	20400.00
8	606.95	50.52	0.657	0.50( 0.49)	0.99	2567.8	20300.00
9	548.90	54.09	0.635	0.50( 0.49)	0.99	2636.5	20200.00
10	545.72	54.28	0.634	0.50( 0.49)	0.99	2640.8	20210.00
11	502.05	57.01	0.617	0.50( 0.49)	0.99	2695.2	20100.00
12	432.41	62.85	0.589	0.50( 0.49)	0.99	2804.6	13600.00
13	113.35	132.83	0.420	0.50( 0.49)	0.98	3894.9	13510.00
14	59.39	161.38	0.386	0.50( 0.49)	0.97	3976.6	13500.00

NEW PEAK FLOW DATA ARE:  
PEAK FLOW RATE(CFS) = 826.37 Tc(MIN.) = 22.78  
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA(ACRES) = 1229.32

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0610210U.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	46.68	19.48	0.50( 0.50)	1.00	82.7	21000.00
TOTAL AREA(ACRES) =			82.7			

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13684.00 TO NODE 13684.00 IS CODE = 11  
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>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	826.37	22.78	1.030	0.50( 0.49)	0.99	1229.3	20810.00
2	824.92	23.37	1.014	0.50( 0.49)	0.99	1266.0	20900.00
3	808.70	26.98	0.930	0.50( 0.49)	0.99	1474.2	20800.00
4	791.04	29.73	0.876	0.50( 0.49)	0.99	1618.5	20700.00
5	711.99	39.76	0.746	0.50( 0.49)	0.99	2141.8	20600.00
6	662.55	46.21	0.691	0.50( 0.50)	0.99	2443.8	20500.00
7	616.48	49.91	0.661	0.50( 0.49)	0.99	2553.9	20400.00
8	606.95	50.52	0.657	0.50( 0.49)	0.99	2567.8	20300.00
9	548.90	54.09	0.635	0.50( 0.49)	0.99	2636.5	20200.00
10	545.72	54.28	0.634	0.50( 0.49)	0.99	2640.8	20210.00
11	502.05	57.01	0.617	0.50( 0.49)	0.99	2695.2	20100.00
12	432.41	62.85	0.589	0.50( 0.49)	0.99	2804.6	13600.00
13	113.35	132.83	0.420	0.50( 0.49)	0.98	3894.9	13510.00
14	59.39	161.38	0.386	0.50( 0.49)	0.97	3976.6	13500.00

LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	46.68	19.48	1.128	0.50( 0.50)	1.00	82.7	21000.00

LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 13684.00 = 4160.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	19.48	1.128	0.50( 0.49)	0.99	1133.8	21000.00
2	865.80	22.78	1.030	0.50( 0.49)	0.99	1312.0	20810.00
3	863.12	23.37	1.014	0.50( 0.49)	0.99	1348.7	20900.00
4	840.65	26.98	0.930	0.50( 0.49)	0.99	1556.9	20800.00
5	819.02	29.73	0.876	0.50( 0.49)	0.99	1701.2	20700.00
6	730.28	39.76	0.746	0.50( 0.49)	0.99	2224.5	20600.00
7	676.78	46.21	0.691	0.50( 0.50)	0.99	2526.5	20500.00
8	628.43	49.91	0.661	0.50( 0.49)	0.99	2636.6	20400.00
9	618.60	50.52	0.657	0.50( 0.49)	0.99	2650.5	20300.00

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10 558.93 54.09 0.635 0.50( 0.49) 0.99 2719.2 20200.00
11 555.67 54.28 0.634 0.50( 0.49) 0.99 2723.5 20210.00
12 510.75 57.01 0.617 0.50( 0.49) 0.99 2777.9 20100.00
13 439.02 62.85 0.589 0.50( 0.49) 0.99 2887.3 13600.00
14 113.35 132.83 0.420 0.50( 0.49) 0.98 3977.7 13510.00
15 59.39 161.38 0.386 0.50( 0.49) 0.97 4059.3 13500.00
TOTAL AREA (ACRES) = 4059.3

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COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

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PEAK FLOW RATE(CFS) = 873.05 Tc(MIN.) = 19.476
EFFECTIVE AREA (ACRES) = 1133.81 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97
TOTAL AREA (ACRES) = 4059.3
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13684.00 = 38861.32 FEET.

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FLOW PROCESS FROM NODE 13684.00 TO NODE 13685.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 200.00 DOWNSTREAM(FEET) = 194.24
CHANNEL LENGTH THRU SUBAREA(FEET) = 122.69 CHANNEL SLOPE = 0.0469
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
CHANNEL FLOW THRU SUBAREA(CFS) = 873.05
FLOW VELOCITY(FEET/SEC.) = 13.60 FLOW DEPTH(FEET) = 4.63
TRAVEL TIME(MIN.) = 0.15 Tc(MIN.) = 19.63
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13685.00 = 38984.01 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	19.63	1.122	0.50( 0.49)	0.99	1133.8	21000.00
2	865.80	22.93	1.026	0.50( 0.49)	0.99	1312.0	20810.00
3	863.12	23.52	1.009	0.50( 0.49)	0.99	1348.7	20900.00
4	840.65	27.13	0.927	0.50( 0.49)	0.99	1556.9	20800.00
5	819.02	29.88	0.873	0.50( 0.49)	0.99	1701.2	20700.00
6	730.28	39.91	0.744	0.50( 0.49)	0.99	2224.5	20600.00
7	676.78	46.37	0.690	0.50( 0.50)	0.99	2526.5	20500.00
8	628.43	50.07	0.660	0.50( 0.49)	0.99	2636.6	20400.00
9	618.60	50.69	0.656	0.50( 0.49)	0.99	2650.5	20300.00
10	558.93	54.26	0.634	0.50( 0.49)	0.99	2719.2	20200.00
11	555.67	54.45	0.633	0.50( 0.49)	0.99	2723.5	20210.00
12	510.75	57.18	0.616	0.50( 0.49)	0.99	2777.9	20100.00
13	439.02	63.03	0.588	0.50( 0.49)	0.99	2887.3	13600.00
14	113.35	133.08	0.420	0.50( 0.49)	0.98	3977.7	13510.00
15	59.39	161.67	0.386	0.50( 0.49)	0.97	4059.3	13500.00

NEW PEAK FLOW DATA ARE:

```

PEAK FLOW RATE(CFS) = 873.05 Tc(MIN.) = 19.63
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1133.81

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FLOW PROCESS FROM NODE 13685.00 TO NODE 13410.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 194.24 DOWNSTREAM(FEET) = 178.72
CHANNEL LENGTH THRU SUBAREA(FEET) = 1843.57 CHANNEL SLOPE = 0.0084
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00
* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.998

```

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	8.39	0.50	1.000	-

```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 874.93
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.14
AVERAGE FLOW DEPTH(FEET) = 6.39 TRAVEL TIME(MIN.) = 4.30
Tc(MIN.) = 23.93
SUBAREA AREA(ACRES) = 8.39 SUBAREA RUNOFF(CFS) = 3.76
EFFECTIVE AREA(ACRES) = 1142.20 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99
TOTAL AREA(ACRES) = 4067.7 PEAK FLOW RATE(CFS) = 873.05
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

```

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

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DEPTH(FEET) = 6.39 FLOW VELOCITY(FEET/SEC.) = 7.13
LONGEST FLOWPATH FROM NODE 13500.00 TO NODE 13410.00 = 40827.58 FEET.

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	873.05	23.93	0.998	0.50( 0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.925	0.50( 0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.913	0.50( 0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.852	0.50( 0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.817	0.50( 0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.706	0.50( 0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.654	0.50( 0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.631	0.50( 0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.627	0.50( 0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.605	0.50( 0.49)	0.99	2727.6	20200.00
11	555.67	59.27	0.603	0.50( 0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.592	0.50( 0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.571	0.50( 0.49)	0.99	2895.7	13600.00
14	113.35	140.26	0.411	0.50( 0.49)	0.98	3986.0	13510.00
15	59.39	170.09	0.376	0.50( 0.49)	0.97	4067.7	13500.00

NEW PEAK FLOW DATA ARE:

```

PEAK FLOW RATE(CFS) = 873.05 Tc(MIN.) = 23.93
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.99 EFFECTIVE AREA (ACRES) = 1142.20

```

END OF STUDY SUMMARY:

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TOTAL AREA(ACRES) = 4067.7 TC(MIN.) = 23.93
EFFECTIVE AREA(ACRES) = 1142.20 AREA-AVERAGED Fm(INCH/HR) = 0.49
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.989
PEAK FLOW RATE(CFS) = 873.05

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\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
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1	873.05	23.93	0.998	0.50	( 0.49)	0.99	1142.2	21000.00
2	865.80	27.24	0.925	0.50	( 0.49)	0.99	1320.4	20810.00
3	863.12	27.83	0.913	0.50	( 0.49)	0.99	1357.1	20900.00
4	840.65	31.47	0.852	0.50	( 0.49)	0.99	1565.3	20800.00
5	819.02	34.25	0.817	0.50	( 0.49)	0.99	1709.6	20700.00
6	730.28	44.42	0.706	0.50	( 0.49)	0.99	2232.9	20600.00
7	676.78	50.96	0.654	0.50	( 0.50)	0.99	2534.9	20500.00
8	628.43	54.75	0.631	0.50	( 0.49)	0.99	2645.0	20400.00
9	618.60	55.38	0.627	0.50	( 0.49)	0.99	2658.9	20300.00
10	558.93	59.07	0.605	0.50	( 0.49)	0.99	2727.6	20200.00
11	555.67	59.27	0.603	0.50	( 0.49)	0.99	2731.8	20210.00
12	510.75	62.10	0.592	0.50	( 0.49)	0.99	2786.3	20100.00
13	439.02	68.14	0.571	0.50	( 0.49)	0.99	2895.7	13600.00
14	113.35	140.26	0.411	0.50	( 0.49)	0.98	3986.0	13510.00
15	59.39	170.09	0.376	0.50	( 0.49)	0.97	4067.7	13500.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Analysis prepared by:

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Santa Ana, CA  
92707

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FILE NAME: S37.DAT  
TIME/DATE OF STUDY: 07:25 07/16/2018  
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--\*TIME-OF-CONCENTRATION MODEL\*--  
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FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<  
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PEAK FLOWRATE TABLE FILE NAME: S34.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14258.29	24.23	0.50 ( 0.49)	0.98	5947.5	50800.00
2	14069.69	34.60	0.50 ( 0.49)	0.98	9817.5	20700.00
3	13914.44	41.35	0.50 ( 0.49)	0.98	12439.9	50300.00
4	13108.08	55.10	0.50 ( 0.49)	0.98	18483.8	20400.00
5	12542.75	62.46	0.50 ( 0.49)	0.97	21399.5	20100.00
6	11686.64	76.36	0.50 ( 0.48)	0.97	26503.3	11801.00
7	11094.95	87.96	0.50 ( 0.48)	0.97	30504.8	11500.00
8	10449.06	100.15	0.50 ( 0.48)	0.97	35173.6	11000.00
9	9754.27	114.87	0.50 ( 0.49)	0.97	41978.8	13000.00
10	8668.71	132.28	0.50 ( 0.49)	0.97	49224.7	11130.00
11	8153.47	140.65	0.50 ( 0.49)	0.97	51920.6	13510.00
12	6845.93	160.62	0.50 ( 0.49)	0.98	57612.0	12400.00
13	6119.41	170.52	0.50 ( 0.49)	0.98	59559.3	13500.00
14	5365.29	182.15	0.50 ( 0.49)	0.98	61224.9	12111.00
15	4433.70	198.67	0.50 ( 0.49)	0.98	63151.9	12261.00
16	3961.96	208.50	0.50 ( 0.49)	0.98	63963.7	10200.00
17	3394.89	224.53	0.50 ( 0.49)	0.98	65201.0	10300.00
18	3162.32	231.67	0.50 ( 0.49)	0.98	65552.1	12010.00
19	2678.62	252.99	0.50 ( 0.49)	0.98	65881.4	12000.00
20	1679.33	324.08	0.50 ( 0.49)	0.98	66551.6	10100.00

TOTAL AREA (ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13700.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 3 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14258.29	24.23	0.50 ( 0.49)	0.98	5947.5	50800.00
2	14069.69	34.60	0.50 ( 0.49)	0.98	9817.5	20700.00
3	13914.44	41.35	0.50 ( 0.49)	0.98	12439.9	50300.00
4	13108.08	55.10	0.50 ( 0.49)	0.98	18483.8	20400.00
5	12542.75	62.46	0.50 ( 0.49)	0.97	21399.5	20100.00
6	11686.64	76.36	0.50 ( 0.48)	0.97	26503.3	11801.00
7	11094.95	87.96	0.50 ( 0.48)	0.97	30504.8	11500.00
8	10449.06	100.15	0.50 ( 0.48)	0.97	35173.6	11000.00
9	9754.27	114.87	0.50 ( 0.49)	0.97	41978.8	13000.00
10	8668.71	132.28	0.50 ( 0.49)	0.97	49224.7	11130.00
11	8153.47	140.65	0.50 ( 0.49)	0.97	51920.6	13510.00
12	6845.93	160.62	0.50 ( 0.49)	0.98	57612.0	12400.00
13	6119.41	170.52	0.50 ( 0.49)	0.98	59559.3	13500.00
14	5365.29	182.15	0.50 ( 0.49)	0.98	61224.9	12111.00
15	4433.70	198.67	0.50 ( 0.49)	0.98	63151.9	12261.00
16	3961.96	208.50	0.50 ( 0.49)	0.98	63963.7	10200.00
17	3394.89	224.53	0.50 ( 0.49)	0.98	65201.0	10300.00
18	3162.32	231.67	0.50 ( 0.49)	0.98	65552.1	12010.00

19 2678.62 252.99 0.50( 0.49) 0.98 65881.4 12000.00  
20 1679.33 324.08 0.50( 0.49) 0.98 66551.6 10100.00  
TOTAL AREA(ACRES) = 66551.6

\*\*\*\*\*

FLOW PROCESS FROM NODE 13700.00 TO NODE 13701.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 170.00 DOWNSTREAM(FEET) = 167.50  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1699.11 CHANNEL SLOPE = 0.0015  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 14258.29  
FLOW VELOCITY(FEET/SEC.) = 11.88 FLOW DEPTH(FEET) = 20.00  
TRAVEL TIME(MIN.) = 2.38 Tc(MIN.) = 26.61  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14258.29	26.61	0.935	0.50( 0.49)	0.98	5947.5	50800.00
2	14069.69	37.01	0.780	0.50( 0.49)	0.98	9817.5	20700.00
3	13914.44	43.79	0.711	0.50( 0.49)	0.98	12439.9	50300.00
4	13108.08	57.69	0.612	0.50( 0.49)	0.98	18483.8	20400.00
5	12542.75	65.16	0.580	0.50( 0.49)	0.97	21399.5	20100.00
6	11686.64	79.27	0.531	0.50( 0.48)	0.97	26503.3	11801.00
7	11094.95	91.02	0.492	0.50( 0.48)	0.97	30504.8	11500.00
8	10449.06	103.41	0.467	0.50( 0.48)	0.97	35173.6	11000.00
9	9754.27	118.24	0.438	0.50( 0.49)	0.97	41978.8	13000.00
10	8668.71	135.74	0.415	0.50( 0.49)	0.97	49224.7	11130.00
11	8153.47	144.17	0.405	0.50( 0.49)	0.97	51920.6	13510.00
12	6845.93	164.29	0.382	0.50( 0.49)	0.98	57612.0	12400.00
13	6119.41	174.30	0.370	0.50( 0.49)	0.98	59559.3	13500.00
14	5365.29	186.06	0.360	0.50( 0.49)	0.98	61224.9	12111.00
15	4433.70	202.76	0.351	0.50( 0.49)	0.98	63151.9	12261.00
16	3961.96	212.72	0.345	0.50( 0.49)	0.98	63963.7	10200.00
17	3394.89	228.91	0.337	0.50( 0.49)	0.98	65201.0	10300.00
18	3162.32	236.13	0.333	0.50( 0.49)	0.98	65552.1	12010.00
19	2678.62	257.64	0.321	0.50( 0.49)	0.98	65881.4	12000.00
20	1679.33	329.30	0.283	0.50( 0.49)	0.98	66551.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14258.29 Tc(MIN.) = 26.61  
AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 5947.53

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

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FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 15.1

>>>>DEFINE MEMORY BANK # 3 <<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509102U.DNA  
MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	75.42	26.59	0.50( 0.44)	0.87	167.7	10200.00

TOTAL AREA(ACRES) = 167.7

\*\*\*\*\*

FLOW PROCESS FROM NODE 13701.00 TO NODE 13701.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14258.29	26.61	0.935	0.50( 0.49)	0.98	5947.5	50800.00
2	14069.69	37.01	0.780	0.50( 0.49)	0.98	9817.5	20700.00
3	13914.44	43.79	0.711	0.50( 0.49)	0.98	12439.9	50300.00
4	13108.08	57.69	0.612	0.50( 0.49)	0.98	18483.8	20400.00
5	12542.75	65.16	0.580	0.50( 0.49)	0.97	21399.5	20100.00
6	11686.64	79.27	0.531	0.50( 0.48)	0.97	26503.3	11801.00
7	11094.95	91.02	0.492	0.50( 0.48)	0.97	30504.8	11500.00
8	10449.06	103.41	0.467	0.50( 0.48)	0.97	35173.6	11000.00
9	9754.27	118.24	0.438	0.50( 0.49)	0.97	41978.8	13000.00
10	8668.71	135.74	0.415	0.50( 0.49)	0.97	49224.7	11130.00
11	8153.47	144.17	0.405	0.50( 0.49)	0.97	51920.6	13510.00
12	6845.93	164.29	0.382	0.50( 0.49)	0.98	57612.0	12400.00
13	6119.41	174.30	0.370	0.50( 0.49)	0.98	59559.3	13500.00
14	5365.29	186.06	0.360	0.50( 0.49)	0.98	61224.9	12111.00
15	4433.70	202.76	0.351	0.50( 0.49)	0.98	63151.9	12261.00
16	3961.96	212.72	0.345	0.50( 0.49)	0.98	63963.7	10200.00
17	3394.89	228.91	0.337	0.50( 0.49)	0.98	65201.0	10300.00
18	3162.32	236.13	0.333	0.50( 0.49)	0.98	65552.1	12010.00
19	2678.62	257.64	0.321	0.50( 0.49)	0.98	65881.4	12000.00
20	1679.33	329.30	0.283	0.50( 0.49)	0.98	66551.6	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	75.42	26.59	0.936	0.50( 0.44)	0.87	167.7	10200.00

LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 13701.00 = 9099.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	26.59	0.936	0.50( 0.49)	0.98	6108.8	10200.00
2	14333.63	26.61	0.935	0.50( 0.49)	0.98	6115.2	50800.00
3	14121.65	37.01	0.780	0.50( 0.49)	0.98	9985.1	20700.00
4	13955.93	43.79	0.711	0.50( 0.49)	0.98	12607.6	50300.00

5	13134.68	57.69	0.612	0.50	(0.49)	0.98	18651.4	20400.00
6	12564.49	65.16	0.580	0.50	(0.49)	0.97	21567.2	20100.00
7	11701.00	79.27	0.531	0.50	(0.48)	0.97	26670.9	11801.00
8	11104.46	91.02	0.492	0.50	(0.48)	0.97	30672.5	11500.00
9	10458.09	103.41	0.467	0.50	(0.48)	0.97	35341.3	11000.00
10	9762.73	118.24	0.438	0.50	(0.49)	0.97	42146.5	13000.00
11	8676.74	135.74	0.415	0.50	(0.49)	0.97	49392.4	11130.00
12	8161.30	144.17	0.405	0.50	(0.49)	0.97	52088.3	13510.00
13	6853.31	164.29	0.382	0.50	(0.49)	0.98	57779.6	12400.00
14	6126.56	174.30	0.370	0.50	(0.49)	0.98	59726.9	13500.00
15	5372.24	186.06	0.360	0.50	(0.49)	0.98	61392.6	12111.00
16	4440.48	202.76	0.351	0.50	(0.49)	0.98	63319.5	12261.00
17	3968.64	212.72	0.345	0.50	(0.49)	0.98	64131.3	10200.00
18	3401.40	228.91	0.337	0.50	(0.49)	0.98	65368.7	10300.00
19	3168.75	236.13	0.333	0.50	(0.49)	0.98	65719.8	12010.00
20	2684.83	257.64	0.321	0.50	(0.49)	0.98	66049.1	12000.00
21	1684.80	329.30	0.283	0.50	(0.49)	0.98	66719.3	10100.00

TOTAL AREA (ACRES) = 66719.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 14333.71 Tc (MIN.) = 26.586  
EFFECTIVE AREA (ACRES) = 6108.76 AREA-AVERAGED Fm (INCH/HR) = 0.49  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA (ACRES) = 66719.3  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13701.00 = 126251.08 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13701.00 TO NODE 13720.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 167.50 DOWNSTREAM (FEET) = 165.51  
CHANNEL LENGTH THRU SUBAREA (FEET) = 192.72 CHANNEL SLOPE = 0.0103  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
CHANNEL FLOW THRU SUBAREA (CFS) = 14333.71  
FLOW VELOCITY (FEET/SEC.) = 19.24 FLOW DEPTH (FEET) = 15.76  
TRAVEL TIME (MIN.) = 0.17 Tc (MIN.) = 26.75  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13720.00 = 126443.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	26.75	0.932	0.50 (0.49)	0.98	6108.8	10200.00
2	14333.63	26.78	0.932	0.50 (0.49)	0.98	6115.2	50800.00
3	14121.65	37.18	0.778	0.50 (0.49)	0.98	9985.1	20700.00
4	13955.93	43.96	0.710	0.50 (0.49)	0.98	12607.6	50300.00
5	13134.68	57.86	0.611	0.50 (0.49)	0.98	18651.4	20400.00
6	12564.49	65.34	0.579	0.50 (0.49)	0.97	21567.2	20100.00
7	11701.00	79.45	0.531	0.50 (0.48)	0.97	26670.9	11801.00
8	11104.46	91.20	0.492	0.50 (0.48)	0.97	30672.5	11500.00
9	10458.09	103.59	0.467	0.50 (0.48)	0.97	35341.3	11000.00
10	9762.73	118.42	0.437	0.50 (0.49)	0.97	42146.5	13000.00
11	8676.74	135.93	0.415	0.50 (0.49)	0.97	49392.4	11130.00
12	8161.30	144.36	0.405	0.50 (0.49)	0.97	52088.3	13510.00
13	6853.31	164.49	0.381	0.50 (0.49)	0.98	57779.6	12400.00
14	6126.56	174.50	0.370	0.50 (0.49)	0.98	59726.9	13500.00

15	5372.24	186.27	0.360	0.50	(0.49)	0.98	61392.6	12111.00
16	4440.48	202.99	0.351	0.50	(0.49)	0.98	63319.5	12261.00
17	3968.64	212.95	0.345	0.50	(0.49)	0.98	64131.3	10200.00
18	3401.40	229.15	0.337	0.50	(0.49)	0.98	65368.7	10300.00
19	3168.75	236.37	0.333	0.50	(0.49)	0.98	65719.8	12010.00
20	2684.83	257.89	0.321	0.50	(0.49)	0.98	66049.1	12000.00
21	1684.80	329.59	0.282	0.50	(0.49)	0.98	66719.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 14333.71 Tc (MIN.) = 26.75  
AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA (ACRES) = 6108.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 165.51 DOWNSTREAM (FEET) = 161.63  
CHANNEL LENGTH THRU SUBAREA (FEET) = 2042.40 CHANNEL SLOPE = 0.0019  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY (NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA (CFS) = 14333.71  
FLOW VELOCITY (FEET/SEC.) = 11.94 FLOW DEPTH (FEET) = 20.00  
TRAVEL TIME (MIN.) = 2.85 Tc (MIN.) = 29.60  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	29.60	0.878	0.50 (0.49)	0.98	6108.8	10200.00
2	14333.63	29.63	0.877	0.50 (0.49)	0.98	6115.2	50800.00
3	14121.65	40.07	0.741	0.50 (0.49)	0.98	9985.1	20700.00
4	13955.93	46.88	0.686	0.50 (0.49)	0.98	12607.6	50300.00
5	13134.68	60.97	0.595	0.50 (0.49)	0.98	18651.4	20400.00
6	12564.49	68.59	0.568	0.50 (0.49)	0.97	21567.2	20100.00
7	11701.00	82.94	0.518	0.50 (0.48)	0.97	26670.9	11801.00
8	11104.46	94.75	0.484	0.50 (0.48)	0.97	30672.5	11500.00
9	10458.09	107.20	0.460	0.50 (0.48)	0.97	35341.3	11000.00
10	9762.73	122.09	0.432	0.50 (0.49)	0.97	42146.5	13000.00
11	8676.74	139.71	0.411	0.50 (0.49)	0.97	49392.4	11130.00
12	8161.30	148.20	0.401	0.50 (0.49)	0.97	52088.3	13510.00
13	6853.31	168.51	0.377	0.50 (0.49)	0.98	57779.6	12400.00
14	6126.56	178.63	0.365	0.50 (0.49)	0.98	59726.9	13500.00
15	5372.24	190.54	0.357	0.50 (0.49)	0.98	61392.6	12111.00
16	4440.48	207.46	0.348	0.50 (0.49)	0.98	63319.5	12261.00
17	3968.64	217.55	0.343	0.50 (0.49)	0.98	64131.3	10200.00
18	3401.40	233.94	0.334	0.50 (0.49)	0.98	65368.7	10300.00
19	3168.75	241.24	0.330	0.50 (0.49)	0.98	65719.8	12010.00
20	2684.83	262.96	0.318	0.50 (0.49)	0.98	66049.1	12000.00
21	1684.80	335.29	0.279	0.50 (0.49)	0.98	66719.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14333.71 Tc(MIN.) = 29.60  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 6108.76

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13720.00 TO NODE 13740.00 IS CODE = 12  
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>>>>CLEAR MEMORY BANK # 3 <<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 3 <<<<<<

PEAK FLOWRATE TABLE FILE NAME: 0509103U.DNA

MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	193.29	27.04	0.50( 0.47)	0.95	474.8	10300.00
TOTAL AREA(ACRES) =						474.8

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13740.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	29.60	0.878	0.50( 0.49)	0.98	6108.8	10200.00
2	14333.63	29.63	0.877	0.50( 0.49)	0.98	6115.2	50800.00
3	14121.65	40.07	0.741	0.50( 0.49)	0.98	9985.1	20700.00
4	13955.93	46.88	0.686	0.50( 0.49)	0.98	12607.6	50300.00
5	13134.68	60.97	0.595	0.50( 0.49)	0.98	18651.4	20400.00
6	12564.49	68.59	0.568	0.50( 0.49)	0.97	21567.2	20100.00
7	11701.00	82.94	0.518	0.50( 0.48)	0.97	26670.9	11801.00
8	11104.46	94.75	0.484	0.50( 0.48)	0.97	30672.5	11500.00
9	10458.09	107.20	0.460	0.50( 0.48)	0.97	35341.3	11000.00
10	9762.73	122.09	0.432	0.50( 0.49)	0.97	42146.5	13000.00
11	8676.74	139.71	0.411	0.50( 0.49)	0.97	49392.4	11130.00
12	8161.30	148.20	0.401	0.50( 0.49)	0.97	52088.3	13510.00
13	6853.31	168.51	0.377	0.50( 0.49)	0.98	57779.6	12400.00
14	6126.56	178.63	0.365	0.50( 0.49)	0.98	59726.9	13500.00
15	5372.24	190.54	0.357	0.50( 0.49)	0.98	61392.6	12111.00
16	4440.48	207.46	0.348	0.50( 0.49)	0.98	63319.5	12261.00
17	3968.64	217.55	0.343	0.50( 0.49)	0.98	64131.3	10200.00
18	3401.40	233.94	0.334	0.50( 0.49)	0.98	65368.7	10300.00
19	3168.75	241.24	0.330	0.50( 0.49)	0.98	65719.8	12010.00
20	2684.83	262.96	0.318	0.50( 0.49)	0.98	66049.1	12000.00
21	1684.80	335.29	0.279	0.50( 0.49)	0.98	66719.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14333.71	29.60	0.878	0.50( 0.49)	0.98	6108.8	10200.00
2	14333.63	29.63	0.877	0.50( 0.49)	0.98	6115.2	50800.00
3	14121.65	40.07	0.741	0.50( 0.49)	0.98	9985.1	20700.00

1 193.29 27.04 0.927 0.50( 0.47) 0.95 474.8 10300.00  
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 13740.00 = 8072.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14527.00	27.04	0.927	0.50( 0.49)	0.98	6054.9	10300.00
2	14505.97	29.60	0.878	0.50( 0.49)	0.98	6583.5	10200.00
3	14505.65	29.63	0.877	0.50( 0.49)	0.98	6590.0	50800.00
4	14235.66	40.07	0.741	0.50( 0.49)	0.98	10459.9	20700.00
5	14046.05	46.88	0.686	0.50( 0.49)	0.98	13082.3	50300.00
6	13185.92	60.97	0.595	0.50( 0.49)	0.97	19126.2	20400.00
7	12604.43	68.59	0.568	0.50( 0.49)	0.97	22041.9	20100.00
8	11719.67	82.94	0.518	0.50( 0.48)	0.97	27145.7	11801.00
9	11114.98	94.75	0.484	0.50( 0.48)	0.97	31147.2	11500.00
10	10468.07	107.20	0.460	0.50( 0.48)	0.97	35816.1	11000.00
11	9772.10	122.09	0.432	0.50( 0.49)	0.97	42621.3	13000.00
12	8685.66	139.71	0.411	0.50( 0.49)	0.97	49867.1	11130.00
13	8170.00	148.20	0.401	0.50( 0.49)	0.97	52563.0	13510.00
14	6861.48	168.51	0.377	0.50( 0.49)	0.98	58254.4	12400.00
15	6134.47	178.63	0.365	0.50( 0.49)	0.98	60201.7	13500.00
16	5380.00	190.54	0.357	0.50( 0.49)	0.98	61867.3	12111.00
17	4448.04	207.46	0.348	0.50( 0.49)	0.98	63794.3	12261.00
18	3976.08	217.55	0.343	0.50( 0.49)	0.98	64606.1	10200.00
19	3408.65	233.94	0.334	0.50( 0.49)	0.98	65843.4	10300.00
20	3175.92	241.24	0.330	0.50( 0.49)	0.98	66194.5	12010.00
21	2691.74	262.96	0.318	0.50( 0.49)	0.98	66523.9	12000.00
22	1690.86	335.29	0.279	0.50( 0.49)	0.98	67194.1	10100.00
TOTAL AREA(ACRES) =						67194.1	

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14527.00 Tc(MIN.) = 27.041  
 EFFECTIVE AREA(ACRES) = 6054.90 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
 TOTAL AREA(ACRES) = 67194.1  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13740.00 = 128486.20 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13740.00 TO NODE 13741.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<

\*\*\*\*\*  
 ELEVATION DATA: UPSTREAM(FEET) = 161.63 DOWNSTREAM(FEET) = 141.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 389.20 CHANNEL SLOPE = 0.0530  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 14527.00  
 FLOW VELOCITY(FEET/SEC.) = 35.66 FLOW DEPTH(FEET) = 11.65  
 TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 27.22  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13741.00 = 128875.40 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14527.00	27.22	0.923	0.50( 0.49)	0.98	6054.9	10300.00
2	14505.97	29.78	0.874	0.50( 0.49)	0.98	6583.5	10200.00
3	14505.65	29.81	0.874	0.50( 0.49)	0.98	6590.0	50800.00

4	14235.66	40.25	0.740	0.50	( 0.49)	0.98	10459.9	20700.00
5	14046.05	47.07	0.684	0.50	( 0.49)	0.98	13082.3	50300.00
6	13185.92	61.16	0.594	0.50	( 0.49)	0.97	19126.2	20400.00
7	12604.43	68.78	0.568	0.50	( 0.49)	0.97	22041.9	20100.00
8	11719.67	83.13	0.518	0.50	( 0.48)	0.97	27145.7	11801.00
9	11114.98	94.95	0.484	0.50	( 0.48)	0.97	31147.2	11500.00
10	10468.07	107.39	0.459	0.50	( 0.48)	0.97	35816.1	11000.00
11	9772.10	122.29	0.431	0.50	( 0.49)	0.97	42621.3	13000.00
12	8685.66	139.92	0.410	0.50	( 0.49)	0.97	49867.1	11130.00
13	8170.00	148.41	0.400	0.50	( 0.49)	0.97	52563.0	13510.00
14	6861.48	168.73	0.376	0.50	( 0.49)	0.98	58254.4	12400.00
15	6134.47	178.86	0.364	0.50	( 0.49)	0.98	60201.7	13500.00
16	5380.00	190.77	0.357	0.50	( 0.49)	0.98	61867.3	12111.00
17	4448.04	207.71	0.348	0.50	( 0.49)	0.98	63794.3	12261.00
18	3976.08	217.80	0.343	0.50	( 0.49)	0.98	64606.1	10200.00
19	3408.65	234.20	0.334	0.50	( 0.49)	0.98	65843.4	10300.00
20	3175.92	241.51	0.330	0.50	( 0.49)	0.98	66194.5	12010.00
21	2691.74	263.24	0.318	0.50	( 0.49)	0.98	66523.9	12000.00
22	1690.86	335.60	0.279	0.50	( 0.49)	0.98	67194.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14527.00 Tc(MIN.) = 27.22  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 6054.90

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13741.00 TO NODE 13802.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 141.00 DOWNSTREAM(FEET) = 135.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1533.41 CHANNEL SLOPE = 0.0039  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 14527.00  
 FLOW VELOCITY(FEET/SEC.) = 13.42 FLOW DEPTH(FEET) = 18.99  
 TRAVEL TIME(MIN.) = 1.90 Tc(MIN.) = 29.13  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14527.00	29.13	0.887	0.50 ( 0.49)	0.98	6054.9	10300.00
2	14505.97	31.69	0.848	0.50 ( 0.49)	0.98	6583.5	10200.00
3	14505.65	31.72	0.848	0.50 ( 0.49)	0.98	6590.0	50800.00
4	14235.66	42.17	0.724	0.50 ( 0.49)	0.98	10459.9	20700.00
5	14046.05	48.99	0.668	0.50 ( 0.49)	0.98	13082.3	50300.00
6	13185.92	63.11	0.587	0.50 ( 0.49)	0.97	19126.2	20400.00
7	12604.43	70.75	0.561	0.50 ( 0.49)	0.97	22041.9	20100.00
8	11719.67	85.14	0.511	0.50 ( 0.48)	0.97	27145.7	11801.00
9	11114.98	96.98	0.480	0.50 ( 0.48)	0.97	31147.2	11500.00
10	10468.07	109.46	0.455	0.50 ( 0.48)	0.97	35816.1	11000.00
11	9772.10	124.40	0.429	0.50 ( 0.49)	0.97	42621.3	13000.00
12	8685.66	142.09	0.408	0.50 ( 0.49)	0.97	49867.1	11130.00
13	8170.00	150.61	0.398	0.50 ( 0.49)	0.97	52563.0	13510.00
14	6861.48	171.03	0.374	0.50 ( 0.49)	0.98	58254.4	12400.00
15	6134.47	181.22	0.362	0.50 ( 0.49)	0.98	60201.7	13500.00
16	5380.00	193.21	0.356	0.50 ( 0.49)	0.98	61867.3	12111.00

17	4448.04	210.27	0.347	0.50	( 0.49)	0.98	63794.3	12261.00
18	3976.08	220.43	0.341	0.50	( 0.49)	0.98	64606.1	10200.00
19	3408.65	236.93	0.332	0.50	( 0.49)	0.98	65843.4	10300.00
20	3175.92	244.29	0.328	0.50	( 0.49)	0.98	66194.5	12010.00
21	2691.74	266.14	0.317	0.50	( 0.49)	0.98	66523.9	12000.00
22	1690.86	338.86	0.277	0.50	( 0.49)	0.98	67194.1	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14527.00 Tc(MIN.) = 29.13  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.98 EFFECTIVE AREA(ACRES) = 6054.90

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 15.1  
 -----

>>>>DEFINE MEMORY BANK # 3 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: 0509104U.DNA  
 MEMORY BANK # 3 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.67	37.76	0.50 ( 0.47)	0.94	599.8	10400.00
TOTAL AREA(ACRES) =			599.8			

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13802.00 IS CODE = 11  
 -----

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14527.00	29.13	0.887	0.50 ( 0.49)	0.98	6054.9	10300.00
2	14505.97	31.69	0.848	0.50 ( 0.49)	0.98	6583.5	10200.00
3	14505.65	31.72	0.848	0.50 ( 0.49)	0.98	6590.0	50800.00
4	14235.66	42.17	0.724	0.50 ( 0.49)	0.98	10459.9	20700.00
5	14046.05	48.99	0.668	0.50 ( 0.49)	0.98	13082.3	50300.00
6	13185.92	63.11	0.587	0.50 ( 0.49)	0.97	19126.2	20400.00
7	12604.43	70.75	0.561	0.50 ( 0.49)	0.97	22041.9	20100.00
8	11719.67	85.14	0.511	0.50 ( 0.48)	0.97	27145.7	11801.00
9	11114.98	96.98	0.480	0.50 ( 0.48)	0.97	31147.2	11500.00
10	10468.07	109.46	0.455	0.50 ( 0.48)	0.97	35816.1	11000.00
11	9772.10	124.40	0.429	0.50 ( 0.49)	0.97	42621.3	13000.00
12	8685.66	142.09	0.408	0.50 ( 0.49)	0.97	49867.1	11130.00
13	8170.00	150.61	0.398	0.50 ( 0.49)	0.97	52563.0	13510.00
14	6861.48	171.03	0.374	0.50 ( 0.49)	0.98	58254.4	12400.00
15	6134.47	181.22	0.362	0.50 ( 0.49)	0.98	60201.7	13500.00
16	5380.00	193.21	0.356	0.50 ( 0.49)	0.98	61867.3	12111.00
17	4448.04	210.27	0.347	0.50 ( 0.49)	0.98	63794.3	12261.00
18	3976.08	220.43	0.341	0.50 ( 0.49)	0.98	64606.1	10200.00
19	3408.65	236.93	0.332	0.50 ( 0.49)	0.98	65843.4	10300.00
20	3175.92	244.29	0.328	0.50 ( 0.49)	0.98	66194.5	12010.00

21 2691.74 266.14 0.317 0.50( 0.49) 0.98 66523.9 12000.00  
 22 1690.86 338.86 0.277 0.50( 0.49) 0.98 67194.1 10100.00  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\* MEMORY BANK # 3 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	162.67	37.76	0.771	0.50( 0.47)	0.94	599.8	10400.00

LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 13802.00 = 12273.00 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	29.13	0.887	0.50( 0.49)	0.97	6517.6	10300.00
2	14668.65	31.69	0.848	0.50( 0.49)	0.97	7086.9	10200.00
3	14668.33	31.72	0.848	0.50( 0.49)	0.97	7093.8	50800.00
4	14512.33	37.76	0.771	0.50( 0.49)	0.97	9425.7	10400.00
5	14373.22	42.17	0.724	0.50( 0.49)	0.98	11059.7	20700.00
6	14153.42	48.99	0.668	0.50( 0.49)	0.98	13682.1	50300.00
7	13249.51	63.11	0.587	0.50( 0.49)	0.97	19726.0	20400.00
8	12653.72	70.75	0.561	0.50( 0.49)	0.97	22641.7	20100.00
9	11742.01	85.14	0.511	0.50( 0.48)	0.97	27745.5	11801.00
10	11130.91	96.98	0.480	0.50( 0.48)	0.97	31747.0	11500.00
11	10483.17	109.46	0.455	0.50( 0.48)	0.97	36415.8	11000.00
12	9786.33	124.40	0.429	0.50( 0.49)	0.97	43221.0	13000.00
13	8699.19	142.09	0.408	0.50( 0.49)	0.97	50466.9	11130.00
14	8183.20	150.61	0.398	0.50( 0.49)	0.97	53162.8	13510.00
15	6873.88	171.03	0.374	0.50( 0.49)	0.98	58854.2	12400.00
16	6146.50	181.22	0.362	0.50( 0.49)	0.98	60801.5	13500.00
17	5391.81	193.21	0.356	0.50( 0.49)	0.98	62467.1	12111.00
18	4459.54	210.27	0.347	0.50( 0.49)	0.98	64394.1	12261.00
19	3987.40	220.43	0.341	0.50( 0.49)	0.98	65205.9	10200.00
20	3419.68	236.93	0.332	0.50( 0.49)	0.98	66443.2	10300.00
21	3186.81	244.29	0.328	0.50( 0.49)	0.98	66794.3	12010.00
22	2702.24	266.14	0.317	0.50( 0.49)	0.98	67123.6	12000.00
23	1700.06	338.86	0.277	0.50( 0.49)	0.98	67793.9	10100.00

TOTAL AREA (ACRES) = 67793.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14689.68 Tc(MIN.) = 29.127  
 EFFECTIVE AREA(ACRES) = 6517.59 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67793.9  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13802.00 = 130408.80 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 135.00 DOWNSTREAM(FEET) = 133.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 207.23 CHANNEL SLOPE = 0.0097  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 14689.68  
 FLOW VELOCITY(FEET/SEC.) = 18.87 FLOW DEPTH(FEET) = 16.11  
 TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 29.31

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13803.00 = 130616.03 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	29.31	0.883	0.50( 0.49)	0.97	6517.6	10300.00
2	14668.65	31.87	0.846	0.50( 0.49)	0.97	7086.9	10200.00
3	14668.33	31.90	0.846	0.50( 0.49)	0.97	7093.8	50800.00
4	14512.33	37.94	0.768	0.50( 0.49)	0.97	9425.7	10400.00
5	14373.22	42.35	0.723	0.50( 0.49)	0.98	11059.7	20700.00
6	14153.42	49.17	0.667	0.50( 0.49)	0.98	13682.1	50300.00
7	13249.51	63.30	0.587	0.50( 0.49)	0.97	19726.0	20400.00
8	12653.72	70.94	0.560	0.50( 0.49)	0.97	22641.7	20100.00
9	11742.01	85.33	0.510	0.50( 0.48)	0.97	27745.5	11801.00
10	11130.91	97.18	0.480	0.50( 0.48)	0.97	31747.0	11500.00
11	10483.17	109.66	0.455	0.50( 0.48)	0.97	36415.8	11000.00
12	9786.33	124.60	0.429	0.50( 0.49)	0.97	43221.0	13000.00
13	8699.19	142.30	0.408	0.50( 0.49)	0.97	50466.9	11130.00
14	8183.20	150.82	0.398	0.50( 0.49)	0.97	53162.8	13510.00
15	6873.88	171.25	0.373	0.50( 0.49)	0.98	58854.2	12400.00
16	6146.50	181.45	0.362	0.50( 0.49)	0.98	60801.5	13500.00
17	5391.81	193.45	0.356	0.50( 0.49)	0.98	62467.1	12111.00
18	4459.54	210.51	0.347	0.50( 0.49)	0.98	64394.1	12261.00
19	3987.40	220.69	0.341	0.50( 0.49)	0.98	65205.9	10200.00
20	3419.68	237.20	0.332	0.50( 0.49)	0.98	66443.2	10300.00
21	3186.81	244.56	0.328	0.50( 0.49)	0.98	66794.3	12010.00
22	2702.24	266.42	0.316	0.50( 0.49)	0.98	67123.6	12000.00
23	1700.06	339.18	0.277	0.50( 0.49)	0.98	67793.9	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14689.68 Tc(MIN.) = 29.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 6517.59

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13802.00 TO NODE 13803.00 IS CODE = 12  
 -----

>>>>CLEAR MEMORY BANK # 3 <<<<<

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 67793.9 TC(MIN.) = 29.31  
 EFFECTIVE AREA(ACRES) = 6517.59 AREA-AVERAGED Fm(INCH/HR) = 0.49  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.973  
 PEAK FLOW RATE(CFS) = 14689.68

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	29.31	0.883	0.50( 0.49)	0.97	6517.6	10300.00
2	14668.65	31.87	0.846	0.50( 0.49)	0.97	7086.9	10200.00
3	14668.33	31.90	0.846	0.50( 0.49)	0.97	7093.8	50800.00
4	14512.33	37.94	0.768	0.50( 0.49)	0.97	9425.7	10400.00
5	14373.22	42.35	0.723	0.50( 0.49)	0.98	11059.7	20700.00
6	14153.42	49.17	0.667	0.50( 0.49)	0.98	13682.1	50300.00
7	13249.51	63.30	0.587	0.50( 0.49)	0.97	19726.0	20400.00
8	12653.72	70.94	0.560	0.50( 0.49)	0.97	22641.7	20100.00
9	11742.01	85.33	0.510	0.50( 0.48)	0.97	27745.5	11801.00
10	11130.91	97.18	0.480	0.50( 0.48)	0.97	31747.0	11500.00

11	10483.17	109.66	0.455	0.50 ( 0.48)	0.97	36415.8	11000.00
12	9786.33	124.60	0.429	0.50 ( 0.49)	0.97	43221.0	13000.00
13	8699.19	142.30	0.408	0.50 ( 0.49)	0.97	50466.9	11130.00
14	8183.20	150.82	0.398	0.50 ( 0.49)	0.97	53162.8	13510.00
15	6873.88	171.25	0.373	0.50 ( 0.49)	0.98	58854.2	12400.00
16	6146.50	181.45	0.362	0.50 ( 0.49)	0.98	60801.5	13500.00
17	5391.81	193.45	0.356	0.50 ( 0.49)	0.98	62467.1	12111.00
18	4459.54	210.51	0.347	0.50 ( 0.49)	0.98	64394.1	12261.00
19	3987.40	220.69	0.341	0.50 ( 0.49)	0.98	65205.9	10200.00
20	3419.68	237.20	0.332	0.50 ( 0.49)	0.98	66443.2	10300.00
21	3186.81	244.56	0.328	0.50 ( 0.49)	0.98	66794.3	12010.00
22	2702.24	266.42	0.316	0.50 ( 0.49)	0.98	67123.6	12000.00
23	1700.06	339.18	0.277	0.50 ( 0.49)	0.98	67793.9	10100.00

=====  
=====  
END OF RATIONAL METHOD ANALYSIS



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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2013 Advanced Engineering Software (aes)  
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

Michael Baker International  
5 Hutton Centre Drive, Suite 500  
Santa Ana, CA  
92707

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FILE NAME: S38.DAT  
TIME/DATE OF STUDY: 07:25 07/16/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.589
- 2) 10.00; 1.732
- 3) 15.00; 1.292
- 4) 20.00; 1.105
- 5) 25.00; 0.965
- 6) 30.00; 0.869
- 7) 40.00; 0.741
- 8) 50.00; 0.659
- 9) 60.00; 0.597
- 10) 90.00; 0.493
- 11) 120.00; 0.433
- 12) 180.00; 0.362
- 13) 360.00; 0.265
- 14) 1200.00; 0.115

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 15.1

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>>>>DEFINE MEMORY BANK # 1 <<<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: S37.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	29.31	0.50 ( 0.49)	0.97	6517.6	10300.00
2	14512.33	37.94	0.50 ( 0.49)	0.97	9425.7	10400.00
3	14153.42	49.17	0.50 ( 0.49)	0.98	13682.1	50300.00
4	13249.51	63.30	0.50 ( 0.49)	0.97	19726.0	20400.00
5	12653.72	70.94	0.50 ( 0.49)	0.97	22641.7	20100.00
6	11742.01	85.33	0.50 ( 0.48)	0.97	27745.5	11801.00
7	11130.91	97.18	0.50 ( 0.48)	0.97	31747.0	11500.00
8	10483.17	109.66	0.50 ( 0.48)	0.97	36415.8	11000.00
9	9786.33	124.60	0.50 ( 0.49)	0.97	43221.0	13000.00
10	8699.19	142.30	0.50 ( 0.49)	0.97	50466.9	11130.00
11	8183.20	150.82	0.50 ( 0.49)	0.97	53162.8	13510.00
12	6873.88	171.25	0.50 ( 0.49)	0.98	58854.2	12400.00
13	6146.50	181.45	0.50 ( 0.49)	0.98	60801.5	13500.00
14	5391.81	193.45	0.50 ( 0.49)	0.98	62467.1	12111.00
15	4459.54	210.51	0.50 ( 0.49)	0.98	64394.1	12261.00
16	3987.40	220.69	0.50 ( 0.49)	0.98	65205.9	10200.00
17	3419.68	237.20	0.50 ( 0.49)	0.98	66443.2	10300.00
18	3186.81	244.56	0.50 ( 0.49)	0.98	66794.3	12010.00
19	2702.24	266.42	0.50 ( 0.49)	0.98	67123.6	12000.00
20	1700.06	339.18	0.50 ( 0.49)	0.98	67793.9	10100.00

TOTAL AREA (ACRES) = 67793.9

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FLOW PROCESS FROM NODE 13803.00 TO NODE 13803.00 IS CODE = 14.0

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>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<<  
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MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	29.31	0.50 ( 0.49)	0.97	6517.6	10300.00
2	14512.33	37.94	0.50 ( 0.49)	0.97	9425.7	10400.00
3	14153.42	49.17	0.50 ( 0.49)	0.98	13682.1	50300.00
4	13249.51	63.30	0.50 ( 0.49)	0.97	19726.0	20400.00
5	12653.72	70.94	0.50 ( 0.49)	0.97	22641.7	20100.00
6	11742.01	85.33	0.50 ( 0.48)	0.97	27745.5	11801.00
7	11130.91	97.18	0.50 ( 0.48)	0.97	31747.0	11500.00
8	10483.17	109.66	0.50 ( 0.48)	0.97	36415.8	11000.00
9	9786.33	124.60	0.50 ( 0.49)	0.97	43221.0	13000.00
10	8699.19	142.30	0.50 ( 0.49)	0.97	50466.9	11130.00
11	8183.20	150.82	0.50 ( 0.49)	0.97	53162.8	13510.00
12	6873.88	171.25	0.50 ( 0.49)	0.98	58854.2	12400.00
13	6146.50	181.45	0.50 ( 0.49)	0.98	60801.5	13500.00
14	5391.81	193.45	0.50 ( 0.49)	0.98	62467.1	12111.00
15	4459.54	210.51	0.50 ( 0.49)	0.98	64394.1	12261.00
16	3987.40	220.69	0.50 ( 0.49)	0.98	65205.9	10200.00
17	3419.68	237.20	0.50 ( 0.49)	0.98	66443.2	10300.00
18	3186.81	244.56	0.50 ( 0.49)	0.98	66794.3	12010.00

19 2702.24 266.42 0.50( 0.49) 0.98 67123.6 12000.00  
 20 1700.06 339.18 0.50( 0.49) 0.98 67793.9 10100.00  
 TOTAL AREA (ACRES) = 67793.9

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 140.00 DOWNSTREAM(FEET) = 137.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 926.91 CHANNEL SLOPE = 0.0032  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.862

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	53.70	0.50	0.983	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.983

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14698.63

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.53

AVERAGE FLOW DEPTH(FEET) = 19.77 TRAVEL TIME(MIN.) = 1.23

Tc(MIN.) = 30.54

SUBAREA AREA(ACRES) = 53.70 SUBAREA RUNOFF(CFS) = 17.90

EFFECTIVE AREA(ACRES) = 6571.29 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97

TOTAL AREA(ACRES) = 67847.6 PEAK FLOW RATE(CFS) = 14689.68

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 19.76 FLOW VELOCITY(FEET/SEC.) = 12.53

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	30.54	0.862	0.50( 0.49)	0.97	6571.3	10300.00
2	14512.33	39.18	0.752	0.50( 0.49)	0.97	9479.4	10400.00
3	14153.42	50.42	0.656	0.50( 0.49)	0.98	13735.8	50300.00
4	13249.51	64.56	0.581	0.50( 0.49)	0.97	19779.7	20400.00
5	12653.72	72.22	0.555	0.50( 0.49)	0.97	22695.4	20100.00
6	11742.01	86.64	0.505	0.50( 0.48)	0.97	27799.2	11801.00
7	11130.91	98.50	0.476	0.50( 0.48)	0.97	31800.7	11500.00
8	10483.17	111.00	0.451	0.50( 0.48)	0.97	36469.5	11000.00
9	9786.33	125.96	0.426	0.50( 0.49)	0.97	43274.7	13000.00
10	8699.19	143.70	0.405	0.50( 0.49)	0.97	50520.6	11130.00
11	8183.20	152.25	0.395	0.50( 0.49)	0.97	53216.5	13510.00
12	6873.88	172.74	0.371	0.50( 0.49)	0.98	58907.9	12400.00
13	6146.50	182.98	0.360	0.50( 0.49)	0.98	60855.2	13500.00
14	5391.81	195.03	0.354	0.50( 0.49)	0.98	62520.8	12111.00
15	4459.54	212.17	0.345	0.50( 0.49)	0.98	64447.8	12261.00
16	3987.40	222.39	0.339	0.50( 0.49)	0.98	65259.6	10200.00
17	3419.68	238.97	0.330	0.50( 0.49)	0.98	66496.9	10300.00
18	3186.81	246.37	0.326	0.50( 0.49)	0.98	66848.0	12010.00
19	2702.24	268.31	0.314	0.50( 0.49)	0.98	67177.4	12000.00
20	1700.06	341.29	0.275	0.50( 0.49)	0.98	67847.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14689.68 Tc(MIN.) = 30.54

AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.97 EFFECTIVE AREA(ACRES) = 6571.29

\*\*\*\*\*

FLOW PROCESS FROM NODE 13803.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION(MIN.) = 30.54

RAINFALL INTENSITY(INCH/HR) = 0.86

AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.97

EFFECTIVE STREAM AREA(ACRES) = 6571.29

TOTAL STREAM AREA(ACRES) = 67847.55

PEAK FLOW RATE(CFS) AT CONFLUENCE = 14689.68

\*\*\*\*\*

FLOW PROCESS FROM NODE 13810.00 TO NODE 13811.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 648.54

ELEVATION DATA: UPSTREAM(FEET) = 756.46 DOWNSTREAM(FEET) = 586.02

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.293

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.530

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.58	0.50	1.000	0	12.29

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 5.17  
 TOTAL AREA(ACRES) = 5.58 PEAK FLOW RATE(CFS) = 5.17

\*\*\*\*\*

FLOW PROCESS FROM NODE 13811.00 TO NODE 13811.50 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 586.02 DOWNSTREAM(FEET) = 437.69  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 696.28 CHANNEL SLOPE = 0.2130  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.79	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.91  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.93  
 AVERAGE FLOW DEPTH(FEET) = 0.78 TRAVEL TIME(MIN.) = 1.96  
 Tc(MIN.) = 14.25  
 SUBAREA AREA(ACRES) = 14.79 SUBAREA RUNOFF(CFS) = 11.42  
 EFFECTIVE AREA(ACRES) = 20.37 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 15.73

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 0.90 FLOW VELOCITY(FEET/SEC.) = 6.51  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13811.50 = 1344.82 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13811.50 TO NODE 13812.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 437.69 DOWNSTREAM(FEET) = 402.36  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 681.04 CHANNEL SLOPE = 0.0519  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.217

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.41	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.68  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.13  
 AVERAGE FLOW DEPTH(FEET) = 1.32 TRAVEL TIME(MIN.) = 2.75  
 Tc(MIN.) = 17.00  
 SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 11.88  
 EFFECTIVE AREA(ACRES) = 38.78 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 38.8 PEAK FLOW RATE(CFS) = 25.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.39 FLOW VELOCITY(FEET/SEC.) = 4.30  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13812.00 = 2025.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13812.00 TO NODE 13813.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 402.36 DOWNSTREAM(FEET) = 259.72  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1282.56 CHANNEL SLOPE = 0.1112  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.091

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	18.41	0.50	1.000	-

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	27.87	0.50	0.858	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.858  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.34  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.12  
 AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 3.49  
 Tc(MIN.) = 20.49  
 SUBAREA AREA(ACRES) = 27.87 SUBAREA RUNOFF(CFS) = 16.61  
 EFFECTIVE AREA(ACRES) = 66.65 AREA-AVERAGED Fm(INCH/HR) = 0.47  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA(ACRES) = 66.7 PEAK FLOW RATE(CFS) = 37.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.41 FLOW VELOCITY(FEET/SEC.) = 6.27  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13813.00 = 3308.42 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 259.72 DOWNSTREAM(FEET) = 137.00  
 FLOW LENGTH(FEET) = 2412.88 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.5 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.98  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 37.24  
 PIPE TRAVEL TIME(MIN.) = 2.37 Tc(MIN.) = 22.86  
 LONGEST FLOWPATH FROM NODE 13810.00 TO NODE 13820.00 = 5721.30 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 22.86  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.025  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	82.54	0.50	0.570	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.570  
 SUBAREA AREA(ACRES) = 82.54 SUBAREA RUNOFF(CFS) = 54.96  
 EFFECTIVE AREA(ACRES) = 149.19 AREA-AVERAGED Fm(INCH/HR) = 0.37  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.74  
 TOTAL AREA(ACRES) = 149.2 PEAK FLOW RATE(CFS) = 88.22

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13813.00 TO NODE 13820.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 22.86  
 RAINFALL INTENSITY(INCH/HR) = 1.02  
 AREA-AVERAGED Fm(INCH/HR) = 0.37  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.74  
 EFFECTIVE STREAM AREA(ACRES) = 149.19  
 TOTAL STREAM AREA(ACRES) = 149.19  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 88.22

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14689.68	30.54	0.862	0.50 ( 0.49)	0.97	6571.3	10300.00
1	14512.33	39.18	0.752	0.50 ( 0.49)	0.97	9479.4	10400.00
1	14153.42	50.42	0.656	0.50 ( 0.49)	0.98	13735.8	50300.00
1	13249.51	64.56	0.581	0.50 ( 0.49)	0.97	19779.7	20400.00
1	12653.72	72.22	0.555	0.50 ( 0.49)	0.97	22695.4	20100.00
1	11742.01	86.64	0.505	0.50 ( 0.48)	0.97	27799.2	11801.00
1	11130.91	98.50	0.476	0.50 ( 0.48)	0.97	31800.7	11500.00
1	10483.17	111.00	0.451	0.50 ( 0.48)	0.97	36469.5	11000.00
1	9786.33	125.96	0.426	0.50 ( 0.49)	0.97	43274.7	13000.00
1	8699.19	143.70	0.405	0.50 ( 0.49)	0.97	50520.6	11130.00
1	8183.20	152.25	0.395	0.50 ( 0.49)	0.97	53216.5	13510.00
1	6873.88	172.74	0.371	0.50 ( 0.49)	0.98	58907.9	12400.00
1	6146.50	182.98	0.360	0.50 ( 0.49)	0.98	60855.2	13500.00
1	5391.81	195.03	0.354	0.50 ( 0.49)	0.98	62520.8	12111.00
1	4459.54	212.17	0.345	0.50 ( 0.49)	0.98	64447.8	12261.00
1	3987.40	222.39	0.339	0.50 ( 0.49)	0.98	65259.6	10200.00
1	3419.68	238.97	0.330	0.50 ( 0.49)	0.98	66496.9	10300.00
1	3186.81	246.37	0.326	0.50 ( 0.49)	0.98	66848.0	12010.00
1	2702.24	268.31	0.314	0.50 ( 0.49)	0.98	67177.4	12000.00
1	1700.06	341.29	0.275	0.50 ( 0.49)	0.98	67847.6	10100.00
2	88.22	22.86	1.025	0.50 ( 0.37)	0.74	149.2	13810.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14777.90	22.86	1.025	0.50 ( 0.48)	0.97	5067.3	13810.00
2	14756.02	30.54	0.862	0.50 ( 0.48)	0.97	6720.5	10300.00
3	14563.83	39.18	0.752	0.50 ( 0.49)	0.97	9628.6	10400.00
4	14192.15	50.42	0.656	0.50 ( 0.49)	0.97	13885.0	50300.00
5	13278.14	64.56	0.581	0.50 ( 0.49)	0.97	19928.9	20400.00
6	12678.79	72.22	0.555	0.50 ( 0.48)	0.97	22844.6	20100.00
7	11760.37	86.64	0.505	0.50 ( 0.48)	0.97	27948.4	11801.00
8	11147.81	98.50	0.476	0.50 ( 0.48)	0.97	31949.9	11500.00
9	10499.18	111.00	0.451	0.50 ( 0.48)	0.97	36618.7	11000.00
10	9801.45	125.96	0.426	0.50 ( 0.48)	0.97	43423.9	13000.00
11	8713.57	143.70	0.405	0.50 ( 0.49)	0.97	50669.8	11130.00
12	8197.22	152.25	0.395	0.50 ( 0.49)	0.97	53365.7	13510.00
13	6887.04	172.74	0.371	0.50 ( 0.49)	0.97	59057.1	12400.00
14	6159.29	182.98	0.360	0.50 ( 0.49)	0.97	61004.3	13500.00
15	5404.37	195.03	0.354	0.50 ( 0.49)	0.97	62670.0	12111.00
16	4471.78	212.17	0.345	0.50 ( 0.49)	0.98	64597.0	12261.00
17	3999.44	222.39	0.339	0.50 ( 0.49)	0.98	65408.8	10200.00

18	3431.40	238.97	0.330	0.50 ( 0.49)	0.98	66646.1	10300.00
19	3198.39	246.37	0.326	0.50 ( 0.49)	0.98	66997.2	12010.00
20	2713.41	268.31	0.314	0.50 ( 0.49)	0.98	67326.5	12000.00
21	1709.83	341.29	0.275	0.50 ( 0.49)	0.98	67996.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14777.90 Tc(MIN.) = 22.86  
 EFFECTIVE AREA(ACRES) = 5067.25 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
 TOTAL AREA(ACRES) = 67996.7  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13820.00 = 131542.94 FEET.

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FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 51

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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 137.00 DOWNSTREAM(FEET) = 133.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1261.34 CHANNEL SLOPE = 0.0032

CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.978

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	31.60	0.50	0.683	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14786.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.46

AVERAGE FLOW DEPTH(FEET) = 19.89 TRAVEL TIME(MIN.) = 1.69

Tc(MIN.) = 24.55

SUBAREA AREA(ACRES) = 31.60 SUBAREA RUNOFF(CFS) = 18.09

EFFECTIVE AREA(ACRES) = 5098.85 AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96

TOTAL AREA(ACRES) = 68028.3 PEAK FLOW RATE(CFS) = 14777.90

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 19.89 FLOW VELOCITY(FEET/SEC.) = 12.46

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14777.90	24.55	0.978	0.50 ( 0.48)	0.96	5098.9	13810.00
2	14756.02	32.23	0.840	0.50 ( 0.48)	0.97	6752.1	10300.00
3	14563.83	40.87	0.734	0.50 ( 0.49)	0.97	9660.2	10400.00
4	14192.15	52.12	0.646	0.50 ( 0.49)	0.97	13916.6	50300.00
5	13278.14	66.30	0.575	0.50 ( 0.49)	0.97	19960.5	20400.00
6	12678.79	73.97	0.549	0.50 ( 0.48)	0.97	22876.2	20100.00
7	11760.37	88.42	0.498	0.50 ( 0.48)	0.97	27980.0	11801.00
8	11147.81	100.31	0.472	0.50 ( 0.48)	0.97	31981.5	11500.00
9	10499.18	112.84	0.447	0.50 ( 0.48)	0.97	36650.3	11000.00
10	9801.45	127.83	0.424	0.50 ( 0.48)	0.97	43455.5	13000.00
11	8713.57	145.63	0.403	0.50 ( 0.49)	0.97	50701.4	11130.00
12	8197.22	154.21	0.393	0.50 ( 0.49)	0.97	53397.3	13510.00

13	6887.04	174.78	0.368	0.50	( 0.49)	0.97	59088.7	12400.00
14	6159.29	185.08	0.359	0.50	( 0.49)	0.97	61035.9	13500.00
15	5404.37	197.20	0.353	0.50	( 0.49)	0.97	62701.6	12111.00
16	4471.78	214.45	0.343	0.50	( 0.49)	0.97	64628.6	12261.00
17	3999.44	224.73	0.338	0.50	( 0.49)	0.98	65440.4	10200.00
18	3431.40	241.40	0.329	0.50	( 0.49)	0.98	66677.7	10300.00
19	3198.39	248.84	0.325	0.50	( 0.49)	0.98	67028.8	12010.00
20	2713.41	270.88	0.313	0.50	( 0.49)	0.98	67358.1	12000.00
21	1709.83	344.18	0.274	0.50	( 0.49)	0.98	68028.3	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14777.90 Tc(MIN.) = 24.55  
 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 5098.85

\*\*\*\*\*

FLOW PROCESS FROM NODE 13820.00 TO NODE 13840.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 24.55  
 RAINFALL INTENSITY(INCH/HR) = 0.98  
 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.96  
 EFFECTIVE STREAM AREA(ACRES) = 5098.85  
 TOTAL STREAM AREA(ACRES) = 68028.34  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 14777.90

\*\*\*\*\*

FLOW PROCESS FROM NODE 13830.00 TO NODE 13831.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 744.71  
 ELEVATION DATA: UPSTREAM(FEET) = 1100.95 DOWNSTREAM(FEET) = 959.21

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.858  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.393  
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	-	5.06	0.50	1.000	0	13.86

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 4.06  
 TOTAL AREA(ACRES) = 5.06 PEAK FLOW RATE(CFS) = 4.06

\*\*\*\*\*

FLOW PROCESS FROM NODE 13831.00 TO NODE 13832.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 959.21 DOWNSTREAM(FEET) = 832.83  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1076.71 CHANNEL SLOPE = 0.1174  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.202

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.57	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.43  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.07  
 AVERAGE FLOW DEPTH(FEET) = 0.97 TRAVEL TIME(MIN.) = 3.54  
 Tc(MIN.) = 17.39  
 SUBAREA AREA(ACRES) = 32.57 SUBAREA RUNOFF(CFS) = 20.58  
 EFFECTIVE AREA(ACRES) = 37.63 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 37.6 PEAK FLOW RATE(CFS) = 23.78

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.17 FLOW VELOCITY(FEET/SEC.) = 5.77  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13832.00 = 1821.42 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13832.00 TO NODE 13833.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 832.83 DOWNSTREAM(FEET) = 572.49  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1883.58 CHANNEL SLOPE = 0.1382  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.044  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.23	0.50	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.70  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.56  
 AVERAGE FLOW DEPTH(FEET) = 1.27 TRAVEL TIME(MIN.) = 4.79  
 Tc(MIN.) = 22.18  
 SUBAREA AREA(ACRES) = 32.23 SUBAREA RUNOFF(CFS) = 15.77  
 EFFECTIVE AREA(ACRES) = 69.86 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 69.9 PEAK FLOW RATE(CFS) = 34.19

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.31 FLOW VELOCITY(FEET/SEC.) = 6.67  
 LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13833.00 = 3705.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13833.00 TO NODE 13834.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 572.49 DOWNSTREAM(FEET) = 471.65  
CHANNEL LENGTH THRU SUBAREA(FEET) = 943.78 CHANNEL SLOPE = 0.1068  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.974

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 27.51 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.06  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.31  
AVERAGE FLOW DEPTH(FEET) = 1.45 TRAVEL TIME(MIN.) = 2.49  
Tc(MIN.) = 24.67  
SUBAREA AREA(ACRES) = 27.51 SUBAREA RUNOFF(CFS) = 11.73  
EFFECTIVE AREA(ACRES) = 97.37 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 97.4 PEAK FLOW RATE(CFS) = 41.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.48 FLOW VELOCITY(FEET/SEC.) = 6.36  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13834.00 = 4648.78 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13834.00 TO NODE 13835.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 471.65 DOWNSTREAM(FEET) = 347.06  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1647.45 CHANNEL SLOPE = 0.0756  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.885

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 94.21 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.90  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.09  
AVERAGE FLOW DEPTH(FEET) = 1.78 TRAVEL TIME(MIN.) = 4.51  
Tc(MIN.) = 29.18  
SUBAREA AREA(ACRES) = 94.21 SUBAREA RUNOFF(CFS) = 32.60  
EFFECTIVE AREA(ACRES) = 191.58 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 191.6 PEAK FLOW RATE(CFS) = 66.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.87 FLOW VELOCITY(FEET/SEC.) = 6.29  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13835.00 = 6296.23 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13835.00 TO NODE 13836.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 347.06 DOWNSTREAM(FEET) = 269.29  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1696.71 CHANNEL SLOPE = 0.0458  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.817

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 233.25 0.50 1.000 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 99.63  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.77  
AVERAGE FLOW DEPTH(FEET) = 2.40 TRAVEL TIME(MIN.) = 4.90  
Tc(MIN.) = 34.08  
SUBAREA AREA(ACRES) = 233.25 SUBAREA RUNOFF(CFS) = 66.45  
EFFECTIVE AREA(ACRES) = 424.83 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 424.8 PEAK FLOW RATE(CFS) = 121.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.58 FLOW VELOCITY(FEET/SEC.) = 6.05  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13836.00 = 7992.94 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13836.00 TO NODE 13837.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 269.29 DOWNSTREAM(FEET) = 191.87  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2529.21 CHANNEL SLOPE = 0.0306  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.725

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 134.70 0.50 0.880 -  
SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.880  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.33  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.39  
AVERAGE FLOW DEPTH(FEET) = 2.92 TRAVEL TIME(MIN.) = 7.82  
Tc(MIN.) = 41.90  
SUBAREA AREA(ACRES) = 134.70 SUBAREA RUNOFF(CFS) = 34.58  
EFFECTIVE AREA(ACRES) = 559.53 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97  
TOTAL AREA(ACRES) = 559.5 PEAK FLOW RATE(CFS) = 121.03  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.78 FLOW VELOCITY(FEET/SEC.) = 5.21  
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13837.00 = 10522.15 FEET.

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*****
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 31
-----
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 191.87 DOWNSTREAM(FEET) = 133.00
FLOW LENGTH( FEET) = 1151.02 MANNING'S N = 0.013
DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.4 INCHES
PIPE-FLOW VELOCITY( FEET/SEC.) = 22.71
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 121.03
PIPE TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 42.75
LONGEST FLOWPATH FROM NODE 13830.00 TO NODE 13840.00 = 11673.17 FEET.

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*****
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 81
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN.) = 42.75
* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.718
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 5.97 0.50 0.622 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622
SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 2.19
EFFECTIVE AREA(ACRES) = 565.50 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.97
TOTAL AREA(ACRES) = 565.5 PEAK FLOW RATE(CFS) = 121.03
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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*****
FLOW PROCESS FROM NODE 13837.00 TO NODE 13840.00 IS CODE = 1
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>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<
=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 42.75
RAINFALL INTENSITY(INCH/HR) = 0.72
AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.50
AREA-AVERAGED Ap = 0.97
EFFECTIVE STREAM AREA(ACRES) = 565.50
TOTAL STREAM AREA(ACRES) = 565.50
PEAK FLOW RATE(CFS) AT CONFLUENCE = 121.03

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** CONFLUENCE DATA **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 14777.90 24.55 0.978 0.50( 0.48) 0.96 5098.9 13810.00
1 14756.02 32.23 0.840 0.50( 0.48) 0.97 6752.1 10300.00
1 14563.83 40.87 0.734 0.50( 0.49) 0.97 9660.2 10400.00

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1 14192.15 52.12 0.646 0.50( 0.49) 0.97 13916.6 50300.00
1 13278.14 66.30 0.575 0.50( 0.49) 0.97 19960.5 20400.00
1 12678.79 73.97 0.549 0.50( 0.48) 0.97 22876.2 20100.00
1 11760.37 88.42 0.498 0.50( 0.48) 0.97 27980.0 11801.00
1 11147.81 100.31 0.472 0.50( 0.48) 0.97 31981.5 11500.00
1 10499.18 112.84 0.447 0.50( 0.48) 0.97 36650.3 11000.00
1 9801.45 127.83 0.424 0.50( 0.48) 0.97 43455.5 13000.00
1 8713.57 145.63 0.403 0.50( 0.49) 0.97 50701.4 11130.00
1 8197.22 154.21 0.393 0.50( 0.49) 0.97 53397.3 13510.00
1 6887.04 174.78 0.368 0.50( 0.49) 0.97 59088.7 12400.00
1 6159.29 185.08 0.359 0.50( 0.49) 0.97 61035.9 13500.00
1 5404.37 197.20 0.353 0.50( 0.49) 0.97 62701.6 12111.00
1 4471.78 214.45 0.343 0.50( 0.49) 0.97 64628.6 12261.00
1 3999.44 224.73 0.338 0.50( 0.49) 0.98 65440.4 10200.00
1 3431.40 241.40 0.329 0.50( 0.49) 0.98 66677.7 10300.00
1 3198.39 248.84 0.325 0.50( 0.49) 0.98 67028.8 12010.00
1 2713.41 270.88 0.313 0.50( 0.49) 0.98 67358.1 12000.00
1 1709.83 344.18 0.274 0.50( 0.49) 0.98 68028.3 10100.00
2 121.03 42.75 0.718 0.50( 0.48) 0.97 565.5 13830.00

```

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
CONFLUENCE FORMULA USED FOR 2 STREAMS.

```

** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 14898.93 24.55 0.978 0.50( 0.48) 0.96 5423.6 13810.00
2 14877.06 32.23 0.840 0.50( 0.48) 0.97 7178.5 10300.00
3 14684.87 40.87 0.734 0.50( 0.49) 0.97 10200.9 10400.00
4 14622.87 42.75 0.718 0.50( 0.49) 0.97 10935.7 13830.00
5 14275.71 52.12 0.646 0.50( 0.49) 0.97 14482.1 50300.00
6 13325.23 66.30 0.575 0.50( 0.49) 0.97 20526.0 20400.00
7 12712.15 73.97 0.549 0.50( 0.48) 0.97 23441.7 20100.00
8 11768.75 88.42 0.498 0.50( 0.48) 0.97 28545.5 11801.00
9 11155.75 100.31 0.472 0.50( 0.48) 0.97 32547.0 11500.00
10 10506.70 112.84 0.447 0.50( 0.48) 0.97 37215.8 11000.00
11 9808.57 127.83 0.424 0.50( 0.48) 0.97 44021.0 13000.00
12 8720.33 145.63 0.403 0.50( 0.49) 0.97 51266.9 11130.00
13 8203.82 154.21 0.393 0.50( 0.49) 0.97 53962.8 13510.00
14 6893.23 174.78 0.368 0.50( 0.49) 0.97 59654.2 12400.00
15 6165.33 185.08 0.359 0.50( 0.49) 0.97 61601.4 13500.00
16 5410.30 197.20 0.353 0.50( 0.49) 0.97 63267.1 12111.00
17 4477.55 214.45 0.343 0.50( 0.49) 0.97 65194.1 12261.00
18 4005.12 224.73 0.338 0.50( 0.49) 0.98 66005.9 10200.00
19 3436.93 241.40 0.329 0.50( 0.49) 0.98 67243.2 10300.00
20 3203.85 248.84 0.325 0.50( 0.49) 0.98 67594.3 12010.00
21 2718.67 270.88 0.313 0.50( 0.49) 0.98 67923.6 12000.00
22 1714.43 344.18 0.274 0.50( 0.49) 0.98 68593.8 10100.00

```

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14898.93 Tc(MIN.) = 24.55  
EFFECTIVE AREA(ACRES) = 5423.57 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 68593.8  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13840.00 = 132804.28 FEET.

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*****
FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 51

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 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 133.00 DOWNSTREAM(FEET) = 130.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 654.44 CHANNEL SLOPE = 0.0046  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.959  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 6.61 0.50 0.975 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.975  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14900.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.33  
 AVERAGE FLOW DEPTH(FEET) = 18.62 TRAVEL TIME(MIN.) = 0.76  
 Tc(MIN.) = 25.31  
 SUBAREA AREA(ACRES) = 6.61 SUBAREA RUNOFF(CFS) = 2.80  
 EFFECTIVE AREA(ACRES) = 5430.18 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA(ACRES) = 68600.5 PEAK FLOW RATE(CFS) = 14898.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 18.62 FLOW VELOCITY(FEET/SEC.) = 14.33  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14898.93	25.31	0.959	0.50( 0.48)	0.96	5430.2	13810.00
2	14877.06	32.99	0.831	0.50( 0.48)	0.97	7185.1	10300.00
3	14684.87	41.63	0.728	0.50( 0.49)	0.97	10207.5	10400.00
4	14622.87	43.51	0.712	0.50( 0.49)	0.97	10942.3	13830.00
5	14275.71	52.89	0.641	0.50( 0.49)	0.97	14488.7	50300.00
6	13325.23	67.08	0.572	0.50( 0.49)	0.97	20532.6	20400.00
7	12712.15	74.77	0.546	0.50( 0.48)	0.97	23448.3	20100.00
8	11768.75	89.23	0.496	0.50( 0.48)	0.97	28552.1	11801.00
9	11155.75	101.13	0.471	0.50( 0.48)	0.97	32553.6	11500.00
10	10506.70	113.67	0.446	0.50( 0.48)	0.97	37222.4	11000.00
11	9808.57	128.68	0.423	0.50( 0.48)	0.97	44027.6	13000.00
12	8720.33	146.50	0.402	0.50( 0.49)	0.97	51273.5	11130.00
13	8203.82	155.09	0.391	0.50( 0.49)	0.97	53969.4	13510.00
14	6893.23	175.70	0.367	0.50( 0.49)	0.97	59660.8	12400.00
15	6165.33	186.03	0.359	0.50( 0.49)	0.97	61608.1	13500.00
16	5410.30	198.18	0.352	0.50( 0.49)	0.97	63273.7	12111.00
17	4477.55	215.48	0.343	0.50( 0.49)	0.97	65200.7	12261.00
18	4005.12	225.79	0.337	0.50( 0.49)	0.98	66012.5	10200.00
19	3436.93	242.50	0.328	0.50( 0.49)	0.98	67249.8	10300.00
20	3203.85	249.96	0.324	0.50( 0.49)	0.98	67600.9	12010.00
21	2718.67	272.05	0.312	0.50( 0.49)	0.98	67930.2	12000.00
22	1714.43	345.49	0.273	0.50( 0.49)	0.98	68600.5	10100.00

NEW PEAK FLOW DATA ARE:  
 PEAK FLOW RATE(CFS) = 14898.93 Tc(MIN.) = 25.31  
 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 5430.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13840.00 TO NODE 13860.00 IS CODE = 1  
 -----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<  
 =====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
 TIME OF CONCENTRATION(MIN.) = 25.31  
 RAINFALL INTENSITY(INCH/HR) = 0.96  
 AREA-AVERAGED Fm(INCH/HR) = 0.48  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.96  
 EFFECTIVE STREAM AREA(ACRES) = 5430.18  
 TOTAL STREAM AREA(ACRES) = 68600.45  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 14898.93

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13850.00 TO NODE 13851.00 IS CODE = 21  
 -----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<  
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 617.57  
 ELEVATION DATA: UPSTREAM(FEET) = 646.95 DOWNSTREAM(FEET) = 490.10

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.544

SUBAREA Tc AND LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" - 4.95 0.50 1.000 0 12.14  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 SUBAREA RUNOFF(CFS) = 4.65  
 TOTAL AREA(ACRES) = 4.95 PEAK FLOW RATE(CFS) = 4.65

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13851.00 TO NODE 13851.50 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<  
 =====

ELEVATION DATA: UPSTREAM(FEET) = 490.10 DOWNSTREAM(FEET) = 440.98  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 351.14 CHANNEL SLOPE = 0.1399  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.060 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.427  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 4.02 0.50 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.41



AVERAGE FLOW DEPTH (FEET) = 0.69 TRAVEL TIME (MIN.) = 1.33  
Tc (MIN.) = 13.46  
SUBAREA AREA (ACRES) = 4.02 SUBAREA RUNOFF (CFS) = 3.35  
EFFECTIVE AREA (ACRES) = 8.97 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 9.0 PEAK FLOW RATE (CFS) = 7.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.74 FLOW VELOCITY (FEET/SEC.) = 4.59  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13851.50 = 968.71 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13851.50 TO NODE 13852.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 440.98 DOWNSTREAM (FEET) = 395.76  
CHANNEL LENGTH THRU SUBAREA (FEET) = 512.91 CHANNEL SLOPE = 0.0882  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.272  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 7.17 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 9.98  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.15  
AVERAGE FLOW DEPTH (FEET) = 0.90 TRAVEL TIME (MIN.) = 2.06  
Tc (MIN.) = 15.52  
SUBAREA AREA (ACRES) = 7.17 SUBAREA RUNOFF (CFS) = 4.98  
EFFECTIVE AREA (ACRES) = 16.14 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 16.1 PEAK FLOW RATE (CFS) = 11.22

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 0.94 FLOW VELOCITY (FEET/SEC.) = 4.27  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13852.00 = 1481.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13852.00 TO NODE 13853.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 395.76 DOWNSTREAM (FEET) = 354.94  
CHANNEL LENGTH THRU SUBAREA (FEET) = 443.69 CHANNEL SLOPE = 0.0920  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 6.76 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 13.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.56  
AVERAGE FLOW DEPTH (FEET) = 0.99 TRAVEL TIME (MIN.) = 1.62  
Tc (MIN.) = 17.15  
SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 4.33  
EFFECTIVE AREA (ACRES) = 22.90 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 22.9 PEAK FLOW RATE (CFS) = 14.66

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.03 FLOW VELOCITY (FEET/SEC.) = 4.65  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13853.00 = 1925.31 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13853.00 TO NODE 13854.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 354.94 DOWNSTREAM (FEET) = 263.57  
CHANNEL LENGTH THRU SUBAREA (FEET) = 962.09 CHANNEL SLOPE = 0.0950  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.096  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 18.16 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 19.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.07  
AVERAGE FLOW DEPTH (FEET) = 1.13 TRAVEL TIME (MIN.) = 3.16  
Tc (MIN.) = 20.31  
SUBAREA AREA (ACRES) = 18.16 SUBAREA RUNOFF (CFS) = 9.74  
EFFECTIVE AREA (ACRES) = 41.06 AREA-AVERAGED Fm (INCH/HR) = 0.50  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA (ACRES) = 41.1 PEAK FLOW RATE (CFS) = 22.03

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 1.19 FLOW VELOCITY (FEET/SEC.) = 5.21  
LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13854.00 = 2887.40 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13854.00 TO NODE 13855.00 IS CODE = 51

-----  
>>>> COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>> TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM (FEET) = 263.57 DOWNSTREAM (FEET) = 188.74  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1228.77 CHANNEL SLOPE = 0.0609  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.060 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.977  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 38.75 0.50 0.879 -

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.879  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.42  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.81  
 AVERAGE FLOW DEPTH(FEET) = 1.48 TRAVEL TIME(MIN.) = 4.26  
 Tc(MIN.) = 24.57  
 SUBAREA AREA(ACRES) = 38.75 SUBAREA RUNOFF(CFS) = 18.74  
 EFFECTIVE AREA(ACRES) = 79.81 AREA-AVERAGED Fm(INCH/HR) = 0.47  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA(ACRES) = 79.8 PEAK FLOW RATE(CFS) = 36.37

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.56 FLOW VELOCITY(FEET/SEC.) = 4.99  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13855.00 = 4116.17 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 188.74 DOWNSTREAM(FEET) = 130.00  
 FLOW LENGTH(FEET) = 2092.67 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 14.5 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.60  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 36.37  
 PIPE TRAVEL TIME(MIN.) = 2.57 Tc(MIN.) = 27.13  
 LONGEST FLOWPATH FROM NODE 13850.00 TO NODE 13860.00 = 6208.84 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN.) = 27.13  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.924  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.41	0.50	0.707	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.707  
 SUBAREA AREA(ACRES) = 43.41 SUBAREA RUNOFF(CFS) = 22.29  
 EFFECTIVE AREA(ACRES) = 123.22 AREA-AVERAGED Fm(INCH/HR) = 0.43  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.86  
 TOTAL AREA(ACRES) = 123.2 PEAK FLOW RATE(CFS) = 54.84

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13855.00 TO NODE 13860.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 27.13

RAINFALL INTENSITY(INCH/HR) = 0.92  
 AREA-AVERAGED Fm(INCH/HR) = 0.43  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.86  
 EFFECTIVE STREAM AREA(ACRES) = 123.22  
 TOTAL STREAM AREA(ACRES) = 123.22  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 54.84

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14898.93	25.31	0.959	0.50( 0.48)	0.96	5430.2	13810.00
1	14877.06	32.99	0.831	0.50( 0.48)	0.97	7185.1	10300.00
1	14684.87	41.63	0.728	0.50( 0.49)	0.97	10207.5	10400.00
1	14622.87	43.51	0.712	0.50( 0.49)	0.97	10942.3	13830.00
1	14275.71	52.89	0.641	0.50( 0.49)	0.97	14488.7	50300.00
1	13325.23	67.08	0.572	0.50( 0.49)	0.97	20532.6	20400.00
1	12712.15	74.77	0.546	0.50( 0.48)	0.97	23448.3	20100.00
1	11768.75	89.23	0.496	0.50( 0.48)	0.97	28552.1	11801.00
1	11155.75	101.13	0.471	0.50( 0.48)	0.97	32553.6	11500.00
1	10506.70	113.67	0.446	0.50( 0.48)	0.97	37222.4	11000.00
1	9808.57	128.68	0.423	0.50( 0.48)	0.97	44027.6	13000.00
1	8720.33	146.50	0.402	0.50( 0.49)	0.97	51273.5	11130.00
1	8203.82	155.09	0.391	0.50( 0.49)	0.97	53969.4	13510.00
1	6893.23	175.70	0.367	0.50( 0.49)	0.97	59660.8	12400.00
1	6165.33	186.03	0.359	0.50( 0.49)	0.97	61608.1	13500.00
1	5410.30	198.18	0.352	0.50( 0.49)	0.97	63273.7	12111.00
1	4477.55	215.48	0.343	0.50( 0.49)	0.97	65200.7	12261.00
1	4005.12	225.79	0.337	0.50( 0.49)	0.98	66012.5	10200.00
1	3436.93	242.50	0.328	0.50( 0.49)	0.98	67249.8	10300.00
1	3203.85	249.96	0.324	0.50( 0.49)	0.98	67600.9	12010.00
1	2718.67	272.05	0.312	0.50( 0.49)	0.98	67930.2	12000.00
1	1714.43	345.49	0.273	0.50( 0.49)	0.98	68600.5	10100.00
2	54.84	27.13	0.924	0.50( 0.43)	0.86	123.2	13850.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14953.71	25.31	0.959	0.50( 0.48)	0.96	5545.1	13810.00
2	14948.58	27.13	0.924	0.50( 0.48)	0.96	5970.2	13850.00
3	14921.55	32.99	0.831	0.50( 0.48)	0.97	7308.3	10300.00
4	14717.92	41.63	0.728	0.50( 0.48)	0.97	10330.7	10400.00
5	14654.22	43.51	0.712	0.50( 0.48)	0.97	11065.5	13830.00
6	14299.17	52.89	0.641	0.50( 0.49)	0.97	14611.9	50300.00
7	13341.08	67.08	0.572	0.50( 0.49)	0.97	20655.8	20400.00
8	12725.04	74.77	0.546	0.50( 0.48)	0.97	23571.5	20100.00
9	11776.51	89.23	0.496	0.50( 0.48)	0.97	28675.3	11801.00
10	11163.12	101.13	0.471	0.50( 0.48)	0.97	32676.8	11500.00
11	10513.68	113.67	0.446	0.50( 0.48)	0.97	37345.6	11000.00
12	9815.19	128.68	0.423	0.50( 0.48)	0.97	44150.9	13000.00
13	8726.63	146.50	0.402	0.50( 0.49)	0.97	51396.7	11130.00
14	8209.95	155.09	0.391	0.50( 0.49)	0.97	54092.6	13510.00
15	6898.98	175.70	0.367	0.50( 0.49)	0.97	59784.0	12400.00
16	6170.95	186.03	0.359	0.50( 0.49)	0.97	61731.3	13500.00
17	5415.82	198.18	0.352	0.50( 0.49)	0.97	63396.9	12111.00

18	4482.92	215.48	0.343	0.50	( 0.49)	0.97	65323.9	12261.00
19	4010.41	225.79	0.337	0.50	( 0.49)	0.97	66135.7	10200.00
20	3442.07	242.50	0.328	0.50	( 0.49)	0.98	67373.0	10300.00
21	3208.94	249.96	0.324	0.50	( 0.49)	0.98	67724.1	12010.00
22	2723.56	272.05	0.312	0.50	( 0.49)	0.98	68053.5	12000.00
23	1718.70	345.49	0.273	0.50	( 0.49)	0.98	68723.7	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 14953.71 Tc(MIN.) = 25.31  
EFFECTIVE AREA(ACRES) = 5545.12 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 68723.7  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13860.00 = 133458.72 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 130.00 DOWNSTREAM(FEET) = 120.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 610.77 CHANNEL SLOPE = 0.0154  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.950

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	4.89	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14954.70  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 22.62  
AVERAGE FLOW DEPTH(FEET) = 14.84 TRAVEL TIME(MIN.) = 0.45  
Tc(MIN.) = 25.76  
SUBAREA AREA(ACRES) = 4.89 SUBAREA RUNOFF(CFS) = 1.98  
EFFECTIVE AREA(ACRES) = 5550.01 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
TOTAL AREA(ACRES) = 68728.6 PEAK FLOW RATE(CFS) = 14953.71  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 14.84 FLOW VELOCITY(FEET/SEC.) = 22.62  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14953.71	25.76	0.950	0.50( 0.48)	0.96	5550.0	13810.00
2	14948.58	27.58	0.915	0.50( 0.48)	0.96	5975.1	13850.00
3	14921.55	33.44	0.825	0.50( 0.48)	0.97	7313.2	10300.00
4	14717.92	42.09	0.724	0.50( 0.48)	0.97	10335.6	10400.00
5	14654.22	43.96	0.708	0.50( 0.48)	0.97	11070.4	13830.00
6	14299.17	53.35	0.638	0.50( 0.49)	0.97	14616.8	50300.00
7	13341.08	67.54	0.571	0.50( 0.49)	0.97	20660.7	20400.00
8	12725.04	75.23	0.544	0.50( 0.48)	0.97	23576.4	20100.00
9	11776.51	89.71	0.494	0.50( 0.48)	0.97	28680.2	11801.00
10	11163.12	101.62	0.470	0.50( 0.48)	0.97	32681.7	11500.00

11	10513.68	114.16	0.445	0.50	( 0.48)	0.97	37350.5	11000.00
12	9815.19	129.18	0.422	0.50	( 0.48)	0.97	44155.7	13000.00
13	8726.63	147.01	0.401	0.50	( 0.49)	0.97	51401.6	11130.00
14	8209.95	155.61	0.391	0.50	( 0.49)	0.97	54097.5	13510.00
15	6898.98	176.25	0.366	0.50	( 0.49)	0.97	59788.9	12400.00
16	6170.95	186.59	0.358	0.50	( 0.49)	0.97	61736.2	13500.00
17	5415.82	198.76	0.352	0.50	( 0.49)	0.97	63401.8	12111.00
18	4482.92	216.09	0.343	0.50	( 0.49)	0.97	65328.8	12261.00
19	4010.41	226.42	0.337	0.50	( 0.49)	0.97	66140.6	10200.00
20	3442.07	243.15	0.328	0.50	( 0.49)	0.98	67377.9	10300.00
21	3208.94	250.62	0.324	0.50	( 0.49)	0.98	67729.0	12010.00
22	2723.56	272.74	0.312	0.50	( 0.49)	0.98	68058.4	12000.00
23	1718.70	346.26	0.272	0.50	( 0.49)	0.98	68728.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE(CFS) = 14953.71 Tc(MIN.) = 25.76  
AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA(ACRES) = 5550.01

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13860.00 TO NODE 13880.00 IS CODE = 1  
-----

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  
TIME OF CONCENTRATION(MIN.) = 25.76  
RAINFALL INTENSITY(INCH/HR) = 0.95  
AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50  
AREA-AVERAGED Ap = 0.96  
EFFECTIVE STREAM AREA(ACRES) = 5550.01  
TOTAL STREAM AREA(ACRES) = 68728.56  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 14953.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13870.00 TO NODE 13871.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 872.65  
ELEVATION DATA: UPSTREAM(FEET) = 558.52 DOWNSTREAM(FEET) = 436.47

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.704  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
NATURAL FAIR COVER						
"GRASS"	-	9.32	0.50	1.000	0	15.70

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
SUBAREA RUNOFF(CFS) = 6.42  
TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 6.42

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13871.00 TO NODE 13872.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	436.47	DOWNSTREAM(FEET) =	337.62
CHANNEL LENGTH THRU SUBAREA(FEET) =	827.95	CHANNEL SLOPE =	0.1194
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) =	1.156		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	14.27	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.64  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.72  
AVERAGE FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 2.92  
Tc(MIN.) = 18.63  
SUBAREA AREA(ACRES) = 14.27 SUBAREA RUNOFF(CFS) = 8.43  
EFFECTIVE AREA(ACRES) = 23.59 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 13.93

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.96 FLOW VELOCITY(FEET/SEC.) = 5.06  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13872.00 = 1700.60 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13872.00 TO NODE 13873.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	337.62	DOWNSTREAM(FEET) =	253.88
CHANNEL LENGTH THRU SUBAREA(FEET) =	1049.16	CHANNEL SLOPE =	0.0798
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.060	MAXIMUM DEPTH(FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) =	1.044		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	35.74	0.50	0.923	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.923  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.32  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.94  
AVERAGE FLOW DEPTH(FEET) = 1.25 TRAVEL TIME(MIN.) = 3.54  
Tc(MIN.) = 22.16  
SUBAREA AREA(ACRES) = 35.74 SUBAREA RUNOFF(CFS) = 18.74  
EFFECTIVE AREA(ACRES) = 59.33 AREA-AVERAGED Fm(INCH/HR) = 0.48  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95  
TOTAL AREA(ACRES) = 59.3 PEAK FLOW RATE(CFS) = 30.30

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 5.27  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13873.00 = 2749.76 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13873.00 TO NODE 13874.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	253.88	DOWNSTREAM(FEET) =	160.73
CHANNEL LENGTH THRU SUBAREA(FEET) =	1518.60	CHANNEL SLOPE =	0.0613
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.040	MAXIMUM DEPTH(FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) =	0.948		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	32.43	0.50	0.900	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.57  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.84  
AVERAGE FLOW DEPTH(FEET) = 1.35 TRAVEL TIME(MIN.) = 3.70  
Tc(MIN.) = 25.86  
SUBAREA AREA(ACRES) = 32.43 SUBAREA RUNOFF(CFS) = 14.54  
EFFECTIVE AREA(ACRES) = 91.76 AREA-AVERAGED Fm(INCH/HR) = 0.47  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 91.8 PEAK FLOW RATE(CFS) = 39.71

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.38 FLOW VELOCITY(FEET/SEC.) = 6.91  
LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13874.00 = 4268.36 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13874.00 TO NODE 13875.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	160.73	DOWNSTREAM(FEET) =	158.14
CHANNEL LENGTH THRU SUBAREA(FEET) =	582.74	CHANNEL SLOPE =	0.0044
CHANNEL BASE(FEET) =	0.00	"Z" FACTOR =	3.000
MANNING'S FACTOR =	0.040	MAXIMUM DEPTH(FEET) =	20.00
* 5 YEAR RAINFALL INTENSITY(INCH/HR) =	0.882		

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	73.67	0.50	0.930	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.54  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.79  
AVERAGE FLOW DEPTH(FEET) = 2.53 TRAVEL TIME(MIN.) = 3.48  
Tc(MIN.) = 29.34  
SUBAREA AREA(ACRES) = 73.67 SUBAREA RUNOFF(CFS) = 27.61  
EFFECTIVE AREA(ACRES) = 165.43 AREA-AVERAGED Fm(INCH/HR) = 0.47  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
TOTAL AREA(ACRES) = 165.4 PEAK FLOW RATE(CFS) = 61.81

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 2.67 FLOW VELOCITY(FEET/SEC.) = 2.90

LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13875.00 = 4851.10 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 158.14 DOWNSTREAM(FEET) = 120.57

FLOW LENGTH(FEET) = 1855.67 MANNING'S N = 0.013

ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000

DEPTH OF FLOW IN 36.0 INCH PIPE IS 21.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 13.72

ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 61.81

PIPE TRAVEL TIME(MIN.) = 2.25 Tc(MIN.) = 31.60

LONGEST FLOWPATH FROM NODE 13870.00 TO NODE 13880.00 = 6706.77 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN.) = 31.60

\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 0.849

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	34.90	0.50	0.743	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743

SUBAREA AREA(ACRES) = 34.90 SUBAREA RUNOFF(CFS) = 14.98

EFFECTIVE AREA(ACRES) = 200.33 AREA-AVERAGED Fm(INCH/HR) = 0.45

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.90

TOTAL AREA(ACRES) = 200.3 PEAK FLOW RATE(CFS) = 71.87

\*\*\*\*\*

FLOW PROCESS FROM NODE 13875.00 TO NODE 13880.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION(MIN.) = 31.60

RAINFALL INTENSITY(INCH/HR) = 0.85

AREA-AVERAGED Fm(INCH/HR) = 0.45

AREA-AVERAGED Fp(INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.90

EFFECTIVE STREAM AREA(ACRES) = 200.33

TOTAL STREAM AREA(ACRES) = 200.33

PEAK FLOW RATE(CFS) AT CONFLUENCE = 71.87

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14953.71	25.76	0.950	0.50( 0.48)	0.96	5550.0	13810.00
1	14948.58	27.58	0.915	0.50( 0.48)	0.96	5975.1	13850.00

1	14921.55	33.44	0.825	0.50( 0.48)	0.97	7313.2	10300.00
1	14717.92	42.09	0.724	0.50( 0.48)	0.97	10335.6	10400.00
1	14654.22	43.96	0.708	0.50( 0.48)	0.97	11070.4	13830.00
1	14299.17	53.35	0.638	0.50( 0.49)	0.97	14616.8	50300.00
1	13341.08	67.54	0.571	0.50( 0.49)	0.97	20660.7	20400.00
1	12725.04	75.23	0.544	0.50( 0.48)	0.97	23576.4	20100.00
1	11776.51	89.71	0.494	0.50( 0.48)	0.97	28680.2	11801.00
1	11163.12	101.62	0.470	0.50( 0.48)	0.97	32681.7	11500.00
1	10513.68	114.16	0.445	0.50( 0.48)	0.97	37350.5	11000.00
1	9815.19	129.18	0.422	0.50( 0.48)	0.97	44155.7	13000.00
1	8726.63	147.01	0.401	0.50( 0.49)	0.97	51401.6	11130.00
1	8209.95	155.61	0.391	0.50( 0.49)	0.97	54097.5	13510.00
1	6898.98	176.25	0.366	0.50( 0.49)	0.97	59788.9	12400.00
1	6170.95	186.59	0.358	0.50( 0.49)	0.97	61736.2	13500.00
1	5415.82	198.76	0.352	0.50( 0.49)	0.97	63401.8	12111.00
1	4482.92	216.09	0.343	0.50( 0.49)	0.97	65328.8	12261.00
1	4010.41	226.42	0.337	0.50( 0.49)	0.97	66140.6	10200.00
1	3442.07	243.15	0.328	0.50( 0.49)	0.98	67377.9	10300.00
1	3208.94	250.62	0.324	0.50( 0.49)	0.98	67729.0	12010.00
1	2723.56	272.74	0.312	0.50( 0.49)	0.98	68058.4	12000.00
1	1718.70	346.26	0.272	0.50( 0.49)	0.98	68728.6	10100.00
2	71.87	31.60	0.849	0.50( 0.45)	0.90	200.3	13870.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15025.58	25.76	0.950	0.50( 0.48)	0.96	5713.3	13810.00
2	15020.45	27.58	0.915	0.50( 0.48)	0.96	6149.9	13850.00
3	15001.93	31.60	0.849	0.50( 0.48)	0.96	7092.0	13870.00
4	14989.15	33.44	0.825	0.50( 0.48)	0.96	7513.5	10300.00
5	14767.31	42.09	0.724	0.50( 0.48)	0.97	10535.9	10400.00
6	14700.83	43.96	0.708	0.50( 0.48)	0.97	11270.7	13830.00
7	14333.11	53.35	0.638	0.50( 0.49)	0.97	14817.2	50300.00
8	13362.88	67.54	0.571	0.50( 0.49)	0.97	20861.0	20400.00
9	12742.03	75.23	0.544	0.50( 0.48)	0.97	23776.7	20100.00
10	11785.46	89.71	0.494	0.50( 0.48)	0.97	28880.5	11801.00
11	11171.63	101.62	0.470	0.50( 0.48)	0.96	32882.1	11500.00
12	10521.73	114.16	0.445	0.50( 0.48)	0.97	37550.9	11000.00
13	9822.84	129.18	0.422	0.50( 0.48)	0.97	44356.1	13000.00
14	8733.89	147.01	0.401	0.50( 0.49)	0.97	51601.9	11130.00
15	8217.03	155.61	0.391	0.50( 0.49)	0.97	54297.9	13510.00
16	6905.61	176.25	0.366	0.50( 0.49)	0.97	59989.2	12400.00
17	6177.44	186.59	0.358	0.50( 0.49)	0.97	61936.5	13500.00
18	5422.19	198.76	0.352	0.50( 0.49)	0.97	63602.2	12111.00
19	4489.12	216.09	0.343	0.50( 0.49)	0.97	65529.1	12261.00
20	4016.51	226.42	0.337	0.50( 0.49)	0.97	66340.9	10200.00
21	3448.01	243.15	0.328	0.50( 0.49)	0.98	67578.3	10300.00
22	3214.80	250.62	0.324	0.50( 0.49)	0.98	67929.4	12010.00
23	2729.21	272.74	0.312	0.50( 0.49)	0.98	68258.7	12000.00
24	1723.63	346.26	0.272	0.50( 0.49)	0.98	68928.9	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 15025.58 Tc(MIN.) = 25.76

EFFECTIVE AREA(ACRES) = 5713.32 AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96

TOTAL AREA (ACRES) = 68928.9  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13880.00 = 134069.48 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM (FEET) = 120.57 DOWNSTREAM (FEET) = 119.70  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1190.21 CHANNEL SLOPE = 0.0007  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY (NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 0.920

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	117.69	0.50	0.724	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.724

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15055.14

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.55

AVERAGE FLOW DEPTH (FEET) = 20.00 TRAVEL TIME (MIN.) = 1.58

Tc (MIN.) = 27.34

SUBAREA AREA (ACRES) = 117.69 SUBAREA RUNOFF (CFS) = 59.10

EFFECTIVE AREA (ACRES) = 5831.01 AREA-AVERAGED Fm (INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96

TOTAL AREA (ACRES) = 69046.6 PEAK FLOW RATE (CFS) = 15025.58

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY (NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 20.00 FLOW VELOCITY (FEET/SEC.) = 12.52

==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15025.58	27.34	0.920	0.50 (0.48)	0.96	5831.0	13810.00
2	15020.45	29.16	0.885	0.50 (0.48)	0.96	6267.6	13850.00
3	15001.93	33.18	0.828	0.50 (0.48)	0.96	7209.7	13870.00
4	14989.15	35.03	0.805	0.50 (0.48)	0.96	7631.2	10300.00

5	14767.31	43.70	0.711	0.50 (0.48)	0.96	10653.6	10400.00
6	14700.83	45.58	0.695	0.50 (0.48)	0.97	11388.4	13830.00
7	14333.11	55.01	0.628	0.50 (0.48)	0.97	14934.9	50300.00
8	13362.88	69.32	0.565	0.50 (0.48)	0.97	20978.7	20400.00
9	12742.03	77.10	0.538	0.50 (0.48)	0.97	23894.4	20100.00
10	11785.46	91.73	0.490	0.50 (0.48)	0.96	28998.2	11801.00
11	11171.63	103.74	0.466	0.50 (0.48)	0.96	32999.8	11500.00
12	10521.73	116.43	0.440	0.50 (0.48)	0.97	37668.6	11000.00
13	9822.84	131.60	0.419	0.50 (0.48)	0.97	44473.8	13000.00
14	8733.89	149.74	0.398	0.50 (0.49)	0.97	51719.6	11130.00
15	8217.03	158.51	0.387	0.50 (0.49)	0.97	54415.6	13510.00
16	6905.61	179.59	0.362	0.50 (0.49)	0.97	60106.9	12400.00
17	6177.44	190.02	0.357	0.50 (0.49)	0.97	62054.2	13500.00
18	5422.19	202.31	0.350	0.50 (0.49)	0.97	63719.9	12111.00
19	4489.12	219.80	0.341	0.50 (0.49)	0.97	65646.8	12261.00
20	4016.51	230.24	0.335	0.50 (0.49)	0.97	66458.6	10200.00
21	3448.01	247.12	0.326	0.50 (0.49)	0.97	67695.9	10300.00
22	3214.80	254.66	0.322	0.50 (0.49)	0.97	68047.1	12010.00
23	2729.21	276.95	0.310	0.50 (0.49)	0.97	68376.4	12000.00
24	1723.63	350.99	0.270	0.50 (0.49)	0.98	69046.6	10100.00

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 15025.58 Tc (MIN.) = 27.34

AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.96 EFFECTIVE AREA (ACRES) = 5831.01

\*\*\*\*\*

FLOW PROCESS FROM NODE 13880.00 TO NODE 13910.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION (MIN.) = 27.34

RAINFALL INTENSITY (INCH/HR) = 0.92

AREA-AVERAGED Fm (INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.50

AREA-AVERAGED Ap = 0.96

EFFECTIVE STREAM AREA (ACRES) = 5831.01

TOTAL STREAM AREA (ACRES) = 69046.58

PEAK FLOW RATE (CFS) AT CONFLUENCE = 15025.58

\*\*\*\*\*

FLOW PROCESS FROM NODE 13889.00 TO NODE 13890.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 447.89

ELEVATION DATA: UPSTREAM (FEET) = 564.89 DOWNSTREAM (FEET) = 421.92

Tc = K \* [(LENGTH \*\* 3.00) / (ELEVATION CHANGE)] \*\* 0.20

SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 6.976

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 2.250

SUBAREA Tc AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
PUBLIC PARK	-	3.03	0.50	0.960	0	6.98

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960  
SUBAREA RUNOFF(CFS) = 4.83  
TOTAL AREA (ACRES) = 3.03 PEAK FLOW RATE (CFS) = 4.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13890.00 TO NODE 13891.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 421.92 DOWNSTREAM(FEET) = 392.64  
CHANNEL LENGTH THRU SUBAREA(FEET) = 435.33 CHANNEL SLOPE = 0.0673  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 2.008

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 8.12 0.50 0.986 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.38  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.13  
AVERAGE FLOW DEPTH(FEET) = 0.82 TRAVEL TIME(MIN.) = 1.41  
Tc(MIN.) = 8.39  
SUBAREA AREA(ACRES) = 8.12 SUBAREA RUNOFF(CFS) = 11.07  
EFFECTIVE AREA(ACRES) = 11.15 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.98  
TOTAL AREA(ACRES) = 11.1 PEAK FLOW RATE(CFS) = 15.24

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.95 FLOW VELOCITY(FEET/SEC.) = 5.64  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13891.00 = 883.22 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13891.00 TO NODE 13892.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 392.64 DOWNSTREAM(FEET) = 324.46  
CHANNEL LENGTH THRU SUBAREA(FEET) = 662.40 CHANNEL SLOPE = 0.1029  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.748

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 12.50 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.28  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.28  
AVERAGE FLOW DEPTH(FEET) = 1.01 TRAVEL TIME(MIN.) = 1.52  
Tc(MIN.) = 9.91  
SUBAREA AREA(ACRES) = 12.50 SUBAREA RUNOFF(CFS) = 14.04  
EFFECTIVE AREA(ACRES) = 23.65 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99

TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) = 26.67

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.08 FLOW VELOCITY(FEET/SEC.) = 7.64  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13892.00 = 1545.62 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13892.00 TO NODE 13893.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 324.46 DOWNSTREAM(FEET) = 240.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 980.03 CHANNEL SLOPE = 0.0853  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.551

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 15.87 0.50 1.000 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.18  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.59  
AVERAGE FLOW DEPTH(FEET) = 1.23 TRAVEL TIME(MIN.) = 2.15  
Tc(MIN.) = 12.06  
SUBAREA AREA(ACRES) = 15.87 SUBAREA RUNOFF(CFS) = 15.00  
EFFECTIVE AREA(ACRES) = 39.52 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 39.5 PEAK FLOW RATE(CFS) = 37.47

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 1.27 FLOW VELOCITY(FEET/SEC.) = 7.75  
LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13893.00 = 2525.65 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13893.00 TO NODE 13894.00 IS CODE = 51

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 240.82 DOWNSTREAM(FEET) = 163.04  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1144.35 CHANNEL SLOPE = 0.0680  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.330

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 28.41 0.50 0.985 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.985  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.21  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.60  
AVERAGE FLOW DEPTH(FEET) = 1.45 TRAVEL TIME(MIN.) = 2.51  
Tc(MIN.) = 14.57  
SUBAREA AREA(ACRES) = 28.41 SUBAREA RUNOFF(CFS) = 21.40

EFFECTIVE AREA(ACRES) = 67.93 AREA-AVERAGED Fm(INCH/HR) = 0.50  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
 TOTAL AREA(ACRES) = 67.9 PEAK FLOW RATE(CFS) = 51.02

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 1.49 FLOW VELOCITY(FEET/SEC.) = 7.65  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13894.00 = 3670.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 31

-----  
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 163.04 DOWNSTREAM(FEET) = 119.70  
 FLOW LENGTH(FEET) = 1899.01 MANNING'S N = 0.013  
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 18.7 INCHES  
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.74  
 ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
 PIPE-FLOW(CFS) = 51.02  
 PIPE TRAVEL TIME(MIN.) = 2.30 Tc(MIN.) = 16.87  
 LONGEST FLOWPATH FROM NODE 13889.00 TO NODE 13910.00 = 5569.01 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 81

-----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN.) = 16.87  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.222  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	11.69	0.50	0.634	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634  
 SUBAREA AREA(ACRES) = 11.69 SUBAREA RUNOFF(CFS) = 9.52  
 EFFECTIVE AREA(ACRES) = 79.62 AREA-AVERAGED Fm(INCH/HR) = 0.47  
 AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
 TOTAL AREA(ACRES) = 79.6 PEAK FLOW RATE(CFS) = 53.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 13894.00 TO NODE 13910.00 IS CODE = 1

-----  
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<  
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 2  
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  
 TIME OF CONCENTRATION(MIN.) = 16.87  
 RAINFALL INTENSITY(INCH/HR) = 1.22  
 AREA-AVERAGED Fm(INCH/HR) = 0.47  
 AREA-AVERAGED Fp(INCH/HR) = 0.50  
 AREA-AVERAGED Ap = 0.94  
 EFFECTIVE STREAM AREA(ACRES) = 79.62  
 TOTAL STREAM AREA(ACRES) = 79.62  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 53.94

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15025.58	27.34	0.920	0.50( 0.48)	0.96	5831.0	13810.00
1	15020.45	29.16	0.885	0.50( 0.48)	0.96	6267.6	13850.00
1	15001.93	33.18	0.828	0.50( 0.48)	0.96	7209.7	13870.00
1	14989.15	35.03	0.805	0.50( 0.48)	0.96	7631.2	10300.00
1	14767.31	43.70	0.711	0.50( 0.48)	0.96	10653.6	10400.00
1	14700.83	45.58	0.695	0.50( 0.48)	0.97	11388.4	13830.00
1	14333.11	55.01	0.628	0.50( 0.48)	0.97	14934.9	50300.00
1	13362.88	69.32	0.565	0.50( 0.48)	0.97	20978.7	20400.00
1	12742.03	77.10	0.538	0.50( 0.48)	0.97	23894.4	20100.00
1	11785.46	91.73	0.490	0.50( 0.48)	0.96	28998.2	11801.00
1	11171.63	103.74	0.466	0.50( 0.48)	0.96	32999.8	11500.00
1	10521.73	116.43	0.440	0.50( 0.48)	0.97	37668.6	11000.00
1	9822.84	131.60	0.419	0.50( 0.48)	0.97	44473.8	13000.00
1	8733.89	149.74	0.398	0.50( 0.49)	0.97	51719.6	11130.00
1	8217.03	158.51	0.387	0.50( 0.49)	0.97	54415.6	13510.00
1	6905.61	179.59	0.362	0.50( 0.49)	0.97	60106.9	12400.00
1	6177.44	190.02	0.357	0.50( 0.49)	0.97	62054.2	13500.00
1	5422.19	202.31	0.350	0.50( 0.49)	0.97	63719.9	12111.00
1	4489.12	219.80	0.341	0.50( 0.49)	0.97	65646.8	12261.00
1	4016.51	230.24	0.335	0.50( 0.49)	0.97	66458.6	10200.00
1	3448.01	247.12	0.326	0.50( 0.49)	0.97	67695.9	10300.00
1	3214.80	254.66	0.322	0.50( 0.49)	0.97	68047.1	12010.00
1	2729.21	276.95	0.310	0.50( 0.49)	0.97	68376.4	12000.00
1	1723.63	350.99	0.270	0.50( 0.49)	0.98	69046.6	10100.00
2	53.94	16.87	1.222	0.50( 0.47)	0.94	79.6	13889.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  
 CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	16.87	1.222	0.50( 0.48)	0.96	3678.4	13889.00
2	15057.89	27.34	0.920	0.50( 0.48)	0.96	5910.6	13810.00
3	15050.25	29.16	0.885	0.50( 0.48)	0.96	6347.2	13850.00
4	15027.66	33.18	0.828	0.50( 0.48)	0.96	7289.3	13870.00
5	15013.19	35.03	0.805	0.50( 0.48)	0.96	7710.8	10300.00
6	14784.62	43.70	0.711	0.50( 0.48)	0.96	10733.2	10400.00
7	14717.03	45.58	0.695	0.50( 0.48)	0.97	11468.0	13830.00
8	14344.49	55.01	0.628	0.50( 0.48)	0.97	15014.5	50300.00
9	13369.73	69.32	0.565	0.50( 0.48)	0.97	21058.3	20400.00
10	12746.94	77.10	0.538	0.50( 0.48)	0.97	23974.0	20100.00
11	11787.64	91.73	0.490	0.50( 0.48)	0.96	29077.8	11801.00
12	11173.70	103.74	0.466	0.50( 0.48)	0.96	33079.4	11500.00
13	10523.69	116.43	0.440	0.50( 0.48)	0.97	37748.2	11000.00
14	9824.70	131.60	0.419	0.50( 0.48)	0.97	44553.4	13000.00
15	8735.66	149.74	0.398	0.50( 0.49)	0.97	51799.3	11130.00
16	8218.75	158.51	0.387	0.50( 0.49)	0.97	54495.2	13510.00
17	6907.22	179.59	0.362	0.50( 0.49)	0.97	60186.5	12400.00
18	6179.03	190.02	0.357	0.50( 0.49)	0.97	62133.8	13500.00
19	5423.75	202.31	0.350	0.50( 0.49)	0.97	63799.5	12111.00
20	4490.64	219.80	0.341	0.50( 0.49)	0.97	65726.4	12261.00
21	4018.00	230.24	0.335	0.50( 0.49)	0.97	66538.2	10200.00
22	3449.46	247.12	0.326	0.50( 0.49)	0.97	67775.6	10300.00



23	3216.23	254.66	0.322	0.50 ( 0.49)	0.97	68126.7	12010.00
24	2730.59	276.95	0.310	0.50 ( 0.49)	0.97	68456.0	12000.00
25	1724.83	350.99	0.270	0.50 ( 0.49)	0.98	69126.2	10100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 15079.52 Tc (MIN.) = 16.87  
 EFFECTIVE AREA (ACRES) = 3678.42 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.96  
 TOTAL AREA (ACRES) = 69126.2  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13910.00 = 135259.69 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 69126.2 TC (MIN.) = 16.87  
 EFFECTIVE AREA (ACRES) = 3678.42 AREA-AVERAGED Fm (INCH/HR) = 0.48  
 AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.956  
 PEAK FLOW RATE (CFS) = 15079.52

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	16.87	1.222	0.50 ( 0.48)	0.96	3678.4	13889.00
2	15057.89	27.34	0.920	0.50 ( 0.48)	0.96	5910.6	13810.00
3	15050.25	29.16	0.885	0.50 ( 0.48)	0.96	6347.2	13850.00
4	15027.66	33.18	0.828	0.50 ( 0.48)	0.96	7289.3	13870.00
5	15013.19	35.03	0.805	0.50 ( 0.48)	0.96	7710.8	10300.00
6	14784.62	43.70	0.711	0.50 ( 0.48)	0.96	10733.2	10400.00
7	14717.03	45.58	0.695	0.50 ( 0.48)	0.97	11468.0	13830.00
8	14344.49	55.01	0.628	0.50 ( 0.48)	0.97	15014.5	50300.00
9	13369.73	69.32	0.565	0.50 ( 0.48)	0.97	21058.3	20400.00
10	12746.94	77.10	0.538	0.50 ( 0.48)	0.97	23974.0	20100.00
11	11787.64	91.73	0.490	0.50 ( 0.48)	0.96	29077.8	11801.00
12	11173.70	103.74	0.466	0.50 ( 0.48)	0.96	33079.4	11500.00
13	10523.69	116.43	0.440	0.50 ( 0.48)	0.97	37748.2	11000.00
14	9824.70	131.60	0.419	0.50 ( 0.48)	0.97	44553.4	13000.00
15	8735.66	149.74	0.398	0.50 ( 0.49)	0.97	51799.3	11130.00
16	8218.75	158.51	0.387	0.50 ( 0.49)	0.97	54495.2	13510.00
17	6907.22	179.59	0.362	0.50 ( 0.49)	0.97	60186.5	12400.00
18	6179.03	190.02	0.357	0.50 ( 0.49)	0.97	62133.8	13500.00
19	5423.75	202.31	0.350	0.50 ( 0.49)	0.97	63799.5	12111.00
20	4490.64	219.80	0.341	0.50 ( 0.49)	0.97	65726.4	12261.00
21	4018.00	230.24	0.335	0.50 ( 0.49)	0.97	66538.2	10200.00
22	3449.46	247.12	0.326	0.50 ( 0.49)	0.97	67775.6	10300.00
23	3216.23	254.66	0.322	0.50 ( 0.49)	0.97	68126.7	12010.00
24	2730.59	276.95	0.310	0.50 ( 0.49)	0.97	68456.0	12000.00
25	1724.83	350.99	0.270	0.50 ( 0.49)	0.98	69126.2	10100.00

=====  
 END OF RATIONAL METHOD ANALYSIS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

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92707

-----  
FILE NAME: S39.DAT  
TIME/DATE OF STUDY: 07:32 07/20/2018  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 5.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 2.586
- 2) 10.00; 1.731
- 3) 15.00; 1.292
- 4) 20.00; 1.104
- 5) 25.00; 0.965
- 6) 30.00; 0.869
- 7) 40.00; 0.741
- 8) 50.00; 0.658
- 9) 60.00; 0.596
- 10) 90.00; 0.493
- 11) 120.00; 0.433
- 12) 180.00; 0.362
- 13) 360.00; 0.264
- 14) 1200.00; 0.115

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER WIDTH (FT)	GEOMETRIES LIP (FT)	MANNING HIKE (FT)	STREETFLOW FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- 2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 13900.00 TO NODE 13901.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 600.65  
ELEVATION DATA: UPSTREAM(FEET) = 442.40 DOWNSTREAM(FEET) = 385.16

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
 SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 10.859  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.656  
 SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN	$T_c$ (MIN.)
AGRICULTURAL POOR COVER "FALLOW"	-	4.00	0.50	1.000	0	10.86

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 SUBAREA RUNOFF(CFS) = 4.16  
 TOTAL AREA(ACRES) = 4.00 PEAK FLOW RATE(CFS) = 4.16

\*\*\*\*\*

FLOW PROCESS FROM NODE 13901.00 TO NODE 13902.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 385.16 DOWNSTREAM(FEET) = 288.21  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 647.42 CHANNEL SLOPE = 0.1497  
 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
 MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
 \* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.509  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	$F_p$ (INCH/HR)	$A_p$ (DECIMAL)	SCS CN
USER-DEFINED	-	8.47	0.50	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.50  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.01  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.45  
 AVERAGE FLOW DEPTH(FEET) = 0.64 TRAVEL TIME(MIN.) = 1.67  
 $T_c$ (MIN.) = 12.53  
 SUBAREA AREA(ACRES) = 8.47 SUBAREA RUNOFF(CFS) = 7.69  
 EFFECTIVE AREA(ACRES) = 12.47 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.50  
 AREA-AVERAGED  $F_p$ (INCH/HR) = 0.50 AREA-AVERAGED  $A_p$  = 1.00  
 TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 11.32

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 0.73 FLOW VELOCITY(FEET/SEC.) = 7.09  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13902.00 = 1248.07 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 13902.00 TO NODE 13903.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 288.21 DOWNSTREAM(FEET) = 184.89  
CHANNEL LENGTH THRU SUBAREA(FEET) = 669.27 CHANNEL SLOPE = 0.1544  
CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.392

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	23.85	0.50	0.982	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.982  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.00  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.40  
AVERAGE FLOW DEPTH(FEET) = 0.91 TRAVEL TIME(MIN.) = 1.33  
Tc(MIN.) = 13.86  
SUBAREA AREA(ACRES) = 23.85 SUBAREA RUNOFF(CFS) = 19.34  
EFFECTIVE AREA(ACRES) = 36.32 AREA-AVERAGED Fm(INCH/HR) = 0.49  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 36.3 PEAK FLOW RATE(CFS) = 29.35

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.03 FLOW VELOCITY(FEET/SEC.) = 9.14  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13903.00 = 1917.34 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 184.89 DOWNSTREAM(FEET) = 155.08  
FLOW LENGTH(FEET) = 876.66 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.3 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.74  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 29.35  
PIPE TRAVEL TIME(MIN.) = 1.06 Tc(MIN.) = 14.92  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13904.00 = 2794.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13903.00 TO NODE 13904.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 14.92  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.299  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.29	0.50	0.996	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.996  
SUBAREA AREA(ACRES) = 21.29 SUBAREA RUNOFF(CFS) = 15.34  
EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.50  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.99  
TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) = 41.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 31  
-----

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<  
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 155.08 DOWNSTREAM(FEET) = 118.00  
FLOW LENGTH(FEET) = 1961.38 MANNING'S N = 0.013  
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 36.000  
DEPTH OF FLOW IN 36.0 INCH PIPE IS 17.5 INCHES  
PIPE-FLOW VELOCITY(FEET/SEC.) = 12.17  
ESTIMATED PIPE DIAMETER(INCH) = 36.00 NUMBER OF PIPES = 1  
PIPE-FLOW(CFS) = 41.63  
PIPE TRAVEL TIME(MIN.) = 2.69 Tc(MIN.) = 17.61  
LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 17.61  
\* 5 YEAR RAINFALL INTENSITY(INCH/HR) = 1.194  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	43.53	0.50	0.649	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.50  
SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 0.649  
SUBAREA AREA(ACRES) = 43.53 SUBAREA RUNOFF(CFS) = 34.06  
EFFECTIVE AREA(ACRES) = 101.14 AREA-AVERAGED Fm(INCH/HR) = 0.42  
AREA-AVERAGED Fp(INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.84  
TOTAL AREA(ACRES) = 101.1 PEAK FLOW RATE(CFS) = 70.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 10  
-----

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 2 <<<<<

PEAK FLOWRATE TABLE FILE NAME: S38.DNA

MEMORY BANK # 2 DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	16.87	0.50( 0.48)	0.96	3678.4	13889.00
2	15057.89	27.34	0.50( 0.48)	0.96	5910.6	13810.00
3	14784.62	43.70	0.50( 0.48)	0.96	10733.2	10400.00
4	14344.49	55.01	0.50( 0.48)	0.97	15014.5	50300.00
5	13369.73	69.32	0.50( 0.48)	0.97	21058.3	20400.00
6	11787.64	91.73	0.50( 0.48)	0.96	29077.8	11801.00
7	11173.70	103.74	0.50( 0.48)	0.96	33079.4	11500.00
8	10523.69	116.43	0.50( 0.48)	0.97	37748.2	11000.00
9	9824.70	131.60	0.50( 0.48)	0.97	44553.4	13000.00

10	8735.66	149.74	0.50	( 0.49)	0.97	51799.3	11130.00
11	8218.75	158.51	0.50	( 0.49)	0.97	54495.2	13510.00
12	6907.22	179.59	0.50	( 0.49)	0.97	60186.5	12400.00
13	6179.03	190.02	0.50	( 0.49)	0.97	62133.8	13500.00
14	5423.75	202.31	0.50	( 0.49)	0.97	63799.5	12111.00
15	4490.64	219.80	0.50	( 0.49)	0.97	65726.4	12261.00
16	4018.00	230.24	0.50	( 0.49)	0.97	66538.2	10200.00
17	3449.46	247.12	0.50	( 0.49)	0.97	67775.6	10300.00
18	3216.23	254.66	0.50	( 0.49)	0.97	68126.7	12010.00
19	2730.59	276.95	0.50	( 0.49)	0.97	68456.0	12000.00
20	1724.83	350.99	0.50	( 0.49)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13910.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	16.87	0.50 ( 0.48)	0.96	3678.4	13889.00
2	15057.89	27.34	0.50 ( 0.48)	0.96	5910.6	13810.00
3	14784.62	43.70	0.50 ( 0.48)	0.96	10733.2	10400.00
4	14344.49	55.01	0.50 ( 0.48)	0.97	15014.5	50300.00
5	13369.73	69.32	0.50 ( 0.48)	0.97	21058.3	20400.00
6	11787.64	91.73	0.50 ( 0.48)	0.96	29077.8	11801.00
7	11173.70	103.74	0.50 ( 0.48)	0.96	33079.4	11500.00
8	10523.69	116.43	0.50 ( 0.48)	0.97	37748.2	11000.00
9	9824.70	131.60	0.50 ( 0.48)	0.97	44553.4	13000.00
10	8735.66	149.74	0.50 ( 0.49)	0.97	51799.3	11130.00
11	8218.75	158.51	0.50 ( 0.49)	0.97	54495.2	13510.00
12	6907.22	179.59	0.50 ( 0.49)	0.97	60186.5	12400.00
13	6179.03	190.02	0.50 ( 0.49)	0.97	62133.8	13500.00
14	5423.75	202.31	0.50 ( 0.49)	0.97	63799.5	12111.00
15	4490.64	219.80	0.50 ( 0.49)	0.97	65726.4	12261.00
16	4018.00	230.24	0.50 ( 0.49)	0.97	66538.2	10200.00
17	3449.46	247.12	0.50 ( 0.49)	0.97	67775.6	10300.00
18	3216.23	254.66	0.50 ( 0.49)	0.97	68126.7	12010.00
19	2730.59	276.95	0.50 ( 0.49)	0.97	68456.0	12000.00
20	1724.83	350.99	0.50 ( 0.49)	0.98	69126.2	10100.00

TOTAL AREA (ACRES) = 69126.2

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13910.00 TO NODE 13920.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM (FEET) = 119.70 DOWNSTREAM (FEET) = 118.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1376.26 CHANNEL SLOPE = 0.0012  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).

AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.153  
SUBAREA LOSS RATE DATA (AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 96.09 0.50 0.535 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15117.84  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 12.60  
AVERAGE FLOW DEPTH (FEET) = 20.00 TRAVEL TIME (MIN.) = 1.82  
Tc (MIN.) = 18.69  
SUBAREA AREA (ACRES) = 96.09 SUBAREA RUNOFF (CFS) = 76.58  
EFFECTIVE AREA (ACRES) = 3774.51 AREA-AVERAGED Fm (INCH/HR) = 0.47  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.95  
TOTAL AREA (ACRES) = 69222.3 PEAK FLOW RATE (CFS) = 15079.52  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL  
CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM  
ALLOWABLE DEPTH).  
AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM  
ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH (FEET) = 20.00 FLOW VELOCITY (FEET/SEC.) = 12.57

==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13904.00 TO NODE 13920.00 IS CODE = 11  
-----

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<  
=====

\*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15079.52	18.69	1.153	0.50 ( 0.47)	0.95	3774.5	13889.00
2	15057.89	29.16	0.885	0.50 ( 0.47)	0.95	6006.7	13810.00
3	14784.62	45.56	0.695	0.50 ( 0.48)	0.96	10829.3	10400.00
4	14344.49	56.92	0.615	0.50 ( 0.48)	0.97	15110.6	50300.00
5	13369.73	71.38	0.557	0.50 ( 0.48)	0.97	21154.4	20400.00
6	11787.64	94.06	0.485	0.50 ( 0.48)	0.96	29173.9	11801.00
7	11173.70	106.21	0.461	0.50 ( 0.48)	0.96	33175.5	11500.00
8	10523.69	119.04	0.435	0.50 ( 0.48)	0.96	37844.3	11000.00
9	9824.70	134.40	0.416	0.50 ( 0.48)	0.97	44649.5	13000.00
10	8735.66	152.73	0.394	0.50 ( 0.49)	0.97	51895.4	11130.00
11	8218.75	161.54	0.384	0.50 ( 0.49)	0.97	54591.3	13510.00
12	6907.22	182.76	0.360	0.50 ( 0.49)	0.97	60282.6	12400.00
13	6179.03	193.29	0.355	0.50 ( 0.49)	0.97	62229.9	13500.00
14	5423.75	205.68	0.348	0.50 ( 0.49)	0.97	63895.6	12111.00
15	4490.64	223.34	0.338	0.50 ( 0.49)	0.97	65822.5	12261.00

16	4018.00	233.87	0.333	0.50	( 0.49)	0.97	66634.3	10200.00
17	3449.46	250.89	0.323	0.50	( 0.49)	0.97	67871.7	10300.00
18	3216.23	258.50	0.319	0.50	( 0.49)	0.97	68222.8	12010.00
19	2730.59	280.94	0.307	0.50	( 0.49)	0.97	68552.1	12000.00
20	1724.83	355.47	0.266	0.50	( 0.49)	0.97	69222.3	10100.00

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.25	17.61	1.194	0.50( 0.42)	0.84	101.1	13900.00

LONGEST FLOWPATH FROM NODE 13900.00 TO NODE 13920.00 = 4755.38 FEET.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15126.22	17.61	1.194	0.50( 0.47)	0.94	3656.6	13900.00
2	15146.06	18.69	1.153	0.50( 0.47)	0.94	3875.6	13889.00
3	15100.03	29.16	0.885	0.50( 0.47)	0.95	6107.9	13810.00
4	14809.45	45.56	0.695	0.50( 0.48)	0.96	10930.5	10400.00
5	14362.06	56.92	0.615	0.50( 0.48)	0.97	15211.7	50300.00
6	13382.00	71.38	0.557	0.50( 0.48)	0.97	21255.6	20400.00
7	11794.53	94.06	0.485	0.50( 0.48)	0.96	29275.1	11801.00
8	11180.25	106.21	0.461	0.50( 0.48)	0.96	33276.6	11500.00
9	10529.87	119.04	0.435	0.50( 0.48)	0.96	37945.4	11000.00
10	9830.61	134.40	0.416	0.50( 0.48)	0.97	44750.6	13000.00
11	8741.26	152.73	0.394	0.50( 0.49)	0.97	51996.5	11130.00
12	8224.21	161.54	0.384	0.50( 0.49)	0.97	54692.4	13510.00
13	6912.35	182.76	0.360	0.50( 0.49)	0.97	60383.7	12400.00
14	6184.07	193.29	0.355	0.50( 0.49)	0.97	62331.0	13500.00
15	5428.69	205.68	0.348	0.50( 0.49)	0.97	63996.7	12111.00
16	4495.45	223.34	0.338	0.50( 0.49)	0.97	65923.7	12261.00
17	4022.73	233.87	0.333	0.50( 0.49)	0.97	66735.4	10200.00
18	3454.06	250.89	0.323	0.50( 0.49)	0.97	67972.8	10300.00
19	3220.77	258.50	0.319	0.50( 0.49)	0.97	68323.9	12010.00
20	2734.95	280.94	0.307	0.50( 0.49)	0.97	68653.2	12000.00
21	1728.62	355.47	0.266	0.50( 0.49)	0.97	69323.4	10100.00

TOTAL AREA (ACRES) = 69323.4

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 15146.06 Tc (MIN.) = 18.694  
EFFECTIVE AREA (ACRES) = 3875.65 AREA-AVERAGED Fm (INCH/HR) = 0.47  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.94  
TOTAL AREA (ACRES) = 69323.4  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13920.00 = 136635.95 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 13920.00 TO NODE 13921.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 118.00 DOWNSTREAM (FEET) = 115.28  
CHANNEL LENGTH THRU SUBAREA (FEET) = 335.44 CHANNEL SLOPE = 0.0081  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.141  
SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	134.30	0.50	0.658	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15195.15  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 17.84  
AVERAGE FLOW DEPTH (FEET) = 16.85 TRAVEL TIME (MIN.) = 0.31  
Tc (MIN.) = 19.01  
SUBAREA AREA (ACRES) = 134.30 SUBAREA RUNOFF (CFS) = 98.17  
EFFECTIVE AREA (ACRES) = 4009.95 AREA-AVERAGED Fm (INCH/HR) = 0.47  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
TOTAL AREA (ACRES) = 69457.7 PEAK FLOW RATE (CFS) = 15146.06  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 16.83 FLOW VELOCITY (FEET/SEC.) = 17.82  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 13921.00 = 136971.39 FEET.

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FLOW PROCESS FROM NODE 13921.00 TO NODE 14010.00 IS CODE = 51  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

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ELEVATION DATA: UPSTREAM (FEET) = 115.28 DOWNSTREAM (FEET) = 100.00  
CHANNEL LENGTH THRU SUBAREA (FEET) = 1396.08 CHANNEL SLOPE = 0.0109  
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 3.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH (FEET) = 20.00  
\* 5 YEAR RAINFALL INTENSITY (INCH/HR) = 1.099

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	96.27	0.50	0.723	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.50  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.723  
TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 15178.02  
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 19.95  
AVERAGE FLOW DEPTH (FEET) = 15.93 TRAVEL TIME (MIN.) = 1.17  
Tc (MIN.) = 20.17  
SUBAREA AREA (ACRES) = 96.27 SUBAREA RUNOFF (CFS) = 63.90  
EFFECTIVE AREA (ACRES) = 4106.22 AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.93  
TOTAL AREA (ACRES) = 69554.0 PEAK FLOW RATE (CFS) = 15146.06  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH (FEET) = 15.91 FLOW VELOCITY (FEET/SEC.) = 19.94  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 14010.00 = 138367.47 FEET.

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END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 69554.0 TC (MIN.) = 20.17  
EFFECTIVE AREA (ACRES) = 4106.22 AREA-AVERAGED Fm (INCH/HR) = 0.46  
AREA-AVERAGED Fp (INCH/HR) = 0.50 AREA-AVERAGED Ap = 0.928  
PEAK FLOW RATE (CFS) = 15146.06

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp (Fm)	Ap	Ae	HEADWATER
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NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	15126.22	19.09	1.138	0.50 ( 0.46)	0.93	3887.2	13900.00
2	15146.06	20.17	1.099	0.50 ( 0.46)	0.93	4106.2	13889.00
3	15100.03	30.64	0.861	0.50 ( 0.47)	0.94	6338.4	13810.00
4	14809.45	47.04	0.683	0.50 ( 0.48)	0.95	11161.0	10400.00
5	14362.06	58.42	0.606	0.50 ( 0.48)	0.96	15442.3	50300.00
6	13382.00	72.90	0.552	0.50 ( 0.48)	0.96	21486.1	20400.00
7	11794.53	95.64	0.482	0.50 ( 0.48)	0.96	29505.6	11801.00
8	11180.25	107.80	0.457	0.50 ( 0.48)	0.96	33507.2	11500.00
9	10529.87	120.66	0.432	0.50 ( 0.48)	0.96	38176.0	11000.00
10	9830.61	136.05	0.414	0.50 ( 0.48)	0.96	44981.2	13000.00
11	8741.26	154.43	0.392	0.50 ( 0.48)	0.97	52227.1	11130.00
12	8224.21	163.27	0.382	0.50 ( 0.49)	0.97	54923.0	13510.00
13	6912.35	184.56	0.360	0.50 ( 0.49)	0.97	60614.3	12400.00
14	6184.07	195.14	0.354	0.50 ( 0.49)	0.97	62561.6	13500.00
15	5428.69	207.59	0.347	0.50 ( 0.49)	0.97	64227.3	12111.00
16	4495.45	225.34	0.337	0.50 ( 0.49)	0.97	66154.2	12261.00
17	4022.73	235.93	0.332	0.50 ( 0.49)	0.97	66966.0	10200.00
18	3454.06	253.03	0.322	0.50 ( 0.49)	0.97	68203.4	10300.00
19	3220.77	260.68	0.318	0.50 ( 0.49)	0.97	68554.5	12010.00
20	2734.95	283.21	0.306	0.50 ( 0.49)	0.97	68883.8	12000.00
21	1728.62	358.01	0.265	0.50 ( 0.49)	0.97	69554.0	10100.00

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 17.0 Release Date: 07/01/2010 License ID 1527

Analysis prepared by:

FILE NAME: S1.DAT
TIME/DATE OF STUDY: 10:21 04/01/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 36.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 14

- 1) 5.00; 4.728
2) 10.00; 3.040
3) 15.00; 2.074
4) 20.00; 1.785
5) 25.00; 1.539
6) 30.00; 1.352
7) 40.00; 1.181
8) 50.00; 1.062
9) 60.00; 0.981
10) 90.00; 0.840
11) 120.00; 0.769
12) 180.00; 0.660
13) 360.00; 0.514
14) 1440.00; 0.233

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
Table with columns: NO., WIDTH (FT), CROSSFALL (FT), IN- / SIDE, OUT- / SIDE, / WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), LIP (FT), GEOMETRIES HIKE (FT), MANNING FACTOR (n)

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*

FLOW PROCESS FROM NODE 10100.00 TO NODE 10101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 934.06
ELEVATION DATA: UPSTREAM(FEET) = 3351.52 DOWNSTREAM(FEET) = 3172.56

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.152
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS Tc
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" - 3.55 0.30 1.000 0 15.15
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
SUBAREA RUNOFF(CFS) = 5.64
TOTAL AREA (ACRES) = 3.55 PEAK FLOW RATE (CFS) = 5.64

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FLOW PROCESS FROM NODE 10101.00 TO NODE 10102.00 IS CODE = 56

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3172.56 DOWNSTREAM(FEET) = 3090.55
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.40 CHANNEL SLOPE = 0.0870
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.47
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.836
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ LAND USE SCS SOIL AREA Fp Ap SCS
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 19.22 0.30 1.000 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.98
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 3.97
AVERAGE FLOW DEPTH(FEET) = 0.44 TRAVEL TIME(MIN.) = 3.96
Tc(MIN.) = 19.11
SUBAREA AREA(ACRES) = 19.22 SUBAREA RUNOFF(CFS) = 26.58
EFFECTIVE AREA(ACRES) = 22.77 AREA-AVERAGED Fm(INCH/HR) = 0.30
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 22.8 PEAK FLOW RATE(CFS) = 31.49
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.59

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.59 FLOW VELOCITY(FEET/SEC.) = 4.75
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10102.00 = 1876.46 FEET.

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FLOW PROCESS FROM NODE 10102.00 TO NODE 10103.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3090.55 DOWNSTREAM(FEET) = 3022.44  
CHANNEL LENGTH THRU SUBAREA(FEET) = 920.65 CHANNEL SLOPE = 0.0740  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.78

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.680

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	21.52	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 44.87

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.08

AVERAGE FLOW DEPTH(FEET) = 0.77 TRAVEL TIME(MIN.) = 3.02

Tc(MIN.) = 22.13

SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 26.73

EFFECTIVE AREA(ACRES) = 44.29 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 44.3 PEAK FLOW RATE(CFS) = 55.02

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 0.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 0.86 FLOW VELOCITY(FEET/SEC.) = 5.46

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 2797.11 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 3022.44 DOWNSTREAM(FEET) = 2962.57  
CHANNEL LENGTH THRU SUBAREA(FEET) = 977.87 CHANNEL SLOPE = 0.0612  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.51

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.560

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	126.78	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 127.06

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.69

AVERAGE FLOW DEPTH(FEET) = 1.47 TRAVEL TIME(MIN.) = 2.44

Tc(MIN.) = 24.56

SUBAREA AREA(ACRES) = 126.78 SUBAREA RUNOFF(CFS) = 143.82

EFFECTIVE AREA(ACRES) = 171.07 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 171.1 PEAK FLOW RATE(CFS) = 194.07

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
\*ESTIMATED CHANNEL HEIGHT(FEET) = 1.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 1.86 FLOW VELOCITY(FEET/SEC.) = 7.62

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 3774.98 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2962.57 DOWNSTREAM(FEET) = 2917.85  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1864.94 CHANNEL SLOPE = 0.0240  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.79

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.68	0.30	1.000	-

SUBAREA AVERAGE PVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 247.80

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.88

AVERAGE FLOW DEPTH(FEET) = 2.73 TRAVEL TIME(MIN.) = 5.28

Tc(MIN.) = 29.85

SUBAREA AREA(ACRES) = 112.68 SUBAREA RUNOFF(CFS) = 107.26

EFFECTIVE AREA(ACRES) = 283.75 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 283.8 PEAK FLOW RATE(CFS) = 270.11

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 2.86

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 2.86 FLOW VELOCITY(FEET/SEC.) = 6.02

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 5639.92 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 10105.00 TO NODE 10105.50 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2917.85 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1406.97 CHANNEL SLOPE = 0.0269  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.21

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.295

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	183.39	0.30	1.000	-



SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 352.27  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.76  
 AVERAGE FLOW DEPTH(FEET) = 3.18 TRAVEL TIME(MIN.) = 3.47  
 Tc(MIN.) = 33.32  
 SUBAREA AREA(ACRES) = 183.39 SUBAREA RUNOFF(CFS) = 164.28  
 EFFECTIVE AREA(ACRES) = 467.14 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 467.1 PEAK FLOW RATE(CFS) = 418.45  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.48

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.48 FLOW VELOCITY(FEET/SEC.) = 7.10  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.50 = 7046.89 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10105.50 TO NODE 10106.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2868.10  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1701.11 CHANNEL SLOPE = 0.0070  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 5.03  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.185

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	60.63	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 442.61  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.40  
 AVERAGE FLOW DEPTH(FEET) = 5.02 TRAVEL TIME(MIN.) = 6.44  
 Tc(MIN.) = 39.76  
 SUBAREA AREA(ACRES) = 60.63 SUBAREA RUNOFF(CFS) = 48.30  
 EFFECTIVE AREA(ACRES) = 527.77 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 527.8 PEAK FLOW RATE(CFS) = 420.47  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.89

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 4.89 FLOW VELOCITY(FEET/SEC.) = 4.34  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 8748.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2868.10 DOWNSTREAM(FEET) = 2781.28  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2951.00 CHANNEL SLOPE = 0.0294  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.61  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.106

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	123.11	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 465.15  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 7.55  
 AVERAGE FLOW DEPTH(FEET) = 3.59 TRAVEL TIME(MIN.) = 6.52  
 Tc(MIN.) = 46.28  
 SUBAREA AREA(ACRES) = 123.11 SUBAREA RUNOFF(CFS) = 89.35  
 EFFECTIVE AREA(ACRES) = 650.88 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 650.9 PEAK FLOW RATE(CFS) = 472.37  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 3.62

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH(FEET) = 3.62 FLOW VELOCITY(FEET/SEC.) = 7.57  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 11699.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 56

-----  
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2781.28 DOWNSTREAM(FEET) = 2725.20  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2630.56 CHANNEL SLOPE = 0.0213  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.20  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.041

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	186.62	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 534.64  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.97  
 AVERAGE FLOW DEPTH(FEET) = 4.18 TRAVEL TIME(MIN.) = 6.29  
 Tc(MIN.) = 52.57  
 SUBAREA AREA(ACRES) = 186.62 SUBAREA RUNOFF(CFS) = 124.51  
 EFFECTIVE AREA(ACRES) = 837.50 AREA-AVERAGED Fm(INCH/HR) = 0.30  
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 837.5 PEAK FLOW RATE(CFS) = 558.75  
 GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT(FEET) = 4.28

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
DEPTH(FEET) = 4.28 FLOW VELOCITY(FEET/SEC.) = 7.05  
LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 14329.56 FEET.

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FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2725.20 DOWNSTREAM(FEET) = 2581.72  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2890.52 CHANNEL SLOPE = 0.0496  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.57  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.001

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	112.07	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 594.12

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 9.76

AVERAGE FLOW DEPTH(FEET) = 3.56 TRAVEL TIME(MIN.) = 4.94

Tc(MIN.) = 57.50

SUBAREA AREA(ACRES) = 112.07 SUBAREA RUNOFF(CFS) = 70.73

EFFECTIVE AREA(ACRES) = 949.57 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 949.6 PEAK FLOW RATE(CFS) = 599.33

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.57

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.57 FLOW VELOCITY(FEET/SEC.) = 9.78

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 17220.08 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 2581.72 DOWNSTREAM(FEET) = 2367.59  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2877.15 CHANNEL SLOPE = 0.0744  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.34  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.973

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	145.21	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 643.33

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 11.55

AVERAGE FLOW DEPTH(FEET) = 3.34 TRAVEL TIME(MIN.) = 4.15

Tc(MIN.) = 61.65

SUBAREA AREA(ACRES) = 145.21 SUBAREA RUNOFF(CFS) = 87.99

EFFECTIVE AREA(ACRES) = 1094.78 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1094.8 PEAK FLOW RATE(CFS) = 663.40

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.39

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.39 FLOW VELOCITY(FEET/SEC.) = 11.65

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 20097.23 FEET.

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FLOW PROCESS FROM NODE 10110.00 TO NODE 10111.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2367.59 DOWNSTREAM(FEET) = 2075.82  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2802.04 CHANNEL SLOPE = 0.1041  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.35

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.957

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	339.01	0.30	1.000	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 763.66

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 13.67

AVERAGE FLOW DEPTH(FEET) = 3.35 TRAVEL TIME(MIN.) = 3.42

Tc(MIN.) = 65.07

SUBAREA AREA(ACRES) = 339.01 SUBAREA RUNOFF(CFS) = 200.53

EFFECTIVE AREA(ACRES) = 1433.79 AREA-AVERAGED Fm(INCH/HR) = 0.30

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00

TOTAL AREA(ACRES) = 1433.8 PEAK FLOW RATE(CFS) = 848.11

GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0

"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT(FEET) = 3.53

END OF SUBAREA CHANNEL FLOW HYDRAULICS:

DEPTH(FEET) = 3.53 FLOW VELOCITY(FEET/SEC.) = 14.09

LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10111.00 = 22899.27 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 10111.00 TO NODE 10112.00 IS CODE = 56

-----  
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2075.82 DOWNSTREAM(FEET) = 2004.03  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3782.59 CHANNEL SLOPE = 0.0190  
GIVEN CHANNEL BASE(FEET) = 10.00 CHANNEL FREEBOARD(FEET) = 0.0  
"Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060

\*ESTIMATED CHANNEL HEIGHT (FEET) = 5.64  
 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.919  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 265.32 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 922.00  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.71  
 AVERAGE FLOW DEPTH (FEET) = 5.63 TRAVEL TIME (MIN.) = 8.17  
 Tc (MIN.) = 73.25  
 SUBAREA AREA (ACRES) = 265.32 SUBAREA RUNOFF (CFS) = 147.77  
 EFFECTIVE AREA (ACRES) = 1699.11 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 1699.1 PEAK FLOW RATE (CFS) = 946.29  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 5.70

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 5.70 FLOW VELOCITY (FEET/SEC.) = 7.77  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.00 = 26681.86 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.00 TO NODE 10112.50 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 2004.03 DOWNSTREAM (FEET) = 1982.04  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1479.53 CHANNEL SLOPE = 0.0149  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.29  
 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.903  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 307.63 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1029.75  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.25  
 AVERAGE FLOW DEPTH (FEET) = 6.29 TRAVEL TIME (MIN.) = 3.40  
 Tc (MIN.) = 76.65  
 SUBAREA AREA (ACRES) = 307.63 SUBAREA RUNOFF (CFS) = 166.90  
 EFFECTIVE AREA (ACRES) = 2006.74 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2006.7 PEAK FLOW RATE (CFS) = 1088.76  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.46

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.46 FLOW VELOCITY (FEET/SEC.) = 7.36  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10112.50 = 28161.39 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 10112.50 TO NODE 10222.00 IS CODE = 56  
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>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
 >>>>TRAVELTIME THRU SUBAREA<<<<<  
 =====

ELEVATION DATA: UPSTREAM (FEET) = 1982.04 DOWNSTREAM (FEET) = 1925.82  
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3416.13 CHANNEL SLOPE = 0.0165  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.40  
 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.868  
 SUBAREA LOSS RATE DATA (AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 USER-DEFINED - 127.40 0.30 1.000 -  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp (INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1121.33  
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 7.70  
 AVERAGE FLOW DEPTH (FEET) = 6.39 TRAVEL TIME (MIN.) = 7.39  
 Tc (MIN.) = 84.04  
 SUBAREA AREA (ACRES) = 127.40 SUBAREA RUNOFF (CFS) = 65.14  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA (ACRES) = 2134.1 PEAK FLOW RATE (CFS) = 1091.15  
 GIVEN CHANNEL BASE (FEET) = 10.00 CHANNEL FREEBOARD (FEET) = 0.0  
 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.060  
 \*ESTIMATED CHANNEL HEIGHT (FEET) = 6.31

END OF SUBAREA CHANNEL FLOW HYDRAULICS:  
 DEPTH (FEET) = 6.31 FLOW VELOCITY (FEET/SEC.) = 7.65  
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10222.00 = 31577.52 FEET.

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA (ACRES) = 2134.1 TC (MIN.) = 84.04  
 EFFECTIVE AREA (ACRES) = 2134.14 AREA-AVERAGED Fm (INCH/HR) = 0.30  
 AREA-AVERAGED Fp (INCH/HR) = 0.30 AREA-AVERAGED Ap = 1.000  
 PEAK FLOW RATE (CFS) = 1091.15  
 =====

END OF RATIONAL METHOD ANALYSIS