CEQA DRAINAGE STUDY

For

SKYLINE RETIREMENT CENTER
LA MESA, CA

Prepared for**:**

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CHAPTER 1 - EXECUTIVE SUMMARY

1.1 – Introduction

The Skyline Retirement Center project site is located east of Campo Rd. (State Route 94) and Via Mercado in the community of Rancho San Diego, California.

For drainage analysis, two (2) points of discharge (POD) have been designated within the project site for hydrologic analysis purposes.

This study analyzes existing and developed condition 100-year peak flowrates from the development to the POD-from the project site.

The project site lies outside any FEMA 100-year floodplain zones. Therefore, no Letters of Map Revision will be required.

Treatment of storm water runoff from the site has been addressed in a separate report - the “Storm Water Quality Management Plan for Skyline Retirement Center” by REC dated September 2017. Hydromodification (HMP) analysis has been presented within the “Technical Memorandum: SWMM Modeling for Skyline Retirement Center”, dated September 2017 by REC.

Per County of San Diego drainage criteria, the Modified Rational Method should be used to determine peak design flowrates when the contributing drainage area is less than 1.0 square mile. Since the total watershed area discharging from the site is less than 1.0 square mile, AES computer software was used to model the pre & post developed condition runoff response per the Modified Rational Method.

Methodology used for the computation of design rainfall events, runoff coefficients, and rainfall intensity values are consistent with criteria set forth in the “County of San Diego Drainage Design Manual”. A more detailed explanation of methodology used for this analysis is listed in Chapter 2 of this report.

Developed condition peak flows were calculated using AES 2015. The corresponding hydrographs were generated using the RickRat Hydro program by Rick Engineering. Hydraulic Modified-Puls detention basin routing of the AES 2015 rational method hydrology was performed using the Army Corps of Engineers HEC-HMS software.

1.2 – Summary of Existing Conditions

In existing conditions, the Skyline Retirement Center project site is an undisturbed-lightly vegetated site.

Runoff from the existing site flows to one (1) of two (2) PODs. POD 1 is a manhole located downstream of the outlet of an existing brow ditch. The brow ditch conveys runoff from the POD 1 tributary area.

POD 2 is a junction structure located beneath the driveway entrance/exit to the adjacent Skyline Church. POD 2 receives runoff the existing natural drainage channel located adjacent to the southeastern project boundary. The runoff is conveyed to POD-2 via one of two existing culverts. There is no run-on from the adjacent parking lot located along the southwestern project boundary. The project site ultimately drains to the receiving Sweetwater Creek/Reservoir located approximately 1 mile east.

There are both A and D-type soils located within the tributary area to POD-1. Per County of San Diego criteria: a weighted coefficient value of 0.29 was calculated. See weighted calculations in Chapter 2.3. The tributary area to POD-2 contains only D-type soils, therefore, per County of San Diego criteria 0.35 was the assumed runoff coefficient. Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the project site is 2.65 inches.

Table 1 below summarizes the existing condition design 100-year peak flow from the project site.

Table 1– SUMMARY OF EXISTING CONDITIONS FLOWS

Discharge Location	Drainage Area (Ac)	Impervious Percentage	Runoff Coefficient (C)	100-Year Peak Flow (cfs)
POD-1	9.83	0.8%	0.29	14.2
POD-2	1.72	0%	0.35	2.9
TOTAL	**11.55**	**-**	**-**	**17.1**

1.3 – Summary of Developed Conditions

The Skyline Retirement Center project proposes the construction of 232 dwelling units, access road/parking lot, and landscaped/undisturbed areas.

The tributary area draining to POD-1 includes both developed and undisturbed/bypass areas. Developed flow runoff is conveyed via street flow to one (1) of three (3) BMPs (BMPs 1-3), for both treatment and detention. Runoff from the bypass area is conveyed directly to POD-1 via a series of brow ditches and stormdrain thus bypassing treatment. Note that the total area tributary to POD-1 increased compared to existing conditions as a result of proposed offsite improvements, along the southern boundary, consisting of a sidewalk and DG path

Tributary area to POD-2 also increased compared to existing conditions. Land usage (i.e. undisturbed natural channel) remained as in existing conditions. The additional area resulted in a longer time of concentration (Tc) compared to existing conditions. As such, the peak flow was lower compared to existing conditions. Thus, no routing was is necessary.

Per County of San Diego criteria: 0.90 (impervious), 0.20 (Type A soils), and 0.35 (Type D soils), were the assumed runoff coefficient values used in the determination of the weighted coefficient values for the area tributary to POD-1. The runoff coefficient for the tributary area to POD-2 remains as in existing conditions, 0.35. See weighted calculations in Chapter 2.3

Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the project site is 2.65 inches.

Table 2 below summarizes the developed condition design 100-year peak flow from the project site.

Table 2– SUMMARY OF DEVELOPED CONDITIONS FLOWS-UNMITIGATED

Discharge Location	Drainage Area (Ac)	Runoff Coefficient (C)	100-Year Peak Flow (cfs)
POD-1	10.02	0.57/0.26	19.89
POD-2	1.80	0.35	2.51
Total	**11.82**	**-**	**22.40**

Prior to discharging from the site, first flush runoff will be treated via three (3) biofiltration with partial retention based BMPs in accordance with standards set forth by the Regional Water Quality Control Board and the County of San Diego's BMP Design Manual (see "Storm Water Quality Management Plan for Skyline Retirement Center").

Three (3) LID biofiltration basins are located within the project site and are responsible for addressing peak flow and hydromodification requirements for the project. In developed conditions, the basins will have surface ponding and riser spillway structures (see dimensions in Tables 3 and 4). Flows will then discharge from the basin via the outlet structures or infiltrate through the base the facility to the receiving amended soil and low flow orifice. The riser structure will act as a spillway such that peak flows can be safely discharged to the receiving storm drain systems.

Beneath the basins' invert lies the proposed LID biofiltration portion of the drainage facility. This portion of the basin is comprised of a 3-inch layer of mulch, an 18-inch layer of amended soil (a highly sandy, organic rich composite with an infiltration capacity of at least 5 inches/hr) and a layer of gravel.

Table 3– SUMMARY OF BMP BASIN DIMENSIONS

BMP	Tributary Area (Ac)	DIMENSIONS					
		BMP Area[(1)], (ft^2)	Low Flow Orifice (in)	Gravel Depth [(5)](in)	Depth Riser Invert (ft)[(2)]	Weir Perimeter Length[(3)] (ft)	Total Surface Depth[(4)] (ft)
BMP-1	2.20	1,509	1.0	27	2.25	8.00	2.50
BMP-2	3.55	4,364	1.5	27	2.00	12.00	2.50
BMP-3	1.33	1,411	0.875	30	2.00	8.00	2.50

Notes:
(1): Area of amended soil = area of gravel = area of the BMP
(2): Depth of ponding beneath riser structure's surface spillway to bottom of mulch layer.
(3): Overflow length, the internal perimeter of the square riser.
(4): Total surface depth of BMP from bottom of mulch layer to crest elevation.
(5): Gravel depth includes the dead storage below the LID orifice (9-inches for BMP 1 and 2. 12-inches for BMP-3) and 6 inches of gravel/sand filter layers. See Basin detail on attachment 5.

Table 4– SUMMARY OF OUTLET DETAILS

Lower Outlet				Middle Slot		Upper Slot		Top Riser	
Basin	Type	B x H (in), #-Dia (in)	Elev. (ft)[(1)]	B x H (in), #-Dia (in)	Elev. (ft)[(1)]	B x H (in), #-Dia (in)	Elev. (ft)[(1)]	Length[(2)] (ft)	Elev.[(1)] (ft)
BMP 1	Orifice	2 – 0.75	0.50	6 x 2	1.00	30 x 3	1.33	8	2.25
BMP 2	Slot	36 x 3	0.75	n/a	n/a	n/a	n/a	12	2.00
BMP 3	Slot	12 x 2	0.50	n/a	n/a	n/a	n/a	8	2.00

Notes:
(1): Basin ground surface elevation assumed to be 0.00 ft elevation.
(2): Overflow length is the internal perimeter of the riser structure.

The developed condition peak flows were calculated using the modified rational method. The corresponding hydrographs were generated using the RickRat Hydro program by Rick Engineering. These hydrographs were then routed through the proposed on-site detention facilities in HEC-HMS. The HMS Modified-Puls results are summarized in Table 5.

Table 5– SUMMARY OF DETENTION BASIN ROUTING

Detention Basin	100-Year Peak Inflow (cfs)	100-Year Peak Outflow (cfs)	Peak Water Surface Elevation (ft)
BMP-1	5.29	3.02	1.64
BMP-2	11.47	3.75	1.17
BMP-3	4.29	1.45	1.57

It should be noted that as a conservative design approach, it has been assumed that the 85th percentile water quality event volume was stored in the detention facilities prior to the routing of the 100-year event storm. The volumes are a conservative hydraulic design methodology only – for water quality discussion and BMP sizing analysis, please refer to the site specific SWQMP.

Additionally, as the detention facilities are multiple-purpose water quality BMPs, there is available storage provided in the biofiltration layers of the basins – namely the engineered fill soil layer and the underlying gravel base layer. As HEC-HMS uses an elevation-storage-discharge function to model the basin volume (stage-storage) and basin discharge (stage-discharge) relationships, the available storage volume provided by these aforementioned sub-layers is accounted for by reducing the total sub-basin volume by the corresponding void ratio for each layer (0.4 for gravel and 0.3 for soil respectively).

Rational method hydrographs, stage-storage, stage-discharge relationships and HEC-HMS model output is provided in Chapter 5 of this report.

1.4 – Summary of Results

Table 6 summarizes developed and existing condition drainage areas and resultant 100-year peak flow rates at the POD from the Skyline Retirement Center project. Per County of San Diego rainfall isopluvial maps, the design 100-year rainfall depth for the site area is 2.65 inches.

Table 6– SUMMARY OF PEAK FLOWS

Discharge Location	Area (ac)			100 Year Peak Flow (cfs)		
	Existing	Developed	Difference	Existing	Developed	Difference
POD-1	9.83	10.02	+0.19	14.2	9.28	-4.92
POD-2	1.72	1.80	+0.08	2.9	2.54	-0.36
Total	**11.55**	**11.82**	**+0.27**	**17.1**	**11.82**	**-5.28**

As shown in the above table, the proposed Skyline Retirement Center project site will result in a net decrease of peak flow discharged from the project site by approximately 5.28cfs.

All developed runoff will receive water quality treatment in accordance with the site specific SWQMP.

Final design details will be provided at the final engineering phase of the development.

1.5 – Conclusions

This report has been prepared in accordance with the County of San Diego Hydrology Manual. This report has evaluated and addressed the potential impacts and proposed mitigation measures. A summary of the facts and findings associated with this project and the measures addressed by this report is as follows:

- The project will not alter drainage patterns on the site or increase runoff after development.
- The ultimate discharge points will not be changed.
- Graded areas and slopes will be hydroseeded to reduce or eliminate sediment discharge.
- Identify and discuss, with appropriate backup/research information, the following question item by item for CEQA purposes. Would the project:

A. Substantially alter the existing drainage patterns of the site or area, including through the alteration if the course of a stream or river, in a manner which would result in substantial erosion or siltation on – or off-site?

The project does not substantially alter the existing drainage pattern of the area and does not alter the course of a stream or river.
The storm drain system for the entire project is designed to route and convey all resulting runoff from developed conditions to existing points of discharge.

B. Substantially alter the existing drainage patterns of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The project will not substantially alter the existing drainage pattern of the area as it will not alter the course of a stream or river, and also will not substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding.

C. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems?

No. All project discharge points release water at rates less than or equal to existing conditions.

D. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps? For example; research the foregoing and provide same (to indicate applicability or not) in the study?

The project does not place any housing within a 100-year flood hazard area.

E. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

There are no structures proposed within a 100-year flood hazard area.

F. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam on-sit or off-site?

NA

1.6 – References

"*County of San Diego Hydrology Manual*", June 2003

"*Stormwater Quality Management Plan for Skyline Retirement Center*", dated April 2016 by REC Consultants.

"*Technical Memorandum: SWMM Modeling for Skyline Retirement Center*", dated April 2016 by REC Consultants

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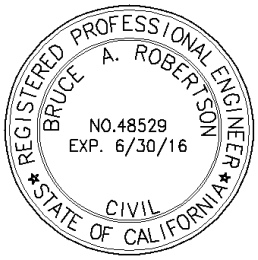
1.7 – Declaration of Responsible Charge

THIS PRELIMINARY DRAINAGE STUDY HAS BEEN PREPARED UNDER THE DIRECTION OF THE FOLLOWING REGISTERED CIVIL ENGINEER. THE REGISTERED ENGINEER ATTESTS TO THE TECHNICAL INFORMATION CONTAINED HEREIN AND THE ENGINEERING DATA UPON WHICH RECOMMENDATIONS, CONCLUSIONS, AND DECISIONS ARE BASED.



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CHAPTER 2 - METHODOLOGY

2.1 – County of San Diego Design Criteria

SECTION 3
RATIONAL METHOD AND MODIFIED RATIONAL METHOD

3.1 THE RATIONAL METHOD

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage, where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and small drainage structures. The RM is recommended for analyzing the runoff response from drainage areas up to approximately 1 square mile in size. It should not be used in instances where there is a junction of independent drainage systems or for drainage areas greater than approximately 1 square mile in size. In these instances, the Modified Rational Method (MRM) should be used for junctions of independent drainage systems in watersheds up to approximately 1 square mile in size (see Section 3.4); or the NRCS Hydrologic Method should be used for watersheds greater than approximately 1 square mile in size (see Section 4).

The RM can be applied using any design storm frequency (e.g., 100-year, 50-year, 10-year, etc.). The local agency determines the design storm frequency that must be used based on the type of project and specific local requirements. A discussion of design storm frequency is provided in Section 2.3 of this manual. A procedure has been developed that converts the 6-hour and 24-hour precipitation isopluvial map data to an Intensity-Duration curve that can be used for the rainfall intensity in the RM formula as shown in Figure 3-1. The RM is applicable to a 6-hour storm duration because the procedure uses Intensity-Duration Design Charts that are based on a 6-hour storm duration.

3.1.1 Rational Method Formula

The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (T_c), which is the time required for water to

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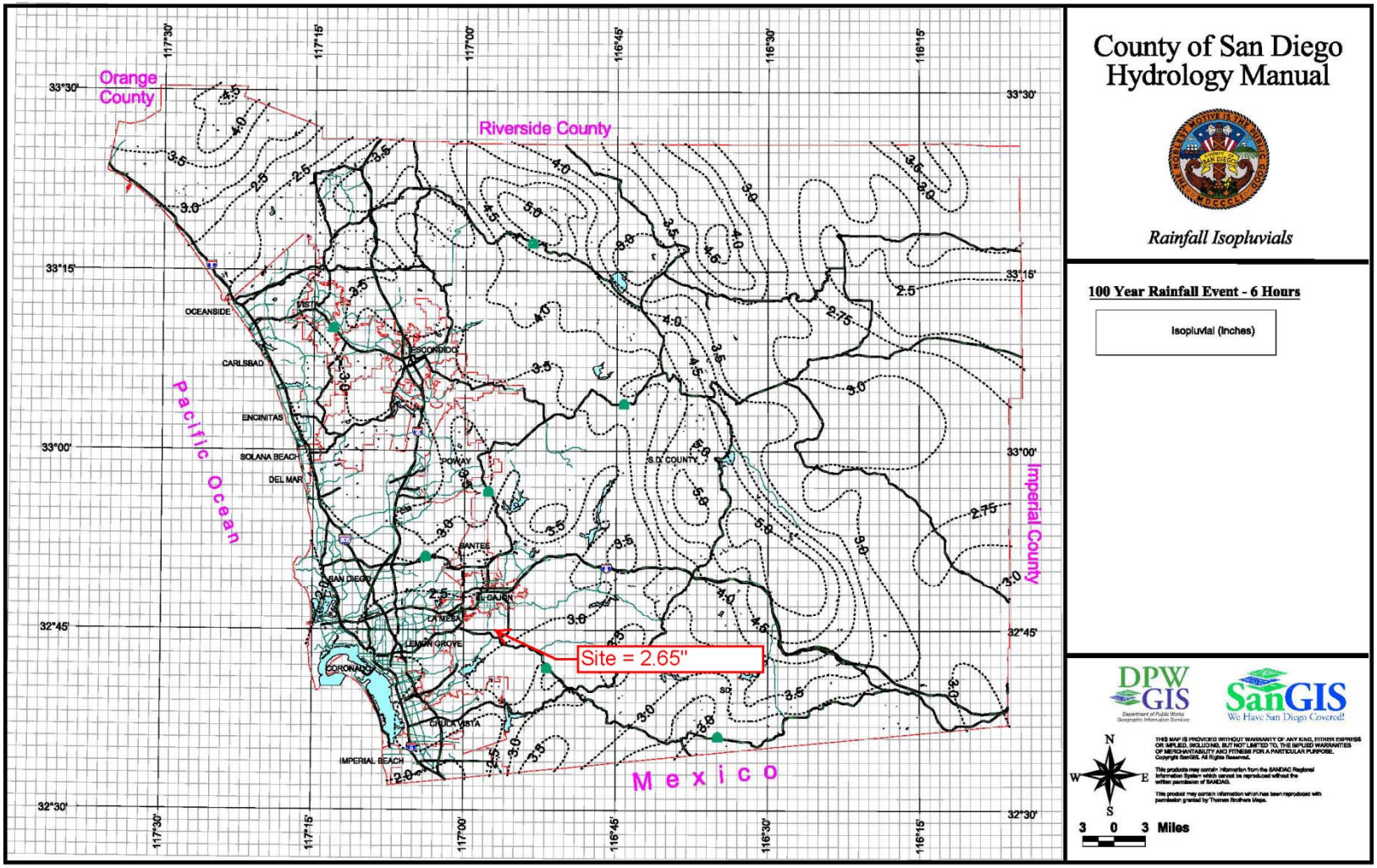
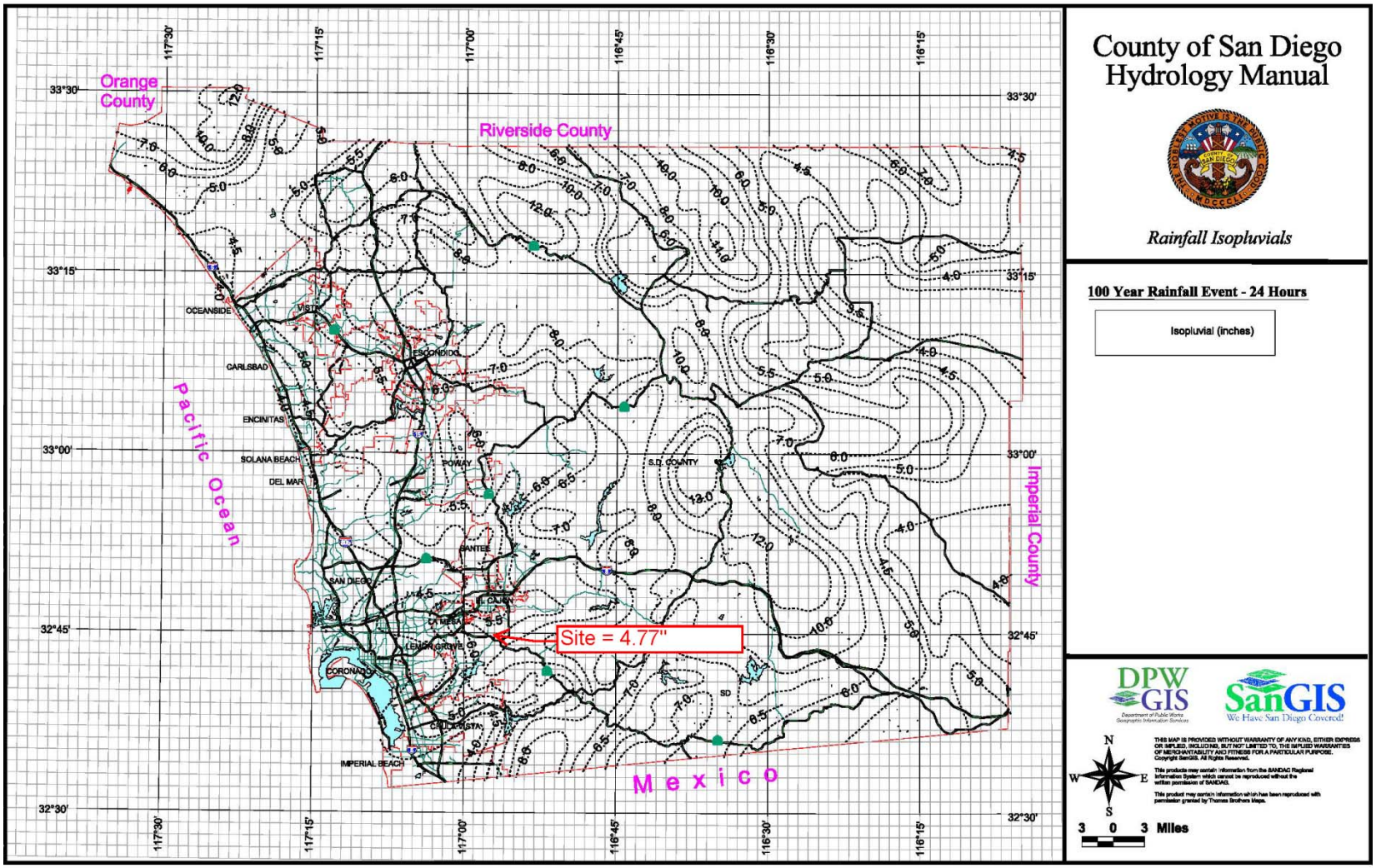
2.2 – Design Rainfall Determination

2.2.1 – 100-Year, 6-Hour Rainfall Isopluvial Map



2.2.2 – 100-Year, 24-Hour Rainfall Isopluvial Map



2.3 – Runoff Coefficient Determination

PRE DEVELOPED AREAS

	Impervious				Type A HSG			Type D HSG					
Area	Area (sq.ft)	Area (ac)	C	%Imp	Area (sq.ft)	Area (ac)	C	Area (sq.ft)	Area (ac)	C	Cp	Total Area (ac)	Weighted C
DMA-1	3283	0.08	0.9	0.8%	192564	4.42	0.20	232138	5.33	0.35	0.28	9.83	0.29
DMA-2						0.00	0.20	74966	1.72	0.35	0.35	1.72	0.35
Total		0.08				4.4			7.1			11.55	

Note: Formula used in Weighted C is per San Diego County Hydrology Manual (2003): C = 0.90*(%Impervious) + Cp*(1-%Impervious)

POST DEVELOPED AREAS

	Impervious				Type A HSG			Type D HSG					
Area	Area (sq.ft)	Area (ac)	C	%Imp	Area (sq.ft)	Area (ac)	C	Area (sq.ft)	Area (ac)	C	Cp	Total Area (ac)	Weighted C
DMA-1	142241	3.27	0.9	46.4%	70107	1.61	0.20	94267	2.16	0.35	0.29	7.04	0.57
DMA-1 Bypass	0	0.00	0.9	0.0%	74080	1.70	0.20	55640	1.28	0.35	0.26	2.98	0.26
DMA-2	0	0.00	1.9	0.0%	0	0.00	0.20	78353	1.80	1.35	1.35	1.80	1.35
		3.3				3.3			5.2			11.82	

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

- The storm frequency of peak discharges is the same as that of I for the given T_c.

- The fraction of rainfall that becomes runoff (or the runoff coefficient, C) is independent of I or precipitation zone number (PZN) condition (PZN Condition is discussed in Section 4.1.2.4).

- The peak rate of runoff is the only information produced by using the RM.

3.1.2 Runoff Coefficient

Table 3-1 lists the estimated runoff coefficients for urban areas. The concepts related to the runoff coefficient were evaluated in a report entitled *Evaluation, Rational Method "C" Values* (Hill, 2002) that was reviewed by the Hydrology Manual Committee. The Report is available at San Diego County Department of Public Works, Flood Control Section and on the San Diego County Department of Public Works web page.

The runoff coefficients are based on land use and soil type. Soil type can be determined from the soil type map provided in Appendix A. An appropriate runoff coefficient (C) for each type of land use in the subarea should be selected from this table and multiplied by the percentage of the total area (A) included in that class. The sum of the products for all land uses is the weighted runoff coefficient (Σ[CA]). Good engineering judgment should be used when applying the values presented in Table 3-1, as adjustments to these values may be appropriate based on site-specific characteristics. In any event, the impervious percentage (% Impervious) as given in the table, for any area, shall govern the selected value for C. The runoff coefficient can also be calculated for an area based on soil type and impervious percentage using the following formula:

$$C = 0.90 \times (\% \text{ Impervious}) + C_p \times (1 - \% \text{ Impervious})$$

Where: C_p = Pervious Coefficient Runoff Value for the soil type (shown in Table 3-1 as Undisturbed Natural Terrain/Permanent Open Space, 0% Impervious). Soil type can be determined from the soil type map provided in Appendix A.

The values in Table 3-1 are typical for most urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the local agency.

2.4 – Urban Watershed Overland Time of flow Nomograph

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

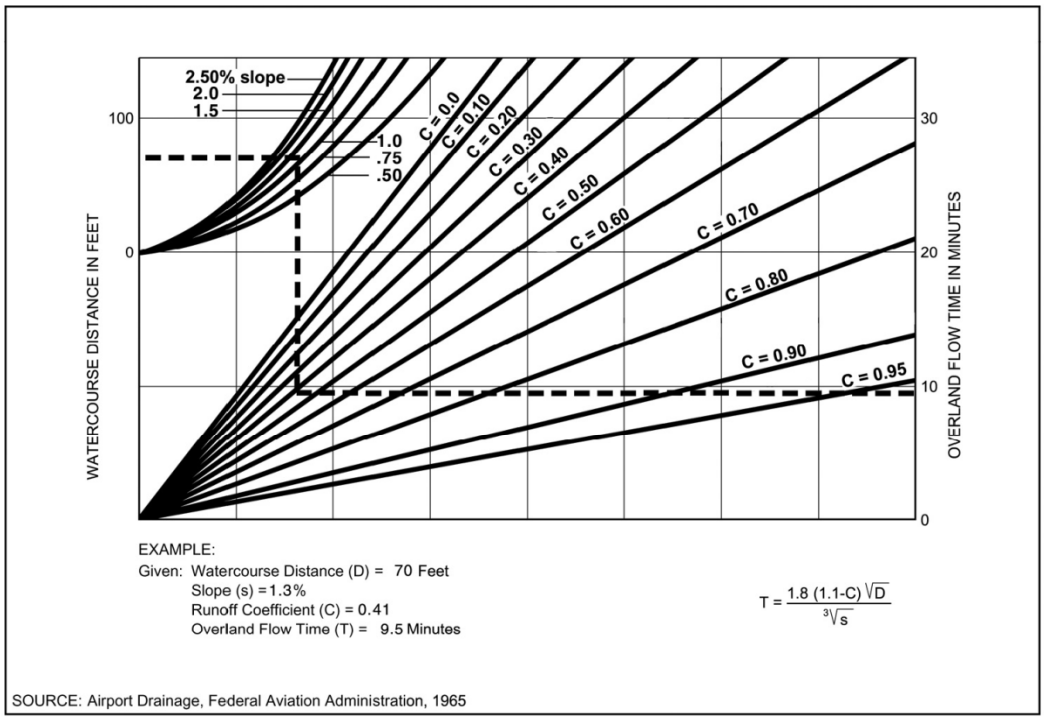
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

**MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)**

Element*	DU/	.5%		1%		2%		3%		5%		10%	
	Acre	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

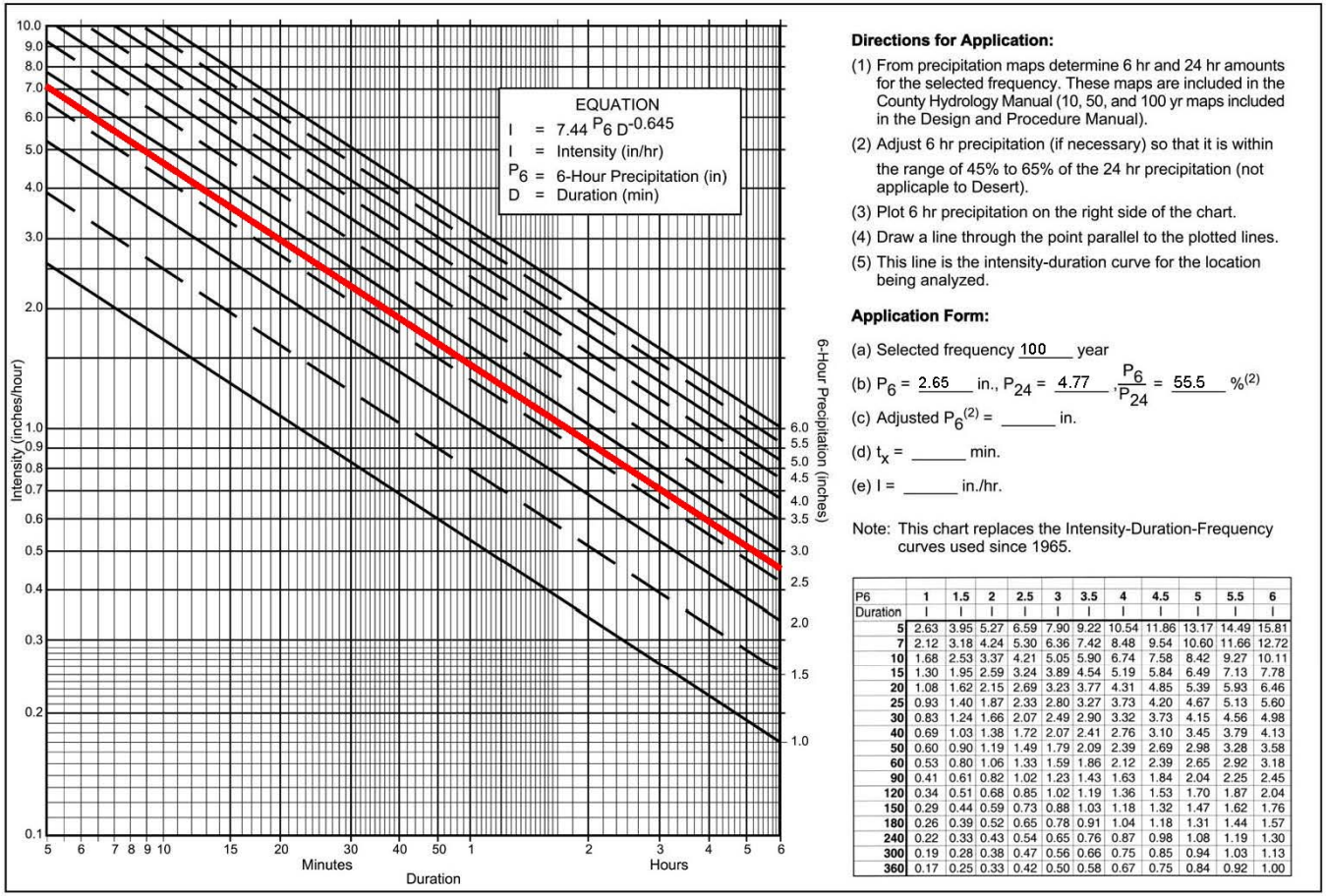
*See Table 3-1 for more detailed description



Rational Formula - Overland Time of Flow Nomograph

FIGURE
3-3

2.5 – County of San Diego Intensity- Duration Curve



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.65 in., P_{24} = 4.77, $\frac{P_6}{P_{24}}$ = 55.5 %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

2.6 – Model Development Summary (from County of San Diego Hydrology Manual)

3.2 DEVELOPING INPUT DATA FOR THE RATIONAL METHOD

This section describes the development of the necessary data to perform RM calculations. Section 3.3 describes the RM calculation process. Input data for calculating peak flows and T_c's with the RM should be developed as follows:

1. On a topographic base map, outline the overall drainage area boundary, showing adjacent drains, existing and proposed drains, and overland flow paths.

2. Verify the accuracy of the drainage map in the field.

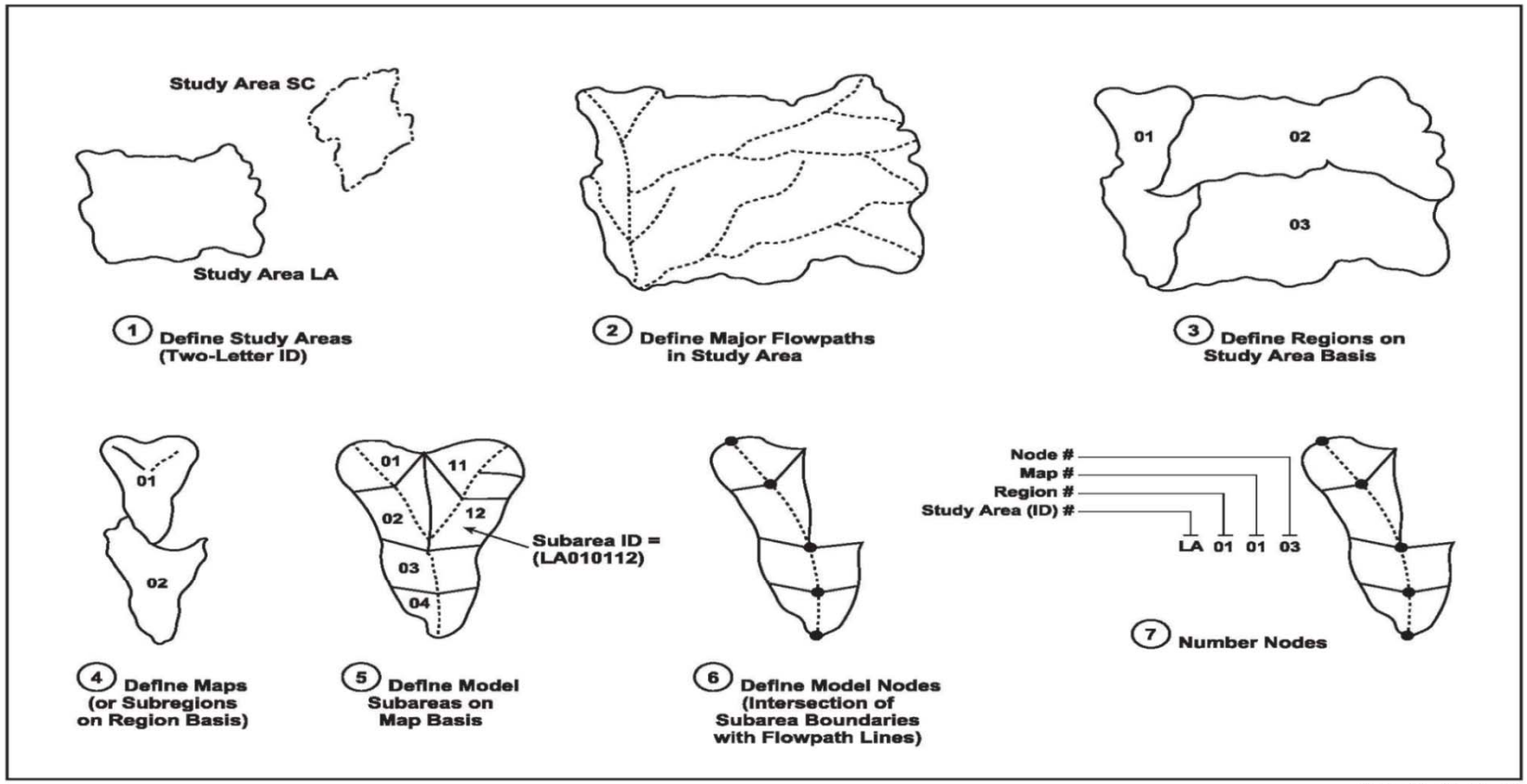
3. Divide the drainage area into subareas by locating significant points of interest. These divisions should be based on topography, soil type, and land use. Ensure that an appropriate first subarea is delineated. For natural areas, the first subarea flow path length should be less than or equal to 4,000 feet plus the overland flow length (Table 3-2). For developed areas, the initial subarea flow path length should be consistent with Table 3-2. The topography and slope within the initial subarea should be generally uniform.

4. Working from upstream to downstream, assign a number representing each subarea in the drainage system to each point of interest. Figure 3-8 provides guidelines for node numbers for geographic information system (GIS)-based studies.

5. Measure each subarea in the drainage area to determine its size in acres (A).

6. Determine the length and effective slope of the flow path in each subarea.

7. Identify the soil type for each subarea.



GIS/Hydrologic Model
Data Base Linkage Setup:
Nodes, Subareas, Links

FIGURE
3-8

8. Determine the runoff coefficient (C) for each subarea based on Table 3-1. If the subarea contains more than one type of development classification, use a proportionate average for C. In determining C for the subarea, use future land use taken from the applicable community plan, Multiple Species Conservation Plan, National Forest land use plan, etc.

9. Calculate the CA value for the subarea.

10. Calculate the Σ(CA) value(s) for the subareas upstream of the point(s) of interest.

11. Determine P_6 and P_{24} for the study using the isopluvial maps provided in Appendix B. If necessary, adjust the value for P_6 to be within 45% to 65% of the value for P_{24}.

See Section 3.3 for a description of the RM calculation process.

3.3 Performing Rational Method Calculations

This section describes the RM calculation process. Using the input data, calculation of peak flows and T_c's should be performed as follows:

1. Determine T_i for the first subarea. Use Table 3-2 or Figure 3-3 as discussed in Section 3.1.4. If the watershed is natural, the travel time to the downstream end of the first subarea can be added to T_i to obtain the T_c. Refer to paragraph 3.1.4.2 (a).

2. Determine I for the subarea using Figure 3-1. If T_i was less than 5 minutes, use the 5 minute time to determine intensity for calculating the flow.

3. Calculate the peak discharge flow rate for the subarea, where $Q_p = \Sigma(CA)\, I$.
In case that the downstream flow rate is less than the upstream flow rate, due to the long travel time that is not offset by the additional subarea runoff, use the upstream peak flow for design purposes until downstream flows increase again.

4. Estimate the T_t to the next point of interest.

5. Add the T_t to the previous T_c to obtain a new T_c.

6. Continue with step 2, above, until the final point of interest is reached.

Note: The MRM should be used to calculate the peak discharge when there is a junction from independent subareas into the drainage system.

3.4 MODIFIED RATIONAL METHOD (FOR JUNCTION ANALYSIS)

The purpose of this section is to describe the steps necessary to develop a hydrology report for a small watershed using the MRM. It is necessary to use the MRM if the watershed contains junctions of independent drainage systems. The process is based on the design manuals of the City/County of San Diego. The general process description for using this method, including an example of the application of this method, is described below.

The engineer should only use the MRM for drainage areas up to approximately 1 square mile in size. If the watershed will significantly exceed 1 square mile then the NRCS method described in Section 4 should be used. The engineer may choose to use either the RM or the MRM for calculations for up to an approximately 1-square-mile area and then transition the study to the NRCS method for additional downstream areas that exceed approximately 1 square mile. The transition process is described in Section 4.

3.4.1 Modified Rational Method General Process Description

The general process for the MRM differs from the RM only when a junction of independent drainage systems is reached. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction are calculated by the RM. The independent drainage systems are then combined using the MRM procedure described below. The peak Q, T_c, and I for each of the independent drainage systems at the point of the junction must be calculated prior to using the MRM procedure to combine the independent drainage systems, as these

values will be used for the MRM calculations. After the independent drainage systems have been combined, RM calculations are continued to the next point of interest.

3.4.2 Procedure for Combining Independent Drainage Systems at a Junction

Calculate the peak Q, T_c, and I for each of the independent drainage systems at the point of the junction. These values will be used for the MRM calculations.

At the junction of two or more independent drainage systems, the respective peak flows are combined to obtain the maximum flow out of the junction at T_c. Based on the approximation that total runoff increases directly in proportion to time, a general equation may be written to determine the maximum Q and its corresponding T_c using the peak Q, T_c, and I for each of the independent drainage systems at the point immediately before the junction. The general equation requires that contributing Q's be numbered in order of increasing T_c.

Let Q_1, T_1, and I_1 correspond to the tributary area with the shortest T_c. Likewise, let Q_2, T_2, and I_2 correspond to the tributary area with the next longer T_c; Q_3, T_3, and I_3 correspond to the tributary area with the next longer T_c; and so on. When only two independent drainage systems are combined, leave Q_3, T_3, and I_3 out of the equation. Combine the independent drainage systems using the junction equation below:

Junction Equation: $T_1 < T_2 < T_3$

$$Q_{T1} = Q_1 + \frac{T_1}{T_2} Q_2 + \frac{T_1}{T_3} Q_3$$

$$Q_{T2} = Q_2 + \frac{I_2}{I_1} Q_1 + \frac{T_2}{T_3} Q_3$$

$$Q_{T3} = Q_3 + \frac{I_3}{I_1} Q_1 + \frac{I_3}{I_2} Q_2$$

Calculate Q_{T1}, Q_{T2}, and Q_{T3}. Select the largest Q and use the T_c associated with that Q for further calculations (see the three Notes for options). If the largest calculated Q's are equal (e.g., $Q_{T1} = Q_{T2} > Q_{T3}$), use the shorter of the T_c's associated with that Q.

This equation may be expanded for a junction of more than three independent drainage systems using the same concept. The concept is that when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a shorter T_c (e.g., Q_1), the Q from the subarea with the shorter T_c is reduced by the ratio of the I's (I_2/I_1); and when Q from a selected subarea (e.g., Q_2) is combined with Q from another subarea with a longer T_c (e.g., Q_3), the Q from the subarea with the longer T_c is reduced by the ratio of the T_c's (T_2/T_3).

Note #1: At a junction of two independent drainage systems that have the same T_c, the tributary flows may be added to obtain the Q_p.

$$Q_p = Q_1 + Q_2 \text{; when } T_1 = T_2 \text{; and } T_c = T_1 = T_2$$

This can be verified by using the junction equation above. Let Q_3, T_3, and $I_3 = 0$. When T_1 and T_2 are the same, I_1 and I_2 are also the same, and T_1/T_2 and $I_2/I_1 = 1$. T_1/T_2 and I_2/I_1 are cancelled from the equations. At this point, $Q_{T1} = Q_{T2} = Q_1 + Q_2$.

Note #2: In the upstream part of a watershed, a conservative computation is acceptable. When the times of concentration (T_c's) are relatively close in magnitude (within 10%), use the shorter T_c for the intensity and the equation $Q = \Sigma(CA)I$.

Note #3: . An optional method of determining the T_c is to use the equation
$T_c = [(\Sigma (CA)7.44\ P_6)/Q]^{1.55}$

This equation is from $Q = \Sigma(CA)I = \Sigma(CA)(7.44\ P_6/T_c^{.645})$ and solving for T_c. The advantage in this option is that the T_c is consistent with the peak flow Q, and avoids inappropriate fluctuation in downstream flows in some cases.

CHAPTER 3 - 100 YEAR HYDROLOGIC ANALYSIS FOR EXISTING CONDITIONS

```
 **************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1643

                              Analysis prepared by:

                                 REC Consultants
                                 2442 Second St.
                                San Diego, Ca 92101


 ************************* DESCRIPTION OF STUDY *************************
* Existing Conditions Hydrology                                          *
* 100 Year Storm                                                         *
* Skyline Retirement Center                                              *
 ************************************************************************

  FILE NAME: 979PRE.DAT
  TIME/DATE OF STUDY: 13:49 09/13/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.650
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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.*

+-------------------------------------------------------------------------+
| Nodes 1-1000 represent tributary flows to POC-1.                        |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

 **************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 --------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =    572.00
  DOWNSTREAM ELEVATION(FEET) =    558.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.414
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.633
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.15

+----------------------------------------------------------------------------+
| Node 2-101 are overland flows. Mannings n= 0.035.                          |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    558.00  DOWNSTREAM(FEET) =    516.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   239.00   CHANNEL SLOPE =  0.1757
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.652
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.61
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.53
  Tc(MIN.) =    6.94
  SUBAREA AREA(ACRES) =     1.71       SUBAREA RUNOFF(CFS) =    2.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.290
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       2.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   3.24
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    101.00 =     303.00 FEET.

+----------------------------------------------------------------------------+
| Node 101-1000 is existing brow ditch flow. Mannings n = 0.013.             |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE   1000.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    516.00  DOWNSTREAM(FEET) =    477.48
  CHANNEL LENGTH THRU SUBAREA(FEET) =   862.00   CHANNEL SLOPE =  0.0447
```

```
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.013   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.966
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2900
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.32
  AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   1.54
  Tc(MIN.) =    8.48
  SUBAREA AREA(ACRES) =     8.04       SUBAREA RUNOFF(CFS) =   11.58
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.290
  TOTAL AREA(ACRES) =        9.8         PEAK FLOW RATE(CFS) =      14.16

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.41   FLOW VELOCITY(FEET/SEC.) =  10.52
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE   1000.00 =    1165.00 FEET.

+-------------------------------------------------------------------------+
| Nodes 3-2000 represent tributary flows to POD-2 from the existing       |
| channel located adjacent to the southeastern project boundary           |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    84.00
  UPSTREAM ELEVATION(FEET) =    548.00
  DOWNSTREAM ELEVATION(FEET) =    520.00
  ELEVATION DIFFERENCE(FEET) =     28.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.743
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.385
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE    201.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    520.00  DOWNSTREAM(FEET) =    488.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   400.00   CHANNEL SLOPE =  0.0800
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.789
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.07
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   3.23
  Tc(MIN.) =    8.97
  SUBAREA AREA(ACRES) =     1.55       SUBAREA RUNOFF(CFS) =    2.60
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.6         PEAK FLOW RATE(CFS) =       2.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE    201.00 =     484.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   488.00  DOWNSTREAM(FEET) =   487.34
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.11
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.75
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    9.12
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE    202.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE   2000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   487.34  DOWNSTREAM(FEET) =   486.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.48
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.75
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    9.34
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE   2000.00 =     604.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =    9.34
  RAINFALL INTENSITY(INCH/HR) =   4.66
  TOTAL STREAM AREA(ACRES) =     1.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.75

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE    203.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  USER-SPECIFIED RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    510.00
  DOWNSTREAM ELEVATION(FEET) =    489.00
  ELEVATION DIFFERENCE(FEET) =     21.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.267
```

```
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.036
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE   2000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   489.00  DOWNSTREAM(FEET) =   484.75
  FLOW LENGTH(FEET) =    43.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   0.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.83
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.17
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    6.41
  LONGEST FLOWPATH FROM NODE      5.00 TO NODE   2000.00 =     143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =    6.41
  RAINFALL INTENSITY(INCH/HR) =   5.95
  TOTAL STREAM AREA(ACRES) =     0.08
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.17

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.75     9.34        4.664          1.64
      2        0.17     6.41        5.945          0.08

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        2.06     6.41       5.945
      2        2.88     9.34       4.664

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.88   Tc(MIN.) =    9.34
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE   2000.00 =     604.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.7  TC(MIN.) =      9.34
  PEAK FLOW RATE(CFS)   =       2.88
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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CHAPTER 4 - 100 YEAR HYDROLOGIC ANALYSIS FOR UNMITIGATED CONDITIONS

```
**************************************************************************

           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
           Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2015 Advanced Engineering Software (aes)
             Ver. 22.0 Release Date: 07/01/2015  License ID 1643

                           Analysis prepared by:

                              REC Consultants
                              2442 Second St.
                            San Diego, Ca 92101


 ************************* DESCRIPTION OF STUDY *************************
* Proposed Conditions Hydrology - Undetained                             *
* 100 Year Storm                                                         *
* Skyline Senior Residence                                               *
 **************************************************************************

  FILE NAME: 979PSTU.DAT
  TIME/DATE OF STUDY: 20:55 09/20/2017
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.650
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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
  2   27.5     22.5    0.025/0.020/0.020   0.50    1.50 0.0313 0.125 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.*

+------------------------------------------------------------------------+
| Nodes 1 to 1000 represent tributary areas to POD-1.                    |
| 100-Series Nodes represent pipe flows                                  |
| Node 1000 is POD-1.                                                    |
+------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    527.00
  DOWNSTREAM ELEVATION(FEET) =    526.75
  ELEVATION DIFFERENCE(FEET) =      0.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.785
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.248
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE    101.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  526.75  DOWNSTREAM ELEVATION(FEET) =  520.25
  STREET LENGTH(FEET) =   230.00   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) =       0.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    8.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.836
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.22   HALFSTREET FLOOD WIDTH(FEET) =   3.03
  FLOW VELOCITY(FEET/SEC.) =  3.20   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    101.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   518.50  DOWNSTREAM(FEET) =   517.00
  FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.48
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.76
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =   10.20
```

```
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    102.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   10.20
  RAINFALL INTENSITY(INCH/HR) =   4.41
  TOTAL STREAM AREA(ACRES) =     0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.76

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    519.88
  DOWNSTREAM ELEVATION(FEET) =    519.24
  ELEVATION DIFFERENCE(FEET) =      0.64
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.691
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.423
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    519.24  DOWNSTREAM(FEET) =    519.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0009
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.840
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.62
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   6.94
  Tc(MIN.) =   12.64
  SUBAREA AREA(ACRES) =     0.38       SUBAREA RUNOFF(CFS) =    0.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.588
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE    102.00 =     305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   12.64
  RAINFALL INTENSITY(INCH/HR) =   3.84
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.76    10.20        4.408          0.64
      2        0.97    12.64        3.840          0.43

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        2.55    10.20       4.408
      2        2.51    12.64       3.840

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.55   Tc(MIN.) =   10.20
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    102.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   517.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.55
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   10.38
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    103.00 =     635.00 FEET.

+--------------------------------------------------------------------------+
| Node 103 is BMP-1                                                        |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.38
  RAINFALL INTENSITY(INCH/HR) =   4.36
  TOTAL STREAM AREA(ACRES) =     1.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.55

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    520.00
  DOWNSTREAM ELEVATION(FEET) =    519.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.179
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.091
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    519.50  DOWNSTREAM(FEET) =    519.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   220.00   CHANNEL SLOPE =  0.0023
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.274
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.81
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   4.52
  Tc(MIN.) =   10.70
  SUBAREA AREA(ACRES) =     0.33       SUBAREA RUNOFF(CFS) =    0.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   0.96
  LONGEST FLOWPATH FROM NODE      5.00 TO NODE    104.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   517.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.46
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.95
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   10.93
  LONGEST FLOWPATH FROM NODE      5.00 TO NODE    103.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.93
  RAINFALL INTENSITY(INCH/HR) =   4.22
  TOTAL STREAM AREA(ACRES) =     0.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.95

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    527.00
  DOWNSTREAM ELEVATION(FEET) =    525.75
  ELEVATION DIFFERENCE(FEET) =      1.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.553
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE    103.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  525.75  DOWNSTREAM ELEVATION(FEET) =  515.00
  STREET LENGTH(FEET) =    75.00   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) =       1.61
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
  STREET FLOW TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =    4.70
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.67      SUBAREA RUNOFF(CFS) =    2.67
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   2.00
  FLOW VELOCITY(FEET/SEC.) =  8.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE    103.00 =     120.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.70
```

```
  RAINFALL INTENSITY(INCH/HR) =   6.98
  TOTAL STREAM AREA(ACRES) =     0.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.95

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.55    10.38        4.358          1.07
      2        0.95    10.93        4.216          0.39
      3        2.95     4.70        6.982          0.74

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.94     4.70       6.982
      2        5.29    10.38       4.358
      3        5.19    10.93       4.216

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.29   Tc(MIN.) =   10.38
  TOTAL AREA(ACRES) =        2.2
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    103.00 =     635.00 FEET.

+----------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-1.                 |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   515.00  DOWNSTREAM(FEET) =   474.50
  FLOW LENGTH(FEET) =   768.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.85
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.29
  PIPE TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =   11.56
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    105.00 =    1403.00 FEET.

+----------------------------------------------------------------------------+
| The model will now store the treated outflows from BMP-1.                  |
| The flow from the following nodes represent bypass flows to POD-1.         |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    573.00
  DOWNSTREAM ELEVATION(FEET) =    554.00
  ELEVATION DIFFERENCE(FEET) =     19.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.963
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.11
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.11

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.00  DOWNSTREAM(FEET) =    539.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   290.00   CHANNEL SLOPE =  0.0517
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.863
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.27
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =    8.76
  SUBAREA AREA(ACRES) =     0.69       SUBAREA RUNOFF(CFS) =    0.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    106.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   539.00  DOWNSTREAM(FEET) =   525.00
  FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.97
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.95
  PIPE TRAVEL TIME(MIN.) =   1.09    Tc(MIN.) =    9.85
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    107.00 =     730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.00  DOWNSTREAM(FEET) =    476.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   870.00   CHANNEL SLOPE =  0.0557
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.164
```

```
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.01
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   7.21
  Tc(MIN.) =   17.06
  SUBAREA AREA(ACRES) =     2.19       SUBAREA RUNOFF(CFS) =    1.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       2.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    108.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   475.50  DOWNSTREAM(FEET) =   474.50
  FLOW LENGTH(FEET) =     7.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.67
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.42
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   17.07
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    105.00 =    1607.50 FEET.

+--------------------------------------------------------------------------+
| The program will now confluence the bypass flows with the previously     |
| saved bypass flows                                                       |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        2.42    17.07       3.163        2.94
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    105.00 =    1607.50 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.29    11.56       4.065        2.20
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    105.00 =    1403.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       6.93      11.56        4.065
      2       6.53      17.07        3.163

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.93   Tc(MIN.) =   11.56
  TOTAL AREA(ACRES) =        5.1

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   474.50  DOWNSTREAM(FEET) =   473.50
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.06
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.93
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   11.61
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    109.00 =    1635.50 FEET.

+----------------------------------------------------------------------------+
| The model will now store the flows to be confluenced later with the      |
| treated outflows from BMP-2.                                               |
| Node 109 is BMP-2.                                                         |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    524.00
  DOWNSTREAM ELEVATION(FEET) =    521.15
  ELEVATION DIFFERENCE(FEET) =      2.85
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.459
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE    110.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  521.15  DOWNSTREAM ELEVATION(FEET) =  491.00
  STREET LENGTH(FEET) =   800.00   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) =       5.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    7.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.18
  STREET FLOW TRAVEL TIME(MIN.) =   3.42   Tc(MIN.) =    6.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.683
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.51      SUBAREA RUNOFF(CFS) =   11.37
  TOTAL AREA(ACRES) =        3.5        PEAK FLOW RATE(CFS) =      11.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.05
  FLOW VELOCITY(FEET/SEC.) =  4.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    110.00 =     845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   480.00  DOWNSTREAM(FEET) =   476.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.96
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.47
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.92
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    109.00 =     885.00 FEET.

+--------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-2.               |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

+--------------------------------------------------------------------------+
| The model will now confluence the treated outflows from BMP-2 with       |
| the previously saved treated outflows from BMP-1 and bypass flows.       |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.47     6.92       5.661        3.54
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    109.00 =     885.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.93    11.61       4.055        5.14
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    109.00 =    1635.50 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      15.60       6.92        5.661
      2      15.14      11.61        4.055

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.60   Tc(MIN.) =    6.92
  TOTAL AREA(ACRES) =        8.7

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE   1000.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   473.50  DOWNSTREAM(FEET) =   473.40
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.10
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.60
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE   1000.00 =    1685.50 FEET.

+--------------------------------------------------------------------------+
| The model will now store the outflows consisting of the bypass flows     |
| and the treated outflows from BMPs 1 and 2.                              |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    521.62
  DOWNSTREAM ELEVATION(FEET) =    519.79
  ELEVATION DIFFERENCE(FEET) =      1.83
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.010
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE    111.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
```

```
  UPSTREAM ELEVATION(FEET) =  519.79  DOWNSTREAM ELEVATION(FEET) =  501.50
  STREET LENGTH(FEET) =   575.00   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 =  1
  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) =       2.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    7.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =    6.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.751
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.25      SUBAREA RUNOFF(CFS) =    4.10
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =       4.29

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.04
  FLOW VELOCITY(FEET/SEC.) =  3.93   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    111.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   497.00  DOWNSTREAM(FEET) =   493.00
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.13
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.29
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.78
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    112.00 =     643.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   493.00  DOWNSTREAM(FEET) =   492.00
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.61
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.29
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.82
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    113.00 =     666.00 FEET.

+----------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-3.                 |
```

```
| Node 113 is BMP-3.                                                          |
|                                                                             |
+-----------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE   1000.00 IS CODE =  31
-----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   492.00  DOWNSTREAM(FEET) =   473.40
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.16
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.29
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    7.11
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE   1000.00 =     881.00 FEET.

+-----------------------------------------------------------------------------+
| The model will now confluence the treated outflows from BMP-3 with          |
| the previously saved outflows.                                              |
|                                                                             |
+-----------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  11
-----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
=============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        4.29     7.11       5.562        1.31
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE   1000.00 =     881.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       15.60     7.12       5.556        8.68
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE   1000.00 =    1685.50 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      19.87       7.11        5.562
      2      19.89       7.12        5.556

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.89   Tc(MIN.) =    7.12
  TOTAL AREA(ACRES) =       10.0

+-----------------------------------------------------------------------------+
| Nodes 15-2000 represent tributary flows to POD-2.                           |
| Node 2000 is POD-2.                                                         |
| 200 series Nodes represent pipe flows.                                      |
+-----------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    556.00
  DOWNSTREAM ELEVATION(FEET) =    550.50
  ELEVATION DIFFERENCE(FEET) =      5.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.648
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.308
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE    201.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    550.50  DOWNSTREAM(FEET) =    488.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   560.00   CHANNEL SLOPE =  0.1116
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.991
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   11.90
  SUBAREA AREA(ACRES) =     1.68       SUBAREA RUNOFF(CFS) =    2.35
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   2.70
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE    201.00 =     660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   488.00  DOWNSTREAM(FEET) =   487.34
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.93
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.44
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   12.05
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE    202.00 =     705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE   2000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   487.34  DOWNSTREAM(FEET) =   486.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.28
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.44
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   12.29
```

```
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE   2000.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =   12.29
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =     1.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.44

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE   2000.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =    502.50
  DOWNSTREAM ELEVATION(FEET) =    489.00
  ELEVATION DIFFERENCE(FEET) =     13.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.854
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =    4.85
  RAINFALL INTENSITY(INCH/HR) =   6.98
  TOTAL STREAM AREA(ACRES) =     0.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.44    12.29        3.909          1.75
      2        0.12     4.85        6.982          0.05

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        1.09     4.85       6.982
      2        2.51    12.29       3.909

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.51   Tc(MIN.) =   12.29
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE   2000.00 =     780.00 FEET.
```

```
 ============================================================================
   END OF STUDY SUMMARY:
   TOTAL AREA(ACRES)     =        1.8  TC(MIN.) =     12.29
   PEAK FLOW RATE(CFS)   =       2.51
 ============================================================================
 ============================================================================
   END OF RATIONAL METHOD ANALYSIS
```

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CHAPTER 5 - 100 YEAR HYDROLOGIC ANALYSIS FOR MITIGATED CONDITIONS

```
_____________________________________________________________________________
*****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1643

                             Analysis prepared by:

                                REC Consultants
                                2442 Second St.
                               San Diego, Ca 92101


 ************************* DESCRIPTION OF STUDY *************************
* Proposed Conditions Hydrology - Detained                                *
* 100 Year Storm                                                          *
* Skyline Senior Residence                                                *
 *************************************************************************

  FILE NAME: 979PSTD.DAT
  TIME/DATE OF STUDY: 21:13 09/20/2017
-----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.650
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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
  2   27.5     22.5    0.025/0.020/0.020   0.50    1.50 0.0312 0.125 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.*

+---------------------------------------------------------------------------+
| Nodes 1 to 1000 represent tributary areas to POD-1.                       |
| 100-Series Nodes represent pipe flows                                     |
| Node 1000 is POD-1.                                                       |
+---------------------------------------------------------------------------+

*****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    527.00
  DOWNSTREAM ELEVATION(FEET) =    526.75
  ELEVATION DIFFERENCE(FEET) =      0.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.785
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.248
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE    101.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  526.75  DOWNSTREAM ELEVATION(FEET) =  520.25
  STREET LENGTH(FEET) =   230.00   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) =       0.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =    8.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.836
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.58      SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =        0.6        PEAK FLOW RATE(CFS) =       1.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.22   HALFSTREET FLOOD WIDTH(FEET) =   3.03
  FLOW VELOCITY(FEET/SEC.) =  3.20   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    101.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   518.50  DOWNSTREAM(FEET) =   517.00
  FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.48
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       1.76
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    102.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   10.20
  RAINFALL INTENSITY(INCH/HR) =   4.41
  TOTAL STREAM AREA(ACRES) =     0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.76

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    519.88
  DOWNSTREAM ELEVATION(FEET) =    519.24
  ELEVATION DIFFERENCE(FEET) =      0.64
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.691
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.423
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    519.24  DOWNSTREAM(FEET) =    519.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00   CHANNEL SLOPE =  0.0009
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.840
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5900
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.62
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   6.94
  Tc(MIN.) =   12.64
  SUBAREA AREA(ACRES) =     0.38       SUBAREA RUNOFF(CFS) =    0.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.588
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE      3.00 TO NODE    102.00 =     305.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 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.) =   12.64
  RAINFALL INTENSITY(INCH/HR) =   3.84
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.76    10.20        4.408          0.64
      2        0.97    12.64        3.840          0.43

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        2.55    10.20       4.408
      2        2.51    12.64       3.840

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.55   Tc(MIN.) =   10.20
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    102.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   517.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.55
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   10.38
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    103.00 =     635.00 FEET.

+--------------------------------------------------------------------------+
| Node 103 is BMP-1                                                        |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.38
  RAINFALL INTENSITY(INCH/HR) =   4.36
  TOTAL STREAM AREA(ACRES) =     1.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.55

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    520.00
  DOWNSTREAM ELEVATION(FEET) =    519.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.179
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.091
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.21

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    519.50  DOWNSTREAM(FEET) =    519.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   220.00   CHANNEL SLOPE =  0.0023
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.274
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.81
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   4.52
  Tc(MIN.) =   10.70
  SUBAREA AREA(ACRES) =     0.33       SUBAREA RUNOFF(CFS) =    0.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   0.96
  LONGEST FLOWPATH FROM NODE      5.00 TO NODE    104.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   517.00  DOWNSTREAM(FEET) =   515.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.46
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.95
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   10.93
  LONGEST FLOWPATH FROM NODE      5.00 TO NODE    103.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.93
  RAINFALL INTENSITY(INCH/HR) =   4.22
  TOTAL STREAM AREA(ACRES) =     0.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.95
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    527.00
  DOWNSTREAM ELEVATION(FEET) =    525.75
  ELEVATION DIFFERENCE(FEET) =      1.25
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.553
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE    103.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  525.75  DOWNSTREAM ELEVATION(FEET) =  515.00
  STREET LENGTH(FEET) =    75.00   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) =       1.61
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    2.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.63
  STREET FLOW TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =    4.70
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    0.67      SUBAREA RUNOFF(CFS) =    2.67
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       2.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.20   HALFSTREET FLOOD WIDTH(FEET) =   2.00
  FLOW VELOCITY(FEET/SEC.) =  8.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE    103.00 =     120.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.70
  RAINFALL INTENSITY(INCH/HR) =   6.98
  TOTAL STREAM AREA(ACRES) =     0.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.95

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.55    10.38        4.358          1.07
      2        0.95    10.93        4.216          0.39
      3        2.95     4.70        6.982          0.74

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        4.94     4.70       6.982
      2        5.29    10.38       4.358
      3        5.19    10.93       4.216

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.29   Tc(MIN.) =   10.38
  TOTAL AREA(ACRES) =        2.2
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    103.00 =     635.00 FEET.

+----------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-1.                 |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  15.00   RAIN INTENSITY(INCH/HOUR) =  3.44
  TOTAL AREA(ACRES) =     2.20   TOTAL RUNOFF(CFS) =      3.02

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   515.00  DOWNSTREAM(FEET) =   474.50
  FLOW LENGTH(FEET) =   768.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.34
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.02
  PIPE TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =   16.37
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    105.00 =    1403.00 FEET.

+----------------------------------------------------------------------------+
| The model will now store the treated outflows from BMP-1.                  |
| The flow from the following nodes represent bypass flows to POD-1.         |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    50.00
  UPSTREAM ELEVATION(FEET) =    573.00
  DOWNSTREAM ELEVATION(FEET) =    554.00
  ELEVATION DIFFERENCE(FEET) =     19.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.963
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.11
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.11

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    554.00  DOWNSTREAM(FEET) =    539.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   290.00   CHANNEL SLOPE =  0.0517
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.863
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.27
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =    8.76
  SUBAREA AREA(ACRES) =     0.69       SUBAREA RUNOFF(CFS) =    0.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       0.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    106.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   539.00  DOWNSTREAM(FEET) =   525.00
  FLOW LENGTH(FEET) =   390.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.97
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.95
  PIPE TRAVEL TIME(MIN.) =   1.09    Tc(MIN.) =    9.85
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    107.00 =     730.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    525.00  DOWNSTREAM(FEET) =    476.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   870.00   CHANNEL SLOPE =  0.0557
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.164
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.01
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   7.21
  Tc(MIN.) =   17.06
  SUBAREA AREA(ACRES) =     2.19       SUBAREA RUNOFF(CFS) =    1.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       2.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    108.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   475.50  DOWNSTREAM(FEET) =   474.50
  FLOW LENGTH(FEET) =     7.50   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.67
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.42
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   17.07
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    105.00 =    1607.50 FEET.

+--------------------------------------------------------------------------+
| The program will now confluence the bypass flows with the previously     |
| saved bypass flows                                                       |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        2.42    17.07       3.163        2.94
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    105.00 =    1607.50 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.02    16.37       3.249        2.20
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    105.00 =    1403.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       5.34      16.37        3.249
      2       5.36      17.07        3.163

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.36   Tc(MIN.) =   17.07
  TOTAL AREA(ACRES) =        5.1

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   474.50  DOWNSTREAM(FEET) =   473.50
  FLOW LENGTH(FEET) =    28.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.31
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.36
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   17.12
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    109.00 =    1635.50 FEET.

+----------------------------------------------------------------------------+
| The model will now store the flows to be confluenced later with the        |
| treated outflows from BMP-2.                                               |
| Node 109 is BMP-2.                                                         |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    524.00
  DOWNSTREAM ELEVATION(FEET) =    521.15
  ELEVATION DIFFERENCE(FEET) =      2.85
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.459
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE    110.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  521.15  DOWNSTREAM ELEVATION(FEET) =  491.00
  STREET LENGTH(FEET) =   800.00   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) =       5.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    7.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.18
  STREET FLOW TRAVEL TIME(MIN.) =   3.42   Tc(MIN.) =    6.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.683
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    3.51      SUBAREA RUNOFF(CFS) =   11.37
  TOTAL AREA(ACRES) =        3.5        PEAK FLOW RATE(CFS) =      11.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.05
  FLOW VELOCITY(FEET/SEC.) =  4.46   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    110.00 =     845.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   480.00  DOWNSTREAM(FEET) =   476.50
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.96
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.47
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.92
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    109.00 =     885.00 FEET.

+--------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-2.               |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.00   RAIN INTENSITY(INCH/HOUR) =  4.20
  TOTAL AREA(ACRES) =     3.54   TOTAL RUNOFF(CFS) =      3.75
```

```
+----------------------------------------------------------------------+
| The model will now confluence the treated outflows from BMP-2 with   |
| the previously saved treated outflows from BMP-1 and bypass flows.   |
|                                                                      |
+----------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  11
--------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.75    11.00       4.199        3.54
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE    109.00 =     885.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.36    17.12       3.157        5.14
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE    109.00 =    1635.50 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       7.19      11.00        4.199
      2       8.18      17.12        3.157

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.18   Tc(MIN.) =   17.12
  TOTAL AREA(ACRES) =        8.7

**************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE   1000.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   473.50  DOWNSTREAM(FEET) =   473.40
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.51
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.18
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   17.35
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE   1000.00 =    1685.50 FEET.

+----------------------------------------------------------------------+
| The model will now store the outflows consisting of the bypass flows |
| and the treated outflows from BMPs 1 and 2.                          |
|                                                                      |
+----------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    45.00
  UPSTREAM ELEVATION(FEET) =    521.62
  DOWNSTREAM ELEVATION(FEET) =    519.79
  ELEVATION DIFFERENCE(FEET) =      1.83
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.010
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.24

**************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE    111.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  519.79  DOWNSTREAM ELEVATION(FEET) =  501.50
  STREET LENGTH(FEET) =   575.00   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 =  1
  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) =       2.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    7.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.02
  STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =    6.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.751
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.570
  SUBAREA AREA(ACRES) =    1.25      SUBAREA RUNOFF(CFS) =    4.10
  TOTAL AREA(ACRES) =        1.3        PEAK FLOW RATE(CFS) =       4.29

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.04
  FLOW VELOCITY(FEET/SEC.) =  3.93   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    111.00 =     620.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   497.00  DOWNSTREAM(FEET) =   493.00
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.13
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.29
```

```
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    6.78
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    112.00 =     643.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   493.00  DOWNSTREAM(FEET) =   492.00
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.61
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.29
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    6.82
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    113.00 =     666.00 FEET.

+--------------------------------------------------------------------------+
| The following outflows are per HEC-HMS printout for BMP-3.               |
| Node 113 is BMP-3.                                                       |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  11.00   RAIN INTENSITY(INCH/HOUR) =  4.20
  TOTAL AREA(ACRES) =     1.30   TOTAL RUNOFF(CFS) =      1.45

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE   1000.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   492.00  DOWNSTREAM(FEET) =   473.40
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.27
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.45
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   11.39
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE   1000.00 =     881.00 FEET.

+--------------------------------------------------------------------------+
| The model will now confluence the treated outflows from BMP-3 with       |
| the previously saved outflows.                                           |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        1.45    11.39       4.106        1.30
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE   1000.00 =     881.00 FEET.
```

```
  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.18    17.35       3.129        8.68
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE   1000.00 =    1685.50 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       6.82      11.39        4.106
      2       9.28      17.35        3.129

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.28   Tc(MIN.) =   17.35
  TOTAL AREA(ACRES) =       10.0

+-------------------------------------------------------------------------+
| Nodes 15-2000 represent tributary flows to POD-2.                       |
| Node 2000 is POD-2.                                                     |
| 200 series Nodes represent pipe flows.                                  |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    556.00
  DOWNSTREAM ELEVATION(FEET) =    550.50
  ELEVATION DIFFERENCE(FEET) =      5.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.648
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.308
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE    201.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    550.50  DOWNSTREAM(FEET) =    488.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   560.00   CHANNEL SLOPE =  0.1116
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.991
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   4.25
  Tc(MIN.) =   11.90
  SUBAREA AREA(ACRES) =     1.68       SUBAREA RUNOFF(CFS) =    2.35
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.350
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       2.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   2.70
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE    201.00 =     660.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   488.00  DOWNSTREAM(FEET) =   487.34
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.93
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.44
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   12.05
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE    202.00 =     705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE   2000.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   487.34  DOWNSTREAM(FEET) =   486.00
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.28
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.44
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   12.29
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE   2000.00 =     780.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =   12.29
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =     1.75
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.44

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE   2000.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =    502.50
  DOWNSTREAM ELEVATION(FEET) =    489.00
  ELEVATION DIFFERENCE(FEET) =     13.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.854
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.982
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2000.00 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.) =    4.85
  RAINFALL INTENSITY(INCH/HR) =   6.98
  TOTAL STREAM AREA(ACRES) =     0.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.44    12.29        3.909          1.75
      2        0.12     4.85        6.982          0.05

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        1.09     4.85       6.982
      2        2.51    12.29       3.909

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.51   Tc(MIN.) =   12.29
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     15.00 TO NODE   2000.00 =     780.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.8  TC(MIN.) =     12.29
  PEAK FLOW RATE(CFS)   =       2.51
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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CHAPTER 6 - MODIFIED-PULS DETENTION ROUTING

6.1 – Rational Method Hydrograph

RATIONAL METHOD HYDROGRAPH PROGRAM
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RUN DATE 9/18/2017
HYDROGRAPH FILE NAME BMP-1
TIME OF CONCENTRATION 10 MIN.
6 HOUR RAINFALL 2.65 INCHES
BASIN AREA 2.2 ACRES
RUNOFF COEFFICIENT 0.57
PEAK DISCHARGE 5.29 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 10	DISCHARGE (CFS) = 0.2
TIME (MIN) = 20	DISCHARGE (CFS) = 0.2
TIME (MIN) = 30	DISCHARGE (CFS) = 0.2
TIME (MIN) = 40	DISCHARGE (CFS) = 0.2
TIME (MIN) = 50	DISCHARGE (CFS) = 0.2
TIME (MIN) = 60	DISCHARGE (CFS) = 0.2
TIME (MIN) = 70	DISCHARGE (CFS) = 0.2
TIME (MIN) = 80	DISCHARGE (CFS) = 0.2
TIME (MIN) = 90	DISCHARGE (CFS) = 0.3
TIME (MIN) = 100	DISCHARGE (CFS) = 0.3
TIME (MIN) = 110	DISCHARGE (CFS) = 0.3
TIME (MIN) = 120	DISCHARGE (CFS) = 0.3
TIME (MIN) = 130	DISCHARGE (CFS) = 0.3
TIME (MIN) = 140	DISCHARGE (CFS) = 0.3
TIME (MIN) = 150	DISCHARGE (CFS) = 0.4
TIME (MIN) = 160	DISCHARGE (CFS) = 0.4
TIME (MIN) = 170	DISCHARGE (CFS) = 0.4
TIME (MIN) = 180	DISCHARGE (CFS) = 0.4
TIME (MIN) = 190	DISCHARGE (CFS) = 0.5
TIME (MIN) = 200	DISCHARGE (CFS) = 0.5
TIME (MIN) = 210	DISCHARGE (CFS) = 0.7
TIME (MIN) = 220	DISCHARGE (CFS) = 0.8
TIME (MIN) = 230	DISCHARGE (CFS) = 1.1
TIME (MIN) = 240	DISCHARGE (CFS) = 1.9
TIME (MIN) = 250	DISCHARGE (CFS) = 5.29
TIME (MIN) = 260	DISCHARGE (CFS) = 0.9
TIME (MIN) = 270	DISCHARGE (CFS) = 0.6
TIME (MIN) = 280	DISCHARGE (CFS) = 0.5
TIME (MIN) = 290	DISCHARGE (CFS) = 0.4
TIME (MIN) = 300	DISCHARGE (CFS) = 0.3
TIME (MIN) = 310	DISCHARGE (CFS) = 0.3
TIME (MIN) = 320	DISCHARGE (CFS) = 0.3
TIME (MIN) = 330	DISCHARGE (CFS) = 0.3
TIME (MIN) = 340	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 370	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/18/2017
HYDROGRAPH FILE NAME BMP-2
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.65 INCHES
BASIN AREA 3.54 ACRES
RUNOFF COEFFICIENT 0.57
PEAK DISCHARGE 11.47 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.3
TIME (MIN) = 14	DISCHARGE (CFS) = 0.3
TIME (MIN) = 21	DISCHARGE (CFS) = 0.3
TIME (MIN) = 28	DISCHARGE (CFS) = 0.3
TIME (MIN) = 35	DISCHARGE (CFS) = 0.3
TIME (MIN) = 42	DISCHARGE (CFS) = 0.4
TIME (MIN) = 49	DISCHARGE (CFS) = 0.4
TIME (MIN) = 56	DISCHARGE (CFS) = 0.4
TIME (MIN) = 63	DISCHARGE (CFS) = 0.4
TIME (MIN) = 70	DISCHARGE (CFS) = 0.4
TIME (MIN) = 77	DISCHARGE (CFS) = 0.4
TIME (MIN) = 84	DISCHARGE (CFS) = 0.4
TIME (MIN) = 91	DISCHARGE (CFS) = 0.4
TIME (MIN) = 98	DISCHARGE (CFS) = 0.4
TIME (MIN) = 105	DISCHARGE (CFS) = 0.5
TIME (MIN) = 112	DISCHARGE (CFS) = 0.5
TIME (MIN) = 119	DISCHARGE (CFS) = 0.5
TIME (MIN) = 126	DISCHARGE (CFS) = 0.5
TIME (MIN) = 133	DISCHARGE (CFS) = 0.5
TIME (MIN) = 140	DISCHARGE (CFS) = 0.5
TIME (MIN) = 147	DISCHARGE (CFS) = 0.6
TIME (MIN) = 154	DISCHARGE (CFS) = 0.6
TIME (MIN) = 161	DISCHARGE (CFS) = 0.6
TIME (MIN) = 168	DISCHARGE (CFS) = 0.7
TIME (MIN) = 175	DISCHARGE (CFS) = 0.7
TIME (MIN) = 182	DISCHARGE (CFS) = 0.8
TIME (MIN) = 189	DISCHARGE (CFS) = 0.8
TIME (MIN) = 196	DISCHARGE (CFS) = 0.9
TIME (MIN) = 203	DISCHARGE (CFS) = 1
TIME (MIN) = 210	DISCHARGE (CFS) = 1.1
TIME (MIN) = 217	DISCHARGE (CFS) = 1.3
TIME (MIN) = 224	DISCHARGE (CFS) = 1.5
TIME (MIN) = 231	DISCHARGE (CFS) = 2.2
TIME (MIN) = 238	DISCHARGE (CFS) = 3
TIME (MIN) = 245	DISCHARGE (CFS) = 11.47
TIME (MIN) = 252	DISCHARGE (CFS) = 1.8
TIME (MIN) = 259	DISCHARGE (CFS) = 1.2
TIME (MIN) = 266	DISCHARGE (CFS) = 0.9
TIME (MIN) = 273	DISCHARGE (CFS) = 0.8
TIME (MIN) = 280	DISCHARGE (CFS) = 0.7
TIME (MIN) = 287	DISCHARGE (CFS) = 0.6
TIME (MIN) = 294	DISCHARGE (CFS) = 0.6
TIME (MIN) = 301	DISCHARGE (CFS) = 0.5
TIME (MIN) = 308	DISCHARGE (CFS) = 0.5
TIME (MIN) = 315	DISCHARGE (CFS) = 0.4
TIME (MIN) = 322	DISCHARGE (CFS) = 0.4
TIME (MIN) = 329	DISCHARGE (CFS) = 0.4
TIME (MIN) = 336	DISCHARGE (CFS) = 0.4
TIME (MIN) = 343	DISCHARGE (CFS) = 0.4
TIME (MIN) = 350	DISCHARGE (CFS) = 0.3
TIME (MIN) = 357	DISCHARGE (CFS) = 0.3
TIME (MIN) = 364	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 9/18/2017
HYDROGRAPH FILE NAME BMP-3
TIME OF CONCENTRATION 7 MIN.
6 HOUR RAINFALL 2.65 INCHES
BASIN AREA 1.31 ACRES
RUNOFF COEFFICIENT 0.57
PEAK DISCHARGE 4.29 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 7	DISCHARGE (CFS) = 0.1
TIME (MIN) = 14	DISCHARGE (CFS) = 0.1
TIME (MIN) = 21	DISCHARGE (CFS) = 0.1
TIME (MIN) = 28	DISCHARGE (CFS) = 0.1
TIME (MIN) = 35	DISCHARGE (CFS) = 0.1
TIME (MIN) = 42	DISCHARGE (CFS) = 0.1
TIME (MIN) = 49	DISCHARGE (CFS) = 0.1
TIME (MIN) = 56	DISCHARGE (CFS) = 0.1
TIME (MIN) = 63	DISCHARGE (CFS) = 0.1
TIME (MIN) = 70	DISCHARGE (CFS) = 0.1
TIME (MIN) = 77	DISCHARGE (CFS) = 0.1
TIME (MIN) = 84	DISCHARGE (CFS) = 0.2
TIME (MIN) = 91	DISCHARGE (CFS) = 0.2
TIME (MIN) = 98	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 112	DISCHARGE (CFS) = 0.2
TIME (MIN) = 119	DISCHARGE (CFS) = 0.2
TIME (MIN) = 126	DISCHARGE (CFS) = 0.2
TIME (MIN) = 133	DISCHARGE (CFS) = 0.2
TIME (MIN) = 140	DISCHARGE (CFS) = 0.2
TIME (MIN) = 147	DISCHARGE (CFS) = 0.2
TIME (MIN) = 154	DISCHARGE (CFS) = 0.2
TIME (MIN) = 161	DISCHARGE (CFS) = 0.2
TIME (MIN) = 168	DISCHARGE (CFS) = 0.2
TIME (MIN) = 175	DISCHARGE (CFS) = 0.3
TIME (MIN) = 182	DISCHARGE (CFS) = 0.3
TIME (MIN) = 189	DISCHARGE (CFS) = 0.3
TIME (MIN) = 196	DISCHARGE (CFS) = 0.3
TIME (MIN) = 203	DISCHARGE (CFS) = 0.4
TIME (MIN) = 210	DISCHARGE (CFS) = 0.4
TIME (MIN) = 217	DISCHARGE (CFS) = 0.5
TIME (MIN) = 224	DISCHARGE (CFS) = 0.6
TIME (MIN) = 231	DISCHARGE (CFS) = 0.8
TIME (MIN) = 238	DISCHARGE (CFS) = 1.1
TIME (MIN) = 245	DISCHARGE (CFS) = 4.29
TIME (MIN) = 252	DISCHARGE (CFS) = 0.7
TIME (MIN) = 259	DISCHARGE (CFS) = 0.4
TIME (MIN) = 266	DISCHARGE (CFS) = 0.3
TIME (MIN) = 273	DISCHARGE (CFS) = 0.3
TIME (MIN) = 280	DISCHARGE (CFS) = 0.3
TIME (MIN) = 287	DISCHARGE (CFS) = 0.2
TIME (MIN) = 294	DISCHARGE (CFS) = 0.2
TIME (MIN) = 301	DISCHARGE (CFS) = 0.2
TIME (MIN) = 308	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 322	DISCHARGE (CFS) = 0.2
TIME (MIN) = 329	DISCHARGE (CFS) = 0.1
TIME (MIN) = 336	DISCHARGE (CFS) = 0.1
TIME (MIN) = 343	DISCHARGE (CFS) = 0.1
TIME (MIN) = 350	DISCHARGE (CFS) = 0.1
TIME (MIN) = 357	DISCHARGE (CFS) = 0.1
TIME (MIN) = 364	DISCHARGE (CFS) = 0

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6.2 – Stage-Storage & Stage-Discharge Relationships

Stage-Area for BMP 1

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	1509	**0**	**BIOFILTRATION[1]**
0.08	1556	51	
0.17	1603	104	
0.25	1649	158	**TOP OF MULCH[2]**
0.33	1694	297	
0.42	1740	440	
0.50	1784	587	**SURFACE DISCHARGE[3]**
0.58	1829	738	
0.67	1872	892	
0.75	1916	1050	
0.83	1959	1211	
0.92	2001	1376	
1.00	2043	1545	**SURFACE DISCHARGE**
1.08	2085	1717	
1.17	2126	1892	
1.25	2167	2071	
1.33	2207	2253	**SURFACE DISCHARGE**
1.42	2247	2439	
1.50	2287	2628	
1.58	2326	2820	
1.67	2364	3015	
1.75	2402	3214	
1.83	2440	3416	
1.92	2477	3621	
2.00	2514	3829	
2.08	2550	4039	
2.17	2586	4253	
2.25	2621	4470	**EMERGENCY WEIR[4]**
2.33	2656	4690	
2.42	2690	4913	
2.50	2725	5139	

SUB SURFACE STORAGE BMP 1

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
-1.50	1509	679	**Amended Soil Base (0.3 voids)**
-3.75	1509	1358	**Gravel Base (0.4 voids)[5]**
Gravel & Amended Soil	**TOTAL =**	2037	(ft^3)
Surface Total	**TOTAL =**	1545	(ft^3)
IMP	**TOTAL =**	**3582**	**(ft^3)**

(1): The area at this surface elevation corresponds to the area of gravel and amended soil (Bio-filtration layer)
(2): The volume for the first 3 inches of surface depth accounts for the voids of mulch
(3): Volume at this elevation coresponds with surface volume for WQ purposes (invert of lowest surface outlet)
(4): This elevation corresponds to the top of the riser elevation.
(5): Gravel Depth includes nine (9) inches of storage below the LID orifice.

Effective Depth:	4.67	in

Stage-Area for BMP 2

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	4364	**0**	**BIOFILTRATION(1)**
0.08	4364	145	
0.17	4364	291	
0.25	4364	436	**TOP OF MULCH(2)**
0.33	4364	800	
0.42	4364	1164	
0.50	4364	1527	
0.58	4364	1891	
0.67	4364	2255	
0.75	4364	2618	**SURFACE DISCHARGE(3)**
0.83	4364	2982	
0.92	4364	3346	
1.00	4364	3709	
1.08	4364	4073	
1.17	4364	4437	
1.25	4364	4800	
1.33	4364	5164	
1.42	4364	5528	
1.50	4364	5891	
1.58	4364	6255	
1.67	4364	6619	
1.75	4364	6982	
1.83	4364	7346	
1.92	4364	7710	
2.00	4364	8073	**EMERGENCY WEIR(4)**
2.08	4364	8437	
2.17	4364	8801	
2.25	4364	9164	
2.33	4364	9528	
2.42	4364	9892	
2.50	4364	10255	

SUB SURFACE STORAGE BMP 2

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
-1.50	4364	1964	**Amended Soil Base (0.3 voids)**
-3.75	4364	3928	**Gravel Base (0.4 voids)(5)**
Gravel & Amended Soil	**TOTAL =**	5891	(ft^3)
Surface Total	**TOTAL =**	3709	(ft^3)
IMP	**TOTAL =**	**9601**	**(ft^3)**

(1): The area at this surface elevation corresponds to the area of gravel and amended soil (Bio-filtration layer)
(2): The volume for the first 3 inches of surface depth accounts for the voids of mulch
(3): Volume at this elevation coresponds with surface volume for WQ purposes (invert of lowest surface outlet)
(4): This elevation corresponds to the top of the riser elevation.
(5): Gravel Depth includes nine (9) inches of storage below the LID orifice.

Effective Depth:	7.20 in

Stage-Area for BMP 3

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
0.00	1411	**0**	**BIOFILTRATION(1)**
0.08	1411	47	
0.17	1411	94	
0.25	1411	141	**TOP OF MULCH(2)**
0.33	1411	259	
0.42	1411	376	
0.50	1411	494	**SURFACE DISCHARGE(3)**
0.58	1411	611	
0.67	1411	729	
0.75	1411	847	
0.83	1411	964	
0.92	1411	1082	
1.00	1411	1199	
1.08	1411	1317	
1.17	1411	1435	
1.25	1411	1552	
1.33	1411	1670	
1.42	1411	1787	
1.50	1411	1905	
1.58	1411	2022	
1.67	1411	2140	
1.75	1411	2258	
1.83	1411	2375	
1.92	1411	2493	
2.00	1411	2610	**EMERGENCY WEIR(4)**
2.08	1411	2728	
2.17	1411	2846	
2.25	1411	2963	
2.33	1411	3081	
2.42	1411	3198	
2.50	1411	3316	

SUB SURFACE STORAGE BMP 3

Elevation (ft)	Area (ft^2)	Volume (ft^3)	
-1.50	1411	635	**Amended Soil Base (0.3 voids)**
-4.00	1411	1411	**Gravel Base (0.4 voids)(5)**
Gravel & Amended Soil	**TOTAL =**	2046	(ft^3)
Surface Total	**TOTAL =**	1199	(ft^3)
IMP	**TOTAL =**	**3245**	**(ft^3)**

(1): The area at this surface elevation corresponds to the area of gravel and amended soil (Bio-filtration layer)
(2): The volume for the first 3 inches of surface depth accounts for the voids of mulch
(3): Volume at this elevation coresponds with surface volume for WQ purposes (invert of lowest surface outlet)
(4): This elevation corresponds to the top of the riser elevation.
(5): Gravel Depth includes twelve (12) inches of storage below the LID orifice.

Effective Depth:	4.20 in

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Outlet structure for Discharge of Detention Basin 1 (note: 0.0 elev = 2.75 ft actual elevation)

Discharge vs Elevation Table

Low orifice:	0.75	"	Lower slot			Emergency Weir		
Number:	2		Invert:	0.25	ft	Invert:	1.750	ft
Cg-low:	0.61		B	0.50	ft	B:	8	ft
			h	0.167	ft			
Middle orifice:	1	"	Upper slot					
number of orif:	0		Invert:	0.833	ft			
Cg-middle:	0.61		B:	2.50	ft			
invert elev:	0.25	ft	h	0.250	ft			

h (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qemer (cfs)	Qtot (cfs)
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.042	0.667	0.000	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.003
0.083	1.333	0.000	0.007	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.007
0.125	2.000	0.000	0.009	0.012	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.009
0.167	2.667	0.000	0.011	0.014	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.011
0.208	3.333	0.000	0.013	0.014	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.013
0.250	4.000	0.000	0.014	0.023	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.014
0.292	4.667	0.500	0.015	0.057	0.015	0.000	0.000	0.000	0.013	0.000	0.000	0.029
0.333	5.333	1.000	0.017	0.147	0.017	0.000	0.000	0.000	0.037	0.000	0.000	0.054
0.375	6.000	1.500	0.018	0.176	0.018	0.000	0.000	0.000	0.069	0.000	0.000	0.086
0.417	6.667	2.000	0.019	0.186	0.019	0.000	0.000	0.000	0.105	0.000	0.000	0.124
0.458	7.333	2.500	0.020	0.196	0.020	0.000	0.000	0.000	0.144	0.000	0.000	0.164
0.500	8.000	3.000	0.021	0.206	0.021	0.000	0.000	0.000	0.167	0.000	0.000	0.187
0.542	8.667	3.500	0.021	0.215	0.021	0.000	0.000	0.000	0.186	0.000	0.000	0.208
0.583	9.333	4.000	0.022	0.223	0.022	0.000	0.000	0.000	0.204	0.000	0.000	0.226
0.625	10.000	4.500	0.023	0.231	0.023	0.000	0.000	0.000	0.220	0.000	0.000	0.243
0.667	10.667	5.000	0.024	0.239	0.024	0.000	0.000	0.000	0.236	0.000	0.000	0.259
0.708	11.333	5.500	0.025	0.247	0.025	0.000	0.000	0.000	0.250	0.000	0.000	0.275
0.750	12.000	6.000	0.025	0.255	0.025	0.000	0.000	0.000	0.263	0.000	0.000	0.289
0.792	12.667	6.500	0.026	0.262	0.026	0.000	0.000	0.000	0.276	0.000	0.000	0.302
0.833	13.333	7.000	0.027	0.269	0.027	0.000	0.000	0.000	0.288	0.000	0.000	0.315
0.875	14.000	7.500	0.028	0.276	0.028	0.000	0.000	0.000	0.300	0.066	0.000	0.394
0.917	14.667	8.000	0.028	0.283	0.028	0.000	0.000	0.000	0.312	0.186	0.000	0.526
0.958	15.333	8.500	0.029	0.289	0.029	0.000	0.000	0.000	0.323	0.342	0.000	0.694
1.000	16.000	9.000	0.030	0.296	0.030	0.000	0.000	0.000	0.333	0.527	0.000	0.890
1.042	16.667	9.500	0.030	0.302	0.030	0.000	0.000	0.000	0.343	0.737	0.000	1.110
1.083	17.333	10.000	0.031	0.308	0.031	0.000	0.000	0.000	0.353	0.969	0.000	1.353
1.125	18.000	10.500	0.031	0.314	0.031	0.000	0.000	0.000	0.363	1.221	0.000	1.615
1.167	18.667	11.000	0.032	0.320	0.032	0.000	0.000	0.000	0.372	1.396	0.000	1.801
1.208	19.333	11.500	0.033	0.326	0.033	0.000	0.000	0.000	0.382	1.530	0.000	1.944
1.250	20.000	12.000	0.033	0.332	0.033	0.000	0.000	0.000	0.391	1.652	0.000	2.076
1.292	20.667	12.500	0.034	0.337	0.034	0.000	0.000	0.000	0.399	1.766	0.000	2.199
1.333	21.333	13.000	0.034	0.343	0.034	0.000	0.000	0.000	0.408	1.874	0.000	2.316
1.375	22.000	13.500	0.035	0.348	0.035	0.000	0.000	0.000	0.416	1.975	0.000	2.426
1.417	22.667	14.000	0.035	0.354	0.035	0.000	0.000	0.000	0.425	2.071	0.000	2.531
1.458	23.333	14.500	0.036	0.359	0.036	0.000	0.000	0.000	0.433	2.163	0.000	2.632
1.500	24.000	15.000	0.036	0.364	0.036	0.000	0.000	0.000	0.441	2.252	0.000	2.729
1.542	24.667	15.500	0.037	0.369	0.037	0.000	0.000	0.000	0.448	2.337	0.000	2.822
1.583	25.333	16.000	0.037	0.374	0.037	0.000	0.000	0.000	0.456	2.419	0.000	2.912
1.625	26.000	16.500	0.038	0.379	0.038	0.000	0.000	0.000	0.464	2.498	0.000	3.000
1.667	26.667	17.000	0.038	0.384	0.038	0.000	0.000	0.000	0.471	2.575	0.000	3.084
1.708	27.333	17.500	0.039	0.389	0.039	0.000	0.000	0.000	0.478	2.650	0.000	3.167
1.750	28.000	18.000	0.039	0.394	0.039	0.000	0.000	0.000	0.486	2.722	0.000	3.247
1.792	28.667	18.500	0.040	0.399	0.040	0.000	0.000	0.000	0.493	2.793	0.211	3.536
1.833	29.333	19.000	0.040	0.403	0.040	0.000	0.000	0.000	0.500	2.862	0.597	3.998
1.875	30.000	19.500	0.041	0.408	0.041	0.000	0.000	0.000	0.507	2.929	1.096	4.573
1.917	30.667	20.000	0.041	0.412	0.041	0.000	0.000	0.000	0.513	2.995	1.687	5.237
1.958	31.333	20.500	0.042	0.417	0.042	0.000	0.000	0.000	0.520	3.060	2.358	5.979
2.000	32.000	21.000	0.042	0.421	0.042	0.000	0.000	0.000	0.527	3.123	3.100	6.791

Outlet structure for Discharge of Detention Basin 2 (note: 0.0 elev = 2.75 ft actual elevation)

Discharge vs Elevation Table

Low orifice:	1.5	"	Lower slot			Emergency Weir	
Number:	0		Invert:	0.00	ft	Invert:	1.500 ft
Cg-low:	0.61		B	3.00	ft	B:	12 ft
			h	0.250	ft		
Middle orifice:	1	"	Upper slot				
number of orif:	0		Invert:	0.000	ft		
Cg-middle:	0.61		B:	0.00	ft		
invert elev:	0.25	ft	h	0.000	ft		

h	H/D-low	H/D-mid	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qslot-low	Qslot-upp	Qemer	Qtot
(ft)	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.042	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.000	0.000	0.079
0.083	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224	0.000	0.000	0.224
0.125	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.411	0.000	0.000	0.411
0.167	1.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.633	0.000	0.000	0.633
0.208	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.884	0.000	0.000	0.884
0.250	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.162	0.000	0.000	1.162
0.292	2.333	0.500	0.000	0.000	0.000	0.000	0.000	0.000	1.465	0.000	0.000	1.465
0.333	2.667	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.676	0.000	0.000	1.676
0.375	3.000	1.500	0.000	0.000	0.000	0.000	0.000	0.000	1.836	0.000	0.000	1.836
0.417	3.333	2.000	0.000	0.000	0.000	0.000	0.000	0.000	1.983	0.000	0.000	1.983
0.458	3.667	2.500	0.000	0.000	0.000	0.000	0.000	0.000	2.120	0.000	0.000	2.120
0.500	4.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	2.248	0.000	0.000	2.248
0.542	4.333	3.500	0.000	0.000	0.000	0.000	0.000	0.000	2.370	0.000	0.000	2.370
0.583	4.667	4.000	0.000	0.000	0.000	0.000	0.000	0.000	2.486	0.000	0.000	2.486
0.625	5.000	4.500	0.000	0.000	0.000	0.000	0.000	0.000	2.596	0.000	0.000	2.596
0.667	5.333	5.000	0.000	0.000	0.000	0.000	0.000	0.000	2.702	0.000	0.000	2.702
0.708	5.667	5.500	0.000	0.000	0.000	0.000	0.000	0.000	2.804	0.000	0.000	2.804
0.750	6.000	6.000	0.000	0.000	0.000	0.000	0.000	0.000	2.903	0.000	0.000	2.903
0.792	6.333	6.500	0.000	0.000	0.000	0.000	0.000	0.000	2.998	0.000	0.000	2.998
0.833	6.667	7.000	0.000	0.000	0.000	0.000	0.000	0.000	3.090	0.000	0.000	3.090
0.875	7.000	7.500	0.000	0.000	0.000	0.000	0.000	0.000	3.180	0.000	0.000	3.180
0.917	7.333	8.000	0.000	0.000	0.000	0.000	0.000	0.000	3.267	0.000	0.000	3.267
0.958	7.667	8.500	0.000	0.000	0.000	0.000	0.000	0.000	3.352	0.000	0.000	3.352
1.000	8.000	9.000	0.000	0.000	0.000	0.000	0.000	0.000	3.434	0.000	0.000	3.434
1.042	8.333	9.500	0.000	0.000	0.000	0.000	0.000	0.000	3.515	0.000	0.000	3.515
1.083	8.667	10.000	0.000	0.000	0.000	0.000	0.000	0.000	3.594	0.000	0.000	3.594
1.125	9.000	10.500	0.000	0.000	0.000	0.000	0.000	0.000	3.671	0.000	0.000	3.671
1.167	9.333	11.000	0.000	0.000	0.000	0.000	0.000	0.000	3.747	0.000	0.000	3.747
1.208	9.667	11.500	0.000	0.000	0.000	0.000	0.000	0.000	3.821	0.000	0.000	3.821
1.250	10.000	12.000	0.000	0.000	0.000	0.000	0.000	0.000	3.894	0.000	0.000	3.894
1.292	10.333	12.500	0.000	0.000	0.000	0.000	0.000	0.000	3.966	0.000	0.000	3.966
1.333	10.667	13.000	0.000	0.000	0.000	0.000	0.000	0.000	4.036	0.000	0.000	4.036
1.375	11.000	13.500	0.000	0.000	0.000	0.000	0.000	0.000	4.105	0.000	0.000	4.105
1.417	11.333	14.000	0.000	0.000	0.000	0.000	0.000	0.000	4.173	0.000	0.000	4.173
1.458	11.667	14.500	0.000	0.000	0.000	0.000	0.000	0.000	4.239	0.000	0.000	4.239
1.500	12.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	4.305	0.000	0.000	4.305
1.542	12.333	15.500	0.000	0.000	0.000	0.000	0.000	0.000	4.370	0.000	0.316	4.686
1.583	12.667	16.000	0.000	0.000	0.000	0.000	0.000	0.000	4.434	0.000	0.895	5.329
1.625	13.000	16.500	0.000	0.000	0.000	0.000	0.000	0.000	4.497	0.000	1.644	6.141
1.667	13.333	17.000	0.000	0.000	0.000	0.000	0.000	0.000	4.559	0.000	2.531	7.090
1.708	13.667	17.500	0.000	0.000	0.000	0.000	0.000	0.000	4.620	0.000	3.537	8.157
1.750	14.000	18.000	0.000	0.000	0.000	0.000	0.000	0.000	4.680	0.000	4.650	9.330

Outlet structure for Discharge of Detention Basin 3 (note: 0.0 elev = 2.75 ft actual elevation)

Discharge vs Elevation Table

Low orifice:	0.75	"	Lower slot			Emergency Weir	
Number:	0		Invert:	0.00	ft	Invert:	1.500 ft
Cg-low:	0.61		B	1.00	ft	B:	8 ft
			h	0.167	ft		
Middle orifice:	1	"	Upper slot				
number of orif:	0		Invert:	0.000	ft		
Cg-middle:	0.61		B:	0.00	ft		
invert elev:	0.25	ft	h	0.000	ft		

h (ft)	H/D-low -	H/D-mid -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qslot-low (cfs)	Qslot-upp (cfs)	Qemer (cfs)	Qtot (cfs)
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.042	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.026
0.083	1.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.000	0.000	0.075
0.125	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.137	0.000	0.000	0.137
0.167	2.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.211	0.000	0.000	0.211
0.208	3.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.288	0.000	0.000	0.288
0.250	4.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.333
0.292	4.667	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.372	0.000	0.000	0.372
0.333	5.333	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.408	0.000	0.000	0.408
0.375	6.000	1.500	0.000	0.000	0.000	0.000	0.000	0.000	0.441	0.000	0.000	0.441
0.417	6.667	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.471	0.000	0.000	0.471
0.458	7.333	2.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500
0.500	8.000	3.000	0.000	0.000	0.000	0.000	0.000	0.000	0.527	0.000	0.000	0.527
0.542	8.667	3.500	0.000	0.000	0.000	0.000	0.000	0.000	0.552	0.000	0.000	0.552
0.583	9.333	4.000	0.000	0.000	0.000	0.000	0.000	0.000	0.577	0.000	0.000	0.577
0.625	10.000	4.500	0.000	0.000	0.000	0.000	0.000	0.000	0.600	0.000	0.000	0.600
0.667	10.667	5.000	0.000	0.000	0.000	0.000	0.000	0.000	0.623	0.000	0.000	0.623
0.708	11.333	5.500	0.000	0.000	0.000	0.000	0.000	0.000	0.645	0.000	0.000	0.645
0.750	12.000	6.000	0.000	0.000	0.000	0.000	0.000	0.000	0.666	0.000	0.000	0.666
0.792	12.667	6.500	0.000	0.000	0.000	0.000	0.000	0.000	0.687	0.000	0.000	0.687
0.833	13.333	7.000	0.000	0.000	0.000	0.000	0.000	0.000	0.707	0.000	0.000	0.707
0.875	14.000	7.500	0.000	0.000	0.000	0.000	0.000	0.000	0.726	0.000	0.000	0.726
0.917	14.667	8.000	0.000	0.000	0.000	0.000	0.000	0.000	0.745	0.000	0.000	0.745
0.958	15.333	8.500	0.000	0.000	0.000	0.000	0.000	0.000	0.763	0.000	0.000	0.763
1.000	16.000	9.000	0.000	0.000	0.000	0.000	0.000	0.000	0.781	0.000	0.000	0.781
1.042	16.667	9.500	0.000	0.000	0.000	0.000	0.000	0.000	0.799	0.000	0.000	0.799
1.083	17.333	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.816	0.000	0.000	0.816
1.125	18.000	10.500	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.000	0.833
1.167	18.667	11.000	0.000	0.000	0.000	0.000	0.000	0.000	0.849	0.000	0.000	0.849
1.208	19.333	11.500	0.000	0.000	0.000	0.000	0.000	0.000	0.865	0.000	0.000	0.865
1.250	20.000	12.000	0.000	0.000	0.000	0.000	0.000	0.000	0.881	0.000	0.000	0.881
1.292	20.667	12.500	0.000	0.000	0.000	0.000	0.000	0.000	0.897	0.000	0.000	0.897
1.333	21.333	13.000	0.000	0.000	0.000	0.000	0.000	0.000	0.912	0.000	0.000	0.912
1.375	22.000	13.500	0.000	0.000	0.000	0.000	0.000	0.000	0.927	0.000	0.000	0.927
1.417	22.667	14.000	0.000	0.000	0.000	0.000	0.000	0.000	0.942	0.000	0.000	0.942
1.458	23.333	14.500	0.000	0.000	0.000	0.000	0.000	0.000	0.957	0.000	0.000	0.957
1.500	24.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	0.971	0.000	0.000	0.971
1.542	24.667	15.500	0.000	0.000	0.000	0.000	0.000	0.000	0.985	0.000	0.211	1.196
1.583	25.333	16.000	0.000	0.000	0.000	0.000	0.000	0.000	0.999	0.000	0.596	1.596
1.625	26.000	16.500	0.000	0.000	0.000	0.000	0.000	0.000	1.013	0.000	1.096	2.109
1.667	26.667	17.000	0.000	0.000	0.000	0.000	0.000	0.000	1.027	0.000	1.687	2.714
1.708	27.333	17.500	0.000	0.000	0.000	0.000	0.000	0.000	1.040	0.000	2.358	3.398
1.750	28.000	18.000	0.000	0.000	0.000	0.000	0.000	0.000	1.053	0.000	3.100	4.153
1.792	28.667	18.500	0.000	0.000	0.000	0.000	0.000	0.000	1.066	0.000	3.906	4.973
1.833	29.333	19.000	0.000	0.000	0.000	0.000	0.000	0.000	1.079	0.000	4.773	5.852
1.875	30.000	19.500	0.000	0.000	0.000	0.000	0.000	0.000	1.092	0.000	5.695	6.787
1.917	30.667	20.000	0.000	0.000	0.000	0.000	0.000	0.000	1.105	0.000	6.670	7.775
1.958	31.333	20.500	0.000	0.000	0.000	0.000	0.000	0.000	1.117	0.000	7.695	8.812
2.000	32.000	21.000	0.000	0.000	0.000	0.000	0.000	0.000	1.130	0.000	8.768	9.897

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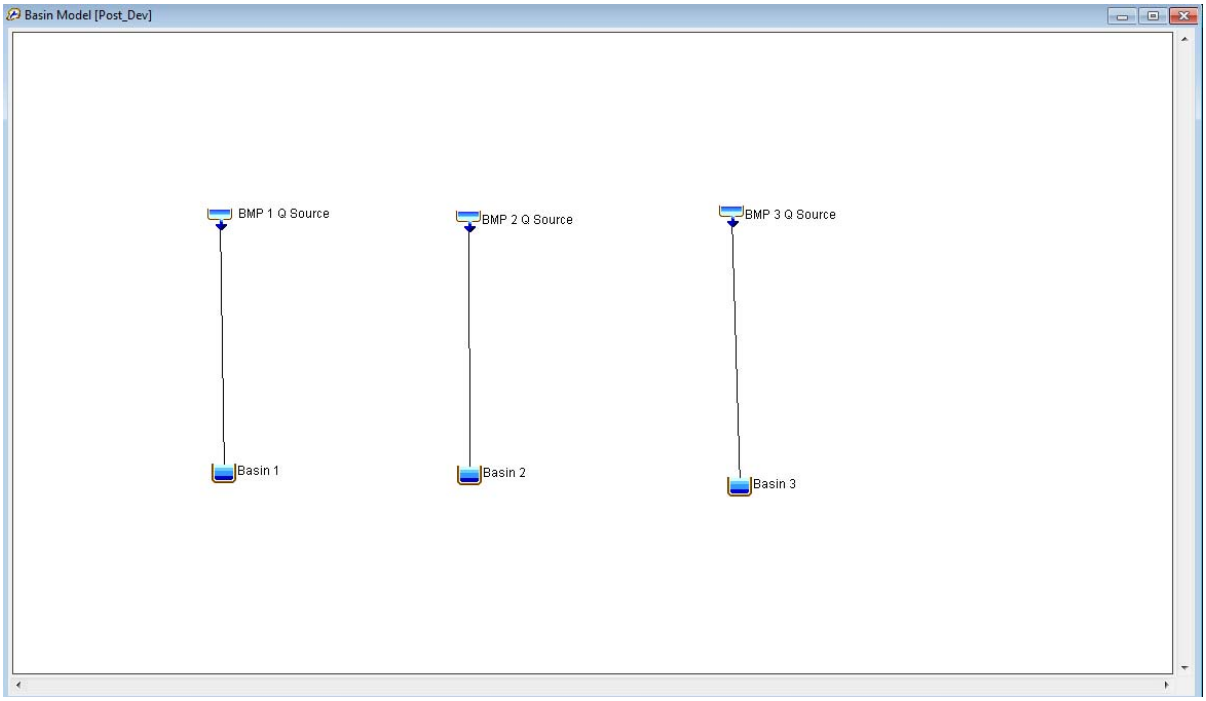
6.3 – HEC-HMS Modified-Puls Routing Results

HEC-HMS Post Development



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Summary Results for Reservoir "Basin 1"

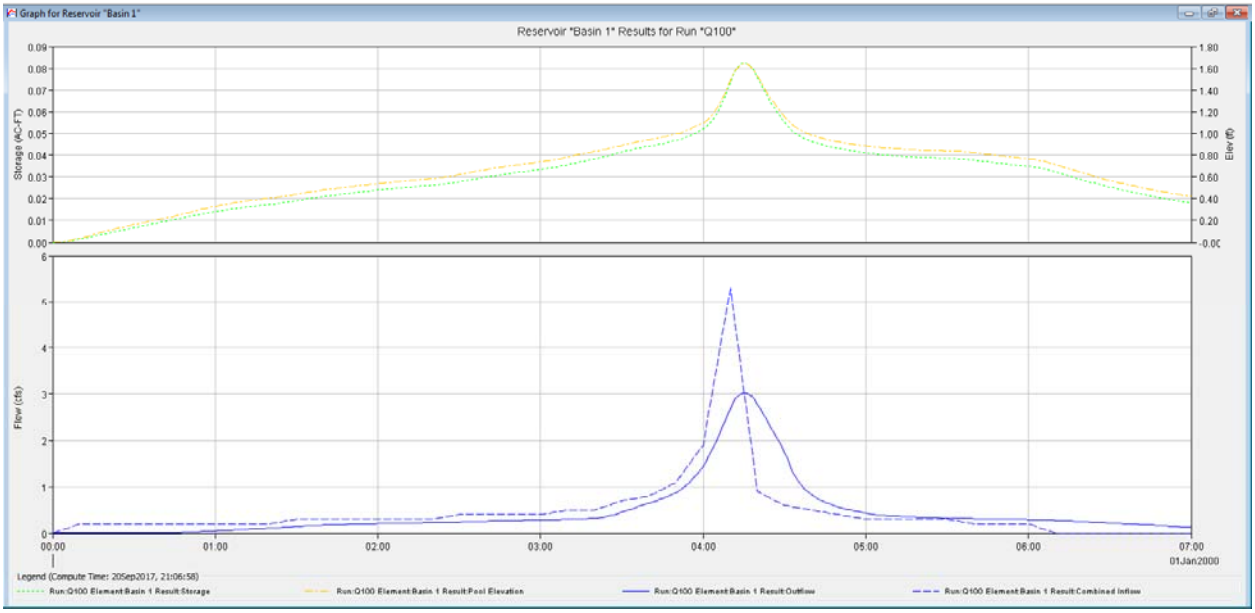
Project: All_Basins Simulation Run: Q100
Reservoir: Basin 1

Start of Run:	01Jan2000, 00:00	Basin Model:	Post_Dev
End of Run:	01Jan2000, 07:00	Meteorologic Model:	Met 1
Compute Time:	20Sep2017, 21:06:58	Control Specifications:	Control 1

Volume Units: (•) IN ( ) AC-FT

Computed Results

Peak Inflow:	5.29 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:10
Peak Discharge:	3.02 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 04:15
Inflow Volume:	n/a	Peak Storage:	0.08 (AC-FT)
Discharge Volume:	n/a	Peak Elevation:	1.64 (FT)



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Project: All_Basins Simulation Run: Q100
Reservoir: Basin 1

Start of Run: 01Jan2000, 00:00 Basin Model: Post_Dev
End of Run: 01Jan2000, 07:00 Meteorologic Model: Met 1
Compute Time: 20Sep2017, 21:06:58 Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:00	0.00	0.00	0.00	0.00
01Jan2000	00:01	0.02	0.00	0.00	0.00
01Jan2000	00:02	0.04	0.00	0.00	0.00
01Jan2000	00:03	0.06	0.00	0.00	0.00
01Jan2000	00:04	0.08	0.00	0.01	0.00
01Jan2000	00:05	0.10	0.00	0.01	0.00
01Jan2000	00:06	0.12	0.00	0.01	0.00
01Jan2000	00:07	0.14	0.00	0.02	0.00
01Jan2000	00:08	0.16	0.00	0.02	0.00
01Jan2000	00:09	0.18	0.00	0.03	0.00
01Jan2000	00:10	0.20	0.00	0.04	0.00
01Jan2000	00:11	0.20	0.00	0.04	0.00
01Jan2000	00:12	0.20	0.00	0.05	0.00
01Jan2000	00:13	0.20	0.00	0.06	0.00
01Jan2000	00:14	0.20	0.00	0.06	0.00
01Jan2000	00:15	0.20	0.00	0.07	0.01
01Jan2000	00:16	0.20	0.00	0.08	0.01
01Jan2000	00:17	0.20	0.00	0.08	0.01
01Jan2000	00:18	0.20	0.00	0.09	0.01
01Jan2000	00:19	0.20	0.00	0.10	0.01
01Jan2000	00:20	0.20	0.00	0.10	0.01
01Jan2000	00:21	0.20	0.00	0.11	0.01
01Jan2000	00:22	0.20	0.00	0.12	0.01
01Jan2000	00:23	0.20	0.00	0.12	0.01
01Jan2000	00:24	0.20	0.01	0.13	0.01
01Jan2000	00:25	0.20	0.01	0.13	0.01

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:26	0.20	0.01	0.14	0.01
01Jan2000	00:27	0.20	0.01	0.15	0.01
01Jan2000	00:28	0.20	0.01	0.15	0.01
01Jan2000	00:29	0.20	0.01	0.16	0.01
01Jan2000	00:30	0.20	0.01	0.16	0.01
01Jan2000	00:31	0.20	0.01	0.17	0.01
01Jan2000	00:32	0.20	0.01	0.17	0.01
01Jan2000	00:33	0.20	0.01	0.18	0.01
01Jan2000	00:34	0.20	0.01	0.18	0.01
01Jan2000	00:35	0.20	0.01	0.19	0.01
01Jan2000	00:36	0.20	0.01	0.19	0.01
01Jan2000	00:37	0.20	0.01	0.20	0.01
01Jan2000	00:38	0.20	0.01	0.21	0.01
01Jan2000	00:39	0.20	0.01	0.21	0.01
01Jan2000	00:40	0.20	0.01	0.22	0.01
01Jan2000	00:41	0.20	0.01	0.22	0.01
01Jan2000	00:42	0.20	0.01	0.23	0.01
01Jan2000	00:43	0.20	0.01	0.23	0.01
01Jan2000	00:44	0.20	0.01	0.24	0.01
01Jan2000	00:45	0.20	0.01	0.24	0.01
01Jan2000	00:46	0.20	0.01	0.25	0.01
01Jan2000	00:47	0.20	0.01	0.25	0.02
01Jan2000	00:48	0.20	0.01	0.26	0.02
01Jan2000	00:49	0.20	0.01	0.27	0.02
01Jan2000	00:50	0.20	0.01	0.27	0.02
01Jan2000	00:51	0.20	0.01	0.28	0.03
01Jan2000	00:52	0.20	0.01	0.28	0.03
01Jan2000	00:53	0.20	0.01	0.29	0.03
01Jan2000	00:54	0.20	0.01	0.30	0.03
01Jan2000	00:55	0.20	0.01	0.30	0.04
01Jan2000	00:56	0.20	0.01	0.31	0.04

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:57	0.20	0.01	0.31	0.04
01Jan2000	00:58	0.20	0.01	0.32	0.04
01Jan2000	00:59	0.20	0.01	0.33	0.05
01Jan2000	01:00	0.20	0.01	0.33	0.05
01Jan2000	01:01	0.20	0.01	0.34	0.05
01Jan2000	01:02	0.20	0.01	0.34	0.06
01Jan2000	01:03	0.20	0.01	0.35	0.06
01Jan2000	01:04	0.20	0.01	0.35	0.06
01Jan2000	01:05	0.20	0.02	0.35	0.07
01Jan2000	01:06	0.20	0.02	0.36	0.07
01Jan2000	01:07	0.20	0.02	0.36	0.07
01Jan2000	01:08	0.20	0.02	0.37	0.07
01Jan2000	01:09	0.20	0.02	0.37	0.08
01Jan2000	01:10	0.20	0.02	0.37	0.08
01Jan2000	01:11	0.20	0.02	0.38	0.08
01Jan2000	01:12	0.20	0.02	0.38	0.09
01Jan2000	01:13	0.20	0.02	0.38	0.09
01Jan2000	01:14	0.20	0.02	0.39	0.09
01Jan2000	01:15	0.20	0.02	0.39	0.09
01Jan2000	01:16	0.20	0.02	0.39	0.10
01Jan2000	01:17	0.20	0.02	0.40	0.10
01Jan2000	01:18	0.20	0.02	0.40	0.10
01Jan2000	01:19	0.20	0.02	0.40	0.11
01Jan2000	01:20	0.20	0.02	0.41	0.11
01Jan2000	01:21	0.21	0.02	0.41	0.11
01Jan2000	01:22	0.22	0.02	0.41	0.11
01Jan2000	01:23	0.23	0.02	0.42	0.12
01Jan2000	01:24	0.24	0.02	0.42	0.12
01Jan2000	01:25	0.25	0.02	0.42	0.12
01Jan2000	01:26	0.26	0.02	0.43	0.13
01Jan2000	01:27	0.27	0.02	0.43	0.13

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:28	0.28	0.02	0.43	0.13
01Jan2000	01:29	0.29	0.02	0.44	0.14
01Jan2000	01:30	0.30	0.02	0.44	0.14
01Jan2000	01:31	0.30	0.02	0.45	0.15
01Jan2000	01:32	0.30	0.02	0.45	0.15
01Jan2000	01:33	0.30	0.02	0.45	0.16
01Jan2000	01:34	0.30	0.02	0.46	0.16
01Jan2000	01:35	0.30	0.02	0.46	0.16
01Jan2000	01:36	0.30	0.02	0.47	0.17
01Jan2000	01:37	0.30	0.02	0.47	0.17
01Jan2000	01:38	0.30	0.02	0.47	0.17
01Jan2000	01:39	0.30	0.02	0.48	0.17
01Jan2000	01:40	0.30	0.02	0.48	0.17
01Jan2000	01:41	0.30	0.02	0.48	0.18
01Jan2000	01:42	0.30	0.02	0.49	0.18
01Jan2000	01:43	0.30	0.02	0.49	0.18
01Jan2000	01:44	0.30	0.02	0.49	0.18
01Jan2000	01:45	0.30	0.02	0.50	0.18
01Jan2000	01:46	0.30	0.02	0.50	0.19
01Jan2000	01:47	0.30	0.02	0.50	0.19
01Jan2000	01:48	0.30	0.02	0.51	0.19
01Jan2000	01:49	0.30	0.02	0.51	0.19
01Jan2000	01:50	0.30	0.02	0.51	0.19
01Jan2000	01:51	0.30	0.02	0.52	0.19
01Jan2000	01:52	0.30	0.02	0.52	0.20
01Jan2000	01:53	0.30	0.02	0.52	0.20
01Jan2000	01:54	0.30	0.02	0.52	0.20
01Jan2000	01:55	0.30	0.02	0.53	0.20
01Jan2000	01:56	0.30	0.02	0.53	0.20
01Jan2000	01:57	0.30	0.02	0.53	0.20
01Jan2000	01:58	0.30	0.02	0.53	0.21

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:59	0.30	0.02	0.54	0.21
01Jan2000	02:00	0.30	0.02	0.54	0.21
01Jan2000	02:01	0.30	0.02	0.54	0.21
01Jan2000	02:02	0.30	0.02	0.54	0.21
01Jan2000	02:03	0.30	0.02	0.55	0.21
01Jan2000	02:04	0.30	0.02	0.55	0.21
01Jan2000	02:05	0.30	0.02	0.55	0.21
01Jan2000	02:06	0.30	0.02	0.55	0.21
01Jan2000	02:07	0.30	0.02	0.56	0.22
01Jan2000	02:08	0.30	0.02	0.56	0.22
01Jan2000	02:09	0.30	0.03	0.56	0.22
01Jan2000	02:10	0.30	0.03	0.56	0.22
01Jan2000	02:11	0.30	0.03	0.57	0.22
01Jan2000	02:12	0.30	0.03	0.57	0.22
01Jan2000	02:13	0.30	0.03	0.57	0.22
01Jan2000	02:14	0.30	0.03	0.57	0.22
01Jan2000	02:15	0.30	0.03	0.57	0.22
01Jan2000	02:16	0.30	0.03	0.58	0.22
01Jan2000	02:17	0.30	0.03	0.58	0.23
01Jan2000	02:18	0.30	0.03	0.58	0.23
01Jan2000	02:19	0.30	0.03	0.58	0.23
01Jan2000	02:20	0.30	0.03	0.59	0.23
01Jan2000	02:21	0.31	0.03	0.59	0.23
01Jan2000	02:22	0.32	0.03	0.59	0.23
01Jan2000	02:23	0.33	0.03	0.59	0.23
01Jan2000	02:24	0.34	0.03	0.60	0.23
01Jan2000	02:25	0.35	0.03	0.60	0.23
01Jan2000	02:26	0.36	0.03	0.60	0.23
01Jan2000	02:27	0.37	0.03	0.61	0.24
01Jan2000	02:28	0.38	0.03	0.61	0.24
01Jan2000	02:29	0.39	0.03	0.62	0.24

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	02:30	0.40	0.03	0.62	0.24
01Jan2000	02:31	0.40	0.03	0.63	0.24
01Jan2000	02:32	0.40	0.03	0.63	0.25
01Jan2000	02:33	0.40	0.03	0.64	0.25
01Jan2000	02:34	0.40	0.03	0.64	0.25
01Jan2000	02:35	0.40	0.03	0.65	0.25
01Jan2000	02:36	0.40	0.03	0.65	0.25
01Jan2000	02:37	0.40	0.03	0.65	0.25
01Jan2000	02:38	0.40	0.03	0.66	0.26
01Jan2000	02:39	0.40	0.03	0.66	0.26
01Jan2000	02:40	0.40	0.03	0.67	0.26
01Jan2000	02:41	0.40	0.03	0.67	0.26
01Jan2000	02:42	0.40	0.03	0.68	0.26
01Jan2000	02:43	0.40	0.03	0.68	0.26
01Jan2000	02:44	0.40	0.03	0.68	0.26
01Jan2000	02:45	0.40	0.03	0.69	0.27
01Jan2000	02:46	0.40	0.03	0.69	0.27
01Jan2000	02:47	0.40	0.03	0.69	0.27
01Jan2000	02:48	0.40	0.03	0.70	0.27
01Jan2000	02:49	0.40	0.03	0.70	0.27
01Jan2000	02:50	0.40	0.03	0.71	0.27
01Jan2000	02:51	0.40	0.03	0.71	0.27
01Jan2000	02:52	0.40	0.03	0.71	0.28
01Jan2000	02:53	0.40	0.03	0.72	0.28
01Jan2000	02:54	0.40	0.03	0.72	0.28
01Jan2000	02:55	0.40	0.03	0.72	0.28
01Jan2000	02:56	0.40	0.03	0.73	0.28
01Jan2000	02:57	0.40	0.03	0.73	0.28
01Jan2000	02:58	0.40	0.03	0.73	0.28
01Jan2000	02:59	0.40	0.03	0.74	0.28
01Jan2000	03:00	0.40	0.03	0.74	0.28

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:01	0.41	0.03	0.74	0.29
01Jan2000	03:02	0.42	0.03	0.75	0.29
01Jan2000	03:03	0.43	0.03	0.75	0.29
01Jan2000	03:04	0.44	0.03	0.75	0.29
01Jan2000	03:05	0.45	0.03	0.76	0.29
01Jan2000	03:06	0.46	0.03	0.76	0.29
01Jan2000	03:07	0.47	0.03	0.77	0.29
01Jan2000	03:08	0.48	0.04	0.77	0.30
01Jan2000	03:09	0.49	0.04	0.78	0.30
01Jan2000	03:10	0.50	0.04	0.78	0.30
01Jan2000	03:11	0.50	0.04	0.79	0.30
01Jan2000	03:12	0.50	0.04	0.79	0.30
01Jan2000	03:13	0.50	0.04	0.80	0.30
01Jan2000	03:14	0.50	0.04	0.80	0.31
01Jan2000	03:15	0.50	0.04	0.81	0.31
01Jan2000	03:16	0.50	0.04	0.81	0.31
01Jan2000	03:17	0.50	0.04	0.82	0.31
01Jan2000	03:18	0.50	0.04	0.82	0.31
01Jan2000	03:19	0.50	0.04	0.83	0.31
01Jan2000	03:20	0.50	0.04	0.84	0.31
01Jan2000	03:21	0.52	0.04	0.84	0.32
01Jan2000	03:22	0.54	0.04	0.84	0.33
01Jan2000	03:23	0.56	0.04	0.85	0.35
01Jan2000	03:24	0.58	0.04	0.86	0.36
01Jan2000	03:25	0.60	0.04	0.86	0.37
01Jan2000	03:26	0.62	0.04	0.87	0.38
01Jan2000	03:27	0.64	0.04	0.87	0.39
01Jan2000	03:28	0.66	0.04	0.88	0.41
01Jan2000	03:29	0.68	0.04	0.89	0.43
01Jan2000	03:30	0.70	0.04	0.89	0.45
01Jan2000	03:31	0.71	0.04	0.90	0.47

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:32	0.72	0.04	0.90	0.49
01Jan2000	03:33	0.73	0.04	0.91	0.51
01Jan2000	03:34	0.74	0.04	0.91	0.53
01Jan2000	03:35	0.75	0.04	0.92	0.55
01Jan2000	03:36	0.76	0.04	0.92	0.57
01Jan2000	03:37	0.77	0.04	0.93	0.59
01Jan2000	03:38	0.78	0.04	0.93	0.61
01Jan2000	03:39	0.79	0.04	0.94	0.63
01Jan2000	03:40	0.80	0.04	0.94	0.65
01Jan2000	03:41	0.83	0.04	0.95	0.67
01Jan2000	03:42	0.86	0.04	0.95	0.68
01Jan2000	03:43	0.89	0.04	0.96	0.71
01Jan2000	03:44	0.92	0.05	0.96	0.73
01Jan2000	03:45	0.95	0.05	0.97	0.75
01Jan2000	03:46	0.98	0.05	0.97	0.78
01Jan2000	03:47	1.01	0.05	0.98	0.80
01Jan2000	03:48	1.04	0.05	0.98	0.83
01Jan2000	03:49	1.07	0.05	0.99	0.85
01Jan2000	03:50	1.10	0.05	1.00	0.88
01Jan2000	03:51	1.18	0.05	1.00	0.91
01Jan2000	03:52	1.26	0.05	1.01	0.95
01Jan2000	03:53	1.34	0.05	1.02	1.00
01Jan2000	03:54	1.42	0.05	1.03	1.05
01Jan2000	03:55	1.50	0.05	1.04	1.10
01Jan2000	03:56	1.58	0.05	1.05	1.16
01Jan2000	03:57	1.66	0.05	1.06	1.23
01Jan2000	03:58	1.74	0.05	1.07	1.29
01Jan2000	03:59	1.82	0.05	1.09	1.36
01Jan2000	04:00	1.90	0.05	1.10	1.44
01Jan2000	04:01	2.24	0.05	1.11	1.53
01Jan2000	04:02	2.58	0.05	1.13	1.65

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:03	2.92	0.06	1.16	1.77
01Jan2000	04:04	3.26	0.06	1.19	1.88
01Jan2000	04:05	3.60	0.06	1.23	2.01
01Jan2000	04:06	3.93	0.06	1.27	2.14
01Jan2000	04:07	4.27	0.06	1.32	2.27
01Jan2000	04:08	4.61	0.07	1.37	2.41
01Jan2000	04:09	4.95	0.07	1.42	2.55
01Jan2000	04:10	5.29	0.07	1.49	2.69
01Jan2000	04:11	4.85	0.08	1.54	2.82
01Jan2000	04:12	4.41	0.08	1.58	2.91
01Jan2000	04:13	3.97	0.08	1.62	2.97
01Jan2000	04:14	3.53	0.08	1.63	3.01
01Jan2000	04:15	3.10	0.08	1.64	3.02
01Jan2000	04:16	2.66	0.08	1.64	3.01
01Jan2000	04:17	2.22	0.08	1.62	2.99
01Jan2000	04:18	1.78	0.08	1.60	2.94
01Jan2000	04:19	1.34	0.08	1.57	2.87
01Jan2000	04:20	0.90	0.08	1.53	2.78
01Jan2000	04:21	0.87	0.07	1.49	2.68
01Jan2000	04:22	0.84	0.07	1.44	2.58
01Jan2000	04:23	0.81	0.07	1.39	2.48
01Jan2000	04:24	0.78	0.07	1.35	2.38
01Jan2000	04:25	0.75	0.06	1.32	2.27
01Jan2000	04:26	0.72	0.06	1.28	2.17
01Jan2000	04:27	0.69	0.06	1.25	2.07
01Jan2000	04:28	0.66	0.06	1.22	1.96
01Jan2000	04:29	0.63	0.06	1.18	1.85
01Jan2000	04:30	0.60	0.05	1.15	1.73
01Jan2000	04:31	0.59	0.05	1.12	1.61
01Jan2000	04:32	0.58	0.05	1.10	1.46
01Jan2000	04:33	0.57	0.05	1.08	1.33

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:34	0.56	0.05	1.06	1.22
01Jan2000	04:35	0.55	0.05	1.04	1.12
01Jan2000	04:36	0.54	0.05	1.03	1.05
01Jan2000	04:37	0.53	0.05	1.02	0.98
01Jan2000	04:38	0.52	0.05	1.00	0.92
01Jan2000	04:39	0.51	0.05	0.99	0.87
01Jan2000	04:40	0.50	0.05	0.98	0.83
01Jan2000	04:41	0.49	0.05	0.98	0.79
01Jan2000	04:42	0.48	0.05	0.97	0.76
01Jan2000	04:43	0.47	0.05	0.96	0.72
01Jan2000	04:44	0.46	0.04	0.95	0.69
01Jan2000	04:45	0.45	0.04	0.95	0.67
01Jan2000	04:46	0.44	0.04	0.94	0.65
01Jan2000	04:47	0.43	0.04	0.94	0.62
01Jan2000	04:48	0.42	0.04	0.93	0.60
01Jan2000	04:49	0.41	0.04	0.93	0.58
01Jan2000	04:50	0.40	0.04	0.92	0.56
01Jan2000	04:51	0.39	0.04	0.92	0.55
01Jan2000	04:52	0.38	0.04	0.91	0.53
01Jan2000	04:53	0.37	0.04	0.91	0.52
01Jan2000	04:54	0.36	0.04	0.91	0.50
01Jan2000	04:55	0.35	0.04	0.90	0.49
01Jan2000	04:56	0.34	0.04	0.90	0.48
01Jan2000	04:57	0.33	0.04	0.90	0.47
01Jan2000	04:58	0.32	0.04	0.89	0.46
01Jan2000	04:59	0.31	0.04	0.89	0.45
01Jan2000	05:00	0.30	0.04	0.89	0.44
01Jan2000	05:01	0.30	0.04	0.88	0.42
01Jan2000	05:02	0.30	0.04	0.88	0.41
01Jan2000	05:03	0.30	0.04	0.88	0.41
01Jan2000	05:04	0.30	0.04	0.87	0.40

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:05	0.30	0.04	0.87	0.39
01Jan2000	05:06	0.30	0.04	0.87	0.39
01Jan2000	05:07	0.30	0.04	0.87	0.38
01Jan2000	05:08	0.30	0.04	0.87	0.38
01Jan2000	05:09	0.30	0.04	0.86	0.37
01Jan2000	05:10	0.30	0.04	0.86	0.37
01Jan2000	05:11	0.30	0.04	0.86	0.37
01Jan2000	05:12	0.30	0.04	0.86	0.36
01Jan2000	05:13	0.30	0.04	0.86	0.36
01Jan2000	05:14	0.30	0.04	0.86	0.36
01Jan2000	05:15	0.30	0.04	0.85	0.35
01Jan2000	05:16	0.30	0.04	0.85	0.35
01Jan2000	05:17	0.30	0.04	0.85	0.35
01Jan2000	05:18	0.30	0.04	0.85	0.35
01Jan2000	05:19	0.30	0.04	0.85	0.34
01Jan2000	05:20	0.30	0.04	0.85	0.34
01Jan2000	05:21	0.30	0.04	0.85	0.34
01Jan2000	05:22	0.30	0.04	0.85	0.34
01Jan2000	05:23	0.30	0.04	0.85	0.34
01Jan2000	05:24	0.30	0.04	0.84	0.33
01Jan2000	05:25	0.30	0.04	0.84	0.33
01Jan2000	05:26	0.30	0.04	0.84	0.33
01Jan2000	05:27	0.30	0.04	0.84	0.33
01Jan2000	05:28	0.30	0.04	0.84	0.33
01Jan2000	05:29	0.30	0.04	0.84	0.33
01Jan2000	05:30	0.30	0.04	0.84	0.32
01Jan2000	05:31	0.29	0.04	0.84	0.32
01Jan2000	05:32	0.28	0.04	0.84	0.32
01Jan2000	05:33	0.27	0.04	0.84	0.32
01Jan2000	05:34	0.26	0.04	0.84	0.32
01Jan2000	05:35	0.25	0.04	0.83	0.31

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:36	0.24	0.04	0.83	0.31
01Jan2000	05:37	0.23	0.04	0.83	0.31
01Jan2000	05:38	0.22	0.04	0.83	0.31
01Jan2000	05:39	0.21	0.04	0.83	0.31
01Jan2000	05:40	0.20	0.04	0.82	0.31
01Jan2000	05:41	0.20	0.04	0.82	0.31
01Jan2000	05:42	0.20	0.04	0.82	0.31
01Jan2000	05:43	0.20	0.04	0.81	0.31
01Jan2000	05:44	0.20	0.04	0.81	0.31
01Jan2000	05:45	0.20	0.04	0.81	0.31
01Jan2000	05:46	0.20	0.04	0.80	0.31
01Jan2000	05:47	0.20	0.04	0.80	0.30
01Jan2000	05:48	0.20	0.04	0.80	0.30
01Jan2000	05:49	0.20	0.04	0.80	0.30
01Jan2000	05:50	0.20	0.04	0.79	0.30
01Jan2000	05:51	0.20	0.04	0.79	0.30
01Jan2000	05:52	0.20	0.04	0.79	0.30
01Jan2000	05:53	0.20	0.04	0.79	0.30
01Jan2000	05:54	0.20	0.04	0.78	0.30
01Jan2000	05:55	0.20	0.04	0.78	0.30
01Jan2000	05:56	0.20	0.04	0.78	0.30
01Jan2000	05:57	0.20	0.04	0.77	0.30
01Jan2000	05:58	0.20	0.04	0.77	0.30
01Jan2000	05:59	0.20	0.03	0.77	0.29
01Jan2000	06:00	0.20	0.03	0.77	0.29
01Jan2000	06:01	0.18	0.03	0.76	0.29
01Jan2000	06:02	0.16	0.03	0.76	0.29
01Jan2000	06:03	0.14	0.03	0.76	0.29
01Jan2000	06:04	0.12	0.03	0.75	0.29
01Jan2000	06:05	0.10	0.03	0.75	0.29
01Jan2000	06:06	0.08	0.03	0.74	0.29

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:07	0.06	0.03	0.74	0.28
01Jan2000	06:08	0.04	0.03	0.73	0.28
01Jan2000	06:09	0.02	0.03	0.72	0.28
01Jan2000	06:10	0.00	0.03	0.72	0.28
01Jan2000	06:11	0.00	0.03	0.71	0.27
01Jan2000	06:12	0.00	0.03	0.70	0.27
01Jan2000	06:13	0.00	0.03	0.69	0.27
01Jan2000	06:14	0.00	0.03	0.69	0.26
01Jan2000	06:15	0.00	0.03	0.68	0.26
01Jan2000	06:16	0.00	0.03	0.67	0.26
01Jan2000	06:17	0.00	0.03	0.66	0.26
01Jan2000	06:18	0.00	0.03	0.66	0.25
01Jan2000	06:19	0.00	0.03	0.65	0.25
01Jan2000	06:20	0.00	0.03	0.64	0.25
01Jan2000	06:21	0.00	0.03	0.63	0.25
01Jan2000	06:22	0.00	0.03	0.62	0.24
01Jan2000	06:23	0.00	0.03	0.62	0.24
01Jan2000	06:24	0.00	0.03	0.61	0.24
01Jan2000	06:25	0.00	0.03	0.60	0.23
01Jan2000	06:26	0.00	0.03	0.60	0.23
01Jan2000	06:27	0.00	0.03	0.59	0.23
01Jan2000	06:28	0.00	0.03	0.58	0.23
01Jan2000	06:29	0.00	0.03	0.57	0.22
01Jan2000	06:30	0.00	0.03	0.57	0.22
01Jan2000	06:31	0.00	0.03	0.56	0.22
01Jan2000	06:32	0.00	0.02	0.56	0.22
01Jan2000	06:33	0.00	0.02	0.55	0.21
01Jan2000	06:34	0.00	0.02	0.54	0.21
01Jan2000	06:35	0.00	0.02	0.54	0.21
01Jan2000	06:36	0.00	0.02	0.53	0.20
01Jan2000	06:37	0.00	0.02	0.53	0.20

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:38	0.00	0.02	0.52	0.20
01Jan2000	06:39	0.00	0.02	0.52	0.20
01Jan2000	06:40	0.00	0.02	0.51	0.19
01Jan2000	06:41	0.00	0.02	0.51	0.19
01Jan2000	06:42	0.00	0.02	0.50	0.19
01Jan2000	06:43	0.00	0.02	0.50	0.18
01Jan2000	06:44	0.00	0.02	0.49	0.18
01Jan2000	06:45	0.00	0.02	0.49	0.18
01Jan2000	06:46	0.00	0.02	0.48	0.18
01Jan2000	06:47	0.00	0.02	0.48	0.17
01Jan2000	06:48	0.00	0.02	0.47	0.17
01Jan2000	06:49	0.00	0.02	0.47	0.17
01Jan2000	06:50	0.00	0.02	0.46	0.16
01Jan2000	06:51	0.00	0.02	0.46	0.16
01Jan2000	06:52	0.00	0.02	0.45	0.16
01Jan2000	06:53	0.00	0.02	0.45	0.15
01Jan2000	06:54	0.00	0.02	0.45	0.15
01Jan2000	06:55	0.00	0.02	0.44	0.14
01Jan2000	06:56	0.00	0.02	0.44	0.14
01Jan2000	06:57	0.00	0.02	0.43	0.13
01Jan2000	06:58	0.00	0.02	0.43	0.13
01Jan2000	06:59	0.00	0.02	0.43	0.13
01Jan2000	07:00	0.00	0.02	0.42	0.12

Summary Results for Reservoir "Basin 2"

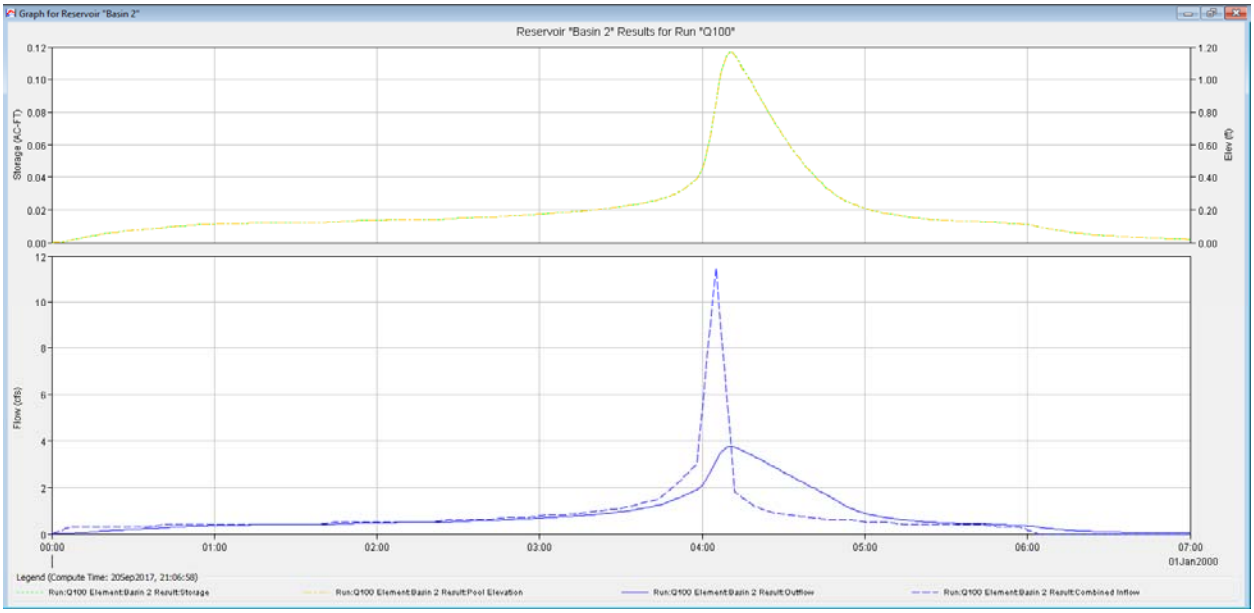
Project: All_Basins Simulation Run: Q100
Reservoir: Basin 2

Start of Run:	01Jan2000, 00:00	Basin Model:	Post_Dev
End of Run:	01Jan2000, 07:00	Meteorologic Model:	Met 1
Compute Time:	20Sep2017, 21:06:58	Control Specifications:	Control 1

Volume Units: (•) IN ( ) AC-FT

Computed Results

Peak Inflow:	11.47 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:05
Peak Discharge:	3.75 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 04:11
Inflow Volume:	n/a	Peak Storage:	0.12 (AC-FT)
Discharge Volume:	n/a	Peak Elevation:	1.17 (FT)



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Project: All_Basins Simulation Run: Q100
Reservoir: Basin 2

Start of Run: 01Jan2000, 00:00 Basin Model: Post_Dev
End of Run: 01Jan2000, 07:00 Meteorologic Model: Met 1
Compute Time: 20Sep2017, 21:06:58 Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:00	0.00	0.00	0.00	0.00
01Jan2000	00:01	0.04	0.00	0.00	0.00
01Jan2000	00:02	0.09	0.00	0.00	0.00
01Jan2000	00:03	0.13	0.00	0.00	0.00
01Jan2000	00:04	0.17	0.00	0.00	0.01
01Jan2000	00:05	0.21	0.00	0.01	0.01
01Jan2000	00:06	0.26	0.00	0.01	0.02
01Jan2000	00:07	0.30	0.00	0.01	0.03
01Jan2000	00:08	0.30	0.00	0.02	0.03
01Jan2000	00:09	0.30	0.00	0.02	0.04
01Jan2000	00:10	0.30	0.00	0.02	0.05
01Jan2000	00:11	0.30	0.00	0.03	0.05
01Jan2000	00:12	0.30	0.00	0.03	0.06
01Jan2000	00:13	0.30	0.00	0.03	0.07
01Jan2000	00:14	0.30	0.00	0.04	0.07
01Jan2000	00:15	0.30	0.00	0.04	0.08
01Jan2000	00:16	0.30	0.00	0.04	0.09
01Jan2000	00:17	0.30	0.00	0.05	0.10
01Jan2000	00:18	0.30	0.00	0.05	0.11
01Jan2000	00:19	0.30	0.01	0.05	0.11
01Jan2000	00:20	0.30	0.01	0.05	0.12
01Jan2000	00:21	0.30	0.01	0.06	0.13
01Jan2000	00:22	0.30	0.01	0.06	0.14
01Jan2000	00:23	0.30	0.01	0.06	0.15
01Jan2000	00:24	0.30	0.01	0.06	0.15
01Jan2000	00:25	0.30	0.01	0.07	0.16

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:26	0.30	0.01	0.07	0.17
01Jan2000	00:27	0.30	0.01	0.07	0.17
01Jan2000	00:28	0.30	0.01	0.07	0.18
01Jan2000	00:29	0.30	0.01	0.07	0.18
01Jan2000	00:30	0.30	0.01	0.07	0.19
01Jan2000	00:31	0.30	0.01	0.08	0.20
01Jan2000	00:32	0.30	0.01	0.08	0.20
01Jan2000	00:33	0.30	0.01	0.08	0.20
01Jan2000	00:34	0.30	0.01	0.08	0.21
01Jan2000	00:35	0.30	0.01	0.08	0.21
01Jan2000	00:36	0.31	0.01	0.08	0.22
01Jan2000	00:37	0.33	0.01	0.08	0.22
01Jan2000	00:38	0.34	0.01	0.08	0.23
01Jan2000	00:39	0.36	0.01	0.09	0.24
01Jan2000	00:40	0.37	0.01	0.09	0.24
01Jan2000	00:41	0.39	0.01	0.09	0.25
01Jan2000	00:42	0.40	0.01	0.09	0.26
01Jan2000	00:43	0.40	0.01	0.09	0.27
01Jan2000	00:44	0.40	0.01	0.10	0.28
01Jan2000	00:45	0.40	0.01	0.10	0.28
01Jan2000	00:46	0.40	0.01	0.10	0.29
01Jan2000	00:47	0.40	0.01	0.10	0.30
01Jan2000	00:48	0.40	0.01	0.10	0.30
01Jan2000	00:49	0.40	0.01	0.10	0.31
01Jan2000	00:50	0.40	0.01	0.10	0.32
01Jan2000	00:51	0.40	0.01	0.11	0.32
01Jan2000	00:52	0.40	0.01	0.11	0.33
01Jan2000	00:53	0.40	0.01	0.11	0.33
01Jan2000	00:54	0.40	0.01	0.11	0.33
01Jan2000	00:55	0.40	0.01	0.11	0.34
01Jan2000	00:56	0.40	0.01	0.11	0.34

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:57	0.40	0.01	0.11	0.35
01Jan2000	00:58	0.40	0.01	0.11	0.35
01Jan2000	00:59	0.40	0.01	0.11	0.35
01Jan2000	01:00	0.40	0.01	0.11	0.36
01Jan2000	01:01	0.40	0.01	0.11	0.36
01Jan2000	01:02	0.40	0.01	0.11	0.36
01Jan2000	01:03	0.40	0.01	0.11	0.36
01Jan2000	01:04	0.40	0.01	0.11	0.37
01Jan2000	01:05	0.40	0.01	0.12	0.37
01Jan2000	01:06	0.40	0.01	0.12	0.37
01Jan2000	01:07	0.40	0.01	0.12	0.37
01Jan2000	01:08	0.40	0.01	0.12	0.37
01Jan2000	01:09	0.40	0.01	0.12	0.37
01Jan2000	01:10	0.40	0.01	0.12	0.38
01Jan2000	01:11	0.40	0.01	0.12	0.38
01Jan2000	01:12	0.40	0.01	0.12	0.38
01Jan2000	01:13	0.40	0.01	0.12	0.38
01Jan2000	01:14	0.40	0.01	0.12	0.38
01Jan2000	01:15	0.40	0.01	0.12	0.38
01Jan2000	01:16	0.40	0.01	0.12	0.38
01Jan2000	01:17	0.40	0.01	0.12	0.38
01Jan2000	01:18	0.40	0.01	0.12	0.39
01Jan2000	01:19	0.40	0.01	0.12	0.39
01Jan2000	01:20	0.40	0.01	0.12	0.39
01Jan2000	01:21	0.40	0.01	0.12	0.39
01Jan2000	01:22	0.40	0.01	0.12	0.39
01Jan2000	01:23	0.40	0.01	0.12	0.39
01Jan2000	01:24	0.40	0.01	0.12	0.39
01Jan2000	01:25	0.40	0.01	0.12	0.39
01Jan2000	01:26	0.40	0.01	0.12	0.39
01Jan2000	01:27	0.40	0.01	0.12	0.39

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:28	0.40	0.01	0.12	0.39
01Jan2000	01:29	0.40	0.01	0.12	0.39
01Jan2000	01:30	0.40	0.01	0.12	0.39
01Jan2000	01:31	0.40	0.01	0.12	0.39
01Jan2000	01:32	0.40	0.01	0.12	0.39
01Jan2000	01:33	0.40	0.01	0.12	0.39
01Jan2000	01:34	0.40	0.01	0.12	0.39
01Jan2000	01:35	0.40	0.01	0.12	0.40
01Jan2000	01:36	0.40	0.01	0.12	0.40
01Jan2000	01:37	0.40	0.01	0.12	0.40
01Jan2000	01:38	0.40	0.01	0.12	0.40
01Jan2000	01:39	0.41	0.01	0.12	0.40
01Jan2000	01:40	0.43	0.01	0.12	0.40
01Jan2000	01:41	0.44	0.01	0.12	0.40
01Jan2000	01:42	0.46	0.01	0.12	0.40
01Jan2000	01:43	0.47	0.01	0.12	0.41
01Jan2000	01:44	0.49	0.01	0.13	0.41
01Jan2000	01:45	0.50	0.01	0.13	0.42
01Jan2000	01:46	0.50	0.01	0.13	0.42
01Jan2000	01:47	0.50	0.01	0.13	0.43
01Jan2000	01:48	0.50	0.01	0.13	0.43
01Jan2000	01:49	0.50	0.01	0.13	0.44
01Jan2000	01:50	0.50	0.01	0.13	0.44
01Jan2000	01:51	0.50	0.01	0.13	0.45
01Jan2000	01:52	0.50	0.01	0.13	0.45
01Jan2000	01:53	0.50	0.01	0.13	0.45
01Jan2000	01:54	0.50	0.01	0.13	0.46
01Jan2000	01:55	0.50	0.01	0.13	0.46
01Jan2000	01:56	0.50	0.01	0.13	0.46
01Jan2000	01:57	0.50	0.01	0.14	0.47
01Jan2000	01:58	0.50	0.01	0.14	0.47

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:59	0.50	0.01	0.14	0.47
01Jan2000	02:00	0.50	0.01	0.14	0.47
01Jan2000	02:01	0.50	0.01	0.14	0.47
01Jan2000	02:02	0.50	0.01	0.14	0.48
01Jan2000	02:03	0.50	0.01	0.14	0.48
01Jan2000	02:04	0.50	0.01	0.14	0.48
01Jan2000	02:05	0.50	0.01	0.14	0.48
01Jan2000	02:06	0.50	0.01	0.14	0.48
01Jan2000	02:07	0.50	0.01	0.14	0.48
01Jan2000	02:08	0.50	0.01	0.14	0.48
01Jan2000	02:09	0.50	0.01	0.14	0.49
01Jan2000	02:10	0.50	0.01	0.14	0.49
01Jan2000	02:11	0.50	0.01	0.14	0.49
01Jan2000	02:12	0.50	0.01	0.14	0.49
01Jan2000	02:13	0.50	0.01	0.14	0.49
01Jan2000	02:14	0.50	0.01	0.14	0.49
01Jan2000	02:15	0.50	0.01	0.14	0.49
01Jan2000	02:16	0.50	0.01	0.14	0.49
01Jan2000	02:17	0.50	0.01	0.14	0.49
01Jan2000	02:18	0.50	0.01	0.14	0.49
01Jan2000	02:19	0.50	0.01	0.14	0.49
01Jan2000	02:20	0.50	0.01	0.14	0.49
01Jan2000	02:21	0.51	0.01	0.14	0.49
01Jan2000	02:22	0.53	0.01	0.14	0.50
01Jan2000	02:23	0.54	0.01	0.14	0.50
01Jan2000	02:24	0.56	0.01	0.14	0.50
01Jan2000	02:25	0.57	0.01	0.14	0.51
01Jan2000	02:26	0.59	0.01	0.14	0.51
01Jan2000	02:27	0.60	0.01	0.15	0.52
01Jan2000	02:28	0.60	0.01	0.15	0.52
01Jan2000	02:29	0.60	0.01	0.15	0.53

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	02:30	0.60	0.01	0.15	0.53
01Jan2000	02:31	0.60	0.01	0.15	0.54
01Jan2000	02:32	0.60	0.01	0.15	0.54
01Jan2000	02:33	0.60	0.02	0.15	0.55
01Jan2000	02:34	0.60	0.02	0.15	0.55
01Jan2000	02:35	0.60	0.02	0.15	0.55
01Jan2000	02:36	0.60	0.02	0.15	0.56
01Jan2000	02:37	0.60	0.02	0.15	0.56
01Jan2000	02:38	0.60	0.02	0.15	0.56
01Jan2000	02:39	0.60	0.02	0.15	0.57
01Jan2000	02:40	0.60	0.02	0.15	0.57
01Jan2000	02:41	0.60	0.02	0.16	0.57
01Jan2000	02:42	0.61	0.02	0.16	0.57
01Jan2000	02:43	0.63	0.02	0.16	0.58
01Jan2000	02:44	0.64	0.02	0.16	0.58
01Jan2000	02:45	0.66	0.02	0.16	0.59
01Jan2000	02:46	0.67	0.02	0.16	0.59
01Jan2000	02:47	0.69	0.02	0.16	0.60
01Jan2000	02:48	0.70	0.02	0.16	0.60
01Jan2000	02:49	0.70	0.02	0.16	0.61
01Jan2000	02:50	0.70	0.02	0.16	0.62
01Jan2000	02:51	0.70	0.02	0.17	0.62
01Jan2000	02:52	0.70	0.02	0.17	0.63
01Jan2000	02:53	0.70	0.02	0.17	0.63
01Jan2000	02:54	0.70	0.02	0.17	0.64
01Jan2000	02:55	0.70	0.02	0.17	0.64
01Jan2000	02:56	0.71	0.02	0.17	0.65
01Jan2000	02:57	0.73	0.02	0.17	0.65
01Jan2000	02:58	0.74	0.02	0.17	0.66
01Jan2000	02:59	0.76	0.02	0.17	0.67
01Jan2000	03:00	0.77	0.02	0.17	0.68

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:01	0.79	0.02	0.18	0.68
01Jan2000	03:02	0.80	0.02	0.18	0.69
01Jan2000	03:03	0.80	0.02	0.18	0.70
01Jan2000	03:04	0.80	0.02	0.18	0.71
01Jan2000	03:05	0.80	0.02	0.18	0.72
01Jan2000	03:06	0.80	0.02	0.18	0.72
01Jan2000	03:07	0.80	0.02	0.18	0.73
01Jan2000	03:08	0.80	0.02	0.18	0.73
01Jan2000	03:09	0.80	0.02	0.18	0.74
01Jan2000	03:10	0.81	0.02	0.19	0.74
01Jan2000	03:11	0.83	0.02	0.19	0.75
01Jan2000	03:12	0.84	0.02	0.19	0.76
01Jan2000	03:13	0.86	0.02	0.19	0.76
01Jan2000	03:14	0.87	0.02	0.19	0.77
01Jan2000	03:15	0.89	0.02	0.19	0.78
01Jan2000	03:16	0.90	0.02	0.19	0.79
01Jan2000	03:17	0.91	0.02	0.19	0.80
01Jan2000	03:18	0.93	0.02	0.20	0.81
01Jan2000	03:19	0.94	0.02	0.20	0.82
01Jan2000	03:20	0.96	0.02	0.20	0.83
01Jan2000	03:21	0.97	0.02	0.20	0.84
01Jan2000	03:22	0.99	0.02	0.20	0.85
01Jan2000	03:23	1.00	0.02	0.21	0.86
01Jan2000	03:24	1.01	0.02	0.21	0.87
01Jan2000	03:25	1.03	0.02	0.21	0.89
01Jan2000	03:26	1.04	0.02	0.21	0.90
01Jan2000	03:27	1.06	0.02	0.21	0.91
01Jan2000	03:28	1.07	0.02	0.22	0.92
01Jan2000	03:29	1.09	0.02	0.22	0.94
01Jan2000	03:30	1.10	0.02	0.22	0.95
01Jan2000	03:31	1.13	0.02	0.22	0.97

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:32	1.16	0.02	0.22	0.98
01Jan2000	03:33	1.19	0.02	0.23	1.00
01Jan2000	03:34	1.21	0.02	0.23	1.02
01Jan2000	03:35	1.24	0.02	0.23	1.03
01Jan2000	03:36	1.27	0.02	0.23	1.05
01Jan2000	03:37	1.30	0.02	0.24	1.07
01Jan2000	03:38	1.33	0.02	0.24	1.09
01Jan2000	03:39	1.36	0.02	0.24	1.12
01Jan2000	03:40	1.39	0.02	0.25	1.14
01Jan2000	03:41	1.41	0.03	0.25	1.16
01Jan2000	03:42	1.44	0.03	0.25	1.19
01Jan2000	03:43	1.47	0.03	0.26	1.21
01Jan2000	03:44	1.50	0.03	0.26	1.24
01Jan2000	03:45	1.60	0.03	0.27	1.27
01Jan2000	03:46	1.70	0.03	0.27	1.31
01Jan2000	03:47	1.80	0.03	0.28	1.35
01Jan2000	03:48	1.90	0.03	0.28	1.40
01Jan2000	03:49	2.00	0.03	0.29	1.45
01Jan2000	03:50	2.10	0.03	0.30	1.50
01Jan2000	03:51	2.20	0.03	0.31	1.54
01Jan2000	03:52	2.31	0.03	0.32	1.59
01Jan2000	03:53	2.43	0.03	0.33	1.64
01Jan2000	03:54	2.54	0.03	0.34	1.69
01Jan2000	03:55	2.66	0.04	0.35	1.74
01Jan2000	03:56	2.77	0.04	0.36	1.79
01Jan2000	03:57	2.89	0.04	0.38	1.84
01Jan2000	03:58	3.00	0.04	0.39	1.89
01Jan2000	03:59	4.21	0.04	0.42	1.97
01Jan2000	04:00	5.42	0.05	0.45	2.10
01Jan2000	04:01	6.63	0.05	0.51	2.26
01Jan2000	04:02	7.84	0.06	0.57	2.45

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:03	9.05	0.07	0.65	2.67
01Jan2000	04:04	10.26	0.07	0.75	2.90
01Jan2000	04:05	11.47	0.09	0.86	3.14
01Jan2000	04:06	10.09	0.10	0.96	3.35
01Jan2000	04:07	8.71	0.10	1.04	3.51
01Jan2000	04:08	7.33	0.11	1.10	3.63
01Jan2000	04:09	5.94	0.11	1.14	3.70
01Jan2000	04:10	4.56	0.12	1.17	3.74
01Jan2000	04:11	3.18	0.12	1.17	3.75
01Jan2000	04:12	1.80	0.12	1.15	3.71
01Jan2000	04:13	1.71	0.11	1.12	3.67
01Jan2000	04:14	1.63	0.11	1.09	3.62
01Jan2000	04:15	1.54	0.11	1.06	3.56
01Jan2000	04:16	1.46	0.10	1.04	3.51
01Jan2000	04:17	1.37	0.10	1.01	3.46
01Jan2000	04:18	1.29	0.10	0.98	3.40
01Jan2000	04:19	1.20	0.10	0.96	3.34
01Jan2000	04:20	1.16	0.09	0.93	3.28
01Jan2000	04:21	1.11	0.09	0.90	3.22
01Jan2000	04:22	1.07	0.09	0.87	3.16
01Jan2000	04:23	1.03	0.08	0.84	3.10
01Jan2000	04:24	0.99	0.08	0.81	3.04
01Jan2000	04:25	0.94	0.08	0.78	2.97
01Jan2000	04:26	0.90	0.08	0.75	2.91
01Jan2000	04:27	0.89	0.07	0.73	2.84
01Jan2000	04:28	0.87	0.07	0.70	2.78
01Jan2000	04:29	0.86	0.07	0.67	2.72
01Jan2000	04:30	0.84	0.06	0.65	2.66
01Jan2000	04:31	0.83	0.06	0.62	2.59
01Jan2000	04:32	0.81	0.06	0.60	2.53
01Jan2000	04:33	0.80	0.06	0.58	2.47

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:34	0.79	0.06	0.55	2.40
01Jan2000	04:35	0.77	0.05	0.53	2.34
01Jan2000	04:36	0.76	0.05	0.51	2.28
01Jan2000	04:37	0.74	0.05	0.49	2.22
01Jan2000	04:38	0.73	0.05	0.47	2.16
01Jan2000	04:39	0.71	0.05	0.45	2.10
01Jan2000	04:40	0.70	0.04	0.43	2.03
01Jan2000	04:41	0.69	0.04	0.42	1.97
01Jan2000	04:42	0.67	0.04	0.40	1.91
01Jan2000	04:43	0.66	0.04	0.38	1.85
01Jan2000	04:44	0.64	0.04	0.36	1.79
01Jan2000	04:45	0.63	0.03	0.35	1.73
01Jan2000	04:46	0.61	0.03	0.33	1.68
01Jan2000	04:47	0.60	0.03	0.32	1.61
01Jan2000	04:48	0.60	0.03	0.31	1.54
01Jan2000	04:49	0.60	0.03	0.29	1.48
01Jan2000	04:50	0.60	0.03	0.28	1.40
01Jan2000	04:51	0.60	0.03	0.27	1.32
01Jan2000	04:52	0.60	0.03	0.26	1.25
01Jan2000	04:53	0.60	0.03	0.25	1.19
01Jan2000	04:54	0.60	0.02	0.25	1.13
01Jan2000	04:55	0.59	0.02	0.24	1.09
01Jan2000	04:56	0.57	0.02	0.23	1.04
01Jan2000	04:57	0.56	0.02	0.23	1.00
01Jan2000	04:58	0.54	0.02	0.22	0.96
01Jan2000	04:59	0.53	0.02	0.21	0.92
01Jan2000	05:00	0.51	0.02	0.21	0.89
01Jan2000	05:01	0.50	0.02	0.20	0.86
01Jan2000	05:02	0.50	0.02	0.20	0.83
01Jan2000	05:03	0.50	0.02	0.20	0.80
01Jan2000	05:04	0.50	0.02	0.19	0.78

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:05	0.50	0.02	0.19	0.76
01Jan2000	05:06	0.50	0.02	0.18	0.74
01Jan2000	05:07	0.50	0.02	0.18	0.72
01Jan2000	05:08	0.50	0.02	0.18	0.70
01Jan2000	05:09	0.49	0.02	0.18	0.68
01Jan2000	05:10	0.47	0.02	0.17	0.67
01Jan2000	05:11	0.46	0.02	0.17	0.65
01Jan2000	05:12	0.44	0.02	0.17	0.64
01Jan2000	05:13	0.43	0.02	0.16	0.62
01Jan2000	05:14	0.41	0.02	0.16	0.61
01Jan2000	05:15	0.40	0.02	0.16	0.59
01Jan2000	05:16	0.40	0.02	0.16	0.58
01Jan2000	05:17	0.40	0.02	0.15	0.57
01Jan2000	05:18	0.40	0.02	0.15	0.56
01Jan2000	05:19	0.40	0.02	0.15	0.54
01Jan2000	05:20	0.40	0.01	0.15	0.53
01Jan2000	05:21	0.40	0.01	0.15	0.52
01Jan2000	05:22	0.40	0.01	0.14	0.52
01Jan2000	05:23	0.40	0.01	0.14	0.51
01Jan2000	05:24	0.40	0.01	0.14	0.50
01Jan2000	05:25	0.40	0.01	0.14	0.49
01Jan2000	05:26	0.40	0.01	0.14	0.49
01Jan2000	05:27	0.40	0.01	0.14	0.48
01Jan2000	05:28	0.40	0.01	0.14	0.48
01Jan2000	05:29	0.40	0.01	0.14	0.47
01Jan2000	05:30	0.40	0.01	0.14	0.46
01Jan2000	05:31	0.40	0.01	0.13	0.46
01Jan2000	05:32	0.40	0.01	0.13	0.46
01Jan2000	05:33	0.40	0.01	0.13	0.45
01Jan2000	05:34	0.40	0.01	0.13	0.45
01Jan2000	05:35	0.40	0.01	0.13	0.45

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:36	0.40	0.01	0.13	0.44
01Jan2000	05:37	0.40	0.01	0.13	0.44
01Jan2000	05:38	0.40	0.01	0.13	0.44
01Jan2000	05:39	0.40	0.01	0.13	0.43
01Jan2000	05:40	0.40	0.01	0.13	0.43
01Jan2000	05:41	0.40	0.01	0.13	0.43
01Jan2000	05:42	0.40	0.01	0.13	0.43
01Jan2000	05:43	0.40	0.01	0.13	0.43
01Jan2000	05:44	0.39	0.01	0.13	0.42
01Jan2000	05:45	0.37	0.01	0.13	0.42
01Jan2000	05:46	0.36	0.01	0.13	0.42
01Jan2000	05:47	0.34	0.01	0.13	0.41
01Jan2000	05:48	0.33	0.01	0.12	0.41
01Jan2000	05:49	0.31	0.01	0.12	0.40
01Jan2000	05:50	0.30	0.01	0.12	0.40
01Jan2000	05:51	0.30	0.01	0.12	0.39
01Jan2000	05:52	0.30	0.01	0.12	0.38
01Jan2000	05:53	0.30	0.01	0.12	0.38
01Jan2000	05:54	0.30	0.01	0.12	0.37
01Jan2000	05:55	0.30	0.01	0.12	0.37
01Jan2000	05:56	0.30	0.01	0.12	0.37
01Jan2000	05:57	0.30	0.01	0.11	0.36
01Jan2000	05:58	0.26	0.01	0.11	0.36
01Jan2000	05:59	0.21	0.01	0.11	0.35
01Jan2000	06:00	0.17	0.01	0.11	0.34
01Jan2000	06:01	0.13	0.01	0.11	0.33
01Jan2000	06:02	0.09	0.01	0.10	0.31
01Jan2000	06:03	0.04	0.01	0.10	0.30
01Jan2000	06:04	0.00	0.01	0.10	0.28
01Jan2000	06:05	0.00	0.01	0.09	0.27
01Jan2000	06:06	0.00	0.01	0.09	0.25

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:07	0.00	0.01	0.09	0.23
01Jan2000	06:08	0.00	0.01	0.08	0.22
01Jan2000	06:09	0.00	0.01	0.08	0.21
01Jan2000	06:10	0.00	0.01	0.08	0.20
01Jan2000	06:11	0.00	0.01	0.07	0.19
01Jan2000	06:12	0.00	0.01	0.07	0.18
01Jan2000	06:13	0.00	0.01	0.07	0.17
01Jan2000	06:14	0.00	0.01	0.07	0.17
01Jan2000	06:15	0.00	0.01	0.06	0.16
01Jan2000	06:16	0.00	0.01	0.06	0.15
01Jan2000	06:17	0.00	0.01	0.06	0.14
01Jan2000	06:18	0.00	0.01	0.06	0.14
01Jan2000	06:19	0.00	0.01	0.06	0.13
01Jan2000	06:20	0.00	0.01	0.06	0.12
01Jan2000	06:21	0.00	0.01	0.05	0.12
01Jan2000	06:22	0.00	0.01	0.05	0.11
01Jan2000	06:23	0.00	0.01	0.05	0.11
01Jan2000	06:24	0.00	0.00	0.05	0.10
01Jan2000	06:25	0.00	0.00	0.05	0.10
01Jan2000	06:26	0.00	0.00	0.05	0.09
01Jan2000	06:27	0.00	0.00	0.05	0.09
01Jan2000	06:28	0.00	0.00	0.04	0.09
01Jan2000	06:29	0.00	0.00	0.04	0.08
01Jan2000	06:30	0.00	0.00	0.04	0.08
01Jan2000	06:31	0.00	0.00	0.04	0.08
01Jan2000	06:32	0.00	0.00	0.04	0.07
01Jan2000	06:33	0.00	0.00	0.04	0.07
01Jan2000	06:34	0.00	0.00	0.04	0.07
01Jan2000	06:35	0.00	0.00	0.04	0.07
01Jan2000	06:36	0.00	0.00	0.04	0.07
01Jan2000	06:37	0.00	0.00	0.03	0.07

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:38	0.00	0.00	0.03	0.06
01Jan2000	06:39	0.00	0.00	0.03	0.06
01Jan2000	06:40	0.00	0.00	0.03	0.06
01Jan2000	06:41	0.00	0.00	0.03	0.06
01Jan2000	06:42	0.00	0.00	0.03	0.06
01Jan2000	06:43	0.00	0.00	0.03	0.06
01Jan2000	06:44	0.00	0.00	0.03	0.05
01Jan2000	06:45	0.00	0.00	0.03	0.05
01Jan2000	06:46	0.00	0.00	0.03	0.05
01Jan2000	06:47	0.00	0.00	0.03	0.05
01Jan2000	06:48	0.00	0.00	0.03	0.05
01Jan2000	06:49	0.00	0.00	0.03	0.05
01Jan2000	06:50	0.00	0.00	0.02	0.05
01Jan2000	06:51	0.00	0.00	0.02	0.05
01Jan2000	06:52	0.00	0.00	0.02	0.04
01Jan2000	06:53	0.00	0.00	0.02	0.04
01Jan2000	06:54	0.00	0.00	0.02	0.04
01Jan2000	06:55	0.00	0.00	0.02	0.04
01Jan2000	06:56	0.00	0.00	0.02	0.04
01Jan2000	06:57	0.00	0.00	0.02	0.04
01Jan2000	06:58	0.00	0.00	0.02	0.04
01Jan2000	06:59	0.00	0.00	0.02	0.04
01Jan2000	07:00	0.00	0.00	0.02	0.04

Summary Results for Reservoir "Basin 3"

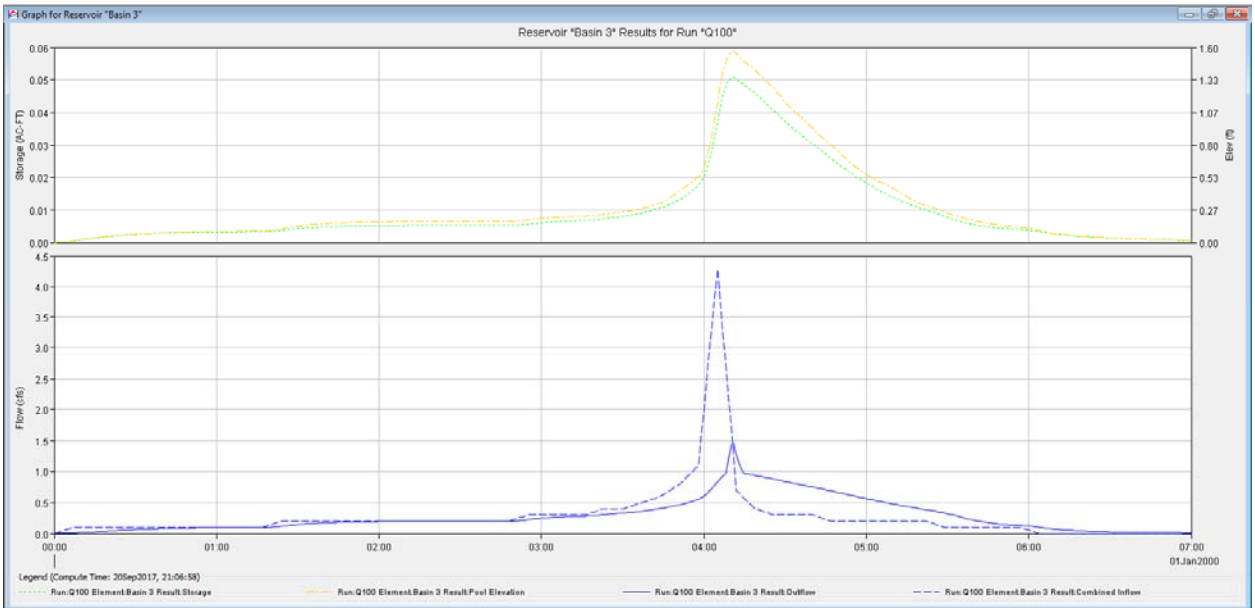
Project: All_Basins Simulation Run: Q100
Reservoir: Basin 3

Start of Run:	01Jan2000, 00:00	Basin Model:	Post_Dev
End of Run:	01Jan2000, 07:00	Meteorologic Model:	Met 1
Compute Time:	20Sep2017, 21:06:58	Control Specifications:	Control 1

Volume Units: (•) IN ( ) AC-FT

Computed Results

Peak Inflow:	4.29 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 04:05
Peak Discharge:	1.45 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 04:11
Inflow Volume:	n/a	Peak Storage:	0.05 (AC-FT)
Discharge Volume:	n/a	Peak Elevation:	1.57 (FT)



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Project: All_Basins Simulation Run: Q100
Reservoir: Basin 3

Start of Run: 01Jan2000, 00:00 Basin Model: Post_Dev
End of Run: 01Jan2000, 07:00 Meteorologic Model: Met 1
Compute Time: 20Sep2017, 21:06:58 Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:00	0.00	0.00	0.00	0.00
01Jan2000	00:01	0.01	0.00	0.00	0.00
01Jan2000	00:02	0.03	0.00	0.00	0.00
01Jan2000	00:03	0.04	0.00	0.00	0.00
01Jan2000	00:04	0.06	0.00	0.00	0.00
01Jan2000	00:05	0.07	0.00	0.01	0.00
01Jan2000	00:06	0.09	0.00	0.01	0.01
01Jan2000	00:07	0.10	0.00	0.01	0.01
01Jan2000	00:08	0.10	0.00	0.02	0.01
01Jan2000	00:09	0.10	0.00	0.02	0.01
01Jan2000	00:10	0.10	0.00	0.02	0.02
01Jan2000	00:11	0.10	0.00	0.02	0.02
01Jan2000	00:12	0.10	0.00	0.03	0.02
01Jan2000	00:13	0.10	0.00	0.03	0.02
01Jan2000	00:14	0.10	0.00	0.03	0.02
01Jan2000	00:15	0.10	0.00	0.04	0.03
01Jan2000	00:16	0.10	0.00	0.04	0.03
01Jan2000	00:17	0.10	0.00	0.04	0.03
01Jan2000	00:18	0.10	0.00	0.04	0.04
01Jan2000	00:19	0.10	0.00	0.05	0.04
01Jan2000	00:20	0.10	0.00	0.05	0.04
01Jan2000	00:21	0.10	0.00	0.05	0.04
01Jan2000	00:22	0.10	0.00	0.05	0.05
01Jan2000	00:23	0.10	0.00	0.05	0.05
01Jan2000	00:24	0.10	0.00	0.06	0.05
01Jan2000	00:25	0.10	0.00	0.06	0.06

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:26	0.10	0.00	0.06	0.06
01Jan2000	00:27	0.10	0.00	0.06	0.06
01Jan2000	00:28	0.10	0.00	0.06	0.06
01Jan2000	00:29	0.10	0.00	0.06	0.06
01Jan2000	00:30	0.10	0.00	0.07	0.07
01Jan2000	00:31	0.10	0.00	0.07	0.07
01Jan2000	00:32	0.10	0.00	0.07	0.07
01Jan2000	00:33	0.10	0.00	0.07	0.07
01Jan2000	00:34	0.10	0.00	0.07	0.07
01Jan2000	00:35	0.10	0.00	0.07	0.07
01Jan2000	00:36	0.10	0.00	0.07	0.07
01Jan2000	00:37	0.10	0.00	0.07	0.08
01Jan2000	00:38	0.10	0.00	0.07	0.08
01Jan2000	00:39	0.10	0.00	0.08	0.08
01Jan2000	00:40	0.10	0.00	0.08	0.08
01Jan2000	00:41	0.10	0.00	0.08	0.08
01Jan2000	00:42	0.10	0.00	0.08	0.08
01Jan2000	00:43	0.10	0.00	0.08	0.08
01Jan2000	00:44	0.10	0.00	0.08	0.08
01Jan2000	00:45	0.10	0.00	0.08	0.09
01Jan2000	00:46	0.10	0.00	0.08	0.09
01Jan2000	00:47	0.10	0.00	0.08	0.09
01Jan2000	00:48	0.10	0.00	0.08	0.09
01Jan2000	00:49	0.10	0.00	0.08	0.09
01Jan2000	00:50	0.10	0.00	0.09	0.09
01Jan2000	00:51	0.10	0.00	0.09	0.09
01Jan2000	00:52	0.10	0.00	0.09	0.09
01Jan2000	00:53	0.10	0.00	0.09	0.09
01Jan2000	00:54	0.10	0.00	0.09	0.09
01Jan2000	00:55	0.10	0.00	0.09	0.09
01Jan2000	00:56	0.10	0.00	0.09	0.09

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	00:57	0.10	0.00	0.09	0.09
01Jan2000	00:58	0.10	0.00	0.09	0.09
01Jan2000	00:59	0.10	0.00	0.09	0.09
01Jan2000	01:00	0.10	0.00	0.09	0.09
01Jan2000	01:01	0.10	0.00	0.09	0.09
01Jan2000	01:02	0.10	0.00	0.09	0.09
01Jan2000	01:03	0.10	0.00	0.09	0.10
01Jan2000	01:04	0.10	0.00	0.09	0.10
01Jan2000	01:05	0.10	0.00	0.09	0.10
01Jan2000	01:06	0.10	0.00	0.09	0.10
01Jan2000	01:07	0.10	0.00	0.09	0.10
01Jan2000	01:08	0.10	0.00	0.09	0.10
01Jan2000	01:09	0.10	0.00	0.09	0.10
01Jan2000	01:10	0.10	0.00	0.09	0.10
01Jan2000	01:11	0.10	0.00	0.09	0.10
01Jan2000	01:12	0.10	0.00	0.09	0.10
01Jan2000	01:13	0.10	0.00	0.09	0.10
01Jan2000	01:14	0.10	0.00	0.09	0.10
01Jan2000	01:15	0.10	0.00	0.09	0.10
01Jan2000	01:16	0.10	0.00	0.09	0.10
01Jan2000	01:17	0.10	0.00	0.09	0.10
01Jan2000	01:18	0.11	0.00	0.09	0.10
01Jan2000	01:19	0.13	0.00	0.09	0.10
01Jan2000	01:20	0.14	0.00	0.10	0.10
01Jan2000	01:21	0.16	0.00	0.10	0.10
01Jan2000	01:22	0.17	0.00	0.10	0.11
01Jan2000	01:23	0.19	0.00	0.11	0.11
01Jan2000	01:24	0.20	0.00	0.11	0.12
01Jan2000	01:25	0.20	0.00	0.12	0.12
01Jan2000	01:26	0.20	0.00	0.12	0.13
01Jan2000	01:27	0.20	0.00	0.12	0.13

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:28	0.20	0.00	0.13	0.14
01Jan2000	01:29	0.20	0.00	0.13	0.14
01Jan2000	01:30	0.20	0.00	0.13	0.14
01Jan2000	01:31	0.20	0.00	0.14	0.15
01Jan2000	01:32	0.20	0.00	0.14	0.15
01Jan2000	01:33	0.20	0.00	0.14	0.16
01Jan2000	01:34	0.20	0.00	0.14	0.16
01Jan2000	01:35	0.20	0.00	0.15	0.16
01Jan2000	01:36	0.20	0.00	0.15	0.17
01Jan2000	01:37	0.20	0.00	0.15	0.17
01Jan2000	01:38	0.20	0.00	0.15	0.17
01Jan2000	01:39	0.20	0.00	0.15	0.17
01Jan2000	01:40	0.20	0.00	0.16	0.17
01Jan2000	01:41	0.20	0.00	0.16	0.18
01Jan2000	01:42	0.20	0.00	0.16	0.18
01Jan2000	01:43	0.20	0.00	0.16	0.18
01Jan2000	01:44	0.20	0.00	0.16	0.18
01Jan2000	01:45	0.20	0.00	0.16	0.18
01Jan2000	01:46	0.20	0.00	0.16	0.18
01Jan2000	01:47	0.20	0.00	0.16	0.19
01Jan2000	01:48	0.20	0.00	0.16	0.19
01Jan2000	01:49	0.20	0.00	0.16	0.19
01Jan2000	01:50	0.20	0.01	0.17	0.19
01Jan2000	01:51	0.20	0.01	0.17	0.19
01Jan2000	01:52	0.20	0.01	0.17	0.19
01Jan2000	01:53	0.20	0.01	0.17	0.19
01Jan2000	01:54	0.20	0.01	0.17	0.19
01Jan2000	01:55	0.20	0.01	0.17	0.19
01Jan2000	01:56	0.20	0.01	0.17	0.19
01Jan2000	01:57	0.20	0.01	0.17	0.19
01Jan2000	01:58	0.20	0.01	0.17	0.19

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	01:59	0.20	0.01	0.17	0.19
01Jan2000	02:00	0.20	0.01	0.17	0.19
01Jan2000	02:01	0.20	0.01	0.17	0.20
01Jan2000	02:02	0.20	0.01	0.17	0.20
01Jan2000	02:03	0.20	0.01	0.17	0.20
01Jan2000	02:04	0.20	0.01	0.17	0.20
01Jan2000	02:05	0.20	0.01	0.17	0.20
01Jan2000	02:06	0.20	0.01	0.17	0.20
01Jan2000	02:07	0.20	0.01	0.17	0.20
01Jan2000	02:08	0.20	0.01	0.17	0.20
01Jan2000	02:09	0.20	0.01	0.17	0.20
01Jan2000	02:10	0.20	0.01	0.17	0.20
01Jan2000	02:11	0.20	0.01	0.17	0.20
01Jan2000	02:12	0.20	0.01	0.17	0.20
01Jan2000	02:13	0.20	0.01	0.17	0.20
01Jan2000	02:14	0.20	0.01	0.17	0.20
01Jan2000	02:15	0.20	0.01	0.17	0.20
01Jan2000	02:16	0.20	0.01	0.17	0.20
01Jan2000	02:17	0.20	0.01	0.17	0.20
01Jan2000	02:18	0.20	0.01	0.17	0.20
01Jan2000	02:19	0.20	0.01	0.17	0.20
01Jan2000	02:20	0.20	0.01	0.17	0.20
01Jan2000	02:21	0.20	0.01	0.17	0.20
01Jan2000	02:22	0.20	0.01	0.17	0.20
01Jan2000	02:23	0.20	0.01	0.17	0.20
01Jan2000	02:24	0.20	0.01	0.17	0.20
01Jan2000	02:25	0.20	0.01	0.17	0.20
01Jan2000	02:26	0.20	0.01	0.17	0.20
01Jan2000	02:27	0.20	0.01	0.17	0.20
01Jan2000	02:28	0.20	0.01	0.17	0.20
01Jan2000	02:29	0.20	0.01	0.17	0.20

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	02:30	0.20	0.01	0.17	0.20
01Jan2000	02:31	0.20	0.01	0.17	0.20
01Jan2000	02:32	0.20	0.01	0.17	0.20
01Jan2000	02:33	0.20	0.01	0.17	0.20
01Jan2000	02:34	0.20	0.01	0.17	0.20
01Jan2000	02:35	0.20	0.01	0.17	0.20
01Jan2000	02:36	0.20	0.01	0.17	0.20
01Jan2000	02:37	0.20	0.01	0.17	0.20
01Jan2000	02:38	0.20	0.01	0.17	0.20
01Jan2000	02:39	0.20	0.01	0.17	0.20
01Jan2000	02:40	0.20	0.01	0.17	0.20
01Jan2000	02:41	0.20	0.01	0.17	0.20
01Jan2000	02:42	0.20	0.01	0.17	0.20
01Jan2000	02:43	0.20	0.01	0.17	0.20
01Jan2000	02:44	0.20	0.01	0.17	0.20
01Jan2000	02:45	0.20	0.01	0.17	0.20
01Jan2000	02:46	0.20	0.01	0.17	0.20
01Jan2000	02:47	0.20	0.01	0.17	0.20
01Jan2000	02:48	0.20	0.01	0.17	0.20
01Jan2000	02:49	0.21	0.01	0.17	0.20
01Jan2000	02:50	0.23	0.01	0.17	0.20
01Jan2000	02:51	0.24	0.01	0.18	0.20
01Jan2000	02:52	0.26	0.01	0.18	0.21
01Jan2000	02:53	0.27	0.01	0.18	0.21
01Jan2000	02:54	0.29	0.01	0.18	0.22
01Jan2000	02:55	0.30	0.01	0.19	0.22
01Jan2000	02:56	0.30	0.01	0.19	0.23
01Jan2000	02:57	0.30	0.01	0.19	0.23
01Jan2000	02:58	0.30	0.01	0.19	0.24
01Jan2000	02:59	0.30	0.01	0.20	0.24
01Jan2000	03:00	0.30	0.01	0.20	0.25

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:01	0.30	0.01	0.20	0.25
01Jan2000	03:02	0.30	0.01	0.20	0.25
01Jan2000	03:03	0.30	0.01	0.20	0.26
01Jan2000	03:04	0.30	0.01	0.20	0.26
01Jan2000	03:05	0.30	0.01	0.21	0.26
01Jan2000	03:06	0.30	0.01	0.21	0.27
01Jan2000	03:07	0.30	0.01	0.21	0.27
01Jan2000	03:08	0.30	0.01	0.21	0.27
01Jan2000	03:09	0.30	0.01	0.21	0.27
01Jan2000	03:10	0.30	0.01	0.21	0.28
01Jan2000	03:11	0.30	0.01	0.21	0.28
01Jan2000	03:12	0.30	0.01	0.21	0.28
01Jan2000	03:13	0.30	0.01	0.21	0.28
01Jan2000	03:14	0.30	0.01	0.21	0.28
01Jan2000	03:15	0.30	0.01	0.22	0.28
01Jan2000	03:16	0.30	0.01	0.22	0.28
01Jan2000	03:17	0.31	0.01	0.22	0.29
01Jan2000	03:18	0.33	0.01	0.22	0.29
01Jan2000	03:19	0.34	0.01	0.22	0.29
01Jan2000	03:20	0.36	0.01	0.22	0.29
01Jan2000	03:21	0.37	0.01	0.22	0.30
01Jan2000	03:22	0.39	0.01	0.23	0.30
01Jan2000	03:23	0.40	0.01	0.23	0.30
01Jan2000	03:24	0.40	0.01	0.23	0.31
01Jan2000	03:25	0.40	0.01	0.24	0.31
01Jan2000	03:26	0.40	0.01	0.24	0.32
01Jan2000	03:27	0.40	0.01	0.24	0.32
01Jan2000	03:28	0.40	0.01	0.25	0.32
01Jan2000	03:29	0.40	0.01	0.25	0.33
01Jan2000	03:30	0.40	0.01	0.25	0.33
01Jan2000	03:31	0.41	0.01	0.25	0.33

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	03:32	0.43	0.01	0.26	0.34
01Jan2000	03:33	0.44	0.01	0.26	0.34
01Jan2000	03:34	0.46	0.01	0.26	0.35
01Jan2000	03:35	0.47	0.01	0.27	0.35
01Jan2000	03:36	0.49	0.01	0.27	0.36
01Jan2000	03:37	0.50	0.01	0.28	0.36
01Jan2000	03:38	0.51	0.01	0.28	0.37
01Jan2000	03:39	0.53	0.01	0.29	0.37
01Jan2000	03:40	0.54	0.01	0.30	0.38
01Jan2000	03:41	0.56	0.01	0.30	0.38
01Jan2000	03:42	0.57	0.01	0.31	0.39
01Jan2000	03:43	0.59	0.01	0.32	0.40
01Jan2000	03:44	0.60	0.01	0.32	0.41
01Jan2000	03:45	0.63	0.01	0.33	0.41
01Jan2000	03:46	0.66	0.01	0.35	0.42
01Jan2000	03:47	0.69	0.01	0.36	0.43
01Jan2000	03:48	0.71	0.01	0.38	0.44
01Jan2000	03:49	0.74	0.01	0.39	0.45
01Jan2000	03:50	0.77	0.01	0.41	0.46
01Jan2000	03:51	0.80	0.01	0.42	0.47
01Jan2000	03:52	0.84	0.01	0.44	0.48
01Jan2000	03:53	0.89	0.01	0.45	0.49
01Jan2000	03:54	0.93	0.01	0.47	0.50
01Jan2000	03:55	0.97	0.02	0.49	0.51
01Jan2000	03:56	1.01	0.02	0.50	0.53
01Jan2000	03:57	1.06	0.02	0.52	0.54
01Jan2000	03:58	1.10	0.02	0.54	0.55
01Jan2000	03:59	1.56	0.02	0.57	0.57
01Jan2000	04:00	2.01	0.02	0.62	0.60
01Jan2000	04:01	2.47	0.02	0.69	0.64
01Jan2000	04:02	2.92	0.03	0.78	0.68

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:03	3.38	0.03	0.88	0.73
01Jan2000	04:04	3.83	0.03	1.02	0.78
01Jan2000	04:05	4.29	0.04	1.14	0.84
01Jan2000	04:06	3.78	0.04	1.29	0.89
01Jan2000	04:07	3.26	0.05	1.39	0.93
01Jan2000	04:08	2.75	0.05	1.47	0.96
01Jan2000	04:09	2.24	0.05	1.53	1.17
01Jan2000	04:10	1.73	0.05	1.57	1.43
01Jan2000	04:11	1.21	0.05	1.57	1.45
01Jan2000	04:12	0.70	0.05	1.55	1.27
01Jan2000	04:13	0.66	0.05	1.52	1.12
01Jan2000	04:14	0.61	0.05	1.50	1.03
01Jan2000	04:15	0.57	0.05	1.48	0.97
01Jan2000	04:16	0.53	0.05	1.47	0.96
01Jan2000	04:17	0.49	0.05	1.45	0.96
01Jan2000	04:18	0.44	0.05	1.43	0.95
01Jan2000	04:19	0.40	0.05	1.41	0.94
01Jan2000	04:20	0.39	0.05	1.39	0.93
01Jan2000	04:21	0.37	0.04	1.37	0.92
01Jan2000	04:22	0.36	0.04	1.35	0.92
01Jan2000	04:23	0.34	0.04	1.32	0.91
01Jan2000	04:24	0.33	0.04	1.30	0.90
01Jan2000	04:25	0.31	0.04	1.28	0.89
01Jan2000	04:26	0.30	0.04	1.26	0.88
01Jan2000	04:27	0.30	0.04	1.23	0.87
01Jan2000	04:28	0.30	0.04	1.20	0.86
01Jan2000	04:29	0.30	0.04	1.17	0.85
01Jan2000	04:30	0.30	0.04	1.15	0.84
01Jan2000	04:31	0.30	0.04	1.13	0.83
01Jan2000	04:32	0.30	0.04	1.10	0.82
01Jan2000	04:33	0.30	0.04	1.08	0.82

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	04:34	0.30	0.03	1.06	0.81
01Jan2000	04:35	0.30	0.03	1.05	0.80
01Jan2000	04:36	0.30	0.03	1.03	0.79
01Jan2000	04:37	0.30	0.03	1.01	0.78
01Jan2000	04:38	0.30	0.03	0.99	0.77
01Jan2000	04:39	0.30	0.03	0.96	0.76
01Jan2000	04:40	0.30	0.03	0.94	0.75
01Jan2000	04:41	0.29	0.03	0.92	0.75
01Jan2000	04:42	0.27	0.03	0.90	0.74
01Jan2000	04:43	0.26	0.03	0.88	0.73
01Jan2000	04:44	0.24	0.03	0.86	0.72
01Jan2000	04:45	0.23	0.03	0.84	0.71
01Jan2000	04:46	0.21	0.03	0.82	0.70
01Jan2000	04:47	0.20	0.03	0.80	0.69
01Jan2000	04:48	0.20	0.03	0.78	0.68
01Jan2000	04:49	0.20	0.02	0.76	0.67
01Jan2000	04:50	0.20	0.02	0.74	0.66
01Jan2000	04:51	0.20	0.02	0.72	0.65
01Jan2000	04:52	0.20	0.02	0.70	0.64
01Jan2000	04:53	0.20	0.02	0.68	0.63
01Jan2000	04:54	0.20	0.02	0.65	0.62
01Jan2000	04:55	0.20	0.02	0.64	0.61
01Jan2000	04:56	0.20	0.02	0.62	0.60
01Jan2000	04:57	0.20	0.02	0.60	0.59
01Jan2000	04:58	0.20	0.02	0.59	0.58
01Jan2000	04:59	0.20	0.02	0.57	0.57
01Jan2000	05:00	0.20	0.02	0.56	0.56
01Jan2000	05:01	0.20	0.02	0.55	0.55
01Jan2000	05:02	0.20	0.02	0.53	0.55
01Jan2000	05:03	0.20	0.02	0.52	0.54
01Jan2000	05:04	0.20	0.02	0.51	0.53

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:05	0.20	0.02	0.50	0.52
01Jan2000	05:06	0.20	0.02	0.49	0.51
01Jan2000	05:07	0.20	0.02	0.47	0.50
01Jan2000	05:08	0.20	0.01	0.46	0.49
01Jan2000	05:09	0.20	0.01	0.45	0.49
01Jan2000	05:10	0.20	0.01	0.44	0.48
01Jan2000	05:11	0.20	0.01	0.43	0.47
01Jan2000	05:12	0.20	0.01	0.42	0.46
01Jan2000	05:13	0.20	0.01	0.40	0.45
01Jan2000	05:14	0.20	0.01	0.39	0.45
01Jan2000	05:15	0.20	0.01	0.38	0.44
01Jan2000	05:16	0.20	0.01	0.36	0.43
01Jan2000	05:17	0.20	0.01	0.35	0.42
01Jan2000	05:18	0.20	0.01	0.34	0.42
01Jan2000	05:19	0.20	0.01	0.33	0.41
01Jan2000	05:20	0.20	0.01	0.32	0.40
01Jan2000	05:21	0.20	0.01	0.31	0.39
01Jan2000	05:22	0.20	0.01	0.30	0.39
01Jan2000	05:23	0.19	0.01	0.30	0.38
01Jan2000	05:24	0.17	0.01	0.29	0.37
01Jan2000	05:25	0.16	0.01	0.28	0.36
01Jan2000	05:26	0.14	0.01	0.27	0.36
01Jan2000	05:27	0.13	0.01	0.27	0.35
01Jan2000	05:28	0.11	0.01	0.26	0.34
01Jan2000	05:29	0.10	0.01	0.25	0.33
01Jan2000	05:30	0.10	0.01	0.24	0.32
01Jan2000	05:31	0.10	0.01	0.23	0.31
01Jan2000	05:32	0.10	0.01	0.23	0.30
01Jan2000	05:33	0.10	0.01	0.22	0.29
01Jan2000	05:34	0.10	0.01	0.21	0.28
01Jan2000	05:35	0.10	0.01	0.21	0.26

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	05:36	0.10	0.01	0.20	0.25
01Jan2000	05:37	0.10	0.01	0.20	0.24
01Jan2000	05:38	0.10	0.01	0.19	0.23
01Jan2000	05:39	0.10	0.01	0.19	0.22
01Jan2000	05:40	0.10	0.01	0.18	0.21
01Jan2000	05:41	0.10	0.01	0.18	0.20
01Jan2000	05:42	0.10	0.01	0.17	0.20
01Jan2000	05:43	0.10	0.01	0.17	0.19
01Jan2000	05:44	0.10	0.00	0.16	0.18
01Jan2000	05:45	0.10	0.00	0.16	0.18
01Jan2000	05:46	0.10	0.00	0.15	0.17
01Jan2000	05:47	0.10	0.00	0.15	0.16
01Jan2000	05:48	0.10	0.00	0.15	0.16
01Jan2000	05:49	0.10	0.00	0.14	0.16
01Jan2000	05:50	0.10	0.00	0.14	0.15
01Jan2000	05:51	0.10	0.00	0.14	0.15
01Jan2000	05:52	0.10	0.00	0.13	0.14
01Jan2000	05:53	0.10	0.00	0.13	0.14
01Jan2000	05:54	0.10	0.00	0.13	0.14
01Jan2000	05:55	0.10	0.00	0.13	0.14
01Jan2000	05:56	0.10	0.00	0.13	0.13
01Jan2000	05:57	0.10	0.00	0.12	0.13
01Jan2000	05:58	0.09	0.00	0.12	0.13
01Jan2000	05:59	0.07	0.00	0.12	0.13
01Jan2000	06:00	0.06	0.00	0.12	0.12
01Jan2000	06:01	0.04	0.00	0.11	0.12
01Jan2000	06:02	0.03	0.00	0.11	0.11
01Jan2000	06:03	0.01	0.00	0.10	0.11
01Jan2000	06:04	0.00	0.00	0.10	0.10
01Jan2000	06:05	0.00	0.00	0.09	0.10
01Jan2000	06:06	0.00	0.00	0.09	0.09

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:07	0.00	0.00	0.08	0.08
01Jan2000	06:08	0.00	0.00	0.08	0.08
01Jan2000	06:09	0.00	0.00	0.07	0.07
01Jan2000	06:10	0.00	0.00	0.07	0.07
01Jan2000	06:11	0.00	0.00	0.07	0.07
01Jan2000	06:12	0.00	0.00	0.06	0.06
01Jan2000	06:13	0.00	0.00	0.06	0.06
01Jan2000	06:14	0.00	0.00	0.06	0.06
01Jan2000	06:15	0.00	0.00	0.06	0.05
01Jan2000	06:16	0.00	0.00	0.06	0.05
01Jan2000	06:17	0.00	0.00	0.05	0.05
01Jan2000	06:18	0.00	0.00	0.05	0.05
01Jan2000	06:19	0.00	0.00	0.05	0.04
01Jan2000	06:20	0.00	0.00	0.05	0.04
01Jan2000	06:21	0.00	0.00	0.05	0.04
01Jan2000	06:22	0.00	0.00	0.05	0.04
01Jan2000	06:23	0.00	0.00	0.04	0.04
01Jan2000	06:24	0.00	0.00	0.04	0.03
01Jan2000	06:25	0.00	0.00	0.04	0.03
01Jan2000	06:26	0.00	0.00	0.04	0.03
01Jan2000	06:27	0.00	0.00	0.04	0.03
01Jan2000	06:28	0.00	0.00	0.04	0.03
01Jan2000	06:29	0.00	0.00	0.04	0.03
01Jan2000	06:30	0.00	0.00	0.04	0.03
01Jan2000	06:31	0.00	0.00	0.04	0.02
01Jan2000	06:32	0.00	0.00	0.03	0.02
01Jan2000	06:33	0.00	0.00	0.03	0.02
01Jan2000	06:34	0.00	0.00	0.03	0.02
01Jan2000	06:35	0.00	0.00	0.03	0.02
01Jan2000	06:36	0.00	0.00	0.03	0.02
01Jan2000	06:37	0.00	0.00	0.03	0.02

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
01Jan2000	06:38	0.00	0.00	0.03	0.02
01Jan2000	06:39	0.00	0.00	0.03	0.02
01Jan2000	06:40	0.00	0.00	0.03	0.02
01Jan2000	06:41	0.00	0.00	0.03	0.02
01Jan2000	06:42	0.00	0.00	0.03	0.02
01Jan2000	06:43	0.00	0.00	0.03	0.02
01Jan2000	06:44	0.00	0.00	0.03	0.02
01Jan2000	06:45	0.00	0.00	0.03	0.02
01Jan2000	06:46	0.00	0.00	0.02	0.02
01Jan2000	06:47	0.00	0.00	0.02	0.02
01Jan2000	06:48	0.00	0.00	0.02	0.02
01Jan2000	06:49	0.00	0.00	0.02	0.02
01Jan2000	06:50	0.00	0.00	0.02	0.02
01Jan2000	06:51	0.00	0.00	0.02	0.01
01Jan2000	06:52	0.00	0.00	0.02	0.01
01Jan2000	06:53	0.00	0.00	0.02	0.01
01Jan2000	06:54	0.00	0.00	0.02	0.01
01Jan2000	06:55	0.00	0.00	0.02	0.01
01Jan2000	06:56	0.00	0.00	0.02	0.01
01Jan2000	06:57	0.00	0.00	0.02	0.01
01Jan2000	06:58	0.00	0.00	0.02	0.01
01Jan2000	06:59	0.00	0.00	0.02	0.01
01Jan2000	07:00	0.00	0.00	0.02	0.01

CHAPTER 7 - HYDROLOGY MAPS

EL=572.00 HP 1
L=64'
EL=558.00 2
SOIL TYPE 'A'
SOIL TYPE 'D'
L=239'
SOIL TYPE 'D'
SOIL TYPE 'A'
EL=516.00 101
SOIL TYPE 'A'
R/W
L=862'
SOIL TYPE 'D'
SOIL TYPE 'A'
3 EL=550.00
L=84'
4 EL=520.00
L=400'
SOIL TYPE 'D'
EL=510.00 5
L=100'
201 EL=488.00
L=45'
202 EL=487.34
EL=489.00 203
L=70'
L=43'
2000 POD 2
EL=484.75
AREA=1.72 AC
Q100 =2.9 CFS
SOIL TYPE 'D'
R/W
1000 POD 1
EL=477.48
AREA=9.83 AC
Q100 =14.2 CFS

SCALE: 1" = 150'

LEGEND

NODE ELEV. EL=1000.0

FLOW–LINE

PROPERTY BOUNDARY

NODE NUMBER 3

BASIN LIMITS

SUB–BASIN BOUNDARY

R·E·C Consultants, Inc.
Civil Engineering · Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232–9200 (619)232–9210 Fax

SKYLINE SENIOR RESIDENCE
HYDROLOGY MAP
EXISTING CONDITIONS

LEGEND

NODE ELEV.	EL=1000.0
STORMDRAIN NODE	113
SOIL BOUNDARY	
DMA LIMITS	
SUB-DMA BOUNDARY	
NODE NUMBER	15
STORMDRAIN	—SD—
FLOW-LINE	
PROPERTY BOUNDARY	

SCALE: 1" = 50'

SKYLINE SENIOR RESIDENCE
HYDROLOGY MAP
PROPOSED CONDITIONS

R·E·C Consultants, Inc.
Civil Engineering·Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

SAVE DATE 9/20/2017 - PLOT DATE 9/20/2017 - FILE NAME P:\Acad\979 - Skyline Senior Residence\Reports\Drainage Study\170913_979-Drainage-Post.dwg

CHAPTER 8 - APPENDICES

Hydrologic Soil Group—San Diego County Area, California
(Skyline)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

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

Date(s) aerial images were photographed: May 2, 2010—Jun 7, 2012

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
FxG	Friant rocky fine sandy loam, 30 to 70 percent slopes	D	6.4	48.5%
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	C	0.0	0.2%
PfC	Placentia sandy loam, thick surface, 2 to 9 percent slo pes	D	1.2	9.0%
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	5.6	42.3%
Totals for Area of Interest			**13.3**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.