C-3
1 of 2

Master Hydrology Report

for

CAUGHLIN RANCH

within the City of Reno

Reno, Washoe County, Nevada

Prepared by:

CODEGA & FRICKE, INC.
engineers + planners + landscape architects
3700 Grant Drive, Suite G
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Introduction

This report deals with the hydrology associated with all areas of the Caughlin Ranch Planned Unit Development located within the City of Reno. Areas of Caughlin Ranch outside of the City limits are not included; however, they all drain into the Alum Creek drainage basin. The capacity of Alum Creek is not analyzed in this report, as previous studies have shown that Alum Creek is capable of passing the 100-year flows at full buildout of the Caughlin Ranch.

The study area is located in Sections 16, 20, 21, 28 and 29, T.19N., R.19E., in Reno, Nevada. (See Figure 1.) It is bordered on the north by the Truckee River, on the west by Alum Creek, on the south by undeveloped areas in Washoe County and on the east by various subdivisions in the City of Reno. McCarran Boulevard runs through the entire site and acts as an intermediate boundary.

Caughlin Ranch is a Planned Unit Development, that is currently under development with a 10-15 year buildout. For the most part, existing development consists of single family homes, commercial areas, a park, and an elementary school. Final development will include additional single family homes, a park, offices, a fire station and higher density housing. Because a large portion of the Caughlin Ranch is either developed or under construction at this time, this report considers three separate development conditions rather than two: historic or pre-development flows; partial or current flows which can be expected at present levels of development; and flows which can be expected with final buildout. These conditions are noted as pre-development, existing and final development conditions respectively.

The purpose of this report is to calculate the peak 5- and 100-year flows for the three development conditions mentioned above. This will show which areas of the Caughlin Ranch, if any, need additional detention to accommodate the proposed future development. Peak flows for the final development conditions are based on "best guess" assumptions as to what the future development will include. These final development peak flows are not meant to be the maximum peak final development flows to be allowed, regardless of the type of future development. To the extent that the plans for the future development areas change, flows for these areas will be recomputed to ensure that they are equal to or less than the pre-development flows.

Pre-development topography consists mainly of moderate to relatively steep hillsides separated by ravines. However, a small section of the study area near the Truckee River is fairly flat with slopes less than 5%. Several major drainageways cross the site including Alum Creek, a drainage way referred to in this report as "Caughlin Creek", Rosewood Wash and five unnamed drainageways. These drainageways carry storm flows across the site from the south to the north and northeast. Three ditches, Steamboat Ditch, Last Chance Ditch and Lake Ditch, traverse the site from west to east and are part of the pre-development conditions.

Much of the information used in this report is taken from previously approved plans and reports prepared for the various Caughlin Ranch projects. However, hydrologic information for some of the drainage areas was not available and therefore is analyzed for the first time. Previous reports and plans used in this report include:

CAUGHLIN RANCH

VICINITY MAP

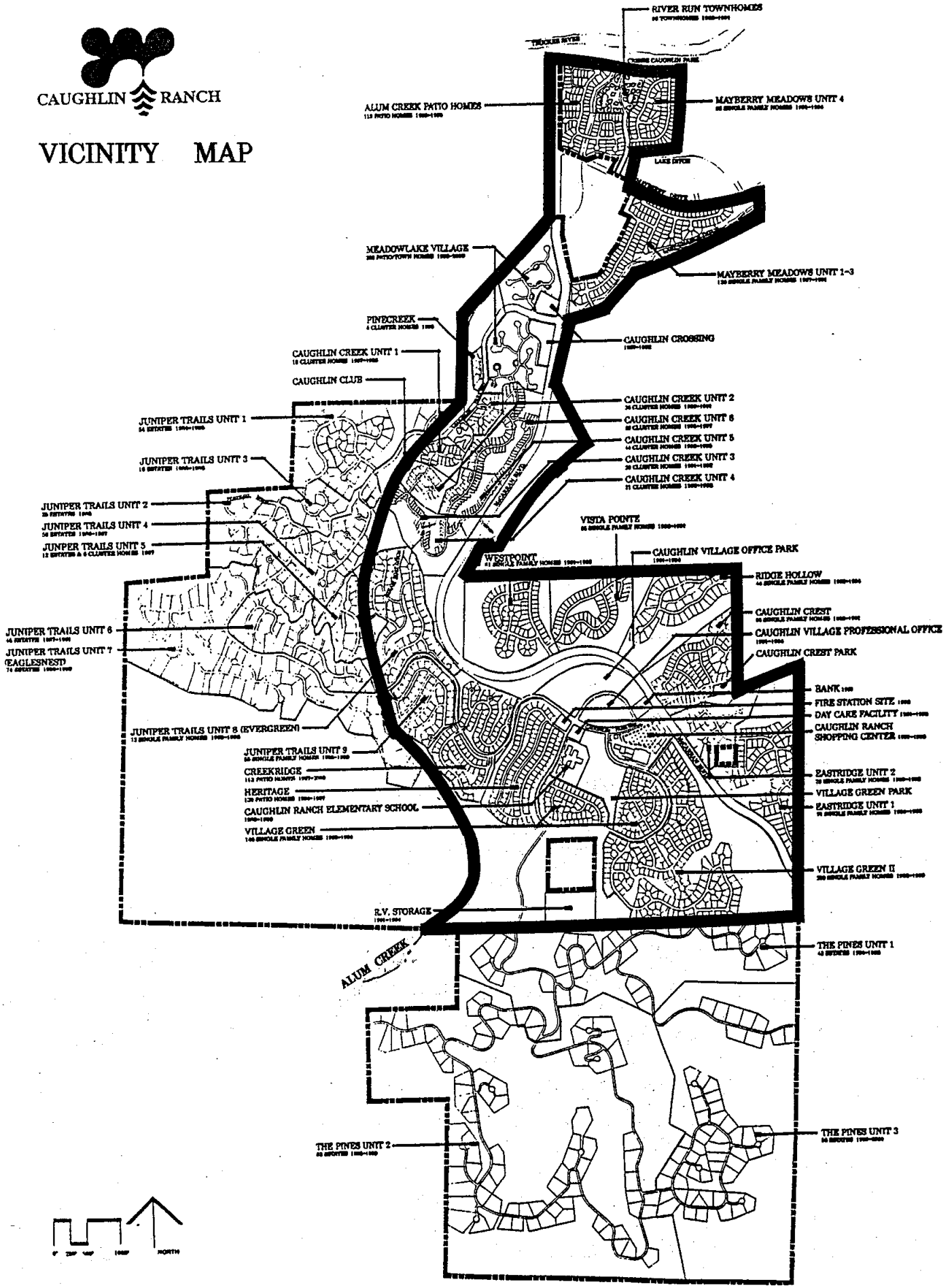

FIGURE 1

1) Hydrology Report for Eastridge Units One and Two, dated August 1986, Omni-Means Ltd.

2) Eastridge Subdivision (Unit One) Improvement Drawings, dated August 1984, Omni-Means, Ltd.

3) Eastridge Unit 2 Improvement Drawings, dated July 1986, Omni-Means, Ltd.

4) Caughlin Crest Improvement Drawings, dated March 1986, Omni-Means Ltd.

5) McCarran Boulevard Improvement Plans, Skyline Boulevard to Cashill Boulevard, dated June 1989, Summit Engineering Corp.

6) River Run Unit One Improvement Plans, dated May 1984, Osgood Engineers, Inc.

7) River Run Unit Two Improvement Plans, dated November 1984, Osgood Engineers, Inc.

8) Alum Creek Patio Homes Unit 1 Improvement Plans, dated January 1987, Omni-Means, Ltd.

9) Hydrologic Analysis of Alum Creek Patio Homes Unit 2, dated February 1988, Omni-Means, Ltd.

10) Alum Creek Patio Homes Unit 2 Improvement Plans, dated February 1988, Omni-Means, Ltd.

11) Alum Creek Patio Homes Unit 3 Improvement Plans, dated April 1990, Omni-Means, Ltd.

12) McCarran Boulevard Improvement Plans, Cashill Boulevard to Plumb Lane, dated June 1989, Summit Engineering Corp.

13) Caughlin Ranch Shopping Center, Hydrology Report, dated April 1990, CODEGA & FRICKE, INC.

14) Caughlin Ranch Shopping Center, Improvement Plans, dated June 1990, CODEGA & FRICKE, INC.

15) Village Green Unit One, Hydrology Report, dated November 1989, CODEGA & FRICKE, INC.

16) Village Green Unit One Improvement Plans, dated August 1989, CODEGA & FRICKE, INC.

17) Caughlin Ranch Elementary School, Hydrology Report, dated June 1989, CODEGA & FRICKE, INC.

18) Caughlin Ranch Elementary School Improvement Plans, dated December 1989, CODEGA & FRICKE, INC.

19) Caughlin Village Hydrology Report, dated July 1989, CODEGA & FRICKE, INC.

20) Caughlin Village Improvement Plans, dated July 1989, CODEGA & FRICKE, INC.

21) Final Hydrology Report for Mayberry Meadows Unit Three, dated April 1988, CODEGA & FRICKE, INC.

22) Mayberry Meadows Unit Three Improvement Plans, dated March 1988, CODEGA & FRICKE, INC.

23) Final Hydrology Report for Mayberry Meadows Unit Two, dated March 1987, CODEGA & FRICKE, INC.

24) Mayberry Meadows Unit Two Improvement Drawings, dated March 1987, CODEGA & FRICKE, INC.

25) Mayberry Meadows Unit Four-A Improvement Plans, dated March 1990, CODEGA & FRICKE, INC.

26) Mayberry Meadows Unit 4-B Improvement Plans, dated April 1990, CODEGA & FRICKE, INC.

27) Caughlin Creek Unit Two-B Hydrology Report, dated November 1989, CODEGA & FRICKE, INC.

28) Caughlin Creek Unit Two-B Improvement Plans, dated October 1989, CODEGA & FRICKE, INC.

29) Caughlin Creek Unit II-A Hydrology Report, dated September 1988, CODEGA & FRICKE, INC.

30) Caughlin Creek Unit Two-A Improvement Plans, dated September 1988, CODEGA & FRICKE, INC.

31) Rosewood Wash Drainage Basin, Hydrology Report for Rosewood Wash Detention Basin Down-Drains, dated August 1990, CODEGA & FRICKE, INC.

32) Westgate Detention Basin, Hydrology Report Summary, dated February 1990, CODEGA & FRICKE, INC.

33) Juniper Trails Unit 8-A, Hydrology Report, dated December 1989, CODEGA & FRICKE, INC.

34) Ridge Hollow Tentative Map, Preliminary Hydrology Report, dated August 1990, CODEGA & FRICKE, INC.

Historic (Pre-Development) Drainage System

The historic drainage system (called the Pre-development Condition) is the condition the site was in prior to development of the Caughlin Ranch. Some minor development had already occurred prior to development by the Caughlin Ranch. These improvements include the construction of the irrigation ditches, Westpac water tanks, Sierra Pacific Power Company substation, dirt roads etc.

As previously mentioned, the site contains eight major drainageways; Alum Creek, "Caughlin Creek", Rosewood Wash and five unnamed drainageways. Under pre-development conditions they drain from the south to the north and northeast. The Steamboat, Last Chance and Lake irrigation ditches cross the site, flowing from west to east. One thing to note is that stormwater runoff upstream of each irrigation ditch is intercepted by the ditches. Because the ditches were constructed long before most construction in the Truckee Meadows, these irrigation ditches are included in our pre-development analysis.

Peak flows are shown on plan sheets 1 and 2 of the Pre-Development Conditions located in the appendix of this report. (These peak flows are listed in tabular form in the conclusion for comparison purposes.) Peak flows throughout the report are calculated using both the Rational Method and the SCS TR-55 Method. (When analyzing a drainage area with a detention basin, the SCS Method must be used.) The method used to calculate peak flows is the same on an area by area basis for all conditions: pre-development, existing and final.

Existing Drainage System

The existing condition is the condition of the site at the time of writing this report. Many areas are under development or already fully developed. Areas that are currently developed are in the northern and southeastern sections of the study area. Projects that are totally developed include: McCarran Boulevard, Alum Creek Patio Homes Units 1 and 2, Mayberry Meadows Units 1, 2, and 3, Caughlin Crossing Phases I through III, Pinecreek, Caughlin Creek Units 1 and 2, Vista Pointe, Caughlin Crest, Eastridge Units 1 and 2, and Caughlin Ranch Elementary School. Areas that are currently under development, and for the purposes of this report, have functioning storm drain systems include: Mayberry Meadows Units 4A and 4B, Caughlin Ranch Shopping Center, Village Green Unit 1, Rosewood Wash Detention Basin, Alum Creek Patio Homes Unit 3, Caughlin Parkway and Village Green Parkway.

Drainageways continue to function essentially the same as they did during pre-development. Detention basins have been constructed in some of the drainagways to decrease peak storm flows. Existing detention basins are located in the following drainage basins: Area 1 (Rosewood Wash), Area 4, Area 8 (Drainageway 4) and Area 14 (Alum Creek).

Refer to plan sheets 3 and 4 (Existing Conditions) in the Appendix for peak flows. (These flows are also tabulated in the conclusion for comparison purposes.) In most cases, the individual peak flows (Q values) for catch basins and overland flow can not be summed to determined the peak flow for an entire drainage area. The individual peak flows can be summed only when the area contains no

detention basins and the time of concentration for the entire area is 10 minutes or less. This is due to the fact that all individual peak flows (at catch basins, etc.) are peak inflow values for a 10 minute time of concentration. When the storm is routed through an entire area, the time of concentration is often longer than 10 minutes, resulting in a lower rainfall intensity.

Final Developed Conditions

The final condition is the final buildout stage (100% development) of the Caughlin Ranch. In trying to develop models for future developments, we used a combination of the master development plan, the most current development plan, the approved master grading plans, and/or a current tentative map. Thus, in areas which are not currently developed, one will see lots, streets and common areas laid out. Based on these assumptions, runoff flows and direction of flows are computed. The final developed conditions are conceptual and subject to change with final design and construction. This report therefore serves as a reference for future design, but changes are anticipated as long as pre-development runoff conditions are not exceeded.

Areas of future development are located along Alum Creek and on both sides of McCarran Boulevard in the central portion of the study area. Remaining projects to be developed include: Meadowlake Village North and South, Caughlin Village, Fire Station, Caughlin Crossing Phases 5 and 6, Caughlin Creek Units 3-12, Juniper Trails Units 8 and 9, Creekridge North and South, Westpoint, Ridge Hollow, Caughlin Village Professional Offices, Caughlin Village Office Park, Westgate, Village Green Park, Village Green Unit 2, Eastgate, South Point, Day Care Facility and the RV/Mini-Warehouse Storage. (See Vicinity Map.)

Again, drainageways will be designed to function basically the same as they do for existing conditions. Additional detention basins are proposed in Area 8 (Drainageway 4), Area 14 (Alum Creek) and Area 16 (Drainageway 5). Refer to plan sheets 5 & 6, Final Developed Conditions in the Appendix for peak flows. (These flows are tabulated in the next section for comparison purposes).

Conclusion

Table 1

Comparison of Peak Flows
Pre-Development, Existing & Final Development Conditions

	Pre-Development			Existing					Final Development				
Drains to	Area #	Q_5	Q_{100}	Area#	Q_5	%*	Q_{100}	%*	Area #	Q_5	%*	Q_{100}	%*
Rosewood Wash	1	63	199	1	45.5	-28	150.2	-25	1	44.6	-29	132.2	-34
Offsite-South	2&3	2.4	6.4	2&3	2.4	0	6.4	0	-	-	N/A	-	N/A
Offsite-Southeast	4	29	86	4	3.5	-88	14.1	-84	4	3.4	-88	13.0	-85
Drainageway 1	5	44.7	122.6	5	34.1	-24	87.7	-28	5	36.7	-18	94.3	-23
Drainageway 2	6	11.9	32.3	6	5.8	-51	15.6	-52	6	5.8	-51	15.6	-52
Drainageway 3	7	29.9	80.6	7	23.3	-22	63.9	-21	7	27.5	-8	75.3	-7
Drainageway 4	8	32	99	8	44.9	+40	125.8	+27	8	31.4	-2	82.3	-17
Drainageway 5	16	36.2	97.5	16	52.4	+45	144.8	+49	16	33.6	-7	92.8	-5
Caughlin Creek	15&18	15.5	40.8	18	4.3	-72	11.7	-71	18	4.3	-72	11.7	-71
Alum Creek	10,14, 19&22	109.2	298.2	10,14 19&22	177.4	+62	484.2	+62	10,14 19&22	212.1	+94	576.0	+93
Offsite-North	13	8.1	22.0	13	8.1	0	22.0	0	13	4.3	-47	11.7	-47
Steamboat Ditch	9,11&12	78.9	226.2	11	70.3	-11	190.8	-16	11	54.9	-30	150.4	-34
Last Chance Ditch	17	4.2	11.4	17	2.8	-33	7.7	-32	-	-	N/A	-	N/A
Lake Ditch	20&21	6.1	16.4	20&21	3.5	-43	9.4	-43	20&21	3.5	-43	9.4	-43
Truckee River	-	-	-	23&24	33.8	N/A	92.3	N/A	23&24	33.8	N/A	92.3	N/A
TOTALS		471.1	1338.4		512.1	+9	1426.6	+7		495.9	+5	1,357.0	+1

*% columns refer to % increase (+) or decrease (-) as compared to pre-development conditions.

There is not a significant increase in the total peak flow for the entire study area for either existing or final development conditions. Increases in total peak flow for the existing conditions are 9% for the 5-year storm and 7% for the 100-year storm, while increases for the final development conditions are 5% for the 5-year storm and 1% for the 100 year storm. These total increases are insignificant due to the fact that methods used to calculate peak flows generate only approximations. Peak flows to all drainageways in the City of Reno (excluding Alum Creek) are decreased for final development conditions.

With the present amount of development, drainageway 4 does have a 40% increase in peak flow for the 5-year existing storm and a 27% increase for the 100-year existing storm. However, with final development the 5-year storm shows a 2% decrease and for the 100-year storm a 15% decrease. Similarly, drainageway 5 has an increase in peak flow of about 47% for existing conditions, but final development will result in about a 6% decrease in peak flow. Full buildout will greatly improve the drainage conditions in both of these drainageways.

This study shows that peak flows are increased to Alum Creek by 62% for existing conditions and 93% for final development conditions. These numbers are conservative for both existing and final development conditions because this report includes only projects located in the City of Reno, and several detention ponds, located in Washoe County, are not taken into account. Throughout the Juniper Trails subdivisions (Washoe County), numerous ponds, have been built which all provide

detention for Alum Creek. Additional detention for flows entering Alum Creek is provided by existing and proposed detention basins in the Caughlin Creek development. The increase in peak flow to Alum Creek should not present problems downstream as previous studies have shown that Alum Creek is capable of handling the 100-year flows for fully developed conditions.

The peak final development flows calculated in this report are accurate to the degree that future development proceeds according to the assumptions made in this report. If future development results in significant changes, final development peak flows will be recalculated to ensure that they are still equal to or less than the historic flows. Also, if a detention basin is proposed in an area that this report analyzed using the Rational Method, all flows (including pre-development) should be recalculated using the SCS Method. Peak pre-development flows calculated by the Rational Method cannot accurately be compared to peak final development flows calculated by the SCS Method.

On April 3, 1991, CODEGA & FRICKE, INC. and the Caughlin Ranch Development Company met with the City Engineer of the City of Reno and his staff to review a draft of this report. The concepts, assumptions, and drainage plans used for the calculations were approved by the City Engineer. Everyone present agreed that this report should serve as a guide for the hydrologic design for future development within the Caughlin Ranch, and comparative analysis will include only those flows generated on or upstream of each site. Future development within the Caughlin Ranch will not be required to mitigate increased runoff created by existing downstream development.

Calculations

Appendix

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

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HYDROLOGY CALCULATIONS

ASSUMPTIONS:

1. PEAK STORM OCCURS DURING WINTER.
2. DITCH FLASHBOARDS ARE REMOVED DURING WINTER. SO DITCHES ARE DRY. FLASHBOARDS ARE LOCATED AT THE MAJOR DRAINAGEWAYS THE DITCH CROSSES.
3. 5 & 100-YEAR FLOWS ARE INTERCEPTED BY THE DITCH AND CARRIED TO THE NEAREST MAJOR DRAINAGEWAY.
4. USE THE RATIONAL METHOD FOR ALL DRAINAGE BASINS THAT HAVE NO DETENTION PONDS.

$Q = i \Sigma C A$

WHERE: Q = FLOW (cfs)
i = RAINFALL INTENSITY (in/hr)
C = RUNOFF COEFFICIENT
A = AREA (ac)

SURFACE	C, RUNOFF COEFFICIENT
UNDEVELOPED LAND (0-5%)	0.30
UNDEVELOPED LAND (>5%)	0.55
* SINGLE FAMILY RESIDENTIAL	0.50
MULTI-RESIDENTIAL	0.65
COMMERCIAL & OFFICE	0.85
PARK	0.25
PAVEMENT	0.90

* SEE ADDITIONAL CALCULATIONS AT THE END OF THIS REPORT (PG. 276) FOR VERIFICATION OF C_w USED FOR SINGLE FAMILY LOTS.

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Engineers & Planners
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RENO, NEVADA 89509
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5. USE THE SCS METHOD FOR ALL DRAINAGE BASINS WITH DETENTION PONDS. REFER TO SCS TR-55 AND THE COMPUTER PROGRAMS QTR55 & POND2 FOR EQUATIONS USED. PRINTOUTS DERIVED FROM QTR55 AND POND2 ARE INCLUDED IN THIS REPORT.

6. TIME OF CONCENTRATION, t_c

$$t_c = \frac{L}{V(60\ \text{sec/min})}$$

WHERE: L = LONGEST FLOW PATH, ft
V = VELOCITY, fps

MINIMUM t_c = 10 MIN. FOR RATIONAL METHOD
= 0.1 HR FOR SCS METHOD

7. THE TRAVEL TIME FROM A DETENTION POND OUTLET TO THE BOTTOM OF A WATERSHED WAS NOT CONSIDERED IN THESE CALCULATIONS. IF TRAVEL TIME WAS ACCOUNTED FOR, THE REPORTED PEAK RUNOFF WOULD BE SLIGHTLY LOWER AND OCCUR SLIGHTLY LATER. THUS PEAK FLOWS FOR DRAINAGE AREAS WITH DETENTION PONDS ARE ON THE CONSERVATIVE SIDE.

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

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PRE-DEVELOPMENT CONDITIONS

DRAINAGE AREAS

AREA #	ACRES ON-SITE	ACRES OFF-SITE	ACRES TOTAL	DRAINS TO
1	115.14	45.66	160.80	ROSEWOOD WASH
2	0.39	—	0.39	OFFSITE - SOUTH
3	2.67	—	2.67	OFFSITE - SOUTH
4	34.86	5.18	40.04	OFFSITE - SOUTHEAST
5	106.33	5.61	111.94	DRAINAGEWAY 1
6	15.47	—	15.47	DRAINAGEWAY 2
7	104.61	—	104.61	DRAINAGEWAY 3
8	69.31	—	69.31	DRAINAGEWAY 4
9	80.49	—	80.49	STEAMBOAT DITCH
10	49.10	3.59	52.69	ALUM CREEK
11	56.53	—	56.53	STEAMBOAT DITCH
12	6.80	—	6.80	STEAMBOAT DITCH
13	10.53	—	10.53	OFFSITE - NORTH
14	53.76	—	53.76	ALUM CREEK
15	65.83	—	65.83	CAUGHLIN CREEK
16	52.92	50.17	103.09	DRAINAGEWAY 5
17	12.62	—	12.62	LAST CHANCE DITCH
18	13.30	—	13.30	CAUGHLIN CREEK
19	57.53	—	57.53	ALUM CREEK
20	15.20	—	15.20	LAKE DITCH
21	3.98	—	3.98	LAKE DITCH
22	54.98	—	54.98	ALUM CREEK

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Engineers & Planners
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CALCULATE ΣCA FOR RATIONAL METHOD

AREA #	TOTAL AC.	ON-SITE AC.	ON-SITE C	OFF-SITE AC	OFF-SITE C	ΣCA
1	USE SCS METHOD					
2	0.39	0.39	0.55	—	—	0.21
3	2.67	2.67	0.55	—	—	1.47
4	USE SCS METHOD					
5	111.94	106.33	0.55	5.61	0.50	61.29
6	15.47	15.47	0.55	—	—	8.51
7	104.61	104.61	0.55	—	—	57.54
8	USE SCS METHOD					
9	80.49	80.49	0.55	—	—	44.27
10	52.69	49.10	0.55	3.59	0.55	28.98
11	56.53	56.53	0.55	—	—	31.09
12	6.80	6.80	0.55	—	—	3.74
13	10.53	10.53	0.55	—	—	5.79
14	53.76	53.76	0.55	—	—	29.57
15	65.83	65.83	0.30	—	—	19.75
16	103.09	52.92	0.55	50.17	0.53	55.70
17	12.62	12.62	0.30	—	—	3.79
18	13.30	13.30	0.30	—	—	3.99
19	57.53	57.53	0.30	—	—	17.26
20	15.20	15.20	0.30	—	—	4.56
21	3.98	3.98	0.30	—	—	1.19
22	54.98	54.98	0.30	—	—	16.49

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Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
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RATIONAL METHOD CALCULATIONS

CALCULATE TIME OF CONCENTRATION, t_c

AREA 2: L = 170'
USE MINIMUM t_c t_c = 10 min.

AREA 3: L = 390'
USE MINIMUM t_c t_c = 10 min.

AREA 5: L = 1980'
ΔELEV = 5327 − 5175 = 152'
S = 152'/1980' = 7.7%, V = 2.7 fps

$$t_t = \frac{1980'}{(2.7\text{ fps})(60\text{ sec/min})} = 12.2\text{ min}$$

L = 770'
ΔELEV = 5175 − 5050 = 125'
S = 125'/770 = 16.2%, V = 3.9 fps

$$t_t = \frac{770'}{(3.9\text{ fps})(60\text{ sec/min})} = 3.3\text{ min}$$

L = 1910'
ΔELEV = 5050 − 4903 = 147'
S = 147'/1910 = 7.7%, V = 2.7 fps

$$t_t = \frac{1910}{(2.7\text{ fps})(60\text{ sec/min})} = 11.8\text{ min}$$

t_c = 27.3 min

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RENO, NEVADA 89509
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AREA 6: $L = 1{,}330'$
Δ ELEV $= 5124 - 5022 = 103'$
$S = 103'/1330' = 7.7\%$, $V = 2.7$ fps

$$t_t = \frac{1330'}{(2.7\text{ fps} \times 60\text{ sec/min})} = 8.2\text{ min}$$

USE MINIMUM t_c, $t_c = 10$ min

AREA 7: $L = 3{,}150'$
Δ ELEV $= 5359 - 5175 = 184'$
$S = 184'/3150' = 5.8\%$, $V = 2.3$ fps

$$t_t = \frac{3150'}{(2.3\text{ fps} \times 60\text{ sec/min})} = 22.8\text{ min}$$

$L = 965'$
Δ ELEV $= 5175 - 5100 = 75'$
$S = 75'/965' = 7.8\%$, $V = 2.7$ fps

$$t_t = \frac{965'}{(2.7\text{ fps} \times 60\text{ sec/min})} = 6.0\text{ min}$$

$L = 800'$
Δ ELEV $= 5100 - 4975' = 125'$
$S = 125'/800' = 15.6\%$, $V = 3.8$ fps

$$t_t = \frac{800'}{(3.8\text{ fps} \times 60\text{ sec/min})} = 3.5\text{ min}$$

$L = 1430'$
Δ ELEV $= 4975' - 4916 = 59'$
$S = 59'/1430' = 4.1\%$, $V = 2.0$ fps

$$t_t = \frac{1430'}{(2.0\text{ fps} \times 60\text{ sec/min})} = 11.9\text{ min}$$

$t_c = 44.2$ min

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Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
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AREA 9: L = 1350'
ΔELEV = 5298 − 5125 = 173'
S = 173'/1350' = 12.8%, V = 3.5 fps

$$t_t = \frac{1350'}{(3.5\,fps \times 60\,sec/min)} = 6.4\,min$$

L = 1380'
ΔELEV = 5125' − 5025' = 100'
S = 100'/1380' = 7.3%, V = 2.6 fps

$$t_t = \frac{1380'}{(2.6\,fps \times 60\,sec/min)} = 8.8\,min$$

L = 740'
ΔELEV = 5025 − 4925 = 100'
S = 100'/740' = 13.5%, V = 3.6 fps

$$t_t = \frac{740'}{(3.6\,fps \times 60\,sec/min)} = 3.4\,min$$

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Engineers & Planners
3690 Grant Drive Suite J
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CALCULATED BY KRK DATE 11-19-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

$L = 690'$
$\Delta ELEV = 4925 - 4875 = 50'$
$S = 50'/690 = 7.3\%$, $V = 2.6$ fps

$$t_t = \frac{690'}{(2.6 fps)(60 sec/min)} = 4.4 min$$

$t_c = 23.0$ min

AREA 10: $L = 810'$
USE MINIMUM t_c $t_c = 10.0$ min

AREA 11: $L = 690'$
$\Delta ELEV = 5102 - 5000 = 102'$
$S = 102'/690' = 14.8\%$, $V = 3.6$ fps

$$t_t = \frac{690'}{(3.6 fps)(60 sec/min)} = 3.2 min$$

$L = 1,470'$
$\Delta ELEV = 5000 - 4882 = 118$
$S = 118'/1470' = 8.0\%$, $V = 2.7$ fps

$$t_t = \frac{1470'}{(2.7 fps)(60 sec/min)} = 9.1 min$$

$t_c = 12.3$ min

AREA 12: $L = 1020'$
USE MINIMUM t_c $t_c = 10.0$ min

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JOB 1016.38
SHEET NO. 9 OF
CALCULATED BY KRK DATE 11-19-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 13: L = 830'
USE MINIMUM t_c t_c = 10.0 min

AREA 14: L = 1,160'
USE MINIMUM t_c t_c = 10.0 min

AREA 15: L = 1250'
ΔELEV = 4875 - 4775 = 100'
S = 100'/1250' = 8.0%, V = 2.7 fps

$t_t = \frac{1250'}{(2.7 fps)(60 sec/min)}$ = 7.7 min

L = 4,150'
ΔELEV = 4775 - 4643 = 132'
S = 132'/4,150' = 3.2%, V = 1.8 fps

$t_t = \frac{4150'}{(1.8 fps)(60 sec/min)}$ = 38.4 min

t_c = 46.1 min

AREA 16: L = 225'
ΔELEV = 4870 - 4825 = 45'
S = 45'/225' = 20.0%, V = 4.4 fps

$t_t = \frac{225'}{(4.4 fps)(60 sec/min)}$ = 0.9 min

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JOB 1016.38
SHEET NO. 10 OF
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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

L = 850'
ΔELEV = 4825 - 4750 = 75'
S = 75'/850' = 8.8%, V = 2.9 fps

$$t_t = \frac{850'}{(2.9 fps \times 60 sec/min)} = 4.9 min$$

L = 1,520'
ΔELEV = 4750 - 4675 = 75'
S = 75'/1520' = 4.9%, V = 2.2 fps

$$t_t = \frac{1520'}{(2.2 fps \times 60 sec/min)} = 11.5 min$$

L = 1,415'
ΔELEV = 4675 - 4645 = 30'
S = 30'/1415' = 2.1%, V = 1.6 fps

$$t_t = \frac{1415'}{(1.6 fps \times 60 sec/min)} = 14.7 min$$

t_c = 32.0 min

AREA 17: L = 1520'
ΔELEV = 4685 - 4645 = 40'
S = 40'/1520' = 2.6%, V = 1.7 fps

$$t_c = \frac{1520'}{(1.7 fps \times 60 sec/min)} = 14.90$$

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JOB 1016.38
SHEET NO. 11 OF
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CHECKED BY DATE
SCALE LAUGHLIN RANCH MASTER HYDROLOGY

AREA 18: L = 940'
ΔELEV = 4645 - 4621 = 24'
S = 24'/940 = 2.6%, V = 1.7 fps

$t_c = \frac{940}{(1.7\text{ fps} \times 60\text{ sec/min})} = 9.2\text{ min}$

USE MINIMUM tc $t_c = 10.0$ min

AREA 19: L = 2,365
ΔELEV = 4645 - 4598 = 47'
S = 47'/2,365' = 2.0%, V = 1.5 fps

$t_c = \frac{2,365}{(1.5\text{ fps} \times 60\text{ sec/min})} = 26.3\text{ min}$

AREA 20: L = 1,870'
ΔELEV = 4645 - 4593 = 52'
S = 52'/1870' = 2.8%, V = 1.7 fps

$t_c = \frac{1870'}{(1.7\text{ fps} \times 60\text{ sec/min})} = 18.3\text{ min}$

AREA 21: L = 340'
USE MINIMUM tc $t_c = 10.0$ min

AREA 22: L = 1,400'
ΔELEV = 4583 - 4564 = 19'
S = 19'/1400' = 1.4%, V = 1.2 fps

$t_c = \frac{1400'}{(1.2\text{ fps} \times 60\text{ sec/min})} = 19.4\text{ min}$

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JOB 1016.38
SHEET NO. 12 OF
CALCULATED BY KRK DATE 11-19-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

CALCULATE PEAK 5 & 100-YEAR FLOWS – RATIONAL METHOD

AREA #	TOTAL AC.	ΣCA	t_c, min	i_5, in/hr	Q_5, cfs	i_{100}, in/hr	Q_{100}, cfs
1	SCS METHOD						
2	0.39	0.21	10.0	1.4	0.29	3.8	0.80
3	2.67	1.47	10.0	1.4	2.06	3.8	5.59
4	SCS METHOD						
5	111.94	61.29	27.3	0.73	44.74	2.0	122.58
6	15.47	8.51	10.0	1.4	11.91	3.8	32.34
7	104.61	57.54	44.2	0.52	29.92	1.4	80.54
8	SCS METHOD						
9	80.49	44.27	23.0	0.82	36.30	2.4	106.25
10	52.69	28.98	10.0	1.4	40.57	3.8	110.12
11	56.53	31.09	12.3	1.2	37.31	3.4	105.71
12	6.80	3.74	10.0	1.4	5.24	3.8	14.21
13	10.53	5.79	10.0	1.4	8.11	3.8	22.00
14	53.76	29.57	10.0	1.4	41.40	3.8	112.37
15	65.83	19.75	46.1	0.50	9.88	1.3	25.68
16	103.09	55.70	32.0	0.65	36.21	1.75	97.48
17	12.62	3.79	14.9	1.1	4.17	3.0	11.37
18	13.30	3.99	10.0	1.4	5.59	3.8	15.16
19	57.53	17.26	26.3	0.72	12.43	2.0	34.52
20	15.20	4.56	18.3	0.96	4.38	2.6	11.86
21	3.98	1.19	10.0	1.4	1.67	3.8	4.52
22	54.98	16.49	19.4	0.90	14.84	2.5	41.23

SCS METHOD CALCULATIONS

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:46:05 12-18-1990

AREA 1

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 1, ROSEWOOD WASH
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: AREA 1 DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
GRASSED WATERWAY S=22.3%	1220	7.20	2.8	=	0.05
GRASSED WATERWAY S=6.9%	2205	4.00	9.2	=	0.15
GRASSED WATERWAY S=8.7%	2990	4.40	11.3	=	0.19
			minutes		hours
		TOTAL Tc ---->	23.3	=	0.39

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

PRE-DEVELOPMENT
AREA 1
5-YEAR STORM

Executed: 12-17-1990 15:49:55
Watershed file: --> CRPRE-1 .MOP
Hydrograph file: --> CRP1-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 1 ROSEWOOD WASH
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
AREA 1	160.80	85.0	0.40	0.00	1.55	0.48	I.23 .23

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 160.80 acres or 0.2512 sq.mi
Peak discharge = 63 cfs = Q_5

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 1	0.39	0.00	0.40	0.00	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

PRE-DEVELOPMENT
AREA 1
100-YEAR STORM

Executed: 12-17-1990 15:49:55
Watershed file: --> CRPRE-1 .MOP
Hydrograph file: --> CRP1-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 1 ROSEWOOD WASH
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
AREA 1	160.80	85.0	0.40	0.00	2.75	1.38	I.13 .13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 160.80 acres or 0.2512 sq.mi
Peak discharge = 199 cfs = Q_{100}

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 1	0.39	0.00	0.40	0.00	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:47:18 12-18-1990

AREA 4

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 4
DECEMBER 12, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: 4

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		TIME hours
SEGMENT 1	350	2.60	2.2	=	0.04
SEGMENT 2	1060	4.60	3.8	=	0.06

	minutes		hours
TOTAL Tc --->	6.1	=	0.10

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

PRE-DEVELOPMENT
AREA 4
5-YR STORM

Executed: 12-13-1990 11:02:47
Watershed file: --> CRPRE-4 .MOP
Hydrograph file: --> CRP4-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 4
DECEMBER 12, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
4-A	40.04	85.0	0.10	0.00	1.55	0.48	I.23 .23

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 40.04 acres or 0.06256 sq.mi
Peak discharge = 29 cfs = Q_5

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-A	0.10	0.00	**	**	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123 Page 1
Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 11:02:47
Watershed file: --> CRPRE-4 .MOP
Hydrograph file: --> CRP4-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 4 — 100 YR STORM
DECEMBER 12, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
4-A	40.04	85.0	0.10	0.00	2.75	1.38	I.13 .13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 40.04 acres or 0.06256 sq.mi
Peak discharge = 86 cfs = Q_{100}

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-A	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:47:55 12-18-1990

AREA 8

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 8
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: AREA 8 DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
GRASSED WATERWAY S=5.1%	1195	3.50	5.7	=	0.09
GRASSED WATERWAY S=9.0%	3050	4.70	10.8	=	0.18
			minutes		hours
		TOTAL Tc --->	16.5	=	0.28

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

PRE-DEVELOPMENT
AREA 8
5-YEAR STORM

Executed: 12-17-1990 14:37:54
Watershed file: --> CRPRE-8 .MOP
Hydrograph file: --> CRP8-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 8
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	!	Runoff (in)	Ia/p input/used	
AREA 8	69.31	85.0	0.30	0.00	1.55	!	0.48	I.23	.23

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 69.31 acres or 0.10830 sq.mi
Peak discharge = 32 cfs = Q_5

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8	0.28	0.00	0.30	0.00	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.

Quick TR-55 Version: 5.41 S/N: 1240540123 Page 1
Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

PRE-DEVELOPMENT AREA 8 100-YEAR STORM

Executed: 12-17-1990 14:37:54
Watershed file: --> CRPRE-8 .MOP
Hydrograph file: --> CRP8-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
PRE-DEVELOPMENT CONDITIONS AREA 8
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
AREA 8	69.31	85.0	0.30	0.00	2.75	1.38	I.13	.13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 69.31 acres or 0.10830 sq.mi
Peak discharge = 99 cfs = Q_{100}

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8	0.28	0.00	0.30	0.00	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.

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JOB 1016.38
SHEET NO. 22 OF
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CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY
REV. 4-12-91

PEAK PRE-DEVELOPMENT FLOWS

AREA #	DRAINS TO	Q_5, cfs	Q_{100} cfs
1	ROSEWOOD WASH	63	199
2	OFFSITE - SOUTH	0.29	0.80
3	OFFSITE - SOUTH	2.06	5.59
4	OFFSITE - SOUTHEAST	29	86
5	DRAINAGEWAY 1	44.74	122.58
6	DRAINAGEWAY 2	11.91	32.34
7	DRAINAGEWAY 3	29.92	80.56
8	DRAINAGEWAY 4	32	99
9	STEAMBOAT DITCH	36.30	106.25
10	ALUM CREEK	40.57	110.12
11	STEAMBOAT DITCH	37.31	105.71
12	STEAMBOAT DITCH	5.24	14.21
13	OFFSITE NORTH	8.11	22.00
14	ALUM CREEK	41.40	112.37
15	CAUGHLIN CREEK	9.88	25.68
16	DRAINAGEWAY 5	36.21	97.48
17	LAST CHANCE DITCH	4.17	11.37
18	CAUGHLIN CREEK	5.59	15.16
19	ALUM CREEK	12.43	34.52
20	LAKE DITCH	4.38	11.86
21	LAKE DITCH	1.67	4.52
22	ALUM CREEK	14.84	41.23

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JOB 1016.38
SHEET NO. 23 OF
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CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

TOTAL PEAK FLOWS TO EACH DRAINAGEWAY
PRE-DEVELOPMENT

DRAINAGEWAY	AREA #'s	Q25, cfs	Q100, cfs
ROSEWOOD WASH	1	103	199
OFFSITE - SOUTH	2 & 3	2.4	6.4
OFFSITE - SOUTHEAST	4	29	86
DRAINAGEWAY 1	5	44.7	122.6
DRAINAGEWAY 2	6	11.9	32.3
DRAINAGEWAY 3	7	29.9	80.6
DRAINAGEWAY 4	8	32	99
DRAINAGEWAY 5	16	36.2	97.5
CAUGHLIN CREEK	15 & 18	15.5	40.8
ALUM CREEK	10, 14, 19, 22	109.2	298.2
OFFSITE - NORTH	13	8.1	22.0
STEAMBOAT DITCH	9, 11 & 12	78.9	226.2
LAST CHANCE DITCH	17	4.2	11.4
LAKE DITCH	20 & 21	6.1	16.4
	TOTAL	471.1	1,338.4

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JOB 1016.38
SHEET NO. 24 OF
CALCULATED BY KRK DATE 11-20-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

EXISTING (PARTIAL DEVELOPMENT) CONDITIONS

STATUS OF DEVELOPMENT AT CAUGHLIN RANCH, IN THE CITY OF RENO:

COMPLETED:
- MCCARRAN BOULEVARD
- ALUM CREEK PATIO HOMES 1-2
- MAYBERRY MEADOWS UNITS 1-3
- CAUGHLIN CROSSING
- PINECREEK
- CAUGHLIN CREEK UNITS 1-2
- VISTA POINTE
- CAUGHLIN CREST
- CAUGHLIN CREST PARK
- EASTRIDGE UNITS 1-2
- CAUGHLIN RANCH ELEMENTARY SCHOOL

UNDER CONSTRUCTION:
- MAYBERRY MEADOWS UNIT 4
- CAUGHLIN RANCH SHOPPING CENTER
- VILLAGE GREEN UNIT 1 - STORM DRAIN IN
- VILLAGE GREEN PARK - PRELIM. GRADING
- VILLAGE GREEN UNIT 2 - PRELIM. GRADING
- ROSEWOOD WASH DETENTION BASIN
- ALUM CREEK PATIO HOMES UNIT 3

FUTURE DEVELOPMENT:
- MEADOWLAKE VILLAGE APARTMENTS
- MEADOWLAKE VILLAGE PATIO HOMES
- FIRE STATION
- CAUGHLIN CREEK UNITS 3-12
- JUNIPER TRAILS UNIT 8-9
- CREEKRIDGE
- CAUGHLIN SQUARE APARTMENTS
- WESTPOINT
- RIDGE HOLLOW
- CAUGHLIN VILLAGE PROFESSIONAL OFFICE

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JOB 1011.38
SHEET NO. 25 OF
CALCULATED BY KRK DATE 11-20-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

FUTURE DEVELOPMENT: DAY CARE FACILITY
EASTGATE
SOUTHPOINT
RV STORAGE
WESTGATE

EXISTING DRAINAGE AREAS THAT ARE STILL IN THEIR PRE-DEVELOPMENT CONDITION: AREA # 2, 3, 13 & 21. PEAK FLOWS FOR THESE AREAS ARE THE SAME AS THEY WERE FOR PRE-DEVELOPMENT CONDITIONS.

CALCULATE PEAK FLOWS FOR EXISTING CONDITIONS

AREA 1: FLOW TO THE EXISTING ROSEWOOD WASH DETENTION BASIN IS ROUTED THROUGH A SERIES OF 3 EXISTING DETENTION BASINS AND 2 DOWN-DRAINS. THE 5 & 10-YR OUTFLOW HYDROGRAPHS FOR THE EXISTING PONDS (SEE HYDROLOGY REPORT FOR ROSEWOOD WASH DETENTION BASIN DOWN-DRAINS) WERE ADDED TO HYDROGRAPHS FOR OVERLAND FLOW TO THE ROSEWOOD WASH DETENTION BASIN. THE RESULTING 5 & 100-YR HYDROGRAPHS WERE ROUTED THROUGH THE POND TO CREATE OUTFLOW HYDROGRAPHS. THESE OUTFLOW HYDROGRAPHS WERE THEN ADDED TO 5 & 100-YR HYDROGRAPHS FOR THE AREA DOWNSTREAM OF ROSEWOOD WASH DETENTION BASIN. THIS CREATED COMPOSITE 5 & 100-YR HYDROGRAPHS FOR ALL OF AREA 1. PEAK FLOWS ARE: Q_5 = 45.5 cfs
Q_{100} = 150.2 cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 10:54:27 12-18-1990

OVERLAND FLOW TO ROSEWOOD DETENTION POND

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS ROSEWOOD DETENTION POND
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea:	OVERLAND TO RW DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
SEGMENT 1		1700	4.60	6.2	=	0.10
				minutes		hours
			TOTAL Tc ---->	6.2	=	0.10

OVERLAND FLOW TO ROSEWOOD DETENTION POND 27

Quick TR-55 Version: 5.41 S/N: 1240540123 Page 1
Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1990 18:04:05
Watershed file: --> ROSEWD .MOP
Hydrograph file: --> ROSE-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS ROSEWOOD WASH DETENTION AREA
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
OVERLAND	32.55	85.0	0.10	0.00	1.55	0.48	I.23 .23

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 32.55 acres or 0.05086 sq.mi
Peak discharge = 23 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
OVERLAND	0.10	0.00	**	**	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

THE ABOVE HYDROGRAPHS WERE ADDED TO EXISTING CONDITIONS HYDROGRAPHS CREATED BY THE ROSEWOOD WASH DETENTION BASIN DOWN-DRAINS STUDY. THE RESULTING 5 & 100-YR HYDROGRAPHS WERE ROUTED THROUGH THE EXISTING ROSEWOOD WASH DETENTION BASIN

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-18-1990 12:12:10
Watershed file: --> ROSEWD .MOP
Hydrograph file: --> ROSE-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS ROSEWOOD WASH DETENTION AREA
DECEMBER 17, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
OVERLAND	32.55	85.0	0.10	0.00	2.75	1.38	I.13	.13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 32.55 acres or 0.05086 sq.mi
Peak discharge = 70 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
OVERLAND	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Outlet Structure File: ROSEWD .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING ROSEWOOD DETENTION POND
DECEMBER 17, 1990
CODEGA & FRICKE, INC.
****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
5041.00	0.0	1
5042.00	2.3	1
5043.00	5.1	1
5044.00	6.9	1
5045.00	9.4	3 +2 +1
5046.00	25.9	3 +2 +1
5047.00	51.7	3 +2 +1
5048.00	81.3	3 +2 +1
5049.00	102.8	3 +2 +1
5050.00	120.4	3 +2 +1

Outlet Structure File: ROSEWD .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING ROSEWOOD DETENTION POND
DECEMBER 17, 1990
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	5041.00
E2 elev.(ft)?	5050.001
Diam. (ft)?	1.0
Inv. el.(ft)?	5041.00
Slope (ft/ft)?	0.020
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0078
M Coeff.?	2.0
c Coeff.?	0.0292
Y Coeff.?	0.74
Form 1 or 2?	1
Slope factor?	0.7

Outlet Structure File: ROSEWD .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING ROSEWOOD DETENTION POND
DECEMBER 17, 1990
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	5044.50
E2 elev.(ft)?	5050.001
Diam. (ft)?	2.5
Inv. el.(ft)?	5044.50
Slope (ft/ft)?	0.100
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0078
M Coeff.?	2.0
c Coeff.?	0.0292
Y Coeff.?	0.74
Form 1 or 2?	1
Slope factor?	0.7

Outlet Structure File: ROSEWD .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING ROSEWOOD DETENTION POND
DECEMBER 17, 1990
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 3 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	5044.50
E2 elev.(ft)?	5050.001
Diam. (ft)?	2.5
Inv. el.(ft)?	5044.50
Slope (ft/ft)?	0.100
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0078
M Coeff.?	2.0
c Coeff.?	0.0292
Y Coeff.?	0.74
Form 1 or 2?	1
Slope factor?	0.70

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54


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**********************************************
*                                            *
*  CAUGHLIN RANCH MASTER HYDROLOGY  1016.38  *
*    EXISTING ROSEWOOD WASH DETENTION POND   *
*                DECEMBER 17, 1990           *
*              CODEGA & FRICKE, INC.         *
* EXISTING CONDITIONS 5-YR STORM             *
**********************************************
```

Inflow Hydrograph: RWE5-IN .HYD
Rating Table file: ROSEWD .PND

-----INITIAL CONDITIONS-----
Elevation = 5041.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5041.00	0.0	0.000
5042.00	2.3	0.015
5043.00	5.1	0.082
5044.00	6.9	0.303
5045.00	9.4	0.693
5046.00	25.9	1.224
5047.00	51.7	1.856
5048.00	81.3	2.536
5049.00	102.8	3.283
5050.00	120.4	4.117

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
3.6	5.9
20.0	25.1
73.3	80.2
167.8	177.2
296.3	322.2
449.2	500.9
613.8	695.1
794.5	897.3
996.2	1116.6

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	-----	0.0	0.0	0.00	5041.00
11.100	0.02	0.0	0.0	0.0	0.01	5041.00
11.200	0.36	0.4	0.1	0.4	0.15	5041.07
11.300	0.94	1.3	0.3	1.4	0.54	5041.23
11.400	1.46	2.4	0.6	2.7	1.06	5041.46
11.500	1.94	3.4	0.9	4.0	1.56	5041.68
11.600	2.33	4.3	1.1	5.1	2.01	5041.87
11.700	5.10	7.4	3.2	8.6	2.69	5042.14
11.800	8.30	13.4	8.9	16.6	3.86	5042.56
11.900	15.24	23.5	21.7	32.4	5.34	5043.13
12.000	31.40	46.6	55.3	68.4	6.51	5043.78
12.100	56.00	87.4	125.7	142.7	8.51	5044.64
12.200	67.79	123.8	214.3	249.5	17.62	5045.50
12.300	64.84	132.6	288.0	346.9	29.46	5046.14
12.400	52.92	117.8	329.8	405.7	37.95	5046.47
12.500	38.97	91.9	341.2	421.7	40.26	5046.56
12.600	33.13	72.1	335.2	413.3	39.05	5046.51
12.700	28.57	61.7	323.5	396.9	36.68	5046.42
12.800	25.99	54.6	310.2	378.1	33.97	5046.31
12.900	25.07	51.1	298.2	361.2	31.53	5046.22
13.000	24.64	49.7	288.7	347.9	29.60	5046.14
13.100	23.15	47.8	280.6	336.5	27.95	5046.08
13.200	21.52	44.7	272.6	325.2	26.33	5046.02
13.300	20.43	42.0	264.5	314.5	25.02	5045.95
13.400	20.60	41.0	257.5	305.5	24.00	5045.88
13.500	20.20	40.8	251.9	298.3	23.18	5045.84
13.600	19.03	39.2	246.4	291.2	22.37	5045.79
13.700	18.81	37.8	241.1	284.3	21.58	5045.74
13.800	18.55	37.4	236.6	278.5	20.92	5045.70
13.900	18.31	36.9	232.8	273.5	20.35	5045.66
14.000	18.06	36.4	229.4	269.2	19.86	5045.63
14.100	17.79	35.8	226.4	265.3	19.42	5045.61
14.200	16.65	34.4	223.0	260.9	18.92	5045.58
14.300	16.05	32.7	219.1	255.7	18.33	5045.54
14.400	15.98	32.0	215.5	251.1	17.81	5045.51
14.500	15.49	31.5	212.3	247.0	17.34	5045.48
14.600	15.24	30.7	209.2	243.0	16.89	5045.45
14.700	14.84	30.1	206.4	239.3	16.47	5045.43
14.800	14.58	29.4	203.7	235.8	16.07	5045.40
14.900	14.17	28.8	201.1	232.4	15.68	5045.38
15.000	13.83	28.0	198.5	229.1	15.30	5045.36
15.100	13.46	27.3	195.9	225.8	14.92	5045.33
15.200	13.14	26.6	193.4	222.5	14.55	5045.31
15.300	12.75	25.9	190.9	219.3	14.19	5045.29
15.400	12.19	24.9	188.3	215.9	13.80	5045.27

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	11.61	23.8	185.3	212.1	13.36	5045.24
15.600	11.14	22.8	182.3	208.1	12.91	5045.21
15.700	10.60	21.7	179.1	204.0	12.45	5045.18
15.800	9.97	20.6	175.8	199.7	11.96	5045.15
15.900	9.38	19.4	172.2	195.1	11.44	5045.12
16.000	8.92	18.3	168.7	190.5	10.92	5045.09
16.100	8.49	17.4	165.3	186.1	10.41	5045.06
16.200	8.13	16.6	162.1	181.9	9.93	5045.03
16.300	6.24	14.4	157.7	176.4	9.38	5044.99
16.400	5.78	12.0	151.3	169.7	9.21	5044.92
16.500	5.68	11.5	144.7	162.7	9.03	5044.85
16.600	5.41	11.1	138.1	155.8	8.85	5044.78
16.700	5.27	10.7	131.4	148.8	8.67	5044.71
16.800	5.04	10.3	124.8	141.7	8.49	5044.63
16.900	4.92	10.0	118.1	134.7	8.30	5044.56
17.000	4.74	9.7	111.5	127.8	8.13	5044.49
17.100	4.66	9.4	105.0	120.9	7.95	5044.42
17.200	4.53	9.2	98.7	114.2	7.78	5044.35
17.300	4.45	9.0	92.4	107.6	7.61	5044.28
17.400	4.35	8.8	86.3	101.2	7.44	5044.22
17.500	4.31	8.7	80.4	95.0	7.28	5044.15
17.600	4.25	8.6	74.8	89.0	7.13	5044.09
17.700	4.23	8.5	69.3	83.2	6.98	5044.03
17.800	4.18	8.4	64.1	77.7	6.82	5043.95
17.900	4.15	8.3	59.1	72.4	6.64	5043.86
18.000	4.12	8.3	54.4	67.4	6.48	5043.77
18.100	4.10	8.2	50.0	62.6	6.33	5043.68
18.200	4.08	8.2	45.8	58.2	6.18	5043.60
18.300	4.08	8.2	41.9	54.0	6.04	5043.52
18.400	4.06	8.1	38.2	50.0	5.91	5043.45
18.500	4.04	8.1	34.7	46.3	5.79	5043.38
18.600	4.04	8.1	31.4	42.8	5.68	5043.32
18.700	4.04	8.1	28.4	39.5	5.57	5043.26
18.800	4.02	8.1	25.5	36.4	5.47	5043.21
18.900	4.02	8.0	22.8	33.5	5.38	5043.15
19.000	4.02	8.0	20.2	30.8	5.29	5043.10
19.100	4.02	8.0	17.9	28.3	5.20	5043.06
19.200	4.02	8.0	15.6	25.9	5.13	5043.02
19.300	4.00	8.0	13.9	23.7	4.90	5042.93
19.400	4.00	8.0	12.6	21.9	4.64	5042.83
19.500	3.00	7.0	11.0	19.6	4.30	5042.72
19.600	3.00	6.0	9.1	17.0	3.92	5042.58
19.700	3.00	6.0	7.8	15.1	3.65	5042.48
19.800	3.00	6.0	6.9	13.8	3.46	5042.42
19.900	3.00	6.0	6.3	12.9	3.33	5042.37
20.000	3.00	6.0	5.8	12.3	3.23	5042.33

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	3.00	6.0	5.5	11.8	3.16	5042.31
20.200	3.00	6.0	5.2	11.5	3.12	5042.29
20.300	3.00	6.0	5.1	11.2	3.08	5042.28
20.400	3.00	6.0	5.0	11.1	3.06	5042.27
20.500	3.00	6.0	4.9	11.0	3.04	5042.26
20.600	3.00	6.0	4.8	10.9	3.03	5042.26
20.700	3.00	6.0	4.8	10.8	3.02	5042.26
20.800	3.00	6.0	4.8	10.8	3.01	5042.26
20.900	3.00	6.0	4.7	10.8	3.01	5042.25
21.000	3.00	6.0	4.7	10.7	3.01	5042.25
21.100	3.00	6.0	4.7	10.7	3.01	5042.25
21.200	3.00	6.0	4.7	10.7	3.00	5042.25
21.300	3.00	6.0	4.7	10.7	3.00	5042.25
21.400	3.00	6.0	4.7	10.7	3.00	5042.25
21.500	3.00	6.0	4.7	10.7	3.00	5042.25
21.600	3.00	6.0	4.7	10.7	3.00	5042.25
21.700	3.00	6.0	4.7	10.7	3.00	5042.25
21.800	3.00	6.0	4.7	10.7	3.00	5042.25
21.900	3.00	6.0	4.7	10.7	3.00	5042.25
22.000	3.00	6.0	4.7	10.7	3.00	5042.25
22.100	3.00	6.0	4.7	10.7	3.00	5042.25
22.200	3.00	6.0	4.7	10.7	3.00	5042.25
22.300	3.00	6.0	4.7	10.7	3.00	5042.25
22.400	3.00	6.0	4.7	10.7	3.00	5042.25
22.500	3.00	6.0	4.7	10.7	3.00	5042.25
22.600	3.00	6.0	4.7	10.7	3.00	5042.25
22.700	3.00	6.0	4.7	10.7	3.00	5042.25
22.800	3.00	6.0	4.7	10.7	3.00	5042.25
22.900	3.00	6.0	4.7	10.7	3.00	5042.25
23.000	3.00	6.0	4.7	10.7	3.00	5042.25
23.100	3.00	6.0	4.7	10.7	3.00	5042.25
23.200	3.00	6.0	4.7	10.7	3.00	5042.25
23.300	3.00	6.0	4.7	10.7	3.00	5042.25
23.400	3.00	6.0	4.7	10.7	3.00	5042.25
23.500	3.00	6.0	4.7	10.7	3.00	5042.25
23.600	3.00	6.0	4.7	10.7	3.00	5042.25
23.700	3.00	6.0	4.7	10.7	3.00	5042.25
23.800	3.00	6.0	4.7	10.7	3.00	5042.25
23.900	3.00	6.0	4.7	10.7	3.00	5042.25
24.000	2.03	5.0	4.0	9.7	2.86	5042.20
24.100	1.79	3.8	2.7	7.8	2.58	5042.10
24.200	1.75	3.5	1.5	6.2	2.34	5042.02
24.300	1.44	3.2	1.0	4.7	1.83	5041.80
24.400	1.40	2.8	0.8	3.9	1.51	5041.66
24.500	1.15	2.6	0.7	3.4	1.33	5041.58
24.600	1.15	2.3	0.7	3.0	1.19	5041.52

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.97	2.1	0.6	2.8	1.09	5041.47
24.800	0.99	2.0	0.6	2.6	1.00	5041.44
24.900	0.82	1.8	0.5	2.4	0.93	5041.40
25.000	0.82	1.6	0.5	2.2	0.84	5041.37
25.100	0.68	1.5	0.4	2.0	0.77	5041.33
25.200	0.70	1.4	0.4	1.8	0.71	5041.31
25.300	0.57	1.3	0.4	1.7	0.65	5041.28
25.400	0.57	1.1	0.3	1.5	0.59	5041.26
25.500	0.47	1.0	0.3	1.4	0.53	5041.23
25.600	0.47	0.9	0.3	1.2	0.48	5041.21
25.700	0.37	0.8	0.2	1.1	0.43	5041.19
25.800	0.39	0.8	0.2	1.0	0.39	5041.17
25.900	0.32	0.7	0.2	0.9	0.36	5041.16
26.000	0.30	0.6	0.2	0.8	0.32	5041.14
26.100	0.18	0.5	0.1	0.7	0.26	5041.11
26.200	0.16	0.3	0.1	0.5	0.19	5041.08
26.300	0.08	0.2	0.1	0.3	0.14	5041.06
26.400	0.10	0.2	0.1	0.3	0.10	5041.04
26.500	0.04	0.1	0.0	0.2	0.08	5041.03
26.600	0.06	0.1	0.0	0.1	0.06	5041.02
26.700	0.01	0.1	0.0	0.1	0.04	5041.02
26.800	0.02	0.0	0.0	0.1	0.02	5041.01
26.900	0.02	0.0	0.0	0.1	0.02	5041.01
27.000	0.02	0.0	0.0	0.1	0.02	5041.01
27.100	0.00	0.0	0.0	0.0	0.01	5041.01
27.200	0.00	0.0	0.0	0.0	0.00	5041.00
27.300	0.00	0.0	0.0	0.0	0.00	5041.00
27.400	0.00	0.0	0.0	0.0	0.00	5041.00
27.500	0.00	0.0	0.0	0.0	0.00	5041.00
27.600	0.00	0.0	0.0	0.0	0.00	5041.00
27.700	0.00	0.0	0.0	0.0	0.00	5041.00
27.800	0.00	0.0	0.0	0.0	0.00	5041.00
27.900	0.00	0.0	0.0	0.0	0.00	5041.00
28.000	0.00	0.0	0.0	0.0	0.00	5041.00
28.100	0.00	0.0	0.0	0.0	0.00	5041.00
28.200	0.00	0.0	0.0	0.0	0.00	5041.00
28.300	0.00	0.0	0.0	0.0	0.00	5041.00
28.400	0.00	0.0	0.0	0.0	0.00	5041.00
28.500	0.00	0.0	0.0	0.0	0.00	5041.00
28.600	0.00	0.0	0.0	0.0	0.00	5041.00
28.700	0.00	0.0	0.0	0.0	0.00	5041.00
28.800	0.00	0.0	0.0	0.0	0.00	5041.00
28.900	0.00	0.0	0.0	0.0	0.00	5041.00
29.000	0.00	0.0	0.0	0.0	0.00	5041.00
29.100	0.00	0.0	0.0	0.0	0.00	5041.00
29.200	0.00	0.0	0.0	0.0	0.00	5041.00

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:20:54

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
29.300	0.00	0.0	0.0	0.0	0.00	5041.00
29.400	0.00	0.0	0.0	0.0	0.00	5041.00
29.500	0.00	0.0	0.0	0.0	0.00	5041.00
29.600	0.00	0.0	0.0	0.0	0.00	5041.00
29.700	0.00	0.0	0.0	0.0	0.00	5041.00
29.800	0.00	0.0	0.0	0.0	0.00	5041.00
29.900	0.00	0.0	0.0	0.0	0.00	5041.00
30.000	0.00	0.0	0.0	0.0	0.00	5041.00

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

Starting Pond W.S. Elevation = 5041.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	67.79 cfs
Peak Outflow	=	40.26 cfs
Peak Elevation	=	5046.56 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	1.58 ac-ft
Total Storage in Pond	=	1.58 ac-ft

POND-2 Version: 5.13 S/N: 1220510325 Page 8

Pond File: ROSEWD .PND
Inflow Hydrograph: RWE5-IN .HYD
Outflow Hydrograph: RWE5-OUT.HYD

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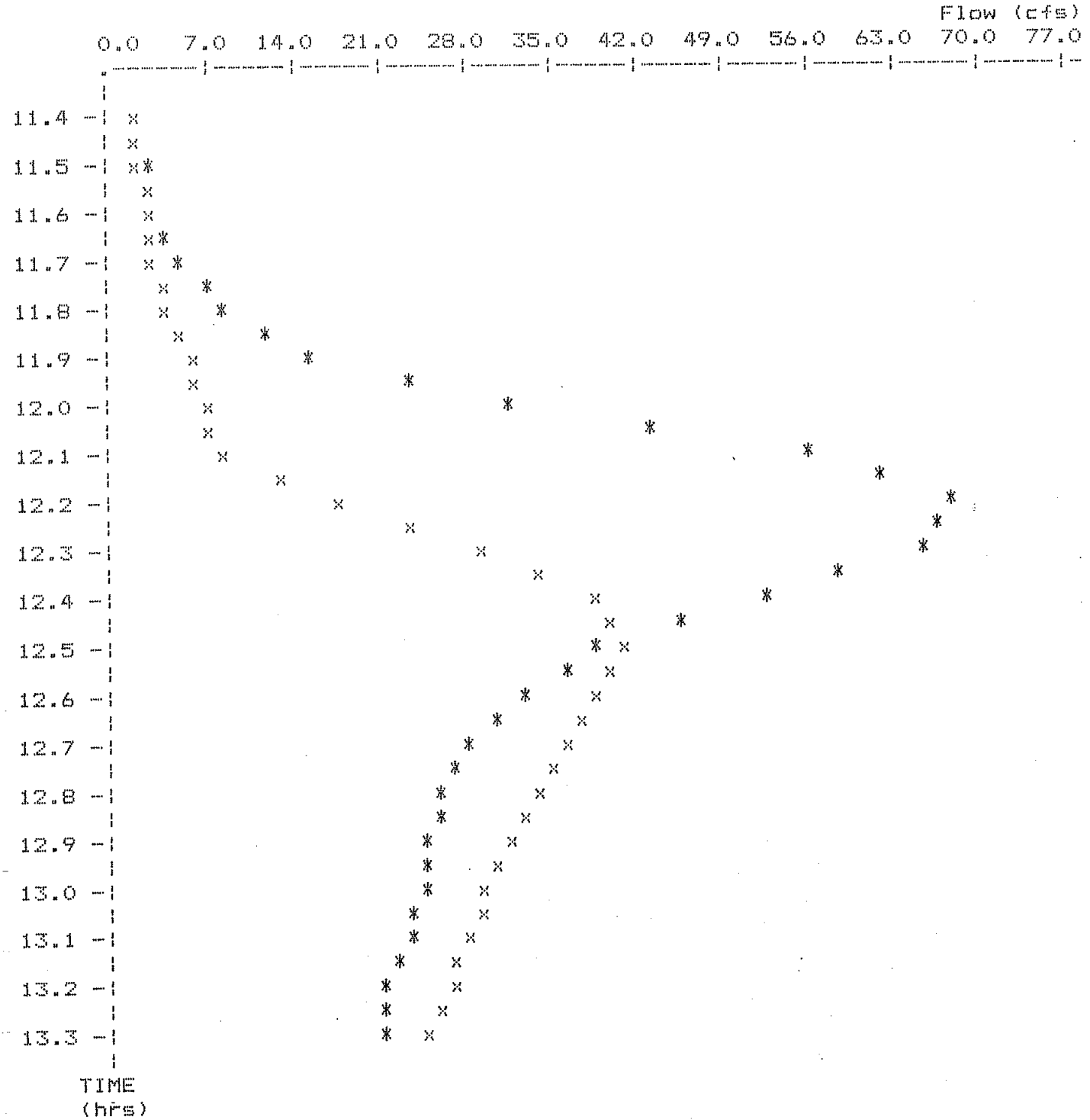
10:20:54

Peak Inflow = 67.79 cfs
Peak Outflow = 40.26 cfs
Peak Elevation = 5046.56 ft



* File: RWE5-IN .HYD Qmax = 67.8 cfs
x File: RWE5-OUT.HYD Qmax = 40.3 cfs

POND-2 Version: 5.13 S/N: 1220510325
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**********************************************
*                                            *
*  CAUGHLIN RANCH MASTER HYDROLOGY  1016.38  *
*    EXISTING ROSEWOOD WASH DETENTION POND   *
*              DECEMBER 17, 1990             *
*            CODEGA & FRICKE, INC.           *
* EXISTING CONDITIONS 100-YR STORM           *
**********************************************
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Inflow Hydrograph: RWEC-IN .HYD
Rating Table file: ROSEWD .PND

-----INITIAL CONDITIONS-----
Elevation = 5041.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5041.00	0.0	0.000
5042.00	2.3	0.015
5043.00	5.1	0.082
5044.00	6.9	0.303
5045.00	9.4	0.693
5046.00	25.9	1.224
5047.00	51.7	1.856
5048.00	81.3	2.536
5049.00	102.8	3.283
5050.00	120.4	4.117

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
3.6	5.9
20.0	25.1
73.3	80.2
167.8	177.2
296.3	322.2
449.2	500.9
613.8	695.1
794.5	897.3
996.2	1116.6

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-18-1990 10:27:12

Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	2.25	------	0.0	0.0	0.00	5041.00
11.100	2.83	5.1	1.1	5.1	1.98	5041.86
11.200	5.70	8.5	3.9	9.6	2.85	5042.20
11.300	7.31	13.0	9.1	17.0	3.92	5042.58
11.400	10.22	17.5	16.3	26.7	5.15	5043.03
11.500	14.44	24.7	29.8	41.0	5.62	5043.29
11.600	14.75	29.2	46.5	59.0	6.21	5043.61
11.700	25.24	40.0	72.4	86.5	7.06	5044.06
11.800	38.82	64.1	119.8	136.5	8.35	5044.58
11.900	50.88	89.7	183.3	209.5	13.07	5045.22
12.000	93.22	144.1	274.1	327.4	26.65	5046.03
12.100	156.38	249.6	413.4	523.7	55.17	5047.12
12.200	170.29	326.7	567.9	740.1	86.08	5048.22
12.300	152.90	323.2	686.8	891.1	102.14	5048.97
12.400	118.38	271.3	742.7	958.1	107.68	5049.28
12.500	88.20	206.6	735.3	949.3	106.98	5049.24
12.600	75.60	163.8	693.2	899.1	102.95	5049.01
12.700	65.53	141.1	642.1	834.4	96.11	5048.69
12.800	58.96	124.5	588.8	766.6	88.91	5048.35
12.900	55.28	114.2	538.8	703.1	82.15	5048.04
13.000	50.75	106.0	497.5	644.8	73.63	5047.74
13.100	47.05	97.8	463.2	595.3	66.09	5047.49
13.200	46.37	93.4	436.2	556.6	60.18	5047.29
13.300	44.93	91.3	416.0	527.5	55.75	5047.14
13.400	42.41	87.3	399.2	503.3	52.07	5047.01
13.500	40.61	83.0	384.2	482.2	49.00	5046.90
13.600	38.45	79.1	370.8	463.3	46.27	5046.79
13.700	35.58	74.0	357.6	444.8	43.59	5046.69
13.800	34.26	69.8	345.3	427.4	41.09	5046.59
13.900	33.64	67.9	335.1	413.2	39.03	5046.51
14.000	32.78	66.4	326.8	401.5	37.35	5046.44
14.100	32.15	64.9	319.9	391.8	35.94	5046.39
14.200	30.80	63.0	313.5	382.8	34.65	5046.34
14.300	30.19	61.0	307.6	374.5	33.45	5046.29
14.400	29.90	60.1	302.8	367.7	32.47	5046.25
14.500	28.30	58.2	298.0	361.0	31.49	5046.22
14.600	27.95	56.3	293.2	354.2	30.52	5046.18
14.700	27.40	55.3	289.1	348.5	29.70	5046.15
14.800	27.30	54.7	285.8	343.8	29.02	5046.12
14.900	27.14	54.4	283.2	340.2	28.50	5046.10
15.000	27.01	54.2	281.2	337.4	28.09	5046.08
15.100	26.87	53.9	279.6	335.1	27.76	5046.07
15.200	26.76	53.6	278.2	333.2	27.49	5046.06
15.300	26.62	53.4	277.1	331.6	27.26	5046.05
15.400	26.49	53.1	276.1	330.2	27.05	5046.04

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	26.34	52.8	275.2	328.9	26.87	5046.04
15.600	26.21	52.6	274.4	327.8	26.70	5046.03
15.700	26.08	52.3	273.6	326.6	26.54	5046.02
15.800	24.49	50.6	271.8	324.1	26.18	5046.01
15.900	23.51	48.0	268.5	319.8	25.62	5045.98
16.000	23.76	47.3	265.5	315.8	25.17	5045.96
16.100	23.42	47.2	263.0	312.7	24.81	5045.93
16.200	23.34	46.8	260.8	309.8	24.48	5045.91
16.300	22.32	45.7	258.3	306.5	24.11	5045.89
16.400	21.87	44.2	255.2	302.5	23.65	5045.86
16.500	21.88	43.8	252.4	298.9	23.25	5045.84
16.600	21.53	43.4	250.0	295.8	22.90	5045.82
16.700	21.43	43.0	247.8	293.0	22.57	5045.80
16.800	21.18	42.6	245.9	290.5	22.28	5045.78
16.900	21.03	42.2	244.1	288.1	22.02	5045.76
17.000	20.84	41.9	242.4	285.9	21.77	5045.75
17.100	20.70	41.5	240.8	283.9	21.54	5045.74
17.200	20.52	41.2	239.4	282.1	21.33	5045.72
17.300	19.39	39.9	237.3	279.3	21.02	5045.70
17.400	19.23	38.6	234.6	275.9	20.63	5045.68
17.500	19.01	38.2	232.3	272.9	20.29	5045.66
17.600	18.75	37.8	230.1	270.1	19.97	5045.64
17.700	18.53	37.3	228.1	267.4	19.66	5045.62
17.800	18.28	36.8	226.2	264.9	19.38	5045.60
17.900	17.99	36.3	224.2	262.4	19.09	5045.59
18.000	17.73	35.7	222.3	260.0	18.81	5045.57
18.100	17.47	35.2	220.4	257.5	18.54	5045.55
18.200	17.25	34.7	218.6	255.2	18.27	5045.54
18.300	17.00	34.3	216.9	252.9	18.01	5045.52
18.400	16.70	33.7	215.1	250.6	17.75	5045.51
18.500	16.40	33.1	213.2	248.2	17.47	5045.49
18.600	16.11	32.5	211.3	245.7	17.20	5045.47
18.700	15.81	31.9	209.4	243.3	16.91	5045.46
18.800	15.45	31.3	207.4	240.7	16.62	5045.44
18.900	15.11	30.6	205.4	238.0	16.32	5045.42
19.000	14.79	29.9	203.3	235.3	16.01	5045.40
19.100	14.47	29.3	201.1	232.5	15.69	5045.38
19.200	14.11	28.6	199.0	229.7	15.37	5045.36
19.300	13.73	27.8	196.7	226.8	15.04	5045.34
19.400	13.37	27.1	194.4	223.8	14.70	5045.32
19.500	13.05	26.4	192.1	220.8	14.36	5045.30
19.600	12.71	25.8	189.8	217.9	14.03	5045.28
19.700	12.30	25.0	187.5	214.8	13.68	5045.26
19.800	11.91	24.2	185.0	211.7	13.32	5045.24
19.900	11.57	23.5	182.6	208.5	12.96	5045.22
20.000	11.27	22.8	180.2	205.4	12.61	5045.19

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	10.99	22.3	177.9	202.5	12.27	5045.17
20.200	10.65	21.6	175.7	199.6	11.94	5045.15
20.300	10.27	20.9	173.4	196.6	11.61	5045.13
20.400	9.95	20.2	171.1	193.6	11.27	5045.11
20.500	9.69	19.6	168.9	190.7	10.94	5045.09
20.600	9.43	19.1	166.7	188.0	10.62	5045.07
20.700	9.23	18.7	164.7	185.4	10.33	5045.06
20.800	9.05	18.3	162.9	183.0	10.06	5045.04
20.900	8.90	18.0	161.2	180.8	9.81	5045.02
21.000	8.79	17.7	159.7	178.9	9.59	5045.01
21.100	8.66	17.5	158.4	177.2	9.40	5045.00
21.200	8.56	17.2	156.9	175.6	9.36	5044.98
21.300	8.50	17.1	155.3	173.9	9.32	5044.97
21.400	8.41	16.9	153.7	172.2	9.27	5044.95
21.500	8.34	16.8	152.0	170.4	9.22	5044.93
21.600	8.30	16.6	150.3	168.6	9.18	5044.91
21.700	8.26	16.6	148.6	166.8	9.13	5044.89
21.800	8.22	16.5	146.9	165.0	9.09	5044.87
21.900	8.18	16.4	145.2	163.3	9.04	5044.86
22.000	8.16	16.3	143.5	161.5	9.00	5044.84
22.100	8.14	16.3	141.9	159.8	8.95	5044.82
22.200	8.12	16.3	140.4	158.2	8.91	5044.80
22.300	8.10	16.2	138.9	156.6	8.87	5044.79
22.400	8.08	16.2	137.4	155.0	8.83	5044.77
22.500	8.08	16.2	136.0	153.5	8.79	5044.76
22.600	8.06	16.1	134.6	152.1	8.75	5044.74
22.700	8.06	16.1	133.3	150.7	8.72	5044.73
22.800	8.04	16.1	132.0	149.4	8.68	5044.71
22.900	8.04	16.1	130.8	148.1	8.65	5044.70
23.000	8.04	16.1	129.6	146.9	8.62	5044.69
23.100	7.91	16.0	128.4	145.6	8.58	5044.67
23.200	7.59	15.5	126.8	143.9	8.54	5044.66
23.300	7.30	14.9	124.8	141.7	8.49	5044.63
23.400	7.08	14.4	122.3	139.1	8.42	5044.61
23.500	6.90	14.0	119.6	136.3	8.34	5044.58
23.600	6.76	13.7	116.7	133.3	8.27	5044.55
23.700	6.62	13.4	113.7	130.1	8.19	5044.51
23.800	6.50	13.1	110.6	126.9	8.10	5044.48
23.900	6.44	12.9	107.6	123.6	8.02	5044.45
24.000	3.82	10.3	102.1	117.8	7.87	5044.39
24.100	3.13	6.9	93.7	109.0	7.64	5044.30
24.200	2.91	6.0	85.0	99.8	7.40	5044.20
24.300	2.57	5.5	76.1	90.5	7.16	5044.11
24.400	2.51	5.1	67.4	81.2	6.92	5044.01
24.500	2.30	4.8	58.9	72.2	6.64	5043.85
24.600	2.30	4.6	50.8	63.5	6.35	5043.70

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	2.17	4.5	43.1	55.3	6.09	5043.55
24.800	2.19	4.4	35.8	47.4	5.83	5043.41
24.900	2.09	4.3	28.9	40.1	5.59	5043.27
25.000	2.10	4.2	22.4	33.1	5.36	5043.15
25.100	1.92	4.0	16.1	26.4	5.14	5043.02
25.200	1.78	3.7	11.1	19.8	4.33	5042.73
25.300	1.54	3.3	7.3	14.4	3.55	5042.45
25.400	1.40	2.9	4.4	10.3	2.94	5042.23
25.500	1.20	2.6	2.1	7.0	2.46	5042.06
25.600	1.14	2.3	1.0	4.4	1.72	5041.75
25.700	1.03	2.2	0.7	3.1	1.23	5041.53
25.800	0.98	2.0	0.6	2.7	1.05	5041.46
25.900	0.87	1.9	0.5	2.4	0.95	5041.41
26.000	0.73	1.6	0.5	2.1	0.83	5041.36
26.100	0.51	1.2	0.4	1.7	0.67	5041.29
26.200	0.39	0.9	0.3	1.3	0.50	5041.22
26.300	0.27	0.7	0.2	0.9	0.37	5041.16
26.400	0.21	0.5	0.2	0.7	0.27	5041.12
26.500	0.13	0.3	0.1	0.5	0.19	5041.08
26.600	0.11	0.2	0.1	0.3	0.14	5041.06
26.700	0.07	0.2	0.1	0.3	0.10	5041.04
26.800	0.07	0.1	0.0	0.2	0.08	5041.03
26.900	0.03	0.1	0.0	0.1	0.06	5041.02
27.000	0.03	0.1	0.0	0.1	0.04	5041.02
27.100	0.01	0.0	0.0	0.1	0.02	5041.01
27.200	0.03	0.0	0.0	0.1	0.02	5041.01
27.300	0.01	0.0	0.0	0.1	0.02	5041.01
27.400	0.01	0.0	0.0	0.0	0.01	5041.01
27.500	0.00	0.0	0.0	0.0	0.01	5041.00
27.600	0.00	0.0	0.0	0.0	0.00	5041.00
27.700	0.00	0.0	0.0	0.0	0.00	5041.00
27.800	0.00	0.0	0.0	0.0	0.00	5041.00
27.900	0.00	0.0	0.0	0.0	0.00	5041.00
28.000	0.00	0.0	0.0	0.0	0.00	5041.00
28.100	0.00	0.0	0.0	0.0	0.00	5041.00
28.200	0.00	0.0	0.0	0.0	0.00	5041.00
28.300	0.00	0.0	0.0	0.0	0.00	5041.00
28.400	0.00	0.0	0.0	0.0	0.00	5041.00
28.500	0.00	0.0	0.0	0.0	0.00	5041.00
28.600	0.00	0.0	0.0	0.0	0.00	5041.00
28.700	0.00	0.0	0.0	0.0	0.00	5041.00
28.800	0.00	0.0	0.0	0.0	0.00	5041.00
28.900	0.00	0.0	0.0	0.0	0.00	5041.00
29.000	0.00	0.0	0.0	0.0	0.00	5041.00
29.100	0.00	0.0	0.0	0.0	0.00	5041.00
29.200	0.00	0.0	0.0	0.0	0.00	5041.00

Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
29.300	0.00	0.0	0.0	0.0	0.00	5041.00
29.400	0.00	0.0	0.0	0.0	0.00	5041.00
29.500	0.00	0.0	0.0	0.0	0.00	5041.00
29.600	0.00	0.0	0.0	0.0	0.00	5041.00
29.700	0.00	0.0	0.0	0.0	0.00	5041.00
29.800	0.00	0.0	0.0	0.0	0.00	5041.00
29.900	0.00	0.0	0.0	0.0	0.00	5041.00
30.000	0.00	0.0	0.0	0.0	0.00	5041.00

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

Starting Pond W.S. Elevation = 5041.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	170.29 cfs
Peak Outflow	=	107.68 cfs
Peak Elevation	=	5049.28 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	3.51 ac-ft
Total Storage in Pond	=	3.51 ac-ft

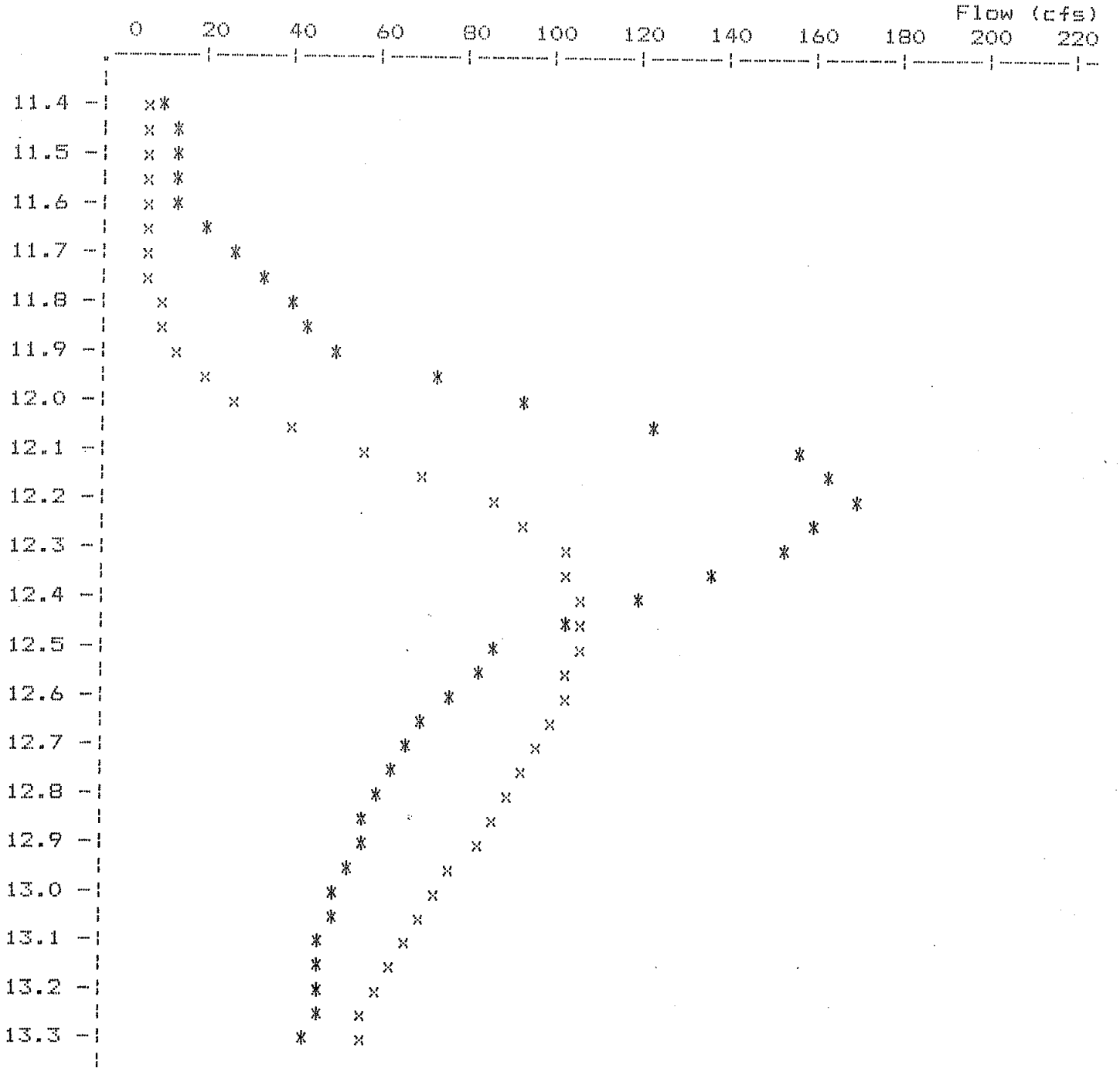
Warning: Inflow hydrograph truncated on left side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: ROSEWD .PND
Inflow Hydrograph: RWEC-IN .HYD
Outflow Hydrograph: RWEC-OUT.HYD

EXECUTED: 12-18-1990
10:27:12

Peak Inflow = 170.29 cfs
Peak Outflow = 107.68 cfs
Peak Elevation = 5049.28 ft



* File: RWEC-IN .HYD Qmax = 170.3 cfs
× File: RWEC-OUT.HYD Qmax = 107.7 cfs

OVERLAND FLOW DOWNSTREAM OF ROSEWOOD WASH DETENTION BASIN

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 10:57:16 12-18-1990

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS DOWNSTREAM OF ROSEWOOD DETENTION POND
DECEMBER 18, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: OVERLND & GUTTR DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
SEGMENT 1 OVERLAND	850	4.60	3.1	=	0.05
GUTTER	350	4.50	1.3	=	0.02
ADDNL TO MAKE MIN. Tc	450	4.50	1.7	=	0.03
			minutes		hours
		TOTAL Tc --->	6.0	=	0.10

OVERLAND FLOW DOWNSTREAM OF ROSEWOOD WASH DET. BASIN

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-18-1990 10:59:55
Watershed file: --> CRE1A .MOP
Hydrograph file: --> CREA1-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS DOWNSTREAM OF ROSEWOOD WASH DETENTION POND
DECEMBER 18, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
AREA 1A	35.74	89.0	0.10	0.00	1.55	0.67	I.16 .16

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 35.74 acres or 0.05584 sq.mi
Peak discharge = 37 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 1A	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

THE ABOVE HYDROGRAPHS WERE ADDED TO THE ROSEWOOD WASH DETENTION BASIN HYDROGRAPHS TO CREATE A COMPOSITE HYDROGRAPH FOR ALL OF AREA 1.

51

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-18-1990 10:59:55
Watershed file: --> CRE1A .MOP
Hydrograph file: --> CREA1-C.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS DOWNSTREAM OF ROSEWOOD WASH DETENTION POND
DECEMBER 18, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	I	Runoff (in)	Ia/p input/used
AREA 1A	35.74	89.0	0.10	0.00	2.75	I	1.68	I.09 .10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

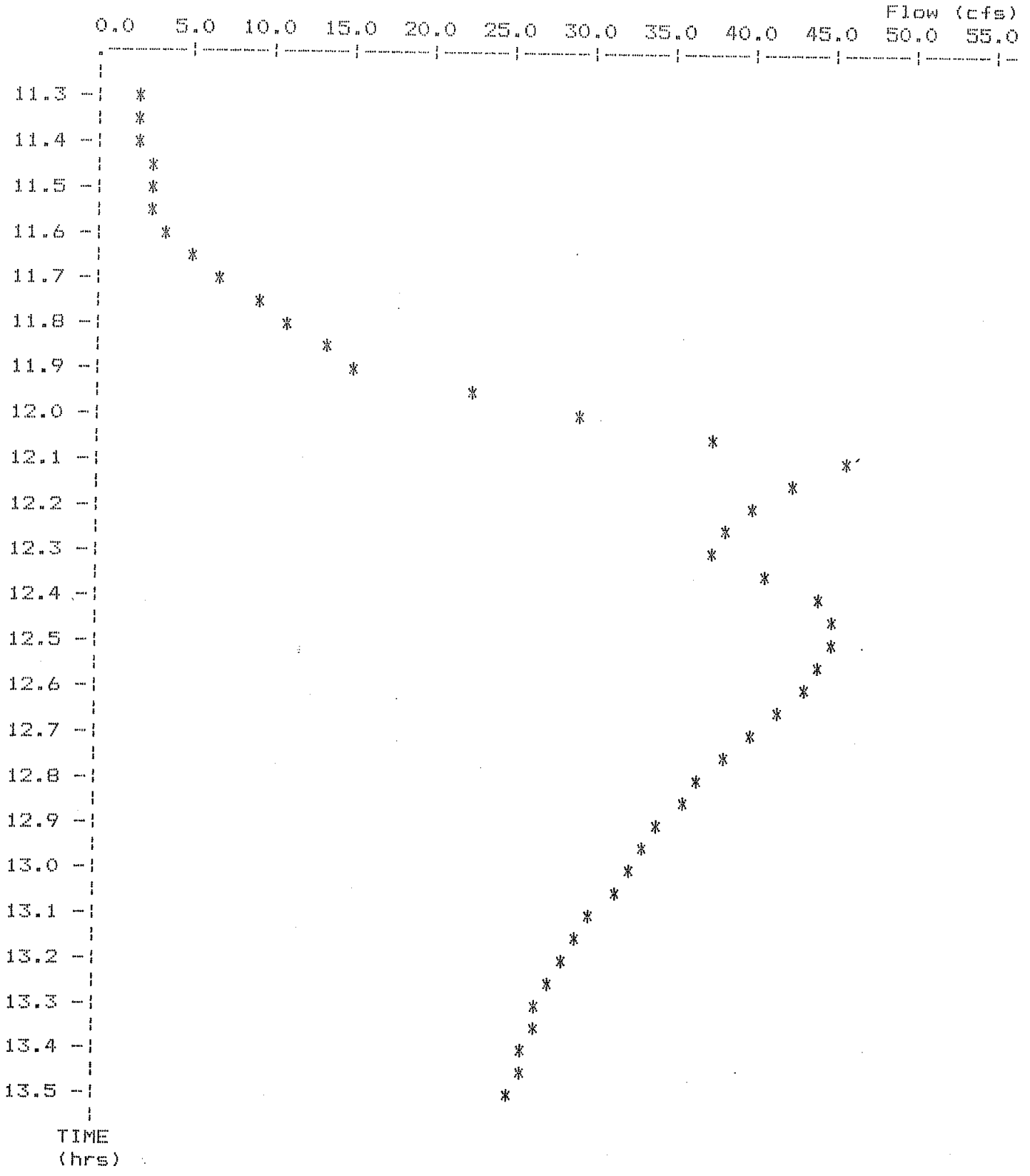
Total area = 35.74 acres or 0.05584 sq.mi
Peak discharge = 95 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 1A	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

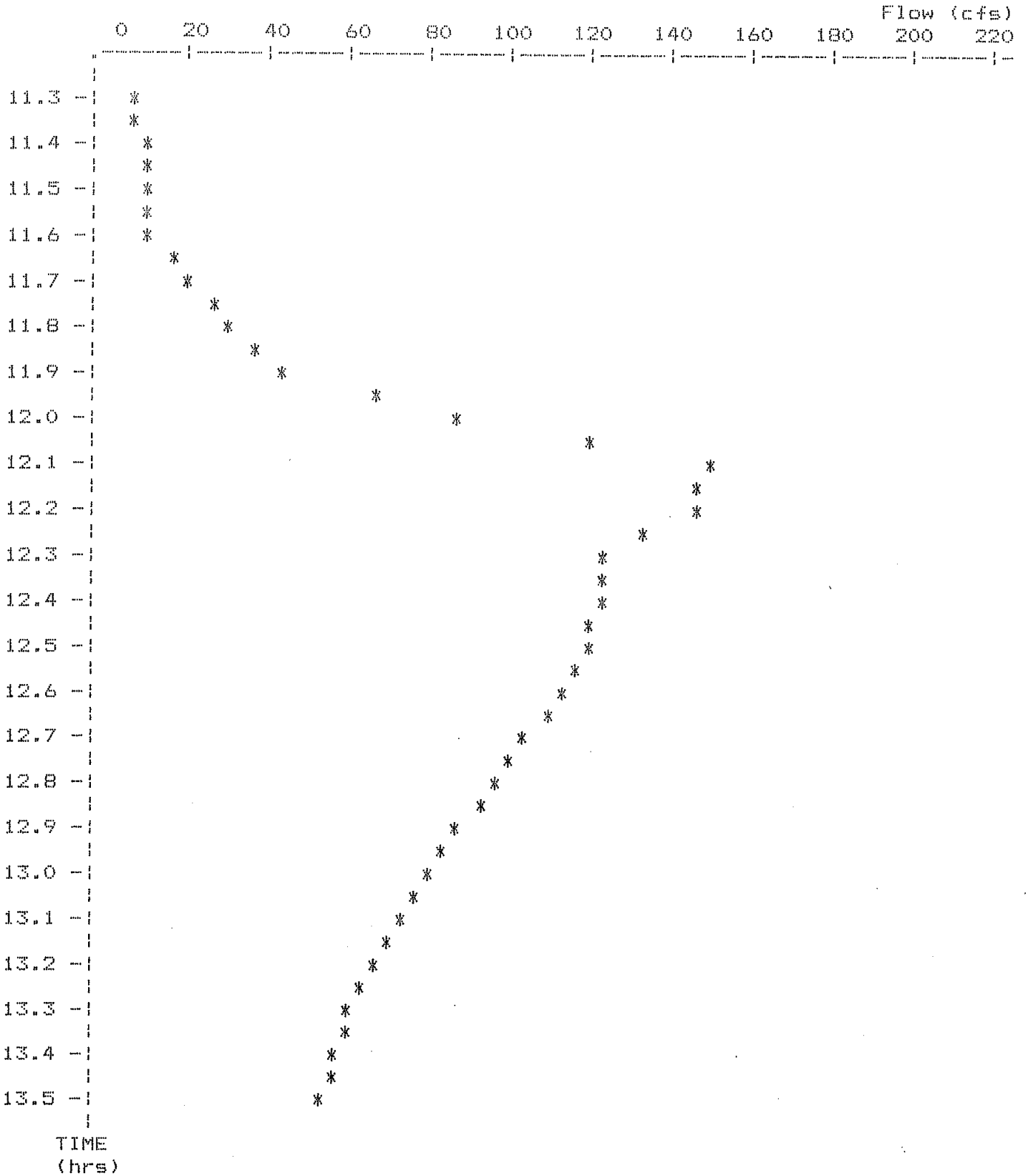
POND-2 Version: 5.13 S/N: 1220510325
Plotted: 12-18-1990



* File: CRE1-5 .HYD Qmax = 45.5 cfs

AREA 1
EXISTING CONDITIONS 5-YR STORM

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 12-18-1990



* File: CRE1-100.HYD Qmax = 150.2 cfs

AREA 1
EXISTING CONDITIONS 100-YR STORM

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

JOB 1016.38
SHEET NO. 54 OF
CALCULATED BY KRK DATE 12-10-90 REV 4-16-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 2: EXISTING CONDITION IS SAME AS PRE-DEVELOPMENT CONDITION
Q_5 = 0.29 cfs
Q_{100} = 0.80 cfs

AREA 3: EXISTING CONDITION IS SAME AS PRE-DEVELOPMENT CONDITION
Q_5 = 2.06 cfs
Q_{100} = 5.59 cfs

AREA 4: THE MAJORITY OF THE AREA DRAINS TO AN EXISTING DETENTION BASIN ADJACENT TO McCARRAN BOULEVARD. IT IS THEN ROUTED THROUGH THE EXISTING STORM DRAIN SYSTEM IN McCARRAN AND EXITS THE SITE TO THE SOUTHEAST. PEAK FLOWS FOR THE STORM DRAIN SYSTEM ARE: Q_5 = 1.8 cfs Q_{100} = 12.3 cfs

A SMALL PORTION OF AREA 4 DRAINS TO THE SOUTHEAST BY GUTTER FLOW IN CHAPARRAL DRIVE. 5 & 100-YR HYDROGRAPHS FOR THIS AREA WERE ADDED TO THE OUTFLOW HYDROGRAPHS FROM THE DETENTION POND. THIS RESULTS IN 5 & 100-YR COMPOSITE HYDROGRAPHS FOR AREA 4. PEAK FLOWS FOR AREA 4 ARE: Q_5 = 3.5 cfs
Q_{100} = 14.0 cfs

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

FLOW INTO EXIST. DETENTION POND

Executed: 12-13-1990 11:10:38
Watershed file: --> CRE-4 .MOP
Hydrograph file: --> CRE4-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 4
DECEMBER 12, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
4-OVERLAND	39.80	86.0	0.10	0.00	1.55	0.53	I.21	.21

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 39.80 acres or 0.06219 sq.mi
Peak discharge = 32 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-OVERLAND	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

FLOW INTO EXISTING DETENTION POND

Executed: 12-13-1990 11:10:38
Watershed file: --> CRE-4 .MOP
Hydrograph file: --> CRE4-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 4
DECEMBER 12, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
4-OVERLAND	39.80	86.0	0.10	0.00	2.75	1.45	I.12	.12

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 39.80 acres or 0.06219 sq.mi
Peak discharge = 90 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-OVERLAND	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

POND-2 Version: 5.13
S/N: 1220510325

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4
APRIL 11, 1991
CODEGA & FRICKE, INC.

EXISTING DETENTION POND PARAMETERS

CALCULATED 04-11-1991 14:14:13
DISK FILE: CRE-4 .VOL

Planimeter scale: 1 inch = 40 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)		* Volume (acre-ft)	Volume Sum (acre-ft)
5,003.00	1.00	0.04	0.00		0.00	0.00
5,004.00	10.96	0.40	0.56		0.19	0.19
5,005.00	*I*	0.42	1.24	0.41		0.60
5,006.00	12.06	0.44	1.27		0.85	1.03
5,007.00	*I*	0.49	1.39	0.46		1.50
5,008.00	14.46	0.53	1.46		0.97	2.00
5,009.00	*I*	0.58	1.66	0.55		2.56
5,010.00	17.13	0.63	1.74		1.16	3.16

I ----> Interpolated area from closest two planimeter readings.

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1, Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))$$

where: EL1, EL2 = Lower and upper elevations of the increment
Area1, Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Outlet Structure File: CRE-4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
JUNE 10, 1991
CODEGA & FRICKE, INC.
****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures	
5003.00	0.0	1	
5003.50	1.1	1	
5004.00	1.3	1	BAFFLE PLATE CONTROLING
5005.00	1.6	1	
5006.00	1.9	1	
5007.00	2.1	1	
5008.00	12.0	1	
5009.00	12.7	1	12" RCP, S = 0.0085 CONTROLING
5010.00	13.3	1	

Outlet Structure File: CRE-4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
JUNE 10, 1991
CODEGA & FRICKE, INC.
****

Outlet Structure File: CRE-4 .STR
Planimeter Input File: CRE-4 .VOL
Rating Table Output File: CRE-4 .PND

Min. Elev.(ft) = 5003 Max. Elev.(ft) = 5010 Incr.(ft) = 1

Additional elevations (ft) to be included in table:
* *
5003.5

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
TABLE	1		->	1

Outflow rating table summary was stored in file:
CRE-4 .PND

Outlet Structure File: CRE-4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
JUNE 10, 1991
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

TABLE
Input your own rating table.
E1 (ft) =5003.00 E2 (ft) =5010.50

Constant (ft) added to each elevation was:

Elev. (ft)	Q (cfs)	
5003	0	BAFFLE PLATE CONTROLS
5003.5	1.1	
5004	1.3	
5005	1.6	
5006	1.9	
5007	2.1	
5008	12	12" RCP CONTROLS
5009	12.7	
5010	13.3	

Outlet Structure File: CRE4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
JUNE 10, 1991
CODEGA & FRICKE, INC.
****

BAFFLE PLATE

>>>>>> Structure No. 2 <<<<<<
(Input Data)

ORIFICE
Orifice - Based on Area and Datum Elevation

E1 elev.(ft)?	5002
E2 elev.(ft)?	5010.001
Orifice coeff.?	0.59
Invert elev.(ft)?	5002
Datum elev.(ft) ?	5002
Orifice area (sq ft)?	0.1963

Outlet Structure File: CRE4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
JUNE 10, 1991
CODEGA & FRICKE, INC.
****

BAFFLE PLATE ONLY

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
5003.00	0.9	2
5003.50	1.1	2
5004.00	1.3	2
5005.00	1.6	2
5006.00	1.9	2
5007.00	2.1	2
5008.00	2.3	2
5009.00	2.5	2
5010.00	2.6	2

CONTROLING STRUCTURE

Outlet Structure File: CRE4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
APRIL 16, 1991
CODEGA & FRICKE, INC.
****

12" RCP OUTLET PIPE

>>>>>> Structure No. 1 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	4998
E2 elev.(ft)?	5010.001
Diam. (ft)?	1.0
Inv. el.(ft)?	4998.00
Slope (ft/ft)?	0.0085
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0098
M Coeff.?	2.0
c Coeff.?	0.0398
Y Coeff.?	0.67
Form 1 or 2?	1
Slope factor?	-0.50

Outlet Structure File: CRE4 .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

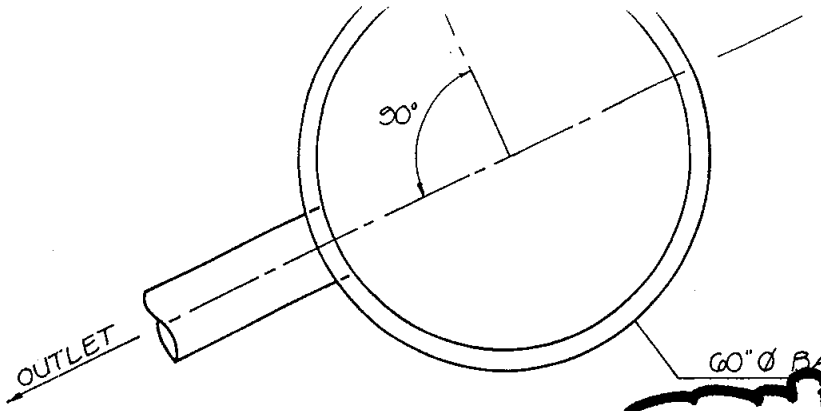
****
CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND IN AREA 4, BAFFLE PLATE & 12" RCP S=.008
APRIL 16, 1991
CODEGA & FRICKE, INC.
****

12" RCP ONLY

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
5003.00	8.2	1
5004.00	9.1	1
5005.00	9.9	1
5006.00	10.7	1
5007.00	11.4	1
5008.00	12.0	1
5009.00	12.7	1
5010.00	13.3	1

} CONTROLING STRUCTURE



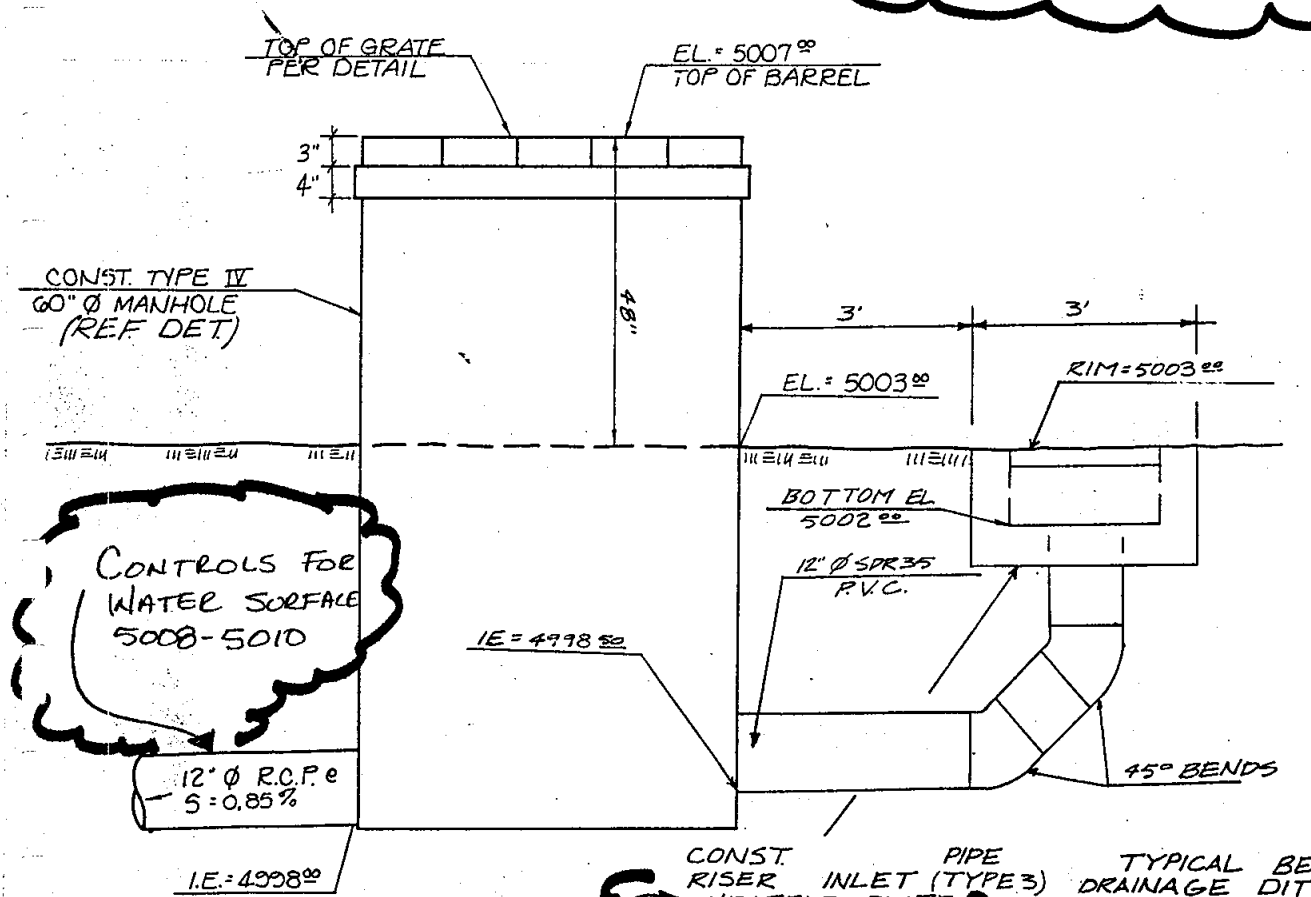
TOP VIEW

PGS. 65-66
FROM: McCARRAN BLVD. AS-BUILT PLANS
(SKYLINE TO CASHILL)
SHT D-4
SUMMIT ENGINEERING
(ON FILE W/ CITY OF RENO)

#5 REBAR @ 12" ON CENTER

WELD AT CROSS POINTS

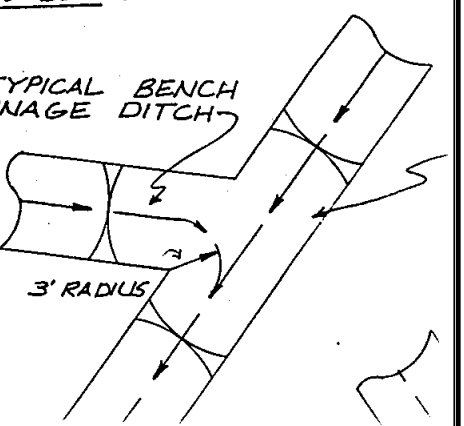
9/16" HOLE FOR 1/2" E



CONTROLS FOR WATER SURFACE 5008-5010

CONTROLS FOR WATER SURFACE 5003-5007

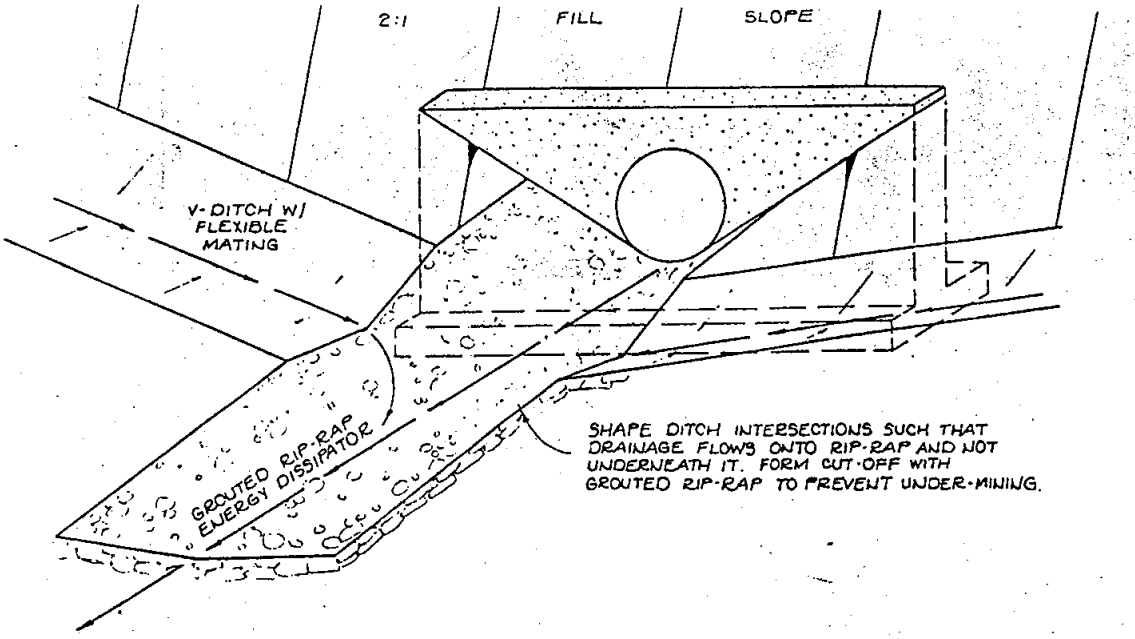
SIDE VIEW



YELLOW

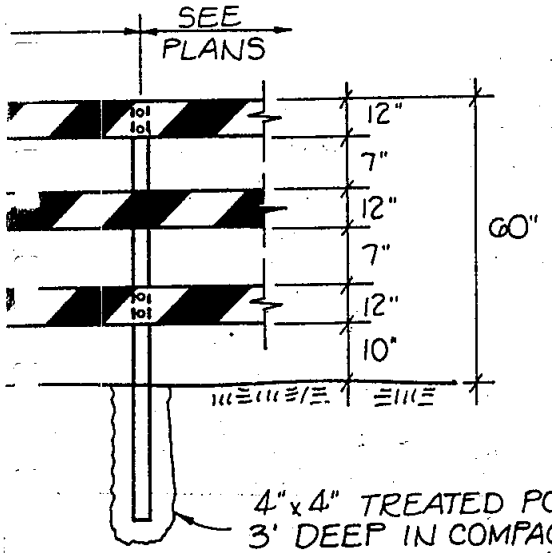
DETENTION STRUCTURE DETAIL

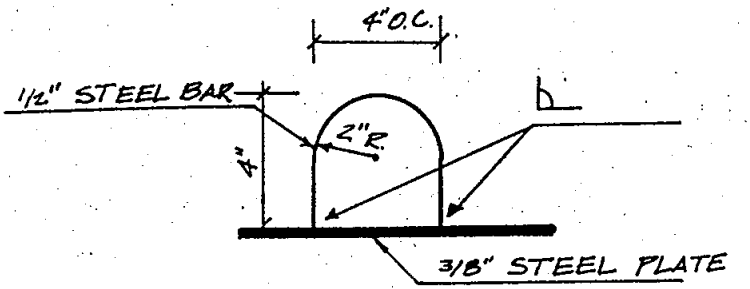
RIW



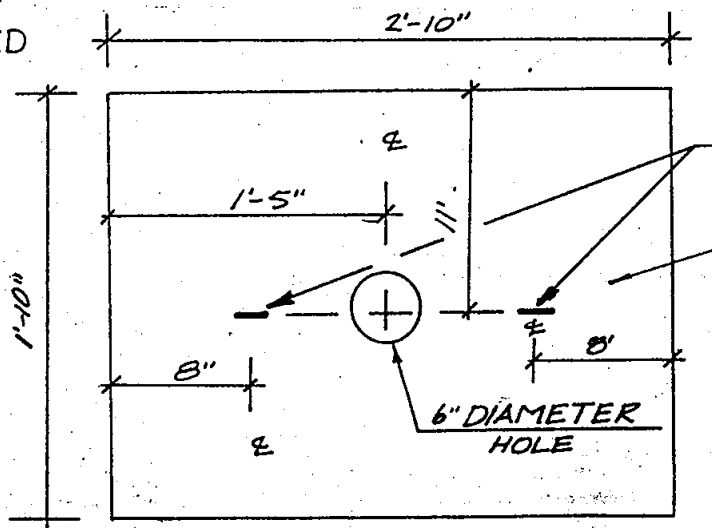
TYPICAL CULVERT OUTLET WITH INTERSECTING V-DITCHES

SUPER





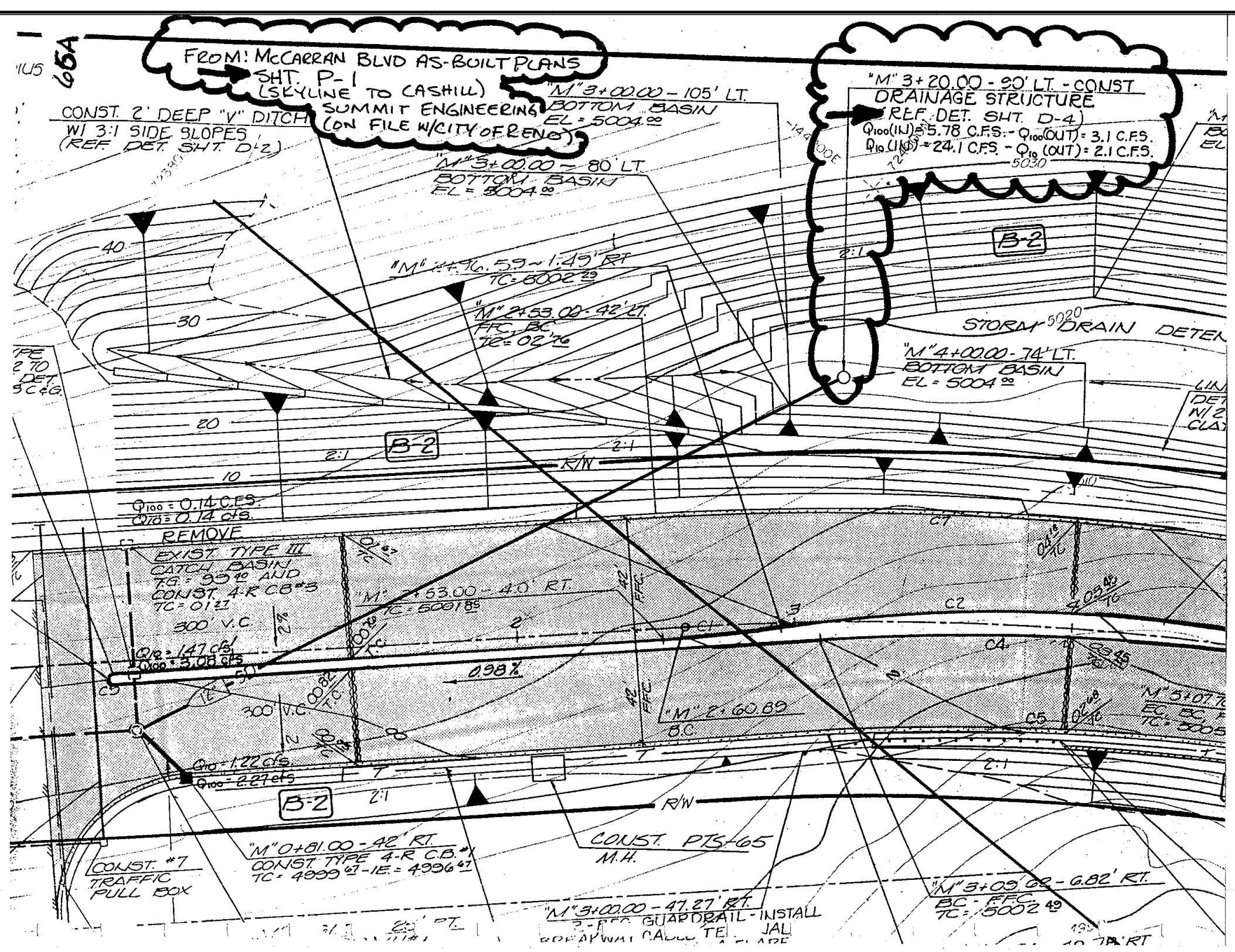
PICK-UP HOOK DETAIL



BARRICADE

BAFFLE PLATE

FROM: McCARRAN BLVD. AS-BUILT PLANS (SKYLINE TO CASHILL)
SHT D-4
SUMMIT ENGINEERING
(ON FILE W/ CITY OF RENO)


65A
FROM! McCARRAN BLVD AS-BUILT PLANS
SHT. P-1
(SKYLINE TO CASHILL)
SUMMIT ENGINEERING
(ON FILE W/CITY OF RENO)
CONST. 2' DEEP "V" DITCH
W/ 3:1 SIDE SLOPES
(REF. DET. SHT. D-2)
"M" 3+00.00 - 105' LT.
BOTTOM BASIN
EL = 5004.00
"M" 3+00.00 - 80' LT.
BOTTOM BASIN
EL = 5004.00
"M" 3+20.00 - 90' LT. - CONST
DRAINAGE STRUCTURE
REF. DET. SHT. D-4)
Q100(IN) = 5.78 C.F.S. - Q100(OUT) = 3.1 C.F.S.
Q10 (IN) = 24.1 C.F.S. - Q10 (OUT) = 2.1 C.F.S.
"M" 4+00.00 - 74' LT.
BOTTOM BASIN
EL = 5004.00
"M" 4+76.59 - 1.45' RT.
TC = 5002.29
"M" 2+53.00 - 42' LT.
FFC, BC
TC = 02.76
B-2
2:1
R/W
Q100 = 0.14 C.F.S.
Q10 = 0.14 cfs.
REMOVE
EXIST TYPE III
CATCH BASIN
T.G. = 95.40 AND
CONST. 4-R C.B. #3
TC = 01.21
300' V.C.
2%
Q10 = 1.47 cfs
Q100 = 5.08 cfs
"M" 2+53.00 - 40' RT.
TC = 5001.85
0.98%
"M" 2+60.69
B.C.
Q10 = 1.22 cfs.
Q100 = 4.27 cfs
CONST. #7
TRAFFIC
PULL BOX
"M" 0+81.00 - 42' RT.
CONST. TYPE 4-R C.B. #4
TC = 4999.67 - I.E. = 4996.67
CONST. PTS-65
M.H.
"M" 3+00.00 - 47.27' RT.
"M" 3+09.00 - 6.82' RT.
BC - FFC
TC = 5002.49
STORM DRAIN DETE
C1
C2
C4
C5
C6
C7

POND-2 Version: 5.13 S/N: 1220510325 Page 1
EXECUTED: 06-10-1991 09:51:02

****
* *
* CAUGHLIN RANCH MASTER HYDROLOGY 1016.38 *
* EXISTING DETENTION POND AREA 4, EXISTING CONDITIONS *
* JUNE 10, 1991 *
* CODEGA & FRICKE, INC. *
* 5-YEAR FLOW THROUGH POND *
****

Inflow Hydrograph: CRE4-5 .HYD
Rating Table file: CRE-4 .PND

-----INITIAL CONDITIONS-----
Elevation = 5003.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5003.00	0.0	0.000
5003.50	1.1	0.048
5004.00	1.3	0.187
5005.00	1.6	0.599
5006.00	1.9	1.032
5007.00	2.1	1.496
5008.00	12.0	2.005
5009.00	12.7	2.560
5010.00	13.3	3.164

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
11.6	12.7
45.2	46.5
145.1	146.7
249.8	251.7
362.1	364.2
485.2	497.2
619.5	632.2
765.6	778.9

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	------	0.0	0.0	0.00	5003.00
11.100	0.00	0.0	0.0	0.0	0.00	5003.00
11.200	1.00	1.0	0.8	1.0	0.09	5003.04
11.300	1.00	2.0	2.3	2.8	0.25	5003.11
11.400	1.00	2.0	3.6	4.3	0.38	5003.17
11.500	1.00	2.0	4.6	5.6	0.49	5003.22
11.600	1.00	2.0	5.5	6.6	0.57	5003.26
11.700	3.00	4.0	7.8	9.5	0.82	5003.37
11.800	6.00	9.0	14.6	16.8	1.12	5003.56
11.900	8.00	14.0	26.2	28.6	1.19	5003.73
12.000	20.00	28.0	51.5	54.2	1.32	5004.08
12.100	32.00	52.0	100.6	103.5	1.47	5004.57
12.200	19.00	51.0	148.4	151.6	1.61	5005.05
12.300	7.00	26.0	171.0	174.4	1.68	5005.26
12.400	5.00	12.0	179.6	183.0	1.70	5005.35
12.500	5.00	10.0	186.2	189.6	1.72	5005.41
12.600	4.00	9.0	191.7	195.2	1.74	5005.46
12.700	3.00	7.0	195.2	198.7	1.75	5005.50
12.800	3.00	6.0	197.7	201.2	1.76	5005.52
12.900	3.00	6.0	200.1	203.7	1.76	5005.54
13.000	3.00	6.0	202.6	206.1	1.77	5005.57
13.100	2.00	5.0	204.1	207.6	1.77	5005.58
13.200	2.00	4.0	204.5	208.1	1.78	5005.58
13.300	2.00	4.0	204.9	208.5	1.78	5005.59
13.400	2.00	4.0	205.4	208.9	1.78	5005.59
13.500	2.00	4.0	205.8	209.4	1.78	5005.60
13.600	2.00	4.0	206.3	209.8	1.78	5005.60
13.700	2.00	4.0	206.7	210.3	1.78	5005.61
13.800	2.00	4.0	207.1	210.7	1.78	5005.61
13.900	2.00	4.0	207.6	211.1	1.78	5005.61
14.000	2.00	4.0	208.0	211.6	1.79	5005.62
14.100	2.00	4.0	208.4	212.0	1.79	5005.62
14.200	1.00	3.0	207.9	211.4	1.79	5005.62
14.300	1.00	2.0	206.3	209.9	1.78	5005.60
14.400	1.00	2.0	204.7	208.3	1.78	5005.59
14.500	1.00	2.0	203.2	206.7	1.77	5005.57
14.600	1.00	2.0	201.7	205.2	1.77	5005.56
14.700	1.00	2.0	200.1	203.7	1.76	5005.54
14.800	1.00	2.0	198.6	202.1	1.76	5005.53
14.900	1.00	2.0	197.1	200.6	1.75	5005.51
15.000	1.00	2.0	195.6	199.1	1.75	5005.50
15.100	1.00	2.0	194.1	197.6	1.75	5005.49
15.200	1.00	2.0	192.6	196.1	1.74	5005.47
15.300	1.00	2.0	191.2	194.6	1.74	5005.46
15.400	1:00	2.0	189.7	193.2	1.73	5005.44

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Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	1.00	2.0	188.2	191.7	1.73	5005.43
15.600	1.00	2.0	186.8	190.2	1.72	5005.42
15.700	1.00	2.0	185.4	188.8	1.72	5005.40
15.800	1.00	2.0	183.9	187.4	1.72	5005.39
15.900	1.00	2.0	182.5	185.9	1.71	5005.37
16.000	1.00	2.0	181.1	184.5	1.71	5005.36
16.100	1.00	2.0	179.7	183.1	1.70	5005.35
16.200	1.00	2.0	178.3	181.7	1.70	5005.33
16.300	1.00	2.0	176.9	180.3	1.70	5005.32
16.400	1.00	2.0	175.5	178.9	1.69	5005.31
16.500	1.00	2.0	174.1	177.5	1.69	5005.29
16.600	1.00	2.0	172.8	176.1	1.68	5005.28
16.700	1.00	2.0	171.4	174.8	1.68	5005.27
16.800	1.00	2.0	170.0	173.4	1.68	5005.25
16.900	1.00	2.0	168.7	172.0	1.67	5005.24
17.000	1.00	2.0	167.4	170.7	1.67	5005.23
17.100	1.00	2.0	166.0	169.4	1.66	5005.22
17.200	1.00	2.0	164.7	168.0	1.66	5005.20
17.300	1.00	2.0	163.4	166.7	1.66	5005.19
17.400	1.00	2.0	162.1	165.4	1.65	5005.18
17.500	1.00	2.0	160.8	164.1	1.65	5005.17
17.600	1.00	2.0	159.5	162.8	1.65	5005.15
17.700	1.00	2.0	158.2	161.5	1.64	5005.14
17.800	1.00	2.0	156.9	160.2	1.64	5005.13
17.900	1.00	2.0	155.7	158.9	1.64	5005.12
18.000	1.00	2.0	154.4	157.7	1.63	5005.10
18.100	1.00	2.0	153.1	156.4	1.63	5005.09
18.200	1.00	2.0	151.9	155.1	1.62	5005.08
18.300	1.00	2.0	150.7	153.9	1.62	5005.07
18.400	1.00	2.0	149.4	152.7	1.62	5005.06
18.500	1.00	2.0	148.2	151.4	1.61	5005.05
18.600	1.00	2.0	147.0	150.2	1.61	5005.03
18.700	1.00	2.0	145.8	149.0	1.61	5005.02
18.800	1.00	2.0	144.6	147.8	1.60	5005.01
18.900	1.00	2.0	143.4	146.6	1.60	5005.00
19.000	1.00	2.0	142.2	145.4	1.60	5004.99
19.100	1.00	2.0	141.0	144.2	1.59	5004.98
19.200	1.00	2.0	139.8	143.0	1.59	5004.96
19.300	1.00	2.0	138.6	141.8	1.59	5004.95
19.400	1.00	2.0	137.5	140.6	1.58	5004.94
19.500	1.00	2.0	136.3	139.5	1.58	5004.93
19.600	1.00	2.0	135.2	138.3	1.57	5004.92
19.700	1.00	2.0	134.0	137.2	1.57	5004.91
19.800	1.00	2.0	132.9	136.0	1.57	5004.89
19.900	1.00	2.0	131.7	134.9	1.56	5004.88
20.000	1.00	2.0	130.6	133.7	1.56	5004.87

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Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	129.5	132.6	1.56	5004.86
20.200	1.00	2.0	128.4	131.5	1.55	5004.85
20.300	1.00	2.0	127.3	130.4	1.55	5004.84
20.400	1.00	2.0	126.2	129.3	1.55	5004.83
20.500	1.00	2.0	125.1	128.2	1.54	5004.82
20.600	1.00	2.0	124.0	127.1	1.54	5004.80
20.700	1.00	2.0	123.0	126.0	1.54	5004.79
20.800	1.00	2.0	121.9	125.0	1.53	5004.78
20.900	1.00	2.0	120.8	123.9	1.53	5004.77
21.000	1.00	2.0	119.8	122.8	1.53	5004.76
21.100	1.00	2.0	118.7	121.8	1.53	5004.75
21.200	1.00	2.0	117.7	120.7	1.52	5004.74
21.300	1.00	2.0	116.6	119.7	1.52	5004.73
21.400	1.00	2.0	115.6	118.6	1.52	5004.72
21.500	1.00	2.0	114.6	117.6	1.51	5004.71
21.600	1.00	2.0	113.5	116.6	1.51	5004.70
21.700	1.00	2.0	112.5	115.5	1.51	5004.69
21.800	1.00	2.0	111.5	114.5	1.50	5004.68
21.900	1.00	2.0	110.5	113.5	1.50	5004.67
22.000	1.00	2.0	109.5	112.5	1.50	5004.66
22.100	1.00	2.0	108.5	111.5	1.49	5004.65
22.200	1.00	2.0	107.6	110.5	1.49	5004.64
22.300	1.00	2.0	106.6	109.6	1.49	5004.63
22.400	1.00	2.0	105.6	108.6	1.49	5004.62
22.500	1.00	2.0	104.6	107.6	1.48	5004.61
22.600	1.00	2.0	103.7	106.6	1.48	5004.60
22.700	1.00	2.0	102.7	105.7	1.48	5004.59
22.800	1.00	2.0	101.8	104.7	1.47	5004.58
22.900	1.00	2.0	100.8	103.8	1.47	5004.57
23.000	1.00	2.0	99.9	102.8	1.47	5004.56
23.100	1.00	2.0	99.0	101.9	1.47	5004.55
23.200	1.00	2.0	98.0	101.0	1.46	5004.54
23.300	1.00	2.0	97.1	100.0	1.46	5004.53
23.400	1.00	2.0	96.2	99.1	1.46	5004.53
23.500	1.00	2.0	95.3	98.2	1.45	5004.52
23.600	1.00	2.0	94.4	97.3	1.45	5004.51
23.700	1.00	2.0	93.5	96.4	1.45	5004.50
23.800	1.00	2.0	92.6	95.5	1.45	5004.49
23.900	1.00	2.0	91.7	94.6	1.44	5004.48
24.000	0.00	1.0	89.8	92.7	1.44	5004.46
24.100	0.00	0.0	87.0	89.8	1.43	5004.43
24.200	0.00	0.0	84.1	87.0	1.42	5004.40
24.300	0.00	0.0	81.3	84.1	1.41	5004.38
24.400	0.00	0.0	78.5	81.3	1.40	5004.35
24.500	0.00	0.0	75.7	78.5	1.40	5004.32
24.600	0.00	0.0	72.9	75.7	1.39	5004.29

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	70.2	72.9	1.38	5004.26
24.800	0.00	0.0	67.4	70.2	1.37	5004.24
24.900	0.00	0.0	64.7	67.4	1.36	5004.21
25.000	0.00	0.0	62.0	64.7	1.35	5004.18
25.100	0.00	0.0	59.3	62.0	1.35	5004.15
25.200	0.00	0.0	56.6	59.3	1.34	5004.13
25.300	0.00	0.0	54.0	56.6	1.33	5004.10
25.400	0.00	0.0	51.3	54.0	1.32	5004.07
25.500	0.00	0.0	48.7	51.3	1.31	5004.05
25.600	0.00	0.0	46.1	48.7	1.31	5004.02
25.700	0.00	0.0	43.5	46.1	1.30	5003.99
25.800	0.00	0.0	40.9	43.5	1.28	5003.95
25.900	0.00	0.0	38.4	40.9	1.27	5003.92

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

Starting Pond W.S. Elevation = 5003.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	32.00 cfs
Peak Outflow	=	1.79 cfs
Peak Elevation	=	5005.62 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.87 ac-ft
Total Storage in Pond	=	0.87 ac-ft

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Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-5 .HYD
Outflow Hydrograph: CE4-5 .HYD

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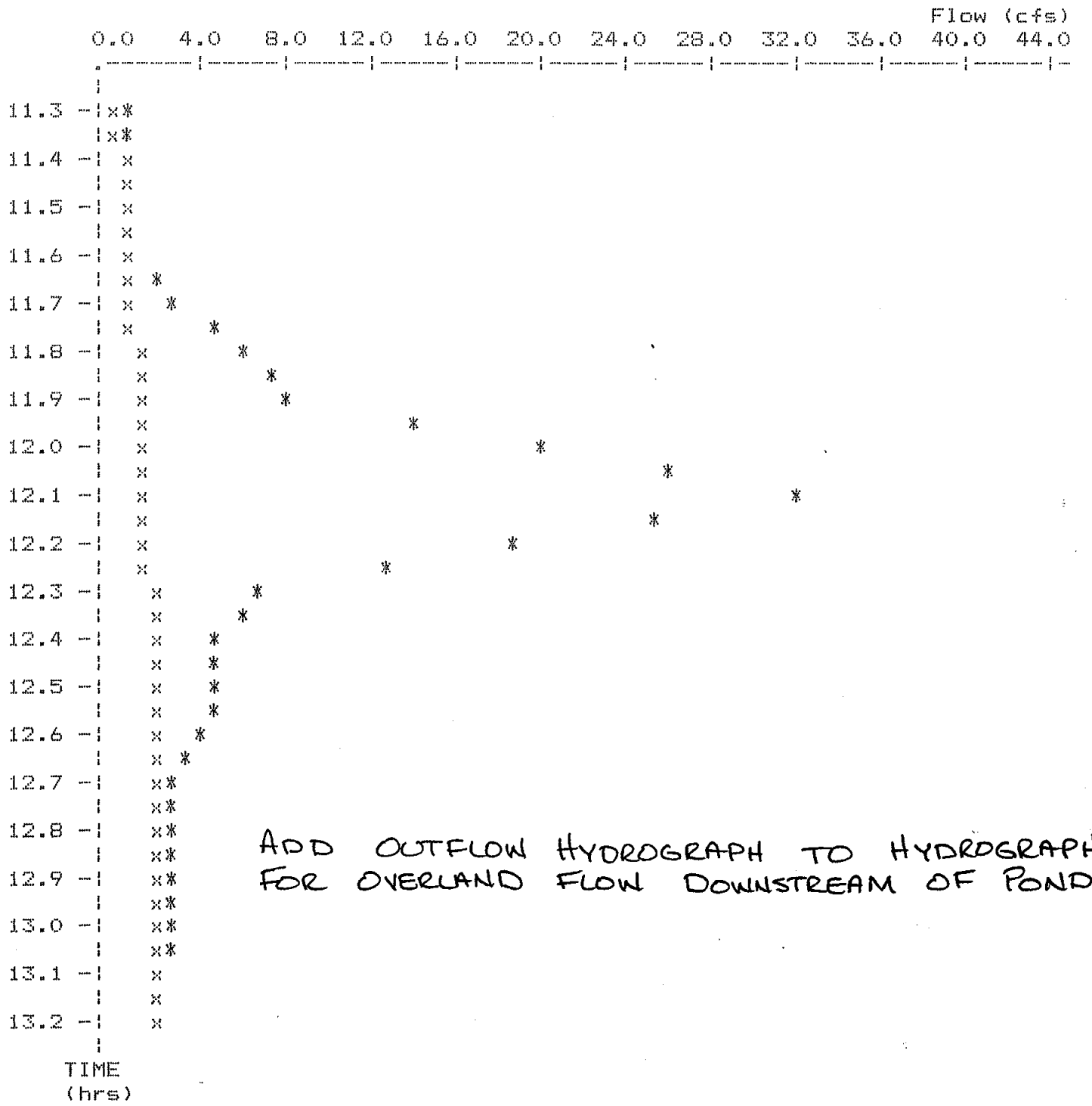
Peak Inflow = 32.00 cfs
Peak Outflow = 1.79 cfs
Peak Elevation = 5005.62 ft



ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR OVERLAND FLOW DOWNSTREAM OF POND.

* File: CRE4-5 .HYD Qmax = 32.0 cfs
x File: CE4-5 .HYD Qmax = 1.8 cfs

POND-2 Version: 5.13 S/N: 1220510325 Page 1
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*****************************************************************
*                                                               *
*       CAUGHLIN RANCH MASTER HYDROLOGY  1016.38                *
* EXISTING DETENTION POND AREA 4, EXISTING CONDITIONS           *
*                        JUNE 10, 1991                          *
*                    CODEGA & FRICKE, INC.                      *
*          100-YEAR FLOW THROUGH POND                           *
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Inflow Hydrograph: CRE4-100.HYD
Rating Table file: CRE-4 .PND

-----INITIAL CONDITIONS-----
Elevation = 5003.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5003.00	0.0	0.000
5003.50	1.1	0.048
5004.00	1.3	0.187
5005.00	1.6	0.599
5006.00	1.9	1.032
5007.00	2.1	1.496
5008.00	12.0	2.005
5009.00	12.7	2.560
5010.00	13.3	3.164

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
11.6	12.7
45.2	46.5
145.1	146.7
249.8	251.7
362.1	364.2
485.2	497.2
619.5	632.2
765.6	778.9

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 09:54:08

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	2.00	-----	0.0	0.0	0.00	5003.00
11.100	2.00	4.0	3.3	4.0	0.35	5003.16
11.200	3.00	5.0	6.9	8.3	0.72	5003.33
11.300	3.00	6.0	10.7	12.9	1.10	5003.50
11.400	3.00	6.0	14.4	16.7	1.12	5003.56
11.500	4.00	7.0	19.1	21.4	1.15	5003.63
11.600	4.00	8.0	24.7	27.1	1.19	5003.71
11.700	12.00	16.0	38.2	40.7	1.27	5003.91
11.800	20.00	32.0	67.5	70.2	1.37	5004.24
11.900	28.00	48.0	112.5	115.5	1.51	5004.69
12.000	58.00	86.0	195.0	198.5	1.75	5005.49
12.100	90.00	148.0	338.8	343.0	2.06	5006.81
12.200	56.00	146.0	462.7	484.8	11.08	5007.91
12.300	20.00	76.0	514.2	538.7	12.22	5008.31
12.400	13.00	33.0	522.7	547.2	12.26	5008.37
12.500	11.00	24.0	522.2	546.7	12.26	5008.37
12.600	10.00	21.0	518.7	543.2	12.24	5008.34
12.700	8.00	18.0	512.3	536.7	12.21	5008.29
12.800	7.00	15.0	503.0	527.3	12.16	5008.22
12.900	6.00	13.0	491.8	516.0	12.10	5008.14
13.000	6.00	12.0	479.7	503.8	12.03	5008.05
13.100	6.00	12.0	468.5	491.7	11.60	5007.96
13.200	5.00	11.0	458.2	479.5	10.69	5007.87
13.300	5.00	10.0	448.5	468.2	9.84	5007.78
13.400	5.00	10.0	440.3	458.5	9.12	5007.71
13.500	5.00	10.0	433.2	450.3	8.51	5007.65
13.600	4.00	9.0	426.4	442.2	7.91	5007.59
13.700	4.00	8.0	419.8	434.4	7.33	5007.53
13.800	4.00	8.0	414.1	427.8	6.83	5007.48
13.900	4.00	8.0	409.3	422.1	6.41	5007.44
14.000	4.00	8.0	405.2	417.3	6.05	5007.40
14.100	4.00	8.0	401.7	413.2	5.75	5007.37
14.200	3.00	7.0	397.9	408.7	5.41	5007.33
14.300	3.00	6.0	393.8	403.9	5.05	5007.30
14.400	3.00	6.0	390.3	399.8	4.75	5007.27
14.500	3.00	6.0	387.3	396.3	4.49	5007.24
14.600	3.00	6.0	384.8	393.3	4.26	5007.22
14.700	3.00	6.0	382.6	390.8	4.08	5007.20
14.800	3.00	6.0	380.8	388.6	3.92	5007.18
14.900	3.00	6.0	379.2	386.8	3.78	5007.17
15.000	3.00	6.0	377.9	385.2	3.66	5007.16
15.100	3.00	6.0	376.8	383.9	3.56	5007.15
15.200	3.00	6.0	375.8	382.8	3.48	5007.14
15.300	2.00	5.0	374.1	380.8	3.33	5007.12
15.400	2.00	4.0	371.9	378.1	3.14	5007.10

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	2.00	4.0	369.9	375.9	2.97	5007.09
15.600	2.00	4.0	368.3	373.9	2.82	5007.07
15.700	2.00	4.0	366.9	372.3	2.70	5007.06
15.800	2.00	4.0	365.7	370.9	2.60	5007.05
15.900	2.00	4.0	364.7	369.7	2.51	5007.04
16.000	2.00	4.0	363.8	368.7	2.43	5007.03
16.100	2.00	4.0	363.1	367.8	2.37	5007.03
16.200	2.00	4.0	362.5	367.1	2.31	5007.02
16.300	2.00	4.0	361.9	366.5	2.27	5007.02
16.400	2.00	4.0	361.5	365.9	2.23	5007.01
16.500	2.00	4.0	361.1	365.5	2.19	5007.01
16.600	2.00	4.0	360.8	365.1	2.16	5007.01
16.700	2.00	4.0	360.5	364.8	2.14	5007.00
16.800	2.00	4.0	360.2	364.5	2.12	5007.00
16.900	2.00	4.0	360.0	364.2	2.10	5007.00
17.000	2.00	4.0	359.8	364.0	2.10	5007.00
17.100	2.00	4.0	359.6	363.8	2.10	5007.00
17.200	2.00	4.0	359.4	363.6	2.10	5006.99
17.300	2.00	4.0	359.2	363.4	2.10	5006.99
17.400	2.00	4.0	359.0	363.2	2.10	5006.99
17.500	2.00	4.0	358.9	363.0	2.10	5006.99
17.600	2.00	4.0	358.7	362.9	2.10	5006.99
17.700	2.00	4.0	358.5	362.7	2.10	5006.99
17.800	2.00	4.0	358.3	362.5	2.10	5006.98
17.900	2.00	4.0	358.1	362.3	2.10	5006.98
18.000	2.00	4.0	357.9	362.1	2.10	5006.98
18.100	2.00	4.0	357.7	361.9	2.10	5006.98
18.200	2.00	4.0	357.5	361.7	2.10	5006.98
18.300	2.00	4.0	357.3	361.5	2.10	5006.98
18.400	2.00	4.0	357.1	361.3	2.09	5006.97
18.500	2.00	4.0	356.9	361.1	2.09	5006.97
18.600	1.00	3.0	355.7	359.9	2.09	5006.96
18.700	1.00	2.0	353.6	357.7	2.09	5006.94
18.800	1.00	2.0	351.4	355.6	2.08	5006.92
18.900	1.00	2.0	349.2	353.4	2.08	5006.90
19.000	1.00	2.0	347.1	351.2	2.08	5006.88
19.100	1.00	2.0	344.9	349.1	2.07	5006.87
19.200	1.00	2.0	342.8	346.9	2.07	5006.85
19.300	1.00	2.0	340.7	344.8	2.07	5006.83
19.400	1.00	2.0	338.5	342.7	2.06	5006.81
19.500	1.00	2.0	336.4	340.5	2.06	5006.79
19.600	1.00	2.0	334.3	338.4	2.05	5006.77
19.700	1.00	2.0	332.2	336.3	2.05	5006.75
19.800	1.00	2.0	330.1	334.2	2.05	5006.73
19.900	1.00	2.0	328.0	332.1	2.04	5006.71
20.000	1.00	2.0	326.0	330.0	2.04	5006.70

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 09:54:08

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	323.9	328.0	2.04	5006.68
20.200	1.00	2.0	321.8	325.9	2.03	5006.66
20.300	1.00	2.0	319.8	323.8	2.03	5006.64
20.400	1.00	2.0	317.7	321.8	2.02	5006.62
20.500	1.00	2.0	315.7	319.7	2.02	5006.60
20.600	1.00	2.0	313.6	317.7	2.02	5006.59
20.700	1.00	2.0	311.6	315.6	2.01	5006.57
20.800	1.00	2.0	309.6	313.6	2.01	5006.55
20.900	1.00	2.0	307.6	311.6	2.01	5006.53
21.000	1.00	2.0	305.6	309.6	2.00	5006.51
21.100	1.00	2.0	303.6	307.6	2.00	5006.50
21.200	1.00	2.0	301.6	305.6	2.00	5006.48
21.300	1.00	2.0	299.6	303.6	1.99	5006.46
21.400	1.00	2.0	297.6	301.6	1.99	5006.44
21.500	1.00	2.0	295.7	299.6	1.99	5006.43
21.600	1.00	2.0	293.7	297.7	1.98	5006.41
21.700	1.00	2.0	291.7	295.7	1.98	5006.39
21.800	1.00	2.0	289.8	293.7	1.97	5006.37
21.900	1.00	2.0	287.8	291.8	1.97	5006.36
22.000	1.00	2.0	285.9	289.8	1.97	5006.34
22.100	1.00	2.0	284.0	287.9	1.96	5006.32
22.200	1.00	2.0	282.1	286.0	1.96	5006.30
22.300	1.00	2.0	280.1	284.1	1.96	5006.29
22.400	1.00	2.0	278.2	282.1	1.95	5006.27
22.500	1.00	2.0	276.3	280.2	1.95	5006.25
22.600	1.00	2.0	274.4	278.3	1.95	5006.24
22.700	1.00	2.0	272.5	276.4	1.94	5006.22
22.800	1.00	2.0	270.7	274.5	1.94	5006.20
22.900	1.00	2.0	268.8	272.7	1.94	5006.19
23.000	1.00	2.0	266.9	270.8	1.93	5006.17
23.100	1.00	2.0	265.1	268.9	1.93	5006.15
23.200	1.00	2.0	263.2	267.1	1.93	5006.14
23.300	1.00	2.0	261.4	265.2	1.92	5006.12
23.400	1.00	2.0	259.5	263.4	1.92	5006.10
23.500	1.00	2.0	257.7	261.5	1.92	5006.09
23.600	1.00	2.0	255.9	259.7	1.91	5006.07
23.700	1.00	2.0	254.0	257.9	1.91	5006.06
23.800	1.00	2.0	252.2	256.0	1.91	5006.04
23.900	1.00	2.0	250.4	254.2	1.90	5006.02
24.000	0.00	1.0	247.6	251.4	1.90	5006.00
24.100	0.00	0.0	243.8	247.6	1.89	5005.96
24.200	0.00	0.0	240.1	243.8	1.88	5005.93
24.300	0.00	0.0	236.3	240.1	1.87	5005.89
24.400	0.00	0.0	232.6	236.3	1.86	5005.85
24.500	0.00	0.0	228.9	232.6	1.85	5005.82
24.600	0.00	0.0	225.3	228.9	1.84	5005.78

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	221.6	225.3	1.82	5005.75
24.800	0.00	0.0	218.0	221.6	1.81	5005.71
24.900	0.00	0.0	214.4	218.0	1.80	5005.68
25.000	0.00	0.0	210.8	214.4	1.79	5005.65
25.100	0.00	0.0	207.2	210.8	1.78	5005.61
25.200	0.00	0.0	203.7	207.2	1.77	5005.58
25.300	0.00	0.0	200.2	203.7	1.76	5005.54
25.400	0.00	0.0	196.7	200.2	1.75	5005.51
25.500	0.00	0.0	193.2	196.7	1.74	5005.48
25.600	0.00	0.0	189.7	193.2	1.73	5005.44
25.700	0.00	0.0	186.3	189.7	1.72	5005.41
25.800	0.00	0.0	182.8	186.3	1.71	5005.38
25.900	0.00	0.0	179.4	182.8	1.70	5005.34

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

Starting Pond W.S. Elevation = 5003.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	90.00 cfs
Peak Outflow	=	12.26 cfs
Peak Elevation	=	5008.37 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	2.21 ac-ft
Total Storage in Pond	=	2.21 ac-ft

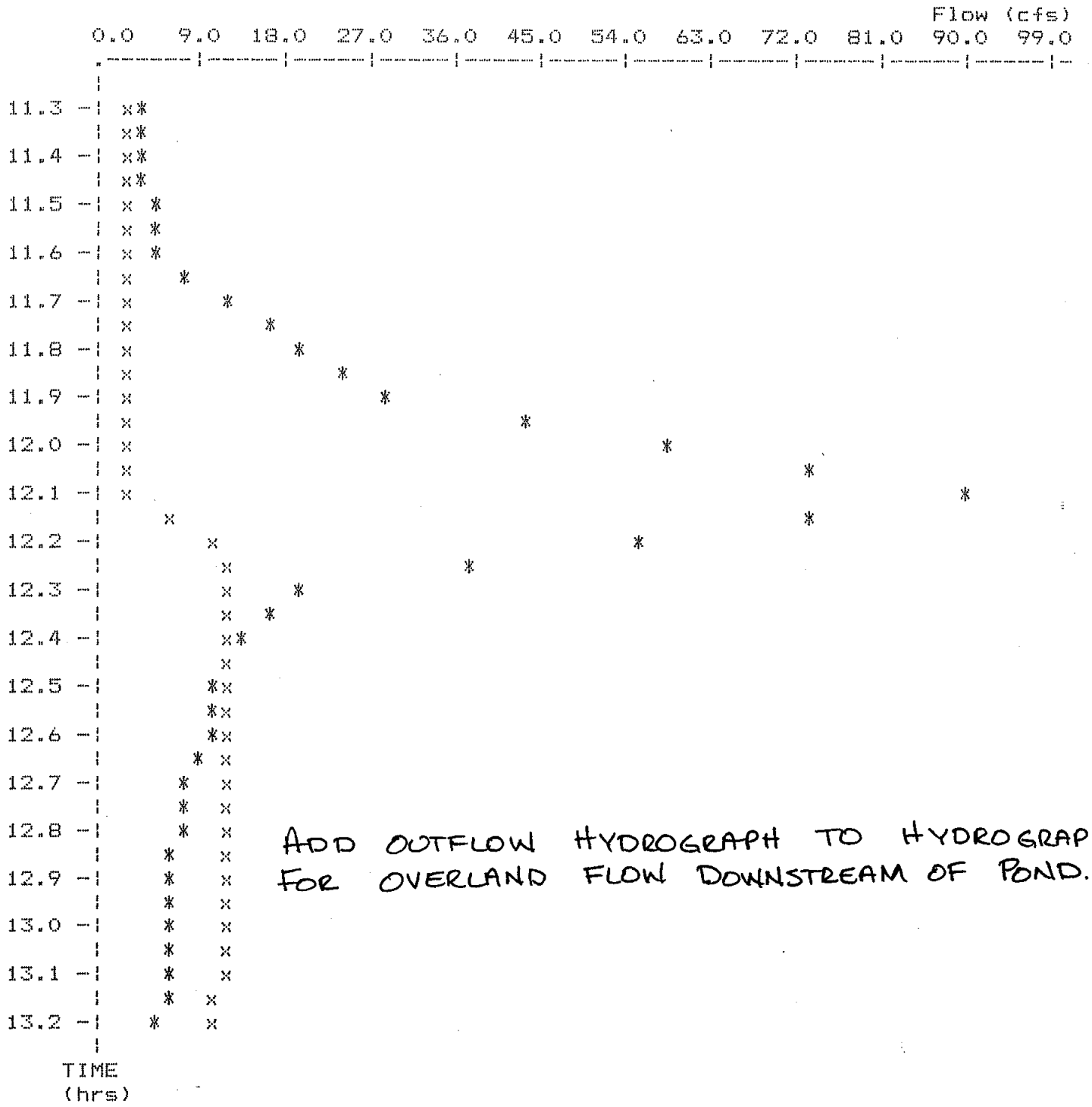
Warning: Inflow hydrograph truncated on left side.

POND-2 Version: 5.13 S/N: 1220510325 Page 7

Pond File: CRE-4 .PND
Inflow Hydrograph: CRE4-100.HYD
Outflow Hydrograph: CE4-100 .HYD

EXECUTED: 06-10-1991
09:54:08

Peak Inflow = 90.00 cfs
Peak Outflow = 12.26 cfs
Peak Elevation = 5008.37 ft



ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR OVERLAND FLOW DOWNSTREAM OF POND.

* File: CRE4-100.HYD Qmax = 90.0 cfs
x File: CE4-100 .HYD Qmax = 12.3 cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:41:41 12-18-1990

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DEVELOPED LAND DOWNSTREAM OF DET. POND AREA 4A
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: 4A

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND YARD SWALE	90	1.00	1.5	=	0.03
GUTTER FLOW	330	5.10	1.1	=	0.02
ADDNL LENGTH TO GET TC=0.10	1000	5.00	3.3	=	0.06
			minutes		hours
		TOTAL Tc --->	5.9	=	0.10

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 11:33:04
Watershed file: --> CRE-4A .MDP
Hydrograph file: --> CE4A-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DEVELOPED LAND DOWNSTREAM OF DET. POND AREA 4A
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

HYDROGRAPH ADDED TO POND OUTFLOW

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
AREA 4A	2.19	87.0	0.10	0.00	1.55	0.57	I.19	.19

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 2.19 acres or 0.00342 sq.mi
Peak discharge = 2 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 4A	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 11:33:04
Watershed file: --> CRE-4A .MOP
Hydrograph file: --> CE4A-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DEVELOPED LAND DOWNSTREAM OF DET. POND AREA 4A
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

HYDROGRAPH ADDED TO POND OUTFLOW

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
AREA 4A	2.19	87.0	0.10	0.00	2.75	1.52	I.11	.11

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 2.19 acres or 0.00342 sq.mi
Peak discharge = 5 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 4A	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Executed 06-10-1991 10:01:00

5-YEAR FLOWS

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	OVERLAND FLOW CE4A-5 (cfs)	POND FLOW CE4-5 (cfs)	TOTAL FLOW AREA 4 CE4T-5 (Total)
11.00	0.0	0.0	0.0
11.10	0.0	0.0	0.0
11.20	0.0	0.1	0.1
11.30	0.0	0.3	0.3
11.40	0.0	0.4	0.4
11.50	0.0	0.5	0.5
11.60	0.0	0.6	0.6
11.70	0.0	0.8	0.8
11.80	0.0	1.1	1.1
11.90	0.0	1.2	1.2
12.00	1.0	1.3	2.3
12.10	2.0	1.5	3.5 = Q_5
12.20	1.0	1.6	2.6
12.30	0.0	1.7	1.7
12.40	0.0	1.7	1.7
12.50	0.0	1.7	1.7
12.60	0.0	1.7	1.7
12.70	0.0	1.8	1.8
12.80	0.0	1.8	1.8
12.90	0.0	1.8	1.8
13.00	0.0	1.8	1.8
13.10	0.0	1.8	1.8
13.20	0.0	1.8	1.8
13.30	0.0	1.8	1.8
13.40	0.0	1.8	1.8
13.50	0.0	1.8	1.8
13.60	0.0	1.8	1.8
13.70	0.0	1.8	1.8
13.80	0.0	1.8	1.8
13.90	0.0	1.8	1.8
14.00	0.0	1.8	1.8
14.10	0.0	1.8	1.8
14.20	0.0	1.8	1.8
14.30	0.0	1.8	1.8
14.40	0.0	1.8	1.8
14.50	0.0	1.8	1.8
14.60	0.0	1.8	1.8
14.70	0.0	1.8	1.8
14.80	0.0	1.8	1.8
14.90	0.0	1.8	1.8

Executed 06-10-1991 10:01:00

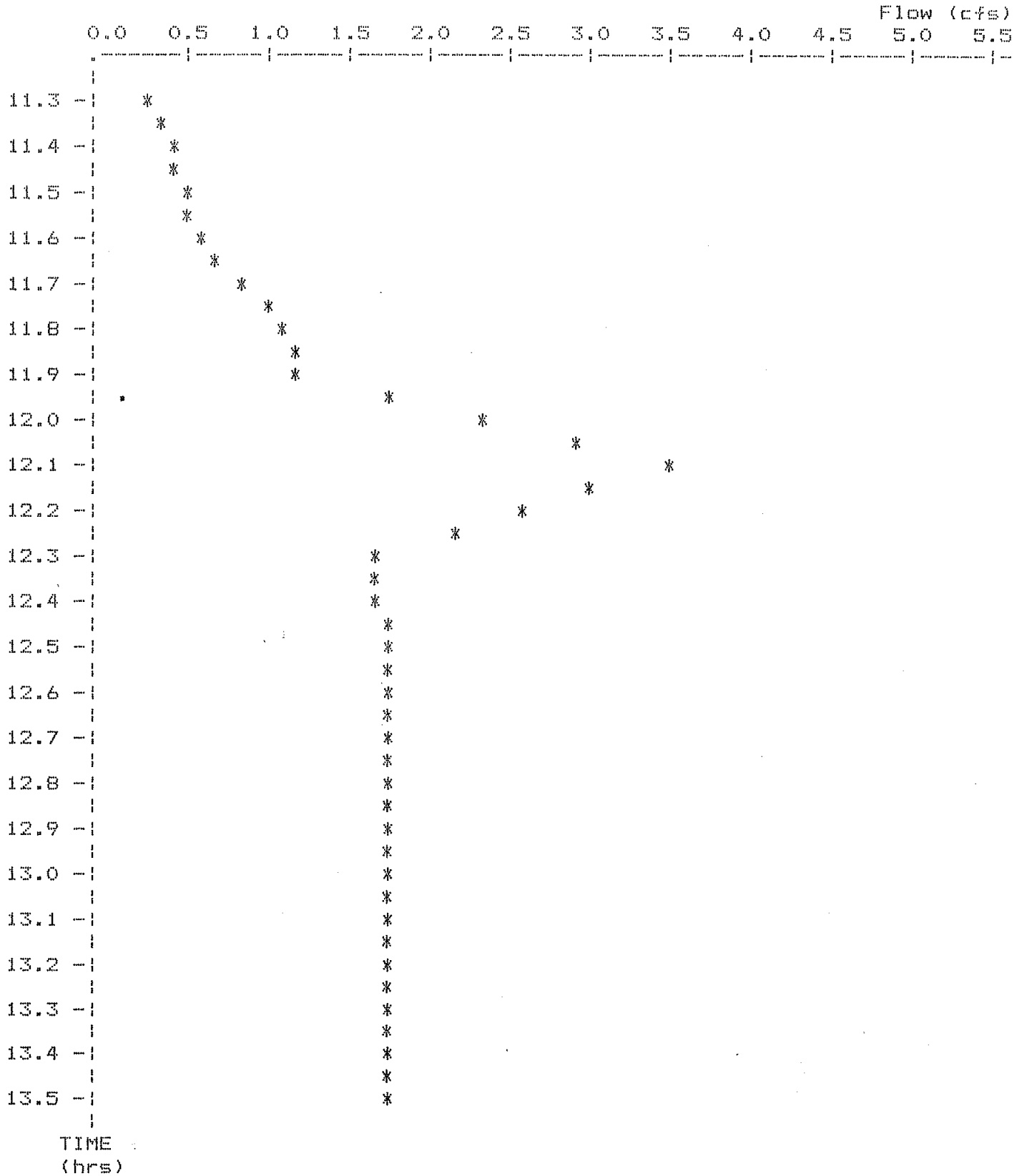
Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CE4A-5 (cfs)	CE4-5 (cfs)	CE4T-5 (Total)
15.00	0.0	1.8	1.8
15.10	0.0	1.8	1.8
15.20	0.0	1.7	1.7
15.30	0.0	1.7	1.7
15.40	0.0	1.7	1.7
15.50	0.0	1.7	1.7
15.60	0.0	1.7	1.7
15.70	0.0	1.7	1.7
15.80	0.0	1.7	1.7
15.90	0.0	1.7	1.7
16.00	0.0	1.7	1.7
16.10	0.0	1.7	1.7
16.20	0.0	1.7	1.7
16.30	0.0	1.7	1.7
16.40	0.0	1.7	1.7
16.50	0.0	1.7	1.7
16.60	0.0	1.7	1.7
16.70	0.0	1.7	1.7
16.80	0.0	1.7	1.7
16.90	0.0	1.7	1.7
17.00	0.0	1.7	1.7
17.10	0.0	1.7	1.7
17.20	0.0	1.7	1.7
17.30	0.0	1.7	1.7
17.40	0.0	1.6	1.6
17.50	0.0	1.6	1.6
17.60	0.0	1.6	1.6
17.70	0.0	1.6	1.6
17.80	0.0	1.6	1.6
17.90	0.0	1.6	1.6
18.00	0.0	1.6	1.6
18.10	0.0	1.6	1.6
18.20	0.0	1.6	1.6
18.30	0.0	1.6	1.6
18.40	0.0	1.6	1.6
18.50	0.0	1.6	1.6
18.60	0.0	1.6	1.6
18.70	0.0	1.6	1.6
18.80	0.0	1.6	1.6
18.90	0.0	1.6	1.6
19.00	0.0	1.6	1.6

AREA 4
TOTAL FLOW
5-YEAR STORM

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 06-10-1991



* File: CE4T-5 .HYD Qmax = 3.5 cfs

Executed 06-10-1991 09:58:12

100-YEAR FLOWS

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	OVERLAND FLOW CE4A-100 (cfs)	POND FLOW CE4-100 (cfs)	TOTAL FLOW AREA 4 CE4T-100 (Total)	
11.00	0.0	0.0	0.0	
11.10	0.0	0.3	0.3	
11.20	0.0	0.7	0.7	
11.30	0.0	1.1	1.1	
11.40	0.0	1.1	1.1	
11.50	0.0	1.1	1.1	
11.60	0.0	1.2	1.2	
11.70	1.0	1.3	2.3	
11.80	1.0	1.4	2.4	
11.90	2.0	1.5	3.5	
12.00	3.0	1.8	4.8	
12.10	5.0	2.1	7.1	
12.20	3.0	11.1	14.1	= Q100
12.30	1.0	12.2	13.2	
12.40	1.0	12.3	13.3	
12.50	1.0	12.3	13.3	
12.60	1.0	12.2	13.2	
12.70	0.0	12.2	12.2	
12.80	0.0	12.2	12.2	
12.90	0.0	12.1	12.1	
13.00	0.0	12.0	12.0	
13.10	0.0	11.6	11.6	
13.20	0.0	10.7	10.7	
13.30	0.0	9.8	9.8	
13.40	0.0	9.1	9.1	
13.50	0.0	8.5	8.5	
13.60	0.0	7.9	7.9	
13.70	0.0	7.3	7.3	
13.80	0.0	6.8	6.8	
13.90	0.0	6.4	6.4	
14.00	0.0	6.1	6.1	
14.10	0.0	5.8	5.8	
14.20	0.0	5.4	5.4	
14.30	0.0	5.1	5.1	
14.40	0.0	4.8	4.8	
14.50	0.0	4.5	4.5	
14.60	0.0	4.3	4.3	
14.70	0.0	4.1	4.1	
14.80	0.0	3.9	3.9	
14.90	0.0	3.8	3.8	

Executed 06-10-1991 09:58:12

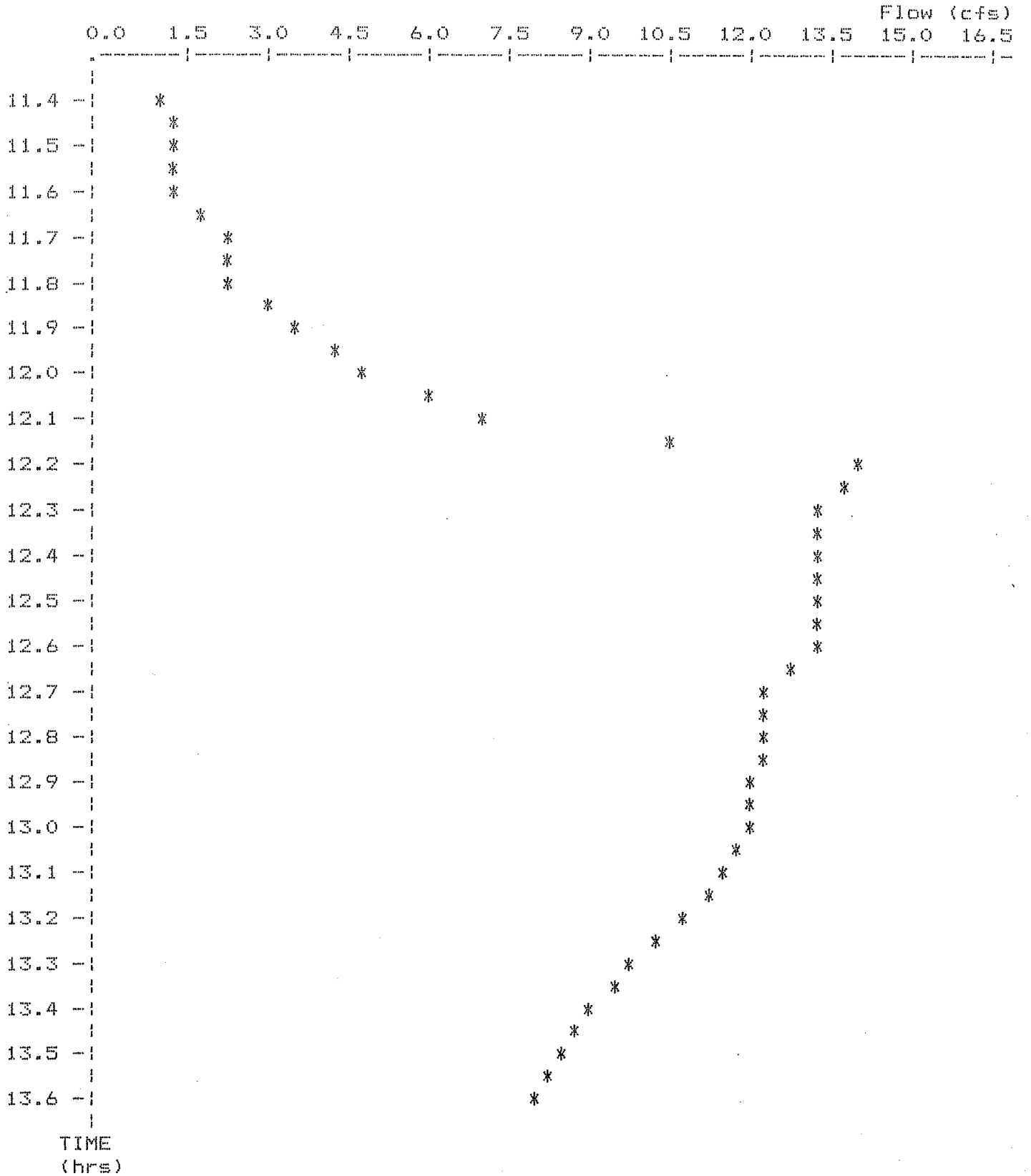
Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CE4A-100 (cfs)	CE4-100 (cfs)	CE4T-100 (Total)
15.00	0.0	3.7	3.7
15.10	0.0	3.6	3.6
15.20	0.0	3.5	3.5
15.30	0.0	3.3	3.3
15.40	0.0	3.1	3.1
15.50	0.0	3.0	3.0
15.60	0.0	2.8	2.8
15.70	0.0	2.7	2.7
15.80	0.0	2.6	2.6
15.90	0.0	2.5	2.5
16.00	0.0	2.4	2.4
16.10	0.0	2.4	2.4
16.20	0.0	2.3	2.3
16.30	0.0	2.3	2.3
16.40	0.0	2.2	2.2
16.50	0.0	2.2	2.2
16.60	0.0	2.2	2.2
16.70	0.0	2.1	2.1
16.80	0.0	2.1	2.1
16.90	0.0	2.1	2.1
17.00	0.0	2.1	2.1
17.10	0.0	2.1	2.1
17.20	0.0	2.1	2.1
17.30	0.0	2.1	2.1
17.40	0.0	2.1	2.1
17.50	0.0	2.1	2.1
17.60	0.0	2.1	2.1
17.70	0.0	2.1	2.1
17.80	0.0	2.1	2.1
17.90	0.0	2.1	2.1
18.00	0.0	2.1	2.1
18.10	0.0	2.1	2.1
18.20	0.0	2.1	2.1
18.30	0.0	2.1	2.1
18.40	0.0	2.1	2.1
18.50	0.0	2.1	2.1
18.60	0.0	2.1	2.1
18.70	0.0	2.1	2.1
18.80	0.0	2.1	2.1
18.90	0.0	2.1	2.1
19.00	0.0	2.1	2.1

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 06-10-1991

AREA 4
TOTAL FLOW
100-YEAR STORM



* File: CE4T-100.HYD Qmax = 14.1 cfs

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RENO, NEVADA 89509
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JOB 1016.38
SHEET NO. 90 OF
CALCULATED BY KRK DATE 12-10-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 5: THE MAJORITY OF AREA 5 IS FULLY DEVELOPED, OR CURRENTLY UNDER CONSTRUCTION. ALL STORM DRAIN SYSTEMS ARE IN, EXCEPT IN THE VILLAGE GREEN PARK AREA. THERE ARE NO EXISTING DETENTION BASINS IN AREA 5. t_c IS GREATER THAN 10 MINUTES; CALCULATE t_c AS FOLLOWS:

CONDUIT	Δ ELEV., ft	LENGTH, ft	SLOPE, %	VELOCITY, ft/sec	TRAVEL TIME, MIN.
OVERLAND	FLOW TO CB				10.0
PIPE		255	5.34	10.8	0.4
OVERLAND	5232.8 - 5169.7 = 63.1	1140	5.54	2.1	9.0
PIPE		400	4.2	10.2	0.6
PIPE		187	6.39	11.8	0.3
PIPE		300	2.6	8.9	0.6
PIPE		83	3.0	9.9	0.1
PIPE		144	12.94	23.8	0.1
PIPE		177	9.77	21.2	0.1
PIPE	183 - 172.5 = 10.5	125	8.4	7.9	0.3
PIPE		385	8.4	7.9	0.8
PIPE	-127 =	150	8.4	7.9	0.3
OVERLAND	5027 - 4903 = 124	1460	8.5	2.8	8.7
				t_c =	31.3 MIN.

i_5 = 0.7 in/hr
i_{100} = 1.8 in/hr

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SHEET NO. 91 OF
CALCULATED BY KRK DATE 12-10-90
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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

ΣCA FOR ALL OF AREA 5:

ΣQ_5 INTO CBs = 35.68 cfs @ t_c = 10 MIN.
(PER EXISTING CONDITIONS PLAN)

$$CA = \frac{Q_5}{i_5} = \frac{35.68 \text{ cfs}}{1.4 \text{ in/hr}} = 25.49$$

CA FOR AREAS NOT INCLUDED IN CATCH BASIN FLOWS:
CA = 6.94 + 16.31 = 23.25

ΣCA = 25.49 + 23.25 = 48.74

$Q_5 = (0.7 \text{ in/hr})(48.74) = 34.12 \text{ cfs}$
$Q_{100} = (1.8 \text{ in/hr})(48.74) = 87.73 \text{ cfs}$

AREA 6: THE ENTIRE AREA IS DEVELOPED AND IS PART OF THE CAUGHLIN CREST SUBDIVISION. RUNOFF FROM THE AREA IS COLLECTED BY A STORM DRAIN SYSTEM AND PIPED OFFSITE TO THE EAST ALONG ROYER COURT. THE TIME OF CONCENTRATION FOR THIS AREA IS APPROXIMATELY 10 MINUTES. PEAK FLOWS FOR THE AREA ARE EQUAL TO THE SUM OF THE FLOWS TO THE CATCH BASINS.

$Q_5 = 5.75 \text{ cfs}$
$Q_{100} = 15.6 \text{ cfs}$

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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 7: MOST OF AREA 7 IS UNDEVELOPED. THE UPPER ¼ HAS BEEN GRADED WHILE THE REMAINDER IS STILL IN ITS PREDEVELOPEMENT STATE. RUNOFF IS MAINLY BY OVERLAND FLOW, BUT SOME STORM DRAIN PIPES HAVE BEEN INSTALLED. t_c IS GREATER THAN 10 MINUTES; CALCULATE t_c AS FOLLOWS:

CONDUIT	ΔELEV, ft.	LENGTH, ft	SLOPE, %	VELOCITY, ft/sec	TRAVEL TIME, MIN
OVERLAND TO CB					10.0
PIPE		185	5.0	10.2	0.3
OVERLAND	5136.4 - 5133.5 = 1.9	460	0.41	0.7	11.0
PIPE		22	0.43	4.39	0.1
PIPE		161	13.94	16.72	0.2
OVERLAND	5100 - 4900 = 200	2165	9.24	3.0	12.0
				t_c =	33.6 MIN

$i_5 = 0.62$ in/hr
$i_{100} = 1.7$ in/hr

ΣCA FOR AREA 7:

ΣQs INTO CATCH BASINS = 6.03 cfs @ t_c = 10 MIN. (PER EXISTING CONDITIONS PLAN)

$$CA = \frac{Q_5}{i_5} = \frac{6.03 \text{ cfs}}{1.44 \text{ in/hr}} = 4.31$$

CA FOR AREAS NOT INCLUDED IN CATCH BASIN FLOWS:
CA = 3.66 + 29.59 = 33.25

ΣCA = 4.31 + 33.25 = 37.56

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JOB 1016.38
SHEET NO. 93 OF
CALCULATED BY KRK DATE 12-10-90 REV. 4-12-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

$Q_5 = (0.162 \text{ in/hr})(37.56) = 23.29 \text{ cfs}$
$Q_{100} = (1.7 \text{ in/hr})(37.56) = 63.85 \text{ cfs}$

AREA 8: ALTHOUGH THIS AREA IS ONLY ABOUT HALF DEVELOPED, THE MAJORITY OF THE STORM DRAIN SYSTEM IS IN. THE UPPER HALF OF AREA 8 IS ROUTED THROUGH THE EXISTING WESTGATE DETENTION AREA. THERE IS ANOTHER SMALL EXISTING DETENTION BASIN ON THE SCHOOL SITE, UPSTREAM OF THE WESTGATE DETENTION BASIN. RUNOFF FROM THE WESTGATE BASIN TRAVELS BOTH BY PIPE SYSTEMS AND OVERLAND FLOW BEFORE EXITING THE SITE TO THE NORTH. THE FOLLOWING CALCULATIONS SHOW 5 & 100-YR FLOWS BEING ROUTED THROUGH THE SCHOOL DETENTION POND. OUTFLOW HYDROGRAPHS FROM THIS POND ARE ADDED TO HYDROGRAPHS FOR OVERLAND FLOW TO THE POND. THE RESULTING 5 & 100-YR HYDROGRAPHS ARE THEN ROUTED THROUGH THE EXISTING WESTGATE DETENTION POND. OUTFLOW HYDROGRAPHS FROM THE WESTGATE POND ARE ADDED TO HYDROGRAPHS FOR THE REMAINING AREA DOWNSTREAM. THIS CREATES 5 & 100-YR COMPOSITE HYDROGRAPHS FOR ALL OF AREA 8. PEAK FLOWS ARE: $Q_5 = 44.9$ cfs
$Q_{100} = 125.8$ cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:46:04 12-18-1990

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8A FLOW TO SCHOOL DETENTION POND
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: AREA 8A

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND FLOW	100	1.30	1.3	=	0.02
PIPE FLOW	300	3.10	1.6	=	0.03
PIPE FLOW	190	7.77	0.4	=	0.01
PIPE FLOW	240	6.51	0.6	=	0.01
ADDNL TO MAKE TC = 0.1	300	2.40	2.1	=	0.03

	minutes		hours
TOTAL Tc ---->	6.0	=	0.10

Quick TR-55 Version: 5.41 S/N: 1240540123 Page 1

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 16:53:52
Watershed file: --> CRE8A .MDP
Hydrograph file: --> CRE8A5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8A FLOW TO SCHOOL DETENTION POND
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	‡ Tt (hrs)	Precip. (in)	I	Runoff (in)	Ia/p input/used
AREA 8A	4.09	93.0	0.10	0.00	1.55		0.91	I9.999999E-02 .10

‡ Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 4.09 acres or 0.00639 sq.mi
Peak discharge = 6 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	‡ Tt (hr)	Rounded Values Tc (hr)	‡ Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8A	0.10	0.00	‡‡	‡‡	No	Computed Ia/p < .1

‡ Travel time from subarea outfall to composite watershed outfall point.
‡‡ Tc & Tt are available in the hydrograph tables.

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 16:53:52
Watershed file: --> CRE8A .WSP
Hydrograph file: --> CRE8A100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8A FLOW TO SCHOOL DETENTION POND
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)		Runoff (in)	Ia/p input/used	
AREA 8A	4.09	93.0	0.10	0.00	2.75	I	2.02	I.05	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 4.09 acres or 0.00639 sq.mi
Peak discharge = 13 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8A	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:17:14

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8A 5-YR OUTFLOW FROM SCHOOL DET. POND
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

Inflow Hydrograph: CREBA5 .HYD
Rating Table file: CRSPOND .PND

----INITIAL CONDITIONS----
Elevation = 192.50 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + O (cfs)
192.50	0.0	0.000	0.0	0.0
192.75	0.2	0.004	1.0	1.2
193.00	0.5	0.008	1.9	2.4
193.25	0.5	0.010	2.4	2.9
193.50	0.7	0.017	4.1	4.8
193.75	0.8	0.020	4.8	5.6
194.00	0.9	0.027	6.5	7.4
194.25	1.1	0.030	7.3	8.4
194.50	1.2	0.038	9.2	10.4
194.75	1.3	0.040	9.7	11.0
195.00	1.4	0.048	11.6	13.0
195.25	1.4	0.049	11.9	13.3
195.50	13.0	0.050	12.1	25.1

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:17:14

Pond File: CRSPOND .PND
Inflow Hydrograph: CREEA5 .HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	-----	0.0	0.0	0.00	192.50
11.100	0.00	0.0	0.0	0.0	0.00	192.50
11.200	0.00	0.0	0.0	0.0	0.00	192.50
11.300	0.00	0.0	0.0	0.0	0.00	192.50
11.400	0.00	0.0	0.0	0.0	0.00	192.50
11.500	0.00	0.0	0.0	0.0	0.00	192.50
11.600	0.00	0.0	0.0	0.0	0.00	192.50
11.700	1.00	1.0	0.7	1.0	0.17	192.71
11.800	1.00	2.0	1.7	2.7	0.50	193.11
11.900	2.00	3.0	3.3	4.7	0.68	193.48
12.000	4.00	6.0	7.0	9.3	1.15	194.36
12.100	6.00	10.0	6.9	17.0	5.06	195.33
12.200	4.00	10.0	7.0	16.9	4.94	195.33
12.300	1.00	5.0	9.3	12.0	1.35	194.87
12.400	1.00	2.0	8.7	11.3	1.32	194.79
12.500	1.00	2.0	8.2	10.7	1.25	194.61
12.600	1.00	2.0	7.8	10.2	1.19	194.47
12.700	1.00	2.0	7.5	9.8	1.17	194.43
12.800	0.00	1.0	6.2	8.5	1.10	194.26
12.900	0.00	0.0	4.6	6.2	0.83	193.83
13.000	0.00	0.0	3.2	4.6	0.67	193.47
13.100	0.00	0.0	2.2	3.2	0.53	193.29
13.200	0.00	0.0	1.3	2.2	0.44	192.95
13.300	0.00	0.0	0.8	1.3	0.23	192.77
13.400	0.00	0.0	0.5	0.8	0.14	192.68
13.500	0.00	0.0	0.4	0.5	0.09	192.62
13.600	0.00	0.0	0.2	0.4	0.06	192.58
13.700	0.00	0.0	0.2	0.2	0.04	192.55
13.800	0.00	0.0	0.1	0.2	0.03	192.53
13.900	0.00	0.0	0.1	0.1	0.02	192.52
14.000	0.00	0.0	0.0	0.1	0.01	192.51
14.100	0.00	0.0	0.0	0.0	0.01	192.51
14.200	0.00	0.0	0.0	0.0	0.00	192.51
14.300	0.00	0.0	0.0	0.0	0.00	192.50
14.400	0.00	0.0	0.0	0.0	0.00	192.50
14.500	0.00	0.0	0.0	0.0	0.00	192.50
14.600	0.00	0.0	0.0	0.0	0.00	192.50
14.700	0.00	0.0	0.0	0.0	0.00	192.50
14.800	0.00	0.0	0.0	0.0	0.00	192.50
14.900	0.00	0.0	0.0	0.0	0.00	192.50
15.000	0.00	0.0	0.0	0.0	0.00	192.50
15.100	0.00	0.0	0.0	0.0	0.00	192.50
15.200	0.00	0.0	0.0	0.0	0.00	192.50
15.300	0.00	0.0	0.0	0.0	0.00	192.50
15.400	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:17:14

Pond File: CRSPOND .PND
Inflow Hydrograph: CREBA5 .HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	0.00	0.0	0.0	0.0	0.00	192.50
15.600	0.00	0.0	0.0	0.0	0.00	192.50
15.700	0.00	0.0	0.0	0.0	0.00	192.50
15.800	0.00	0.0	0.0	0.0	0.00	192.50
15.900	0.00	0.0	0.0	0.0	0.00	192.50
16.000	0.00	0.0	0.0	0.0	0.00	192.50
16.100	0.00	0.0	0.0	0.0	0.00	192.50
16.200	0.00	0.0	0.0	0.0	0.00	192.50
16.300	0.00	0.0	0.0	0.0	0.00	192.50
16.400	0.00	0.0	0.0	0.0	0.00	192.50
16.500	0.00	0.0	0.0	0.0	0.00	192.50
16.600	0.00	0.0	0.0	0.0	0.00	192.50
16.700	0.00	0.0	0.0	0.0	0.00	192.50
16.800	0.00	0.0	0.0	0.0	0.00	192.50
16.900	0.00	0.0	0.0	0.0	0.00	192.50
17.000	0.00	0.0	0.0	0.0	0.00	192.50
17.100	0.00	0.0	0.0	0.0	0.00	192.50
17.200	0.00	0.0	0.0	0.0	0.00	192.50
17.300	0.00	0.0	0.0	0.0	0.00	192.50
17.400	0.00	0.0	0.0	0.0	0.00	192.50
17.500	0.00	0.0	0.0	0.0	0.00	192.50
17.600	0.00	0.0	0.0	0.0	0.00	192.50
17.700	0.00	0.0	0.0	0.0	0.00	192.50
17.800	0.00	0.0	0.0	0.0	0.00	192.50
17.900	0.00	0.0	0.0	0.0	0.00	192.50
18.000	0.00	0.0	0.0	0.0	0.00	192.50
18.100	0.00	0.0	0.0	0.0	0.00	192.50
18.200	0.00	0.0	0.0	0.0	0.00	192.50
18.300	0.00	0.0	0.0	0.0	0.00	192.50
18.400	0.00	0.0	0.0	0.0	0.00	192.50
18.500	0.00	0.0	0.0	0.0	0.00	192.50
18.600	0.00	0.0	0.0	0.0	0.00	192.50
18.700	0.00	0.0	0.0	0.0	0.00	192.50
18.800	0.00	0.0	0.0	0.0	0.00	192.50
18.900	0.00	0.0	0.0	0.0	0.00	192.50
19.000	0.00	0.0	0.0	0.0	0.00	192.50
19.100	0.00	0.0	0.0	0.0	0.00	192.50
19.200	0.00	0.0	0.0	0.0	0.00	192.50
19.300	0.00	0.0	0.0	0.0	0.00	192.50
19.400	0.00	0.0	0.0	0.0	0.00	192.50
19.500	0.00	0.0	0.0	0.0	0.00	192.50
19.600	0.00	0.0	0.0	0.0	0.00	192.50
19.700	0.00	0.0	0.0	0.0	0.00	192.50
19.800	0.00	0.0	0.0	0.0	0.00	192.50
19.900	0.00	0.0	0.0	0.0	0.00	192.50
20.000	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:17:14

Pond File: CRSPOND .PND
Inflow Hydrograph: CREBA5 .HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	0.00	0.0	0.0	0.0	0.00	192.50
20.200	0.00	0.0	0.0	0.0	0.00	192.50
20.300	0.00	0.0	0.0	0.0	0.00	192.50
20.400	0.00	0.0	0.0	0.0	0.00	192.50
20.500	0.00	0.0	0.0	0.0	0.00	192.50
20.600	0.00	0.0	0.0	0.0	0.00	192.50
20.700	0.00	0.0	0.0	0.0	0.00	192.50
20.800	0.00	0.0	0.0	0.0	0.00	192.50
20.900	0.00	0.0	0.0	0.0	0.00	192.50
21.000	0.00	0.0	0.0	0.0	0.00	192.50
21.100	0.00	0.0	0.0	0.0	0.00	192.50
21.200	0.00	0.0	0.0	0.0	0.00	192.50
21.300	0.00	0.0	0.0	0.0	0.00	192.50
21.400	0.00	0.0	0.0	0.0	0.00	192.50
21.500	0.00	0.0	0.0	0.0	0.00	192.50
21.600	0.00	0.0	0.0	0.0	0.00	192.50
21.700	0.00	0.0	0.0	0.0	0.00	192.50
21.800	0.00	0.0	0.0	0.0	0.00	192.50
21.900	0.00	0.0	0.0	0.0	0.00	192.50
22.000	0.00	0.0	0.0	0.0	0.00	192.50
22.100	0.00	0.0	0.0	0.0	0.00	192.50
22.200	0.00	0.0	0.0	0.0	0.00	192.50
22.300	0.00	0.0	0.0	0.0	0.00	192.50
22.400	0.00	0.0	0.0	0.0	0.00	192.50
22.500	0.00	0.0	0.0	0.0	0.00	192.50
22.600	0.00	0.0	0.0	0.0	0.00	192.50
22.700	0.00	0.0	0.0	0.0	0.00	192.50
22.800	0.00	0.0	0.0	0.0	0.00	192.50
22.900	0.00	0.0	0.0	0.0	0.00	192.50
23.000	0.00	0.0	0.0	0.0	0.00	192.50
23.100	0.00	0.0	0.0	0.0	0.00	192.50
23.200	0.00	0.0	0.0	0.0	0.00	192.50
23.300	0.00	0.0	0.0	0.0	0.00	192.50
23.400	0.00	0.0	0.0	0.0	0.00	192.50
23.500	0.00	0.0	0.0	0.0	0.00	192.50
23.600	0.00	0.0	0.0	0.0	0.00	192.50
23.700	0.00	0.0	0.0	0.0	0.00	192.50
23.800	0.00	0.0	0.0	0.0	0.00	192.50
23.900	0.00	0.0	0.0	0.0	0.00	192.50
24.000	0.00	0.0	0.0	0.0	0.00	192.50
24.100	0.00	0.0	0.0	0.0	0.00	192.50
24.200	0.00	0.0	0.0	0.0	0.00	192.50
24.300	0.00	0.0	0.0	0.0	0.00	192.50
24.400	0.00	0.0	0.0	0.0	0.00	192.50
24.500	0.00	0.0	0.0	0.0	0.00	192.50
24.600	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:17:14

Pond File: CRSPOND .PND
Inflow Hydrograph: CREBA5 .HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	0.0	0.0	0.00	192.50
24.800	0.00	0.0	0.0	0.0	0.00	192.50
24.900	0.00	0.0	0.0	0.0	0.00	192.50
25.000	0.00	0.0	0.0	0.0	0.00	192.50
25.100	0.00	0.0	0.0	0.0	0.00	192.50
25.200	0.00	0.0	0.0	0.0	0.00	192.50
25.300	0.00	0.0	0.0	0.0	0.00	192.50
25.400	0.00	0.0	0.0	0.0	0.00	192.50
25.500	0.00	0.0	0.0	0.0	0.00	192.50
25.600	0.00	0.0	0.0	0.0	0.00	192.50
25.700	0.00	0.0	0.0	0.0	0.00	192.50
25.800	0.00	0.0	0.0	0.0	0.00	192.50
25.900	0.00	0.0	0.0	0.0	0.00	192.50

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRSPOND .PND
Inflow Hydrograph: CREEA5 .HYD
Outflow Hydrograph: CRSPOND .HYD

Starting Pond W.S. Elevation = 192.50 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 6.00 cfs
Peak Outflow = 5.06 cfs
Peak Elevation = 195.33 ft

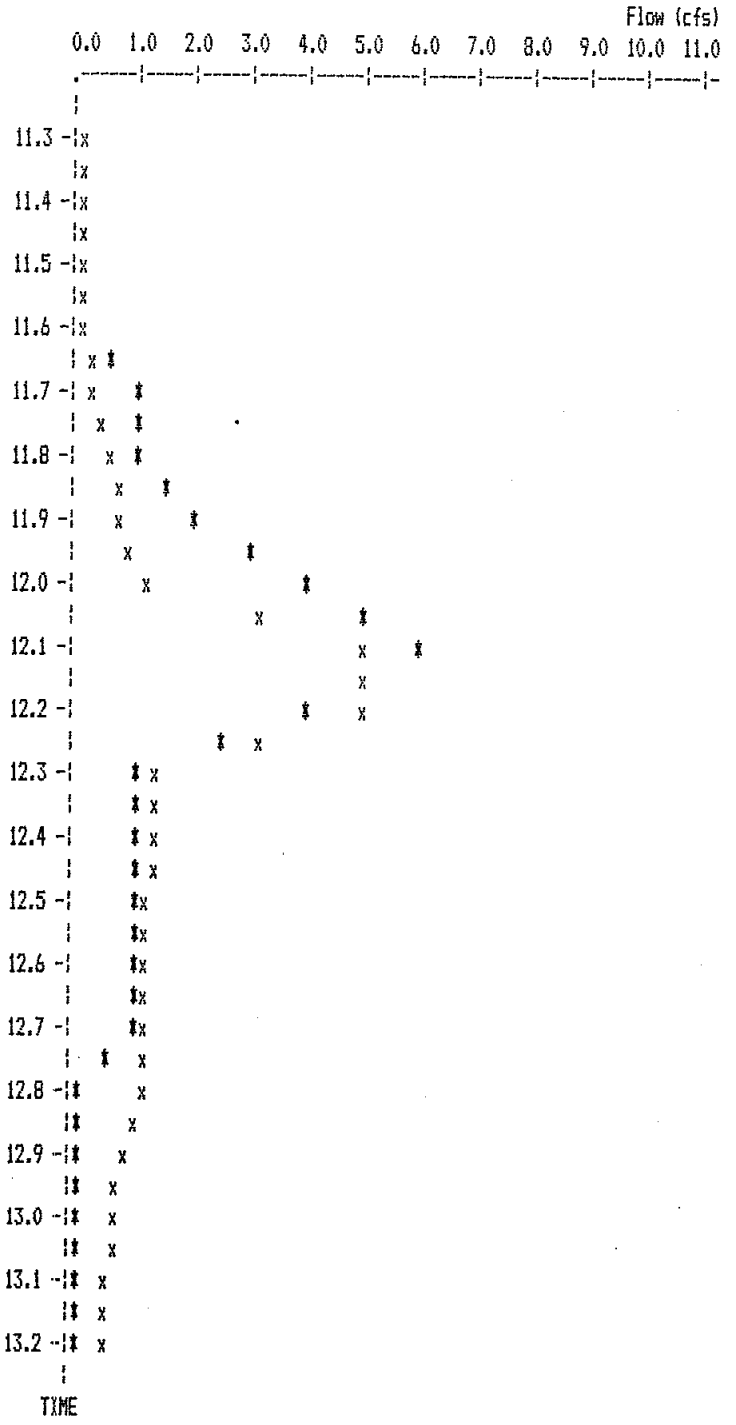
***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.05 ac-ft
Total Storage in Pond	=	0.05 ac-ft

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A5 .HYD
Outflow Hydrograph: ~~CRSPOND .HYD~~ CE8A5.HYD

EXECUTED: 12-13-1990
17:17:14

Peak Inflow = 6.00 cfs
Peak Outflow = 5.06 cfs
Peak Elevation = 195.33 ft



* File: CRE8A5 .HYD Qmax = 6.0 cfs
x File: CRSPOND .HYD Qmax = 5.1 cfs

POND-2 Version: 5.13 S/N: 1220510325 Page 1
EXECUTED: 12-13-1990 17:24:35

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8A 100-YR OUTFLOW FROM SCHOOL DET. POND
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

Inflow Hydrograph: CRE8A100.HYD
Rating Table file: CRSPOND .PND

----INITIAL CONDITIONS----
Elevation = 192.50 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + O (cfs)
192.50	0.0	0.000	0.0	0.0
192.75	0.2	0.004	1.0	1.2
193.00	0.5	0.008	1.9	2.4
193.25	0.5	0.010	2.4	2.9
193.50	0.7	0.017	4.1	4.8
193.75	0.8	0.020	4.8	5.6
194.00	0.9	0.027	6.5	7.4
194.25	1.1	0.030	7.3	8.4
194.50	1.2	0.038	9.2	10.4
194.75	1.3	0.040	9.7	11.0
195.00	1.4	0.048	11.6	13.0
195.25	1.4	0.049	11.9	13.3
195.50	13.0	0.050	12.1	25.1

Time increment (t) = 0.100 hrs.

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A100.HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	-----	0.0	0.0	0.00	192.50
11.100	0.00	0.0	0.0	0.0	0.00	192.50
11.200	0.00	0.0	0.0	0.0	0.00	192.50
11.300	0.00	0.0	0.0	0.0	0.00	192.50
11.400	0.00	0.0	0.0	0.0	0.00	192.50
11.500	1.00	1.0	0.7	1.0	0.17	192.71
11.600	1.00	2.0	1.7	2.7	0.50	193.11
11.700	2.00	3.0	3.3	4.7	0.68	193.48
11.800	3.00	5.0	6.1	8.3	1.09	194.23
11.900	4.00	7.0	10.3	13.1	1.40	195.11
12.000	8.00	12.0	1.8	22.3	10.28	195.44
12.100	13.00	21.0	1.3	22.8	10.71	195.45
12.200	8.00	21.0	1.7	22.3	10.30	195.44
12.300	3.00	11.0	10.0	12.7	1.39	194.97
12.400	2.00	5.0	8.8	15.0	3.08	195.29
12.500	2.00	4.0	10.0	12.8	1.39	194.97
12.600	1.00	3.0	10.2	13.0	1.40	195.02
12.700	1.00	2.0	9.5	12.2	1.36	194.90
12.800	1.00	2.0	8.9	11.5	1.33	194.81
12.900	1.00	2.0	8.3	10.9	1.28	194.70
13.000	1.00	2.0	7.9	10.3	1.20	194.49
13.100	1.00	2.0	7.6	9.9	1.18	194.44
13.200	1.00	2.0	7.2	9.6	1.16	194.40
13.300	1.00	2.0	7.0	9.2	1.14	194.36
13.400	1.00	2.0	6.7	9.0	1.13	194.32
13.500	1.00	2.0	6.5	8.7	1.12	194.29
13.600	1.00	2.0	6.3	8.5	1.10	194.26
13.700	1.00	2.0	6.1	8.3	1.08	194.22
13.800	1.00	2.0	6.0	8.1	1.04	194.18
13.900	0.00	1.0	5.3	7.0	0.88	193.94
14.000	0.00	0.0	3.8	5.3	0.75	193.63
14.100	0.00	0.0	2.6	3.8	0.59	193.36
14.200	0.00	0.0	1.6	2.6	0.50	193.07
14.300	0.00	0.0	1.0	1.6	0.30	192.83
14.400	0.00	0.0	0.6	1.0	0.17	192.71
14.500	0.00	0.0	0.4	0.6	0.11	192.64
14.600	0.00	0.0	0.3	0.4	0.07	192.59
14.700	0.00	0.0	0.2	0.3	0.05	192.56
14.800	0.00	0.0	0.1	0.2	0.03	192.54
14.900	0.00	0.0	0.1	0.1	0.02	192.53
15.000	0.00	0.0	0.1	0.1	0.01	192.52
15.100	0.00	0.0	0.0	0.1	0.01	192.51
15.200	0.00	0.0	0.0	0.0	0.01	192.51
15.300	0.00	0.0	0.0	0.0	0.00	192.50
15.400	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325 Page 3
EXECUTED: 12-13-1990 17:24:35

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A100.HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	0.00	0.0	0.0	0.0	0.00	192.50
15.600	0.00	0.0	0.0	0.0	0.00	192.50
15.700	0.00	0.0	0.0	0.0	0.00	192.50
15.800	0.00	0.0	0.0	0.0	0.00	192.50
15.900	0.00	0.0	0.0	0.0	0.00	192.50
16.000	0.00	0.0	0.0	0.0	0.00	192.50
16.100	0.00	0.0	0.0	0.0	0.00	192.50
16.200	0.00	0.0	0.0	0.0	0.00	192.50
16.300	0.00	0.0	0.0	0.0	0.00	192.50
16.400	0.00	0.0	0.0	0.0	0.00	192.50
16.500	0.00	0.0	0.0	0.0	0.00	192.50
16.600	0.00	0.0	0.0	0.0	0.00	192.50
16.700	0.00	0.0	0.0	0.0	0.00	192.50
16.800	0.00	0.0	0.0	0.0	0.00	192.50
16.900	0.00	0.0	0.0	0.0	0.00	192.50
17.000	0.00	0.0	0.0	0.0	0.00	192.50
17.100	0.00	0.0	0.0	0.0	0.00	192.50
17.200	0.00	0.0	0.0	0.0	0.00	192.50
17.300	0.00	0.0	0.0	0.0	0.00	192.50
17.400	0.00	0.0	0.0	0.0	0.00	192.50
17.500	0.00	0.0	0.0	0.0	0.00	192.50
17.600	0.00	0.0	0.0	0.0	0.00	192.50
17.700	0.00	0.0	0.0	0.0	0.00	192.50
17.800	0.00	0.0	0.0	0.0	0.00	192.50
17.900	0.00	0.0	0.0	0.0	0.00	192.50
18.000	0.00	0.0	0.0	0.0	0.00	192.50
18.100	0.00	0.0	0.0	0.0	0.00	192.50
18.200	0.00	0.0	0.0	0.0	0.00	192.50
18.300	0.00	0.0	0.0	0.0	0.00	192.50
18.400	0.00	0.0	0.0	0.0	0.00	192.50
18.500	0.00	0.0	0.0	0.0	0.00	192.50
18.600	0.00	0.0	0.0	0.0	0.00	192.50
18.700	0.00	0.0	0.0	0.0	0.00	192.50
18.800	0.00	0.0	0.0	0.0	0.00	192.50
18.900	0.00	0.0	0.0	0.0	0.00	192.50
19.000	0.00	0.0	0.0	0.0	0.00	192.50
19.100	0.00	0.0	0.0	0.0	0.00	192.50
19.200	0.00	0.0	0.0	0.0	0.00	192.50
19.300	0.00	0.0	0.0	0.0	0.00	192.50
19.400	0.00	0.0	0.0	0.0	0.00	192.50
19.500	0.00	0.0	0.0	0.0	0.00	192.50
19.600	0.00	0.0	0.0	0.0	0.00	192.50
19.700	0.00	0.0	0.0	0.0	0.00	192.50
19.800	0.00	0.0	0.0	0.0	0.00	192.50
19.900	0.00	0.0	0.0	0.0	0.00	192.50
20.000	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325 Page 4
EXECUTED: 12-13-1990 17:24:35

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A100.HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	0.00	0.0	0.0	0.0	0.00	192.50
20.200	0.00	0.0	0.0	0.0	0.00	192.50
20.300	0.00	0.0	0.0	0.0	0.00	192.50
20.400	0.00	0.0	0.0	0.0	0.00	192.50
20.500	0.00	0.0	0.0	0.0	0.00	192.50
20.600	0.00	0.0	0.0	0.0	0.00	192.50
20.700	0.00	0.0	0.0	0.0	0.00	192.50
20.800	0.00	0.0	0.0	0.0	0.00	192.50
20.900	0.00	0.0	0.0	0.0	0.00	192.50
21.000	0.00	0.0	0.0	0.0	0.00	192.50
21.100	0.00	0.0	0.0	0.0	0.00	192.50
21.200	0.00	0.0	0.0	0.0	0.00	192.50
21.300	0.00	0.0	0.0	0.0	0.00	192.50
21.400	0.00	0.0	0.0	0.0	0.00	192.50
21.500	0.00	0.0	0.0	0.0	0.00	192.50
21.600	0.00	0.0	0.0	0.0	0.00	192.50
21.700	0.00	0.0	0.0	0.0	0.00	192.50
21.800	0.00	0.0	0.0	0.0	0.00	192.50
21.900	0.00	0.0	0.0	0.0	0.00	192.50
22.000	0.00	0.0	0.0	0.0	0.00	192.50
22.100	0.00	0.0	0.0	0.0	0.00	192.50
22.200	0.00	0.0	0.0	0.0	0.00	192.50
22.300	0.00	0.0	0.0	0.0	0.00	192.50
22.400	0.00	0.0	0.0	0.0	0.00	192.50
22.500	0.00	0.0	0.0	0.0	0.00	192.50
22.600	0.00	0.0	0.0	0.0	0.00	192.50
22.700	0.00	0.0	0.0	0.0	0.00	192.50
22.800	0.00	0.0	0.0	0.0	0.00	192.50
22.900	0.00	0.0	0.0	0.0	0.00	192.50
23.000	0.00	0.0	0.0	0.0	0.00	192.50
23.100	0.00	0.0	0.0	0.0	0.00	192.50
23.200	0.00	0.0	0.0	0.0	0.00	192.50
23.300	0.00	0.0	0.0	0.0	0.00	192.50
23.400	0.00	0.0	0.0	0.0	0.00	192.50
23.500	0.00	0.0	0.0	0.0	0.00	192.50
23.600	0.00	0.0	0.0	0.0	0.00	192.50
23.700	0.00	0.0	0.0	0.0	0.00	192.50
23.800	0.00	0.0	0.0	0.0	0.00	192.50
23.900	0.00	0.0	0.0	0.0	0.00	192.50
24.000	0.00	0.0	0.0	0.0	0.00	192.50
24.100	0.00	0.0	0.0	0.0	0.00	192.50
24.200	0.00	0.0	0.0	0.0	0.00	192.50
24.300	0.00	0.0	0.0	0.0	0.00	192.50
24.400	0.00	0.0	0.0	0.0	0.00	192.50
24.500	0.00	0.0	0.0	0.0	0.00	192.50
24.600	0.00	0.0	0.0	0.0	0.00	192.50

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-13-1990 17:24:35

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A100.HYD
Outflow Hydrograph: CRSPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	0.0	0.0	0.00	192.50
24.800	0.00	0.0	0.0	0.0	0.00	192.50
24.900	0.00	0.0	0.0	0.0	0.00	192.50
25.000	0.00	0.0	0.0	0.0	0.00	192.50
25.100	0.00	0.0	0.0	0.0	0.00	192.50
25.200	0.00	0.0	0.0	0.0	0.00	192.50
25.300	0.00	0.0	0.0	0.0	0.00	192.50
25.400	0.00	0.0	0.0	0.0	0.00	192.50
25.500	0.00	0.0	0.0	0.0	0.00	192.50
25.600	0.00	0.0	0.0	0.0	0.00	192.50
25.700	0.00	0.0	0.0	0.0	0.00	192.50
25.800	0.00	0.0	0.0	0.0	0.00	192.50
25.900	0.00	0.0	0.0	0.0	0.00	192.50

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRSPOND .PND
Inflow Hydrograph: CRE8A100.HYD
Outflow Hydrograph: CRSPOND .HYD

Starting Pond W.S. Elevation = 192.50 ft

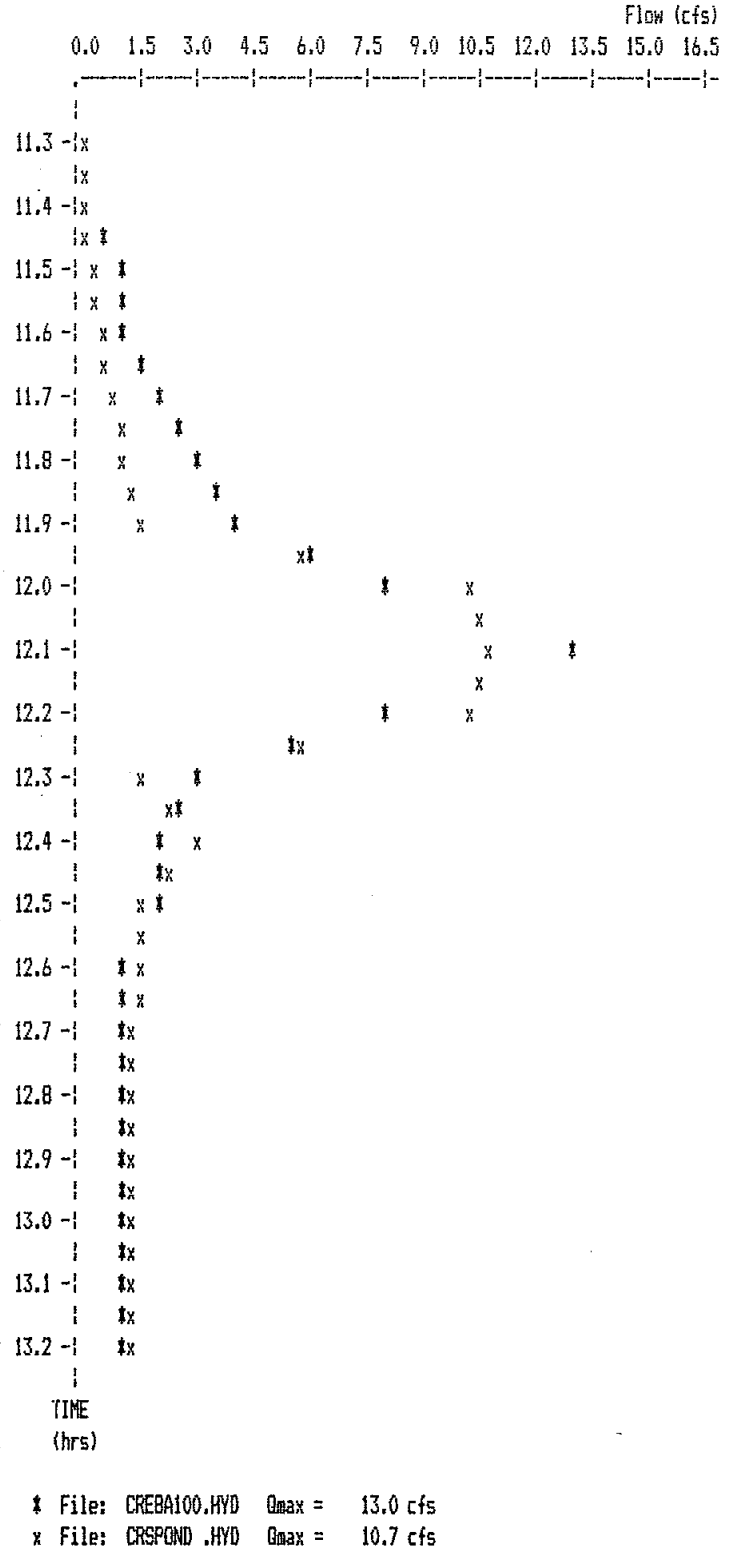
***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 13.00 cfs
Peak Outflow = 10.71 cfs
Peak Elevation = 195.45 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.05 ac-ft
Total Storage in Pond	=	0.05 ac-ft

Pond File: CRSPOND .PND
Inflow Hydrograph: CREBA100.HYD
Outflow Hydrograph: ~~CRSPOND .HYD~~ CEBA100.HYD
EXECUTED: 12-13-1990
Peak Inflow = 13.00 cfs 17:24:35
Peak Outflow = 10.71 cfs
Peak Elevation = 195.45 ft



‡ File: CREBA100.HYD Qmax = 13.0 cfs
x File: CRSPOND .HYD Qmax = 10.7 cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:55:53 12-18-1990

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8B FLOW TO WG POND EXCLUDING SCH POND
DECEMBER 14, 1990
CODEGA & FRICKE, INC.

Tc or Tt DATA

Subarea: AREA 8B DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND FLOW	110	1.00	1.8	=	0.03
PIPE FLOW	332	7.50	0.7	=	0.01
PIPE FLOW	547	12.40	0.7	=	0.01
PIPE FLOW	274	12.10	0.4	=	0.01
PIPE FLOW	285	11.60	0.4	=	0.01
ADDNL TO MAKE TC = 0.1	300	2.60	1.9	=	0.03
			minutes		hours
		TOTAL Tc --->	6.0	=	0.10

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-14-1990 10:50:53
Watershed file: ---> CRE8B .MOP
Hydrograph file: ---> CRE8B5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8B FLOW TO WG DET POND EXCLUDING SCH POND
DECEMBER 14, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	!	Runoff (in)	Ia/p input/used
AREA 8B	22.51	89.0	0.10	0.00	1.55	!	0.67	I.16 .16

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 22.51 acres or 0.03517 sq.mi
Peak discharge = 23 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8B	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

ADD TO OUTFLOW HYDROGRAPH FROM SCHOOL DETENTION POND & ROUTE THRU WESTGATE DETENTION POND.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-14-1990 10:50:53
Watershed file: --> CRE8B .MOP
Hydrograph file: --> CRE8B100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8B FLOW TO WG DET POND EXCLUDING SCH POND
DECEMBER 14, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
AREA 8B	22.51	89.0	0.10	0.00	2.75	1.68	I.09 .10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 22.51 acres or 0.03517 sq.mi
Peak discharge = 60 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8B	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

ADD TO OUTFLOW HYDROGRAPH FROM SCHOOL DETENTION POND & ROUTE THRU WESTGATE DETENTION POND

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:17:23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**********************************************************************
*                                                                    *
*       CAUGHLIN RANCH MASTER HYDROLOGY STUDY     1016.38            *
*  EXISTING CONDITIONS AREA 8A & 8B WESTGATE DETENTION POND          *
*                        DECEMBER 14, 1990                           *
*                     CODEGA & FRICKE, INC.                          *
*                          5-YR STORM                                *
**********************************************************************
```

Inflow Hydrograph: CRE8W5 .HYD
Rating Table file: WGPOND .PND

-----INITIAL CONDITIONS-----
Elevation = 69.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
69.00	0.0	0.000
70.00	0.3	0.030
71.00	4.4	0.140
72.00	5.9	0.290
73.00	7.0	0.500
74.00	8.1	0.760
75.00	16.3	1.090
76.00	28.3	1.480
77.00	34.4	1.920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
7.3	7.6
33.9	38.3
70.2	76.1
121.0	128.0
183.9	192.0
263.8	280.1
358.2	386.5
464.6	499.0

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:17:23

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	------	0.0	0.0	0.00	69.00
11.100	0.00	0.0	0.0	0.0	0.00	69.00
11.200	1.00	1.0	0.9	1.0	0.04	69.13
11.300	1.00	2.0	2.7	2.9	0.12	69.39
11.400	1.00	2.0	4.3	4.7	0.19	69.62
11.500	1.00	2.0	5.8	6.3	0.25	69.84
11.600	1.00	2.0	7.1	7.8	0.33	70.01
11.700	4.00	5.0	10.3	12.1	0.91	70.15
11.800	6.00	10.0	16.3	20.3	2.00	70.42
11.900	9.00	15.0	24.4	31.3	3.47	70.77
12.000	19.00	28.0	42.5	52.4	4.96	71.37
12.100	29.00	48.0	78.0	90.5	6.20	72.28
12.200	18.00	47.0	111.2	125.0	6.94	72.94
12.300	6.00	24.0	120.9	135.2	7.12	73.11
12.400	5.00	11.0	117.8	131.9	7.07	73.06
12.500	4.00	9.0	112.8	126.8	6.97	72.98
12.600	4.00	8.0	107.1	120.8	6.85	72.86
12.700	3.00	7.0	100.7	114.1	6.71	72.73
12.800	2.00	5.0	92.7	105.7	6.53	72.57
12.900	2.00	4.0	84.0	96.7	6.34	72.40
13.000	2.00	4.0	75.7	88.0	6.15	72.23
13.100	2.00	4.0	67.7	79.7	5.98	72.07
13.200	1.00	3.0	59.4	70.7	5.69	71.86
13.300	1.00	2.0	50.7	61.4	5.32	71.61
13.400	1.00	2.0	42.8	52.7	4.97	71.38
13.500	1.00	2.0	35.5	44.8	4.66	71.17
13.600	1.00	2.0	28.9	37.5	4.29	70.97
13.700	1.00	2.0	24.1	30.9	3.41	70.76
13.800	1.00	2.0	20.5	26.1	2.77	70.60
13.900	1.00	2.0	17.9	22.5	2.30	70.49
14.000	1.00	2.0	16.0	19.9	1.95	70.40
14.100	1.00	2.0	14.6	18.0	1.70	70.34
14.200	1.00	2.0	13.6	16.6	1.51	70.30
14.300	1.00	2.0	12.9	15.6	1.37	70.26
14.400	1.00	2.0	12.3	14.9	1.27	70.24
14.500	1.00	2.0	11.9	14.3	1.20	70.22
14.600	1.00	2.0	11.6	13.9	1.15	70.21
14.700	1.00	2.0	11.4	13.6	1.11	70.20
14.800	1.00	2.0	11.2	13.4	1.08	70.19
14.900	1.00	2.0	11.1	13.2	1.06	70.18
15.000	1.00	2.0	11.0	13.1	1.04	70.18
15.100	1.00	2.0	11.0	13.0	1.03	70.18
15.200	1.00	2.0	10.9	13.0	1.02	70.18
15.300	1.00	2.0	10.9	12.9	1.02	70.17
15.400	1.00	2.0	10.9	12.9	1.01	70.17

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:17:23

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	1.00	2.0	10.9	12.9	1.01	70.17
15.600	1.00	2.0	10.8	12.9	1.01	70.17
15.700	1.00	2.0	10.8	12.8	1.00	70.17
15.800	1.00	2.0	10.8	12.8	1.00	70.17
15.900	1.00	2.0	10.8	12.8	1.00	70.17
16.000	1.00	2.0	10.8	12.8	1.00	70.17
16.100	1.00	2.0	10.8	12.8	1.00	70.17
16.200	1.00	2.0	10.8	12.8	1.00	70.17
16.300	1.00	2.0	10.8	12.8	1.00	70.17
16.400	1.00	2.0	10.8	12.8	1.00	70.17
16.500	1.00	2.0	10.8	12.8	1.00	70.17
16.600	1.00	2.0	10.8	12.8	1.00	70.17
16.700	1.00	2.0	10.8	12.8	1.00	70.17
16.800	1.00	2.0	10.8	12.8	1.00	70.17
16.900	1.00	2.0	10.8	12.8	1.00	70.17
17.000	1.00	2.0	10.8	12.8	1.00	70.17
17.100	1.00	2.0	10.8	12.8	1.00	70.17
17.200	1.00	2.0	10.8	12.8	1.00	70.17
17.300	1.00	2.0	10.8	12.8	1.00	70.17
17.400	1.00	2.0	10.8	12.8	1.00	70.17
17.500	1.00	2.0	10.8	12.8	1.00	70.17
17.600	1.00	2.0	10.8	12.8	1.00	70.17
17.700	1.00	2.0	10.8	12.8	1.00	70.17
17.800	0.00	1.0	10.1	11.8	0.87	70.14
17.900	0.00	0.0	8.8	10.1	0.64	70.08
18.000	0.00	0.0	7.9	8.8	0.47	70.04
18.100	0.00	0.0	7.2	7.9	0.34	70.01
18.200	0.00	0.0	6.6	7.2	0.29	69.95
18.300	0.00	0.0	6.1	6.6	0.26	69.88
18.400	0.00	0.0	5.6	6.1	0.24	69.81
18.500	0.00	0.0	5.2	5.6	0.22	69.74
18.600	0.00	0.0	4.8	5.2	0.20	69.68
18.700	0.00	0.0	4.4	4.8	0.19	69.63
18.800	0.00	0.0	4.0	4.4	0.17	69.58
18.900	0.00	0.0	3.7	4.0	0.16	69.53
19.000	0.00	0.0	3.4	3.7	0.15	69.49
19.100	0.00	0.0	3.1	3.4	0.14	69.45
19.200	0.00	0.0	2.9	3.1	0.12	69.42
19.300	0.00	0.0	2.7	2.9	0.11	69.38
19.400	0.00	0.0	2.5	2.7	0.11	69.35
19.500	0.00	0.0	2.3	2.5	0.10	69.32
19.600	0.00	0.0	2.1	2.3	0.09	69.30
19.700	0.00	0.0	1.9	2.1	0.08	69.28
19.800	0.00	0.0	1.8	1.9	0.08	69.25
19.900	0.00	0.0	1.6	1.8	0.07	69.23
20.000	0.00	0.0	1.5	1.6	0.06	69.21

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:17:23

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	0.00	0.0	1.4	1.5	0.06	69.20
20.200	0.00	0.0	1.3	1.4	0.05	69.18
20.300	0.00	0.0	1.2	1.3	0.05	69.17
20.400	0.00	0.0	1.1	1.2	0.05	69.15
20.500	0.00	0.0	1.0	1.1	0.04	69.14
20.600	0.00	0.0	0.9	1.0	0.04	69.13
20.700	0.00	0.0	0.8	0.9	0.04	69.12
20.800	0.00	0.0	0.8	0.8	0.03	69.11
20.900	0.00	0.0	0.7	0.8	0.03	69.10
21.000	0.00	0.0	0.7	0.7	0.03	69.09
21.100	0.00	0.0	0.6	0.7	0.03	69.09
21.200	0.00	0.0	0.6	0.6	0.02	69.08
21.300	0.00	0.0	0.5	0.6	0.02	69.07
21.400	0.00	0.0	0.5	0.5	0.02	69.07
21.500	0.00	0.0	0.4	0.5	0.02	69.06
21.600	0.00	0.0	0.4	0.4	0.02	69.06
21.700	0.00	0.0	0.4	0.4	0.02	69.05
21.800	0.00	0.0	0.3	0.4	0.01	69.05
21.900	0.00	0.0	0.3	0.3	0.01	69.04
22.000	0.00	0.0	0.3	0.3	0.01	69.04
22.100	0.00	0.0	0.3	0.3	0.01	69.04
22.200	0.00	0.0	0.2	0.3	0.01	69.03
22.300	0.00	0.0	0.2	0.2	0.01	69.03
22.400	0.00	0.0	0.2	0.2	0.01	69.03
22.500	0.00	0.0	0.2	0.2	0.01	69.03
22.600	0.00	0.0	0.2	0.2	0.01	69.02
22.700	0.00	0.0	0.2	0.2	0.01	69.02
22.800	0.00	0.0	0.1	0.2	0.01	69.02
22.900	0.00	0.0	0.1	0.1	0.01	69.02
23.000	0.00	0.0	0.1	0.1	0.01	69.02
23.100	0.00	0.0	0.1	0.1	0.00	69.02
23.200	0.00	0.0	0.1	0.1	0.00	69.02
23.300	0.00	0.0	0.1	0.1	0.00	69.01
23.400	0.00	0.0	0.1	0.1	0.00	69.01
23.500	0.00	0.0	0.1	0.1	0.00	69.01
23.600	0.00	0.0	0.1	0.1	0.00	69.01
23.700	0.00	0.0	0.1	0.1	0.00	69.01
23.800	0.00	0.0	0.1	0.1	0.00	69.01
23.900	0.00	0.0	0.1	0.1	0.00	69.01
24.000	0.00	0.0	0.1	0.1	0.00	69.01
24.100	0.00	0.0	0.1	0.1	0.00	69.01
24.200	0.00	0.0	0.0	0.1	0.00	69.01
24.300	0.00	0.0	0.0	0.0	0.00	69.01
24.400	0.00	0.0	0.0	0.0	0.00	69.01
24.500	0.00	0.0	0.0	0.0	0.00	69.01
24.600	0.00	0.0	0.0	0.0	0.00	69.00

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:17:23

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
24.700	0.00
24.800	0.00
24.900	0.00
25.000	0.00
25.100	0.00
25.200	0.00
25.300	0.00
25.400	0.00
25.500	0.00
25.600	0.00
25.700	0.00
25.800	0.00
25.900	0.00
26.000	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00
0.0	0.0	0.0	0.00	69.00

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

Starting Pond W.S. Elevation = 69.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	29.00 cfs
Peak Outflow	=	7.12 cfs
Peak Elevation	=	73.11 ft

***** Summary of Approximate Peak Storage *****

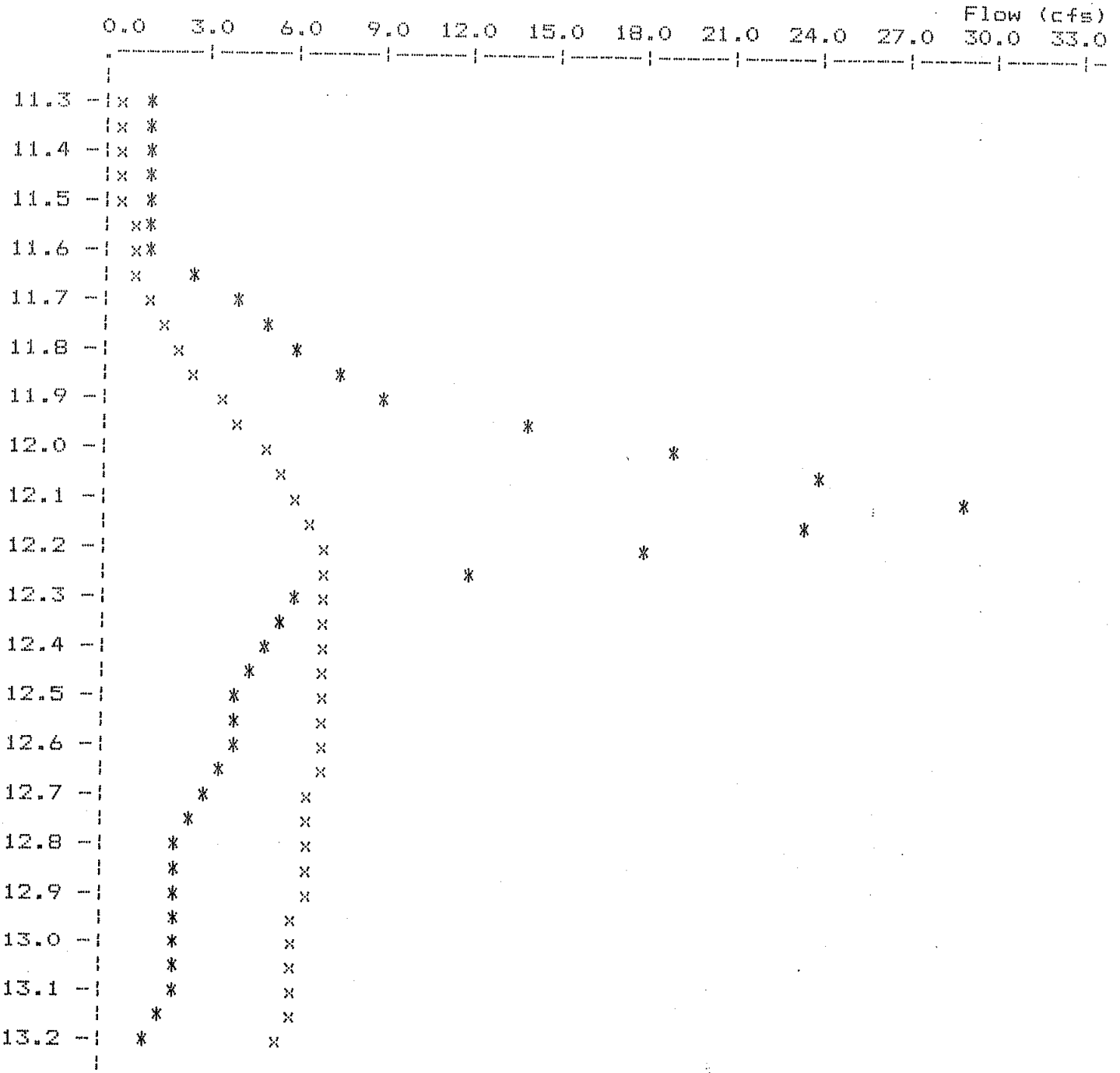
Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.53 ac-ft
Total Storage in Pond	=	0.53 ac-ft

POND-2 Version: 5.13 S/N: 1220510325

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W5 .HYD
Outflow Hydrograph: WGPOND .HYD

EXECUTED: 12-14-1990
11:17:23

Peak Inflow = 29.00 cfs
Peak Outflow = 7.12 cfs
Peak Elevation = 73.11 ft



* File: CRE8W5 .HYD Qmax = 29.0 cfs
x File: WGPOND .HYD Qmax = 7.1 cfs

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:19:50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**********************************************************************
*                                                                    *
*       CAUGHLIN RANCH MASTER HYDROLOGY STUDY     1016.38            *
*   EXISTING CONDITIONS AREA 8A & 8B WESTGATE DETENTION POND         *
*                        DECEMBER 14, 1990                           *
*                      CODEGA & FRICKE, INC.                         *
*                        100-YR STORM                                *
**********************************************************************
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Inflow Hydrograph: CRE8W100.HYD
Rating Table file: WGPOND .PND

-----INITIAL CONDITIONS-----
Elevation = 69.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
69.00	0.0	0.000
70.00	0.3	0.030
71.00	4.4	0.140
72.00	5.9	0.290
73.00	7.0	0.500
74.00	8.1	0.760
75.00	16.3	1.090
76.00	28.3	1.480
77.00	34.4	1.920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
7.3	7.6
33.9	38.3
70.2	76.1
121.0	128.0
183.9	192.0
263.8	280.1
358.2	386.5
464.6	499.0

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:19:50

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W100.HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	1.00	------	0.0	0.0	0.00	69.00
11.100	1.00	2.0	1.8	2.0	0.08	69.26
11.200	2.00	3.0	4.5	4.8	0.19	69.64
11.300	2.00	4.0	7.6	8.5	0.42	70.03
11.400	2.00	4.0	9.9	11.6	0.84	70.13
11.500	4.00	6.0	13.1	15.9	1.42	70.27
11.600	4.00	8.0	16.9	21.1	2.11	70.44
11.700	11.00	15.0	24.8	31.9	3.55	70.79
11.800	17.00	28.0	42.8	52.8	4.98	71.38
11.900	24.00	41.0	71.7	83.8	6.06	72.15
12.000	46.00	70.0	127.2	141.7	7.24	73.21
12.100	73.00	119.0	219.9	246.2	13.15	74.62
12.200	45.00	118.0	292.3	337.9	22.83	75.54
12.300	16.00	61.0	304.2	353.3	24.56	75.69
12.400	11.00	27.0	287.0	331.2	22.06	75.48
12.500	9.00	20.0	268.4	307.0	19.34	75.25
12.600	7.00	16.0	250.8	284.4	16.78	75.04
12.700	6.00	13.0	234.2	263.8	14.78	74.82
12.800	5.00	11.0	219.1	245.2	13.05	74.60
12.900	5.00	10.0	206.0	229.1	11.55	74.42
13.000	5.00	10.0	195.3	216.0	10.33	74.27
13.100	5.00	10.0	186.7	205.3	9.34	74.15
13.200	4.00	9.0	178.8	195.7	8.44	74.04
13.300	4.00	8.0	170.8	186.8	8.01	73.92
13.400	4.00	8.0	163.0	178.8	7.87	73.79
13.500	4.00	8.0	155.5	171.0	7.74	73.67
13.600	4.00	8.0	148.3	163.5	7.61	73.56
13.700	3.00	7.0	140.4	155.3	7.47	73.43
13.800	3.00	6.0	131.7	146.4	7.32	73.29
13.900	2.00	5.0	122.4	136.7	7.15	73.14
14.000	2.00	4.0	112.5	126.4	6.97	72.97
14.100	2.00	4.0	103.0	116.5	6.76	72.78
14.200	2.00	4.0	93.9	107.0	6.56	72.60
14.300	2.00	4.0	85.2	97.9	6.36	72.42
14.400	2.00	4.0	76.8	89.2	6.18	72.25
14.500	2.00	4.0	68.8	80.8	6.00	72.09
14.600	2.00	4.0	61.3	72.8	5.77	71.91
14.700	2.00	4.0	54.3	65.3	5.47	71.71
14.800	2.00	4.0	47.9	58.3	5.20	71.53
14.900	2.00	4.0	42.1	51.9	4.94	71.36
15.000	2.00	4.0	36.6	46.1	4.71	71.21
15.100	2.00	4.0	31.6	40.6	4.49	71.06
15.200	2.00	4.0	27.6	35.6	4.05	70.91
15.300	2.00	4.0	24.5	31.6	3.50	70.78
15.400	2.00	4.0	22.3	28.5	3.10	70.68

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:19:50

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W100.HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	2.00	4.0	20.7	26.3	2.81	70.61
15.600	2.00	4.0	19.5	24.7	2.59	70.56
15.700	2.00	4.0	18.7	23.5	2.43	70.52
15.800	1.00	3.0	17.3	21.7	2.18	70.46
15.900	1.00	2.0	15.6	19.3	1.87	70.38
16.000	1.00	2.0	14.3	17.6	1.64	70.33
16.100	1.00	2.0	13.4	16.3	1.47	70.28
16.200	1.00	2.0	12.7	15.4	1.34	70.25
16.300	1.00	2.0	12.2	14.7	1.25	70.23
16.400	1.00	2.0	11.8	14.2	1.18	70.22
16.500	1.00	2.0	11.5	13.8	1.13	70.20
16.600	1.00	2.0	11.3	13.5	1.10	70.19
16.700	1.00	2.0	11.2	13.3	1.07	70.19
16.800	1.00	2.0	11.1	13.2	1.05	70.18
16.900	1.00	2.0	11.0	13.1	1.04	70.18
17.000	1.00	2.0	11.0	13.0	1.03	70.18
17.100	1.00	2.0	10.9	13.0	1.02	70.18
17.200	1.00	2.0	10.9	12.9	1.02	70.17
17.300	1.00	2.0	10.9	12.9	1.01	70.17
17.400	1.00	2.0	10.9	12.9	1.01	70.17
17.500	1.00	2.0	10.8	12.9	1.01	70.17
17.600	1.00	2.0	10.8	12.8	1.00	70.17
17.700	1.00	2.0	10.8	12.8	1.00	70.17
17.800	1.00	2.0	10.8	12.8	1.00	70.17
17.900	1.00	2.0	10.8	12.8	1.00	70.17
18.000	1.00	2.0	10.8	12.8	1.00	70.17
18.100	1.00	2.0	10.8	12.8	1.00	70.17
18.200	1.00	2.0	10.8	12.8	1.00	70.17
18.300	1.00	2.0	10.8	12.8	1.00	70.17
18.400	1.00	2.0	10.8	12.8	1.00	70.17
18.500	1.00	2.0	10.8	12.8	1.00	70.17
18.600	1.00	2.0	10.8	12.8	1.00	70.17
18.700	1.00	2.0	10.8	12.8	1.00	70.17
18.800	1.00	2.0	10.8	12.8	1.00	70.17
18.900	1.00	2.0	10.8	12.8	1.00	70.17
19.000	1.00	2.0	10.8	12.8	1.00	70.17
19.100	1.00	2.0	10.8	12.8	1.00	70.17
19.200	1.00	2.0	10.8	12.8	1.00	70.17
19.300	1.00	2.0	10.8	12.8	1.00	70.17
19.400	1.00	2.0	10.8	12.8	1.00	70.17
19.500	1.00	2.0	10.8	12.8	1.00	70.17
19.600	1.00	2.0	10.8	12.8	1.00	70.17
19.700	1.00	2.0	10.8	12.8	1.00	70.17
19.800	1.00	2.0	10.8	12.8	1.00	70.17
19.900	1.00	2.0	10.8	12.8	1.00	70.17
20.000	1.00	2.0	10.8	12.8	1.00	70.17

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:19:50

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W100.HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	10.8	12.8	1.00	70.17
20.200	1.00	2.0	10.8	12.8	1.00	70.17
20.300	1.00	2.0	10.8	12.8	1.00	70.17
20.400	1.00	2.0	10.8	12.8	1.00	70.17
20.500	1.00	2.0	10.8	12.8	1.00	70.17
20.600	1.00	2.0	10.8	12.8	1.00	70.17
20.700	1.00	2.0	10.8	12.8	1.00	70.17
20.800	1.00	2.0	10.8	12.8	1.00	70.17
20.900	1.00	2.0	10.8	12.8	1.00	70.17
21.000	1.00	2.0	10.8	12.8	1.00	70.17
21.100	1.00	2.0	10.8	12.8	1.00	70.17
21.200	1.00	2.0	10.8	12.8	1.00	70.17
21.300	1.00	2.0	10.8	12.8	1.00	70.17
21.400	1.00	2.0	10.8	12.8	1.00	70.17
21.500	1.00	2.0	10.8	12.8	1.00	70.17
21.600	1.00	2.0	10.8	12.8	1.00	70.17
21.700	1.00	2.0	10.8	12.8	1.00	70.17
21.800	1.00	2.0	10.8	12.8	1.00	70.17
21.900	1.00	2.0	10.8	12.8	1.00	70.17
22.000	1.00	2.0	10.8	12.8	1.00	70.17
22.100	1.00	2.0	10.8	12.8	1.00	70.17
22.200	1.00	2.0	10.8	12.8	1.00	70.17
22.300	1.00	2.0	10.8	12.8	1.00	70.17
22.400	1.00	2.0	10.8	12.8	1.00	70.17
22.500	1.00	2.0	10.8	12.8	1.00	70.17
22.600	1.00	2.0	10.8	12.8	1.00	70.17
22.700	1.00	2.0	10.8	12.8	1.00	70.17
22.800	1.00	2.0	10.8	12.8	1.00	70.17
22.900	1.00	2.0	10.8	12.8	1.00	70.17
23.000	1.00	2.0	10.8	12.8	1.00	70.17
23.100	1.00	2.0	10.8	12.8	1.00	70.17
23.200	1.00	2.0	10.8	12.8	1.00	70.17
23.300	1.00	2.0	10.8	12.8	1.00	70.17
23.400	1.00	2.0	10.8	12.8	1.00	70.17
23.500	1.00	2.0	10.8	12.8	1.00	70.17
23.600	1.00	2.0	10.8	12.8	1.00	70.17
23.700	1.00	2.0	10.8	12.8	1.00	70.17
23.800	1.00	2.0	10.8	12.8	1.00	70.17
23.900	1.00	2.0	10.8	12.8	1.00	70.17
24.000	0.00	1.0	10.1	11.8	0.87	70.14
24.100	0.00	0.0	8.8	10.1	0.64	70.08
24.200	0.00	0.0	7.9	8.8	0.47	70.04
24.300	0.00	0.0	7.2	7.9	0.34	70.01
24.400	0.00	0.0	6.6	7.2	0.29	69.95
24.500	0.00	0.0	6.1	6.6	0.26	69.88
24.600	0.00	0.0	5.6	6.1	0.24	69.81

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-14-1990 11:19:50

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W100.HYD
Outflow Hydrograph: WGPOND .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	5.2	5.6	0.22	69.74
24.800	0.00	0.0	4.8	5.2	0.20	69.68
24.900	0.00	0.0	4.4	4.8	0.19	69.63
25.000	0.00	0.0	4.0	4.4	0.17	69.58
25.100	0.00	0.0	3.7	4.0	0.16	69.53
25.200	0.00	0.0	3.4	3.7	0.15	69.49
25.300	0.00	0.0	3.1	3.4	0.14	69.45
25.400	0.00	0.0	2.9	3.1	0.12	69.42
25.500	0.00	0.0	2.7	2.9	0.11	69.38
25.600	0.00	0.0	2.5	2.7	0.11	69.35
25.700	0.00	0.0	2.3	2.5	0.10	69.32
25.800	0.00	0.0	2.1	2.3	0.09	69.30
25.900	0.00	0.0	1.9	2.1	0.08	69.28
26.000	0.00	0.0	1.8	1.9	0.08	69.25

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WGPOND .PND
Inflow Hydrograph: CREBW100.HYD
Outflow Hydrograph: WGPOND .HYD

Starting Pond W.S. Elevation = 69.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	73.00 cfs
Peak Outflow	=	24.56 cfs
Peak Elevation	=	75.69 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	1.36 ac-ft
Total Storage in Pond	=	1.36 ac-ft

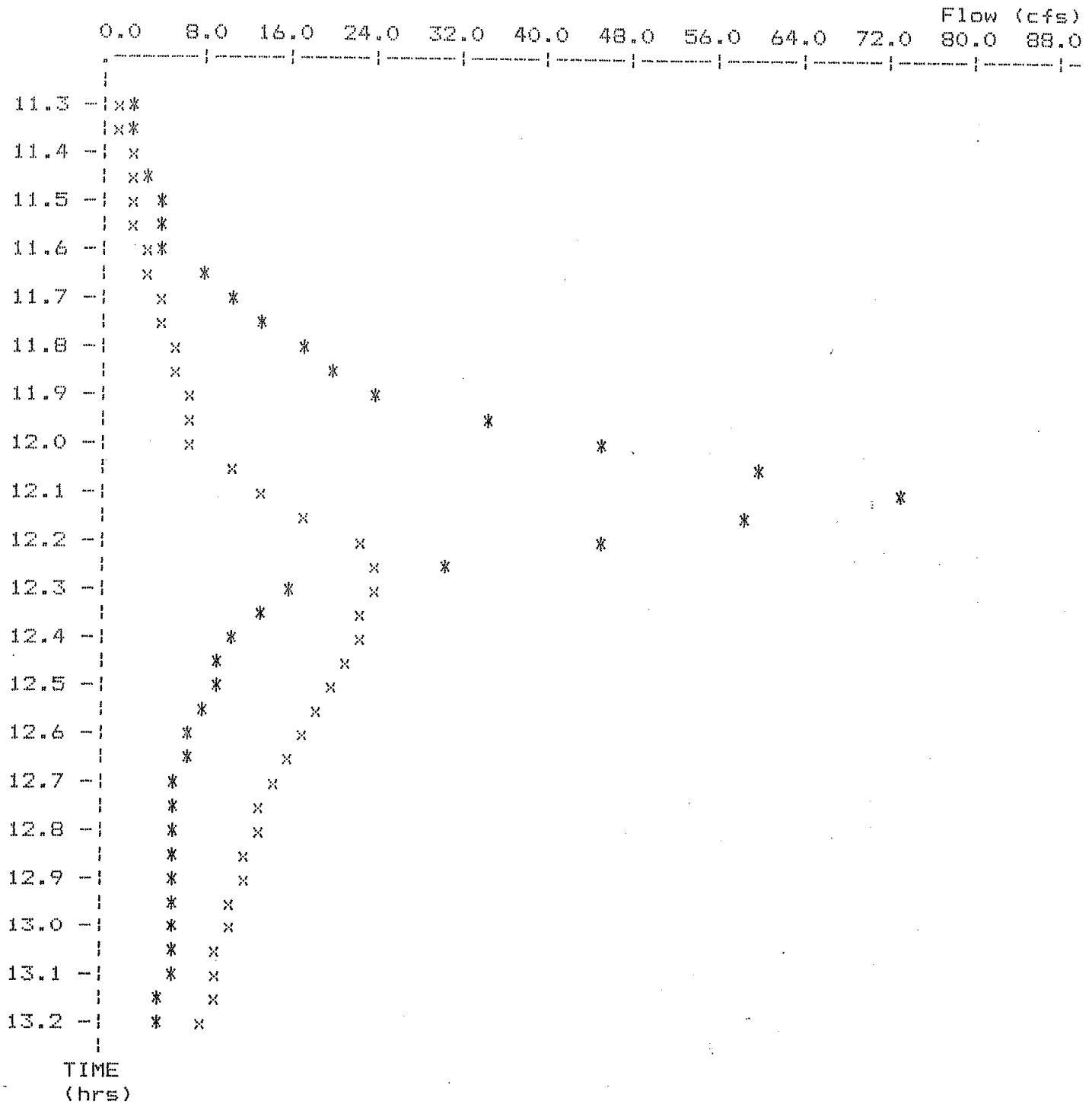
Warning: Inflow hydrograph truncated on left side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: WGPOND .PND
Inflow Hydrograph: CRE8W100.HYD
Outflow Hydrograph: WGPOND .HYD

EXECUTED: 12-14-1990
11:19:50

Peak Inflow = 73.00 cfs
Peak Outflow = 24.56 cfs
Peak Elevation = 75.69 ft



* File: CRE8W100.HYD Qmax = 73.0 cfs
x File: WGPOND .HYD Qmax = 24.6 cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:29:57 04-02-1991

FILE: CREBC

FLOW @ Westpoint/ Vista Pointe

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXIST. CONDITIONS AREA 8C DNSTRM OF WG PND
APRIL 2, 1991
CODEGA & FRICKE, INC.

RUNOFF CURVE NUMBER SUMMARY

Subarea Description	Area (acres)	CN (weighted)
1 WESTPOINT	9.90	85
2 VISTA POINTE	24.98	87
3 McCARRAN BLVD	4.39	91
4 CAUGHLIN SQR.	13.16	91

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:29:57 04-02-1991

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXIST. CONDITIONS AREA 8C DNSTRM OF WG PND
APRIL 2, 1991
CODEGA & FRICKE, INC.

RUNOFF CURVE NUMBER DATA

Composite Area: 1 WESTPOINT

SURFACE DESCRIPTION	AREA (acres)	CN	
WESTPOINT UNDEVELOPED	9.90	85	
COMPOSITE AREA ---->	9.90	85.0	(85)

Composite Area: 2 VISTA POINTE

SURFACE DESCRIPTION	AREA (acres)	CN	
VISTA PT. SINGLE FAM. SUBDIV.	13.43	88	
GRASSED COMMON AREA (PARK)	0.91	79	
PAVED COMMON AREA	0.56	98	
SLOPED COMMON AREA (GRASSED)	0.50	87	
NATURAL COMMON AREA	9.58	85	
COMPOSITE AREA ---->	24.98	86.7	(87)

Composite Area: 3 McCARRAN BLVD

SURFACE DESCRIPTION	AREA (acres)	CN	
McCARRAN BOULEVARD PAVEMENT	1.43	98	
McCARRAN BOULEVARD SLOPE GRASS	2.96	87	
COMPOSITE AREA ---->	4.39	90.6	(91)

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:29:57 04-02-1991

Composite Area: 4 CAUGHLIN SQR.

SURFACE DESCRIPTION	AREA (acres)	CN	
NEWLY GRADED AREAS NO VEG.	13.16	91	
COMPOSITE AREA --->	13.16	91.0	(91)

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:32:59 04-02-1991

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using Length/Velocity)

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREAS DOWNSTREAM OF WESTGATE DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Subarea descr.	Tc or Tt	Time (hrs)
1 WESTPOINT	Tc	0.10
2 VISTA POINTE	Tc	0.24
3 McCARRAN BLVD	Tc	0.10
4 CAUGHLIN SQR	Tc	0.10

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:32:59 04-02-1991

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREAS DOWNSTREAM OF WESTGATE DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Tc or Tt DATA

Subarea: 1 WESTPOINT DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
MINIMUM Tc	360	1.00	6.0	=	0.10
		TOTAL Tc --->	minutes 6.0	=	hours 0.10

Subarea: 2 VISTA POINTE DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND TO YD	360	1.00	6.0	=	0.10
PIPED	115	5.80	0.3	=	0.01
PIPED	250	5.80	0.7	=	0.01
PIPED	120	12.40	0.2	=	0.00
PIPED	80	12.20	0.1	=	0.00
PIPED	250	18.00	0.2	=	0.00
OVERLAND	1050	2.60	6.7	=	0.11
		TOTAL Tc --->	minutes 14.3	=	hours 0.24

Subarea: 3 McCARRAN BLVD DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
MINIMUM Tc	360	1.00	6.0	=	0.10
		TOTAL Tc --->	minutes 6.0	=	hours 0.10

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:32:59 04-02-1991

Subarea: 4 CAUGHLIN SQR DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes	TIME hours
MINIMUM Tc	360	1.00	6.0 =	0.10

	minutes	hours
TOTAL Tc ---->	6.0 =	0.10

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:33:44 04-02-1991

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using Length/Velocity)

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING Tt FOR AREAS DOWNSTREAM OF WESTGATE DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Subarea descr.	Tc or Tt	Time (hrs)
1 WESTPOINT	Tt	0.00
2 VISTA POINTE	Tt	0.00
3 McCARRAN BLVD	Tt	0.12
4 CAUGHLIN SQR.	Tt	0.12

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 13:33:44 04-02-1991

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING Tt FOR AREAS DOWNSTREAM OF WESTGATE DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Tc or Tt DATA

Subarea: 3 McCARRAN BLVD DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
PIPED	52	8.80	0.1	=	0.00
PIPED	250	18.00	0.2	=	0.00
OVERLAND	1050	2.60	6.7	=	0.11
			minutes		hours
		TOTAL Tt --->	7.1	=	0.12

Subarea: 4 CAUGHLIN SQR. DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
PIPED	221	8.80	0.4	=	0.01
PIPED	52	8.80	0.1	=	0.00
PIPED	250	18.00	0.2	=	0.00
OVERLAND	1050	2.60	6.7	=	0.11
			minutes		hours
		TOTAL Tt --->	7.5	=	0.12

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 04-02-1991 13:34:56
Watershed file: --> CRE8C .MOP
Hydrograph file: --> CRE8C5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8C DOWNSTREAM OF WESTGATE DETENTION POND
APRIL 2, 1991
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
1 WESTPOINT	9.90	85.0	0.10	0.00	1.55	0.48	I.23	.23
2 VISTA POINTE	24.98	87.0	0.20	0.00	1.55	0.57	I.19	.19
3 McCARRAN BLVD	4.39	91.0	0.10	0.10	1.55	0.78	I.13	.13
4 CAUGHLIN SQR.	13.16	91.0	0.10	0.10	1.55	0.78	I.13	.13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 52.43 acres or 0.08192 sq.mi
Peak discharge = 38 cfs

WARNING: Drainage areas of two or more subareas
differ by a factor of 5 or greater.

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
1 WESTPOINT	0.10	0.00	**	**	Yes	--
2 VISTA POINTE	0.24	0.00	0.20	0.00	Yes	--
3 McCARRAN BLVD	0.10	0.12	0.10	0.10	Yes	--
4 CAUGHLIN SQR.	0.10	0.12	0.10	0.10	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

ADDED TO OUTFLOW OF WESTGATE DETENTION POND.

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 04-02-1991 13:34:56
Watershed file: --> CRE8C .MOP
Hydrograph file: --> CRE8C100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING CONDITIONS AREA 8C DOWNSTREAM OF WESTGATE DETENTION POND
APRIL 2, 1991
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
1 WESTPOINT	9.90	85.0	0.10	0.00	2.75	1.38	I.13	.13
2 VISTA POINTE	24.98	87.0	0.20	0.00	2.75	1.52	I.11	.11
3 McCARRAN BLVD	4.39	91.0	0.10	0.10	2.75	1.84	I.07	.10
4 CAUGHLIN SQR.	13.16	91.0	0.10	0.10	2.75	1.84	I.07	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 52.43 acres or 0.08192 sq.mi
Peak discharge = 103 cfs

WARNING: Drainage areas of two or more subareas
differ by a factor of 5 or greater.

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
1 WESTPOINT	0.10	0.00	**	**	Yes	--
2 VISTA POINTE	0.24	0.00	0.20	0.00	Yes	--
3 McCARRAN BLVD	0.10	0.12	0.10	0.10	No	Computed Ia/p < .1
4 CAUGHLIN SQR.	0.10	0.12	0.10	0.10	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

ADDED TO OUTFLOW OF WESTGATE DETENTION POND.

POND-2 Version: 5.13 S/N: 1220510325

Executed 04-02-1991 16:09:11

Data directory: *.HYD

EXISTING CONDITIONS 5-YEAR STORM

File Summary for Composite Hydrograph

Time (hrs)	CRE8C5 (cfs) FLOW DOWNSTREAM OF WESTGATE POND.	WGPD5 (cfs) OUTFLOW FROM WESTGATE POND	WPVP5 (Total) TOTAL EXISTING FLOW DRAINAGEWAY #4	
11.00	0.0	0.0	0.0	
11.10	0.0	0.0	0.0	
11.20	0.0	0.0	0.0	
11.30	0.0	0.1	0.1	
11.40	1.0	0.2	1.2	
11.50	1.0	0.3	1.3	
11.60	2.0	0.3	2.3	
11.70	4.0	0.9	4.9	
11.80	6.0	2.0	8.0	
11.90	8.0	3.5	11.5	
12.00	16.0	5.0	21.0	
12.10	32.0	6.2	38.2	
12.20	38.0	6.9	44.9	= Q5
12.30	28.0	7.1	35.1	
12.40	15.0	7.1	22.1	
12.50	10.0	7.0	17.0	
12.60	8.0	6.8	14.9	
12.70	7.0	6.7	13.7	
12.80	6.0	6.5	12.5	
12.90	5.0	6.3	11.3	
13.00	4.0	6.2	10.1	
13.10	4.0	6.0	10.0	
13.20	4.0	5.7	9.7	
13.30	3.0	5.3	8.3	
13.40	2.0	5.0	7.0	
13.50	2.0	4.7	6.7	
13.60	2.0	4.3	6.3	
13.70	2.0	3.4	5.4	
13.80	2.0	2.8	4.8	
13.90	2.0	2.3	4.3	
14.00	2.0	2.0	4.0	
14.10	2.0	1.7	3.7	
14.20	2.0	1.5	3.5	
14.30	2.0	1.4	3.4	
14.40	2.0	1.3	3.3	
14.50	2.0	1.2	3.2	
14.60	2.0	1.1	3.2	
14.70	2.0	1.1	3.1	
14.80	2.0	1.1	3.1	
14.90	2.0	1.1	3.1	

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EXISTING CONDITIONS 5-YEAR STORM

File Summary for Composite Hydrograph

Time (hrs)	CRE8C5 (cfs) FLOW DOWNSTREAM OF WESTGATE POND	WGPD5 (cfs) OUTFLOW FROM WESTGATE POND	WPVP5 (Total) TOTAL EXISTING FLOW DRAINAGEWAY #4
15.00	2.0	1.0	3.0
15.10	2.0	1.0	3.0
15.20	2.0	1.0	3.0
15.30	1.0	1.0	2.0
15.40	1.0	1.0	2.0
15.50	1.0	1.0	2.0
15.60	1.0	1.0	2.0
15.70	1.0	1.0	2.0
15.80	1.0	1.0	2.0
15.90	1.0	1.0	2.0
16.00	1.0	1.0	2.0
16.10	1.0	1.0	2.0
16.20	1.0	1.0	2.0
16.30	1.0	1.0	2.0
16.40	1.0	1.0	2.0
16.50	1.0	1.0	2.0
16.60	1.0	1.0	2.0
16.70	1.0	1.0	2.0
16.80	1.0	1.0	2.0
16.90	1.0	1.0	2.0
17.00	1.0	1.0	2.0
17.10	1.0	1.0	2.0
17.20	1.0	1.0	2.0
17.30	1.0	1.0	2.0
17.40	1.0	1.0	2.0
17.50	1.0	1.0	2.0
17.60	1.0	1.0	2.0
17.70	1.0	1.0	2.0
17.80	0.0	0.9	0.9
17.90	0.0	0.6	0.6
18.00	0.0	0.5	0.5
18.10	0.0	0.3	0.3
18.20	0.0	0.3	0.3
18.30	0.0	0.3	0.3
18.40	0.0	0.2	0.2
18.50	0.0	0.2	0.2
18.60	0.0	0.2	0.2
18.70	0.0	0.2	0.2
18.80	0.0	0.2	0.2
18.90	0.0	0.2	0.2
19.00	0.0	0.2	0.2

POND-2 Version: 5.13 S/N: 1220510325

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EXISTING CONDITIONS 100-YEAR STORM

File Summary for Composite Hydrograph

Time (hrs)	CRE8C100 (cfs) FLOW DOWNSTREAM OF WESTGATE POND	WGPD100 (cfs) OUTFLOW FROM WESTGATE POND	WGVP100 (Total) TOTAL EXISTING FLOW DRAINAGEWAY #4	
11.00	2.0	0.0	2.0	
11.10	3.0	0.1	3.1	
11.20	3.0	0.2	3.2	
11.30	4.0	0.4	4.4	
11.40	5.0	0.8	5.8	
11.50	6.0	1.4	7.4	
11.60	7.0	2.1	9.1	
11.70	13.0	3.5	16.5	
11.80	20.0	5.0	25.0	
11.90	26.0	6.1	32.1	
12.00	50.0	7.2	57.2	
12.10	91.0	13.1	104.2	
12.20	103.0	22.8	125.8	= Q_{100}
12.30	70.0	24.6	94.6	
12.40	37.0	22.1	59.1	
12.50	24.0	19.3	43.3	
12.60	18.0	16.8	34.8	
12.70	15.0	14.8	29.8	
12.80	12.0	13.1	25.0	
12.90	10.0	11.6	21.5	
13.00	9.0	10.3	19.3	
13.10	8.0	9.3	17.3	
13.20	8.0	8.4	16.4	
13.30	8.0	8.0	16.0	
13.40	7.0	7.9	14.9	
13.50	7.0	7.7	14.7	
13.60	7.0	7.6	14.6	
13.70	7.0	7.5	14.5	
13.80	7.0	7.3	14.3	
13.90	6.0	7.2	13.1	
14.00	6.0	7.0	13.0	
14.10	5.0	6.8	11.8	
14.20	5.0	6.6	11.6	
14.30	4.0	6.4	10.4	
14.40	4.0	6.2	10.2	
14.50	4.0	6.0	10.0	
14.60	4.0	5.8	9.8	
14.70	4.0	5.5	9.5	
14.80	4.0	5.2	9.2	
14.90	4.0	4.9	8.9	

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EXISTING CONDITIONS 100-YEAR STORM

File Summary for Composite Hydrograph

Time (hrs)	CRESC100 (cfs) FLOW DOWNSTREAM OF WESTGATE POND	WGPD100 (cfs) OUTFLOW FROM WESTGATE POND	WGVP100 (Total) TOTAL EXISTING FLOW DRAINAGEWAY #4
15.00	4.0	4.7	8.7
15.10	4.0	4.5	8.5
15.20	4.0	4.1	8.1
15.30	4.0	3.5	7.5
15.40	4.0	3.1	7.1
15.50	4.0	2.8	6.8
15.60	4.0	2.6	6.6
15.70	4.0	2.4	6.4
15.80	3.0	2.2	5.2
15.90	3.0	1.9	4.9
16.00	3.0	1.6	4.6
16.10	3.0	1.5	4.5
16.20	3.0	1.3	4.3
16.30	2.0	1.3	3.3
16.40	2.0	1.2	3.2
16.50	2.0	1.1	3.1
16.60	2.0	1.1	3.1
16.70	2.0	1.1	3.1
16.80	2.0	1.0	3.0
16.90	2.0	1.0	3.0
17.00	2.0	1.0	3.0
17.10	2.0	1.0	3.0
17.20	2.0	1.0	3.0
17.30	2.0	1.0	3.0
17.40	2.0	1.0	3.0
17.50	2.0	1.0	3.0
17.60	2.0	1.0	3.0
17.70	2.0	1.0	3.0
17.80	2.0	1.0	3.0
17.90	2.0	1.0	3.0
18.00	2.0	1.0	3.0
18.10	2.0	1.0	3.0
18.20	2.0	1.0	3.0
18.30	2.0	1.0	3.0
18.40	2.0	1.0	3.0
18.50	2.0	1.0	3.0
18.60	2.0	1.0	3.0
18.70	2.0	1.0	3.0
18.80	2.0	1.0	3.0
18.90	2.0	1.0	3.0
19.00	2.0	1.0	3.0

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JOB 10160.38
SHEET NO. 142 OF
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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 9: INCLUDED WITH AREA 11

AREA 10: THE MAJORITY OF AREA 10 IS UNDEVELOPED, AND ALL RUNOFF FLOWS TO ALUM CREEK. CAUGHLIN PARKWAY RUNS ALONG THE NORTH-EASTERN EDGE OF THIS DRAINAGE AREA. THE ROADWAY HAS BEEN ROUGH GRADED, BUT THE STORM DRAIN SYSTEM HAS NOT BEEN INSTALLED. THERE ARE NO EXISTING DETENTION BASINS IN THIS AREA. t_c IS GREATER THAN 10 MIN. CALCULATE t_c AS FOLLOWS:

CONDUIT	ΔELEV, ft	LENGTH, ft	SLOPE, %	VELOCITY, fps	TRAVELTIME, min
OVERLAND	43	400	10.75	3.1	2.2
OVERLAND	50	570	8.8	2.9	3.3
OVERLAND	50	220	22.7	4.6	0.8
OVERLAND	25	200	12.5	3.3	1.0
OVERLAND	25	580	4.3	2.0	4.9
OVERLAND	100	590	16.9	4.0	2.5
OVERLAND	100	990	10.1	3.1	5.3

t_c = 20.0 MIN.

i_5 = 0.90 in/hr
i_{100} = 2.45 in/hr

A = 110.48 ac.
C = 0.55

$Q_5 = (0.90\ in/hr)(0.55)(110.48\ ac) = 54.69\ cfs$
$Q_{100} = (2.45\ in/hr)(0.55)(110.48\ ac) = 148.87\ cfs$

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AREA 11 : (INCLUDES AREAS 9 + 12)
EXCEPT FOR McCARRAN BOULEVARD, AREA 11 IS UNDEVELOPED. FLOW IN THE UPPER SECTION OF THIS AREA (OLD AREA 9) IS CHANNELIZED, AND IT IS INTERCEPTED BY STEAMBOAT DITCH. THE REMAINDER OF THE DRAINAGE AREA FLOWS INTO STEAMBOAT DITCH BY OVERLAND FLOW. SINCE MOST OF THE FLOW IS CHANNELIZED, AND ALL OVERLAND FLOW PATHS ARE SHORT: USE t_c = 10 MIN.
i_5 = 1.4 in/hr
i_{100} = 3.8 in/hr

	Ac.	C	CA
UNDEVELOPED	82.74	0.55	45.51
McCARRAN BLVD	5.23	0.90	4.71
			ΣCA = 50.22

$Q_5 = (1.4\ in/hr)(50.22) = 70.31$ cfs
$Q_{100} = (3.8\ in/hr)(50.22) = 190.84$ cfs

AREA 13: EXISTING CONDITION IS SAME AS PRE-DEVELOPMENT CONDITION

Q_5 = 8.11 cfs
Q_{100} = 22.00 cfs

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AREA 14: APPROXIMATELY 1/3 OF AREA 14 IS DEVELOPED INTO SINGLE FAMILY LOTS. THE DEVELOPED PORTIONS ARE LOCATED IMEDIATELY ADJACENT TO ALUM CREEK. ALL RUNOFF DRAINS BY SHEETFLOW OR IS PIPED TO ALUM CREEK. APPROXIMATELY 2/3 OF THIS AREA IS ROUTED THROUGH A SERIES OF THREE SMALL DETENTION PONDS IMMEDIATELY BEFORE IT ENTERS ALUM CREEK. CALCULATIONS FOR THESE PONDS ARE NOT INCLUDED IN THIS REPORT, AS SEPARATE STUDIES HAVE SHOWN THAT ALUM CREEK CAN HANDLE 100-YR STORM FLOWS. THEREFORE THE PEAK FLOWS REPORTED BELOW ARE CONSERVATIVE, THEY ARE ACTUALLY SLIGHTLY LOWER DUE TO THE DETENTION PONDS. FLOW PATHS ARE SHORT; t_c = 10 MIN.

i_5 = 1.4 in/hr
i_{100} = 3.8 in/hr

LAND TYPE	Ac.	C	CA
SINGLE FAMILY	26.26	0.50	13.13
OPEN SPACE	6.56	0.30	1.97
UNDEVELOPED	78.52	0.55	43.19
			ΣCA = 58.29

$Q_5 = (1.4 \text{ in/hr})(58.29) = 81.61$ cfs
$Q_{100} = (3.8 \text{ in/hr})(58.29) = 221.50$ cfs

AREA 15: INCLUDED IN AREA 16.

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AREA 16: JUST UNDER HALF OF AREA 16 IS DEVELOPED. FLOW IS DIRECTED TO DRAINAGEWAY 5 BY PIPEFLOW AND SHEET FLOW. AT THE BOTTOM OF THIS AREA THE RUNOFF IS COLLECTED IN THE CAUGHLIN CROSSING STORM DRAIN SYSTEM. TIME OF CONCENTRATION IS BASICALLY THE SAME AS PRE-DEVELOPMENT CONDITIONS, EXCEPT THE LAST 600' IS IN A PIPE NETWORK AND TRAVEL TIME IS NEGLIGIBLE. USING INFORMATION FROM PRE-DEVELOPMENT CONDITIONS, CALCULATE t_c AS FOLLOWS:

$$t_c = 0.9 + 4.9 + 11.5 + \frac{1415' - 600'}{(1.6 fps)(60 sec/min)} = 25.8 \text{ min}$$

$i_5 = 0.76$ in/hr
$i_{100} = 2.1$ in/hr

LAND TYPE	Ac.	C	CA
UNDEVELOPED	38.89	0.55	48.89
SINGLE FAMILY	19.66	0.50	9.83
McCARRAN BLVD	6.18	0.90	5.56
OFFICE/COMMERCIAL	5.48	0.85	4.66
		$\Sigma CA =$	68.94

$Q_5 = (0.76)(68.94) = 52.39$ cfs
$Q_{100} = (2.1)(68.94) = 144.77$ cfs

AREA 17: AREA 17 IS TOTALLY UNDEVELOPED. RUNOFF FLOWS BY SHEET FLOW TO LAST CHANCE DITCH. FLOW PATHS ARE SHORT; t_c = 10 MINUTES.

6.75 AC @ C=0.30

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$Q_5 = (1.4 in/hr)(0.30)(6.75) = 2.84$ cfs
$Q_{100} = (3.8 in/hr)(0.30)(6.75) = 7.70$ cfs

AREA 18: AREA 18 IS TOTALLY UNDEVELOPED. RUNOFF IS BY SHEETFLOW TO CAUGHLIN CREEK. FLOW PATHS ARE SHORT; t_c = 10 MINUTES.

10.29 Ac @ C = 0.30

$Q_5 = (1.4 in/hr)(0.30)(10.29 Ac) = 4.32$ cfs
$Q_{100} = (3.8 in/hr)(0.30)(10.29 Ac) = 11.73$ cfs

AREA 19: THE MAJORITY OF AREA 19 IS UNDEVELOPED. THE DEVELOPED PARTS CONSIST OF McCARRAN BOULEVARD, MAYBERRY DRIVE AND A SMALL PORTION OF MAYBERRY MEADOWS SUBDIVISION. RUNOFF FLOWS BY SHEETFLOW TO ALUM CREEK. FLOW PATHS ARE SHORT; t_c = 10 MIN.

LAND DESCRIPTION	Ac	C	CA
STREETS	8.88	0.90	7.99
SINGLE FAMILY	1.84	0.50	0.92
UNDEVELOPED	27.37	0.30	8.21
			$\Sigma CA = 17.12$

$Q_5 = (1.4)(17.12) = 23.97$ cfs
$Q_{100} = (3.8)(17.12) = 65.06$ cfs

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AREA 20: AREA 20 IS A GRASSED ENTRANCE AREA TO THE MAYBERRY MEADOWS SUBDIVISION. RUNOFF SHEETFLOWS TO LAKE DITCH. FLOW PATHS ARE SHORT; t_c = 10 MIN.

LAND DESCRIPTION	A	C	CA
PAVEMENT	0.43	0.90	0.39
GRASSED AREA	2.72	0.25	0.68
			ΣCA = 1.07

$Q_5 = (1.4)(1.07) = 1.5$ cfs
$Q_{100} = (3.8)(1.07) = 4.07$ cfs

AREA 21: AREA 21 IS MOSTLY UNDEVELOPED. THE ONLY CHANGE FROM PRE-DEVELOPMENT CONDITIONS IS THAT A STREET HAS BEEN CONSTRUCTED ACROSS IT. RUNOFF IS BY SHEET FLOW TO LAKE DITCH. FLOW PATHS ARE SHORT; t_c = 10 MIN.

LAND DESCRIPTION	Ac.	C	CA
UNDEVELOPED	3.64	0.30	1.09
PAVEMENT	0.34	0.90	0.31
		ΣCA	1.40

$Q_5 = (1.4)(1.40) = 1.96$ cfs
$Q_{100} = (3.8)(1.40) = 5.32$ cfs

AREA 22: AREA 22 IS ENTIRELY DEVELOPED. ALL RUNOFF IS BY SHEET FLOW OR PIPE FLOW TO ALUM CREEK. DEVELOPMENT CONSISTS OF TOWNHOMES & PATIO HOMES.

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FLOW PATHS ARE SHORT; t_c = 10 MIN. PEAK FLOWS ARE EQUAL TO THE SUM OF THE FLOWS SHOWN ON THE EXISTING CONDITIONS PLAN.

Q_5 = 17.14 cfs
Q_{100} = 48.80 cfs

AREA 23: AREA 23 IS ENTIRELY DEVELOPED INTO THE MAYBERRY MEADOWS SUBDIVISION. RUNOFF IS ROUTED THROUGH A PIPE NETWORK TO THE TRUCKEE RIVER. THERE IS NO DETENTION ON SITE. TC IS GREATER THAN 10 MINUTES. CALCULATE t_c AS FOLLOWS:

CONDUIT	DELEV.ft	LENGTH.ft	SLOPE,%	VELOCITY,fps	TRAVELTIME,MIN.
OVERLAND TO CB					10
PIPE		277		9.7	0.5
PIPE		185		5.2	0.6
PIPE		120		5.7	0.4
PIPE		560		6.0	1.5
PIPE		200		7.3	0.4
PIPE		325		6.0	0.9
PIPE		518		4.3	2.0
PIPE		2182		6.7	5.4

t_c = 21.7 MIN.
i_5 = 0.84 in/hr
i_{100} = 2.3 in/hr

ΣCA FOR ENTIRE AREA:
ΣQ_5 INTO STORM DRAIN = 24.19 @ t_c = 10 MIN

$$\Sigma CA = \frac{24.19}{1.4} = 17.28$$

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$Q_5 = (0.84)(17.28) = 14.52$ cfs
$Q_{100} = (2.3)(17.28) = 39.74$ cfs

AREA 24: AREA 24 IS ENTIRELY DEVELOPED INTO THE MAYBERRY MEADOWS SUBDIVISION. ALL RUNOFF IS COLLECTED IN A STORM DRAIN SYSTEM AND ROUTED TO THE TRUCKEE RIVER. t_c IS GREATER THAN 10 MINUTES. CALCULATE t_c AS FOLLOWS:

CONDUIT	ΔELEV, ft	LENGTH, ft	SLOPE, ft	VELOCITY, FPS	TRAVEL TIME MIN
OVERLAND TO CB					10
PIPE		187		7.2	0.4
PIPE		130		6.1	0.4
PIPE		180		7.4	0.4
PIPE		205		9.4	0.4
PIPE		290		8.2	0.6

$t_c = 12.2$ MIN.
$i_5 = 1.25$ in/hr
$i_{100} = 3.4$ in/hr

ΣCA FOR ENTIRE AREA:
Σ Q_5 INTO STORM DRAIN = 21.63 cfs @ t_c = 10 min

$$\Sigma CA = \frac{21.63}{1.4} = 15.45$$

$Q_5 = (1.25)(15.45) = 19.31$ cfs
$Q_{100} = (3.4)(15.45) = 52.53$ cfs

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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

PEAK EXISTING FLOWS

AREA #	DRAINS TO	Q_5, cfs	Q_{100}, cfs
1	ROSEWOOD WASH	45.5	150.2
2	OFFSITE - SOUTH	0.29	0.80
3	OFFSITE - SOUTH	2.06	5.59
4	OFFSITE - SOUTHEAST	3.5	14.0
5	DRAINAGEWAY 1	34.12	87.73
6	DRAINAGEWAY 2	5.75	15.6
7	DRAINAGEWAY 3	23.29	63.85
8	DRAINAGEWAY 4	44.9	125.8
10	ALUM CREEK	54.69	148.87
11	STEAMBOAT DITCH	70.31	190.84
13	OFFSITE - NORTH	8.11	22.00
14	ALUM CREEK	81.61	221.50
16	DRAINAGEWAY 5	52.39	144.77
17	LAST CHANCE DITCH	2.84	7.70
18	CAUGHLIN CREEK	4.32	11.73
19	ALUM CREEK	23.97	65.06
20	LAKE DITCH	1.5	4.07
21	LAKE DITCH	1.96	5.32
22	ALUM CREEK	17.14	48.80
23	TRUCKEE RIVER	14.52	39.74
24	TRUCKEE RIVER	19.31	52.53

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TOTAL PEAK FLOWS TO EACH DRAINAGEWAY
EXISTING CONDITIONS

AREA #	DRAINS TO	Q_5, cfs	Q_{100}, cfs
1	ROSEWOOD WASH	45.5	150.2
2 & 3	OFFSITE - SOUTH	2.4	6.4
4	OFFSITE - SOUTHEAST	3.5	14.0
5	DRAINAGEWAY 1	34.1	87.7
6	DRAINAGEWAY 2	5.8	15.6
7	DRAINAGEWAY 3	23.3	63.9
8	DRAINAGEWAY 4	44.9	125.8
16	DRAINAGEWAY 5	52.4	144.8
18	CAUGHLIN CREEK	4.3	11.7
10, 14, 19 & 22	ALUM CREEK	177.4	484.2
13	OFFSITE - NORTH	8.1	22.0
11	STEAMBOAT DITCH	70.3	190.8
17	LAST CHANCE DITCH	2.8	7.7
20 & 21	LAKE DITCH	3.5	9.4
23 & 24	TRUCKEE RIVER	33.8	92.3
	TOTAL	512.1	1,426.5

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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

FINAL DEVELOPED CONDITIONS

THE FOLLOWING CALCULATIONS ARE BASED ON TENTATIVE MAPS AND PRELIMINARY PLANS FOR THE REMAINDER OF CAUGHLIN RANCH. SOME ASSUMPTIONS MADE IN THIS SECTION (PROPOSED STORM DRAIN LINES, PROPOSED DETENTION PONDS, ETC.) MAY CHANGE WITH THE FINAL DEVELOPMENT OF CAUGHLIN RANCH. IF FLOWS FOR AN AREA HAVE BEEN CALCULATED BY THE RATIONAL METHOD, AND FINAL DEVELOPMENT INCLUDES THE CONSTRUCTION OF A DETENTION POND IN THAT AREA, ALL FLOWS (INCLUDING PRE-DEVELOPMENT) FOR THAT AREA NEED TO BE RECALCULATED USING THE SCS METHOD. (PRE-DEVELOPMENT FLOWS CALCULATED BY THE RATIONAL METHOD SHOULD NOT BE COMPARED TO FINAL DEVELOPMENT FLOWS CALCULATED BY THE SCS METHOD.)

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

JOB 1016.38
SHEET NO. 153 OF
CALCULATED BY KRK DATE 12-18-90
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

CALCULATE PEAK FLOWS FOR FINAL CONDITIONS

AREA 1: TWO ADDITIONAL DETENTION PONDS WILL BE CONSTRUCTED IN THIS AREA, UPSTREAM OF ROSEWOOD WASH. ALL ADDITIONAL DEVELOPMENT WILL BE UPSTREAM OF ROSEWOOD WASH. RUNOFF FROM THE AREA TO BE DEVELOPED WILL BE ROUTED THROUGH 5 DETENTION PONDS BEFORE ENTERING THE ROSEWOOD WASH DETENTION POND. HYDROGRAPHS FOR THESE PONDS (SEE HYDROLOGY REPORT FOR ROSEWOOD WASH DETENTION BASIN DOWN-DRAINS) ARE ADDED TO THE 5 & 100-YR HYDROGRAPHS FOR THE AREA FLOWING DIRECTLY INTO ROSEWOOD WASH. (EXISTING & FINAL CONDITIONS FOR THE AREA FLOWING DIRECTLY INTO ROSEWOOD WASH AND THE AREA DOWNSTREAM OF ROSEWOOD WASH ARE THE SAME.) THE RESULTING HYDROGRAPH IS ROUTED THROUGH ROSEWOOD WASH DETENTION POND. THE 5 & 100-YR OUTFLOW HYDROGRAPHS ARE ADDED TO THE HYDROGRAPHS FOR THE DOWNSTREAM AREA TO CREATE COMPOSITE HYDROGRAPHS FOR THE ENTIRE AREA. PEAK FLOWS ARE:

Q_5 = 44.6 cfs
Q_{100} = 132.2 cfs

AREAS 2 & 3: PROPOSED GRADING IS SUCH THAT THESE AREAS BECOME PART OF AREA 1 AND DRAIN TO ROSEWOOD WASH

POND-2 Version: 5.13 S/N: 1220510325
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*****************************************************************
*                                                               *
*          CAUGHLIN RANCH MASTER HYDROLOGY  1016.38             *
*  EXISTING ROSEWOOD WASH DETENTION POND - FINAL CONDITIONS     *
*                      DECEMBER 17, 1990                        *
*                    CODEGA & FRICKE, INC.                      *
*                        5-YR STORM                             *
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Inflow Hydrograph: RWF5-IN .HYD
Rating Table file: ROSEWD .PND

-----INITIAL CONDITIONS-----
Elevation = 5041.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5041.00	0.0	0.000
5042.00	2.3	0.015
5043.00	5.1	0.082
5044.00	6.9	0.303
5045.00	9.4	0.693
5046.00	25.9	1.224
5047.00	51.7	1.856
5048.00	81.3	2.536
5049.00	102.8	3.283
5050.00	120.4	4.117

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
3.6	5.9
20.0	25.1
73.3	80.2
167.8	177.2
296.3	322.2
449.2	500.9
613.8	695.1
794.5	897.3
996.2	1116.6

Time increment (t) = 0.100 hrs.

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	------	0.0	0.0	0.00	5041.00
11.100	0.00	0.0	0.0	0.0	0.00	5041.00
11.200	0.18	0.2	0.0	0.2	0.07	5041.03
11.300	0.47	0.6	0.2	0.7	0.27	5041.12
11.400	0.67	1.1	0.3	1.3	0.50	5041.22
11.500	1.03	1.7	0.4	2.0	0.77	5041.34
11.600	1.68	2.7	0.7	3.1	1.23	5041.53
11.700	4.34	6.0	1.9	6.7	2.42	5042.04
11.800	7.47	11.8	6.8	13.7	3.44	5042.41
11.900	11.20	18.7	15.2	25.5	5.11	5043.01
12.000	25.41	36.6	39.9	51.9	5.97	5043.49
12.100	42.19	67.6	92.3	107.5	7.60	5044.28
12.200	40.83	83.0	156.6	175.3	9.35	5044.98
12.300	35.20	76.0	201.2	232.7	15.71	5045.38
12.400	32.36	67.6	229.2	268.8	19.82	5045.63
12.500	26.19	58.6	243.8	287.7	21.97	5045.76
12.600	21.69	47.9	246.8	291.6	22.42	5045.79
12.700	17.05	38.7	242.1	285.5	21.73	5045.75
12.800	15.19	32.2	233.4	274.3	20.45	5045.67
12.900	14.58	29.8	224.8	263.2	19.18	5045.59
13.000	13.85	28.4	217.2	253.3	18.05	5045.52
13.100	13.68	27.5	210.5	244.7	17.08	5045.47
13.200	13.49	27.2	205.1	237.7	16.28	5045.42
13.300	12.67	26.2	200.2	231.3	15.55	5045.37
13.400	12.32	25.0	195.5	225.2	14.86	5045.33
13.500	12.54	24.9	191.7	220.3	14.30	5045.30
13.600	11.42	24.0	188.1	215.7	13.78	5045.27
13.700	11.52	22.9	184.6	211.1	13.25	5045.23
13.800	11.49	23.0	181.9	207.6	12.85	5045.21
13.900	11.54	23.0	179.8	204.9	12.55	5045.19
14.000	11.27	22.8	178.0	202.6	12.29	5045.18
14.100	10.91	22.2	176.2	200.2	12.02	5045.16
14.200	10.68	21.6	174.3	197.8	11.74	5045.14
14.300	10.47	21.2	172.5	195.4	11.47	5045.13
14.400	10.29	20.8	170.8	193.3	11.22	5045.11
14.500	10.15	20.4	169.3	191.2	11.00	5045.10
14.600	10.03	20.2	167.9	189.4	10.79	5045.08
14.700	9.95	20.0	166.6	187.8	10.61	5045.07
14.800	9.88	19.8	165.6	186.5	10.45	5045.06
14.900	9.83	19.7	164.6	185.3	10.31	5045.06
15.000	9.78	19.6	163.8	184.2	10.20	5045.05
15.100	9.75	19.5	163.2	183.4	10.10	5045.04
15.200	9.71	19.5	162.6	182.6	10.02	5045.04
15.300	9.68	19.4	162.1	182.0	9.94	5045.03
15.400	9.64	19.3	161.7	181.4	9.88	5045.03

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	9.60	19.2	161.3	180.9	9.82	5045.03
15.600	9.56	19.2	160.9	180.4	9.77	5045.02
15.700	9.52	19.1	160.6	180.0	9.71	5045.02
15.800	9.30	18.8	160.1	179.4	9.64	5045.01
15.900	8.98	18.3	159.3	178.4	9.53	5045.01
16.000	8.75	17.7	158.2	177.0	9.40	5045.00
16.100	8.56	17.3	156.8	175.6	9.36	5044.98
16.200	8.43	17.0	155.2	173.8	9.31	5044.97
16.300	8.32	16.8	153.4	172.0	9.26	5044.95
16.400	8.22	16.5	151.5	170.0	9.21	5044.93
16.500	8.13	16.4	149.6	167.9	9.16	5044.90
16.600	8.06	16.2	147.6	165.8	9.10	5044.88
16.700	7.99	16.1	145.5	163.6	9.05	5044.86
16.800	7.92	15.9	143.4	161.4	8.99	5044.84
16.900	7.84	15.8	141.3	159.2	8.94	5044.81
17.000	7.78	15.6	139.2	156.9	8.88	5044.79
17.100	7.69	15.5	137.0	154.7	8.82	5044.77
17.200	7.61	15.3	134.8	152.3	8.76	5044.74
17.300	7.52	15.1	132.5	149.9	8.70	5044.72
17.400	7.43	15.0	130.2	147.5	8.63	5044.69
17.500	7.34	14.8	127.9	145.0	8.57	5044.67
17.600	7.25	14.6	125.4	142.4	8.50	5044.64
17.700	7.16	14.4	123.0	139.8	8.44	5044.61
17.800	7.05	14.2	120.4	137.2	8.37	5044.59
17.900	6.95	14.0	117.9	134.4	8.30	5044.56
18.000	6.84	13.8	115.2	131.6	8.23	5044.53
18.100	6.74	13.6	112.5	128.8	8.15	5044.50
18.200	6.63	13.4	109.7	125.8	8.08	5044.47
18.300	6.52	13.2	106.8	122.8	8.00	5044.44
18.400	6.41	12.9	103.9	119.8	7.92	5044.41
18.500	6.30	12.7	101.0	116.6	7.84	5044.38
18.600	6.18	12.5	97.9	113.5	7.76	5044.34
18.700	6.07	12.3	94.8	110.2	7.67	5044.31
18.800	5.96	12.0	91.7	106.9	7.59	5044.27
18.900	5.85	11.8	88.5	103.5	7.50	5044.24
19.000	5.75	11.6	85.3	100.1	7.41	5044.20
19.100	5.64	11.4	82.0	96.7	7.32	5044.17
19.200	5.52	11.2	78.7	93.2	7.23	5044.13
19.300	5.41	10.9	75.4	89.7	7.14	5044.10
19.400	5.30	10.7	72.0	86.1	7.05	5044.06
19.500	4.19	9.5	67.6	81.5	6.93	5044.01
19.600	4.08	8.3	62.4	75.9	6.76	5043.92
19.700	3.98	8.1	57.3	70.4	6.58	5043.82
19.800	3.87	7.9	52.3	65.1	6.41	5043.73
19.900	3.78	7.7	47.5	59.9	6.24	5043.63
20.000	3.68	7.5	42.8	54.9	6.07	5043.54

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	3.59	7.3	38.2	50.1	5.92	5043.45
20.200	3.49	7.1	33.8	45.3	5.76	5043.37
20.300	3.40	6.9	29.5	40.7	5.61	5043.28
20.400	3.30	6.7	25.2	36.2	5.46	5043.20
20.500	3.21	6.5	21.1	31.7	5.32	5043.12
20.600	3.13	6.3	17.1	27.4	5.18	5043.04
20.700	3.04	6.2	13.6	23.3	4.84	5042.91
20.800	2.97	6.0	11.0	19.6	4.30	5042.71
20.900	2.90	5.9	9.1	16.9	3.90	5042.57
21.000	2.83	5.7	7.6	14.8	3.60	5042.46
21.100	2.78	5.6	6.5	13.2	3.37	5042.38
21.200	2.72	5.5	5.6	12.0	3.19	5042.32
21.300	2.67	5.4	4.9	11.0	3.04	5042.27
21.400	2.62	5.3	4.3	10.2	2.93	5042.22
21.500	2.57	5.2	3.9	9.5	2.83	5042.19
21.600	2.53	5.1	3.5	9.0	2.75	5042.16
21.700	2.49	5.0	3.1	8.5	2.68	5042.14
21.800	2.45	4.9	2.8	8.1	2.62	5042.11
21.900	2.42	4.9	2.6	7.7	2.56	5042.09
22.000	2.39	4.8	2.3	7.4	2.52	5042.08
22.100	2.35	4.7	2.1	7.1	2.47	5042.06
22.200	2.33	4.7	1.9	6.8	2.44	5042.05
22.300	2.30	4.6	1.8	6.6	2.40	5042.04
22.400	2.28	4.6	1.6	6.4	2.37	5042.02
22.500	2.26	4.5	1.5	6.2	2.34	5042.01
22.600	2.24	4.5	1.4	6.0	2.31	5042.00
22.700	2.22	4.5	1.3	5.8	2.27	5041.99
22.800	2.20	4.4	1.2	5.7	2.22	5041.97
22.900	2.18	4.4	1.2	5.6	2.20	5041.96
23.000	2.17	4.4	1.2	5.6	2.18	5041.95
23.100	2.16	4.3	1.2	5.6	2.17	5041.94
23.200	2.14	4.3	1.2	5.5	2.15	5041.94
23.300	2.13	4.3	1.2	5.5	2.14	5041.93
23.400	2.12	4.3	1.2	5.5	2.13	5041.93
23.500	2.11	4.2	1.2	5.4	2.12	5041.92
23.600	2.10	4.2	1.2	5.4	2.11	5041.92
23.700	2.09	4.2	1.2	5.4	2.10	5041.91
23.800	2.09	4.2	1.2	5.4	2.09	5041.91
23.900	2.08	4.2	1.2	5.3	2.09	5041.91
24.000	2.07	4.2	1.2	5.3	2.08	5041.90
24.100	2.05	4.1	1.2	5.3	2.06	5041.90
24.200	2.00	4.1	1.1	5.2	2.03	5041.88
24.300	1.95	4.0	1.1	5.1	1.99	5041.86
24.400	1.89	3.8	1.1	5.0	1.93	5041.84
24.500	1.81	3.7	1.0	4.8	1.87	5041.81
24.600	1.74	3.6	1.0	4.6	1.80	5041.78

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	1.66	3.4	1.0	4.4	1.72	5041.75
24.800	1.58	3.2	0.9	4.2	1.64	5041.71
24.900	1.50	3.1	0.9	4.0	1.56	5041.68
25.000	1.42	2.9	0.8	3.8	1.48	5041.64
25.100	1.34	2.8	0.8	3.6	1.40	5041.61
25.200	1.26	2.6	0.7	3.4	1.32	5041.57
25.300	1.19	2.5	0.7	3.2	1.25	5041.54
25.400	1.12	2.3	0.7	3.0	1.18	5041.51
25.500	1.05	2.2	0.6	2.8	1.10	5041.48
25.600	0.98	2.0	0.6	2.7	1.03	5041.45
25.700	0.92	1.9	0.5	2.5	0.97	5041.42
25.800	0.86	1.8	0.5	2.3	0.91	5041.39
25.900	0.81	1.7	0.5	2.2	0.85	5041.37
26.000	0.78	1.6	0.5	2.1	0.81	5041.35
26.100	0.76	1.5	0.4	2.0	0.78	5041.34
26.200	0.74	1.5	0.4	1.9	0.76	5041.33
26.300	0.72	1.5	0.4	1.9	0.74	5041.32
26.400	0.70	1.4	0.4	1.8	0.72	5041.31
26.500	0.67	1.4	0.4	1.8	0.69	5041.30
26.600	0.65	1.3	0.4	1.7	0.67	5041.29
26.700	0.63	1.3	0.4	1.7	0.65	5041.28
26.800	0.61	1.2	0.4	1.6	0.63	5041.27
26.900	0.59	1.2	0.3	1.6	0.61	5041.26
27.000	0.57	1.2	0.3	1.5	0.59	5041.25
27.100	0.55	1.1	0.3	1.4	0.57	5041.25
27.200	0.53	1.1	0.3	1.4	0.55	5041.24
27.300	0.51	1.0	0.3	1.3	0.53	5041.23
27.400	0.49	1.0	0.3	1.3	0.51	5041.22
27.500	0.48	1.0	0.3	1.3	0.49	5041.21
27.600	0.46	0.9	0.3	1.2	0.47	5041.21
27.700	0.44	0.9	0.3	1.2	0.46	5041.20
27.800	0.43	0.9	0.2	1.1	0.44	5041.19
27.900	0.41	0.8	0.2	1.1	0.42	5041.18
28.000	0.39	0.8	0.2	1.0	0.41	5041.18
28.100	0.38	0.8	0.2	1.0	0.39	5041.17
28.200	0.36	0.7	0.2	1.0	0.37	5041.16
28.300	0.35	0.7	0.2	0.9	0.36	5041.16
28.400	0.34	0.7	0.2	0.9	0.35	5041.15
28.500	0.32	0.7	0.2	0.9	0.33	5041.15
28.600	0.31	0.6	0.2	0.8	0.32	5041.14
28.700	0.30	0.6	0.2	0.8	0.31	5041.13
28.800	0.29	0.6	0.2	0.8	0.30	5041.13
28.900	0.28	0.6	0.2	0.7	0.29	5041.13
29.000	0.27	0.6	0.2	0.7	0.28	5041.12
29.100	0.26	0.5	0.2	0.7	0.27	5041.12
29.200	0.25	0.5	0.1	0.7	0.26	5041.11

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
29.300	0.24	0.5	0.1	0.6	0.25	5041.11
29.400	0.23	0.5	0.1	0.6	0.24	5041.10
29.500	0.22	0.5	0.1	0.6	0.23	5041.10
29.600	0.21	0.4	0.1	0.6	0.22	5041.09
29.700	0.20	0.4	0.1	0.5	0.21	5041.09
29.800	0.19	0.4	0.1	0.5	0.20	5041.09
29.900	0.18	0.4	0.1	0.5	0.19	5041.08
30.000	0.18	0.4	0.1	0.5	0.18	5041.08

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

Starting Pond W.S. Elevation = 5041.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	42.19 cfs
Peak Outflow	=	22.42 cfs
Peak Elevation	=	5045.79 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	1.11 ac-ft
Total Storage in Pond	=	1.11 ac-ft

Warning: Inflow hydrograph truncated on right side.

Pond File: ROSEWD .PND
Inflow Hydrograph: RWF5-IN .HYD
Outflow Hydrograph: RWF5-OUT.HYD

EXECUTED: 12-18-1990
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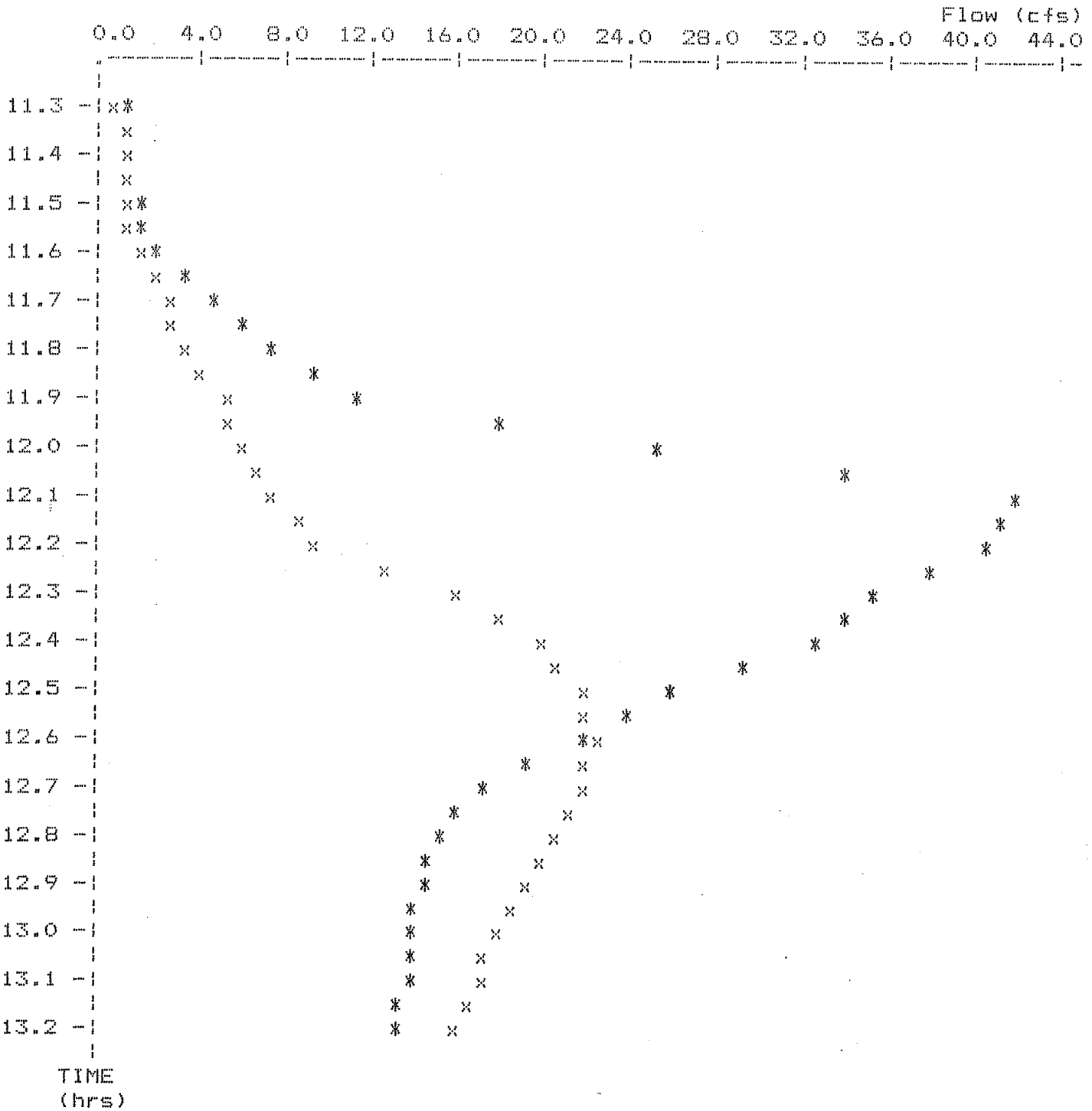
Peak Inflow = 42.19 cfs
Peak Outflow = 22.42 cfs
Peak Elevation = 5045.79 ft



* File: RWF5-IN .HYD Qmax = 42.2 cfs
x File: RWF5-OUT.HYD Qmax = 22.4 cfs

POND-2 Version: 5.13 S/N: 1220510325
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**********************************************************************
*                                                                    *
*          CAUGHLIN RANCH MASTER HYDROLOGY  1016.38                  *
*  EXISTING ROSEWOOD WASH DETENTION POND - FINAL CONDITIONS          *
*                      DECEMBER 17, 1990                             *
*                   CODEGA & FRICKE, INC.                            *
*                   100-YR STORM                                     *
**********************************************************************
```

Inflow Hydrograph: RWFC-IN .HYD
Rating Table file: ROSEWD .PND

-----INITIAL CONDITIONS-----
Elevation = 5041.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5041.00	0.0	0.000
5042.00	2.3	0.015
5043.00	5.1	0.082
5044.00	6.9	0.303
5045.00	9.4	0.693
5046.00	25.9	1.224
5047.00	51.7	1.856
5048.00	81.3	2.536
5049.00	102.8	3.283
5050.00	120.4	4.117

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
3.6	5.9
20.0	25.1
73.3	80.2
167.8	177.2
296.3	322.2
449.2	500.9
613.8	695.1
794.5	897.3
996.2	1116.6

Time increment (t) = 0.100 hrs.

Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	1.05	------	0.0	0.0	0.00	5041.00
11.100	1.83	2.9	0.6	2.9	1.12	5041.49
11.200	4.70	6.5	2.2	7.2	2.49	5042.07
11.300	5.66	10.4	6.0	12.6	3.27	5042.35
11.400	6.10	11.8	9.7	17.8	4.03	5042.62
11.500	7.70	13.8	13.7	23.5	4.87	5042.92
11.600	8.39	16.1	19.3	29.8	5.26	5043.09
11.700	17.74	26.1	33.9	45.5	5.77	5043.37
11.800	30.50	48.2	68.3	82.2	6.95	5044.02
11.900	42.66	73.2	124.5	141.4	8.48	5044.63
12.000	75.21	117.9	208.7	242.3	16.81	5045.45
12.100	116.29	191.5	325.9	400.2	37.16	5046.44
12.200	103.25	219.5	428.5	545.4	58.48	5047.23
12.300	91.10	194.4	482.3	622.8	70.28	5047.63
12.400	68.23	159.3	495.3	641.6	73.14	5047.72
12.500	60.52	128.8	483.1	624.1	70.47	5047.63
12.600	58.29	118.8	467.7	601.9	67.10	5047.52
12.700	55.12	113.4	453.3	581.1	63.93	5047.41
12.800	53.09	108.2	439.6	561.5	60.93	5047.31
12.900	50.36	103.5	426.8	543.1	58.12	5047.22
13.000	45.06	95.4	412.4	522.3	54.95	5047.11
13.100	40.19	85.3	395.2	497.6	51.22	5046.98
13.200	37.56	77.8	377.6	472.9	47.65	5046.84
13.300	35.89	73.5	362.1	451.1	44.50	5046.72
13.400	35.21	71.1	349.3	433.2	41.92	5046.62
13.500	34.59	69.8	339.4	419.1	39.89	5046.54
13.600	33.06	67.7	330.7	407.0	38.14	5046.47
13.700	31.96	65.0	322.7	395.7	36.51	5046.41
13.800	30.56	62.5	315.2	385.2	35.00	5046.35
13.900	29.27	59.8	308.0	375.1	33.53	5046.30
14.000	28.45	57.7	301.4	365.7	32.18	5046.24
14.100	27.74	56.2	295.6	357.6	31.00	5046.20
14.200	27.14	54.9	290.5	350.4	29.97	5046.16
14.300	26.53	53.7	286.0	344.2	29.07	5046.12
14.400	26.00	52.5	282.0	338.6	28.26	5046.09
14.500	24.54	50.5	277.8	332.6	27.40	5046.06
14.600	24.14	48.7	273.4	326.5	26.51	5046.02
14.700	23.72	47.9	269.7	321.3	25.80	5045.99
14.800	23.32	47.0	266.2	316.8	25.28	5045.96
14.900	22.94	46.3	262.9	312.5	24.79	5045.93
15.000	22.60	45.5	259.8	308.4	24.33	5045.90
15.100	22.26	44.9	256.8	304.6	23.90	5045.88
15.200	21.97	44.2	254.1	301.1	23.49	5045.85
15.300	20.50	42.5	250.6	296.5	22.98	5045.82
15.400	19.69	40.2	246.1	290.8	22.32	5045.78

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	19.41	39.1	241.9	285.2	21.69	5045.74
15.600	18.99	38.4	238.0	280.3	21.12	5045.71
15.700	18.83	37.8	234.6	275.8	20.62	5045.68
15.800	18.59	37.4	231.6	272.0	20.19	5045.65
15.900	18.51	37.1	229.1	268.7	19.81	5045.63
16.000	18.30	36.8	226.9	265.9	19.49	5045.61
16.100	18.19	36.5	225.0	263.4	19.21	5045.59
16.200	17.99	36.2	223.3	261.2	18.95	5045.58
16.300	17.87	35.9	221.7	259.1	18.72	5045.56
16.400	17.69	35.6	220.2	257.3	18.51	5045.55
16.500	17.57	35.3	218.9	255.5	18.31	5045.54
16.600	17.40	35.0	217.6	253.9	18.12	5045.53
16.700	17.27	34.7	216.4	252.3	17.94	5045.52
16.800	17.11	34.4	215.2	250.8	17.77	5045.51
16.900	16.98	34.1	214.1	249.3	17.61	5045.50
17.000	16.84	33.8	213.0	247.9	17.45	5045.49
17.100	16.70	33.5	212.0	246.6	17.29	5045.48
17.200	16.57	33.3	211.0	245.3	17.14	5045.47
17.300	15.43	32.0	209.2	243.0	16.88	5045.45
17.400	15.31	30.7	206.9	240.0	16.54	5045.43
17.500	15.17	30.5	204.9	237.4	16.24	5045.41
17.600	15.06	30.2	203.1	235.1	15.99	5045.40
17.700	14.96	30.0	201.6	233.2	15.76	5045.39
17.800	14.85	29.8	200.3	231.4	15.57	5045.37
17.900	14.75	29.6	199.1	229.9	15.39	5045.36
18.000	14.64	29.4	198.0	228.5	15.23	5045.35
18.100	14.53	29.2	197.0	227.2	15.09	5045.34
18.200	14.41	28.9	196.1	226.0	14.95	5045.34
18.300	14.30	28.7	195.2	224.8	14.81	5045.33
18.400	14.19	28.5	194.3	223.7	14.68	5045.32
18.500	14.04	28.2	193.4	222.5	14.55	5045.31
18.600	13.55	27.6	192.2	221.0	14.38	5045.30
18.700	12.95	26.5	190.5	218.7	14.12	5045.29
18.800	12.58	25.5	188.4	216.0	13.81	5045.27
18.900	12.30	24.9	186.3	213.3	13.50	5045.25
19.000	12.06	24.4	184.2	210.6	13.20	5045.23
19.100	11.88	23.9	182.3	208.2	12.92	5045.21
19.200	11.70	23.6	180.6	205.9	12.66	5045.20
19.300	11.53	23.2	179.0	203.8	12.42	5045.18
19.400	11.38	22.9	177.5	201.9	12.20	5045.17
19.500	11.23	22.6	176.1	200.1	12.00	5045.16
19.600	11.09	22.3	174.8	198.4	11.81	5045.15
19.700	10.94	22.0	173.5	196.8	11.63	5045.14
19.800	10.80	21.7	172.4	195.3	11.46	5045.12
19.900	10.66	21.5	171.3	193.8	11.29	5045.11
20.000	10.54	21.2	170.2	192.5	11.13	5045.11

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Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	10.43	21.0	169.2	191.2	10.99	5045.10
20.200	10.33	20.8	168.3	189.9	10.85	5045.09
20.300	10.20	20.5	167.4	188.8	10.72	5045.08
20.400	10.06	20.3	166.4	187.6	10.58	5045.07
20.500	9.95	20.0	165.6	186.5	10.45	5045.06
20.600	9.83	19.8	164.7	185.3	10.32	5045.06
20.700	9.73	19.6	163.9	184.3	10.20	5045.05
20.800	9.62	19.4	163.0	183.2	10.08	5045.04
20.900	9.52	19.1	162.3	182.2	9.96	5045.03
21.000	9.41	18.9	161.5	181.2	9.85	5045.03
21.100	9.30	18.7	160.7	180.2	9.74	5045.02
21.200	9.20	18.5	160.0	179.2	9.63	5045.01
21.300	9.10	18.3	159.2	178.3	9.52	5045.01
21.400	9.00	18.1	158.5	177.3	9.41	5045.00
21.500	8.90	17.9	157.6	176.4	9.38	5044.99
21.600	8.81	17.7	156.7	175.4	9.35	5044.98
21.700	8.71	17.5	155.5	174.2	9.32	5044.97
21.800	8.61	17.3	154.3	172.8	9.29	5044.95
21.900	8.51	17.1	152.9	171.4	9.25	5044.94
22.000	8.40	16.9	151.4	169.8	9.21	5044.92
22.100	8.30	16.7	149.8	168.1	9.16	5044.91
22.200	8.20	16.5	148.0	166.3	9.12	5044.89
22.300	8.09	16.3	146.2	164.3	9.07	5044.87
22.400	7.98	16.1	144.2	162.3	9.01	5044.85
22.500	7.86	15.8	142.1	160.1	8.96	5044.82
22.600	7.75	15.6	140.0	157.8	8.90	5044.80
22.700	7.64	15.4	137.7	155.4	8.84	5044.77
22.800	7.53	15.2	135.3	152.8	8.77	5044.75
22.900	7.42	15.0	132.8	150.3	8.70	5044.72
23.000	7.30	14.7	130.3	147.6	8.64	5044.69
23.100	7.18	14.5	127.6	144.8	8.56	5044.67
23.200	7.07	14.3	124.9	141.9	8.49	5044.64
23.300	6.96	14.0	122.1	138.9	8.41	5044.61
23.400	6.85	13.8	119.3	135.9	8.34	5044.57
23.500	6.74	13.6	116.3	132.9	8.26	5044.54
23.600	6.63	13.4	113.4	129.7	8.18	5044.51
23.700	6.51	13.1	110.3	126.5	8.09	5044.48
23.800	6.40	12.9	107.2	123.2	8.01	5044.44
23.900	6.29	12.7	104.1	119.9	7.92	5044.41
24.000	5.01	11.3	99.7	115.4	7.81	5044.36
24.100	4.61	9.6	94.1	109.4	7.65	5044.30
24.200	4.28	8.9	88.0	103.0	7.49	5044.23
24.300	4.03	8.3	81.7	96.3	7.31	5044.17
24.400	3.79	7.8	75.2	89.5	7.14	5044.10
24.500	3.56	7.4	68.6	82.6	6.96	5044.02
24.600	3.36	6.9	62.1	75.6	6.75	5043.92

Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	3.15	6.5	55.5	68.6	6.52	5043.79
24.800	2.97	6.1	49.1	61.7	6.29	5043.66
24.900	2.80	5.8	42.7	54.8	6.07	5043.54
25.000	2.64	5.4	36.4	48.1	5.85	5043.42
25.100	2.49	5.1	30.3	41.6	5.64	5043.30
25.200	2.34	4.8	24.3	35.1	5.43	5043.18
25.300	2.18	4.5	18.3	28.8	5.22	5043.07
25.400	2.03	4.2	13.1	22.5	4.73	5042.87
25.500	1.90	3.9	9.2	17.0	3.92	5042.58
25.600	1.76	3.7	6.2	12.8	3.31	5042.36
25.700	1.65	3.4	3.9	9.6	2.84	5042.19
25.800	1.52	3.2	2.1	7.1	2.47	5042.06
25.900	1.42	2.9	1.1	5.1	1.98	5041.86
26.000	1.32	2.7	0.8	3.9	1.50	5041.65
26.100	1.22	2.5	0.7	3.4	1.32	5041.57
26.200	1.13	2.4	0.7	3.1	1.21	5041.52
26.300	1.04	2.2	0.6	2.8	1.11	5041.48
26.400	0.95	2.0	0.6	2.6	1.02	5041.44
26.500	0.88	1.8	0.5	2.4	0.94	5041.41
26.600	0.81	1.7	0.5	2.2	0.87	5041.38
26.700	0.78	1.6	0.5	2.1	0.81	5041.35
26.800	0.76	1.5	0.4	2.0	0.78	5041.34
26.900	0.73	1.5	0.4	1.9	0.75	5041.33
27.000	0.71	1.4	0.4	1.9	0.73	5041.32
27.100	0.68	1.4	0.4	1.8	0.70	5041.31
27.200	0.66	1.3	0.4	1.7	0.68	5041.29
27.300	0.64	1.3	0.4	1.7	0.66	5041.29
27.400	0.62	1.3	0.4	1.6	0.64	5041.28
27.500	0.60	1.2	0.3	1.6	0.62	5041.27
27.600	0.58	1.2	0.3	1.5	0.60	5041.26
27.700	0.55	1.1	0.3	1.5	0.57	5041.25
27.800	0.53	1.1	0.3	1.4	0.55	5041.24
27.900	0.52	1.1	0.3	1.4	0.53	5041.23
28.000	0.50	1.0	0.3	1.3	0.51	5041.22
28.100	0.48	1.0	0.3	1.3	0.50	5041.22
28.200	0.46	0.9	0.3	1.2	0.48	5041.21
28.300	0.44	0.9	0.3	1.2	0.46	5041.20
28.400	0.43	0.9	0.2	1.1	0.44	5041.19
28.500	0.41	0.8	0.2	1.1	0.42	5041.18
28.600	0.39	0.8	0.2	1.0	0.41	5041.18
28.700	0.38	0.8	0.2	1.0	0.39	5041.17
28.800	0.36	0.7	0.2	1.0	0.37	5041.16
28.900	0.35	0.7	0.2	0.9	0.36	5041.16
29.000	0.34	0.7	0.2	0.9	0.35	5041.15
29.100	0.32	0.7	0.2	0.9	0.33	5041.15
29.200	0.31	0.6	0.2	0.8	0.32	5041.14

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
29.300	0.30	0.6	0.2	0.8	0.31	5041.13
29.400	0.29	0.6	0.2	0.8	0.30	5041.13
29.500	0.28	0.6	0.2	0.7	0.29	5041.13
29.600	0.26	0.5	0.2	0.7	0.27	5041.12
29.700	0.25	0.5	0.1	0.7	0.26	5041.11
29.800	0.24	0.5	0.1	0.6	0.25	5041.11
29.900	0.23	0.5	0.1	0.6	0.24	5041.10
30.000	0.22	0.5	0.1	0.6	0.23	5041.10

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

Starting Pond W.S. Elevation = 5041.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	116.29 cfs
Peak Outflow	=	73.14 cfs
Peak Elevation	=	5047.72 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	2.35 ac-ft
Total Storage in Pond	=	2.35 ac-ft

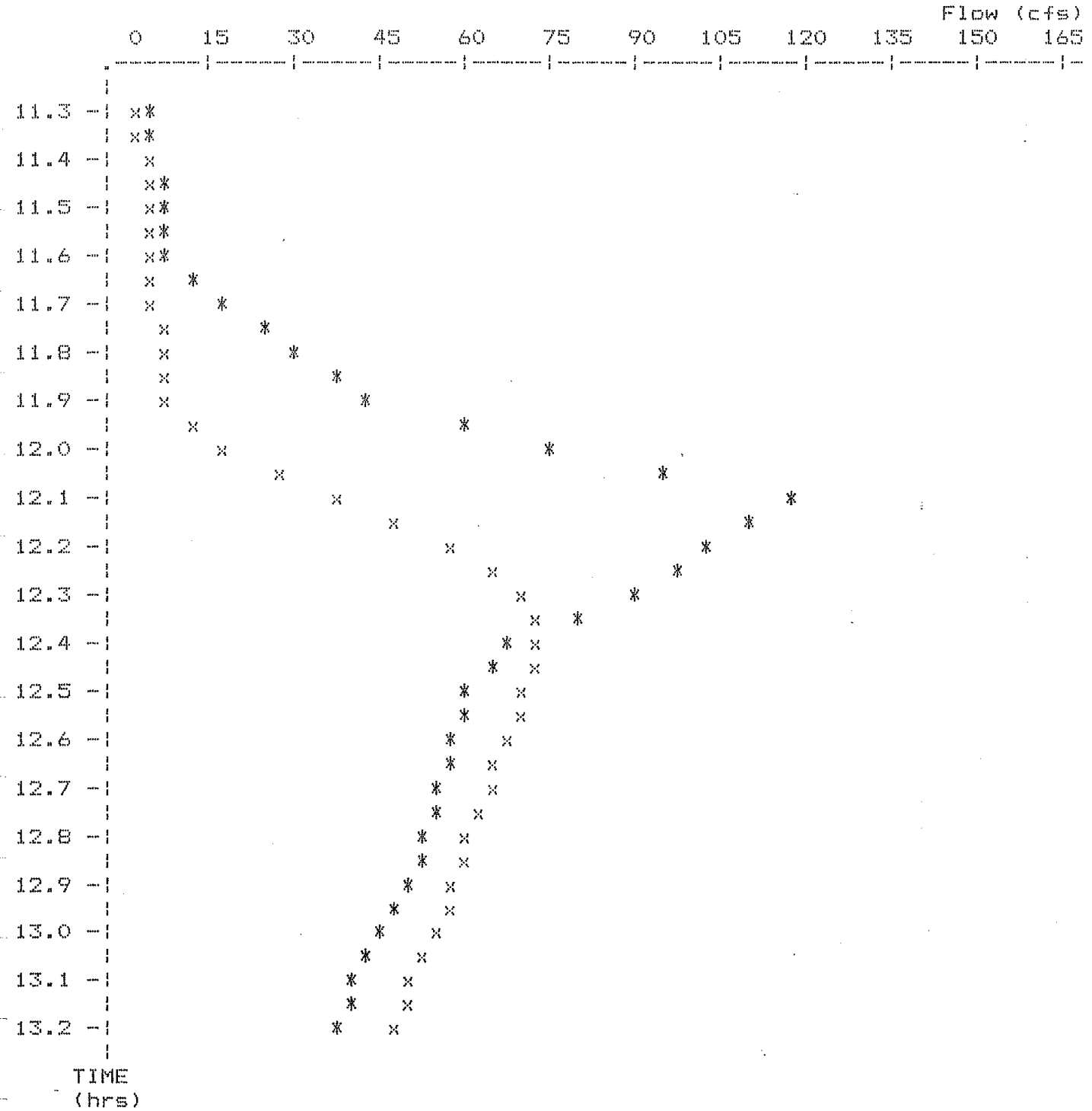
Warning: Inflow hydrograph truncated on left side.
Warning: Inflow hydrograph truncated on right side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: ROSEWD .PND
Inflow Hydrograph: RWFC-IN .HYD
Outflow Hydrograph: RWFC-OUT.HYD

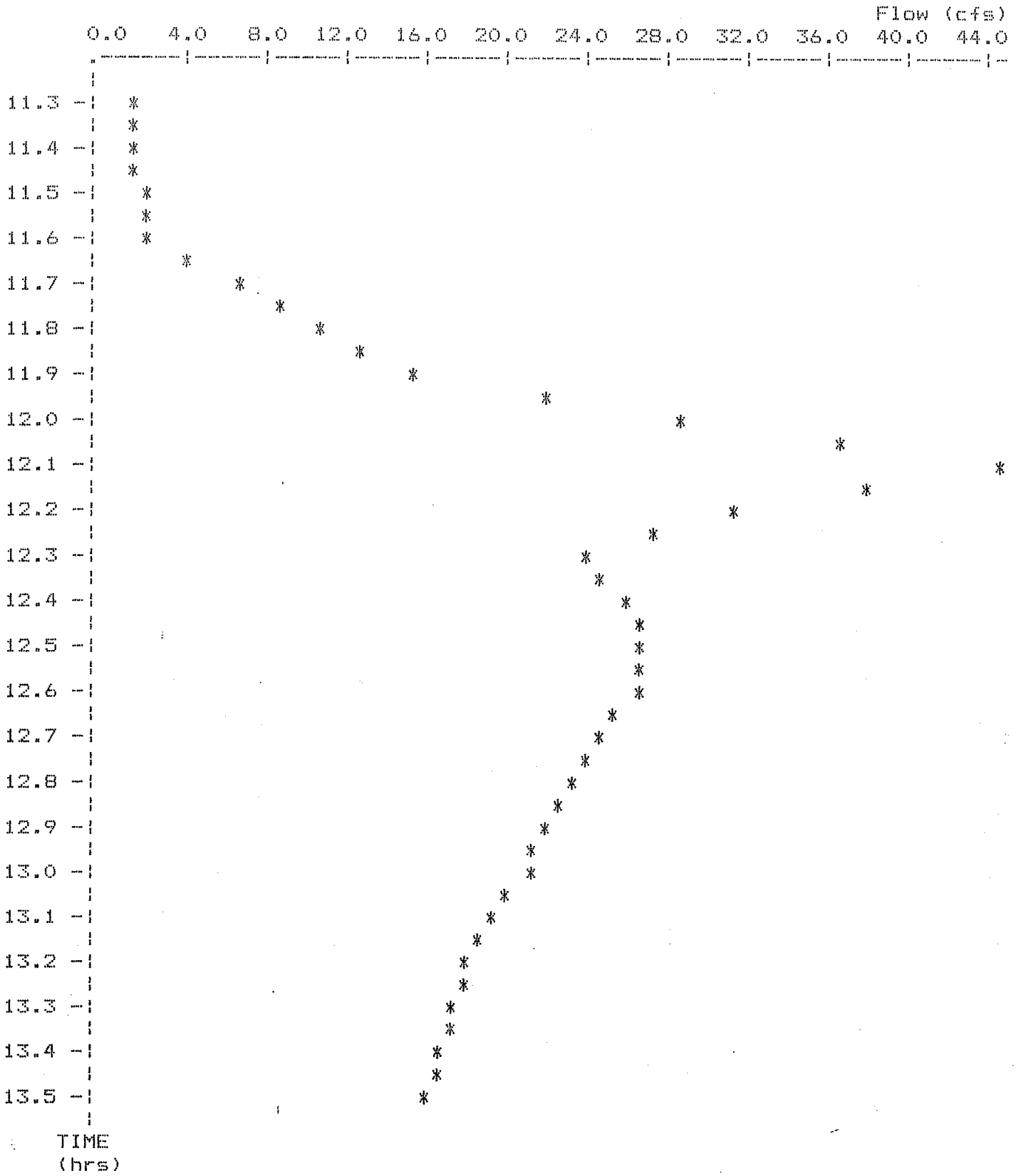
EXECUTED: 12-18-1990
10:37:59

Peak Inflow = 116.29 cfs
Peak Outflow = 73.14 cfs
Peak Elevation = 5047.72 ft



* File: RWFC-IN .HYD Qmax = 116.3 cfs
x File: RWFC-OUT.HYD Qmax = 73.1 cfs

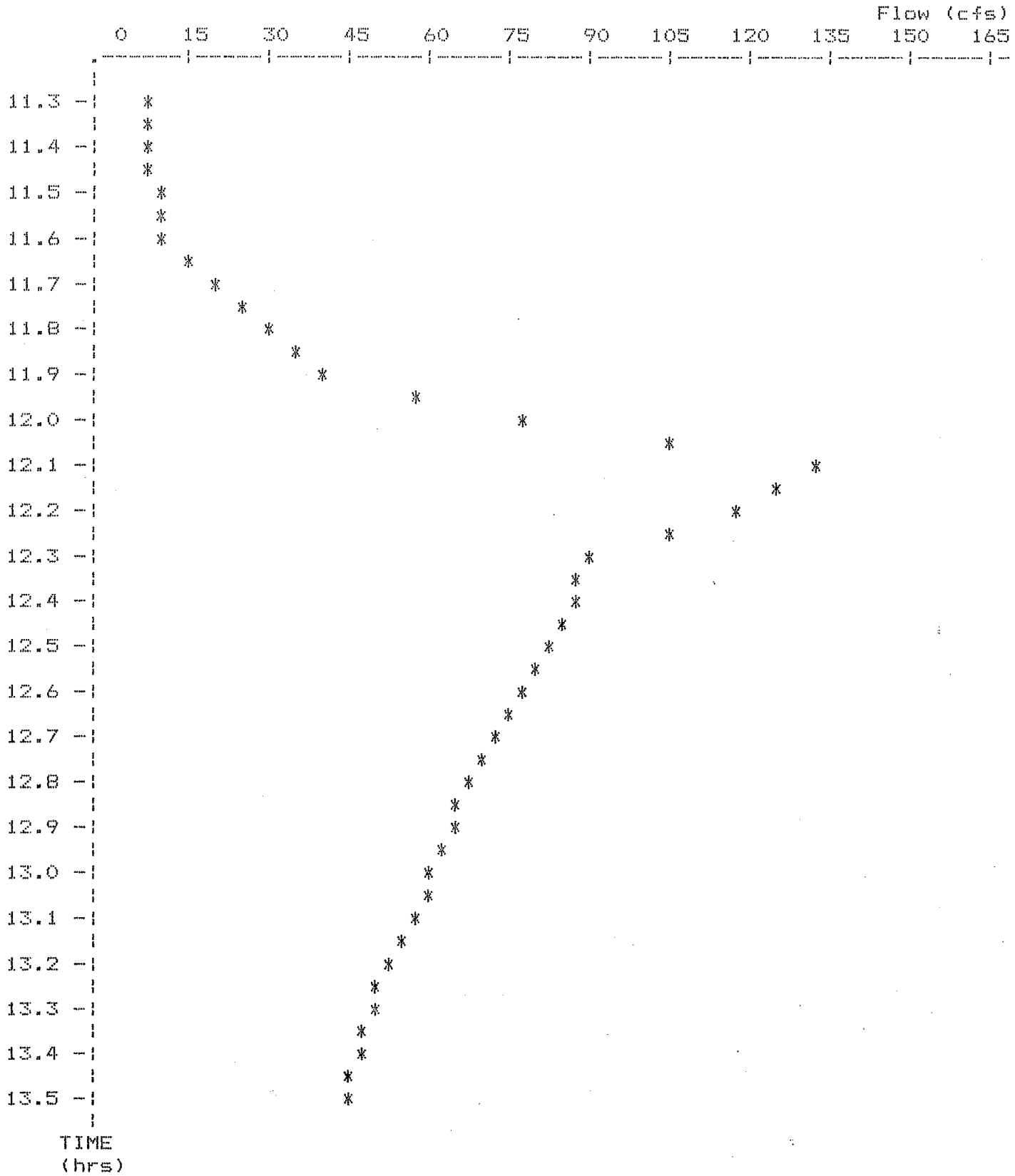
POND-2 Version: 5.13 S/N: 1220510325
Plotted: 12-18-1990



* File: CRF1-5 .HYD Qmax = 44.6 cfs

AREA 1
FINAL CONDITIONS 5-YR STORM

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 12-18-1990



* File: CRF1-100.HYD Qmax = 132.2 cfs

AREA 1
FINAL CONDITIONS 100-YR STORM

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

JOB 1016.38
SHEET NO. 172 OF
CALCULATED BY KRK DATE 12-18-90 REV 4-16-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 4: THERE IS VERY LITTLE CHANGE IN AREA 4 BETWEEN EXISTING & FINAL CONDITIONS. STORMWATER ROUTING REMAINS THE SAME FOR FINAL CONDITIONS AS EXISTING, HOWEVER THERE WILL BE A SLIGHT CHANGE IN THE AREA FLOWING INTO THE DETENTION POND. A SMALL SECTION WILL BE GRADED TO DRAIN TO AREA ONE, AND ANOTHER SMALL SECTION WILL BE DEVELOPED AS SINGLE FAMILY LOTS. THE HYDROGRAPHS FOR THE AREA DOWNSTREAM OF THE DETENTION POND WILL REMAIN THE SAME AS THE EXISTING CONDITIONS. THESE HYDROGRAPHS WILL BE ADDED TO THE OUTFLOW HYDROGRAPHS FROM THE DETENTION POND TO CREATE COMPOSITE HYDROGRAPHS FOR AREA 4. PEAK FLOWS ARE: $Q_5 = 3.4$ cfs
$Q_{100} = 12.9$ cfs

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 14:05:16
Watershed file: --> CRF4 .MOP
Hydrograph file: --> CRF4-5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
FINAL DEVELOPED CONDITIONS AREA 4
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
4-OVERLAND	35.97	86.0	0.10	0.00	1.55	0.53	I.21	.21

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 35.97 acres or 0.05620 sq.mi
Peak discharge = 29 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-OVERLAND	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123
Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-13-1990 14:05:16
Watershed file: --> CRF4 .MOP
Hydrograph file: --> CRF4-100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
FINAL DEVELOPED CONDITIONS AREA 4
DECEMBER 13, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
4-OVERLAND	35.97	86.0	0.10	0.00	2.75	1.45	I.12	.12

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 35.97 acres or 0.05620 sq.mi
Peak discharge = 82 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
4-OVERLAND	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:04:39

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**********************************************************************
*                                                                    *
*            CAUGHLIN RANCH MASTER HYDROLOGY  1016.38                *
*  EXISTING DETENTION POND AREA 4, FINAL DEVELOPED CONDITIONS        *
*                          JUNE 10, 1991                             *
*                       CODEGA & FRICKE, INC.                        *
*                          5-YEAR STORM                              *
**********************************************************************
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Inflow Hydrograph: CRF4-5 .HYD
Rating Table file: CRE-4 .PND

-----INITIAL CONDITIONS-----
Elevation = 5003.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5003.00	0.0	0.000
5003.50	1.1	0.048
5004.00	1.3	0.187
5005.00	1.6	0.599
5006.00	1.9	1.032
5007.00	2.1	1.496
5008.00	12.0	2.005
5009.00	12.7	2.560
5010.00	13.3	3.164

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
11.6	12.7
45.2	46.5
145.1	146.7
249.8	251.7
362.1	364.2
485.2	497.2
619.5	632.2
765.6	778.9

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:04:39

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	------	0.0	0.0	0.00	5003.00
11.100	0.00	0.0	0.0	0.0	0.00	5003.00
11.200	0.00	0.0	0.0	0.0	0.00	5003.00
11.300	0.00	0.0	0.0	0.0	0.00	5003.00
11.400	0.00	0.0	0.0	0.0	0.00	5003.00
11.500	1.00	1.0	0.8	1.0	0.09	5003.04
11.600	1.00	2.0	2.3	2.8	0.25	5003.11
11.700	3.00	4.0	5.2	6.3	0.55	5003.25
11.800	5.00	8.0	11.0	13.2	1.10	5003.51
11.900	7.00	12.0	20.7	23.0	1.16	5003.65
12.000	18.00	25.0	43.1	45.7	1.30	5003.99
12.100	29.00	47.0	87.3	90.1	1.43	5004.44
12.200	17.00	46.0	130.1	133.3	1.56	5004.87
12.300	6.00	23.0	149.9	153.1	1.62	5005.06
12.400	5.00	11.0	157.6	160.9	1.64	5005.14
12.500	4.00	9.0	163.3	166.6	1.66	5005.19
12.600	3.00	7.0	167.0	170.3	1.67	5005.23
12.700	3.00	6.0	169.6	173.0	1.68	5005.25
12.800	3.00	6.0	172.2	175.6	1.68	5005.28
12.900	2.00	5.0	173.9	177.2	1.69	5005.29
13.000	2.00	4.0	174.5	177.9	1.69	5005.30
13.100	2.00	4.0	175.1	178.5	1.69	5005.30
13.200	2.00	4.0	175.7	179.1	1.69	5005.31
13.300	2.00	4.0	176.3	179.7	1.69	5005.32
13.400	2.00	4.0	176.9	180.3	1.70	5005.32
13.500	2.00	4.0	177.6	180.9	1.70	5005.33
13.600	2.00	4.0	178.2	181.6	1.70	5005.33
13.700	2.00	4.0	178.7	182.2	1.70	5005.34
13.800	2.00	4.0	179.3	182.7	1.70	5005.34
13.900	2.00	4.0	179.9	183.3	1.70	5005.35
14.000	1.00	3.0	179.5	182.9	1.70	5005.35
14.100	1.00	2.0	178.1	181.5	1.70	5005.33
14.200	1.00	2.0	176.7	180.1	1.70	5005.32
14.300	1.00	2.0	175.4	178.7	1.69	5005.31
14.400	1.00	2.0	174.0	177.4	1.69	5005.29
14.500	1.00	2.0	172.6	176.0	1.68	5005.28
14.600	1.00	2.0	171.2	174.6	1.68	5005.27
14.700	1.00	2.0	169.9	173.2	1.68	5005.25
14.800	1.00	2.0	168.6	171.9	1.67	5005.24
14.900	1.00	2.0	167.2	170.6	1.67	5005.23
15.000	1.00	2.0	165.9	169.2	1.66	5005.21
15.100	1.00	2.0	164.6	167.9	1.66	5005.20
15.200	1.00	2.0	163.3	166.6	1.66	5005.19
15.300	1.00	2.0	161.9	165.3	1.65	5005.18
15.400	1.00	2.0	160.6	163.9	1.65	5005.16

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:04:39

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	1.00	2.0	159.4	162.6	1.65	5005.15
15.600	1.00	2.0	158.1	161.4	1.64	5005.14
15.700	1.00	2.0	156.8	160.1	1.64	5005.13
15.800	1.00	2.0	155.5	158.8	1.63	5005.12
15.900	1.00	2.0	154.3	157.5	1.63	5005.10
16.000	1.00	2.0	153.0	156.3	1.63	5005.09
16.100	1.00	2.0	151.8	155.0	1.62	5005.08
16.200	1.00	2.0	150.5	153.8	1.62	5005.07
16.300	1.00	2.0	149.3	152.5	1.62	5005.06
16.400	1.00	2.0	148.1	151.3	1.61	5005.04
16.500	1.00	2.0	146.8	150.1	1.61	5005.03
16.600	1.00	2.0	145.6	148.8	1.61	5005.02
16.700	1.00	2.0	144.4	147.6	1.60	5005.01
16.800	1.00	2.0	143.2	146.4	1.60	5005.00
16.900	1.00	2.0	142.0	145.2	1.60	5004.99
17.000	1.00	2.0	140.8	144.0	1.59	5004.97
17.100	1.00	2.0	139.7	142.8	1.59	5004.96
17.200	1.00	2.0	138.5	141.7	1.59	5004.95
17.300	1.00	2.0	137.3	140.5	1.58	5004.94
17.400	1.00	2.0	136.2	139.3	1.58	5004.93
17.500	1.00	2.0	135.0	138.2	1.57	5004.92
17.600	1.00	2.0	133.9	137.0	1.57	5004.90
17.700	1.00	2.0	132.8	135.9	1.57	5004.89
17.800	1.00	2.0	131.6	134.8	1.56	5004.88
17.900	1.00	2.0	130.5	133.6	1.56	5004.87
18.000	1.00	2.0	129.4	132.5	1.56	5004.86
18.100	1.00	2.0	128.3	131.4	1.55	5004.85
18.200	1.00	2.0	127.2	130.3	1.55	5004.84
18.300	1.00	2.0	126.1	129.2	1.55	5004.83
18.400	1.00	2.0	125.0	128.1	1.54	5004.81
18.500	1.00	2.0	123.9	127.0	1.54	5004.80
18.600	1.00	2.0	122.8	125.9	1.54	5004.79
18.700	1.00	2.0	121.8	124.8	1.53	5004.78
18.800	1.00	2.0	120.7	123.8	1.53	5004.77
18.900	1.00	2.0	119.6	122.7	1.53	5004.76
19.000	1.00	2.0	118.6	121.6	1.53	5004.75
19.100	1.00	2.0	117.6	120.6	1.52	5004.74
19.200	1.00	2.0	116.5	119.6	1.52	5004.73
19.300	1.00	2.0	115.5	118.5	1.52	5004.72
19.400	1.00	2.0	114.5	117.5	1.51	5004.71
19.500	1.00	2.0	113.4	116.5	1.51	5004.70
19.600	1.00	2.0	112.4	115.4	1.51	5004.69
19.700	1.00	2.0	111.4	114.4	1.50	5004.68
19.800	1.00	2.0	110.4	113.4	1.50	5004.67
19.900	1.00	2.0	109.4	112.4	1.50	5004.66
20.000	1.00	2.0	108.4	111.4	1.49	5004.65

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:04:39

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	107.5	110.4	1.49	5004.64
20.200	1.00	2.0	106.5	109.5	1.49	5004.63
20.300	1.00	2.0	105.5	108.5	1.49	5004.62
20.400	1.00	2.0	104.5	107.5	1.48	5004.61
20.500	1.00	2.0	103.6	106.5	1.48	5004.60
20.600	1.00	2.0	102.6	105.6	1.48	5004.59
20.700	1.00	2.0	101.7	104.6	1.47	5004.58
20.800	1.00	2.0	100.7	103.7	1.47	5004.57
20.900	1.00	2.0	99.8	102.7	1.47	5004.56
21.000	0.00	1.0	97.9	100.8	1.46	5004.54
21.100	0.00	0.0	95.0	97.9	1.45	5004.51
21.200	0.00	0.0	92.1	95.0	1.45	5004.48
21.300	0.00	0.0	89.2	92.1	1.44	5004.45
21.400	0.00	0.0	86.3	89.2	1.43	5004.43
21.500	0.00	0.0	83.5	86.3	1.42	5004.40
21.600	0.00	0.0	80.7	83.5	1.41	5004.37
21.700	0.00	0.0	77.9	80.7	1.40	5004.34
21.800	0.00	0.0	75.1	77.9	1.39	5004.31
21.900	0.00	0.0	72.3	75.1	1.39	5004.29
22.000	0.00	0.0	69.6	72.3	1.38	5004.26
22.100	0.00	0.0	66.8	69.6	1.37	5004.23
22.200	0.00	0.0	64.1	66.8	1.36	5004.20
22.300	0.00	0.0	61.4	64.1	1.35	5004.18
22.400	0.00	0.0	58.7	61.4	1.34	5004.15
22.500	0.00	0.0	56.0	58.7	1.34	5004.12
22.600	0.00	0.0	53.4	56.0	1.33	5004.09
22.700	0.00	0.0	50.7	53.4	1.32	5004.07
22.800	0.00	0.0	48.1	50.7	1.31	5004.04
22.900	0.00	0.0	45.5	48.1	1.30	5004.02
23.000	0.00	0.0	42.9	45.5	1.29	5003.98
23.100	0.00	0.0	40.4	42.9	1.28	5003.95
23.200	0.00	0.0	37.8	40.4	1.26	5003.91
23.300	0.00	0.0	35.3	37.8	1.25	5003.87
23.400	0.00	0.0	32.9	35.3	1.23	5003.83
23.500	0.00	0.0	30.4	32.9	1.22	5003.80
23.600	0.00	0.0	28.0	30.4	1.20	5003.76
23.700	0.00	0.0	25.6	28.0	1.19	5003.73
23.800	0.00	0.0	23.3	25.6	1.18	5003.69
23.900	0.00	0.0	21.0	23.3	1.16	5003.66
24.000	0.00	0.0	18.7	21.0	1.15	5003.62
24.100	0.00	0.0	16.4	18.7	1.14	5003.59
24.200	0.00	0.0	14.2	16.4	1.12	5003.56
24.300	0.00	0.0	11.9	14.2	1.11	5003.52
24.400	0.00	0.0	9.9	11.9	1.04	5003.47
24.500	0.00	0.0	8.1	9.9	0.86	5003.39
24.600	0.00	0.0	6.7	8.1	0.71	5003.32

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:04:39

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	5.6	6.7	0.58	5003.27
24.800	0.00	0.0	4.6	5.6	0.48	5003.22
24.900	0.00	0.0	3.8	4.6	0.40	5003.18
25.000	0.00	0.0	3.1	3.8	0.33	5003.15
25.100	0.00	0.0	2.6	3.1	0.27	5003.12
25.200	0.00	0.0	2.1	2.6	0.23	5003.10
25.300	0.00	0.0	1.8	2.1	0.19	5003.08
25.400	0.00	0.0	1.5	1.8	0.15	5003.07
25.500	0.00	0.0	1.2	1.5	0.13	5003.06
25.600	0.00	0.0	1.0	1.2	0.10	5003.05
25.700	0.00	0.0	0.8	1.0	0.09	5003.04
25.800	0.00	0.0	0.7	0.8	0.07	5003.03
25.900	0.00	0.0	0.6	0.7	0.06	5003.03

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

Starting Pond W.S. Elevation = 5003.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	29.00 cfs
Peak Outflow	=	1.70 cfs
Peak Elevation	=	5005.35 ft

***** Summary of Approximate Peak Storage *****

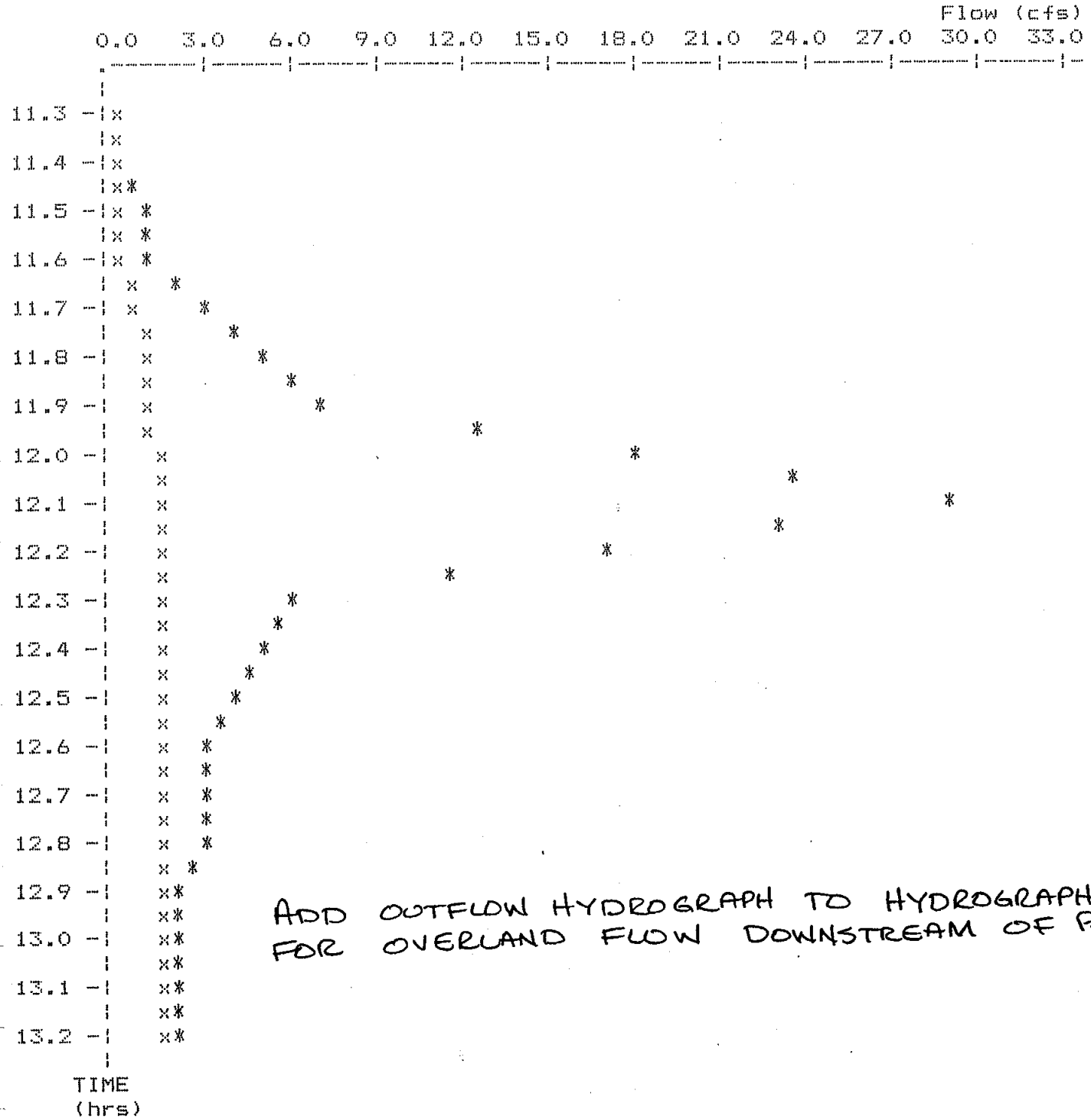
Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.75 ac-ft
Total Storage in Pond	=	0.75 ac-ft

POND-2 Version: 5.13 S/N: 1220510325 Page 7

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-5 .HYD
Outflow Hydrograph: CF4-5 .HYD

EXECUTED: 06-10-1991
10:04:39

Peak Inflow = 29.00 cfs
Peak Outflow = 1.70 cfs
Peak Elevation = 5005.35 ft



ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR OVERLAND FLOW DOWNSTREAM OF POND

* File: CRF4-5 .HYD Qmax = 29.0 cfs
x File: CF4-5 .HYD Qmax = 1.7 cfs

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:15:31

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
EXISTING DETENTION POND AREA 4, FINAL DEVELOPED CONDITIONS
JUNE 10, 1991
CODEGA & FRICKE, INC.
100-YEAR STORM

Inflow Hydrograph: CRF4-100.HYD
Rating Table file: CRE-4 .PND

-----INITIAL CONDITIONS-----
Elevation = 5003.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
5003.00	0.0	0.000
5003.50	1.1	0.048
5004.00	1.3	0.187
5005.00	1.6	0.599
5006.00	1.9	1.032
5007.00	2.1	1.496
5008.00	12.0	2.005
5009.00	12.7	2.560
5010.00	13.3	3.164

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
11.6	12.7
45.2	46.5
145.1	146.7
249.8	251.7
362.1	364.2
485.2	497.2
619.5	632.2
765.6	778.9

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 06-10-1991 10:15:31

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	2.00	------	0.0	0.0	0.00	5003.00
11.100	2.00	4.0	3.3	4.0	0.35	5003.16
11.200	2.00	4.0	6.0	7.3	0.63	5003.29
11.300	2.00	4.0	8.3	10.0	0.87	5003.40
11.400	3.00	5.0	11.1	13.3	1.10	5003.51
11.500	3.00	6.0	14.8	17.1	1.13	5003.57
11.600	4.00	7.0	19.5	21.8	1.15	5003.64
11.700	11.00	15.0	32.1	34.5	1.23	5003.82
11.800	19.00	30.0	59.4	62.1	1.35	5004.16
11.900	26.00	45.0	101.4	104.4	1.47	5004.58
12.000	52.00	78.0	176.0	179.4	1.69	5005.31
12.100	82.00	134.0	306.0	310.0	2.00	5006.52
12.200	50.00	132.0	422.8	438.0	7.60	5007.56
12.300	18.00	68.0	467.8	490.8	11.53	5007.95
12.400	12.00	30.0	473.8	497.8	12.00	5008.00
12.500	10.00	22.0	472.0	495.8	11.90	5007.99
12.600	9.00	19.0	467.9	491.0	11.54	5007.95
12.700	7.00	16.0	461.9	483.9	11.01	5007.90
12.800	6.00	13.0	454.2	474.9	10.34	5007.83
12.900	6.00	12.0	446.8	466.2	9.69	5007.77
13.000	6.00	12.0	440.5	458.8	9.14	5007.71
13.100	6.00	12.0	435.2	452.5	8.68	5007.66
13.200	5.00	11.0	429.8	446.2	8.20	5007.62
13.300	4.00	9.0	423.5	438.8	7.65	5007.56
13.400	4.00	8.0	417.2	431.5	7.11	5007.51
13.500	4.00	8.0	412.0	425.2	6.64	5007.46
13.600	4.00	8.0	407.5	420.0	6.25	5007.42
13.700	4.00	8.0	403.6	415.5	5.92	5007.39
13.800	4.00	8.0	400.4	411.6	5.63	5007.36
13.900	4.00	8.0	397.6	408.4	5.39	5007.33
14.000	3.00	7.0	394.4	404.6	5.11	5007.30
14.100	3.00	6.0	390.8	400.4	4.79	5007.27
14.200	3.00	6.0	387.7	396.8	4.53	5007.25
14.300	3.00	6.0	385.1	393.7	4.30	5007.22
14.400	3.00	6.0	382.9	391.1	4.10	5007.20
14.500	3.00	6.0	381.1	388.9	3.94	5007.19
14.600	3.00	6.0	379.5	387.1	3.80	5007.17
14.700	3.00	6.0	378.1	385.5	3.68	5007.16
14.800	2.00	5.0	376.1	383.1	3.51	5007.14
14.900	2.00	4.0	373.5	380.1	3.28	5007.12
15.000	2.00	4.0	371.3	377.5	3.09	5007.10
15.100	2.00	4.0	369.5	375.3	2.93	5007.08
15.200	2.00	4.0	367.9	373.5	2.79	5007.07
15.300	2.00	4.0	366.6	371.9	2.67	5007.06
15.400	2.00	4.0	365.4	370.6	2.57	5007.05

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	2.00	4.0	364.4	369.4	2.49	5007.04
15.600	2.00	4.0	363.6	368.4	2.41	5007.03
15.700	2.00	4.0	362.9	367.6	2.35	5007.03
15.800	2.00	4.0	362.3	366.9	2.30	5007.02
15.900	2.00	4.0	361.8	366.3	2.26	5007.02
16.000	2.00	4.0	361.4	365.8	2.22	5007.01
16.100	2.00	4.0	361.0	365.4	2.18	5007.01
16.200	2.00	4.0	360.7	365.0	2.16	5007.01
16.300	2.00	4.0	360.4	364.7	2.13	5007.00
16.400	2.00	4.0	360.2	364.4	2.11	5007.00
16.500	2.00	4.0	360.0	364.2	2.10	5007.00
16.600	2.00	4.0	359.8	364.0	2.10	5007.00
16.700	2.00	4.0	359.6	363.8	2.10	5007.00
16.800	2.00	4.0	359.4	363.6	2.10	5006.99
16.900	2.00	4.0	359.2	363.4	2.10	5006.99
17.000	2.00	4.0	359.0	363.2	2.10	5006.99
17.100	2.00	4.0	358.8	363.0	2.10	5006.99
17.200	2.00	4.0	358.6	362.8	2.10	5006.99
17.300	2.00	4.0	358.4	362.6	2.10	5006.99
17.400	2.00	4.0	358.2	362.4	2.10	5006.98
17.500	2.00	4.0	358.0	362.2	2.10	5006.98
17.600	2.00	4.0	357.8	362.0	2.10	5006.98
17.700	2.00	4.0	357.6	361.8	2.10	5006.98
17.800	2.00	4.0	357.4	361.6	2.10	5006.98
17.900	2.00	4.0	357.3	361.4	2.10	5006.98
18.000	2.00	4.0	357.1	361.3	2.09	5006.97
18.100	2.00	4.0	356.9	361.1	2.09	5006.97
18.200	2.00	4.0	356.7	360.9	2.09	5006.97
18.300	2.00	4.0	356.5	360.7	2.09	5006.97
18.400	2.00	4.0	356.3	360.5	2.09	5006.97
18.500	2.00	4.0	356.1	360.3	2.09	5006.97
18.600	1.00	3.0	355.0	359.1	2.09	5006.95
18.700	1.00	2.0	352.8	357.0	2.09	5006.94
18.800	1.00	2.0	350.6	354.8	2.08	5006.92
18.900	1.00	2.0	348.5	352.6	2.08	5006.90
19.000	1.00	2.0	346.3	350.5	2.08	5006.88
19.100	1.00	2.0	344.2	348.3	2.07	5006.86
19.200	1.00	2.0	342.0	346.2	2.07	5006.84
19.300	1.00	2.0	339.9	344.0	2.06	5006.82
19.400	1.00	2.0	337.8	341.9	2.06	5006.80
19.500	1.00	2.0	335.7	339.8	2.06	5006.78
19.600	1.00	2.0	333.6	337.7	2.05	5006.76
19.700	1.00	2.0	331.5	335.6	2.05	5006.75
19.800	1.00	2.0	329.4	333.5	2.05	5006.73
19.900	1.00	2.0	327.3	331.4	2.04	5006.71
20.000	1.00	2.0	325.2	329.3	2.04	5006.69

POND-2 Version: 5.13 S/N: 1220510325
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Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	323.1	327.2	2.03	5006.67
20.200	1.00	2.0	321.1	325.1	2.03	5006.65
20.300	1.00	2.0	319.0	323.1	2.03	5006.63
20.400	1.00	2.0	317.0	321.0	2.02	5006.62
20.500	1.00	2.0	314.9	319.0	2.02	5006.60
20.600	1.00	2.0	312.9	316.9	2.02	5006.58
20.700	1.00	2.0	310.9	314.9	2.01	5006.56
20.800	1.00	2.0	308.9	312.9	2.01	5006.54
20.900	1.00	2.0	306.9	310.9	2.01	5006.53
21.000	1.00	2.0	304.8	308.9	2.00	5006.51
21.100	1.00	2.0	302.9	306.8	2.00	5006.49
21.200	1.00	2.0	300.9	304.9	1.99	5006.47
21.300	1.00	2.0	298.9	302.9	1.99	5006.45
21.400	1.00	2.0	296.9	300.9	1.99	5006.44
21.500	1.00	2.0	294.9	298.9	1.98	5006.42
21.600	1.00	2.0	293.0	296.9	1.98	5006.40
21.700	1.00	2.0	291.0	295.0	1.98	5006.38
21.800	1.00	2.0	289.1	293.0	1.97	5006.37
21.900	1.00	2.0	287.1	291.1	1.97	5006.35
22.000	1.00	2.0	285.2	289.1	1.97	5006.33
22.100	1.00	2.0	283.3	287.2	1.96	5006.32
22.200	1.00	2.0	281.4	285.3	1.96	5006.30
22.300	1.00	2.0	279.4	283.4	1.96	5006.28
22.400	1.00	2.0	277.5	281.4	1.95	5006.26
22.500	1.00	2.0	275.6	279.5	1.95	5006.25
22.600	1.00	2.0	273.7	277.6	1.95	5006.23
22.700	1.00	2.0	271.9	275.7	1.94	5006.21
22.800	1.00	2.0	270.0	273.9	1.94	5006.20
22.900	1.00	2.0	268.1	272.0	1.94	5006.18
23.000	1.00	2.0	266.2	270.1	1.93	5006.16
23.100	1.00	2.0	264.4	268.2	1.93	5006.15
23.200	1.00	2.0	262.5	266.4	1.93	5006.13
23.300	1.00	2.0	260.7	264.5	1.92	5006.11
23.400	1.00	2.0	258.8	262.7	1.92	5006.10
23.500	1.00	2.0	257.0	260.8	1.92	5006.08
23.600	1.00	2.0	255.2	259.0	1.91	5006.07
23.700	1.00	2.0	253.4	257.2	1.91	5006.05
23.800	1.00	2.0	251.6	255.4	1.91	5006.03
23.900	1.00	2.0	249.8	253.6	1.90	5006.02
24.000	0.00	1.0	247.0	250.8	1.90	5005.99
24.100	0.00	0.0	243.2	247.0	1.89	5005.96
24.200	0.00	0.0	239.4	243.2	1.88	5005.92
24.300	0.00	0.0	235.7	239.4	1.87	5005.88
24.400	0.00	0.0	232.0	235.7	1.85	5005.85
24.500	0.00	0.0	228.3	232.0	1.84	5005.81
24.600	0.00	0.0	224.6	228.3	1.83	5005.78

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
24.700	0.00
24.800	0.00
24.900	0.00
25.000	0.00
25.100	0.00
25.200	0.00
25.300	0.00
25.400	0.00
25.500	0.00
25.600	0.00
25.700	0.00
25.800	0.00
25.900	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	221.0	224.6	1.82	5005.74
0.0	217.4	221.0	1.81	5005.71
0.0	213.8	217.4	1.80	5005.67
0.0	210.2	213.8	1.79	5005.64
0.0	206.6	210.2	1.78	5005.61
0.0	203.1	206.6	1.77	5005.57
0.0	199.6	203.1	1.76	5005.54
0.0	196.1	199.6	1.75	5005.50
0.0	192.6	196.1	1.74	5005.47
0.0	189.1	192.6	1.73	5005.44
0.0	185.7	189.1	1.72	5005.40
0.0	182.2	185.7	1.71	5005.37
0.0	178.8	182.2	1.70	5005.34

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

Starting Pond W.S. Elevation = 5003.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	82.00 cfs
Peak Outflow	=	12.00 cfs
Peak Elevation	=	5008.00 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	2.01 ac-ft
Total Storage in Pond	=	2.01 ac-ft

Warning: Inflow hydrograph truncated on left side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: CRE-4 .PND
Inflow Hydrograph: CRF4-100.HYD
Outflow Hydrograph: CF4-100 .HYD

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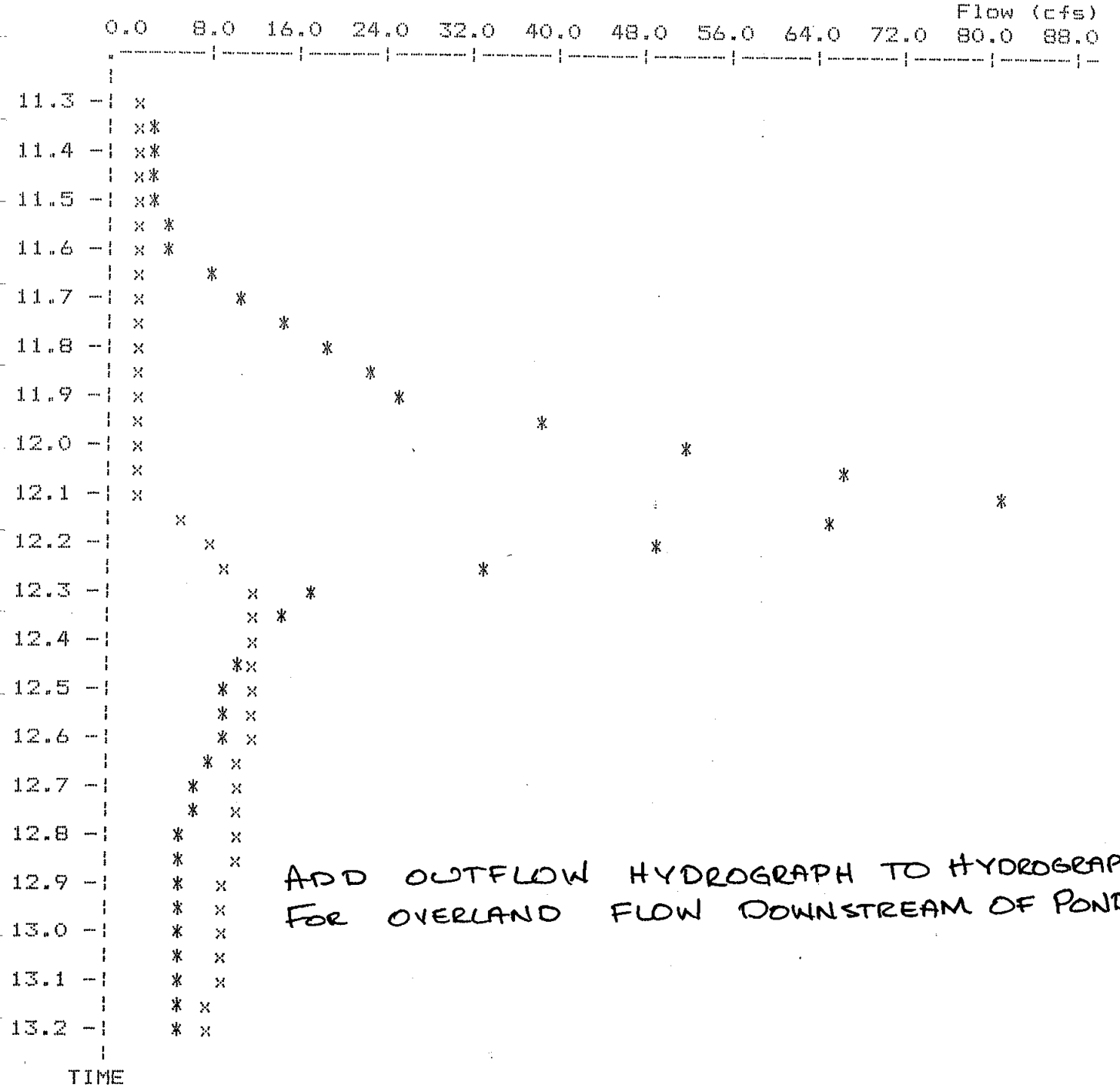
Peak Inflow = 82.00 cfs
Peak Outflow = 12.00 cfs
Peak Elevation = 5008.00 ft



ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR OVERLAND FLOW DOWNSTREAM OF POND.

* File: CRF4-100.HYD Qmax = 82.0 cfs
x File: CF4-100 .HYD Qmax = 12.0 cfs

Executed 06-10-1991 10:20:48

5-YEAR STORM

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	POND FLOW CF4-5 (cfs)	OVERLAND FLOW CE4A-5 (cfs)	TOTAL FLOW AREA 4 CF4T-5 (Total)
11.00	0.0	0.0	0.0
11.10	0.0	0.0	0.0
11.20	0.0	0.0	0.0
11.30	0.0	0.0	0.0
11.40	0.0	0.0	0.0
11.50	0.1	0.0	0.1
11.60	0.3	0.0	0.3
11.70	0.6	0.0	0.6
11.80	1.1	0.0	1.1
11.90	1.2	0.0	1.2
12.00	1.3	1.0	2.3
12.10	1.4	2.0	3.4 = Q_5
12.20	1.6	1.0	2.6
12.30	1.6	0.0	1.6
12.40	1.6	0.0	1.6
12.50	1.7	0.0	1.7
12.60	1.7	0.0	1.7
12.70	1.7	0.0	1.7
12.80	1.7	0.0	1.7
12.90	1.7	0.0	1.7
13.00	1.7	0.0	1.7
13.10	1.7	0.0	1.7
13.20	1.7	0.0	1.7
13.30	1.7	0.0	1.7
13.40	1.7	0.0	1.7
13.50	1.7	0.0	1.7
13.60	1.7	0.0	1.7
13.70	1.7	0.0	1.7
13.80	1.7	0.0	1.7
13.90	1.7	0.0	1.7
14.00	1.7	0.0	1.7
14.10	1.7	0.0	1.7
14.20	1.7	0.0	1.7
14.30	1.7	0.0	1.7
14.40	1.7	0.0	1.7
14.50	1.7	0.0	1.7
14.60	1.7	0.0	1.7
14.70	1.7	0.0	1.7
14.80	1.7	0.0	1.7
14.90	1.7	0.0	1.7

Executed 06-10-1991 10:20:48

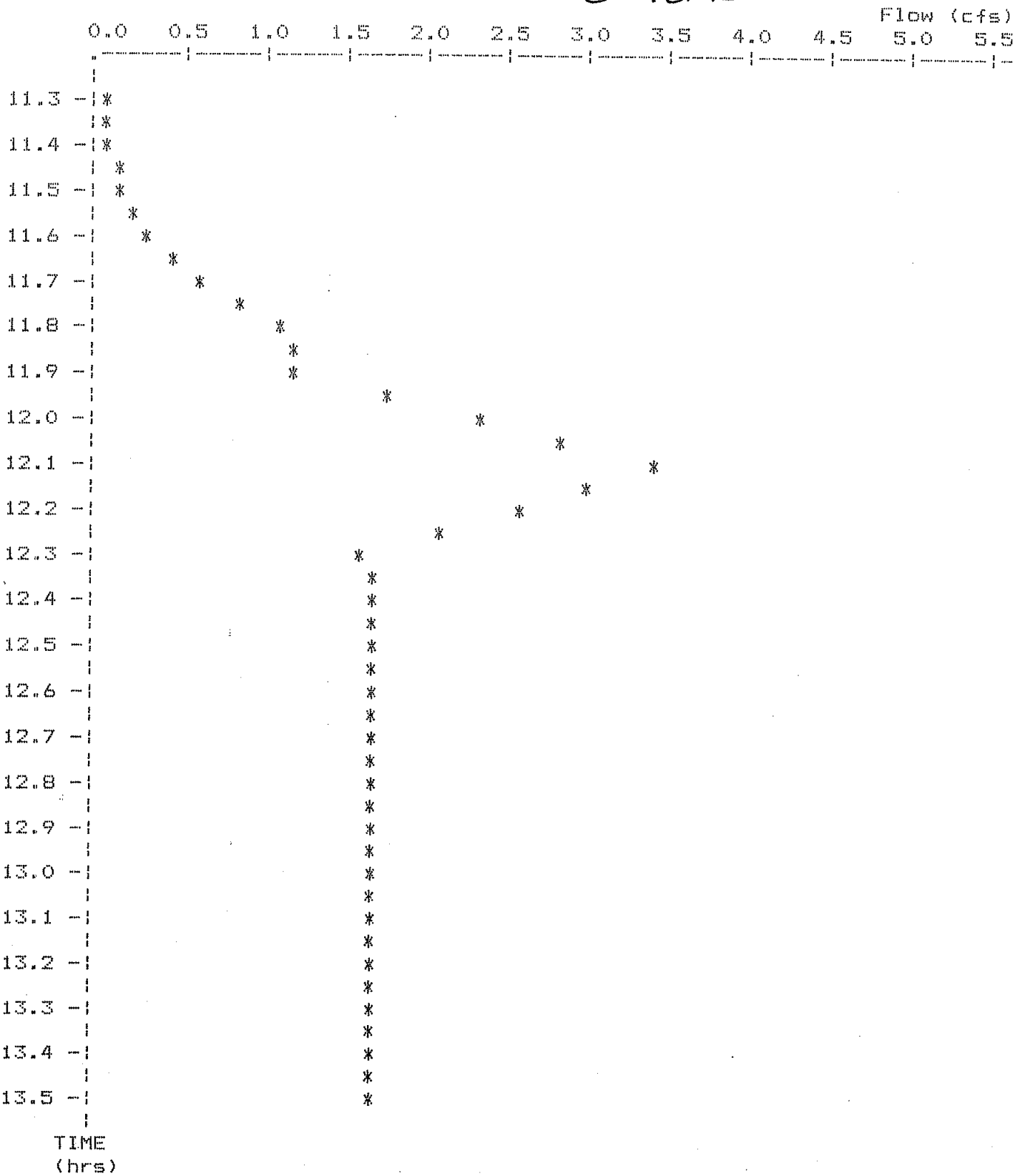
Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF4-5 (cfs)	CE4A-5 (cfs)	CF4T-5 (Total)
15.00	1.7	0.0	1.7
15.10	1.7	0.0	1.7
15.20	1.7	0.0	1.7
15.30	1.6	0.0	1.6
15.40	1.6	0.0	1.6
15.50	1.6	0.0	1.6
15.60	1.6	0.0	1.6
15.70	1.6	0.0	1.6
15.80	1.6	0.0	1.6
15.90	1.6	0.0	1.6
16.00	1.6	0.0	1.6
16.10	1.6	0.0	1.6
16.20	1.6	0.0	1.6
16.30	1.6	0.0	1.6
16.40	1.6	0.0	1.6
16.50	1.6	0.0	1.6
16.60	1.6	0.0	1.6
16.70	1.6	0.0	1.6
16.80	1.6	0.0	1.6
16.90	1.6	0.0	1.6
17.00	1.6	0.0	1.6
17.10	1.6	0.0	1.6
17.20	1.6	0.0	1.6
17.30	1.6	0.0	1.6
17.40	1.6	0.0	1.6
17.50	1.6	0.0	1.6
17.60	1.6	0.0	1.6
17.70	1.6	0.0	1.6
17.80	1.6	0.0	1.6
17.90	1.6	0.0	1.6
18.00	1.6	0.0	1.6
18.10	1.5	0.0	1.5
18.20	1.5	0.0	1.5
18.30	1.5	0.0	1.5
18.40	1.5	0.0	1.5
18.50	1.5	0.0	1.5
18.60	1.5	0.0	1.5
18.70	1.5	0.0	1.5
18.80	1.5	0.0	1.5
18.90	1.5	0.0	1.5
19.00	1.5	0.0	1.5

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 06-10-1991

AREA 4
TOTAL FLOW
5-YEAR STORM



* File: CF4T-5 .HYD Qmax = 3.4 cfs

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100-YEAR STORM

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	POND FLOW CF4-100 (cfs)	OVERLAND FLOW CE4A-100 (cfs)	TOTAL FLOW AREA 4 CF4T-100 (Total)	
11.00	0.0	0.0	0.0	
11.10	0.3	0.0	0.3	
11.20	0.6	0.0	0.6	
11.30	0.9	0.0	0.9	
11.40	1.1	0.0	1.1	
11.50	1.1	0.0	1.1	
11.60	1.1	0.0	1.1	
11.70	1.2	1.0	2.2	
11.80	1.4	1.0	2.3	
11.90	1.5	2.0	3.5	
12.00	1.7	3.0	4.7	
12.10	2.0	5.0	7.0	
12.20	7.6	3.0	10.6	
12.30	11.5	1.0	12.5	
12.40	12.0	1.0	13.0	= Q_{100}
12.50	11.9	1.0	12.9	
12.60	11.5	1.0	12.5	
12.70	11.0	0.0	11.0	
12.80	10.3	0.0	10.3	
12.90	9.7	0.0	9.7	
13.00	9.1	0.0	9.1	
13.10	8.7	0.0	8.7	
13.20	8.2	0.0	8.2	
13.30	7.7	0.0	7.7	
13.40	7.1	0.0	7.1	
13.50	6.6	0.0	6.6	
13.60	6.3	0.0	6.3	
13.70	5.9	0.0	5.9	
13.80	5.6	0.0	5.6	
13.90	5.4	0.0	5.4	
14.00	5.1	0.0	5.1	
14.10	4.8	0.0	4.8	
14.20	4.5	0.0	4.5	
14.30	4.3	0.0	4.3	
14.40	4.1	0.0	4.1	
14.50	3.9	0.0	3.9	
14.60	3.8	0.0	3.8	
14.70	3.7	0.0	3.7	
14.80	3.5	0.0	3.5	
14.90	3.3	0.0	3.3	

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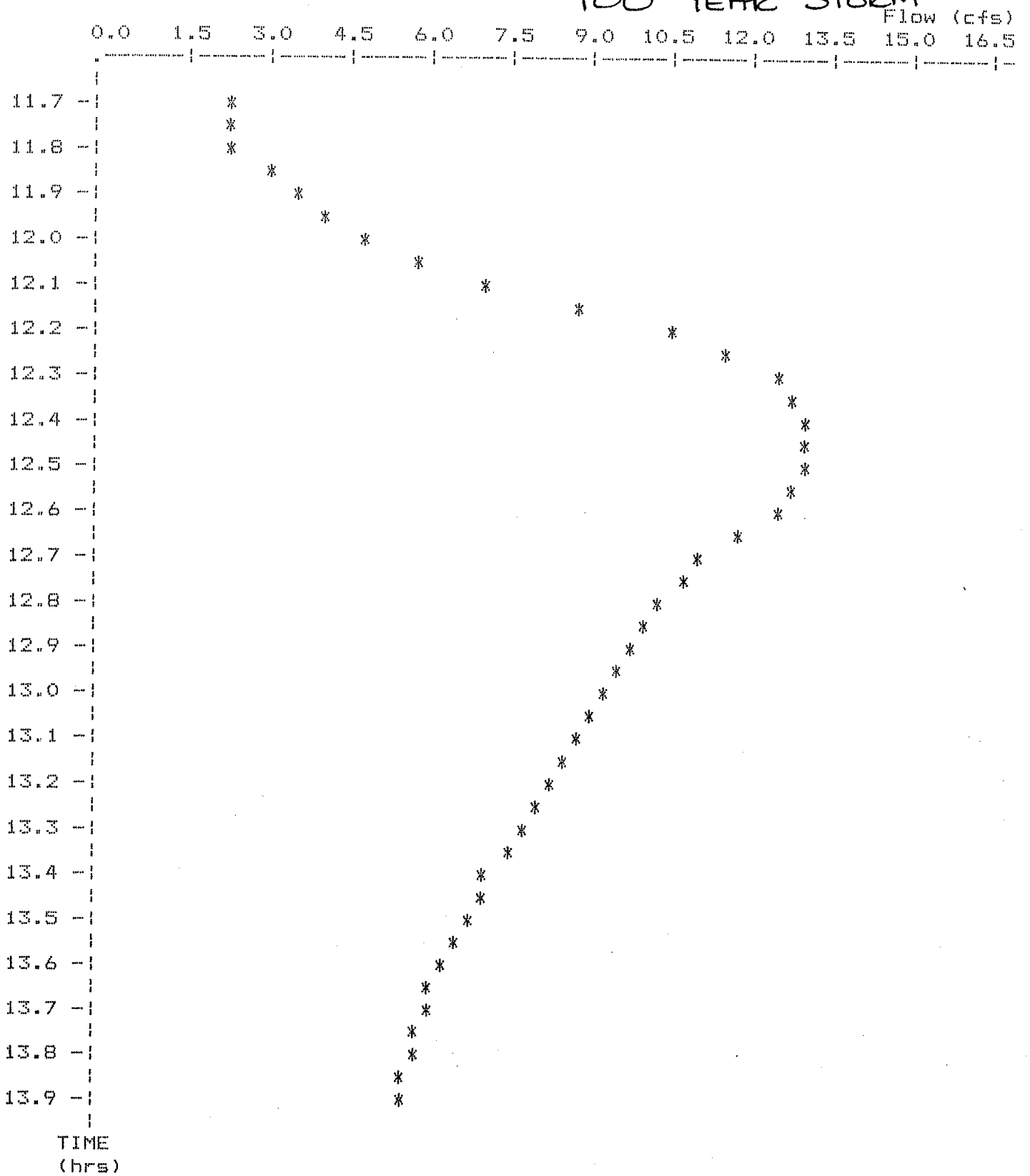
Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF4-100 (cfs)	CE4A-100 (cfs)	CF4T-100 (Total)
15.00	3.1	0.0	3.1
15.10	2.9	0.0	2.9
15.20	2.8	0.0	2.8
15.30	2.7	0.0	2.7
15.40	2.6	0.0	2.6
15.50	2.5	0.0	2.5
15.60	2.4	0.0	2.4
15.70	2.3	0.0	2.3
15.80	2.3	0.0	2.3
15.90	2.3	0.0	2.3
16.00	2.2	0.0	2.2
16.10	2.2	0.0	2.2
16.20	2.2	0.0	2.2
16.30	2.1	0.0	2.1
16.40	2.1	0.0	2.1
16.50	2.1	0.0	2.1
16.60	2.1	0.0	2.1
16.70	2.1	0.0	2.1
16.80	2.1	0.0	2.1
16.90	2.1	0.0	2.1
17.00	2.1	0.0	2.1
17.10	2.1	0.0	2.1
17.20	2.1	0.0	2.1
17.30	2.1	0.0	2.1
17.40	2.1	0.0	2.1
17.50	2.1	0.0	2.1
17.60	2.1	0.0	2.1
17.70	2.1	0.0	2.1
17.80	2.1	0.0	2.1
17.90	2.1	0.0	2.1
18.00	2.1	0.0	2.1
18.10	2.1	0.0	2.1
18.20	2.1	0.0	2.1
18.30	2.1	0.0	2.1
18.40	2.1	0.0	2.1
18.50	2.1	0.0	2.1
18.60	2.1	0.0	2.1
18.70	2.1	0.0	2.1
18.80	2.1	0.0	2.1
18.90	2.1	0.0	2.1
19.00	2.1	0.0	2.1

POND-2 Version: 5.13 S/N: 1220510325
Plotted: 06-10-1991

AREA 4
TOTAL FLOW
100-YEAR STORM



* File: CF4T-100.HYD Qmax = 13.0 cfs

CODEGA & FRICKE, INC.
Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

JOB 1016.38
SHEET NO. 195 OF
CALCULATED BY KRK DATE 12-18-90 REV. 4-12-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 5: THE VILLAGE GREEN PARK, VILLAGE GREEN UNIT ONE AND A PORTION OF EASTGATE ARE ALL THAT REMAINS TO BE DEVELOPED IN AREA 5. t_c FOR THE FINAL CONDITIONS IS THE SAME AS FOR EXISTING CONDITIONS.

$t_c = 31.3$ MIN
$i_5 = 0.7$ in/hr
$i_{100} = 1.8$ in/hr.

ΣCA FOR ALL OF AREA 5:

ΣQ_5 INTO STORM DRAIN = 50.49 cfs @ $t_c = 10$ min

$CA = \frac{50.49}{1.4} = 36.06$ STORM DRAIN SYSTEM

CA FOR AREAS NOT INCLUDED IN STORM DRAIN:
$CA = 16.31$

$\Sigma CA = 36.06 + 16.31 = 52.37$

$Q_5 = (0.7 \text{ in/hr})(52.37) = 36.66$ cfs
$Q_{100} = (1.8 \text{ in/hr})(52.37) = 94.27$ cfs

A SMALL DETENTION BASIN MAY BE CONSTRUCTED IN THE EASTGATE SUBDIVISION. THIS WOULD REDUCE FINAL DEVELOPMENT FLOWS SLIGHTLY. IF A DETENTION POND IS BUILT IN THIS AREA, ALL FLOWS (INCLUDING PRE-DEVELOPMENT) SHOULD BE RECALCULATED USING THE SCS METHOD.

AREA 6: FINAL CONDITIONS ARE THE SAME AS DEVELOPED CONDITIONS.

$Q_5 = 5.75$ cfs
$Q_{100} = 15.16$ cfs

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JOB 1016.38
SHEET NO. 196 OF
CALCULATED BY KRK DATE 12-18-90 REV 4-12-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 7: THE UPPER PORTION OF AREA 7 (ABOVE MCCARRAN BLVD.) WILL BE DEVELOPED INTO AN OFFICE PARK WHILE THE LOWER SECTION WILL BE DEVELOPED INTO THE PROPOSED RIDGE HOLLOW SINGLE FAMILY SUBDIVISION. t_c IS BASICALLY THE SAME AS IT WAS FOR EXISTING CONDITIONS. t_c = 33.6 min.
$i_5 = 0.62$ in/hr
$i_{100} = 1.7$ in/hr.

ΣCA FOR AREA 7:

OFFICE PARK: (13.5 Ac)(0.85) CA = 11.48

SINGLE FAM: (28.03 Ac)(0.50) CA = 14.01

MCCARRAN PVMT: (1.47 Ac)(0.90) CA = 1.32

UNDEVELOPED & MCCARRAN SLOPE: (31.8 Ac)(0.55) CA = 17.49

$\Sigma CA = 11.48 + 14.01 + 1.32 + 17.49 = 44.30$

$Q_5 = (0.62 \text{ in/hr})(44.30) = 27.5$ cfs
$Q_{100} = (1.7 \text{ in/hr})(44.30) = 75.3$ cfs

A DETENTION BASIN MAY BE CONSTRUCTED WITH THE RIDGE HOLLOW SUBDIVISION. THIS WOULD REDUCE FINAL DEVELOPMENT FLOWS. IF A DETENTION POND IS CONSTRUCTED IN THIS AREA, ALL FLOWS (INCLUDING PRE-DEVELOPMENT) SHOULD BE RECALCULATED USING THE SCS METHOD.

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Engineers & Planners
3690 Grant Drive Suite J
RENO, NEVADA 89509
(702) 827-8833

JOB 1016.38
SHEET NO. 197 OF
CALCULATED BY KRK DATE 12-18-90 REV. 4-15-91
CHECKED BY DATE
SCALE CAUGHLIN RANCH MASTER HYDROLOGY

AREA 8: REMAINING DEVELOPMENT IN AREA 8 INCLUDES AN OFFICE PARK IN THE CENTRAL SECTION AND A SINGLE FAMILY SUBDIVISION IN THE LOWER SECTION. WESTGATE DETENTION POND AND A SMALL DETENTION POND ON THE SCHOOL SITE ARE LOCATED IN THE CENTRAL PORTION OF AREA 8. A DETENTION POND WILL BE INSTALLED AT THE BOTTOM OF THE DRAINAGE AREA, WHEN THE WESTPOINT SUBDIVISION IS CONSTRUCTED. HYDROGRAPHS AND ROUTING THROUGH THE WESTGATE POND ARE BASICALLY THE SAME, EXCEPT A SMALLER PORTION OF WESTGATE WILL DRAIN TO THE POND THAN UNDER THE EXISTING CALCULATIONS. OUTFLOW HYDROGRAPHS FROM THE WESTGATE POND ARE ADDED TO HYDROGRAPHS FOR OVERLAND FLOW AND ROUTED THROUGH THE PROPOSED POND AT THE BOTTOM OF THE AREA. OUTFLOW HYDROGRAPHS FROM THIS LOWER POND ARE THEN ADDED TO HYDROGRAPHS FOR THE REMAINDER OF THE OVERLAND FLOW IN THE AREA.

$Q_5 = 31.4$ cfs
$Q_{100} = 82.3$ cfs

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-19-1990 08:35:17
Watershed file: --> CRF8B .MOP
Hydrograph file: --> CRF8B5.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
FINAL CONDITIONS AREA 8B FLOW TO WG DET POND EXCLUDING SCH POND
DECEMBER 19, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
AREA 8B	14.51	91.0	0.10	0.00	1.55	0.78	I.13 .13

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 14.51 acres or 0.02267 sq.mi
Peak discharge = 18 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8B	0.10	0.00	**	**	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-19-1990 08:35:17
Watershed file: --> CRF8B .MOP
Hydrograph file: --> CRF8B100.HYD

CAUGHLIN RANCH MASTER HYDROLOGY 1016.38
FINAL CONDITIONS AREA 8B FLOW TO WG DET POND EXCLUDING SCH POND
DECEMBER 19, 1990
CODEGA & FRICKE, INC.

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
AREA 8B	14.51	91.0	0.10	0.00	2.75	1.84	I.07	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 14.51 acres or 0.02267 sq.mi
Peak discharge = 42 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 8B	0.10	0.00	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:49:15


```
**********************************************************************
*                                                                    *
*        CAUGHLIN RANCH MASTER HYDROLOGY STUDY     1016.38           *
*  FINAL CONDITIONS AREA 8A & 8B WESTGATE DETENTION POND 5-YR        *
*                      DECEMBER 19, 1990                             *
*                    CODEGA & FRICKE, INC.                           *
*                                                                    *
**********************************************************************
```

Inflow Hydrograph: CRF8B5 .HYD
Rating Table file: WGPOND .PND

-----INITIAL CONDITIONS-----
Elevation = 69.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
69.00	0.0	0.000
70.00	0.3	0.030
71.00	4.4	0.140
72.00	5.9	0.290
73.00	7.0	0.500
74.00	8.1	0.760
75.00	16.3	1.090
76.00	28.3	1.480
77.00	34.4	1.920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
7.3	7.6
33.9	38.3
70.2	76.1
121.0	128.0
183.9	192.0
263.8	280.1
358.2	386.5
464.6	499.0

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:49:15

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	------	0.0	0.0	0.00	69.00
11.100	0.00	0.0	0.0	0.0	0.00	69.00
11.200	1.00	1.0	0.9	1.0	0.04	69.13
11.300	1.00	2.0	2.7	2.9	0.12	69.39
11.400	1.00	2.0	4.3	4.7	0.19	69.62
11.500	1.00	2.0	5.8	6.3	0.25	69.84
11.600	1.00	2.0	7.1	7.8	0.33	70.01
11.700	2.00	3.0	8.9	10.1	0.65	70.08
11.800	4.00	6.0	12.3	14.9	1.27	70.24
11.900	5.00	9.0	17.0	21.3	2.13	70.45
12.000	11.00	16.0	25.6	33.0	3.70	70.83
12.100	18.00	29.0	44.5	54.6	5.05	71.43
12.200	11.00	29.0	61.9	73.5	5.80	71.93
12.300	4.00	15.0	65.1	76.9	5.92	72.02
12.400	3.00	7.0	60.6	72.1	5.74	71.89
12.500	2.00	5.0	54.7	65.6	5.48	71.72
12.600	2.00	4.0	48.2	58.7	5.21	71.54
12.700	2.00	4.0	42.3	52.2	4.95	71.37
12.800	1.00	3.0	36.0	45.3	4.68	71.19
12.900	1.00	2.0	29.3	38.0	4.36	70.99
13.000	1.00	2.0	24.3	31.3	3.46	70.77
13.100	1.00	2.0	20.7	26.3	2.80	70.61
13.200	1.00	2.0	18.1	22.7	2.32	70.49
13.300	1.00	2.0	16.1	20.1	1.97	70.41
13.400	1.00	2.0	14.7	18.1	1.71	70.34
13.500	1.00	2.0	13.7	16.7	1.52	70.30
13.600	1.00	2.0	12.9	15.7	1.38	70.26
13.700	1.00	2.0	12.3	14.9	1.28	70.24
13.800	1.00	2.0	11.9	14.3	1.21	70.22
13.900	1.00	2.0	11.6	13.9	1.15	70.21
14.000	1.00	2.0	11.4	13.6	1.11	70.20
14.100	1.00	2.0	11.2	13.4	1.08	70.19
14.200	1.00	2.0	11.1	13.2	1.06	70.19
14.300	1.00	2.0	11.0	13.1	1.04	70.18
14.400	1.00	2.0	11.0	13.0	1.03	70.18
14.500	1.00	2.0	10.9	13.0	1.02	70.18
14.600	1.00	2.0	10.9	12.9	1.02	70.17
14.700	1.00	2.0	10.9	12.9	1.01	70.17
14.800	1.00	2.0	10.9	12.9	1.01	70.17
14.900	1.00	2.0	10.8	12.9	1.01	70.17
15.000	1.00	2.0	10.8	12.8	1.00	70.17
15.100	1.00	2.0	10.8	12.8	1.00	70.17
15.200	1.00	2.0	10.8	12.8	1.00	70.17
15.300	0.00	1.0	10.1	11.8	0.87	70.14
15.400	0.00	0.0	8.8	10.1	0.64	70.08

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	0.00	0.0	7.9	8.8	0.47	70.04
15.600	0.00	0.0	7.2	7.9	0.34	70.01
15.700	0.00	0.0	6.6	7.2	0.29	69.95
15.800	0.00	0.0	6.1	6.6	0.26	69.88
15.900	0.00	0.0	5.6	6.1	0.24	69.81
16.000	0.00	0.0	5.2	5.6	0.22	69.74
16.100	0.00	0.0	4.8	5.2	0.21	69.68
16.200	0.00	0.0	4.4	4.8	0.19	69.63
16.300	0.00	0.0	4.0	4.4	0.17	69.58
16.400	0.00	0.0	3.7	4.0	0.16	69.53
16.500	0.00	0.0	3.4	3.7	0.15	69.49
16.600	0.00	0.0	3.1	3.4	0.14	69.45
16.700	0.00	0.0	2.9	3.1	0.12	69.42
16.800	0.00	0.0	2.7	2.9	0.11	69.38
16.900	0.00	0.0	2.5	2.7	0.11	69.35
17.000	0.00	0.0	2.3	2.5	0.10	69.32
17.100	0.00	0.0	2.1	2.3	0.09	69.30
17.200	0.00	0.0	1.9	2.1	0.08	69.28
17.300	0.00	0.0	1.8	1.9	0.08	69.25
17.400	0.00	0.0	1.6	1.8	0.07	69.23
17.500	0.00	0.0	1.5	1.6	0.06	69.21
17.600	0.00	0.0	1.4	1.5	0.06	69.20
17.700	0.00	0.0	1.3	1.4	0.05	69.18
17.800	0.00	0.0	1.2	1.3	0.05	69.17
17.900	0.00	0.0	1.1	1.2	0.05	69.15
18.000	0.00	0.0	1.0	1.1	0.04	69.14
18.100	0.00	0.0	0.9	1.0	0.04	69.13
18.200	0.00	0.0	0.8	0.9	0.04	69.12
18.300	0.00	0.0	0.8	0.8	0.03	69.11
18.400	0.00	0.0	0.7	0.8	0.03	69.10
18.500	0.00	0.0	0.7	0.7	0.03	69.09
18.600	0.00	0.0	0.6	0.7	0.03	69.09
18.700	0.00	0.0	0.6	0.6	0.02	69.08
18.800	0.00	0.0	0.5	0.6	0.02	69.07
18.900	0.00	0.0	0.5	0.5	0.02	69.07
19.000	0.00	0.0	0.4	0.5	0.02	69.06
19.100	0.00	0.0	0.4	0.4	0.02	69.06
19.200	0.00	0.0	0.4	0.4	0.02	69.05
19.300	0.00	0.0	0.3	0.4	0.01	69.05
19.400	0.00	0.0	0.3	0.3	0.01	69.04
19.500	0.00	0.0	0.3	0.3	0.01	69.04
19.600	0.00	0.0	0.3	0.3	0.01	69.04
19.700	0.00	0.0	0.2	0.3	0.01	69.03
19.800	0.00	0.0	0.2	0.2	0.01	69.03
19.900	0.00	0.0	0.2	0.2	0.01	69.03
20.000	0.00	0.0	0.2	0.2	0.01	69.03

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:49:15

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

INFLOW HYDROGRAPH | ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	0.00	0.0	0.2	0.2	0.01	69.03
20.200	0.00	0.0	0.2	0.2	0.01	69.02
20.300	0.00	0.0	0.1	0.2	0.01	69.02
20.400	0.00	0.0	0.1	0.1	0.01	69.02
20.500	0.00	0.0	0.1	0.1	0.01	69.02
20.600	0.00	0.0	0.1	0.1	0.00	69.02
20.700	0.00	0.0	0.1	0.1	0.00	69.02
20.800	0.00	0.0	0.1	0.1	0.00	69.01
20.900	0.00	0.0	0.1	0.1	0.00	69.01
21.000	0.00	0.0	0.1	0.1	0.00	69.01
21.100	0.00	0.0	0.1	0.1	0.00	69.01
21.200	0.00	0.0	0.1	0.1	0.00	69.01
21.300	0.00	0.0	0.1	0.1	0.00	69.01
21.400	0.00	0.0	0.1	0.1	0.00	69.01
21.500	0.00	0.0	0.1	0.1	0.00	69.01
21.600	0.00	0.0	0.1	0.1	0.00	69.01
21.700	0.00	0.0	0.0	0.1	0.00	69.01
21.800	0.00	0.0	0.0	0.0	0.00	69.01
21.900	0.00	0.0	0.0	0.0	0.00	69.01
22.000	0.00	0.0	0.0	0.0	0.00	69.01
22.100	0.00	0.0	0.0	0.0	0.00	69.00
22.200	0.00	0.0	0.0	0.0	0.00	69.00
22.300	0.00	0.0	0.0	0.0	0.00	69.00
22.400	0.00	0.0	0.0	0.0	0.00	69.00
22.500	0.00	0.0	0.0	0.0	0.00	69.00
22.600	0.00	0.0	0.0	0.0	0.00	69.00
22.700	0.00	0.0	0.0	0.0	0.00	69.00
22.800	0.00	0.0	0.0	0.0	0.00	69.00
22.900	0.00	0.0	0.0	0.0	0.00	69.00
23.000	0.00	0.0	0.0	0.0	0.00	69.00
23.100	0.00	0.0	0.0	0.0	0.00	69.00
23.200	0.00	0.0	0.0	0.0	0.00	69.00
23.300	0.00	0.0	0.0	0.0	0.00	69.00
23.400	0.00	0.0	0.0	0.0	0.00	69.00
23.500	0.00	0.0	0.0	0.0	0.00	69.00
23.600	0.00	0.0	0.0	0.0	0.00	69.00
23.700	0.00	0.0	0.0	0.0	0.00	69.00
23.800	0.00	0.0	0.0	0.0	0.00	69.00
23.900	0.00	0.0	0.0	0.0	0.00	69.00
24.000	0.00	0.0	0.0	0.0	0.00	69.00
24.100	0.00	0.0	0.0	0.0	0.00	69.00
24.200	0.00	0.0	0.0	0.0	0.00	69.00
24.300	0.00	0.0	0.0	0.0	0.00	69.00
24.400	0.00	0.0	0.0	0.0	0.00	69.00
24.500	0.00	0.0	0.0	0.0	0.00	69.00
24.600	0.00	0.0	0.0	0.0	0.00	69.00

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

INFLOW HYDROGRAPH

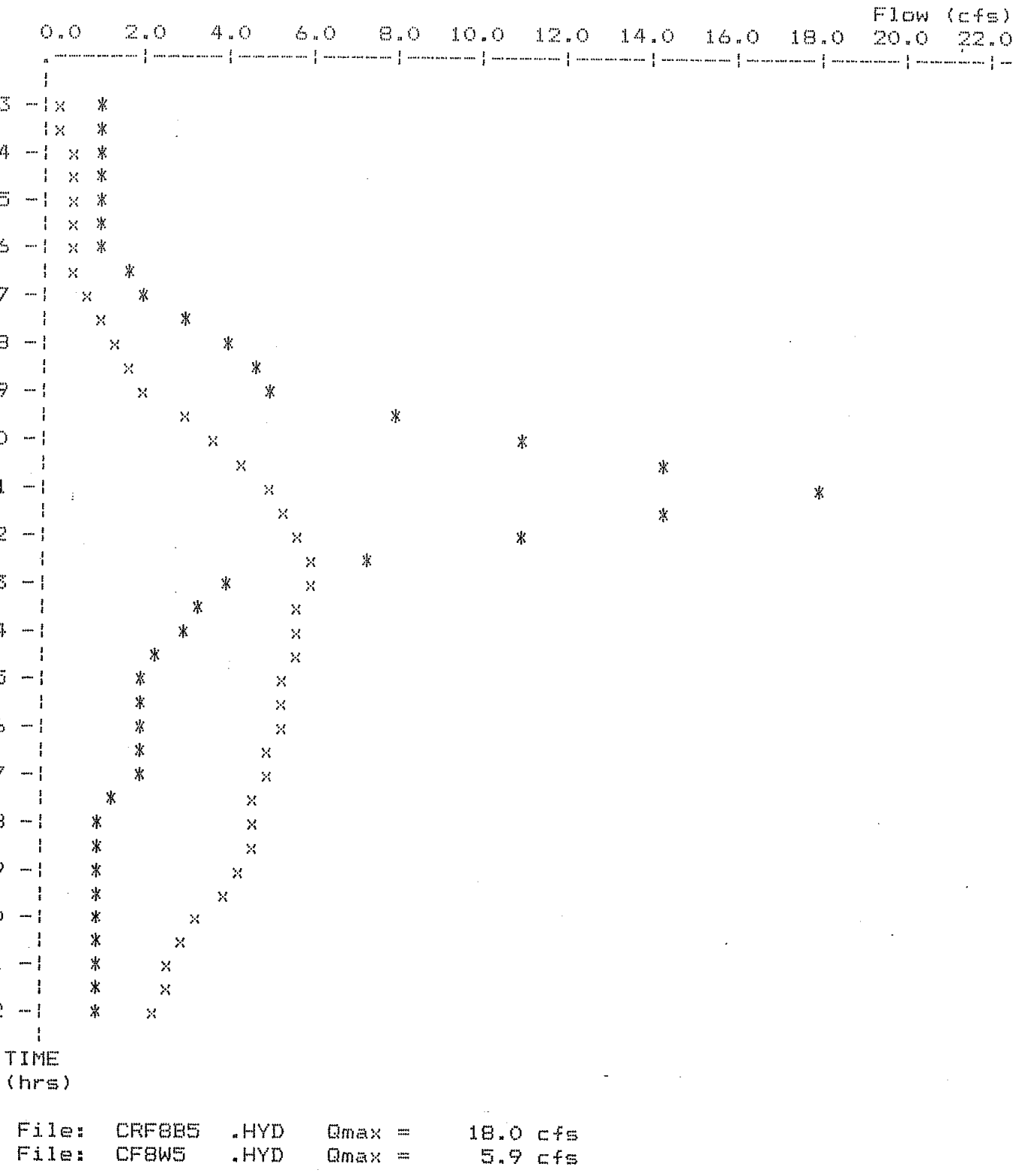
ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	0.0	0.0	0.00	69.00
24.800	0.00	0.0	0.0	0.0	0.00	69.00
24.900	0.00	0.0	0.0	0.0	0.00	69.00
25.000	0.00	0.0	0.0	0.0	0.00	69.00
25.100	0.00	0.0	0.0	0.0	0.00	69.00
25.200	0.00	0.0	0.0	0.0	0.00	69.00
25.300	0.00	0.0	0.0	0.0	0.00	69.00
25.400	0.00	0.0	0.0	0.0	0.00	69.00
25.500	0.00	0.0	0.0	0.0	0.00	69.00
25.600	0.00	0.0	0.0	0.0	0.00	69.00
25.700	0.00	0.0	0.0	0.0	0.00	69.00
25.800	0.00	0.0	0.0	0.0	0.00	69.00
25.900	0.00	0.0	0.0	0.0	0.00	69.00

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

EXECUTED: 12-19-1990
08:49:15

Peak Inflow = 18.00 cfs
Peak Outflow = 5.92 cfs
Peak Elevation = 72.02 ft



* File: CRF8B5 .HYD Qmax = 18.0 cfs
x File: CF8W5 .HYD Qmax = 5.9 cfs

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B5 .HYD
Outflow Hydrograph: CF8W5 .HYD

Starting Pond W.S. Elevation = 69.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	18.00 cfs
Peak Outflow	=	5.92 cfs
Peak Elevation	=	72.02 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.29 ac-ft
Total Storage in Pond	=	0.29 ac-ft

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:42:09


```
**********************************************************************
*                                                                    *
*          CAUGHLIN RANCH MASTER HYDROLOGY STUDY    1016.38          *
*   FINAL CONDITIONS AREAS 8A & 8B WESTGATE DETENTION POND 100-YR    *
*                          DECEMBER 19, 1990                         *
*                        CODEGA & FRICKE, INC.                       *
*                                                                    *
**********************************************************************
```

Inflow Hydrograph: CRF8B100.HYD
Rating Table file: WGPOND .PND

-----INITIAL CONDITIONS-----
Elevation = 69.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
69.00	0.0	0.000
70.00	0.3	0.030
71.00	4.4	0.140
72.00	5.9	0.290
73.00	7.0	0.500
74.00	8.1	0.760
75.00	16.3	1.090
76.00	28.3	1.480
77.00	34.4	1.920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
7.3	7.6
33.9	38.3
70.2	76.1
121.0	128.0
183.9	192.0
263.8	280.1
358.2	386.5
464.6	499.0

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:42:09

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	1.00	------	0.0	0.0	0.00	69.00
11.100	1.00	2.0	1.8	2.0	0.08	69.26
11.200	1.00	2.0	3.5	3.8	0.15	69.51
11.300	1.00	2.0	5.1	5.5	0.22	69.73
11.400	1.00	2.0	6.5	7.1	0.28	69.94
11.500	2.00	3.0	8.4	9.5	0.56	70.06
11.600	2.00	4.0	10.5	12.4	0.95	70.16
11.700	6.00	8.0	15.0	18.5	1.76	70.36
11.800	10.00	16.0	24.1	31.0	3.43	70.76
11.900	14.00	24.0	38.6	48.1	4.79	71.26
12.000	27.00	41.0	67.6	79.6	5.97	72.07
12.100	42.00	69.0	122.3	136.6	7.15	73.13
12.200	26.00	68.0	174.2	190.3	8.07	73.97
12.300	9.00	35.0	189.8	209.2	9.70	74.19
12.400	6.00	15.0	186.2	204.8	9.29	74.14
12.500	5.00	11.0	180.0	197.2	8.58	74.06
12.600	4.00	9.0	172.9	189.0	8.05	73.95
12.700	4.00	8.0	165.1	180.9	7.91	73.83
12.800	3.00	7.0	156.6	172.1	7.76	73.69
12.900	3.00	6.0	147.4	162.6	7.59	73.54
13.000	3.00	6.0	138.5	153.4	7.44	73.40
13.100	2.00	5.0	129.0	143.5	7.27	73.24
13.200	2.00	4.0	118.8	133.0	7.09	73.08
13.300	2.00	4.0	109.1	122.8	6.89	72.90
13.400	2.00	4.0	99.7	113.1	6.68	72.71
13.500	2.00	4.0	90.7	103.7	6.48	72.53
13.600	2.00	4.0	82.1	94.7	6.29	72.36
13.700	2.00	4.0	73.9	86.1	6.11	72.19
13.800	2.00	4.0	66.0	77.9	5.94	72.04
13.900	2.00	4.0	58.7	70.0	5.66	71.84
14.000	2.00	4.0	52.0	62.7	5.37	71.65
14.100	2.00	4.0	45.8	56.0	5.10	71.47
14.200	1.00	3.0	39.1	48.8	4.82	71.28
14.300	1.00	2.0	32.1	41.1	4.51	71.08
14.400	1.00	2.0	26.4	34.1	3.84	70.86
14.500	1.00	2.0	22.3	28.4	3.08	70.68
14.600	1.00	2.0	19.2	24.3	2.53	70.54
14.700	1.00	2.0	17.0	21.2	2.12	70.44
14.800	1.00	2.0	15.3	19.0	1.82	70.37
14.900	1.00	2.0	14.1	17.3	1.60	70.32
15.000	1.00	2.0	13.2	16.1	1.44	70.28
15.100	1.00	2.0	12.6	15.2	1.32	70.25
15.200	1.00	2.0	12.1	14.6	1.24	70.23
15.300	1.00	2.0	11.8	14.1	1.17	70.21
15.400	1.00	2.0	11.5	13.8	1.13	70.20

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:42:09

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	1.00	2.0	11.3	13.5	1.09	70.19
15.600	1.00	2.0	11.2	13.3	1.07	70.19
15.700	1.00	2.0	11.1	13.2	1.05	70.18
15.800	1.00	2.0	11.0	13.1	1.04	70.18
15.900	1.00	2.0	11.0	13.0	1.03	70.18
16.000	1.00	2.0	10.9	13.0	1.02	70.18
16.100	1.00	2.0	10.9	12.9	1.01	70.17
16.200	1.00	2.0	10.9	12.9	1.01	70.17
16.300	1.00	2.0	10.8	12.9	1.01	70.17
16.400	1.00	2.0	10.8	12.8	1.01	70.17
16.500	1.00	2.0	10.8	12.8	1.00	70.17
16.600	1.00	2.0	10.8	12.8	1.00	70.17
16.700	1.00	2.0	10.8	12.8	1.00	70.17
16.800	1.00	2.0	10.8	12.8	1.00	70.17
16.900	1.00	2.0	10.8	12.8	1.00	70.17
17.000	1.00	2.0	10.8	12.8	1.00	70.17
17.100	1.00	2.0	10.8	12.8	1.00	70.17
17.200	1.00	2.0	10.8	12.8	1.00	70.17
17.300	1.00	2.0	10.8	12.8	1.00	70.17
17.400	1.00	2.0	10.8	12.8	1.00	70.17
17.500	1.00	2.0	10.8	12.8	1.00	70.17
17.600	1.00	2.0	10.8	12.8	1.00	70.17
17.700	1.00	2.0	10.8	12.8	1.00	70.17
17.800	1.00	2.0	10.8	12.8	1.00	70.17
17.900	1.00	2.0	10.8	12.8	1.00	70.17
18.000	1.00	2.0	10.8	12.8	1.00	70.17
18.100	1.00	2.0	10.8	12.8	1.00	70.17
18.200	1.00	2.0	10.8	12.8	1.00	70.17
18.300	1.00	2.0	10.8	12.8	1.00	70.17
18.400	1.00	2.0	10.8	12.8	1.00	70.17
18.500	1.00	2.0	10.8	12.8	1.00	70.17
18.600	1.00	2.0	10.8	12.8	1.00	70.17
18.700	1.00	2.0	10.8	12.8	1.00	70.17
18.800	1.00	2.0	10.8	12.8	1.00	70.17
18.900	1.00	2.0	10.8	12.8	1.00	70.17
19.000	1.00	2.0	10.8	12.8	1.00	70.17
19.100	1.00	2.0	10.8	12.8	1.00	70.17
19.200	1.00	2.0	10.8	12.8	1.00	70.17
19.300	1.00	2.0	10.8	12.8	1.00	70.17
19.400	1.00	2.0	10.8	12.8	1.00	70.17
19.500	1.00	2.0	10.8	12.8	1.00	70.17
19.600	1.00	2.0	10.8	12.8	1.00	70.17
19.700	1.00	2.0	10.8	12.8	1.00	70.17
19.800	1.00	2.0	10.8	12.8	1.00	70.17
19.900	1.00	2.0	10.8	12.8	1.00	70.17
20.000	1.00	2.0	10.8	12.8	1.00	70.17

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:42:09

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	1.00	2.0	10.8	12.8	1.00	70.17
20.200	1.00	2.0	10.8	12.8	1.00	70.17
20.300	1.00	2.0	10.8	12.8	1.00	70.17
20.400	1.00	2.0	10.8	12.8	1.00	70.17
20.500	1.00	2.0	10.8	12.8	1.00	70.17
20.600	1.00	2.0	10.8	12.8	1.00	70.17
20.700	1.00	2.0	10.8	12.8	1.00	70.17
20.800	1.00	2.0	10.8	12.8	1.00	70.17
20.900	1.00	2.0	10.8	12.8	1.00	70.17
21.000	1.00	2.0	10.8	12.8	1.00	70.17
21.100	1.00	2.0	10.8	12.8	1.00	70.17
21.200	1.00	2.0	10.8	12.8	1.00	70.17
21.300	1.00	2.0	10.8	12.8	1.00	70.17
21.400	1.00	2.0	10.8	12.8	1.00	70.17
21.500	1.00	2.0	10.8	12.8	1.00	70.17
21.600	1.00	2.0	10.8	12.8	1.00	70.17
21.700	1.00	2.0	10.8	12.8	1.00	70.17
21.800	1.00	2.0	10.8	12.8	1.00	70.17
21.900	1.00	2.0	10.8	12.8	1.00	70.17
22.000	1.00	2.0	10.8	12.8	1.00	70.17
22.100	1.00	2.0	10.8	12.8	1.00	70.17
22.200	1.00	2.0	10.8	12.8	1.00	70.17
22.300	1.00	2.0	10.8	12.8	1.00	70.17
22.400	1.00	2.0	10.8	12.8	1.00	70.17
22.500	1.00	2.0	10.8	12.8	1.00	70.17
22.600	1.00	2.0	10.8	12.8	1.00	70.17
22.700	1.00	2.0	10.8	12.8	1.00	70.17
22.800	1.00	2.0	10.8	12.8	1.00	70.17
22.900	1.00	2.0	10.8	12.8	1.00	70.17
23.000	1.00	2.0	10.8	12.8	1.00	70.17
23.100	1.00	2.0	10.8	12.8	1.00	70.17
23.200	1.00	2.0	10.8	12.8	1.00	70.17
23.300	1.00	2.0	10.8	12.8	1.00	70.17
23.400	1.00	2.0	10.8	12.8	1.00	70.17
23.500	1.00	2.0	10.8	12.8	1.00	70.17
23.600	1.00	2.0	10.8	12.8	1.00	70.17
23.700	1.00	2.0	10.8	12.8	1.00	70.17
23.800	1.00	2.0	10.8	12.8	1.00	70.17
23.900	1.00	2.0	10.8	12.8	1.00	70.17
24.000	0.00	1.0	10.1	11.8	0.87	70.14
24.100	0.00	0.0	8.8	10.1	0.64	70.08
24.200	0.00	0.0	7.9	8.8	0.47	70.04
24.300	0.00	0.0	7.2	7.9	0.34	70.01
24.400	0.00	0.0	6.6	7.2	0.29	69.95
24.500	0.00	0.0	6.1	6.6	0.26	69.88
24.600	0.00	0.0	5.6	6.1	0.24	69.81

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 12-19-1990 08:42:09

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	0.00	0.0	5.2	5.6	0.22	69.74
24.800	0.00	0.0	4.8	5.2	0.20	69.68
24.900	0.00	0.0	4.4	4.8	0.19	69.63
25.000	0.00	0.0	4.0	4.4	0.17	69.58
25.100	0.00	0.0	3.7	4.0	0.16	69.53
25.200	0.00	0.0	3.4	3.7	0.15	69.49
25.300	0.00	0.0	3.1	3.4	0.14	69.45
25.400	0.00	0.0	2.9	3.1	0.12	69.42
25.500	0.00	0.0	2.7	2.9	0.11	69.38
25.600	0.00	0.0	2.5	2.7	0.11	69.35
25.700	0.00	0.0	2.3	2.5	0.10	69.32
25.800	0.00	0.0	2.1	2.3	0.09	69.30
25.900	0.00	0.0	1.9	2.1	0.08	69.28

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

Starting Pond W.S. Elevation = 69.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	42.00 cfs
Peak Outflow	=	9.70 cfs
Peak Elevation	=	74.19 ft

***** Summary of Approximate Peak Storage *****

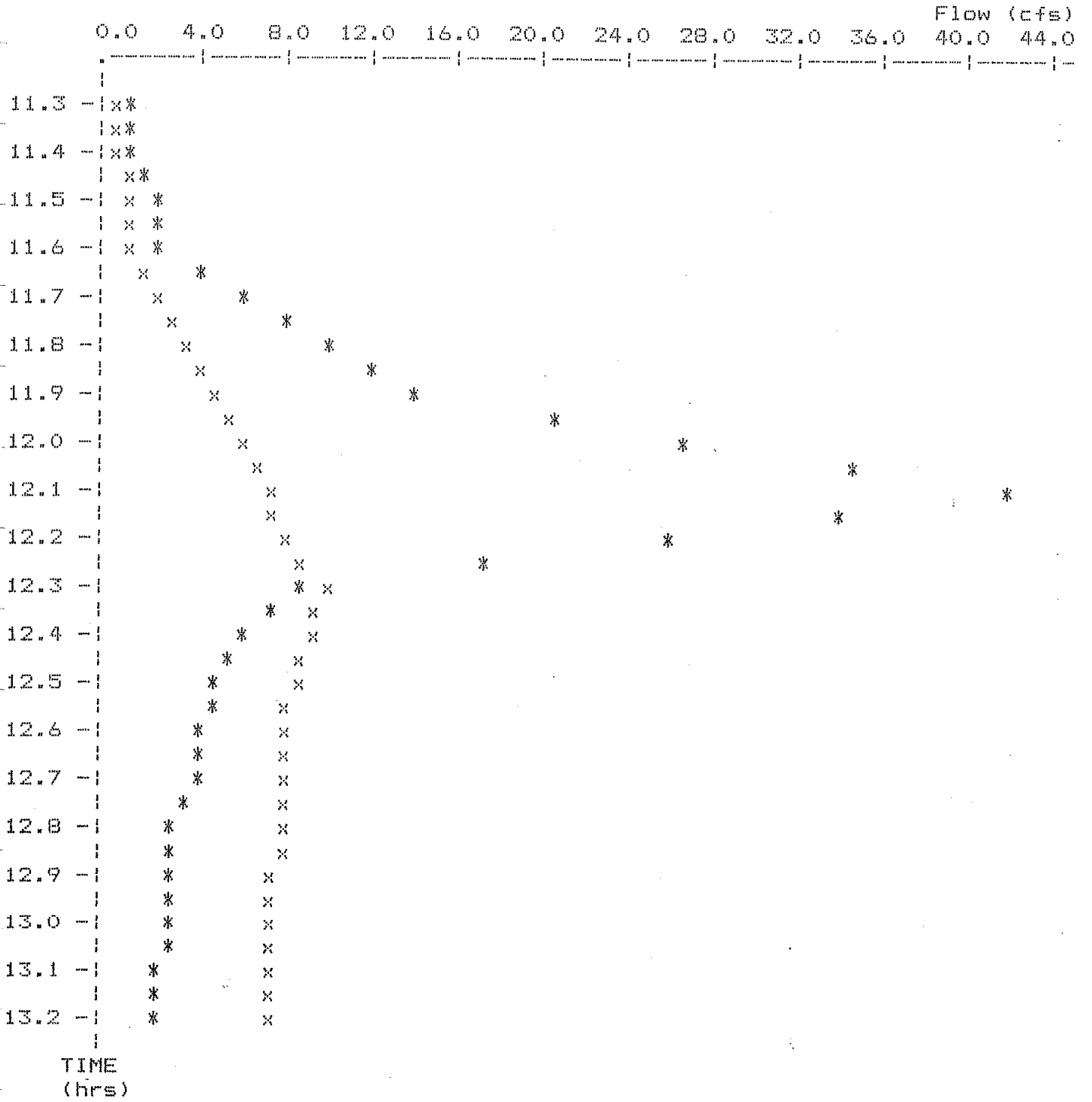
Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.82 ac-ft
Total Storage in Pond	=	0.82 ac-ft

Warning: Inflow hydrograph truncated on left side.

Pond File: WGPOND .PND
Inflow Hydrograph: CRF8B100.HYD
Outflow Hydrograph: CF8W100 .HYD

EXECUTED: 12-19-1990
08:42:09

Peak Inflow = 42.00 cfs
Peak Outflow = 9.70 cfs
Peak Elevation = 74.19 ft



* File: CRF8B100.HYD Qmax = 42.0 cfs
x File: CF8W100 .HYD Qmax = 9.7 cfs

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:45:10 04-02-1991
FILE: WSTPNTPD.RCN

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DET. POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

RUNOFF CURVE NUMBER SUMMARY

	Subarea Description	Area (acres)	CN (weighted)
1	UPPER SD LINE	9.06	87
2	LOWER SD LINE	13.42	87
3	McCARRAN BLVD	4.39	91
4	CAUGHLIN SQR.	13.16	94
5	VISTA POINTE	17.02	87

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:45:10 04-02-1991

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DET. POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

RUNOFF CURVE NUMBER DATA

Composite Area: 1 UPPER SD LINE

SURFACE DESCRIPTION	AREA (acres)	CN	
WESTPOINT SINGLE FAM. SUBDIV.	6.39	88	
WESTPOINT NATURAL COMMON AREA	2.67	85	
COMPOSITE AREA --->	9.06	87.1	(87)

Composite Area: 2 LOWER SD LINE

SURFACE DESCRIPTION	AREA (acres)	CN	
WESTPOINT SINGLE FAM. SUBDIV.	9.78	88	
WESTPOINT NATURAL COMMON AREA	3.64	85	
COMPOSITE AREA --->	13.42	87.2	(87)

Composite Area: 3 McCARRAN BLVD

SURFACE DESCRIPTION	AREA (acres)	CN	
McCARRAN BOULEVARD PAVEMENT	1.43	98	
McCARRAN BOULEVARD SLOPE GRASS	2.96	87	
COMPOSITE AREA --->	4.39	90.6	(91)

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:45:10 04-02-1991

Composite Area: 4 CAUGHLIN SQR.

SURFACE DESCRIPTION	AREA (acres)	CN	
CAUGHLIN SQUARE OFFICE PARK	13.16	94	
COMPOSITE AREA --->	13.16	94.0	(94)

Composite Area: 5 VISTA POINTE

SURFACE DESCRIPTION	AREA (acres)	CN	
VISTA PT. SINGLE FAM. SUBDIV.	11.31	88	
GRASSED COMMON AREA (PARK)	0.91	79	
PAVED COMMON AREA	0.56	98	
SLOPED COMMON AREA (GRASSES)	0.50	87	
NATURAL COMMON AREA	3.74	85	
COMPOSITE AREA --->	17.02	87.2	(87)

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:54:42 04-02-1991
FILE: WSTPNTPD.TCM

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using Length/Velocity)

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Subarea descr.	Tc or Tt	Time (hrs)
1 UPPER SD LINE	Tc	0.15
2 LOWER SD LINE	Tc	0.18
3 McCARRAN BLVD	Tc	0.10
4 CAUGHLIN SQR	Tc	0.10
5 VISTA POINTE	Tc	0.13

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:54:42 04-02-1991

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Tc or Tt DATA

Subarea: 1 UPPER SD LINE

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND TO CB#6	360	1.00	6.0	=	0.10
PIPED	60	4.00	0.3	=	0.00
PIPED	221	3.70	1.0	=	0.02
PIPED	100	3.50	0.5	=	0.01
PIPED	141	3.70	0.6	=	0.01
PIPED	143	3.70	0.6	=	0.01
PIPED EXIST. SDMH GREENSBURG C.	67	6.50	0.2	=	0.00
		TOTAL Tc ---->	minutes 9.2	=	hours 0.15

Subarea: 2 LOWER SD LINE

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND TO YD#1	360	1.00	6.0	=	0.10
PIPED	124	3.50	0.6	=	0.01
PIPED	93	4.20	0.4	=	0.01
PIPED	239	4.20	0.9	=	0.02
PIPED	157	4.20	0.6	=	0.01
PIPED	92	4.20	0.4	=	0.01
PIPED SDMH F-5 TO SDMH G-3	273	4.40	1.0	=	0.02
PIPED	200	6.20	0.5	=	0.01
OVERLAND	95	12.50	0.1	=	0.00
		TOTAL Tc ---->	minutes 10.6	=	hours 0.18

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:54:42 04-02-1991

Subarea: 3 McCARRAN BLVD DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
MINIMUM Tc	360	1.00	6.0	=	0.10
		TOTAL Tc ---->	minutes 6.0	=	hours 0.10

Subarea: 4 CAUGHLIN SQR DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
6 MIN FOR SITE - CONSERVATIVE	360	1.00	6.0	=	0.10
		TOTAL Tc ---->	minutes 6.0	=	hours 0.10

Subarea: 5 VISTA POINTE DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND TO YD	360	1.00	6.0	=	0.10
PIPED	115	5.80	0.3	=	0.01
PIPID	250	5.80	0.7	=	0.01
PIPED	120	12.40	0.2	=	0.00
PIPED	80	12.20	0.1	=	0.00
PIPED	490	18.00	0.5	=	0.01
OVERLAND	145	18.00	0.1	=	0.00
		TOTAL Tc ---->	minutes 7.9	=	hours 0.13

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:51:49 04-02-1991
FILE: WESTPT.TCM

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using Length/Velocity)

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Subarea descr.	Tc or Tt	Time (hrs)
1 UPPER SD LINE	Tt	0.01
2 LOWER SD LINE	Tt	0.00
3 McCARRAN BLVD	Tt	0.01
4 CAUGHLIN SQR.	Tt	0.02
5 VISTA POINTE	Tt	0.00

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:51:49 04-02-1991

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

Tc or Tt DATA

Subarea: 1 UPPER SD LINE

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
PIPED	100	7.50	0.2	=	0.00
PIPED	490	18.00	0.5	=	0.01
OVERLAND	145	18.00	0.1	=	0.00
		TOTAL Tt ---->	minutes 0.8	=	hours 0.01

Subarea: 3 McCARRAN BLVD

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
PIPED	52	8.80	0.1	=	0.00
PIPED	490	18.00	0.5	=	0.01
OVERLAND	145	18.00	0.1	=	0.00
		TOTAL Tt ---->	minutes 0.7	=	hours 0.01

Subarea: 4 CAUGHLIN SQR.

DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
PIPED	221	8.80	0.4	=	0.01
PIPED	52	8.80	0.1	=	0.00
PIPED	490	18.00	0.5	=	0.01
OVERLAND	145	18.00	0.1	=	0.00

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 08:51:49 04-02-1991

	minutes		hours
TOTAL Tt --->	1.1	=	0.02

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 5 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 04-02-1991 08:55:38
Watershed file: --> WSTPNTPD.MOP
Hydrograph file: --> WSTD5.HYD

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
1 UPPER SD LINE	9.06	87.0	0.20	0.00	1.55	0.57	I.19	.19
2 LOWER SD LINE	13.42	87.0	0.20	0.00	1.55	0.57	I.19	.19
3 McCARRAN BLVD	4.39	91.0	0.10	0.00	1.55	0.78	I.13	.13
4 CAUGHLIN SQR.	13.16	94.0	0.10	0.00	1.55	0.98	I.08	.10
5 VISTA POINTE	17.02	87.0	0.10	0.00	1.55	0.57	I.19	.19

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 57.05 acres or 0.08914 sq.mi
Peak discharge = 53 cfs = Q_5

ADD TO OUTFLOW HYDROGRAPH FROM WESTGATE POND AND ROUTE RESULTING HYDROGRAPH THROUGH WESTPOINT POND.

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
1 UPPER SD LINE	0.15	0.01	0.20	0.00	Yes	---
2 LOWER SD LINE	0.18	0.00	0.20	0.00	Yes	---
3 McCARRAN BLVD	0.10	0.01	0.10	0.00	Yes	---
4 CAUGHLIN SQR.	0.10	0.02	0.10	0.00	No	Computed Ia/p < .1
5 VISTA POINTE	0.13	0.00	0.10	0.00	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.

Quick TR-55 Version: 5.41 S/N: 1240540123

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 04-02-1991 08:55:38
Watershed file: ---> WSTPNTPD.MOP
Hydrograph file: ---> WSTD100.HYD

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW TO DETENTION POND
CODEGA & FRICKE, INC.
APRIL 2, 1991

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
1 UPPER SD LINE	9.06	87.0	0.20	0.00	2.75	1.52	I.11	.11
2 LOWER SD LINE	13.42	87.0	0.20	0.00	2.75	1.52	I.11	.11
3 McCARRAN BLVD	4.39	91.0	0.10	0.00	2.75	1.84	I.07	.10
4 CAUGHLIN SQR.	13.16	94.0	0.10	0.00	2.75	2.11	I.05	.10
5 VISTA POINTE	17.02	87.0	0.10	0.00	2.75	1.52	I.11	.11

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 57.05 acres or 0.08914 sq.mi
Peak discharge = 137 cfs = Q_{100}

ADD TO OUTFLOW HYDROGRAPH FROM WESTGATE POND AND ROUTE RESULTING HYDROGRAPH THROUGH WESTPOINT POND.

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
1 UPPER SD LINE	0.15	0.01	0.20	0.00	Yes	---
2 LOWER SD LINE	0.18	0.00	0.20	0.00	Yes	---
3 McCARRAN BLVD	0.10	0.01	0.10	0.00	No	Computed Ia/p < .1
4 CAUGHLIN SQR.	0.10	0.02	0.10	0.00	No	Computed Ia/p < .1
5 VISTA POINTE	0.13	0.00	0.10	0.00	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.

POND-2 Version: 5.13 S/N: 1220510325

Executed 04-02-1991 09:01:19

5-YEAR FLOW INTO WESTPOINT POND

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	Outflow from Westgate Pond CF8W5 (cfs)	Flows Between Westgate & Westpoint Pond WSTD5 (cfs)	Total Flow into Westpoint Pond WPD5 (Total)
11.00	0.0	0.0	0.0
11.10	0.0	0.0	0.0
11.20	0.0	1.0	1.0
11.30	0.1	1.0	1.1
11.40	0.2	1.0	1.2
11.50	0.3	1.0	1.3
11.60	0.3	1.0	1.3
11.70	0.6	6.0	6.7
11.80	1.3	11.0	12.3
11.90	2.1	16.0	18.1
12.00	3.7	31.0	34.7
12.10	5.1	53.0	58.0
12.20	5.8	40.0	45.8
12.30	5.9	18.0	23.9
12.40	5.7	11.0	16.7
12.50	5.5	8.0	13.5
12.60	5.2	8.0	13.2
12.70	4.9	5.0	9.9
12.80	4.7	5.0	9.7
12.90	4.4	4.0	8.4
13.00	3.5	4.0	7.5
13.10	2.8	4.0	6.8
13.20	2.3	4.0	6.3
13.30	2.0	4.0	6.0
13.40	1.7	4.0	5.7
13.50	1.5	4.0	5.5
13.60	1.4	3.0	4.4
13.70	1.3	3.0	4.3
13.80	1.2	3.0	4.2
13.90	1.1	3.0	4.2
14.00	1.1	3.0	4.1
14.10	1.1	3.0	4.1
14.20	1.1	2.0	3.1
14.30	1.0	2.0	3.0
14.40	1.0	2.0	3.0
14.50	1.0	2.0	3.0
14.60	1.0	2.0	3.0
14.70	1.0	2.0	3.0
14.80	1.0	2.0	3.0
14.90	1.0	2.0	3.0

Executed 04-02-1991 09:01:19

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF8W5 (cfs)	WSTD5 (cfs)	WPD5 (Total)
15.00	1.0	2.0	3.0
15.10	1.0	2.0	3.0
15.20	1.0	2.0	3.0
15.30	0.9	1.0	1.9
15.40	0.6	1.0	1.6
15.50	0.5	1.0	1.5
15.60	0.3	1.0	1.3
15.70	0.3	1.0	1.3
15.80	0.3	0.0	0.3
15.90	0.2	0.0	0.2
16.00	0.2	0.0	0.2
16.10	0.2	0.0	0.2
16.20	0.2	0.0	0.2
16.30	0.2	0.0	0.2
16.40	0.2	0.0	0.2
16.50	0.2	0.0	0.2
16.60	0.1	0.0	0.1
16.70	0.1	0.0	0.1
16.80	0.1	0.0	0.1
16.90	0.1	0.0	0.1
17.00	0.1	0.0	0.1
17.10	0.1	0.0	0.1
17.20	0.1	0.0	0.1
17.30	0.1	0.0	0.1
17.40	0.1	0.0	0.1
17.50	0.1	0.0	0.1
17.60	0.1	0.0	0.1
17.70	0.1	0.0	0.1
17.80	0.1	0.0	0.1
17.90	0.1	0.0	0.1
18.00	0.0	0.0	0.0
18.10	0.0	0.0	0.0
18.20	0.0	0.0	0.0
18.30	0.0	0.0	0.0
18.40	0.0	0.0	0.0
18.50	0.0	0.0	0.0
18.60	0.0	0.0	0.0
18.70	0.0	0.0	0.0
18.80	0.0	0.0	0.0
18.90	0.0	0.0	0.0
19.00	0.0	0.0	0.0

Executed 04-02-1991 09:03:16

100-YEAR FLOW INTO WESTPOINT POND

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CFBW100 (cfs) Outflow from Westgate Pond	WSTD100 (cfs) Flows Between Westgate & Westpoint Pond	WPD100 (Total) Total Flow into Westpoint Pond
11.00	0.0	3.0	3.0
11.10	0.1	3.0	3.1
11.20	0.2	4.0	4.2
11.30	0.2	4.0	4.2
11.40	0.3	5.0	5.3
11.50	0.6	6.0	6.6
11.60	0.9	7.0	7.9
11.70	1.8	18.0	19.8
11.80	3.4	30.0	33.4
11.90	4.8	41.0	45.8
12.00	6.0	82.0	88.0
12.10	7.2	137.0	144.1
12.20	8.1	102.0	110.1
12.30	9.7	46.0	55.7
12.40	9.3	27.0	36.3
12.50	8.6	21.0	29.6
12.60	8.1	17.0	25.0
12.70	7.9	14.0	21.9
12.80	7.8	12.0	19.8
12.90	7.6	12.0	19.6
13.00	7.4	11.0	18.4
13.10	7.3	9.0	16.3
13.20	7.1	8.0	15.1
13.30	6.9	8.0	14.9
13.40	6.7	8.0	14.7
13.50	6.5	8.0	14.5
13.60	6.3	8.0	14.3
13.70	6.1	8.0	14.1
13.80	5.9	7.0	12.9
13.90	5.7	6.0	11.7
14.00	5.4	6.0	11.4
14.10	5.1	5.0	10.1
14.20	4.8	5.0	9.8
14.30	4.5	4.0	8.5
14.40	3.8	4.0	7.8
14.50	3.1	4.0	7.1
14.60	2.5	4.0	6.5
14.70	2.1	4.0	6.1
14.80	1.8	4.0	5.8
14.90	1.6	4.0	5.6

Executed 04-02-1991 09:03:16

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF8W100 (cfs)	WSTD100 (cfs)	WPD100 (Total)
15.00	1.4	4.0	5.4
15.10	1.3	4.0	5.3
15.20	1.2	4.0	5.2
15.30	1.2	4.0	5.2
15.40	1.1	4.0	5.1
15.50	1.1	4.0	5.1
15.60	1.1	4.0	5.1
15.70	1.0	4.0	5.1
15.80	1.0	4.0	5.0
15.90	1.0	4.0	5.0
16.00	1.0	4.0	5.0
16.10	1.0	4.0	5.0
16.20	1.0	4.0	5.0
16.30	1.0	3.0	4.0
16.40	1.0	3.0	4.0
16.50	1.0	3.0	4.0
16.60	1.0	3.0	4.0
16.70	1.0	3.0	4.0
16.80	1.0	3.0	4.0
16.90	1.0	3.0	4.0
17.00	1.0	3.0	4.0
17.10	1.0	3.0	4.0
17.20	1.0	3.0	4.0
17.30	1.0	3.0	4.0
17.40	1.0	3.0	4.0
17.50	1.0	3.0	4.0
17.60	1.0	3.0	4.0
17.70	1.0	3.0	4.0
17.80	1.0	3.0	4.0
17.90	1.0	3.0	4.0
18.00	1.0	3.0	4.0
18.10	1.0	3.0	4.0
18.20	1.0	3.0	4.0
18.30	1.0	3.0	4.0
18.40	1.0	3.0	4.0
18.50	1.0	3.0	4.0
18.60	1.0	3.0	4.0
18.70	1.0	3.0	4.0
18.80	1.0	3.0	4.0
18.90	1.0	3.0	4.0
19.00	1.0	3.0	4.0

Executed 04-02-1991 09:03:16

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF8W100 (cfs)	WSTD100 (cfs)	WPD100 (Total)
19.10	1.0	3.0	4.0
19.20	1.0	3.0	4.0
19.30	1.0	3.0	4.0
19.40	1.0	3.0	4.0
19.50	1.0	2.0	3.0
19.60	1.0	2.0	3.0
19.70	1.0	2.0	3.0
19.80	1.0	2.0	3.0
19.90	1.0	2.0	3.0
20.00	1.0	2.0	3.0
20.10	1.0	2.0	3.0
20.20	1.0	2.0	3.0
20.30	1.0	2.0	3.0
20.40	1.0	2.0	3.0
20.50	1.0	2.0	3.0
20.60	1.0	2.0	3.0
20.70	1.0	2.0	3.0
20.80	1.0	2.0	3.0
20.90	1.0	2.0	3.0
21.00	1.0	2.0	3.0
21.10	1.0	1.0	2.0
21.20	1.0	1.0	2.0
21.30	1.0	1.0	2.0
21.40	1.0	1.0	2.0
21.50	1.0	1.0	2.0
21.60	1.0	1.0	2.0
21.70	1.0	1.0	2.0
21.80	1.0	1.0	2.0
21.90	1.0	1.0	2.0
22.00	1.0	1.0	2.0
22.10	1.0	1.0	2.0
22.20	1.0	1.0	2.0
22.30	1.0	1.0	2.0
22.40	1.0	1.0	2.0
22.50	1.0	1.0	2.0
22.60	1.0	1.0	2.0
22.70	1.0	1.0	2.0
22.80	1.0	1.0	2.0
22.90	1.0	1.0	2.0
23.00	1.0	1.0	2.0
23.10	1.0	1.0	2.0

Executed 04-02-1991 09:03:16

Data directory: *.HYD

File Summary for Composite Hydrograph

Time (hrs)	CF8W100 (cfs)	WSTD100 (cfs)	WPD100 (Total)
23.20	1.0	1.0	2.0
23.30	1.0	1.0	2.0
23.40	1.0	1.0	2.0
23.50	1.0	1.0	2.0
23.60	1.0	1.0	2.0
23.70	1.0	1.0	2.0
23.80	1.0	1.0	2.0
23.90	1.0	1.0	2.0
24.00	0.9	0.0	0.9
24.10	0.6	0.0	0.6
24.20	0.5	0.0	0.5
24.30	0.3	0.0	0.3
24.40	0.3	0.0	0.3
24.50	0.3	0.0	0.3
24.60	0.2	0.0	0.2
24.70	0.2	0.0	0.2
24.80	0.2	0.0	0.2
24.90	0.2	0.0	0.2
25.00	0.2	0.0	0.2
25.10	0.2	0.0	0.2
25.20	0.2	0.0	0.2
25.30	0.1	0.0	0.1
25.40	0.1	0.0	0.1
25.50	0.1	0.0	0.1
25.60	0.1	0.0	0.1
25.70	0.1	0.0	0.1
25.80	0.1	0.0	0.1
25.90	0.1	0.0	0.1
26.00	0.0	0.0	0.0
26.10	0.0	0.0	0.0
26.20	0.0	0.0	0.0
26.30	0.0	0.0	0.0
26.40	0.0	0.0	0.0
26.50	0.0	0.0	0.0
26.60	0.0	0.0	0.0
26.70	0.0	0.0	0.0
26.80	0.0	0.0	0.0
26.90	0.0	0.0	0.0
27.00	0.0	0.0	0.0

POND-2 Version: 5.13
S/N: 1220510325

WESTPOINT DETENTION POND 1075.12
JANUARY 3, 1991
CODEGA & FRICKE INC.

CALCULATED 01-04-1991 13:28:28
DISK FILE: WSTPNT .VOL

Planimeter scale: 1 inch = 60 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
4,985.00	1.15	0.09	0.00	0.00	0.00
4,986.00	*I*	0.11	0.31	0.10	0.10
4,987.00	*I*	0.14	0.34	0.23	0.23
4,988.00	*I*	0.16	0.37	0.37	0.37
4,989.00	*I*	0.18	0.41	0.54	0.54
4,990.00	2.53	0.21	0.44	0.74	0.74
4,991.00	*I*	0.23	0.67	0.22	0.96
4,992.00	*I*	0.26	0.71	0.47	1.21
4,993.00	*I*	0.29	0.75	0.75	1.49
4,994.00	*I*	0.32	0.79	1.05	1.79
4,995.00	4.29	0.35	0.84	1.39	2.13

I ---> Interpolated area from closest two planimeter readings.

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
4985.00	0.0	1 +2
4985.50	1.8	1 +2
4986.00	6.0	1 +2
4986.50	11.1	1 +2
4987.00	14.7	1 +2
4987.50	17.6	1 +2
4988.00	20.2	1 +2
4988.50	22.4	1 +2
4989.00	24.4	1 +2
4989.50	26.3	1 +2
4990.00	28.0	1 +2
4990.10	28.4	1 +2 +3
4990.50	30.5	1 +2 +3
4991.00	34.9	1 +2 +3
4991.50	40.6	1 +2 +3
4992.00	46.9	1 +2 +3
4992.50	53.5	1 +2 +3
4993.00	58.7	1 +2 +3
4993.50	63.3	1 +2 +3
4994.00	67.4	1 +2 +3
4994.50	71.2	1 +2 +3
4995.00	74.9	1 +2 +3

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

Outlet Structure File: WESTPT .STR
Planimeter Input File: WSTPNT .VOL
Rating Table Output File: WESTPT .PND

Min. Elev.(ft) = 4985 Max. Elev.(ft) = 4995 Incr.(ft) = .5

Additional elevations (ft) to be included in table:
* *
4990.10

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
CULVERT-CR	1		->	1
CULVERT-CR	2		->	2
CULVERT-CR	3		->	3

Outflow rating table summary was stored in file:
WESTPT .PND

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	4985.00
E2 elev.(ft)?	4995.001
Diam. (ft)?	1.25
Inv. el.(ft)?	4985.00
Slope (ft/ft)?	0.01
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.00
c Coeff.?	0.0317
Y Coeff.?	.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	4985.00
E2 elev.(ft)?	4995.001
Diam. (ft)?	1.25
Inv. el.(ft)?	4985.00
Slope (ft/ft)?	0.01
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.00
c Coeff.?	0.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

>>>>>> Structure No. 3 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	4990.10
E2 elev.(ft)?	4995.001
Diam. (ft)?	2.00
Inv. el.(ft)?	4990.10
Slope (ft/ft)?	0.01
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.00
c Coeff.?	0.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

Outflow Rating Table for Structure #1
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages		
4985.00	0.0	No headwater		
4985.50	0.9	Equ.1: HW =.5	dc=.374	Ac=.308
4986.00	3.0	Equ.1: HW =1.0	dc=.697	Ac=.703
4986.50	5.5	Submerged: HW =1.5		
4987.00	7.3	Submerged: HW =2.0		
4987.50	8.8	Submerged: HW =2.5		
4988.00	10.1	Submerged: HW =3.0		
4988.50	11.2	Submerged: HW =3.5		
4989.00	12.2	Submerged: HW =4.0		
4989.50	13.2	Submerged: HW =4.5		
4990.00	14.0	Submerged: HW =5.0		
4990.10	14.2	Submerged: HW =5.1		
4990.50	14.9	Submerged: HW =5.5		
4991.00	15.6	Submerged: HW =6.0		
4991.50	16.4	Submerged: HW =6.5		
4992.00	17.1	Submerged: HW =7.0		
4992.50	17.8	Submerged: HW =7.5		
4993.00	18.4	Submerged: HW =8.0		
4993.50	19.0	Submerged: HW =8.5		
4994.00	19.7	Submerged: HW =9.0		
4994.50	20.3	Submerged: HW =9.5		
4995.00	20.8	Submerged: HW =10.0		

Used Unsubmerged Equ. Form (1) for elev. less than 4986.36 ft
Used Submerged Equation for elevations greater than 4986.49 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=4986.36 ft; Q1=4.8 cfs; Dc=.89 ft; E2=4986.49 ft; Q2=5.49 cfs

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

Outflow Rating Table for Structure #2
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
4985.00	0.0	No headwater
4985.50	0.9	Equ.1: HW =.5 dc=.374 Ac=.308
4986.00	3.0	Equ.1: HW =1.0 dc=.697 Ac=.703
4986.50	5.5	Submerged: HW =1.5
4987.00	7.3	Submerged: HW =2.0
4987.50	8.8	Submerged: HW =2.5
4988.00	10.1	Submerged: HW =3.0
4988.50	11.2	Submerged: HW =3.5
4989.00	12.2	Submerged: HW =4.0
4989.50	13.2	Submerged: HW =4.5
4990.00	14.0	Submerged: HW =5.0
4990.10	14.2	Submerged: HW =5.1
4990.50	14.9	Submerged: HW =5.5
4991.00	15.6	Submerged: HW =6.0
4991.50	16.4	Submerged: HW =6.5
4992.00	17.1	Submerged: HW =7.0
4992.50	17.8	Submerged: HW =7.5
4993.00	18.4	Submerged: HW =8.0
4993.50	19.0	Submerged: HW =8.5
4994.00	19.7	Submerged: HW =9.0
4994.50	20.3	Submerged: HW =9.5
4995.00	20.8	Submerged: HW =10.0

Used Unsubmerged Equ. Form (1) for elev. less than 4986.36 ft
Used Submerged Equation for elevations greater than 4986.49 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=4986.36 ft; Q1=4.8 cfs; Dc=.89 ft; E2=4986.49 ft; Q2=5.49 cfs

Outlet Structure File: WESTPT .STR

POND-2 Version: 5.13 S/N: 1220510325
Date Executed: Time Executed:

****
OUTLET STRUCTURE
WESTPOINT DETENTION POND 1075.12
APRIL 5, 1991
CODEGA & FRICKE, INC.
****

Outflow Rating Table for Structure #3
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages		
4985.00	0.0	E < Inv.El.= 4990.1		
4985.50	0.0	E < Inv.El.= 4990.1		
4986.00	0.0	E < Inv.El.= 4990.1		
4986.50	0.0	E < Inv.El.= 4990.1		
4987.00	0.0	E < Inv.El.= 4990.1		
4987.50	0.0	E < Inv.El.= 4990.1		
4988.00	0.0	E < Inv.El.= 4990.1		
4988.50	0.0	E < Inv.El.= 4990.1		
4989.00	0.0	E < Inv.El.= 4990.1		
4989.50	0.0	E < Inv.El.= 4990.1		
4990.00	0.0	E < Inv.El.= 4990.1		
4990.10	0.0	No headwater		
4990.50	0.8	Equ.1: HW =.4	dc=.299	Ac=.294
4991.00	3.6	Equ.1: HW =.9	dc=.666	Ac=.916
4991.50	7.8	Equ.1: HW =1.4	dc=.995	Ac=1.561
4992.00	12.8	Equ.1: HW =1.9	dc=1.285	Ac=2.134
4992.50	17.9	Submerged: HW =2.4		
4993.00	21.8	Submerged: HW =2.9		
4993.50	25.2	Submerged: HW =3.4		
4994.00	28.0	Submerged: HW =3.9		
4994.50	30.7	Submerged: HW =4.4		
4995.00	33.2	Submerged: HW =4.9		

Used Unsubmerged Equ. Form (1) for elev. less than 4992.28 ft
Used Submerged Equation for elevations greater than 4992.48 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:

E1=4992.28 ft; Q1=15.55 cfs; Dc=1.42 ft; E2=4992.48 ft; Q2=17.77 cfs

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:27:12


```
**********************************************
*                                            *
*            WESTPOINT  1075.12              *
* DETENTION POND ROUTING 5-YEAR STORM        *
*               APRIL 5, 1991                *
*          CODEGA & FRICKE, INC.             *
*                                            *
**********************************************
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Inflow Hydrograph: WPD5 .HYD
Rating Table file: WESTPT .PND

-----INITIAL CONDITIONS-----
Elevation = 4985.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
4985.00	0.0	0.000
4985.50	1.8	0.050
4986.00	6.0	0.104
4986.50	11.1	0.164
4987.00	14.7	0.229
4987.50	17.6	0.299
4988.00	20.2	0.375
4988.50	22.4	0.457
4989.00	24.4	0.545
4989.50	26.3	0.639
4990.00	28.0	0.740
4990.10	28.4	0.762
4990.50	30.5	0.848
4991.00	34.9	0.962
4991.50	40.6	1.083
4992.00	46.9	1.211
4992.50	53.5	1.346
4993.00	58.7	1.488
4993.50	63.3	1.638
4994.00	67.4	1.795
4994.50	71.2	1.960
4995.00	74.9	2.134

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
12.0	13.8
25.2	31.2
39.6	50.7
55.3	70.0
72.4	90.0
90.7	110.9
110.6	133.0
131.9	156.3
154.7	181.0
179.2	207.2
184.3	212.7
205.2	235.7
232.9	267.8
262.1	302.7
293.0	339.9
325.7	379.2
360.1	418.8
396.3	459.6
434.4	501.8
474.4	545.6
516.3	591.2

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:27:12

Pond File: WESTPT .PND
Inflow Hydrograph: WPD5 .HYD
Outflow Hydrograph: WPOUT5 .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	0.00	-----	0.0	0.0	0.00	4985.00
11.100	0.00	0.0	0.0	0.0	0.00	4985.00
11.200	1.04	1.0	0.8	1.0	0.14	4985.04
11.300	1.12	2.2	2.2	2.9	0.38	4985.11
11.400	1.19	2.3	3.3	4.5	0.58	4985.16
11.500	1.25	2.4	4.3	5.8	0.75	4985.21
11.600	1.33	2.6	5.1	6.8	0.89	4985.25
11.700	6.65	8.0	9.6	13.0	1.70	4985.47
11.800	12.27	18.9	17.9	28.6	5.36	4985.92
11.900	18.13	30.4	27.4	48.3	10.45	4986.44
12.000	34.70	52.8	47.8	80.2	16.18	4987.25
12.100	58.05	92.8	94.5	140.6	23.05	4988.66
12.200	45.80	103.9	143.5	198.3	27.42	4989.83
12.300	23.92	69.7	156.3	213.2	28.45	4990.11
12.400	16.74	40.7	142.3	197.0	27.34	4989.80
12.500	13.48	30.2	121.2	172.5	25.65	4989.33
12.600	13.21	26.7	100.6	147.9	23.68	4988.82
12.700	9.95	23.2	80.8	123.7	21.47	4988.29
12.800	9.68	19.6	62.6	100.4	18.89	4987.75
12.900	8.36	18.0	48.2	80.6	16.24	4987.27
13.000	7.46	15.8	36.8	64.0	13.57	4986.84
13.100	6.80	14.3	28.8	51.1	11.17	4986.51
13.200	6.32	13.1	24.3	41.9	8.78	4986.27
13.300	5.97	12.3	21.8	36.6	7.40	4986.14
13.400	5.71	11.7	20.3	33.5	6.59	4986.06
13.500	5.52	11.2	19.4	31.5	6.08	4986.01
13.600	4.38	9.9	18.2	29.3	5.53	4985.94
13.700	4.28	8.7	17.0	26.9	4.95	4985.87
13.800	4.21	8.5	16.3	25.5	4.61	4985.83
13.900	4.15	8.4	15.8	24.6	4.40	4985.81
14.000	4.11	8.3	15.5	24.1	4.27	4985.79
14.100	4.08	8.2	15.3	23.7	4.19	4985.78
14.200	3.06	7.1	14.7	22.5	3.89	4985.75
14.300	3.04	6.1	13.8	20.8	3.48	4985.70
14.400	3.03	6.1	13.4	19.9	3.27	4985.67
14.500	3.02	6.1	13.1	19.4	3.15	4985.66
14.600	3.02	6.0	13.0	19.2	3.09	4985.65
14.700	3.01	6.0	12.9	19.0	3.05	4985.65
14.800	3.01	6.0	12.9	18.9	3.03	4985.65
14.900	3.01	6.0	12.9	18.9	3.02	4985.65
15.000	3.00	6.0	12.8	18.9	3.01	4985.64
15.100	3.00	6.0	12.8	18.8	3.01	4985.64
15.200	3.00	6.0	12.8	18.8	3.00	4985.64
15.300	1.87	4.9	12.2	17.7	2.73	4985.61
15.400	1.64	3.5	11.2	15.7	2.26	4985.55

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:27:12

Pond File: WESTPT .PND
Inflow Hydrograph: WPD5 .HYD
Outflow Hydrograph: WPOUT5 .HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
15.500	1.47
15.600	1.34
15.700	1.29
15.800	0.26
15.900	0.24
16.000	0.22
16.100	0.21
16.200	0.19
16.300	0.17
16.400	0.16
16.500	0.15
16.600	0.14
16.700	0.12
16.800	0.11
16.900	0.11
17.000	0.10
17.100	0.09
17.200	0.08
17.300	0.08
17.400	0.07
17.500	0.06
17.600	0.06
17.700	0.05
17.800	0.05
17.900	0.05
18.000	0.04
18.100	0.04
18.200	0.04
18.300	0.03
18.400	0.03
18.500	0.03
18.600	0.03
18.700	0.02
18.800	0.02
18.900	0.02
19.000	0.02

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
3.1	10.5	14.3	1.92	4985.51
2.8	9.8	13.3	1.73	4985.48
2.6	9.2	12.5	1.62	4985.45
1.6	8.0	10.8	1.40	4985.39
0.5	6.3	8.5	1.10	4985.31
0.5	5.0	6.7	0.88	4985.24
0.4	4.0	5.4	0.70	4985.20
0.4	3.3	4.4	0.57	4985.16
0.4	2.7	3.6	0.47	4985.13
0.3	2.2	3.0	0.39	4985.11
0.3	1.9	2.5	0.33	4985.09
0.3	1.6	2.2	0.28	4985.08
0.3	1.4	1.9	0.24	4985.07
0.2	1.2	1.6	0.21	4985.06
0.2	1.0	1.4	0.18	4985.05
0.2	0.9	1.3	0.16	4985.05
0.2	0.8	1.1	0.15	4985.04
0.2	0.7	1.0	0.13	4985.04
0.2	0.7	0.9	0.12	4985.03
0.2	0.6	0.8	0.11	4985.03
0.1	0.5	0.7	0.10	4985.03
0.1	0.5	0.7	0.09	4985.02
0.1	0.4	0.6	0.08	4985.02
0.1	0.4	0.5	0.07	4985.02
0.1	0.4	0.5	0.07	4985.02
0.1	0.3	0.5	0.06	4985.02
0.1	0.3	0.4	0.05	4985.02
0.1	0.3	0.4	0.05	4985.01
0.1	0.3	0.4	0.05	4985.01
0.1	0.2	0.3	0.04	4985.01
0.1	0.2	0.3	0.04	4985.01
0.1	0.2	0.3	0.04	4985.01
0.1	0.2	0.3	0.03	4985.01
0.0	0.2	0.2	0.03	4985.01
0.0	0.2	0.2	0.03	4985.01
0.0	0.1	0.2	0.03	4985.01

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WESTPT .PND
Inflow Hydrograph: WPD5 .HYD
Outflow Hydrograph: WPOUT5 .HYD

Starting Pond W.S. Elevation = 4985.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	58.05 cfs
Peak Outflow	=	28.45 cfs
Peak Elevation	=	4990.11 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.76 ac-ft
Total Storage in Pond	=	0.76 ac-ft

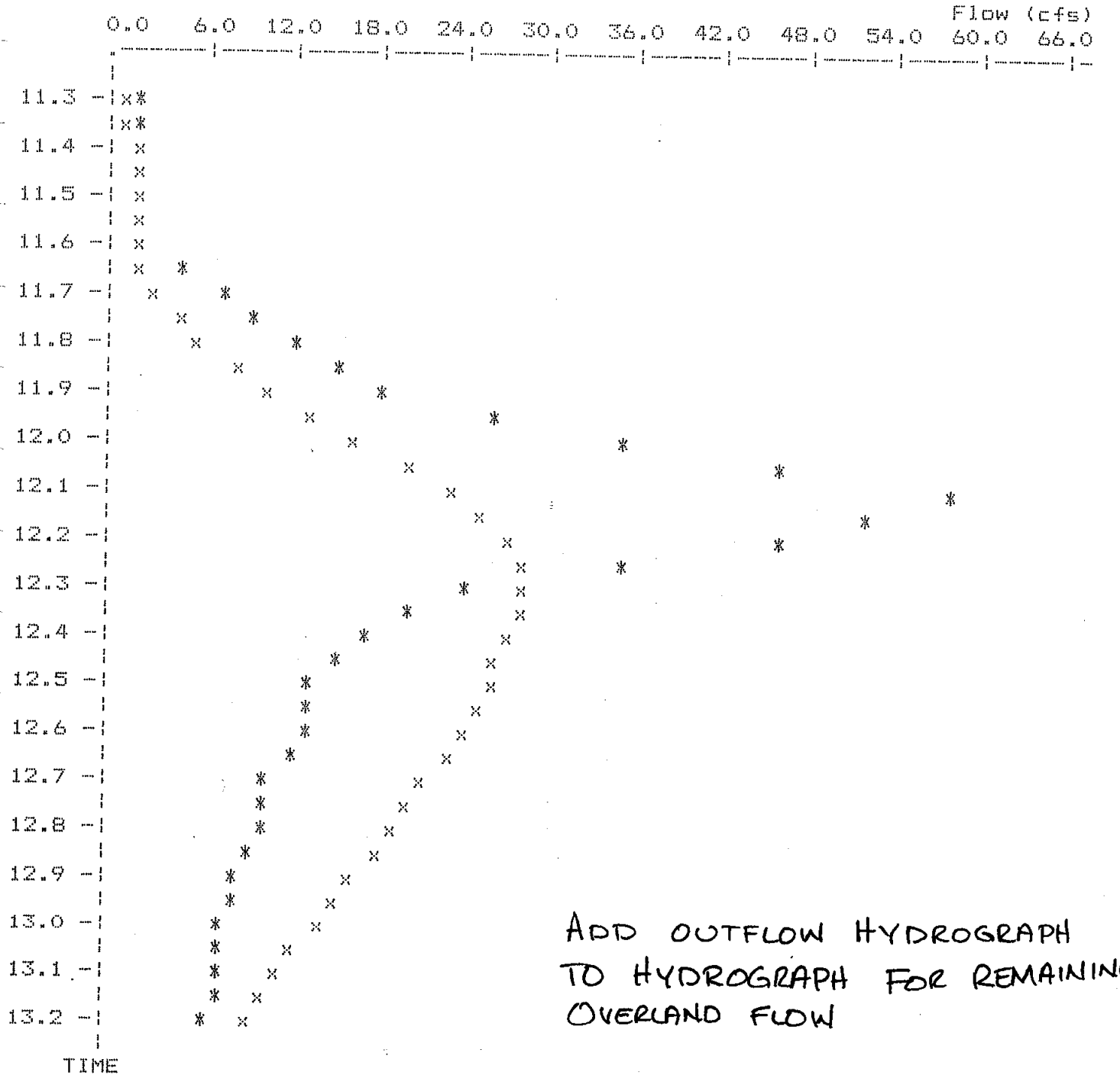
Warning: Inflow hydrograph truncated on right side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: WESTPT .PND
Inflow Hydrograph: WPD5 .HYD
Outflow Hydrograph: WPOUT5 .HYD

EXECUTED: 04-05-1991
09:27:12

Peak Inflow = 58.05 cfs
Peak Outflow = 28.45 cfs
Peak Elevation = 4990.11 ft



* File: WPD5 .HYD Qmax = 58.0 cfs
x File: WPOUT5 .HYD Qmax = 28.5 cfs

ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR REMAINING OVERLAND FLOW

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:28:39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**********************************************
*                                            *
*              WESTPOINT  1075.12            *
*    DETENTION POND ROUTING 100-YEAR STORM   *
*                 APRIL 5, 1991              *
*            CODEGA & FRICKE, INC.           *
*                                            *
**********************************************
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Inflow Hydrograph: WPD100 .HYD
Rating Table file: WESTPT .PND

-----INITIAL CONDITIONS-----
Elevation = 4985.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
4985.00	0.0	0.000
4985.50	1.8	0.050
4986.00	6.0	0.104
4986.50	11.1	0.164
4987.00	14.7	0.229
4987.50	17.6	0.299
4988.00	20.2	0.375
4988.50	22.4	0.457
4989.00	24.4	0.545
4989.50	26.3	0.639
4990.00	28.0	0.740
4990.10	28.4	0.762
4990.50	30.5	0.848
4991.00	34.9	0.962
4991.50	40.6	1.083
4992.00	46.9	1.211
4992.50	53.5	1.346
4993.00	58.7	1.488
4993.50	63.3	1.638
4994.00	67.4	1.795
4994.50	71.2	1.960
4995.00	74.9	2.134

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
12.0	13.8
25.2	31.2
39.6	50.7
55.3	70.0
72.4	90.0
90.7	110.9
110.6	133.0
131.9	156.3
154.7	181.0
179.2	207.2
184.3	212.7
205.2	235.7
232.9	267.8
262.1	302.7
293.0	339.9
325.7	379.2
360.1	418.8
396.3	459.6
434.4	501.8
474.4	545.6
516.3	591.2

Time increment (t) = 0.100 hrs.

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:28:39

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	3.00	------	0.0	0.0	0.00	4985.00
11.100	3.08	6.1	4.5	6.1	0.79	4985.22
11.200	4.15	7.2	8.7	11.7	1.53	4985.42
11.300	4.22	8.4	11.9	17.0	2.58	4985.59
11.400	5.28	9.5	14.1	21.4	3.63	4985.72
11.500	6.56	11.8	16.5	26.0	4.73	4985.85
11.600	7.95	14.5	19.1	31.0	5.95	4985.99
11.700	19.76	27.7	26.7	46.8	10.08	4986.40
11.800	33.43	53.2	47.6	79.9	16.13	4987.25
11.900	45.79	79.2	83.3	126.8	21.79	4988.36
12.000	87.97	133.8	159.4	217.0	28.79	4990.18
12.100	144.15	232.1	281.3	391.5	55.13	4992.66
12.200	110.07	254.2	394.9	535.5	70.33	4994.39
12.300	55.70	165.8	415.8	560.6	72.42	4994.66
12.400	36.29	92.0	371.9	507.8	67.92	4994.07
12.500	29.58	65.9	316.1	437.8	60.84	4993.23
12.600	25.05	54.6	266.6	370.7	52.08	4992.39
12.700	21.91	47.0	228.7	313.5	42.43	4991.65
12.800	19.76	41.7	199.7	270.3	35.32	4991.04
12.900	19.59	39.4	177.1	239.0	30.96	4990.55
13.000	18.44	38.0	157.9	215.2	28.63	4990.14
13.100	16.27	34.7	138.5	192.6	27.05	4989.72
13.200	15.09	31.4	119.0	169.9	25.44	4989.27
13.300	14.89	30.0	101.4	149.0	23.77	4988.84
13.400	14.68	29.6	86.6	131.0	22.20	4988.46
13.500	14.48	29.2	74.4	115.8	20.68	4988.11
13.600	14.29	28.8	64.7	103.2	19.24	4987.81
13.700	14.11	28.4	57.1	93.1	17.99	4987.57
13.800	12.94	27.1	50.6	84.2	16.76	4987.35
13.900	11.66	24.6	44.3	75.2	15.46	4987.13
14.000	11.37	23.0	39.0	67.4	14.20	4986.93
14.100	10.10	21.5	34.6	60.4	12.91	4986.75
14.200	9.82	19.9	30.9	54.5	11.81	4986.60
14.300	8.51	18.3	27.8	49.3	10.71	4986.46
14.400	7.84	16.4	25.4	44.2	9.38	4986.33
14.500	7.08	14.9	23.6	40.3	8.38	4986.23
14.600	6.53	13.6	22.1	37.2	7.56	4986.15
14.700	6.12	12.7	20.9	34.7	6.91	4986.09
14.800	5.82	11.9	20.0	32.8	6.42	4986.04
14.900	5.60	11.4	19.3	31.4	6.05	4986.00
15.000	5.44	11.0	18.8	30.4	5.79	4985.97
15.100	5.32	10.8	18.4	29.5	5.59	4985.95
15.200	5.24	10.6	18.0	28.9	5.44	4985.93
15.300	5.17	10.4	17.8	28.4	5.33	4985.92
15.400	5.13	10.3	17.6	28.1	5.24	4985.91

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:28:39

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	5.09	10.2	17.5	27.8	5.18	4985.90
15.600	5.07	10.2	17.4	27.6	5.13	4985.90
15.700	5.05	10.1	17.3	27.5	5.10	4985.89
15.800	5.04	10.1	17.2	27.4	5.07	4985.89
15.900	5.03	10.1	17.2	27.3	5.05	4985.89
16.000	5.02	10.1	17.2	27.3	5.04	4985.89
16.100	5.01	10.0	17.2	27.2	5.03	4985.88
16.200	5.01	10.0	17.1	27.2	5.02	4985.88
16.300	4.01	9.0	16.6	26.2	4.77	4985.85
16.400	4.01	8.0	15.8	24.6	4.40	4985.81
16.500	4.00	8.0	15.4	23.8	4.21	4985.79
16.600	4.00	8.0	15.2	23.4	4.11	4985.77
16.700	4.00	8.0	15.1	23.2	4.06	4985.77
16.800	4.00	8.0	15.0	23.1	4.03	4985.77
16.900	4.00	8.0	15.0	23.0	4.02	4985.76
17.000	4.00	8.0	15.0	23.0	4.01	4985.76
17.100	4.00	8.0	15.0	23.0	4.00	4985.76
17.200	4.00	8.0	15.0	23.0	4.00	4985.76
17.300	4.00	8.0	15.0	23.0	4.00	4985.76
17.400	4.00	8.0	14.9	23.0	4.00	4985.76
17.500	4.00	8.0	14.9	22.9	4.00	4985.76
17.600	4.00	8.0	14.9	22.9	4.00	4985.76
17.700	4.00	8.0	14.9	22.9	4.00	4985.76
17.800	4.00	8.0	14.9	22.9	4.00	4985.76
17.900	4.00	8.0	14.9	22.9	4.00	4985.76
18.000	4.00	8.0	14.9	22.9	4.00	4985.76
18.100	4.00	8.0	14.9	22.9	4.00	4985.76
18.200	4.00	8.0	14.9	22.9	4.00	4985.76
18.300	4.00	8.0	14.9	22.9	4.00	4985.76
18.400	4.00	8.0	14.9	22.9	4.00	4985.76
18.500	4.00	8.0	14.9	22.9	4.00	4985.76
18.600	4.00	8.0	14.9	22.9	4.00	4985.76
18.700	4.00	8.0	14.9	22.9	4.00	4985.76
18.800	4.00	8.0	14.9	22.9	4.00	4985.76
18.900	4.00	8.0	14.9	22.9	4.00	4985.76
19.000	4.00	8.0	14.9	22.9	4.00	4985.76
19.100	4.00	8.0	14.9	22.9	4.00	4985.76
19.200	4.00	8.0	14.9	22.9	4.00	4985.76
19.300	4.00	8.0	14.9	22.9	4.00	4985.76
19.400	4.00	8.0	14.9	22.9	4.00	4985.76
19.500	3.00	7.0	14.4	21.9	3.76	4985.73
19.600	3.00	6.0	13.6	20.4	3.39	4985.69
19.700	3.00	6.0	13.2	19.6	3.20	4985.67
19.800	3.00	6.0	13.0	19.2	3.10	4985.66
19.900	3.00	6.0	12.9	19.0	3.05	4985.65
20.000	3.00	6.0	12.9	18.9	3.03	4985.65

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:28:39

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	3.00	6.0	12.8	18.9	3.01	4985.64
20.200	3.00	6.0	12.8	18.8	3.01	4985.64
20.300	3.00	6.0	12.8	18.8	3.00	4985.64
20.400	3.00	6.0	12.8	18.8	3.00	4985.64
20.500	3.00	6.0	12.8	18.8	3.00	4985.64
20.600	3.00	6.0	12.8	18.8	3.00	4985.64
20.700	3.00	6.0	12.8	18.8	3.00	4985.64
20.800	3.00	6.0	12.8	18.8	3.00	4985.64
20.900	3.00	6.0	12.8	18.8	3.00	4985.64
21.000	3.00	6.0	12.8	18.8	3.00	4985.64
21.100	2.00	5.0	12.3	17.8	2.76	4985.61
21.200	2.00	4.0	11.5	16.3	2.39	4985.57
21.300	2.00	4.0	11.1	15.5	2.20	4985.55
21.400	2.00	4.0	10.9	15.1	2.10	4985.54
21.500	2.00	4.0	10.8	14.9	2.05	4985.53
21.600	2.00	4.0	10.7	14.8	2.03	4985.53
21.700	2.00	4.0	10.7	14.7	2.01	4985.53
21.800	2.00	4.0	10.7	14.7	2.01	4985.52
21.900	2.00	4.0	10.7	14.7	2.00	4985.52
22.000	2.00	4.0	10.7	14.7	2.00	4985.52
22.100	2.00	4.0	10.7	14.7	2.00	4985.52
22.200	2.00	4.0	10.7	14.7	2.00	4985.52
22.300	2.00	4.0	10.7	14.7	2.00	4985.52
22.400	2.00	4.0	10.7	14.7	2.00	4985.52
22.500	2.00	4.0	10.7	14.7	2.00	4985.52
22.600	2.00	4.0	10.7	14.7	2.00	4985.52
22.700	2.00	4.0	10.7	14.7	2.00	4985.52
22.800	2.00	4.0	10.7	14.7	2.00	4985.52
22.900	2.00	4.0	10.7	14.7	2.00	4985.52
23.000	2.00	4.0	10.7	14.7	2.00	4985.52
23.100	2.00	4.0	10.7	14.7	2.00	4985.52
23.200	2.00	4.0	10.7	14.7	2.00	4985.52
23.300	2.00	4.0	10.7	14.7	2.00	4985.52
23.400	2.00	4.0	10.7	14.7	2.00	4985.52
23.500	2.00	4.0	10.7	14.7	2.00	4985.52
23.600	2.00	4.0	10.7	14.7	2.00	4985.52
23.700	2.00	4.0	10.7	14.7	2.00	4985.52
23.800	2.00	4.0	10.7	14.7	2.00	4985.52
23.900	2.00	4.0	10.7	14.7	2.00	4985.52
24.000	0.87	2.9	10.0	13.5	1.76	4985.49
24.100	0.64	1.5	8.5	11.5	1.50	4985.42
24.200	0.47	1.1	7.1	9.6	1.25	4985.35
24.300	0.34	0.8	5.9	7.9	1.03	4985.29
24.400	0.29	0.6	4.8	6.5	0.85	4985.23
24.500	0.26	0.6	4.0	5.4	0.70	4985.19
24.600	0.24	0.5	3.3	4.5	0.58	4985.16

POND-2 Version: 5.13 S/N: 1220510325
EXECUTED: 04-05-1991 09:28:39

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
24.700	0.22
24.800	0.20
24.900	0.19
25.000	0.17
25.100	0.16
25.200	0.15
25.300	0.14
25.400	0.12
25.500	0.11
25.600	0.11
25.700	0.10
25.800	0.09
25.900	0.08
26.000	0.00
26.100	0.00
26.200	0.00
26.300	0.00
26.400	0.00
26.500	0.00
26.600	0.00
26.700	0.00
26.800	0.00
26.900	0.00
27.000	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.5	2.8	3.8	0.49	4985.14
0.4	2.4	3.2	0.42	4985.12
0.4	2.0	2.8	0.36	4985.10
0.4	1.8	2.4	0.31	4985.09
0.3	1.6	2.1	0.27	4985.08
0.3	1.4	1.9	0.24	4985.07
0.3	1.2	1.7	0.22	4985.06
0.3	1.1	1.5	0.19	4985.05
0.2	1.0	1.3	0.17	4985.05
0.2	0.9	1.2	0.16	4985.04
0.2	0.8	1.1	0.14	4985.04
0.2	0.7	1.0	0.13	4985.04
0.2	0.7	0.9	0.12	4985.03
0.1	0.6	0.8	0.10	4985.03
0.0	0.4	0.6	0.07	4985.02
0.0	0.3	0.4	0.05	4985.01
0.0	0.2	0.3	0.04	4985.01
0.0	0.2	0.2	0.03	4985.01
0.0	0.1	0.2	0.02	4985.01
0.0	0.1	0.1	0.02	4985.00
0.0	0.1	0.1	0.01	4985.00
0.0	0.1	0.1	0.01	4985.00
0.0	0.0	0.1	0.01	4985.00
0.0	0.0	0.0	0.00	4985.00

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

Starting Pond W.S. Elevation = 4985.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	144.15 cfs
Peak Outflow	=	72.42 cfs
Peak Elevation	=	4994.67 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	2.02 ac-ft
Total Storage in Pond	=	2.02 ac-ft

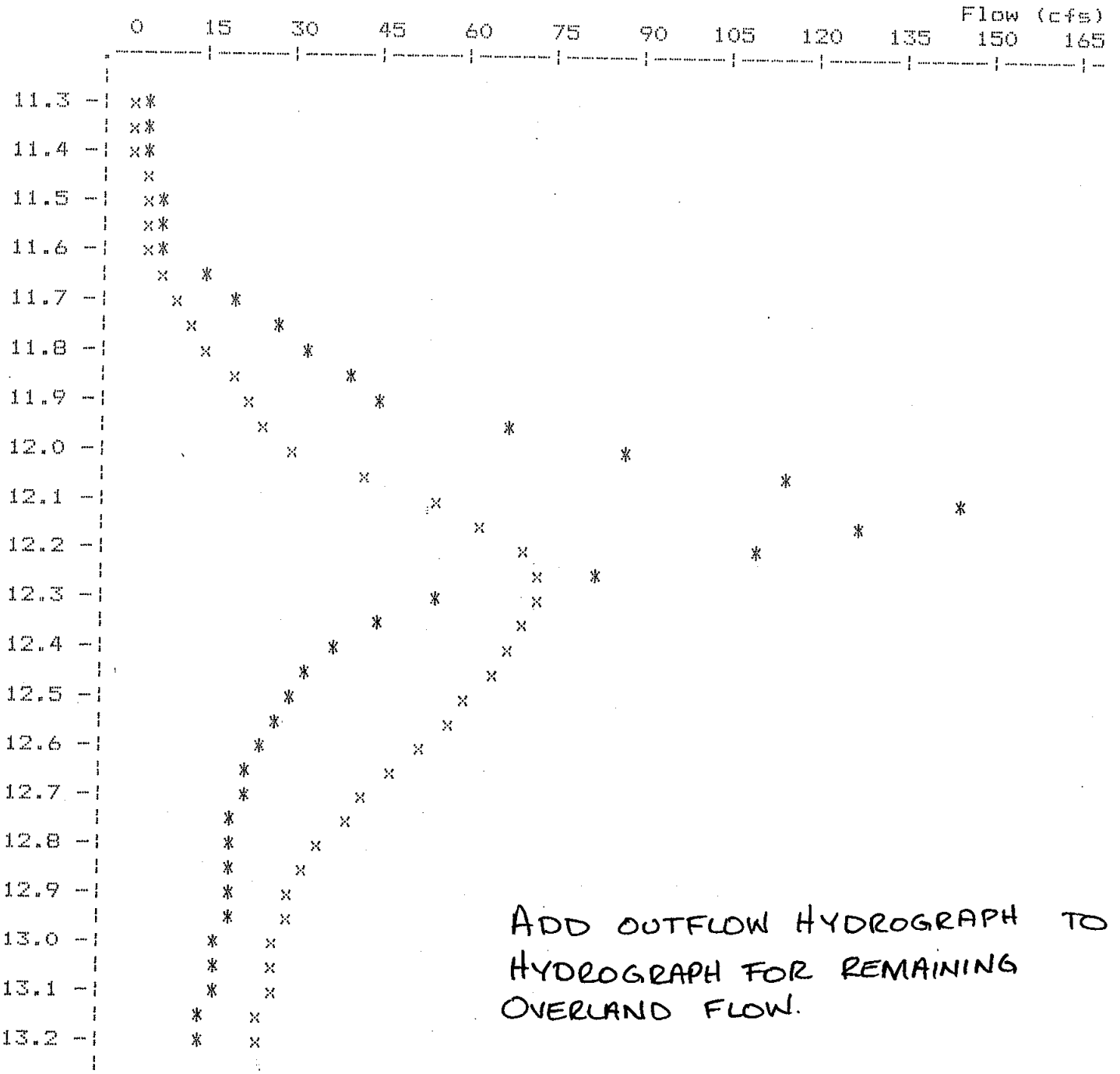
Warning: Inflow hydrograph truncated on left side.

POND-2 Version: 5.13 S/N: 1220510325

Pond File: WESTPT .PND
Inflow Hydrograph: WPD100 .HYD
Outflow Hydrograph: WPOUT100.HYD

EXECUTED: 04-05-1991
09:28:39

Peak Inflow = 144.15 cfs
Peak Outflow = 72.42 cfs
Peak Elevation = 4994.67 ft



* File: WPD100 .HYD Qmax = 144.1 cfs
x File: WPOUT100.HYD Qmax = 72.4 cfs

ADD OUTFLOW HYDROGRAPH TO HYDROGRAPH FOR REMAINING OVERLAND FLOW.

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 15:55:33 03-28-1991
FILE: WSTBTTM.TCM

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using Length/Velocity)

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DOWNSTREAM OF DETENTION POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

Subarea descr.	Tc or Tt	Time (hrs)
OVERLAND FLOW	Tc	0.10

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 15:55:33 03-28-1991

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DOWNSTREAM OF DETENTION POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

Tc or Tt DATA

Subarea: OVERLAND FLOW DESCRIPTION	LENGTH (feet)	VELOCITY (ft/sec)	TIME minutes		hours
OVERLAND TO DRAINAGEWAY #4	895	3.60	4.1	=	0.07
ADDITIONAL TO MAKE MIN. Tc	115	1.00	1.9	=	0.03
		TOTAL Tc --->	minutes 6.1	=	hours 0.10

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 15:35:11 03-28-1991
FILE: WSTBTTM.RCN

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DNSTRM OF POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

RUNOFF CURVE NUMBER SUMMARY

Subarea Description	Area (acres)	CN (weighted)
OVERLAND FLOW	8.56	86

Quick TR-55 Ver.5.41 S/N:1240540123
Executed: 15:35:11 03-28-1991

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DNSTRM OF POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

RUNOFF CURVE NUMBER DATA

Composite Area: OVERLAND FLOW

SURFACE DESCRIPTION	AREA (acres)	CN	
VISTA PT. SINGLE FAM. SUBDIV.	2.12	88	
VISTA PT. NATURAL COMMON AREA	5.84	85	
WESTPOINT NATURAL COMMON AREA	0.60	85	
COMPOSITE AREA --->	8.56	85.7	(86)

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 03-28-1991 15:58:18
Watershed file: --> WSTBTTM .MOP
Hydrograph file: --> WSTBT5.HYD

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DOWNSTREAM OF DETENTION POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
OVERLAND FLOW	8.56	86.0	0.10	0.00	1.55	0.53	I.21 .21

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 8.56 acres or 0.01338 sq.mi
Peak discharge = 7 cfs $= Q_5$

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
OVERLAND FLOW	0.10	0.00	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Quick TR-55 Version: 5.41 S/N: 1240540123
Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 03-28-1991 15:58:18
Watershed file: --> WSTBTTM .MOP
Hydrograph file: --> WSTBT100.HYD

WESTPOINT 1075.12
DEVELOPED CONDITIONS - FLOW DOWNSTREAM OF DETENTION POND
CODEGA & FRICKE, INC.
MARCH 28, 1991

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
OVERLAND FLOW	8.56	86.0	0.10	0.00	2.75	1.45	I.12	.12

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 8.56 acres or 0.01338 sq.mi
Peak discharge = 19 cfs = Q_{100}

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
OVERLAND FLOW	0.10	0.00	**	**	Yes	---

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Executed 04-05-1991 09:31:48

Data directory: *.HYD

5-YEAR FLOWS

File Summary for Composite Hydrograph

Time (hrs)	POND OUTFLOW WPOUT5 (cfs)	DOWNSTREAM OVERLAND FLOW WSTBT5 (cfs)	TOTAL FLOW DRAINAGEWAY 4 DW4-5 (Total)
11.00	0.0	0.0	0.0
11.10	0.0	0.0	0.0
11.20	0.1	0.0	0.1
11.30	0.4	0.0	0.4
11.40	0.6	0.0	0.6
11.50	0.8	0.0	0.8
11.60	0.9	0.0	0.9
11.70	1.7	1.0	2.7
11.80	5.4	1.0	6.4
11.90	10.4	2.0	12.4
12.00	16.2	4.0	20.2
12.10	23.0	7.0	30.0
12.20	27.4	4.0	31.4
12.30	28.5	2.0	30.5
12.40	27.3	1.0	28.3
12.50	25.6	1.0	26.6
12.60	23.7	1.0	24.7
12.70	21.5	1.0	22.5
12.80	18.9	1.0	19.9
12.90	16.2	1.0	17.2
13.00	13.6	1.0	14.6
13.10	11.2	0.0	11.2
13.20	8.8	0.0	8.8
13.30	7.4	0.0	7.4
13.40	6.6	0.0	6.6
13.50	6.1	0.0	6.1
13.60	5.5	0.0	5.5
13.70	4.9	0.0	4.9
13.80	4.6	0.0	4.6
13.90	4.4	0.0	4.4
14.00	4.3	0.0	4.3
14.10	4.2	0.0	4.2
14.20	3.9	0.0	3.9
14.30	3.5	0.0	3.5
14.40	3.3	0.0	3.3
14.50	3.2	0.0	3.2
14.60	3.1	0.0	3.1
14.70	3.0	0.0	3.0
14.80	3.0	0.0	3.0
14.90	3.0	0.0	3.0

= Q_5 FOR ENTIRE DRAINAGEWAY

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5-YEAR FLOWS

File Summary for Composite Hydrograph

Time (hrs)	POND OUTFLOW WPOUT5 (cfs)	DOWNSTREAM OVERLAND FLOW WSTBT5 (cfs)	TOTAL FLOW DRAINAGEWAY 4 DW4-5 (Total)
15.00	3.0	0.0	3.0
15.10	3.0	0.0	3.0
15.20	3.0	0.0	3.0
15.30	2.7	0.0	2.7
15.40	2.3	0.0	2.3
15.50	1.9	0.0	1.9
15.60	1.7	0.0	1.7
15.70	1.6	0.0	1.6
15.80	1.4	0.0	1.4
15.90	1.1	0.0	1.1
16.00	0.9	0.0	0.9
16.10	0.7	0.0	0.7
16.20	0.6	0.0	0.6
16.30	0.5	0.0	0.5
16.40	0.4	0.0	0.4
16.50	0.3	0.0	0.3
16.60	0.3	0.0	0.3
16.70	0.2	0.0	0.2
16.80	0.2	0.0	0.2
16.90	0.2	0.0	0.2
17.00	0.2	0.0	0.2
17.10	0.2	0.0	0.2
17.20	0.1	0.0	0.1
17.30	0.1	0.0	0.1
17.40	0.1	0.0	0.1
17.50	0.1	0.0	0.1
17.60	0.1	0.0	0.1
17.70	0.1	0.0	0.1
17.80	0.1	0.0	0.1
17.90	0.1	0.0	0.1
18.00	0.1	0.0	0.1
18.10	0.1	0.0	0.1
18.20	0.1	0.0	0.1
18.30	0.1	0.0	0.1
18.40	0.0	0.0	0.0
18.50	0.0	0.0	0.0
18.60	0.0	0.0	0.0
18.70	0.0	0.0	0.0
18.80	0.0	0.0	0.0
18.90	0.0	0.0	0.0
19.00	0.0	0.0	0.0

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100-YEAR FLOWS

File Summary for Composite Hydrograph

Time (hrs)	POND OUTFLOW WPOUT100 (cfs)	DOWNSTREAM OVERLAND FLOW WSTBT100 (cfs)	TOTAL FLOW DRAINAGEWAY4 DW4-100 (Total)
11.00	0.0	0.0	0.0
11.10	0.8	0.0	0.8
11.20	1.5	1.0	2.5
11.30	2.6	1.0	3.6
11.40	3.6	1.0	4.6
11.50	4.7	1.0	5.7
11.60	5.9	1.0	6.9
11.70	10.1	3.0	13.1
11.80	16.1	4.0	20.1
11.90	21.8	6.0	27.8
12.00	28.8	12.0	40.8
12.10	55.1	19.0	74.1
12.20	70.3	12.0	82.3 = Q_{100} FOR ENTIRE DRAINAGEWAY
12.30	72.4	4.0	76.4
12.40	67.9	3.0	70.9
12.50	60.8	2.0	62.8
12.60	52.1	2.0	54.1
12.70	42.4	2.0	44.4
12.80	35.3	2.0	37.3
12.90	31.0	2.0	33.0
13.00	28.6	1.0	29.6
13.10	27.0	1.0	28.0
13.20	25.4	1.0	26.4
13.30	23.8	1.0	24.8
13.40	22.2	1.0	23.2
13.50	20.7	1.0	21.7
13.60	19.2	1.0	20.2
13.70	18.0	1.0	19.0
13.80	16.8	1.0	17.8
13.90	15.5	1.0	16.5
14.00	14.2	1.0	15.2
14.10	12.9	1.0	13.9
14.20	11.8	1.0	12.8
14.30	10.7	1.0	11.7
14.40	9.4	1.0	10.4
14.50	8.4	1.0	9.4
14.60	7.6	1.0	8.6
14.70	6.9	1.0	7.9
14.80	6.4	1.0	7.4
14.90	6.1	1.0	7.1

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100-YEAR FLOWS

File Summary for Composite Hydrograph

Time (hrs)	POND OUTFLOW WPOUT100 (cfs)	DOWNSTREAM OVERLAND FLOW WSTBT100 (cfs)	TOTAL FLOW DRAINAGEWAY 4 DW4-100 (Total)
15.00	5.8	1.0	6.8
15.10	5.6	1.0	6.6
15.20	5.4	1.0	6.4
15.30	5.3	1.0	6.3
15.40	5.2	1.0	6.2
15.50	5.2	1.0	6.2
15.60	5.1	1.0	6.1
15.70	5.1	1.0	6.1
15.80	5.1	0.0	5.1
15.90	5.1	0.0	5.1
16.00	5.0	0.0	5.0
16.10	5.0	0.0	5.0
16.20	5.0	0.0	5.0
16.30	4.8	0.0	4.8
16.40	4.4	0.0	4.4
16.50	4.2	0.0	4.2
16.60	4.1	0.0	4.1
16.70	4.1	0.0	4.1
16.80	4.0	0.0	4.0
16.90	4.0	0.0	4.0
17.00	4.0	0.0	4.0
17.10	4.0	0.0	4.0
17.20	4.0	0.0	4.0
17.30	4.0	0.0	4.0
17.40	4.0	0.0	4.0
17.50	4.0	0.0	4.0
17.60	4.0	0.0	4.0
17.70	4.0	0.0	4.0
17.80	4.0	0.0	4.0
17.90	4.0	0.0	4.0
18.00	4.0	0.0	4.0
18.10	4.0	0.0	4.0
18.20	4.0	0.0	4.0
18.30	4.0	0.0	4.0
18.40	4.0	0.0	4.0
18.50	4.0	0.0	4.0
18.60	4.0	0.0	4.0
18.70	4.0	0.0	4.0
18.80	4.0	0.0	4.0
18.90	4.0	0.0	4.0
19.00	4.0	0.0	4.0

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AREA 9: INCLUDED WITH AREA 11

AREA 10: APPROXIMATELY 2/3 OF AREA 10 WILL BE DEVELOPED INTO SINGLE FAMILY LOTS, THE REMAINDER WILL STAY IN ITS NATURAL STATE. ALL RUNOFF FROM THIS AREA WILL BE DIRECTED TO ALUM CREEK. RUNOFF WILL BE ROUTED BY A STORM DRAIN SYSTEM AND OVERLAND FLOW. NO DETENTION IS PROPOSED FOR THIS AREA. t_c IS GREATER THAN 10 MINUTES. CALCULATE t_c AS FOLLOWS:

CONDUIT	DELEV, ft	LENGTH, ft	SLOPE, %	VELOCITY, fps	TRAVEL TIME, min
TO STORM DRAIN SYSTEM					10 MINIMUM
PIPE		200		16.2	0.2
PIPE		120		16.8	0.1
PIPE		120		17.7	0.1
PIPE		120		16.4	0.1
PIPE		97		16.4	0.1
PIPE		300		16.6	0.3
PIPE + OVERLAND TO ALUM CREEK					0.5 MINIMUM

t_c = 11.4 MINIMUM
i_5 = 1.3 in/hr
i_{100} = 3.5 in/hr

ΣCA FOR ALL OF AREA 10:
ΣQ_5 INTO STORM DRAIN = 42.73 @ t_c = 10 min.

$$CA = \frac{42.73}{1.4} = 30.52$$

AREAS NOT INCLUDED IN ABOVE STORM DRAIN
30.09 Ac DEVELOPED C=0.50 CA = 15.05
37.56 Ac UNDEVELOPED C=0.55 CA = 20.66
35.71

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$\Sigma CA = 35.71 + 30.52 = 66.23$

$Q_5 = (41.3^{cfs}/_{in})(66.23) = 86.10$ cfs
$Q_{100} = (3.5^{cfs}/_{in})(66.23) = 231.81$ cfs

AREA 11: SINGLE FAMILY LOTS WILL BE DEVELOPED ON THE SECTION OF AREA 11 THAT IS WEST OF McCARRAN BLVD. THE REMAINDER OF THIS AREA WILL BE LEFT IN ITS NATURAL STATE. MUCH OF AREA 11 FLOWS INTO CAUGHLIN CREEK AND IS THEN INTERCEPTED BY STEAMBOAT DITCH, AS IN THE PRE-DEVELOPMENT CONDITIONS. IT MAY BE NECESSARY TO CONSTRUCT A SMALL DETENTION POND IN THE CREEKRIDGE DEVELOPMENT TO LIMIT FLOWS DIRECTED INTO THE McCARRAN STORM DRAIN SYSTEM. MOST OF THE FLOW IS CHANNELIZED (CAUGHLIN CREEK) AND OVERLAND FLOW PATHS ARE SHORT. t_c = 10 MINUTES. PEAK FLOWS ARE EQUAL TO THE SUM OF FLOWS ON THE FINAL DEVELOPED CONDITIONS PLAN.

$Q_5 = 54.94$ cfs
$Q_{100} = 150.38$ cfs

IF A DETENTION POND IS CONSTRUCTED WITH FUTURE DEVELOPMENT, ALL FLOWS (INCLUDING PRE-DEVELOPMENT) SHOULD BE RECALCULATED USING THE SCS METHOD.

AREA 12: INCLUDED WITH AREA 11.

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AREA 13: A SMALL PORTION OF AREA 13 WILL BE DEVELOPED INTO SINGLE FAMILY LOTS; THE REMAINDER WILL REMAIN UNDEVELOPED. RUNOFF IS BY OVERLAND FLOW. FLOW PATHS ARE SHORT; t_c = 10 MIN.
i_5 = 1.4 in/hr
i_{100} = 3.8 in/hr.

	A	C	CA
UNDEVELOPED	4.21	055	2.32
DEVELOPED	1.51	0.50	0.76

$\Sigma CA = 3.08$

$Q_5 = (1.4 \text{ in/hr})(3.08) = 4.31$ cfs
$Q_{100} = (3.8 \text{ in/hr})(3.08) = 11.70$ cfs

AREA 14: MOST OF AREA 14 WILL BE DEVELOPED. NEW DEVELOPMENT INCLUDES THE REMAINDER OF CAUGHLIN CREEK AND THE MEADOW-LAKE VILLAGE DEVELOPMENT. ALL RUNOFF WILL BE DIRECTED TO ALUM CREEK BY A STORM DRAIN SYSTEM AND BY SHEET FLOW. IN ADDITION TO THE THREE EXISTING DETENTION PONDS, APPROXIMATELY FOUR MORE WILL BE BUILT. OVER HALF OF THE SITE WILL BE ROUTED THROUGH THE PONDS. CALCULATIONS FOR THE PONDS ARE NOT INCLUDED IN THIS REPORT, AS SEPARATE STUDIES HAVE SHOWN THAT ALUM CREEK CAN HANDLE THE 100-YR STORM FLOWS. THEREFORE, THE PEAK FLOWS REPORTED

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SCALE CAUGHLIN RANCH MASTER HYDROLOGY

ARE CONSERVATIVE; ACTUAL FLOWS WILL BE SMALLER DUE TO THE DETENTION PONDS. FLOW PATHS ARE SHORT; t_c = 10 MIN.
i_5 = 1.4 in/hr
i_{100} = 3.8 in/hr

Land Type	Ac.	C	CA
SINGLE FAMILY	73.45	0.50	36.73
APARTMENTS	9.41	0.65	6.12
OPEN SPACE	18.36	0.30	5.51
UNDEVELOPED	16.18	0.55	8.90
McCARRAN BLVD	2.07	0.90	1.86
		ΣCA =	59.12

$Q_5 = (1.4)(59.12) = 82.77$ cfs
$Q_{100} = (3.8)(59.12) = 224.66$ cfs

AREA 15: INCLUDED IN AREA 16

AREA 16: THERE WILL NOT BE MUCH CHANGE FROM EXISTING CONDITIONS IN THIS AREA. NEW DEVELOPMENT INCLUDES A SMALL PART OF CAUGHLIN CREEK AND A FIRE STATION. ONE OR TWO DETENTION PONDS MAY BE CONSTRUCTED WITH CAUGHLIN CREEK. ONLY A SMALL PORTION OF THIS AREA WILL BE ROUTED THROUGH THE PONDS. CALCULATIONS FOR THE PROPOSED PONDS ARE NOT INCLUDED IN THIS REPORT AS ALUM CREEK CAN HANDLE THE 100-YR FLOWS. RUNOFF IN THIS AREA IS COLLECTED IN THE McCARRAN BLVD. AND CAUGHLIN CROSSING

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STORM DRAIN SYSTEMS, TRAVEL TIME IS THE SAME AS EXISTING CONDITIONS.
t_c = 25.8 MIN
i_5 = 0.76 in/hr
i_{100} = 2.1 in/hr

LAND TYPE	Ac	C	CA
UNDEVELOPED	52.87	0.55	29.08
SINGLE FAMILY	6.30	0.50	3.15
McCARRAN BLVD.	5.87	0.90	5.28
OFFICE/COMMERCIAL	7.85	0.85	6.67
			ΣCA = 44.18

$Q_5 = (0.76)(44.18) = 33.58$ cfs
$Q_{100} = (2.1)(44.18) = 92.78$ cfs

AREA 17: INCLUDED WITH AREA 14

AREA 18: NO CHANGE FROM EXISTING CONDITIONS.
Q_5 = 4.32 cfs
Q_{100} = 11.73 cfs

AREA 19: ONLY A SMALL SECTION OF AREA 19 WILL BE DEVELOPED AS PART OF THE MEADOW-LAKE APARTMENTS. THE REST OF THE AREA WILL STAY THE SAME AS EXISTING CONDITIONS. ALL RUNOFF WILL BE ROUTED TO ALUM CREEK. FLOW PATHS ARE SHORT;
t_c = 10 MIN.
i_5 = 1.4 in/hr
i_{100} = 3.8 in/hr

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LAND DESCRIPTION	Ac	C	CA
STREETS	8.88	0.90	7.99
SINGLE FAMILY	1.84	0.50	0.92
UNDEVELOPED	12.0	0.30	3.6
APARTMENTS	9.37	0.65	6.09
			ΣCA = 18.6

$Q_5 = (1.4)(18.6) = 26.04$ in/hr
$Q_{100} = (3.8)(18.6) = 70.68$ in/hr

AREAS 20-24: NO CHANGE FROM EXISTING CONDITIONS

AREA 20:
$Q_5 = 1.5$ cfs
$Q_{100} = 4.07$ cfs

AREA 21:
$Q_5 = 1.96$ cfs
$Q_{100} = 5.32$ cfs

AREA 22:
$Q_5 = 17.14$ cfs
$Q_{100} = 48.80$ cfs

AREA 23:
$Q_5 = 14.52$ cfs
$Q_{100} = 39.74$ cfs

AREA 24:
$Q_5 = 19.31$ cfs
$Q_{100} = 52.53$ cfs

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PEAK FINAL DEVELOPMENT FLOWS

AREA #	DRAINS TO	Q_5, cfs	Q_{100}, cfs
1	ROSEWOOD WASH	44.6	132.2
4	OFFSITE - SOUTHEAST	3.4	12.9
5	DRAINAGEWAY 1	36.666	94.27
6	DRAINAGEWAY 2	5.75	15.6
7	DRAINAGEWAY 3	27.5	75.3
8	DRAINAGEWAY 4	31.4	182.3
10	ALUM CREEK	86.10	231.81
11	STEAMBOAT DITCH	54.94	150.38
13	OFFSITE - NORTH	4.31	11.70
14	ALUM CREEK	82.77	224.666
16	DRAINAGEWAYS	33.58	92.78
18	CAUGHLIN CREEK	4.32	11.73
19	ALUM CREEK	26.04	70.68
20	LAKE DITCH	1.5	4.07
21	LAKE DITCH	1.96	5.32
22	ALUM CREEK	17.14	48.80
23	TRUCKEE RIVER	14.52	39.74
24	TRUCKEE RIVER	19.31	52.53

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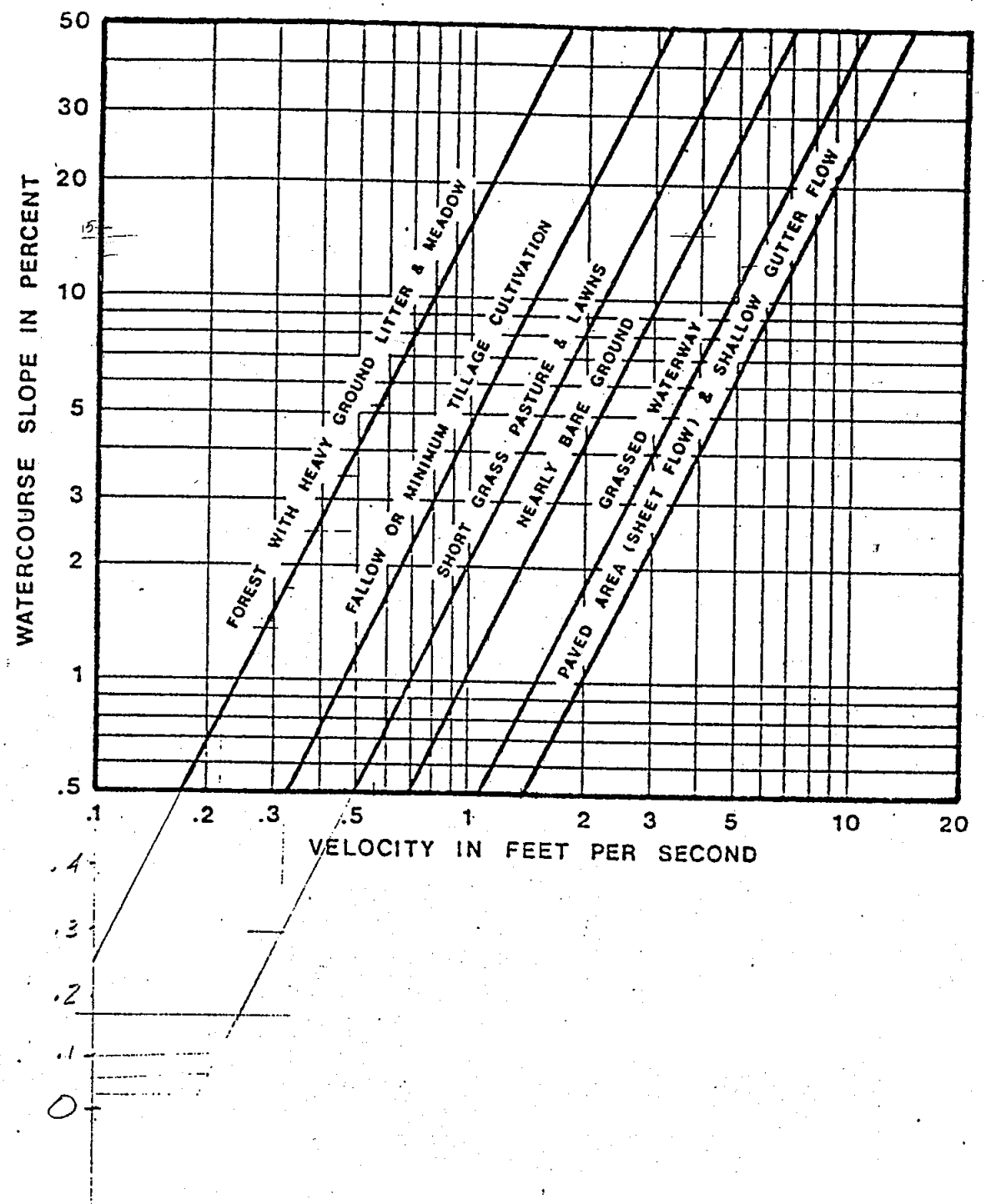
TOTAL PEAK FLOWS TO EACH DRAINAGEWAY
FINAL DEVELOPMENT CONDITIONS

AREA #	DRAINS TO	Q_5, cfs	Q_{100}, cfs
1	ROSEWOOD WASH	44.6	132.2
—	OFFSITE - SOUTH	0	0
4	OFFSITE - SOUTHEAST	3.4	12.9
5	DRAINAGEWAY 1	36.7	94.3
6	DRAINAGEWAY 2	5.8	15.6
7	DRAINAGEWAY 3	27.5	75.3
8	DRAINAGEWAY 4	31.4	82.3
16	DRAINAGEWAY 5	33.6	92.8
18	CAUGHLIN CREEK	4.3	11.7
10, 14, 19 & 22	ALUM CREEK	212.1	576.0
13	OFFSITE - NORTH	4.3	11.7
11	STEAMBOAT DITCH	54.9	150.4
—	LAST CHANCE DITCH	0	0
20 & 21	LAKE DITCH	3.5	9.4
23 & 24	TRUCKEE RIVER	33.8	92.3
	TOTAL	495.9	1,356.90

BOULDER COUNTY
STORM DRAINAGE CRITERIA MANUAL

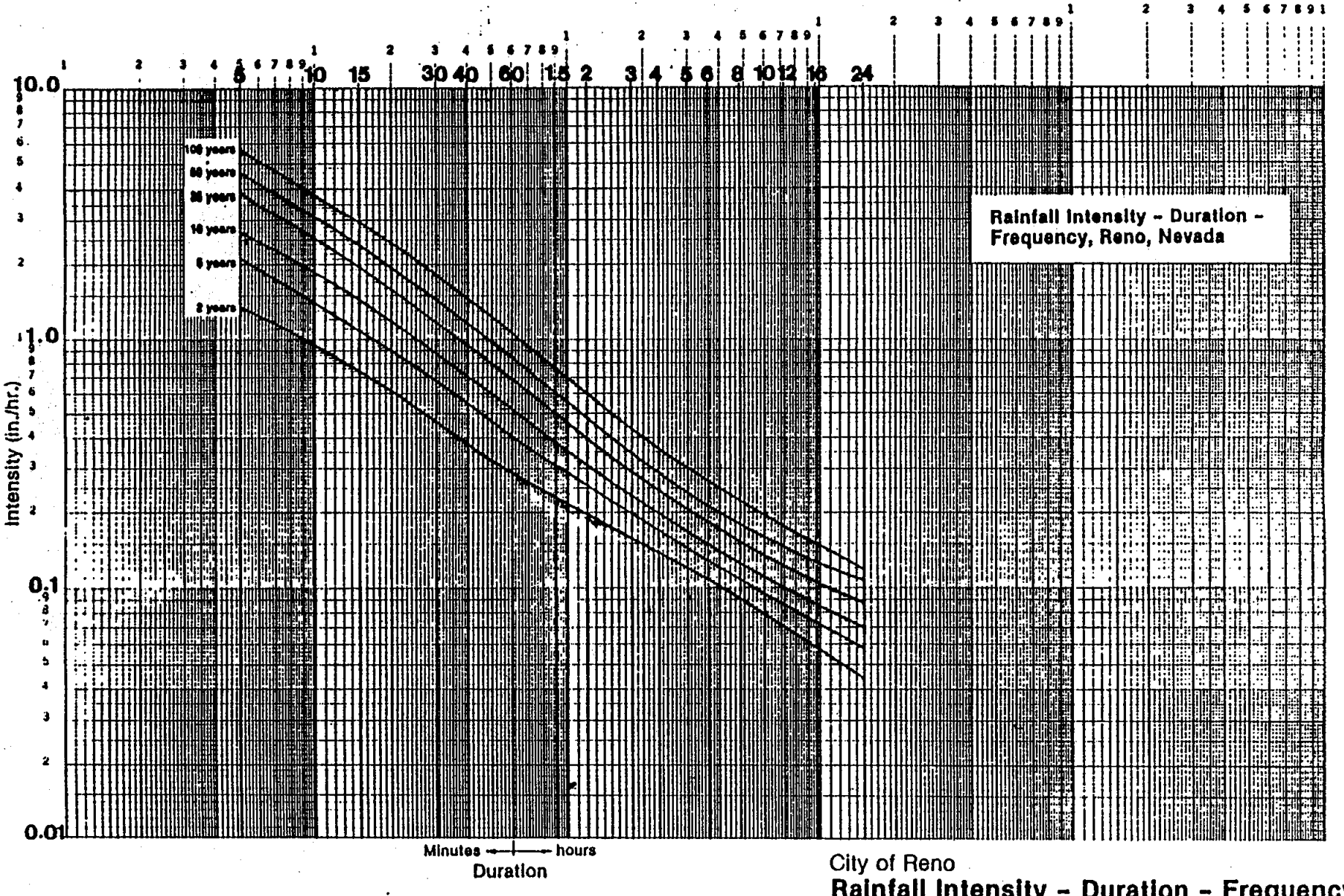
FIGURE 602

TRAVEL TIME VELOCITY FOR RATIONAL METHOD



WRC ENG.

REFERENCE: "Urban Hydrology For Small Watersheds" Technical Release No. 55, USDA, SCS Jan. 1975.



City of Reno

Rainfall Intensity - Duration - Frequency Curves for General Reno Area

Based on Rainfall Data from Cannon Airport Gauging Station

Figure 4

2211

Table 2-2d.—Runoff curve numbers for arid and semiarid rangelands[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	(87) McCARRAN R.O.W. / SLOPE AREAS	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	(85) UNDEV. LAND
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

[1]Average runoff condition, and I_a = 0.2S. For range in humid regions, use table 2-2c.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

Table 2-2a.—Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and I_a = 0.2S.

[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

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SCALE

USE OF HYDROLOGIC GROUP C FOR DEVELOPED AREAS

THE MAJORITY OF THE UNDISTURBED NATURAL SOILS IN THE CAUGHLIN RANCH FALL INTO HYDROLOGIC GROUP D, AS THEY HAVE A CLAY LAYER NEAR THE SURFACE. IN MOST OF THE SOILS, A MORE PERMEABLE LAYER (SANDY TO GRAVELLY LOAM OR A POORLY CEMENTED SILTSTONE) IS LOCATED BELOW THE CLAY LAYER.

IN MOST OF THE DEVELOPED AREAS, THE ORIGINAL GROUND IS SIGNIFICANTLY DISTURBED BY CUTS AND FILLS TO PROVIDE FLATTER BUILDING AREAS. THE CUTS RESULT IN THE REMOVAL OF THE CLAY LAYER AND EXPOSE THE MORE PERMEABLE SOIL BENEATH THE CLAY. THE FILL AREAS HAVE AN ALTERED SOIL PROFILE WITHOUT A DISTINCT CLAY LAYER. TOPSOIL, WHICH ALSO ABSORBS MORE RUNOFF THAN THE ORIGINAL CLAYS, IS BROUGHT IN FOR MOST OF THE LAWN/LANDSCAPED AREAS. THEREFORE SOIL IN THE DEVELOPED AREAS WILL ABSORB MORE RUNOFF THAN THE UNDISTURBED NATURAL SOILS. TO ACCOUNT FOR THIS, HYDROLOGIC SOIL GROUP C IS USED FOR RUNOFF CALCULATIONS IN THE DEVELOPED AREAS. (THROUGHOUT THE CALCULATIONS, HYDROLOGIC SOIL GROUP D IS USED FOR ALL AREAS THAT REMAIN IN THEIR NATURAL STATE.)

SEE THE FOLLOWING PAGE, FROM SCS TR-55, FOR FURTHER DISCUSSION OF THE HYDROLOGIC SOIL GROUP.

Appendix A: Hydrologic soil groups

Soils are classified into hydrologic soil groups (HSG's) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSG's, which are A, B, C, and D, are one element used in determining runoff curve numbers (see chapter 2). For the convenience of TR-55 users, exhibit A-1 lists the HSG classification of United States soils.

The infiltration rate is the rate at which water enters the soil at the soil surface. It is controlled by surface conditions. HSG also indicates the transmission rate—the rate at which the water moves within the soil. This rate is controlled by the soil profile. Approximate numerical ranges for transmission rates shown in the HSG definitions were first published by Musgrave (USDA 1955). The four groups are defined by SCS soil scientists as follows:

Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (greater than 0.30 in/hr).

Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr).

Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

In exhibit A-1, some of the listed soils have an added modifier; for example, "Abrazo, gravelly." This refers to a gravelly phase of the Abrazo series that is found in SCS soil map legends.

Disturbed soil profiles

As a result of urbanization, the soil profile may be considerably altered and the listed group classification may no longer apply. In these circumstances, use the following to determine HSG according to the texture of the new surface soil, provided that significant compaction has not occurred (Brakensiek and Rawls 1983):

HSG	*Soil textures*
A	Sand, loamy sand, or sandy loam
B	Silt loam or loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, or clay

Drainage and group D soils

Some soils in the list are in group D because of a high water table that creates a drainage problem. Once these soils are effectively drained, they are placed in a different group. For example, Ackerman soil is classified as A/D. This indicates that the drained Ackerman soil is in group A and the undrained soil is in group D.

CODEGA & FRICKE, INC.
engineers + planners + landscape architects
3700 Grant Drive/Suite G • Reno, Nevada 89509
(702) 827-8833 • Fax (702) 827-1831

PROJECT CAUGHLIN RANCH MASTER HYDROLOGY JOB NO: 1016.38
COPY TO: SHEET 276 OF
CALCULATED BY KRK DATE 3-21-91
CHECKED BY DATE
SCALE

VERIFY C VALUE USED FOR SINGLE FAMILY LOTS

CALCULATE CW FOR SINGLE FAMILY LOT AT CAUGHLIN RANCH. SEE ATTACHED FOR LOT IN VISTA POINTE THAT THE CALCULATIONS ARE BASED ON. THIS LOT HAS A MUCH LARGER SLOPE AREA THAN MOST LOTS IN CAUGHLIN RANCH. THE SUBDIVISIONS HAVE BEEN GRADED SO THAT MANY OF THE LOTS DO NOT HAVE ANY SLOPES.

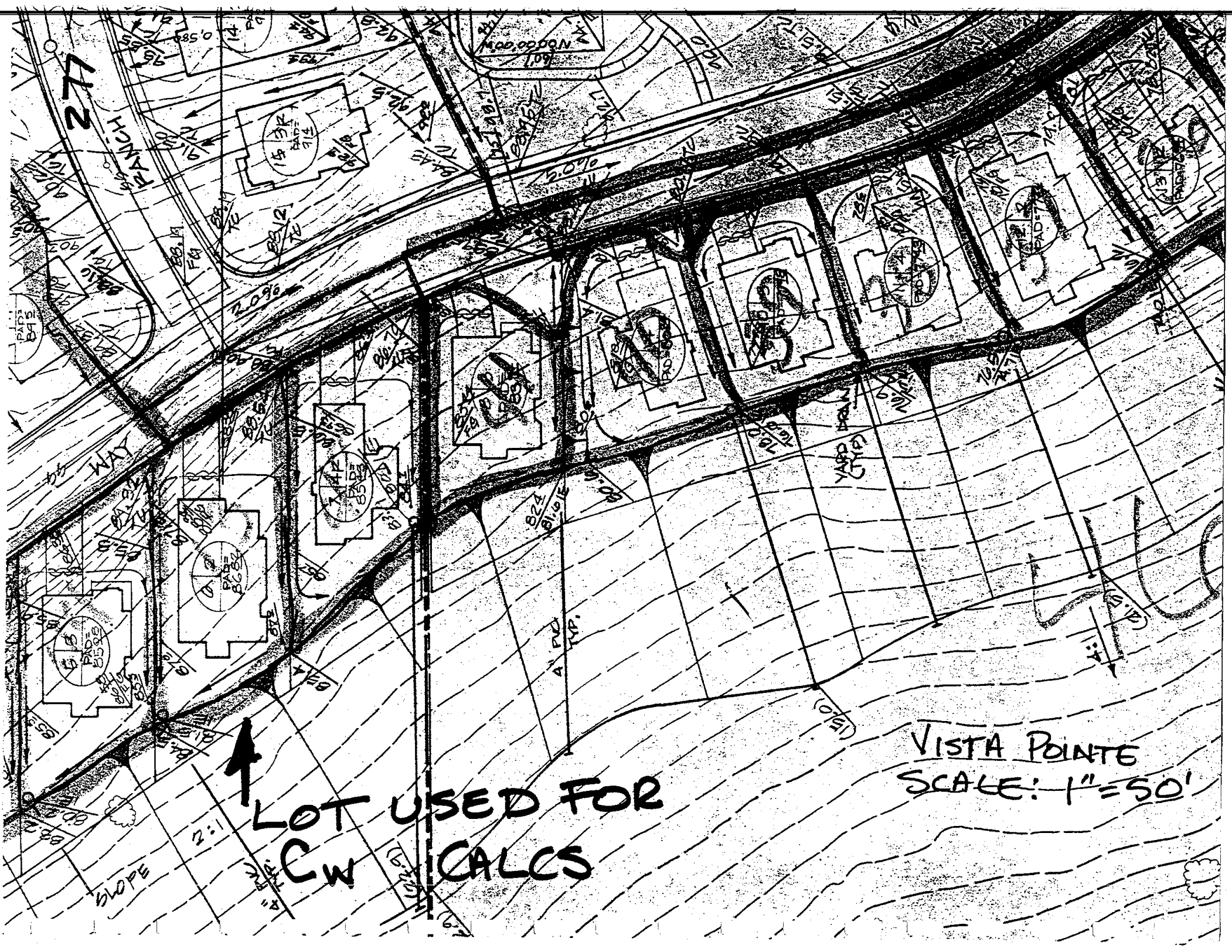
SURFACE	AREA	C	CA
HOUSE & DRIVE	0.069 Ac.	0.90	0.062
USABLE YARD	0.110 Ac	0.25	0.028
SLOPE	0.026 Ac	0.50	0.013
TOTAL	0.205		0.103

$$C_W = \frac{0.103}{0.205} = \underline{\underline{0.50}}$$ - AS USED IN CAUGHLIN RANCH MASTER HYDROLOGY REPORT.

CW FOR SAME LOT/ASSUME NO SLOPE (MANY LOTS IN CAUGHLIN RANCH DO NOT HAVE ANY SLOPES.)

SURFACE	AREA	C	CA
HOUSE & DRIVE	0.069 Ac	0.90	0.062
USABLE YARD	0.136 Ac	0.25	0.034

$$C_W = \frac{0.096}{0.205} = 47$$


LOT USED FOR
CW CALCS
VISTA POINTE
SCALE: 1"=50'

City of Reno

Inter-Office Memo

Date: July 28, 1995

To: Glen Daily, P.E., Assc. Civil Eng.

From: Robert M. Gottsacker, Senior Civil Engineer

RE: **WESTGATE DETENTION POND**

Pursuant to our conversation of July 26, 1995, further investigation of the available information relative to the above referenced detention facility has been discovered:

1) Existing piping is present in Village Green and Caughlin Parkway to the Vantage Point subdivision, with capacity to enable diversion of storm flows around the Westgate detention pond. This piping was installed at the time of construction of Caughlin Parkway, and was plugged at the manhole to provide for diversion into the Westgate detention pond. (Please see attached map at Point 1.)

2) Installation of piping and elimination of the temporary detention pond above McCarran Boulevard was performed within the Vantage Point subdivision with construction of Unit 2. Pipes were designed to carry 100 year flows, inclusive of those reduced by the Westgate detention pond. (Please see attached map at Point 2.)

3) The Westgate detention facility was constructed with Westpoint Unit 1 to reduce flows originating in the Vantage Point and Westpoint subdivisions to below pre-existing conditions. It was verbally confirmed by Gary Probert, P.E., engineer for the Westpoint facility, that the design of said facility incorporated the continued use of the Westgate Detention Pond. (Please see attached xeroxed portion of map at Point 3.)

Conclusion: Although existing piping appears to have capacity to contain 100 year flows, inclusive of those entering the Westpoint detention facility, usability of said site for location of a fire station is predicated on the ability to displace the available Westgate detention to another facility. It is recommended that the entity offering the site to the City be required to perform an in-depth analysis of the hydraulics/hydrology to demonstrate the adequacy of the site for the proposed use, such study initiating at the Westpoint detention facility and continuing upstream to above the Westgate Detention Pond.

CC - SV
- BT

13
1
11.70

INFLOW
Q5=58.05 Q100=144.15
OUTFLOW
Q5=28.45 Q100=72.42

"Westpointe Pond"
DRAINAGEWAY 4
DETENTION BASIN

POINT 3
EXISTING DETENTION CONSTRUCTED WITH WESTPOINT UNIT 1

McCARRAN BLVD.

POINT 2
EXISTING PIPE
CONSTRUCTED WITH VANTAGE POINT UNIT 2

AREA 8
Q5=31.4
Q100=82.3

INFLOW
Q5=18.0 Q100=42.0
OUTFLOW
Q5=5.9 Q100=9.7

POINT 1
EXISTING PIPE
PLUGGED @ MANHOLE WITH INLET TO POND

Westgate Pond
DETENTION BASIN

CAUGHLIN PARKWAY

INFLOW
Q5=6.0 Q100=13.0
OUTFLOW
Q5=5.1 Q100=10.7

AREA 10
Q5=86.10
Q100=231.81

VILLAGE