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HYDROLOGIC STUDY

FOR

FOUNTAIN LAKE DAM

AT

FOUNTAIN HILLS, ARIZONA

November 22, 1995

TOWN OF FOUNTAIN HILLS
MAY 3 0 1996
ENGINEERING DEPARTMENT

Prepared for

ANDERSON-NELSON, INC.
4441 East McDowell Road
Phoenix, Arizona 85008

Prepared by

AGK ENGINEERS, INC.
2255 North 44th Street, Suite 330
Phoenix, Arizona 85008
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Registered Professional Engineer (Civil)
CERTIFICATE NO.
10283
SAMUEL E.
KAO
Date Signed 11/22/95
ARIZONA, U.S.A.

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A. PURPOSE AND SCOPE

AGK Engineers, Inc. (AGK) is currently performing a hydrologic study and floodplain delineation project for the south part of the Town of Fountain Hills under contract with the Flood Control District of Maricopa County (District). The study includes the Colony Wash and Panorama Channel watersheds which surround Fountain Lake. The methodology for hydrologic modeling is based on the guidelines outlined in the District's *Hydrologic Design Manual* **(Reference 1)**. Procedures of parameter estimation and results of runoff modeling have been reviewed and approved by the District at various stages of the project.

Fountain Lake is owned and operated by MCO Properties and is under the jurisdiction of the Arizona Department of Water Resources (ADWR). In their last inspection, ADWR felt that the existing spillway information contained in their file is inadequate because the spillway has been modified after its original construction. In September 1995, Anderson-Nelson Inc., a consultant to MCO, retained AGK as a subconsultant to perform the hydrologic study for the Fountain Lake and its spillway using the same methodology as required by the District for the floodplain delineation project. The scope of the project includes the following:

1. To estimate the 100-year flood and the ½ Probable Maximum Flood (½ PMF) at the lake site.

2. To evaluate the spillway performance under both 100-year and ½ PMF conditions.

B. PROJECT LOCATION

The project area is located in the Town of Fountain Hills, within Section 14, Township 3 North, Range 6 East, Gila and Salt River Base and Meridian, Maricopa County, Arizona. The general location for Fountain Lake Dam is shown in **Figure 1.**

C. WATERSHED DESCRIPTION

Two watersheds contribute to the inflow of Fountain Lake: the Fountain Channel watershed and the Panorama watershed. The watershed of Fountain Channel is situated on the south side of Palisades Boulevard between Saguaro Boulevard and Fountain Hills Boulevard and includes a large percentage of commercial area. The Panorama watershed is located on the east side of Saguaro Boulevard and the east and north sides of Panorama Drive. Runoff modeling was conducted on the basis of future development conditions, which were derived from zoning maps provided by the Town of Fountain Hills. Normally, Fountain Channel would intercept the runoff and divert it away from the lake. Likewise, Panorama Drive would act as a channel to divert the runoff to the south. However, during an unusually large storm, neither channel would have enough capacity to divert the entire flow from the lake and a significant amount of flow would overtop the banks and find its way to the lake.

LOCATION MAP

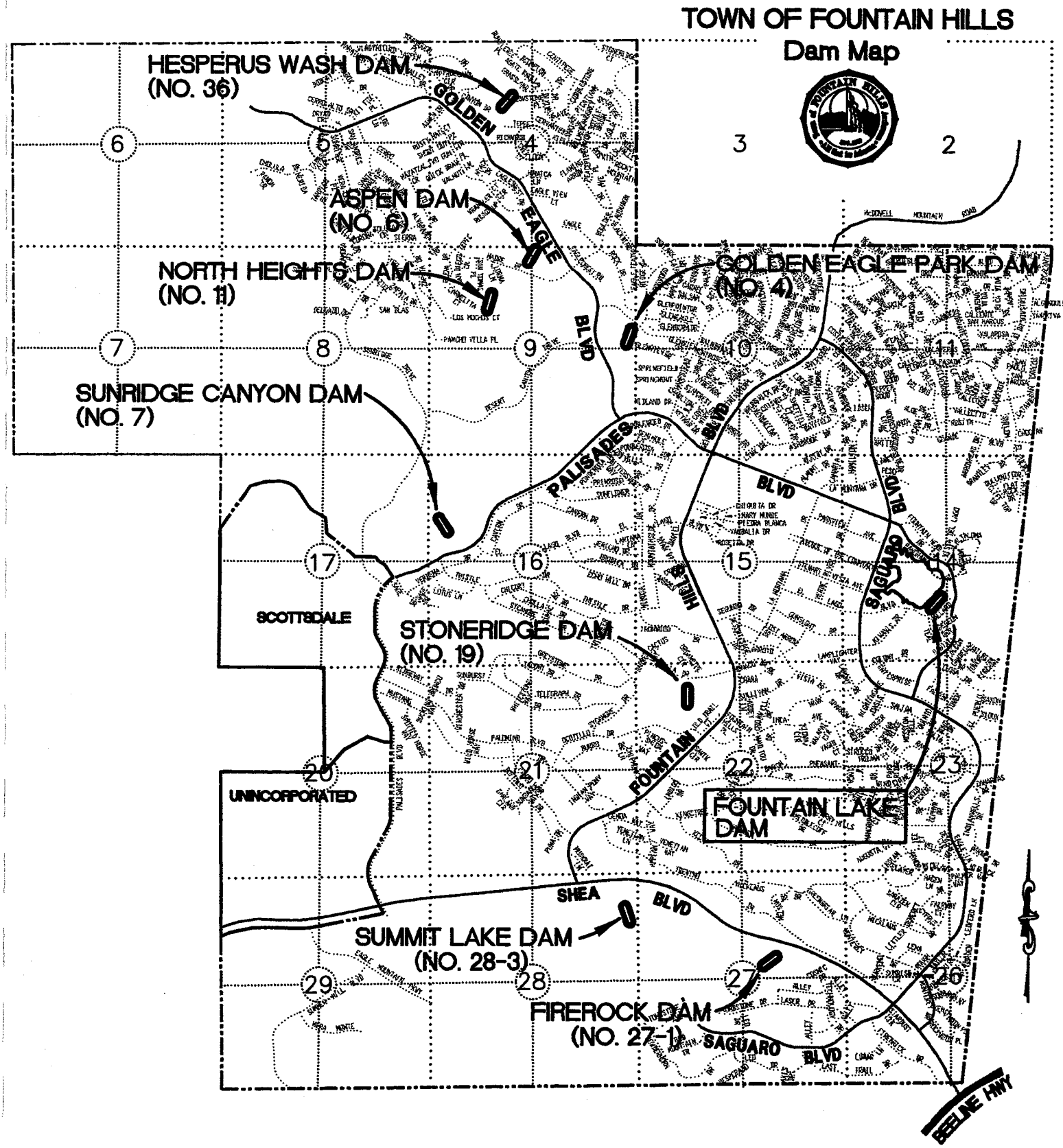


FIGURE 1

As shown on **Plate 1**, the two watersheds were divided into numerous subareas according to its flow patterns. Drainage basin delineation was based on the 1"=200', 2-foot contour interval map prepared by Kenney Aerial Mapping, Inc **(Reference 2)**, and supplemented by field verification. The size, elevation, slope, and other characteristics of the subareas are shown in **Appendix A.1**

D. HYDROLOGIC MODELING

1. Methodology

Hydrologic modeling was performed by use of the 1991 version of HEC-1 computer program developed by the U.S. Army Corps of Engineers **(Reference 3)**. Estimation procedures for model parameters and components were based on the District's Manual **(Reference 1)**.

2. Soils and Land Use

Information on soil groups was obtained from the Soil Survey of Aguila-Carefree Area, published by the Soil Conservation Service (SCS) in April 1986 **(Reference 4)**. Boundaries of the soil groups are shown on **Plate 2**. Information on land use was furnished by the Town of Fountain Hills. Location of specific land use withing the watersheds are shown on **Plate 3**. As mention earlier , the hydrology was based on the future development conditions.

3. Rainfall Input for 100-year Frequency Storm

The estimated rainfall depth for storms up to 100-year frequency were obtained from the charts derived from the NOAA Atlas published for Arizona **(Reference 5)**. The 24-hour storm was used for volume estimation. Rainfall depth for the 100-year storm was estimated to be 4.0 inches. A copy of the rainfall chart is included in **Appendix B**. The SCS Type II distribution was used for the 24-hour storm.

4. Probable Maximum Precipitation

The probable maximum precipitation (PMP) and its time distribution were estimated in accordance with the procedures contained in the U.S. Department of Commerce Hydrometeorological Report No. 49 **(Reference 6)**. Detailed computations for PMP are also included in **Appendix B**.

5. Rainfall Losses

Rainfall losses, which consist of surface retention loss and infiltration losses, were computed from the Green-Ampt method. The parameters estimation for the Green-Ampt method is discussed below and summarized in **Appendix A.3**

Surface Retention Loss - The surface retention loss (IA) for each soil group was estimated on the basis of land use pattern and soil slopes obtained from Reference 4, as well as the criteria given in table 4.1 of the Manual.

Percent of Rock Outcrop - The weighted values of percentage of rock outcrop (RTIMP) for each subarea was computed according to the information obtained from **Reference 4**. A spreadsheet program supplied by the District was used to calculate the effect of each soil type.

Infiltration Losses - The three parameters as coded in HEC-1 for infiltration losses are:

- Hydraulic conductivity at natural saturation (XKSAT)
- Wetting front capillary suction (PSIF)
- Volumetric soil moisture deficit (DTHETA)

The parameter values for various soil groups were taken from Table 4.2 of the Manual and computed by the District spreadsheet program known as MCUHP1. A comparison of the values obtained from the two sources yielded slight differences for PSIF and DTHETA. At the direction of the District, the values generated by their spreadsheet program were used. Weighted values of these parameters were computed for all the subareas for both the current and future development conditions. However, only the values for future development conditions were used in the modeling.

The selection of DTHETA was based on the dry antecedent soil moisture condition for open and/or unzoned areas and the normal antecedent soil moisture condition for all zoned areas. In addition, values for XKSAT were adjusted according to the vegetation cover. A 30 percent vegetation cover was used for most undeveloped and low density residential areas. Areas that are on the steep slopes or have other

zoning designations have been assigned with other percentage of vegetation cover based upon aerial photography of the specific area.

6. Unit Hydrograph and Time of Concentration

The Clark unit hydrograph was used in the computation of peak discharges in this study because all the subareas are less than 5 square miles in size. The Clark unit hydrograph consists of three parameters:

- Time of Concentration
- Storage Coefficient
- Time-Area Relation

Time of Concentration - The Papadakis method was used for estimating the time of concentration. It is a function of length and slope of the flow path, average rainfall intensity, and the watershed resistance coefficient, which is a function of watershed type and size. Values of these parameters are shown in **Appendices A.1and A.3**. The length and slope of the flow path for each subarea were obtained from the topographic map **(Reference 2)**. A slope adjustment procedure for slopes greater than 200 feet per mile was implemented for several subareas in the watershed. This procedure was based on Figure 5.4 of the Manual. The rainfall intensity for each subarea was automatically computed by the MCUHP1 computer program. The values for resistance coefficient were determined from Table 5.1 of the Manual.

Storage Coefficient and Time-Area Relation - The storage coefficient is a function of time of concentration, the watershed size and the length of flow path. The time-area relation is a parameter showing the equal travel-time zones in a watershed.

The computation for time of concentration, storage coefficient and time-area relation was performed by means of trial-and-error method through the computer program of MCUHP1. The input and output values (including the ordinates of Clark unit hydrographs) are presented in **Appendix A.3** of this report. A review of the results indicated that all areas are suitable for the Clark method.

7. Runoff Modeling

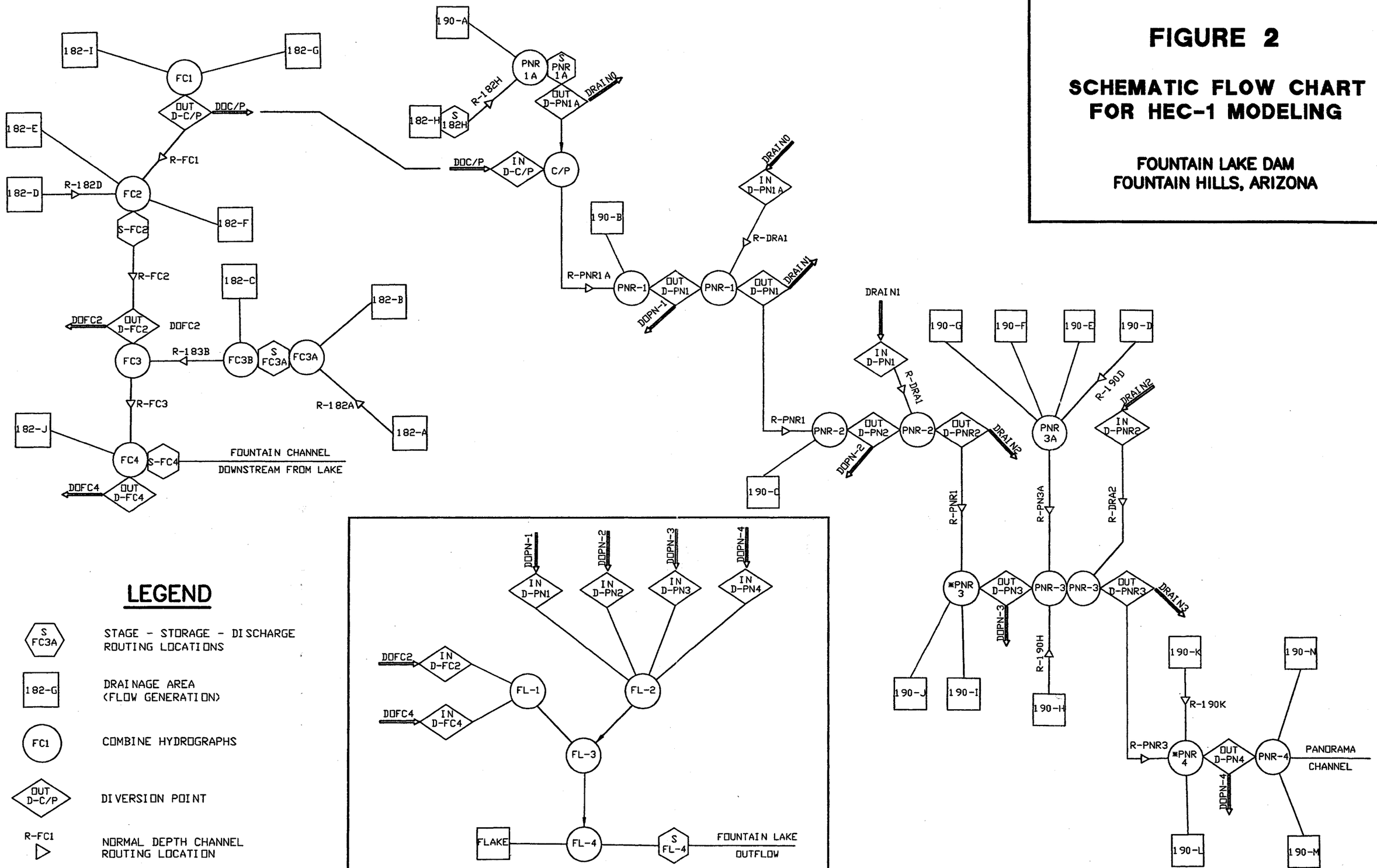
A time step of 2 minutes was used in the computation. Flows through the existing culverts were modeled by the level-pool reservoir routing method, as contained in the HEC-1 program. The relationships among stage, storage, and outflow at the existing culverts were developed from the 1" = 200' topographic map **(Reference 2)**. The normal depth routing method was used for routing flow from one concentration point to the next.

The channel cross-sections used for normal depth routing were either digitized from the topographic base map in the case that coincided with the location of a hydraulic analysis cross-section, or were plotted by hand from the topographic base map. Schematic flow chart of the runoff model is presented in **Figure 2**.

FIGURE 2

SCHEMATIC FLOW CHART FOR HEC-1 MODELING

FOUNTAIN LAKE DAM
FOUNTAIN HILLS, ARIZONA



HEC-1 MODELING FOR LAKE INFLOWS

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8. Flow Split

Flow split at the Intersection of Saguaro Boulevard and Panorama Drive was calculated in the following manner. Flow from basins 182-H and 190-A were assumed to flow to Panorama Drive since the storm drain would pick up most of the flow just east of Saguaro Boulevard. Flow from basins 182-I and 182-G was split between Saguaro Boulevard and Panorama Drive. The flow was split based on the assumption that the flow depth at the intersection would be the same for both roads and hence the amount of flow each road would convey was calculated using Manning's normal depth equation based on this flow depth. Details of this split flow calculation are included in **Appendix C**.

9. Lake Inflows

The function of Fountain Lake is to provide storage for the effluent from the sewage treatment plant. Under normal condition, storm runoff generated from the watershed would be diverted to washes downstream of the lake by Fountain Channel as well as the storm drain and street gutters along Panorama Drive. However, during an unusually large storm, runoff would exceed the channel and street capacities and spill over to the lake. The amounts of spillage from Fountain Channel and Panorama Drive to Fountain Lake under both the 100-year and ½ PMF conditions were evaluated by use of the HEC-1 computer program **(Reference 3)** in conjunction with the HEC-2 computer program **(Reference 7)**. Details of the lake inflow modeling are discussed in the following paragraphs.

Lake Inflow from Fountain Channel - For modeling purposes, Fountain Channel was divided into two reaches. The upper reach was from the upstream end of the channel to Concentration Point FC-3, and the lower reach was from Concentration Point FC-3 to the culvert at El Lago Boulevard (Concentration Point FC-4).

Channel cross-sections used in the HEC-2 program were digitized from the two-foot contour interval map prepared by Kenney Aerial Mapping in 1991 **(Reference 2)**. Locations of the cross-sections and channel reaches are illustrated on a drawing included in **Appendix D.1.**

The weir geometry used in the HEC-2 program for rating curve development was obtained from a topographic map prepared by Kenney Aerial Mapping for the Fountain Lake area in 1994 **(Reference 8).** The scale of the map was 1" = 40', with one-foot contour intervals. The map was based on Fountain Hills datum. However, elevations of the weir geometry used in the HEC-2 program were adjusted to conform with the survey datum used for the digitized cross sections, which were based on the NGVD 1929 datum. According to Anderson-Nelson, Inc., the conversion equation is as follows:

NGVD 1929 Datum = Fountain Hills Datum - 1.26 feet

Multiple water surface profiles with various flow rates were performed using the HEC-2 program in order to establish a flow rating curve for each reach. This rating curve information was then used as input values for the diversion option (DI and DQ cards) in HEC-1.

The diversion flow in the upper reach of Fountain Channel was taken out as inflow to the lake at Concentration Point FC-3 before adding to the runoff from FC-3B. Similarly, diversion flow in the lower reach was taken out as inflow to the lake at Concentration Point FC-4. The schematic flow diagram for modeling the inflow from Fountain Channel to the lake is shown in **Figure 2**. Details of the calculations and the HEC-2 output are included in **Appendix D.1**.

Lake Inflow from Panorama Drive - There is a storm drain running along the east edge of Panorama Drive. In this study, it was assumed that the storm drain would convey the runoff to its capacity during both the 100-year and ½ PMF conditions. Thus, the amount of flow which equals to the storm drain capacity was removed from the HEC-1 model by means of a diversion card. The storm drain information and its capacity were derived from the as-built drawings of the Panorama Drive paving plans **(Reference 9)**.

The rating curve information for spillage from Panorama Drive was also developed by means of the HEC-2 program. Cross sections along Panorama Drive were generated from the as-built plans, using the west center line of roadway as shown on the 1" = 40' topographic map for station identifications on the GR cards. Weir geometry was also obtained from this topographic map. All elevations were adjusted to conform with the NGVD 1929 datum.

The diversion flows were taken out at four different locations (PNR-1 through PNR-4) along Panorama Drive. The schematic flow diagram for modeling

the inflow from Panorama Drive to the lake is also shown in **Figure 2**. Details of the calculations and the HEC-2 output are included in **Appendix D.2.**

Lake Inflow from Direct Rainfall - The direct rainfall on lake surface was calculated using the SCS curve number method contained in the HEC-1 computer program, with a CN value of 100.

Results of Lake Inflow Modeling - As shown in **Figure 2**, spillages from Fountain Channel were combined at Concentration Point FL-1, while spillages from Panorama Drive were combined at Concentration Point FL-2. These flows were then combined at Concentration Point FL-3, and joined the direct rainfall on the lake surface at Concentration Point FL-4. The estimation of ½ PMF was based on the input of the full PMP with a 50 percent reduction of all hydrograph ordinates. The "FLOW" option on the JR card was used in the HEC-1 program to expedite the computation. Results of the inflow modeling are presented in **Table 1.**

10. Lake Outflow

Lake outflow was computed by routing the inflow hydrograph through the spillway using the level pool routing method. The stage-volume relationship of the lake was obtained from the 1" = 40' topographic map **(Reference 8).**

TABLE 1

ESTIMATED INFLOWS TO FOUNTAIN LAKE

Concentration Point	Flow in Channel/Street	Flow in Storm Drain	Flow to Lake
100-YEAR STORM			
Fountain Channel FC-2	356	N/A	0
Fountain Channel FC-3	258	N/A	91
Fountain Channel FC-4	463	N/A	0
Panorama Drive PNR-1	0	75	0
Panorama Drive PNR-2	0	140	0
Panorama Drive PNR-3	0	179	12
Panorama Drive PNR-4	162	200	21
½ PMF			
Fountain Channel FC-2	1300	N/A	0
Fountain Channel FC-3	351	N/A	948
Fountain Channel FC-4	1037	N/A	99
Panorama Drive PNR-1	274	110	148
Panorama Drive PNR-2	381	160	1
Panorama Drive PNR-3	987	180	179
Panorama Drive PNR-4	1044	200	120

NOTE: All flow figures are expressed in cfs.

The stage-discharge relationship at the spillway was computed using the critical depth method. The spillway of the lake, as shown in **Figure 3**, is along the grassed berm at the south end of the lake and the north street curb along El Lago Boulevard. However, there is a concrete apron near the south end of the lake. In this study, both the spillway and the concrete apron were evaluated and the spillway was found to be the controlling section for the water surface elevation in the lake.

There is a catch basin near the spillway for removing local runoff from the lake's spillway. Due to its small size, the capacity of the catch basin was ignored during the computation of the stage-discharge relationship. Detail calculations for the stage-discharge relationship are included in **Appendix E.**

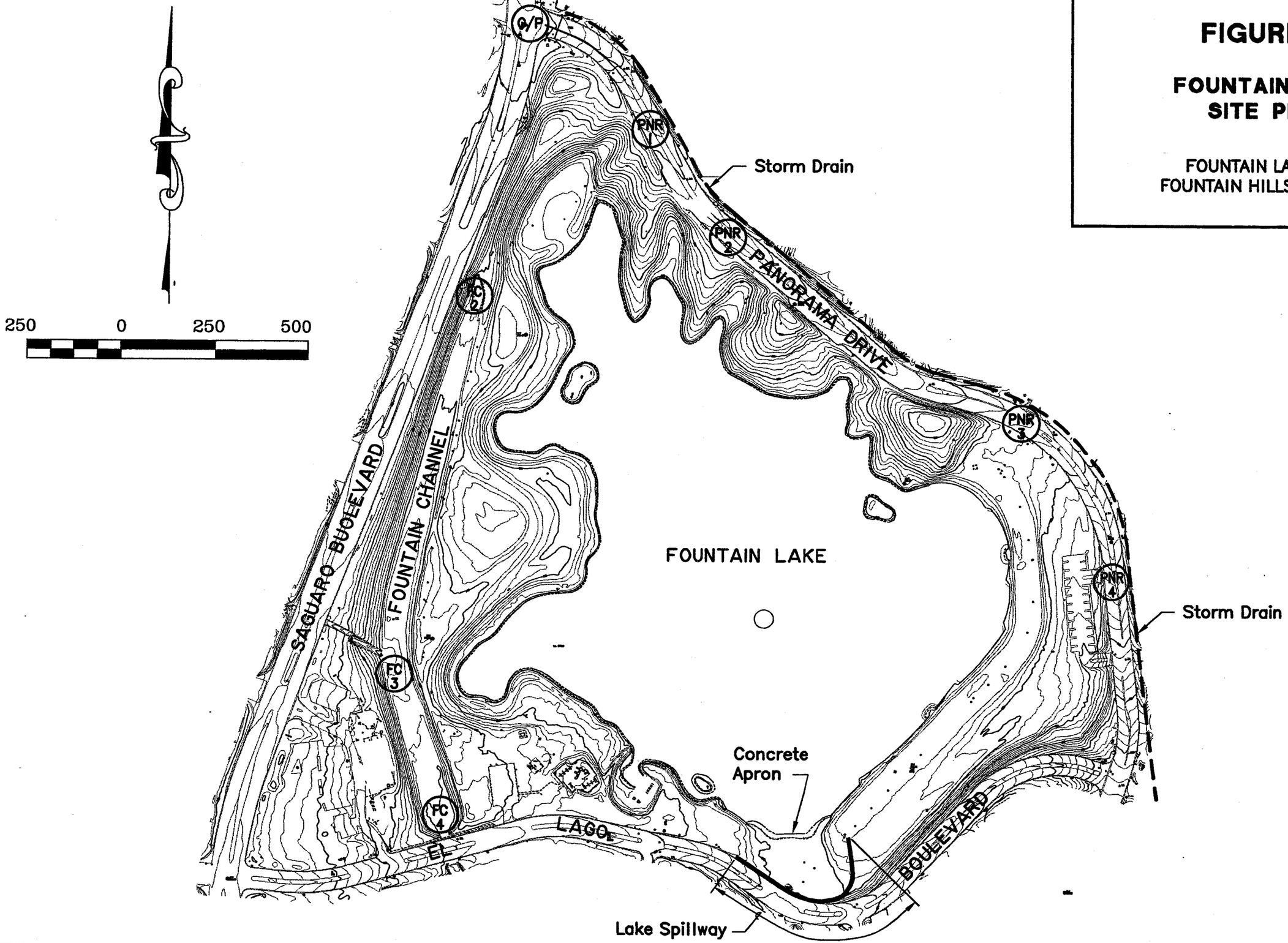
According to the Town of Fountain Hills and MCO Properties, the normal operating level for Fountain lake is set at one (1) foot below the spillway crest. According to the field survey performed by Anderson-Nelson, Inc. In October 1995, the elevation of the lowest point along the spillway crest, which occurs at the grassed berm, is 1574.49 (based on Fountain Hills datum). Therefore, the initial water surface elevation in the lake was assumed to be 1573.49 in this study. This is a rather conservative assumption because according to MCO Properties, the current normal operating level of the lake is set at one (1) foot below the top of grouted edge treatment around the lake which is much lower than the spillway crest.

According to the HEC-1 output, as shown in **Appendix F.1**, the lake surface elevation during a 100-year storm would be at 1574.23 (based on Fountain Hills datum), which is below the lowest point of the spillway. Therefore, based on this HEC-1 modeling, outflow would not occur during a 100-year storm.

FIGURE 3

FOUNTAIN LAKE SITE PLAN

FOUNTAIN LAKE DAM
FOUNTAIN HILLS, ARIZONA



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As for the ½ PMF condition, an outflow of 389 cfs would be expected over the spillway crest of Fountain Lake. The HEC-2 output for the ½ PMF condition is included in **Appendix F.2** of this report.

E. CONCLUSION AND RECOMMENDATION

The conclusion of zero outflow during a 100-year storm and an outflow of 389 cfs during a ½ PMF was obtained based on the assumptions and modeling methodology stated in this report. Furthermore, the analysis was based on a maximum operating elevation of 1573.49 (Fountain Hills survey datum) for the lake level. Therefore, water surface of the lake should be maintained below this maximum level by the responsible party at all times.

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1. Flood Control District of Maricopa County, *Hydrologic Design Manual for Maricopa County, Arizona, Vol. I-Hydrology*, Undated.

2. Kenney Aerial Mapping, Inc., *Topographic Maps for the Town of Fountain Hills, Scale 1" = 200', Contour Interval = 2 feet,* 1991.

3. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, *Generalized Computer Program 723-X6-L2010, HEC-1 flood hydrograph Package,* Davis, California, February 1981, Revised May 1991.

4. U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Aguila-Carefree Area,* April 1986.

5. U.S. Department of Commerce, national Oceanic and Atmospheric Administration, National Weather Service, *Precipitation-Frequency Atlas of the Western United States, Volume VIII - Arizona,* 1973.

6. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Probable Maximum Precipitation Estimates, Colorado River and Great Basin Drainages,* Hydrometeorological Report No. 49, September 1977.

7. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, *Generalized Computer Program 723-X6-L202A, HEC-2 Water Surface Profiles,* Davis, California, May 1991.

8. Cooper Aerial Co., *Topographic Maps for Fountain Lake, Scale 1"=40', Contour Interval = 1 foot*, August 5, 1994.

9. Anderson -Nelson, Inc., Fountain Hill, Arizona - *Panorama Drive Paving Plans*, December 1987.

APPENDIX A

SUMMARY OF MODEL INPUT PARAMETERS

A.1

WATERSHED PARAMETERS

A.1 Watershed Parameters - Colony Wash (180)

BASIN	Set	BASIN AREA		BASIN LENGTH		BASIN ELEVATION			SLOPE		ADJ.	Land	Kb
NUMBER	#	Acres	Sq. Miles	Feet	Miles	Highest	Lowest	Change	Ft/Ft	Ft/Mi	Ft/Mi	Type	
182A	193	32.23	0.050	2000	0.38	1702	1647	55	0.028	145.2	-	B	0.059
182B	173	24.78	0.039	2400	0.45	1650	1599	51	0.021	112.2	-	B	0.061
182C	175	14.26	0.022	2200	0.42	1649	1594	55	0.025	132.0	-	B	0.064
182D	194	60.37	0.094	3165	0.60	1724	1635	89	0.028	148.5	-	B	0.056
182E	171	40.90	0.064	2600	0.49	1645	1594	51	0.020	103.6	-	B	0.058
182F	172	9.62	0.015	2550	0.48	1647	1594	53	0.021	109.7	-	B	0.066
182G	188	30.85	0.048	3910	0.74	1685	1601	84	0.021	113.4	-	B	0.060
182I	170	25.58	0.040	3080	0.58	1650	1601	49	0.016	84.0	-	B	0.061
182J	174	9.53	0.015	1700	0.32	1596	1578	18	0.011	55.9	-	B	0.067
182K	182	15.33	0.024	1025	0.19	1597	1574	23	0.022	118.5	-	B	0.064
182L	180	3.34	0.005	710	0.13	1584	1560	24	0.034	178.5	-	B	0.073
TOTAL	11	266.78	0.417										

A.1 Watershed Parameters - Panorama Channel (190)

BASIN NUMBER	Set #	BASIN AREA		BASIN LENGTH		BASIN ELEVATION			SLOPE		ADJ. Ft/Mi	Land Type	Kb
		Acres	Sq. Miles	Feet	Miles	Highest	Lowest	Change	Ft/Ft	Ft/Mi			
182H	168	17.18	0.027	1600	0.30	1697	1605	92	0.058	303.6	266	C	0.119
190A	167	11.95	0.019	1350	0.26	1716	1598	118	0.087	461.5	297	C	0.123
190B	166	4.66	0.007	1025	0.19	1675	1588	87	0.085	448.2	295	C	0.133
190C	165	13.86	0.022	1385	0.26	1685	1585	100	0.072	381.2	286	C	0.121
190D	159	3.46	0.005	375	0.07	1701	1614	87	0.232	1225.0	366	C	0.137
190E	160	2.14	0.003	950	0.18	1650	1575	75	0.079	416.8	291	B	0.075
190F	158	4.08	0.006	875	0.17	1629	1575	54	0.062	325.9	273	C	0.135
190G	150	4.14	0.006	1180	0.22	1707	1575	132	0.112	590.6	311	C	0.135
190H	161	47.74	0.075	2300	0.44	1719	1580	139	0.060	319.1	271	C	0.108
190I	164	7.45	0.012	1215	0.23	1677	1575	102	0.084	443.3	295	B	0.068
190J	157	5.84	0.009	1150	0.22	1677	1575	102	0.089	468.3	297	C	0.131
190K	151	5.20	0.008	1100	0.21	1703	1566	137	0.125	657.6	321	C	0.132
190L	156	7.26	0.011	1215	0.23	1590	1552	38	0.031	165.1	-	B	0.068
TOTAL	13	134.96	0.211										

GRAND TOTAL	Basin	Acres	Sq. Miles
	24	401.7	0.628

A.2

SOIL AND LAND USE INFORMATION

A.2 Soils and Land Use Information - Colony Wash (180)

BASIN	TOTAL	SOILS :	GROUP	40	-	-	-	TOTAL
NUMBER	AREA		ACRES	9.62	-	-	-	9.62
182F	9.62		PERCENT	100%	-	-	-	100%
LENGTH	SLOPE	LAND USE:	ZONE	RUR-190	C-2	-	-	TOTAL
Mi	Ft/Mi		ACRES	2.62	7.00	-	-	9.62
0.48	109.7		PERCENT	27%	73%	-	-	100%
LAND			% DEV	100%	50%	-	-	
TYPE	Kb		% VEG	0%	5%	-	-	64%
B	0.066		I.A.	0.05	0.05	-	-	T.D.

BASIN	TOTAL	SOILS :	GROUP	40	-	-	-	TOTAL
NUMBER	AREA		ACRES	30.85	-	-	-	30.85
182G	30.85		PERCENT	100%	-	-	-	100%
LENGTH	SLOPE	LAND USE:	ZONE	R-3	R-5	RUR-190	C-2	TOTAL
Mi	Ft/Mi		ACRES	7.37	1.33	0.20	21.95	30.85
0.74	113.4		PERCENT	24%	4%	1%	71%	100%
LAND			% DEV	65%	100%	100%	60%	
TYPE	Kb		% VEG	4%	4%	0%	0%	63%
B	0.060		I.A.	0.09	0.09	0.05	0.05	T.D.

BASIN	TOTAL	SOILS :	GROUP	40	41	-	-	TOTAL
NUMBER	AREA		ACRES	24.54	1.04	-	-	25.58
182I	25.58		PERCENT	96%	4%	-	-	100%
LENGTH	SLOPE	LAND USE:	ZONE	R-3	R-4	R-5	C-2	TOTAL
Mi	Ft/Mi		ACRES	9.58	1.02	6.86	8.12	25.58
0.58	84.0		PERCENT	37%	4%	27%	32%	100%
LAND			% DEV	45%	100%	100%	55%	
TYPE	Kb		% VEG	3%	3%	3%	5%	65%
B	0.061		I.A.	0.08	0.08	0.08	0.05	T.D.

BASIN	TOTAL	SOILS :	GROUP	40	-	-	-	TOTAL
NUMBER	AREA		ACRES	9.53	-	-	-	9.53
182J	9.53		PERCENT	100%	-	-	-	100%
LENGTH	SLOPE	LAND USE:	ZONE	RUR-190	C-1	-	-	TOTAL
Mi	Ft/Mi		ACRES	6.53	3.00	-	-	9.53
0.32	55.9		PERCENT	69%	31%	-	-	100%
LAND			% DEV	0%	40%	-	-	
TYPE	Kb		% VEG	30%	5%	-	-	13%
B	0.067		I.A.	0.15	0.10	-	-	T.D.

BASIN	TOTAL	SOILS :	GROUP	40	-	-	-	TOTAL
NUMBER	AREA		ACRES	15.33	-	-	-	15.33
182K	15.33		PERCENT	100%	-	-	-	100%
LENGTH	SLOPE	LAND USE:	ZONE	R-3	C-1	-	-	TOTAL
Mi	Ft/Mi		ACRES	2.29	13.04	-	-	15.33
0.19	118.5		PERCENT	15%	85%	-	-	100%
LAND			% DEV	100%	10%	-	-	
TYPE	Kb		% VEG	5%	10%	-	-	23%
B	0.064		I.A.	0.05	0.10	-	-	T.D.

A.2 Soils and Land Use Information - Colony Wash (180)

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	40	-	-	-	TOTAL
			ACRES	3.34	-	-	-	3.34
182L	3.34		PERCENT	100%	-	-	-	100%
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-3	R-5	C-1	-	TOTAL
			ACRES	2.45	0.17	0.72	-	3.34
0.13	178.5		PERCENT	73%	5%	22%	-	100%
LAND TYPE			% DEV	100%	0%	0%	-	
	Kb		% VEG	7%	7%	30%	-	73%
B	0.073		I.A.	0.10	0.10	0.15	-	T.D.

A.2 Soils and Land Use Information - Panorama Channel (190)

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	41	-	-	-	TO
			ACRES	17.18	-	-	-	
182H	17.18		PERCENT	100%	-	-	-	
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-5	-	-	-	TO
			ACRES	17.18	-	-	-	
0.30	266.0		PERCENT	100%	-	-	-	
LAND			% DEV	10%	-	-	-	
TYPE	Kb		% VEG	30%	-	-	-	
C	0.119		I.A.	0.15	-	-	-	T

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	41	-	-	-	TO
			ACRES	11.95	-	-	-	
190A	11.95		PERCENT	100%	-	-	-	
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-5	-	-	-	TO
			ACRES	11.95	-	-	-	
0.26	297.0		PERCENT	100%	-	-	-	1
LAND			% DEV	10%	-	-	-	
TYPE	Kb		% VEG	30%	-	-	-	
C	0.123		I.A.	0.15	-	-	-	T

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	40	41	-	-	TO
			ACRES	0.43	4.22	-	-	
190B	4.66		PERCENT	9%	91%	-	-	1
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-5	-	-	-	TO
			ACRES	4.66	-	-	-	
0.19	295.0		PERCENT	100%	-	-	-	1
LAND			% DEV	45%	-	-	-	
TYPE	Kb		% VEG	20%	-	-	-	
C	0.133		I.A.	0.15	-	-	-	T.

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	40	41	-	-	TO
			ACRES	0.82	13.04	-	-	1
190C	13.86		PERCENT	6%	94%	-	-	1
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-5	-	-	-	TO
			ACRES	13.86	-	-	-	1
0.26	286.0		PERCENT	100%	-	-	-	1
LAND			% DEV	40%	-	-	-	
TYPE	Kb		% VEG	20%	-	-	-	
C	0.121		I.A.	0.15	-	-	-	T.

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	41	-	-	-	TO
			ACRES	3.46	-	-	-	
190D	3.46		PERCENT	100%	-	-	-	1
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-3	-	-	-	TO
			ACRES	3.46	-	-	-	
0.07	366.0		PERCENT	100%	-	-	-	1
LAND			% DEV	0%	-	-	-	
TYPE	Kb		% VEG	20%	-	-	-	
C	0.137		I.A.	0.10	-	-	-	T.

A.3

MCUHP-1 PROGRAM INPUT/OUTPUT VALUES

A.3 MCUHP-1 Program Input - Colony Wash (180)

Sub-Area	AREA (sq. mi.)	LENGTH (miles)	Kb	SLOPE (ft/mile)	IA (in)	DTHETA	PSIF	XKSAT	RTIMP (%) Existing	RTIMP (%) Future
182A	0.050	0.380	0.059	145.20	0.150	0.250	5.70	0.189	4.50	90.00
182B	0.039	0.450	0.061	112.20	0.095	0.250	5.70	0.170	15.33	80.67
182C	0.022	0.420	0.064	132.00	0.078	0.250	5.70	0.170	35.71	83.06
182D	0.094	0.600	0.056	148.50	0.100	0.250	5.70	0.188	18.85	89.78
182E	0.064	0.490	0.058	103.60	0.091	0.250	5.70	0.170	40.86	74.29
182F	0.015	0.480	0.066	109.70	0.050	0.250	5.70	0.170	41.91	65.49
182G	0.048	0.740	0.060	113.40	0.061	0.250	5.70	0.170	51.89	82.37
182I	0.040	0.580	0.061	84.00	0.070	0.250	5.70	0.170	47.41	72.94
182J	0.015	0.320	0.067	55.90	0.134	0.250	5.70	0.193	3.68	28.33
182K	0.024	0.190	0.064	118.50	0.093	0.250	5.70	0.170	19.84	86.27
182L	0.005	0.130	0.073	178.50	0.111	0.250	5.70	0.174	51.38	70.39

A.3 MCUHP-1 Program Input - Panorama Channel (190)

Sub-Area	AREA (sq. mi.)	LENGTH (miles)	Kb	SLOPE (ft/mile)	IA (in)	DTHETA	PSIF	XKSAT	RTIMP (%) Existing	RTIMP (%) Future
182H	0.027	0.300	0.119	266.00	0.150	0.250	5.70	0.207	6.50	65.00
190A	0.019	0.260	0.123	297.00	0.150	0.250	5.70	0.207	6.50	65.00
190B	0.007	0.190	0.133	295.00	0.150	0.250	5.70	0.189	29.25	65.00
190C	0.022	0.260	0.121	286.00	0.150	0.250	5.70	0.189	26.00	65.00
190D	0.005	0.070	0.137	366.00	0.100	0.250	5.70	0.189	0.00	65.00
190E	0.003	0.180	0.075	291.00	0.050	0.250	5.70	0.170	32.50	65.00
190F	0.006	0.170	0.135	273.00	0.100	0.250	5.70	0.170	6.50	65.00
190G	0.006	0.220	0.135	311.00	0.100	0.250	5.70	0.170	16.25	65.00
190H	0.075	0.440	0.108	271.00	0.150	0.250	5.70	0.207	3.25	65.00
190I	0.012	0.230	0.068	295.00	0.105	0.250	5.70	0.174	42.50	59.85
190J	0.009	0.220	0.131	297.00	0.140	0.250	5.70	0.196	16.25	65.00
190K	0.008	0.210	0.132	321.00	0.150	0.250	5.70	0.207	0.00	65.00
190L	0.011	0.230	0.068	165.10	0.102	0.250	5.40	0.218	30.13	62.76

A.2 Soils and Land Use Information - Panorama Channel (190)

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	40	41	-	-	TOTAL
			ACRES	0.26	5.58	-	-	5.84
190J	5.84		PERCENT	4%	96%	-	-	100%
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-3	R-5	-	-	TOTAL
			ACRES	1.42	4.42	-	-	5.84
0.22	297.0		PERCENT	24%	76%	-	-	100%
LAND			% DEV	25%	25%	-	-	
TYPE	Kb		% VEG	24%	24%	-	-	25%
C	0.131		I.A.	0.14	0.14	-	-	T.D.

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	41	-	-	-	TOTAL
			ACRES	5.20	-	-	-	5.20
190K	5.20		PERCENT	100%	-	-	-	100%
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-3	R-4	-	-	TOTAL
			ACRES	5.11	0.09	-	-	5.20
0.21	321.0		PERCENT	98%	2%	-	-	100%
LAND			% DEV	0%	0%	-	-	
TYPE	Kb		% VEG	30%	30%	-	-	0%
C	0.132		I.A.	0.15	0.15	-	-	T.D.

BASIN NUMBER	TOTAL AREA	SOILS :	GROUP	6	40	41	-	TOTAL
			ACRES	0.55	2.25	4.46	-	7.26
190L	7.26		PERCENT	8%	31%	61%	-	100%
LENGTH Mi	SLOPE Ft/Mi	LAND USE:	ZONE	R-3	R-4	RUR-190	-	TOTAL
			ACRES	5.74	1.27	0.25	-	7.26
0.23	165.1		PERCENT	79%	17%	3%	-	100%
LAND			% DEV	50%	50%	0%	-	
TYPE	Kb		% VEG	23%	23%	30%	-	48%
B	0.068		I.A.	0.10	0.10	0.15	-	T.D.

APPENDIX B

RAINFALL CHARTS AND PROBABLE MAXIMUM PRECIPITATION

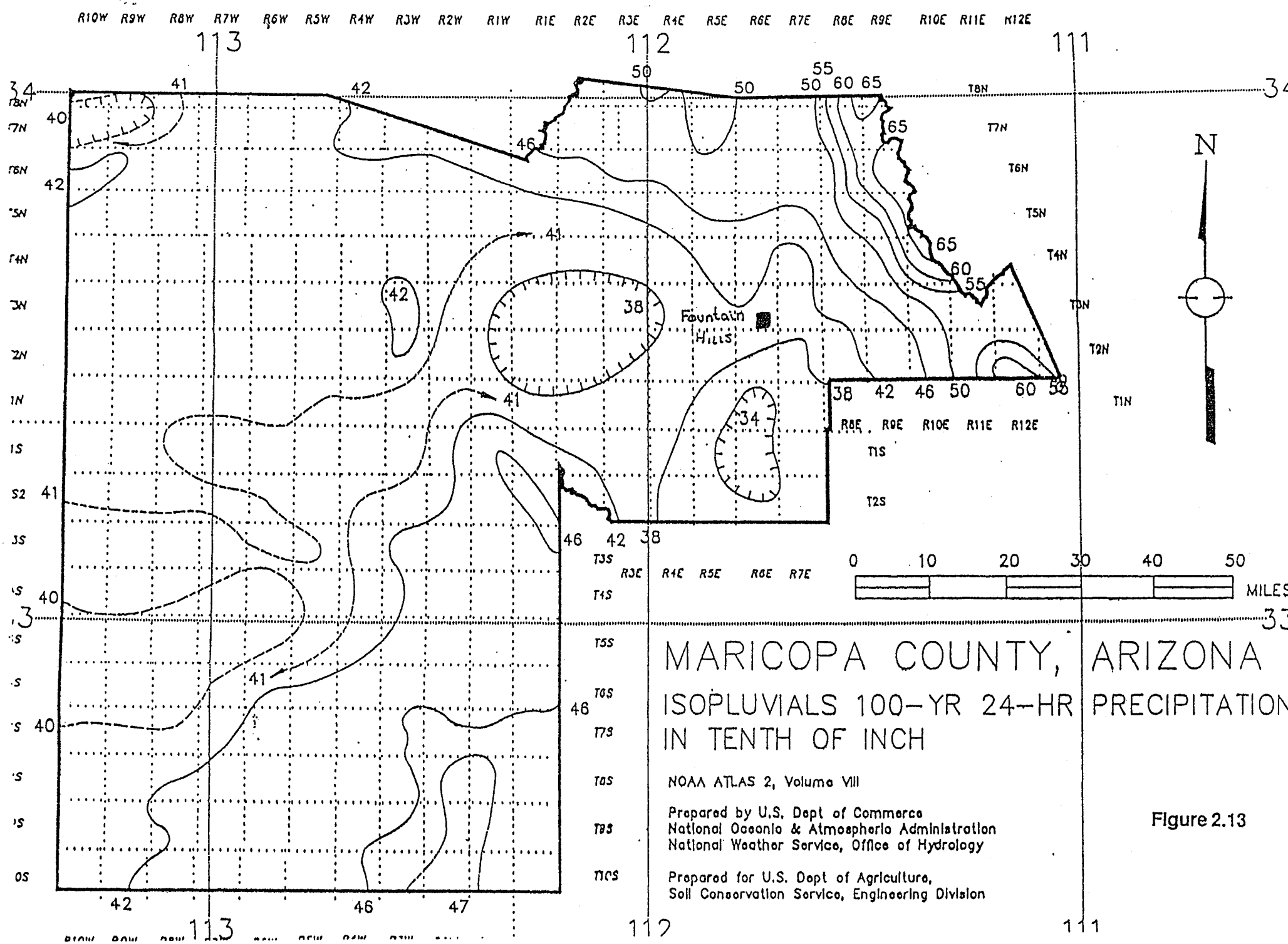

MARICOPA COUNTY, ARIZONA
ISOPLUVIALS 100-YR 24-HR PRECIPITATION
IN TENTH OF INCH
NOAA ATLAS 2, Volume VIII
Prepared by U.S. Dept of Commerce
National Oceanic & Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Dept of Agriculture,
Soil Conservation Service, Engineering Division
Fountain Hills
N
0 10 20 30 40 50
MILES
113
112
111
34
33

Figure 2.13

Client	Anderson-Nelson, Inc.		
Job	Fountain Hills (Fountain Lake hydrology)	**Job #**	
By	HAA	**Date**	12-Sep-95
Check		**Date**	

PMP CALCULATIONS

Area	0.63	sq. miles
Latitude	33 44'	
Longitude	111 44'	
Elevation	1620	

1 Average 1-hr 1-mi2 PMP (Figure 4.5) — 11.5 in.

2a Reduction for elevation. (No adjustment for elevations up to 5,000 feet: 5% decrease per 1,000 feet above 5,000 feet — 100 %

2b Multiply step 1 by step 2a — 11.5 in.

3 Average 6/1 ratio for drainage(figure 4.7) — 1.24

	Duration (hr)									
	1/4	1/2	3/4	1	2	3	4	5	6	
4 Duration variation for 6/1-hr ratio of step 3 (table 4.4)	74.00	89.00	95.00	100.00	111.60	117.40	120.80	122.60	124.00	%
5 1-mi^2 PMP for indicated duration (step 2b X step 4)	8.51	10.24	10.93	11.50	12.83	13.50	13.89	14.10	14.26	in.
6 Aeral reduction (figure 4.9)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	%
7 Aeral reduction PMP (steps 5 X 6)	8.51	10.24	10.93	11.50	12.83	13.50	13.89	14.10	14.26	in.
8 Incremental PMP (successive Substraction in step 7)				11.500	1.334	0.667	0.391	0.207	0.161	in.
	8.510	1.725	0.690	0.575	} 15-min. increments					
9 Time sequence of incr-mental PMP according to: EMR110-2-1411										
Hourly increment (table 4.7)				0.161	0.391	1.334	11.5	0.667	0.207	in.
Four largest 15-min. Increments (table 4.8)				8.51	1.725	0.69	0.575			in.

Client	Anderson-Nelson, Inc.		
Job	Fountain Hills (Fountain Lake hydrology)	**Job #**	
By	HAA	**Date**	12-Sep-95
Check		**Date**	

PMP CALCULATIONS

Cumulative Hourly and maximum 15-min PMP

Time (Hour)	15-min PMP	Hourly PMP	Cumulative PMP
0			0.00
1.00		0.16	0.16
2.00		0.39	0.55
3.00		1.33	1.89
3.25	8.51		10.40
3.50	1.72		12.12
3.75	0.69		12.81
4.00	0.57	11.50	13.39
5.00		0.67	14.05
6.00		0.21	14.26

Time vrs. Cumulative PMP were ploted (Graph 1) and 15 min. values obtained from the graph. This values were entered in the shaded areas of the table below

Cumulative PMP Distribution

Time (hours)	Cumulative Depth (in)	Unit Cumulative Depth
0.00	0.00	0.0000
0.25	0.01	0.0007
0.50	0.02	0.0014
0.75	0.08	0.0056
1.00	0.16	0.0113
1.25	0.22	0.0154
1.50	0.32	0.0224
1.75	0.41	0.0288
2.00	0.55	0.0387
2.25	0.75	0.0526
2.50	1.00	0.0701
2.75	1.38	0.0968
3.00	1.89	0.1323
3.25	10.40	0.7290
3.50	12.12	0.8500
3.75	12.81	0.8984
4.00	13.39	0.9387
4.25	13.56	0.9509
4.50	13.76	0.9649
4.75	13.92	0.9762
5.00	14.05	0.9855
5.25	14.17	0.9937
5.50	14.25	0.9993
5.75	14.26	1.0000
6.00	14.26	1.0000

The final distribution was ploted (Graph 2) and need to be checked for to ensure a smoth curve

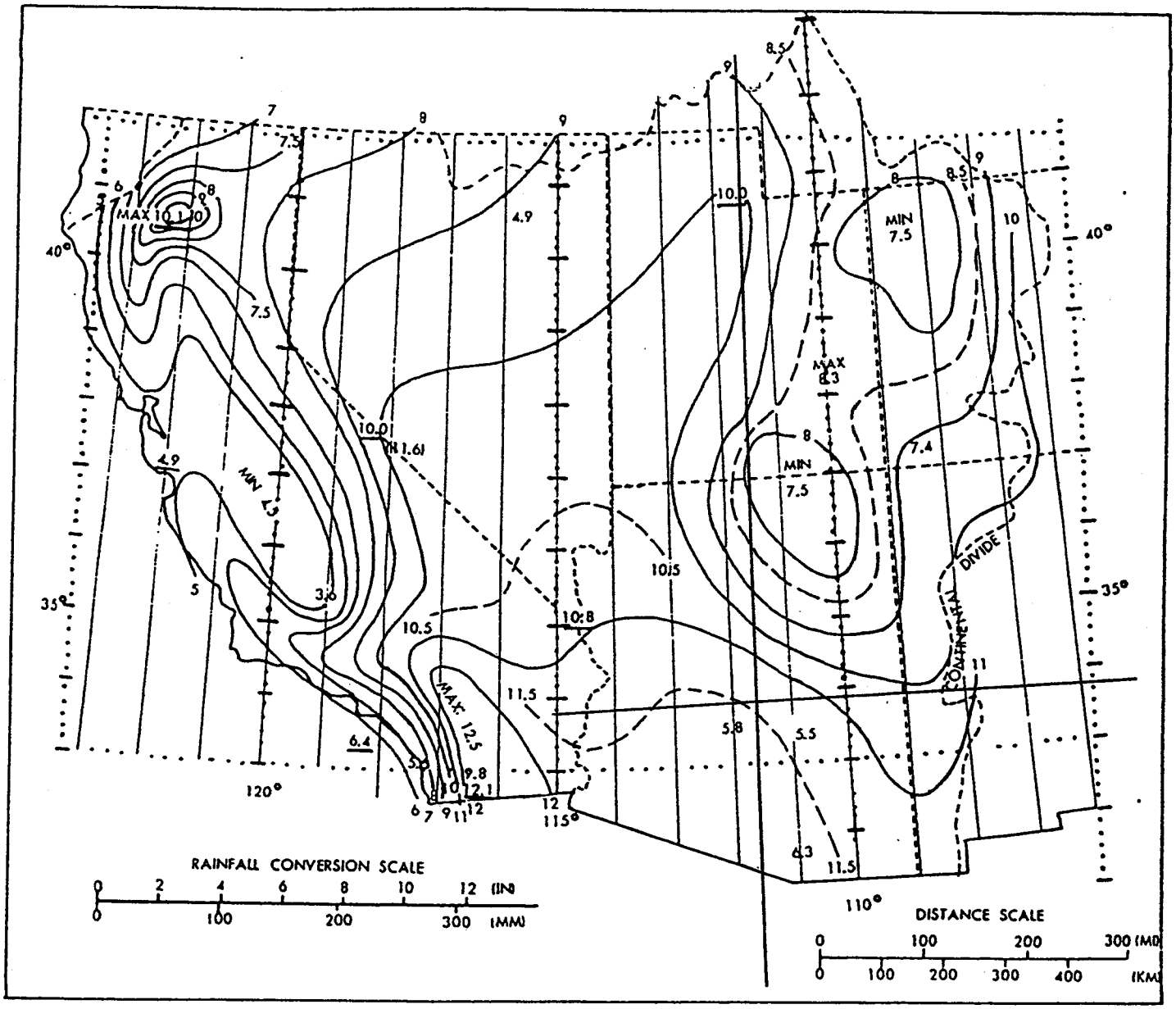


Figure 4.5--Local-storm PMP for 1 mi^2 (2.6 km^2) 1 hr. Directly applicable for locations between sea level and 5000 ft (1524 m). Elevation adjustment must be applied for locations above 5000 ft.

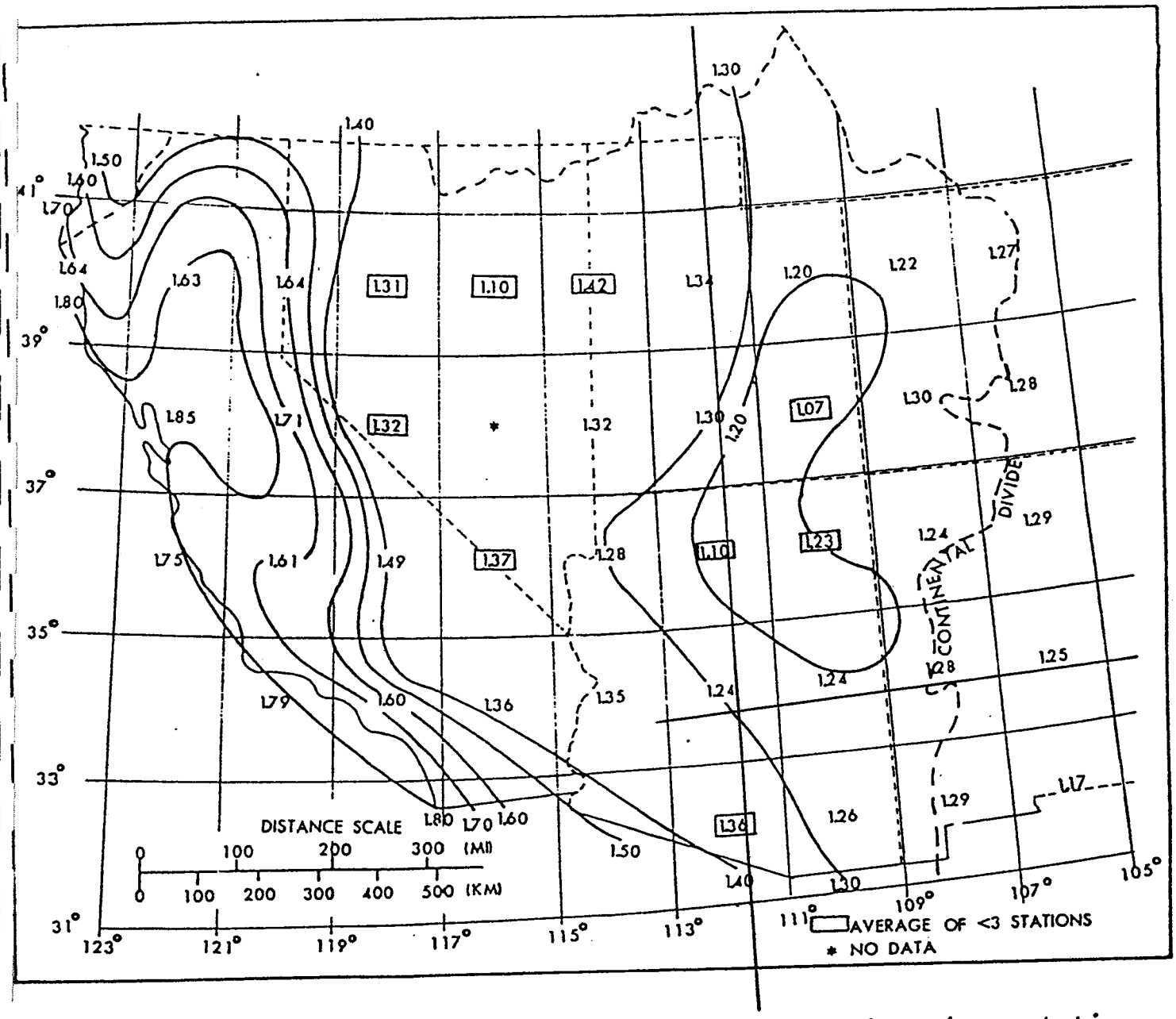


Figure 4.7.--Analysis of 6/1-hr ratios of averaged maximum station data (plotted at midpoints of a 2° latitude-longitude grid).

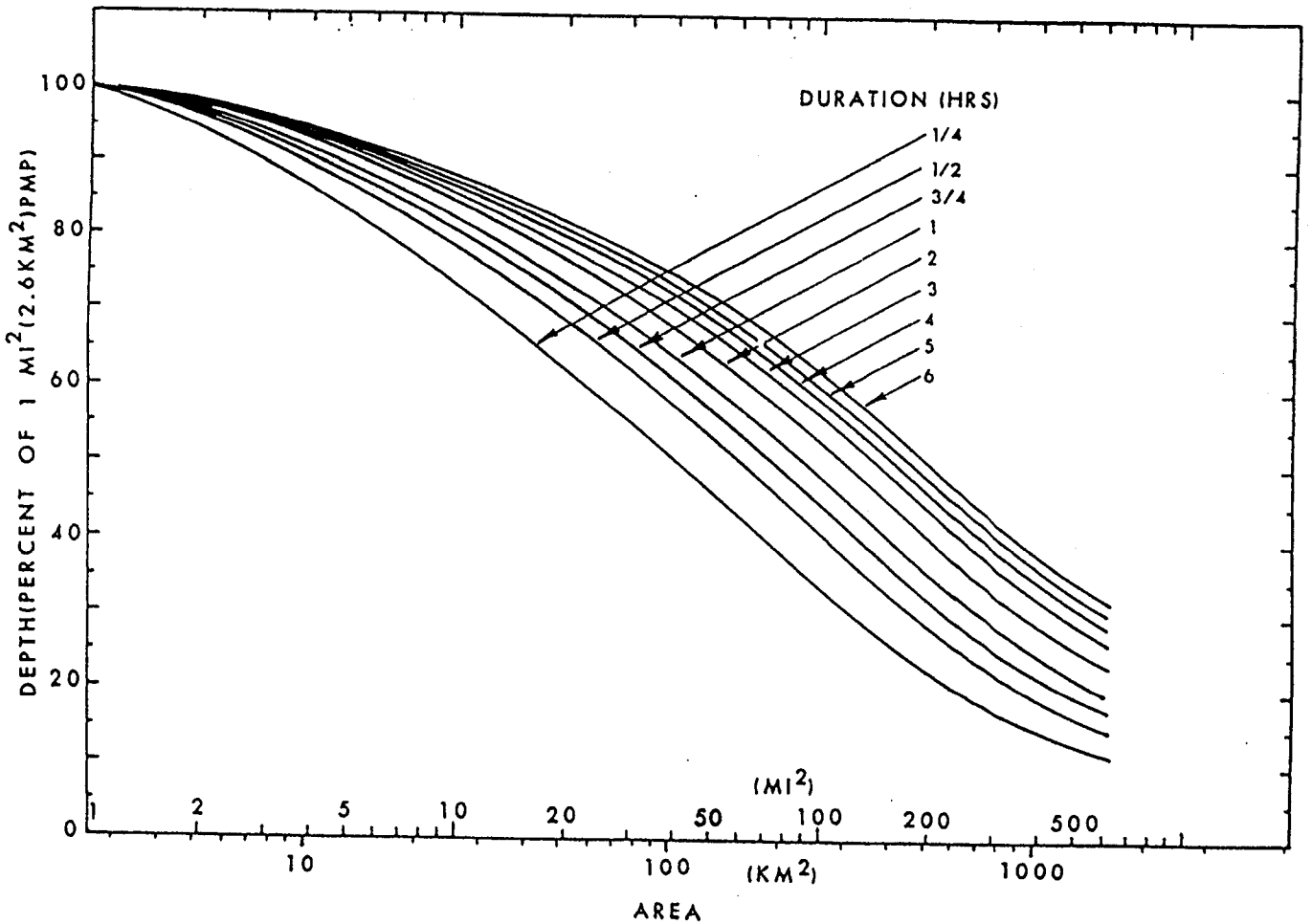
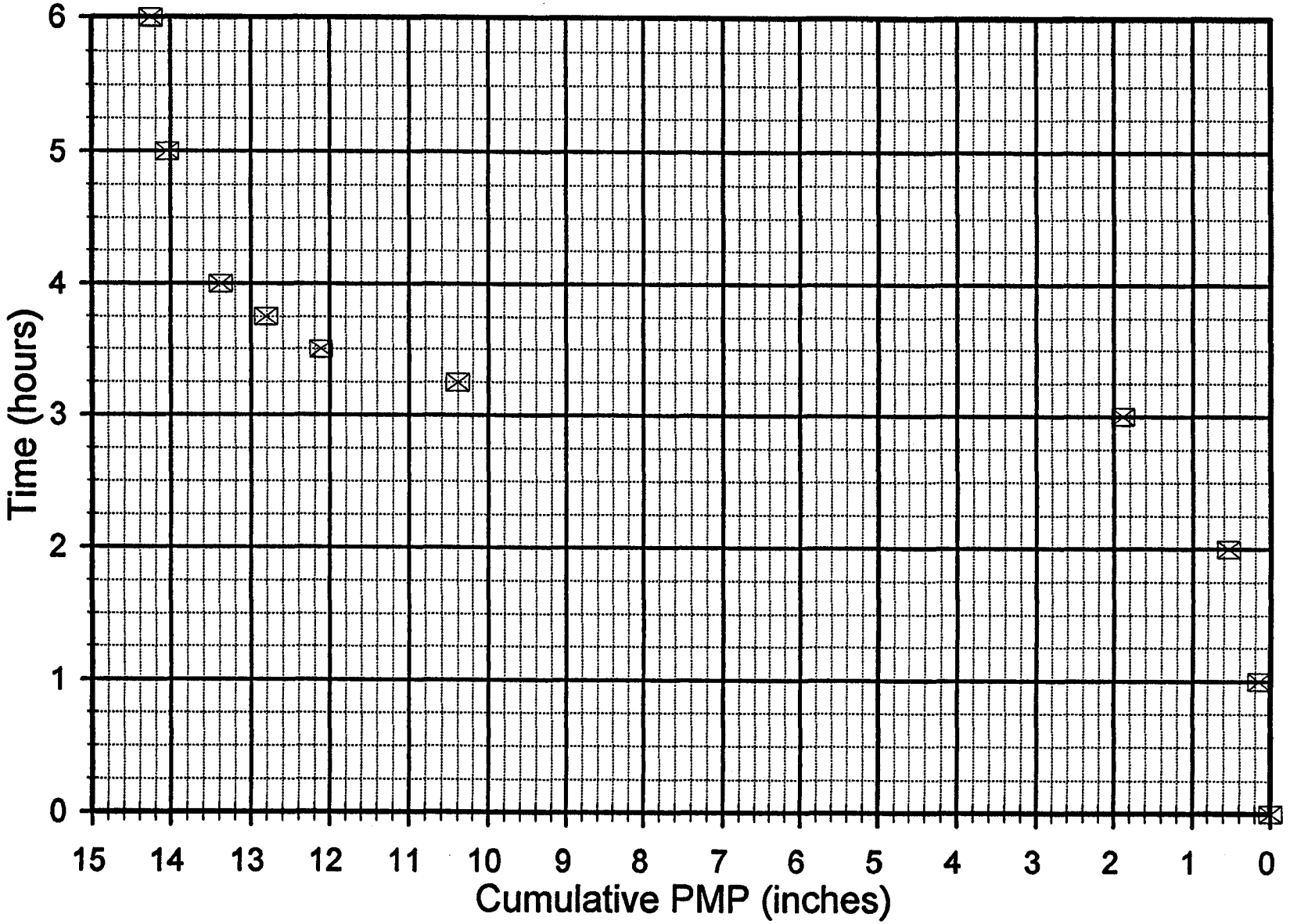
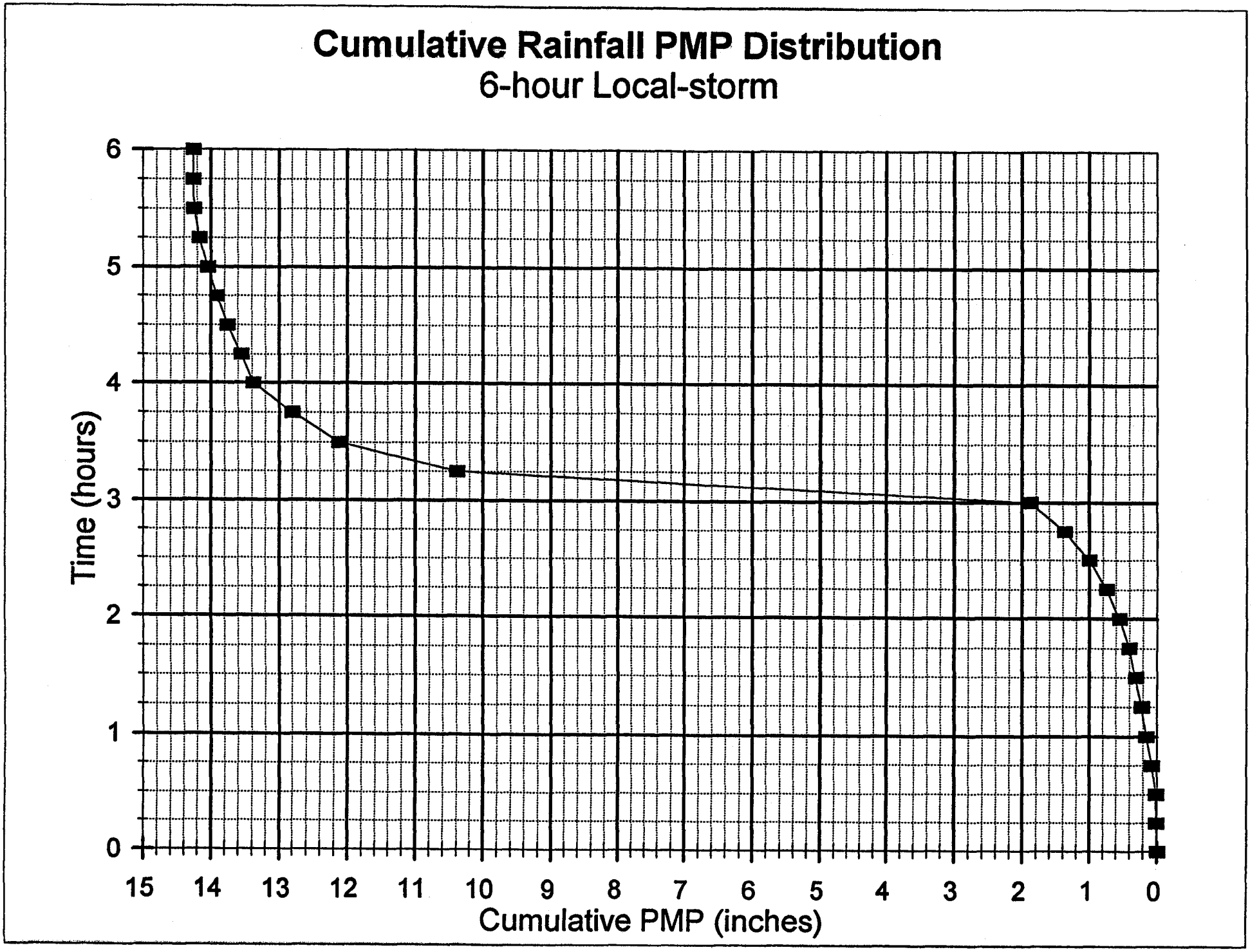


Figure 4.9.--Adopted depth-area relations for local-storm PMP.


Cumulative Rainfall PMP Distribution
6-hour Local-storm
Time (hours)
0
1
2
3
4
5
6
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Cumulative PMP (inches)


Cumulative Rainfall PMP Distribution
6-hour Local-storm
Time (hours)
0
1
2
3
4
5
6
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Cumulative PMP (inches)

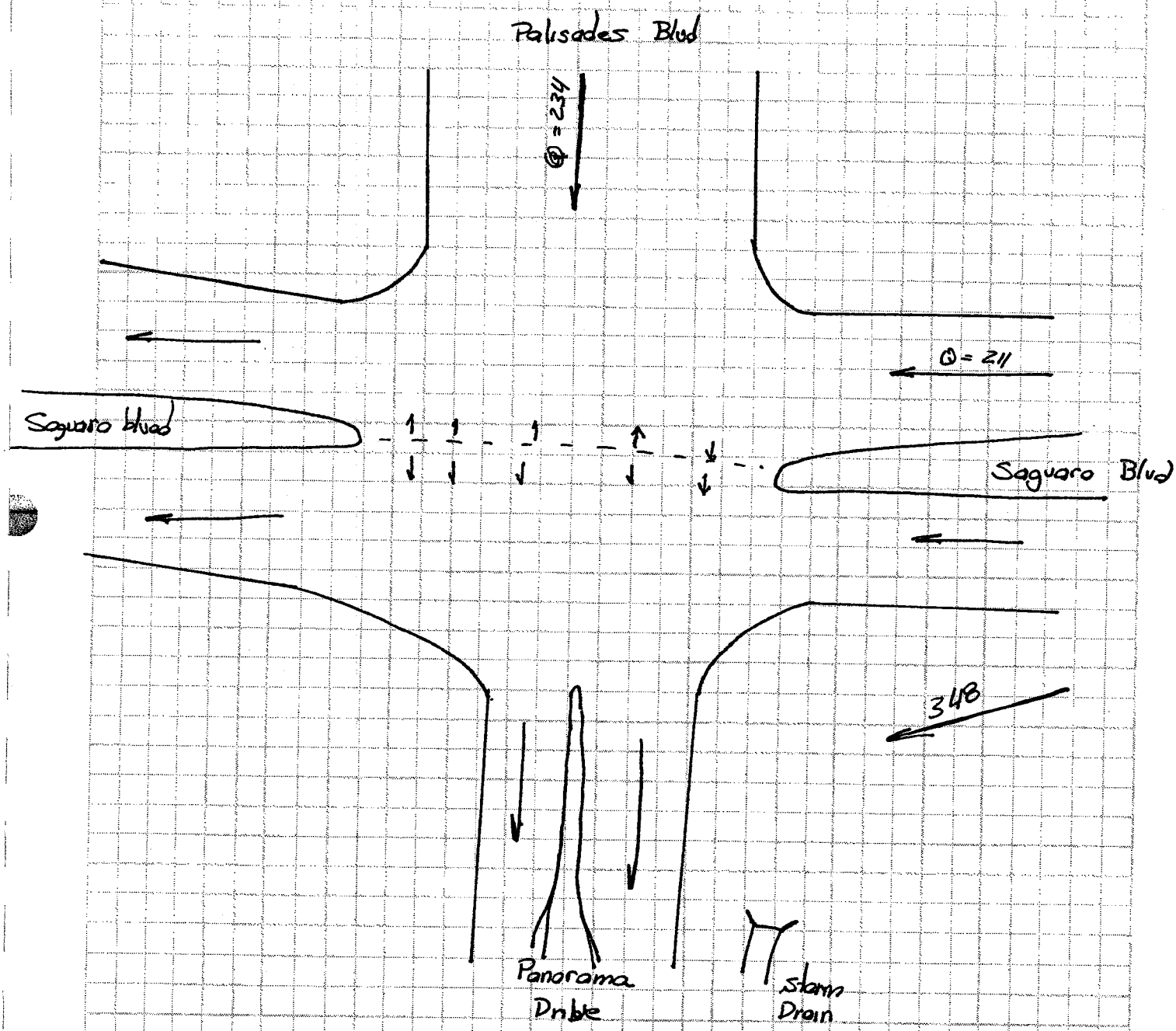
APPENDIX C

FLOW SPLIT CALCULATION AT PANORAMA DRIVE AND SAGUARO BOULEVARD

ACK ENGINEERS, INC.
2255 N. 44th St. • Phoenix, Az. 85008 • Phone (602) 244-2566

SHEET 1 OF 3
BY HAA DATE
CHECK DATE

CLIENT Anderson - Nelson
JOB Fountain Hills hydrology
JOB NO. 465-14



Panorama slope = $\frac{5}{208}$ = 0.024 ft/ft

Saguaro Blvd slope = $\frac{2}{138}$ = 0.014 ft/ft

Fountain Lake Hydrology
Split flow at intersection of Saguaro Blvd. and Panorama Dr.

Combined		Panorama				Saguaro			
		B 61.7				B 89.6			
		S 0.024				S 0.014			
		n 0.025				n 0.025			
Q	y	A	P	R	Q	A	P	R	Q
118	0.25	15.43	62.20	0.25	56	22.40	90.10	0.25	62
374	0.50	30.85	62.70	0.49	177	44.80	90.60	0.49	197
732	0.75	46.28	63.20	0.73	346	67.20	91.10	0.74	386
1177	1.00	61.70	63.70	0.97	556	89.60	91.60	0.98	621
1700	1.25	77.13	64.20	1.20	803	112.00	92.10	1.22	897
2294	1.50	92.55	64.70	1.43	1082	134.40	92.60	1.45	1212
2953	1.75	107.98	65.20	1.66	1392	156.80	93.10	1.68	1561
3673	2.00	123.40	65.70	1.88	1730	179.20	93.60	1.91	1943

ACK ENGINEERS, INC.
2255 N. 44th St., Ste. 330, Phoenix, AZ 85008 Tel: (602) 244-2566

BY HAN DATE 3

CHECK _____ DATE _____

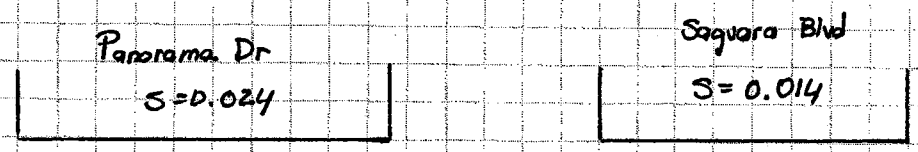
CLIENT Anderson-Nelson

JOB NAME Fountain Lake Hydrology

JOB NO. _____

Panorama Dr. Width. = 61.7 ft.

Saguaro Blvd Width = 89.6



$Q_p + Q_s = Q_{Total}$

$Y = Y_p = Y_s$

assuming normal depth in both roads then

$$Q_p = \frac{1.486}{n} A_p R_p^{2/3} S_p^{1/2}$$

$$Q_s = \frac{1.486}{n} A_s R_s^{2/3} S_s^{1/2}$$

$A = BY$

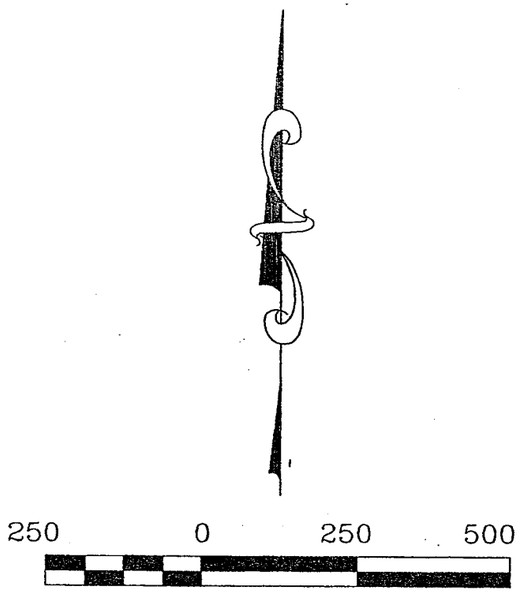
$R = (BY)/(B\,2Y)$

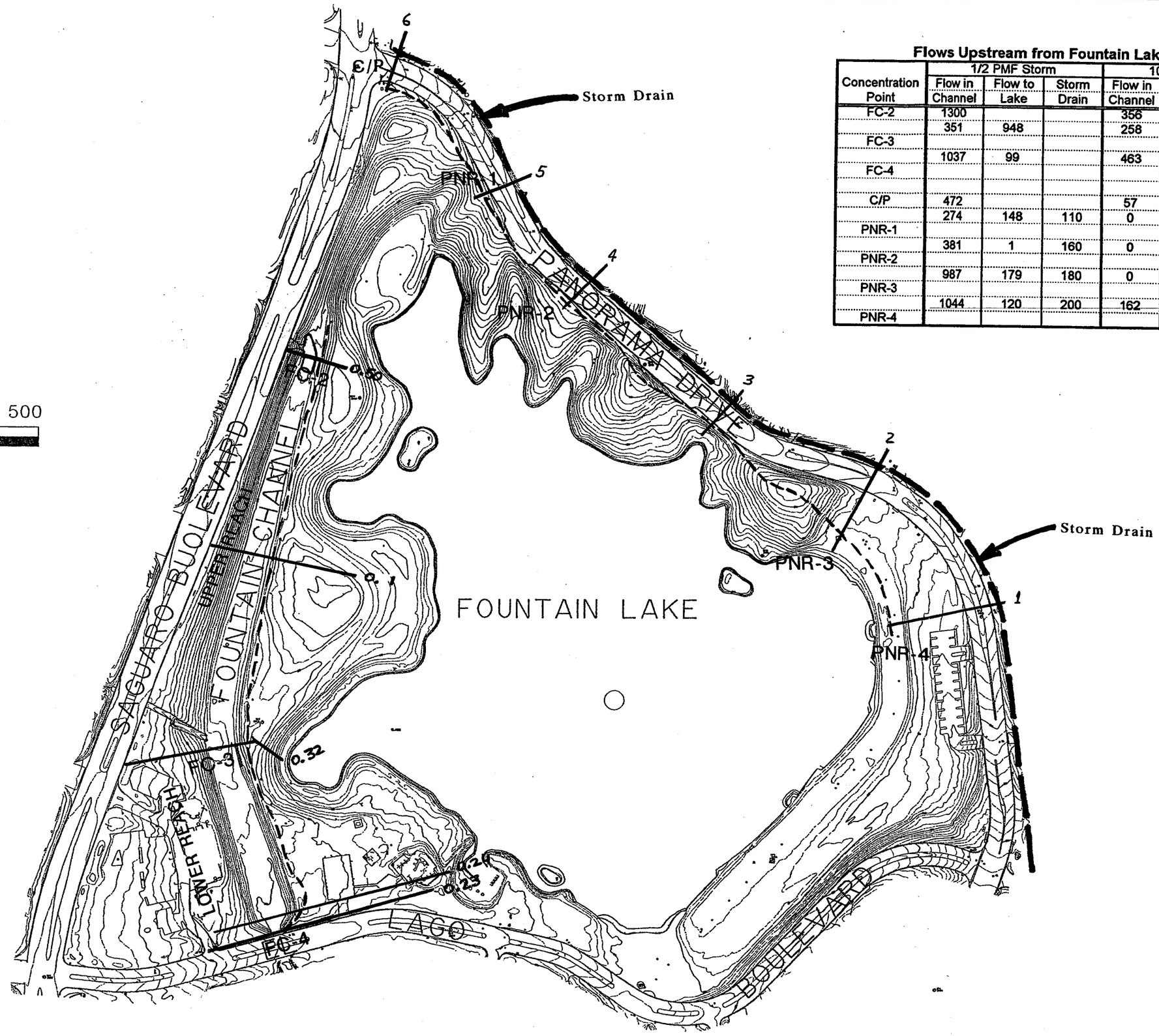
APPENDIX D

FLOW DIVERSION CALCULATIONS

D.1

FLOW DIVERSION ALONG FOUNTAIN CHANNEL





Flows Upstream from Fountain Lake (cfs)

Concentration Point	1/2 PMF Storm			100-Year Storm		
	Flow in Channel	Flow to Lake	Storm Drain	Flow in Channel	Flow to Lake	Storm Drain
FC-2	1300			356		
	351	948		258	91	
FC-3						
	1037	99		463	0	
FC-4						
C/P	472			57		
	274	148	110	0	0	75
PNR-1						
	381	1	160	0	0	140
PNR-2						
	987	179	180	0	12	179
PNR-3						
	1044	120	200	162	21	200
PNR-4						

Diversion at FC-2

HEC-2 Upstream Flow	HEC2 Downstream Flow	Diverted Flow
200	200	0
400	278	122
600	305	295
800	322	478
1000	339	661
1200	349	851
1800	363	1437
2000	364	1636
2700	365	2335

Diversion at FC-4

HEC-2 Upstream Flow	HEC2 Downstream Flow	Diverted Flow
200	200	0
500	500	0
800	799	1
1100	1019	81
1400	1170	230
1700	1299	401
2000	1402	598
2400	1504	896
3000	1595	1405

ACK ENGINEERS, INC.
2255 N. 44th St. Phoenix, AZ · Phone (602) 244-2566

SHEET _____ OF _____

BY HAA DATE 26-Oct-95

CLIENT: Anderson-Nelson, Inc. CHECK _____ DATE _____

JOB: Fountain Channel Hydrology JOB NO. 465.14

Location = Fountain Channel @ El Lago crossing (2 - 4' X 10') RBC
Pipe size (H, W) = 4 ' 10 '
Number of pipes = 2
Type of Pipe = RBC
Culvert inlet flow-line = 1577.35
Spillway elevation = 1584.07
Opening Area = 40.00 sq-ft

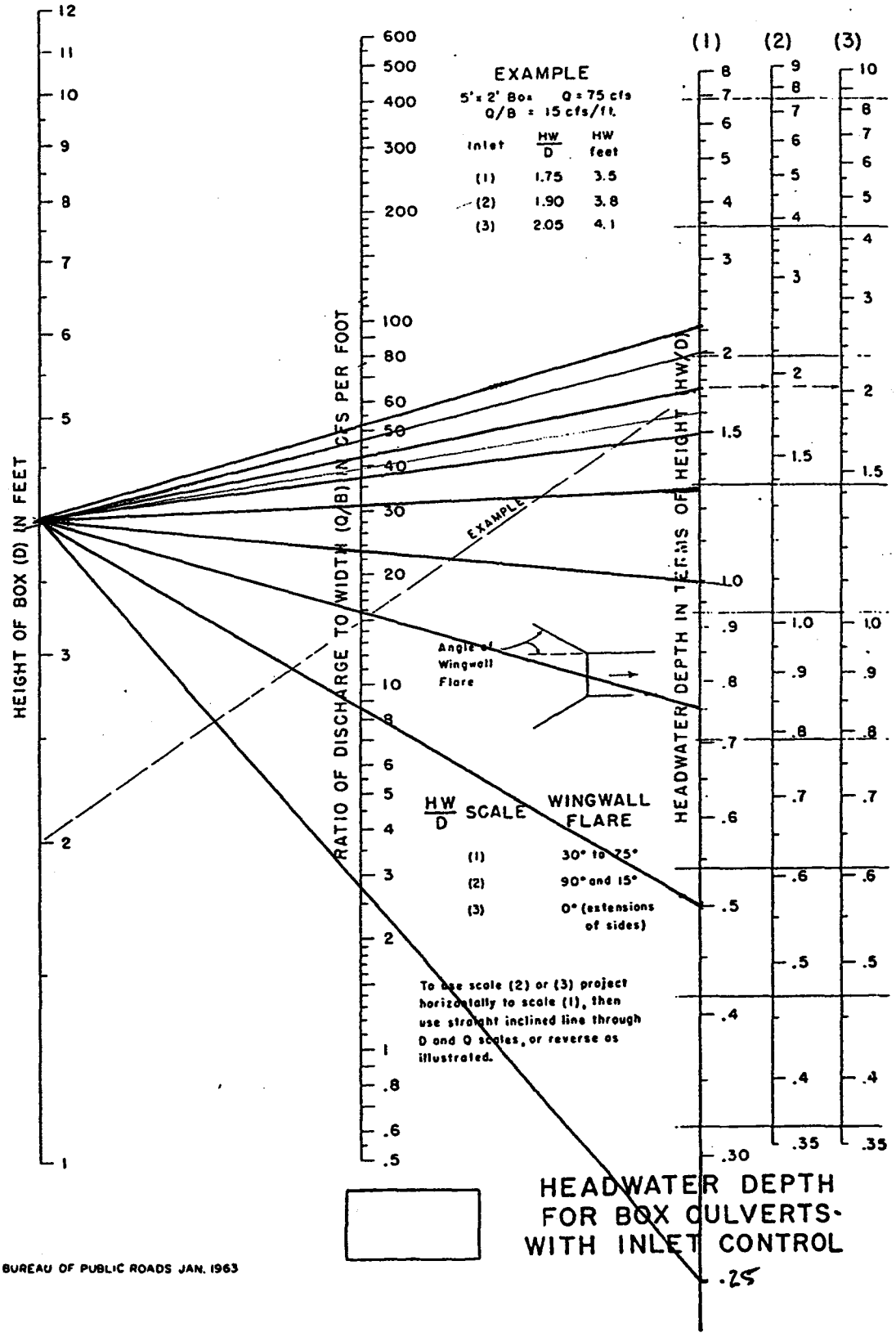
Water Surface Elevation	Height of Water HW (ft)	HW/D	Coefficient Orfice/weir C	Flow Rate Q (cfs)
Orifice flow only				
1577.35	0.00	0.00	0.00	0.0
1578.35	1.00	3.00	0.68	54.4
1579.35	2.00	6.00	1.37	174.0
1580.35	3.00	9.00	1.90	316.2
1581.35	4.00	12.00	2.30	463.7
1582.35	5.00	15.00	2.73	638.6
1583.35	6.00	18.00	2.93	774.0
Orifice and weir flow				
1584.07 Orifice	6.72	20.16	2.93	834.7
weir	0.00	L= 0	2.7	0.0
			Total =	834.7
1584.20 Orifice	6.85	35	2.93	845.4
weir	0.13	L= 21	2.7	2.7
			Total =	848.1
1584.30 Orifice	6.95	40	2.93	853.7
weir	0.23	L= 30	2.7	8.9
			Total =	862.6
1584.40 Orifice	7.05	45	2.93	861.8
weir	0.33	L= 21	2.7	10.7
			Total =	872.6
1584.50 Orifice	7.15	50	2.93	870.0
weir	0.43	L= 21	2.7	16.0
			Total =	885.9
1584.75 Orifice	7.40	22.2	2.93	890.1
weir	0.68	L= 75	2.7	113.6
			Total =	1003.7
1585.00 Orifice	7.65	22.95	2.93	910.0
weir	0.93	L= 100	2.7	242.2
			Total =	1152.2
1586.00 Orifice	8.65	25.95	2.93	987.7
weir	1.93	L= 150	2.7	1085.9
			Total =	2073.6

ACK ENGINEERS, INC.
2255 N. 44th St. Suite 220 • Phoenix, Az. 85008 • Phone (602) 244-2566

SHEET 5 OF 6
BY JDS DATE 5-20-93
CHECK _____ DATE _____

CLIENT FCDMC FOUNTAIN HILLS
JOB FOUNTAIN CHANNEL @ El Lago DR.
2-4'x10' BOXES 1825
JOB NO. 310.43

CHART I



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

ACK ENGINEERS, INC.
2255 N. 44th St., Ste. 330, Phoenix, AZ 85008 Tel: (602) 244-2566

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Dambreak Analysis. Fountain Lake
JOB NO. _____

Fountain Channel @ Panoro El Lago Dr Crossing
Culvert = 2 - 4' x 10' RCB
Inv = 1577.35

Water Surface Elev.	Height of Water HW	HW/D	Q/B (cfs/ft)	Q (cfs)
1577.35	0	0	0.	
1578.35	1	0.25	2.7	54
1579.35	2	0.50	8.7	174
1580.35	3	0.75	15.8	316
1581.35	4	1	23	460
1582.35	5	1.25	32	640
1583.35	6	1.50	37	740
1584.35	7	1.75	43	860
1585.35	8	2	47	940
1586.35	9	2.25	52	1040

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    26OCT95    TIME    14:56:15  *
*********************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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?6OCT95      14:56:15                                                                    PAGE
                                                                THIS RUN EXECUTED 26OCT95    14:56:15
*************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.2;  May 1991
*************************************


SPLIT FLOW BEING PERFORMED


SF     Split Flow into Fountain Lake


TW      Left bank between sections 0.24 and 0.32
NS    14    0.24    0.32      -1     2.5
NC       1585.94      23 1585.74      65 1584.74      80 1584.74     165 1585.24
NC   217 1586.14     243 1586.04     263 1585.74     296 1584.74     338 1584.54
NC   379 1584.74     404 1585.14     429 1585.74     451 1585.84


TW      Left bank between sections 0.23 and 0.24
NS     5    0.23    0.24      -1     2.5
NC       1583.44       9 1583.74      33 1584.74      53 1586.14      65 1585.94


T1      Fountain Lake Hydrology                              File: FL-SPILL.H2
T1      Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

T2      Multiple run Spill flow into Fountain Channel
T3      Fountain Hills - FOUNTAIN CHANNEL SPILL

[illegible]R data from stereo model received October 93 from KAM
T4 Revised photogrametric x-sec. received May 94
T5 1"=200' 2-feet Contour mapping from KAM flown 8-91
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Ither parameters may not be accurate


J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              2                          9                                  1578.75

JR                          **************RATING CURVE DATA**************

     0   1577.35      174   1578.35      464   1581.35      774   1583.35    834.7   1584.07
   886    1584.5   1152.2      1585     2074      1586     4000      1587

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1                                                      -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38       43       1        2


NC    .058     .058     .031      .1       .3
NT      9      200      500      800     1100     1400     1700     2000     2400     3000

 Culvert FC1 inlet
X1    0.23       20     9990    10010       80       80       80
        10                                                          1583.5    1584.7
--  1582.4   9813.3   1582.9   9836.5   1582.9   9878.4   1583.5   9917.2   1583.4   9957.9
```

R	1583.5	9974.2	1577.3	9990	1577.3	10000.0	1577.3	10010	1584.5	10025.3
	1585.2	10077.1	1586.5	10111.8	1587.8	10145.1	1588.3	10159.4	1588.0	10162.4
	1588.7	10174.0	1588.9	10186.8	1589.6	10189.7	1590.2	10203.9	1591.7	10235.2
X1	0.24	19	9974.5	10035.6	70	65	50			
GR	1583.8	9809.1	1584.4	9851.1	1584.5	9871.8	1585.5	9891.0	1586.2	9912.0
R	1586.0	9933.1	1580.1	9961.5	1579.1	9974.5	1573.9	10000.0	1579.4	10035.6
R	1585.3	10066.4	1586.9	10088.2	1588.8	10123.4	1590.1	10161.6	1589.2	10183.1
R	1589.8	10193.7	1589.9	10207.8	1590.7	10211.5	1591.6	10229.2		
1	0.32	15	9992.7	10029.5	435	451	440			
3				9965.5						
GR	1586.6	9965.5	1585.1	9980.3	1582.5	9992.7	1581.6	10000.0	1583.0	10029.5
GR	1583.4	10063.8	1586.7	10082.0	1590.3	10101.4	1592.8	10137.1	1594.2	10165.0
R	1594.5	10192.2	1595.6	10211.9	1596.9	10232.8	1597.6	10253.1	1597.7	10265.3
X1	0.41	9	9987.7	10036.2	480	470	487			
X3				9967						
R	1584.9	9967.0	1582.6	9987.7	1583.0	10000.0	1583.0	10036.2	1587.6	10058.2
R	1591.7	10079.8	1595.7	10103.8	1597.7	10114.0	1598.1	10122.7		
1	0.50	12	9988.7	10018.4	440	436	434			
3				9967.2						
R	1587.2	9967.2	1584.8	9988.7	1585.6	10000.0	1585.5	10018.4	1592.1	10047.8
GR	1596.1	10068.3	1595.3	10078.5	1595.6	10108.2	1597.5	10118.2	1595.6	10129.3
GR	1595.6	10150.1	1595.8	10153.3						

THIS RUN EXECUTED 26OCT95 14:56:22

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - FOUNTAI

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
	.230	200.00	1578.75	1578.75
	.230	500.00	1581.58	1579.98
	.230	799.28	1583.65	1580.96
	.230	1018.62	1584.75	1581.62
	.230	1170.26	1585.02	1582.02
	.230	1299.44	1585.16	1582.36
	.230	1401.79	1585.27	1582.63
	.230	1504.40	1585.38	1582.89
	.230	1594.82	1585.48	1582.99
	.240	200.00	1579.56	1576.27
	.240	500.00	1582.14	1577.32
*	.240	800.00	1584.01	1578.03
*	.240	1074.29	1584.90	1578.54
	.240	1257.14	1585.17	1578.85
	.240	1405.98	1585.32	1579.08
*	.240	1524.83	1585.43	1579.26
*	.240	1645.70	1585.55	1579.38
	.240	1753.10	1585.65	1579.51
	.320	200.00	1583.24	1583.24
*	.320	500.00	1583.98	1583.98
*	.320	800.00	1584.46	1584.46
	.320	1100.00	1584.84	1584.84
	.320	1400.00	1585.23	1585.23
*	.320	1700.00	1585.55	1585.55
*	.320	2000.00	1585.85	1585.85
	.320	2400.00	1586.22	1586.22
	.320	3000.00	1586.78	1586.78
*	.410	200.00	1584.73	1583.71
*	.410	500.00	1585.73	1584.33
	.410	800.00	1586.45	1584.84
	.410	1100.00	1587.05	1585.26
*	.410	1400.00	1587.55	1585.61
*	.410	1700.00	1588.00	1585.94
	.410	2000.00	1588.40	1586.25
	.410	2400.00	1588.89	1586.64
	.410	3000.00	1589.52	1587.17
*	.500	200.00	1586.36	1586.36
	.500	500.00	1587.20	1587.20
	.500	800.00	1587.76	1587.76
*	.500	1100.00	1588.24	1588.24
*	.500	1400.00	1588.67	1588.67
	.500	1700.00	1589.07	1589.07
	.500	2000.00	1589.45	1589.45
	.500	2400.00	1589.92	1589.92
*	.500	3000.00	1590.55	1590.55

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*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    26OCT95    TIME    15:00:11  *
*********************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.2;  May 1991
************************************


SPLIT FLOW BEING PERFORMED


SF     Split Flow into Fountain Lake


W      Left bank between sections 0.41 and 0.50
S     4    0.41    0.50      -1     2.5
WC    0 1584.84     225 1585.74     302 1588.64     436 1586.69


W      Left bank between sections 0.32 and 0.41
S     7    0.32     .41      -1     2.5
WC    0 1585.84      20 1585.94     108 1585.74     171 1586.24     302 1585.74
WC  361 1584.44     470 1584.84


T1     Fountain Lake Hydrology                              File: FL-SPILL.H2
T1     Prepared for Anderson-Nelson Inc.
T1     by AGK Engineers, Inc.

T2     Multiple run Spill flow into Fountain Channel
T3     Fountain Hills - FOUNTAIN CHANNEL SPILL

GR data from stereo model received October 93 from KAM
evised photogrametric x-sec. received May 94
T5 1"=200' 2-feet Contour mapping from KAM flown 8-91
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Ither parameters may not be accurate

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC    HVINS     Q        WSEL     FQ

              2                          9                                  1578.75

JR                          **************RATING CURVE DATA**************

     0   1577.35      174   1578.35      464   1581.35      774   1583.35    834.7   1584.07
   886    1584.5   1152.2      1585     2074      1586     4000      1587

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1                                                     -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38       43       1        2


NC    .058     .058     .031      .1       .3
QT      9      200      400      600      800     1000     1200     1800     2000     2700

 Culvert FC1 inlet
X1    0.23       20     9990    10010       80       80       80
X3      10                                                        1583.5   1584.7
    1582.4   9813.3   1582.9   9836.5   1582.9   9878.4   1583.5   9917.2   1583.4   9957.9
    1583.5   9974.2   1577.3     9990   1577.3  10000.0   1577.3    10010   1584.5  10025.3
```

GR	1585.2	10077.1	1586.5	10111.8	1587.8	10145.1	1588.3	10159.4	1588.0	10162.4
	1588.7	10174.0	1588.9	10186.8	1589.6	10189.7	1590.2	10203.9	1591.7	10235.2
X1	0.24	19	9974.5	10035.6	70	65	50			
GR	1583.8	9809.1	1584.4	9851.1	1584.5	9871.8	1585.5	9891.0	1586.2	9912.0
GR	1586.0	9933.1	1580.1	9961.5	1579.1	9974.5	1573.9	10000.0	1579.4	10035.6
GR	1585.3	10066.4	1586.9	10088.2	1588.8	10123.4	1590.1	10161.6	1589.2	10183.1
GR	1589.8	10193.7	1589.9	10207.8	1590.7	10211.5	1591.6	10229.2		
X1	0.32	15	9992.7	10029.5	435	451	440			
X3				9965.5						
GR	1586.6	9965.5	1585.1	9980.3	1582.5	9992.7	1581.6	10000.0	1583.0	10029.5
GR	1583.4	10063.8	1586.7	10082.0	1590.3	10101.4	1592.8	10137.1	1594.2	10165.0
GR	1594.5	10192.2	1595.6	10211.9	1596.9	10232.8	1597.6	10253.1	1597.7	10265.3
X1	0.41	9	9987.7	10036.2	480	470	487			
X3				9967						
GR	1584.9	9967.0	1582.6	9987.7	1583.0	10000.0	1583.0	10036.2	1587.6	10058.2
GR	1591.7	10079.8	1595.7	10103.8	1597.7	10114.0	1598.1	10122.7		
X1	0.50	12	9988.7	10018.4	440	436	434			
X3				9967.2						
GR	1587.2	9967.2	1584.8	9988.7	1585.6	10000.0	1585.5	10018.4	1592.1	10047.8
GR	1596.1	10068.3	1595.3	10078.5	1595.6	10108.2	1597.5	10118.2	1595.6	10129.3
GR	1595.6	10150.1	1595.8	10153.3						

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - FOUNTAI

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
	.230	200.00	1578.75	1578.75
	.230	277.92	1579.42	1579.11
	.230	305.05	1579.71	1579.23
	.230	322.16	1579.88	1579.30
	.230	339.14	1580.06	1579.37
	.230	349.12	1580.16	1579.41
	.230	363.29	1580.31	1579.46
	.230	363.81	1580.31	1579.46
	.230	359.30	1580.27	1579.45
	.240	200.00	1579.56	1576.27
	.240	277.92	1580.15	1576.60
*	.240	305.05	1580.38	1576.71
*	.240	322.16	1580.54	1576.78
	.240	339.14	1580.69	1576.83
	.240	349.12	1580.78	1576.86
*	.240	363.29	1580.92	1576.91
*	.240	363.81	1580.92	1576.91
	.240	359.30	1580.88	1576.91
	.320	200.00	1583.24	1583.24
*	.320	277.92	1583.50	1583.50
*	.320	305.05	1583.57	1583.57
	.320	322.16	1583.61	1583.61
	.320	339.14	1583.66	1583.66
*	.320	349.12	1583.68	1583.68
*	.320	363.29	1583.70	1583.70
	.320	363.81	1583.70	1583.70
	.320	359.30	1583.71	1583.71
*	.410	200.00	1584.73	1583.71
*	.410	316.80	1585.09	1583.98
	.410	375.95	1585.22	1584.10
	.410	419.92	1585.31	1584.19
*	.410	457.40	1585.38	1584.26
*	.410	483.20	1585.43	1584.31
	.410	521.10	1585.50	1584.37
	.410	521.54	1585.50	1584.37
	.410	509.59	1585.47	1584.35
*	.500	200.00	1586.36	1586.36
	.500	400.00	1586.93	1586.93
	.500	600.00	1587.39	1587.39
*	.500	800.00	1587.76	1587.76
*	.500	1000.00	1588.08	1588.08
	.500	1200.00	1588.39	1588.39
	.500	1800.00	1589.20	1589.20
	.500	2000.00	1589.45	1589.45
*	.500	2700.00	1590.26	1590.26

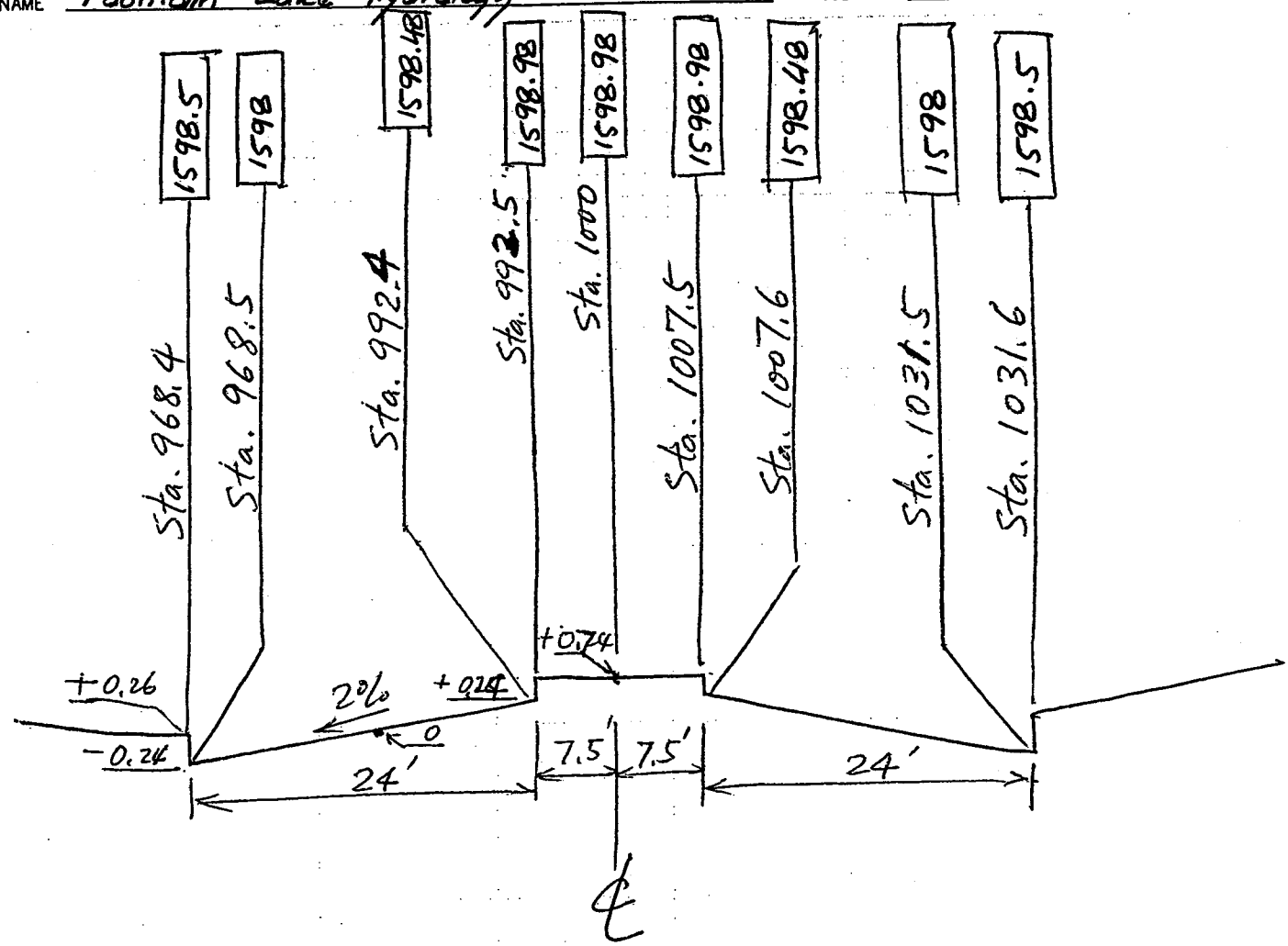
D.2

FLOW DIVERSION ALONG PANORAMA DRIVE

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 6

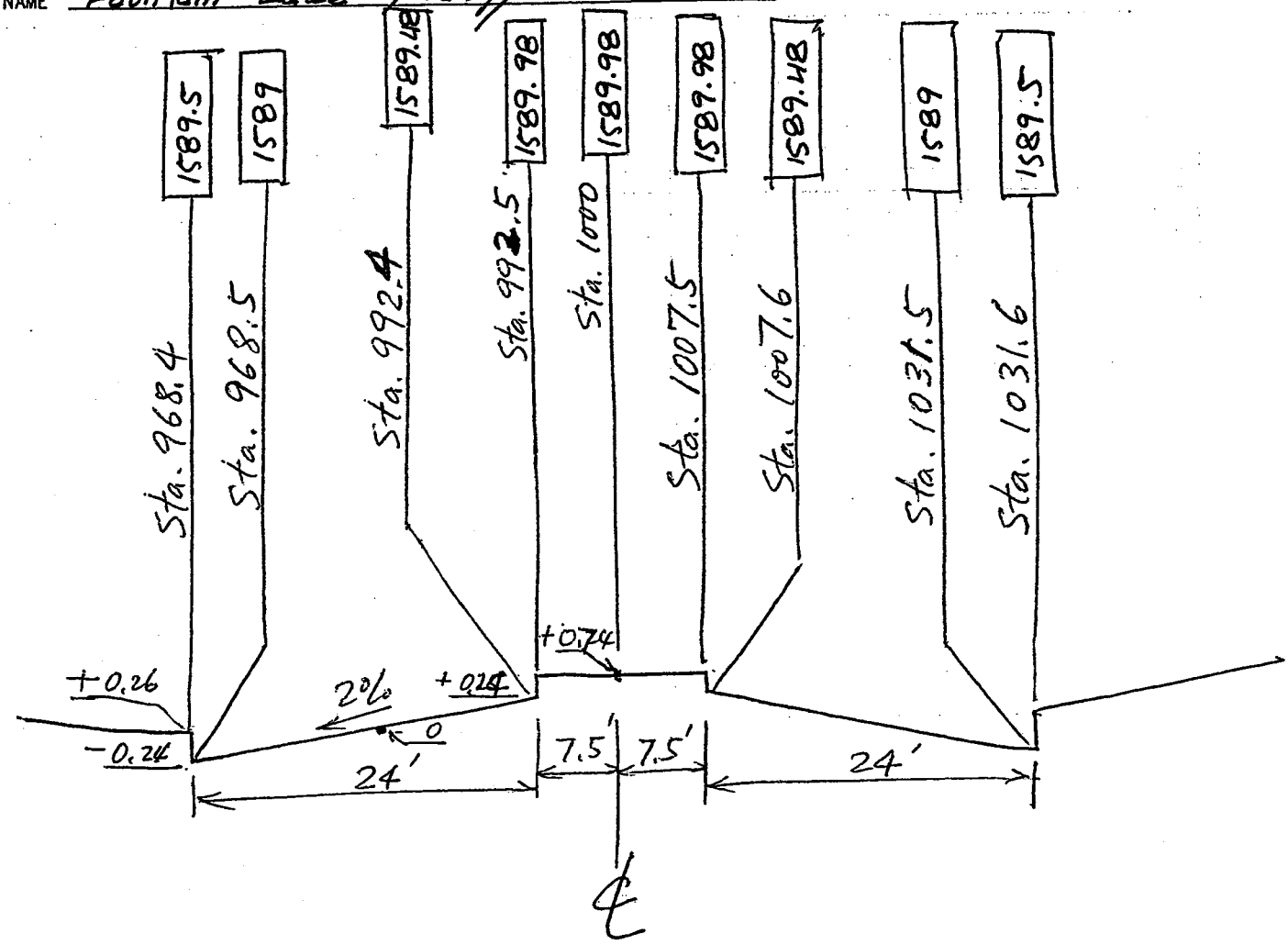
Reference STA 980.4

Reference Elev 1598.24

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 5

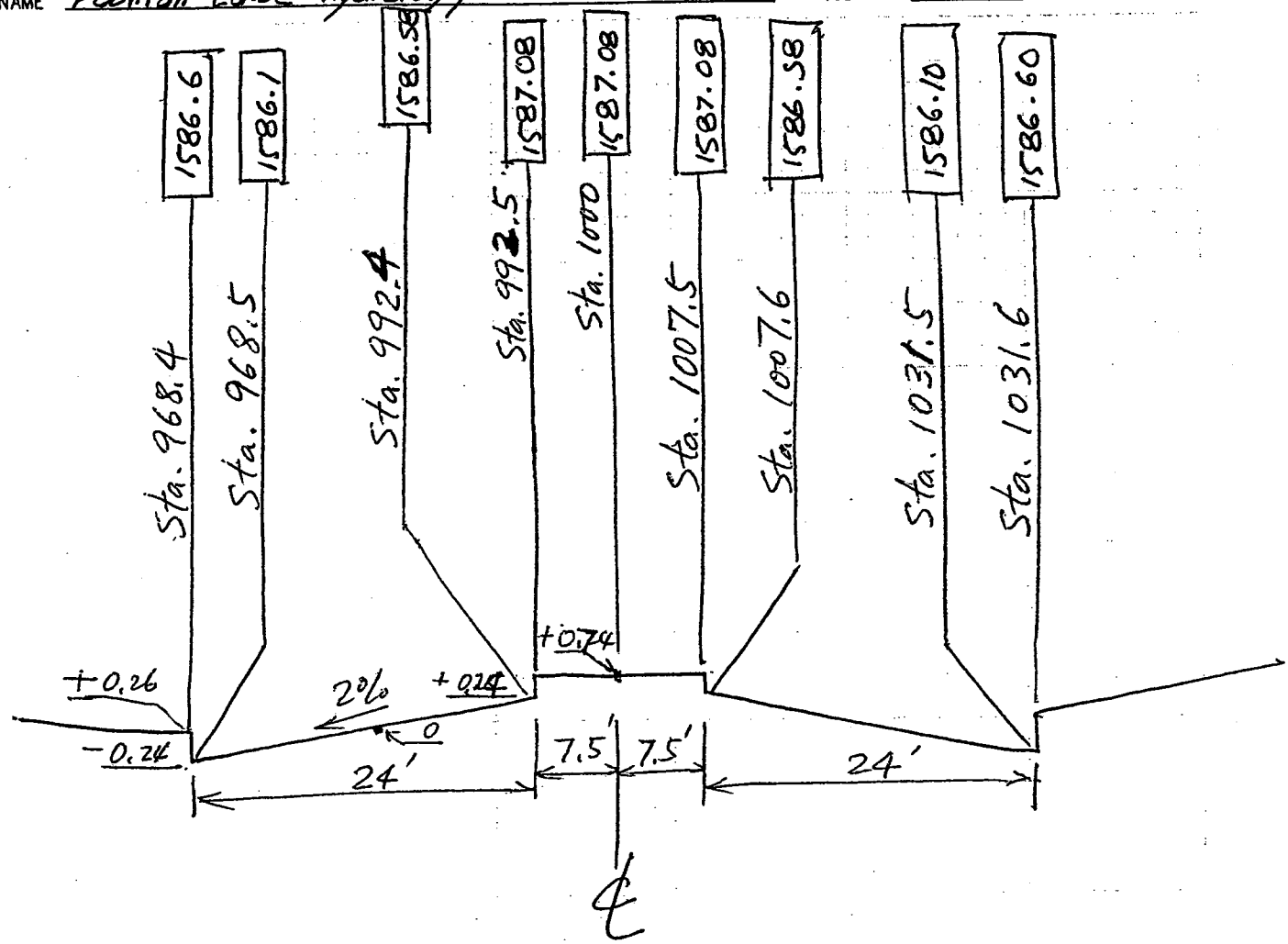
Reference STA 980.4

Reference Elv. 1589.24

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 4

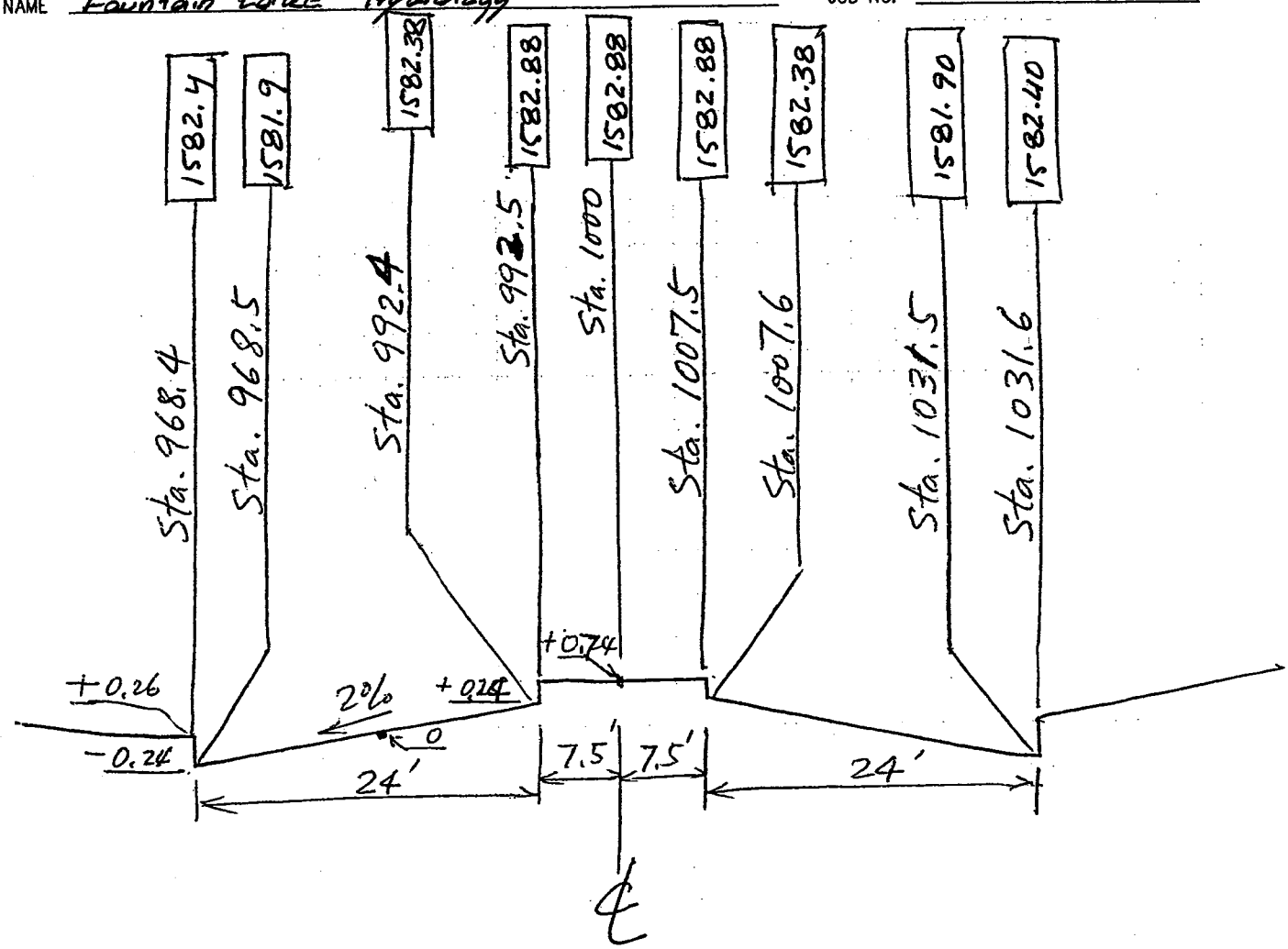
Reference STA 980.4

Reference Elv. 1586.34

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 3

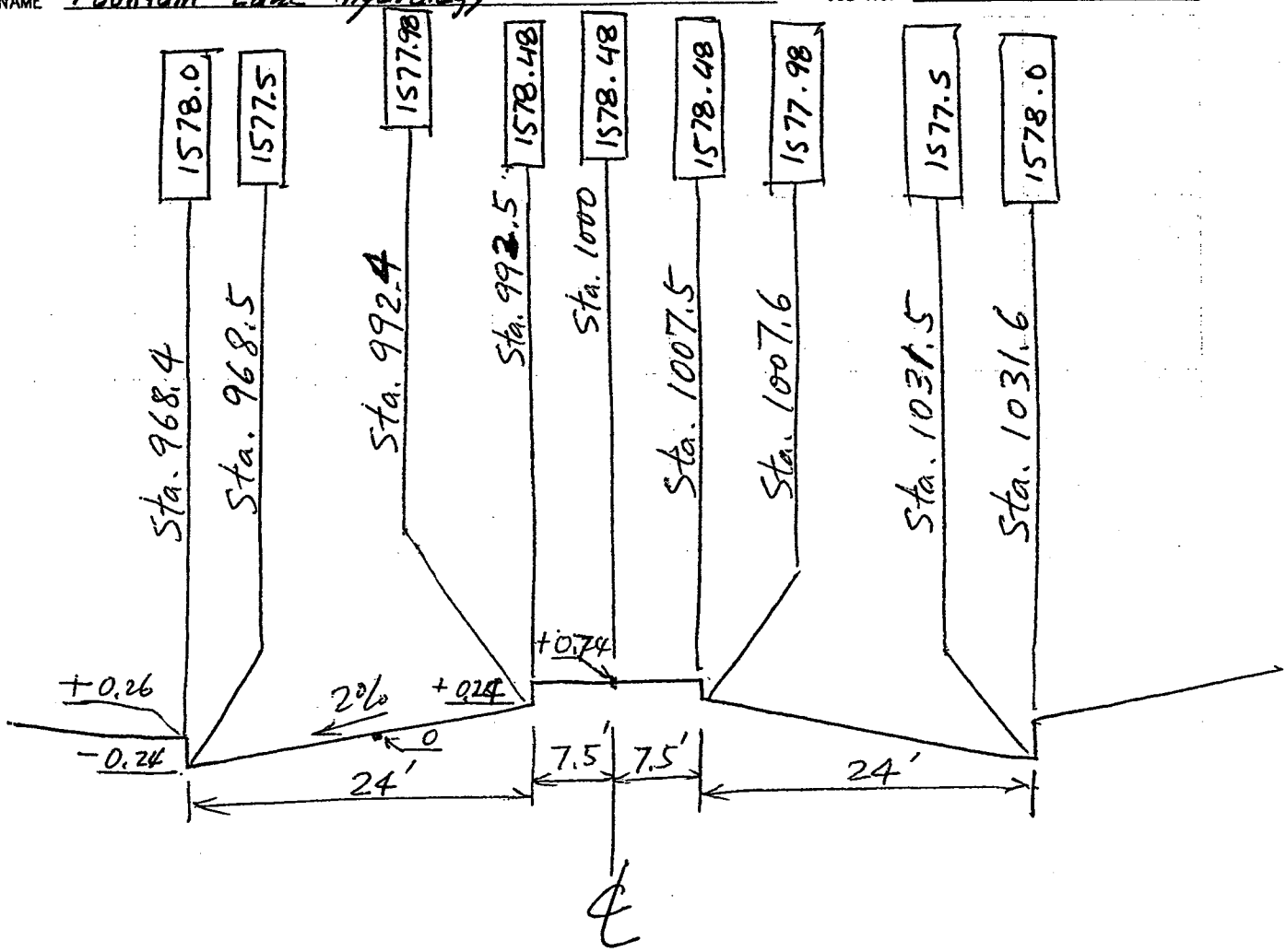
Reference STA. 980.45

Reference Elv. 1582.14

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 2

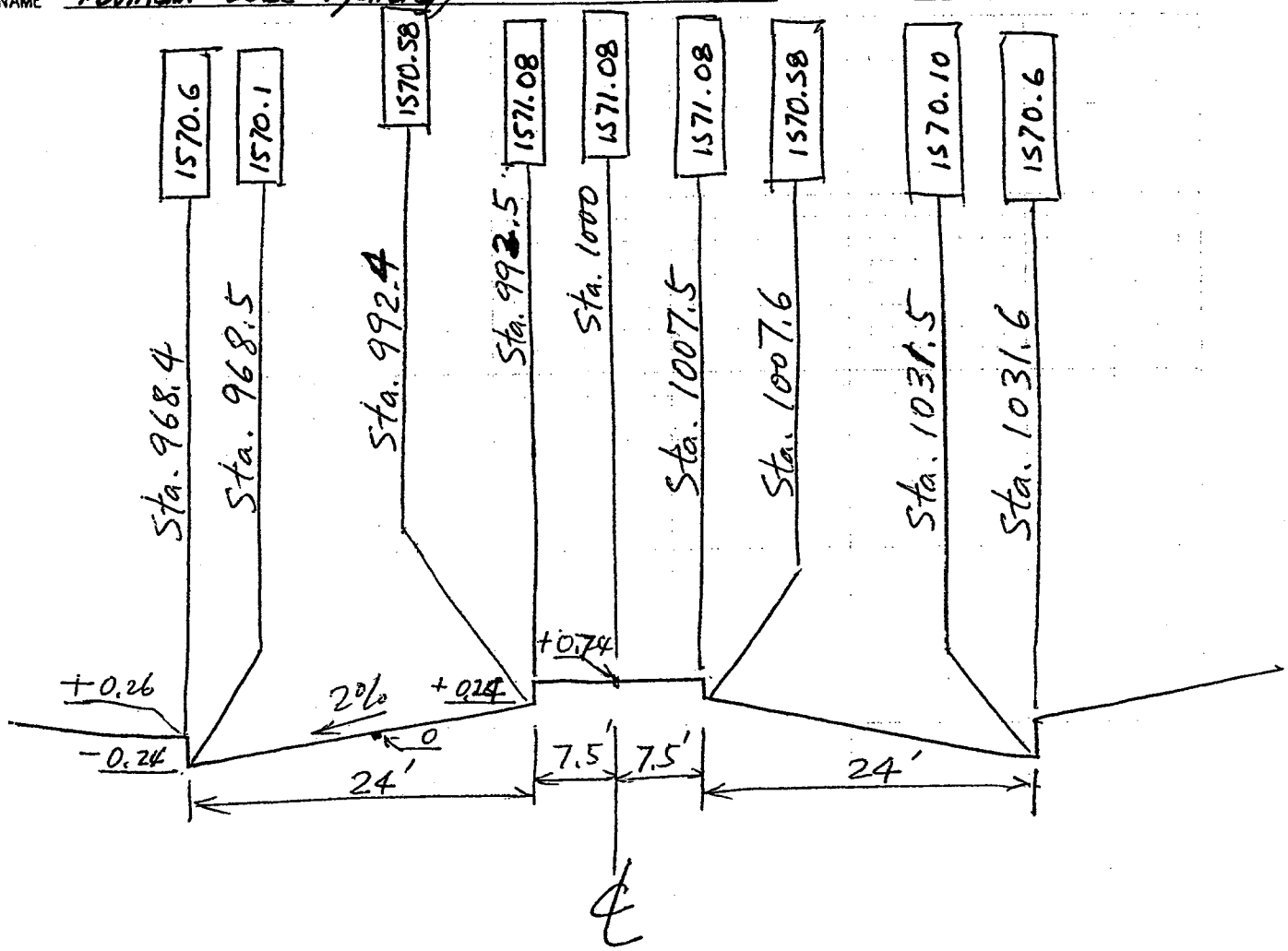
Reference Sta 980.45

Reference Elv. 1577.74

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE _____
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____



PANORAMA DR.

X-SEC NO. 1

Reference sta 980.45

Reference Elv. 1570.34

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE 11-6-95
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME _____ JOB NO. _____

SPLIT FLOW

between x-sec 1 and 2 (Panorama Dr)

Inflow	Outflow	Spill
200	178	22
400	360	40
800	713	87
1000	890	110
1400	1236	164
1800	1577	223
2000	1745	255
2500	2158	342
3000	2563	437

```
*****************************************
HEC-2 WATER SURFACE PROFILES            *
*                                       *
Version   4.6.2;  May 1991              *
*                                       *
RUN DATE    06NOV95    TIME    15:28:11 *
*****************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06NOV95 15:28:11

```
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
```

SPLIT FLOW BEING PERFORMED

```
SF      Split Flow into Fountain Lake


TW      Right bank between sections 1 and 2
WS      2       1       2      -1     2.7
WC      0 1577.44     300 1577.24
```



```
T1      Fountain Lake Hydrology                          File: PN-1SPLT.H2
T1      Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

T2      Multiple run Spill flow into Fountain Lake
T3      Fountain Hills - PANORAMA DRIVE SPILL

T4 GR data from Typical section and 1' countour map KAM
T5 1"=40' 1-feet Contour mapping from KAM
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Other parameters may not be accurate

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                           -1                                  1571.09

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                                                           -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         2                                                          150


NC     .058      .035      .025       .1       .3
QT        9       200       400      800     1000      1400      1800      2000      2500      3000

X1        1        24     968.4   1031.6
X3                                826.92            1218.28
GR   1572.7   826.92   1571.74   849.42   1570.74    862.54   1572.74    897.66   1571.74    920.16
GR   1570.7   933.28    1570.6   968.40   1570.10    968.50   1570.34    980.45   1570.58    992.40
GR   1571.1   992.50   1571.08  1000.00   1571.08   1007.50   1570.58   1007.60   1570.10   1031.50
GR   1570.6   1031.6   1570.74  1037.16   1571.74   1092.92   1572.74   1140.98   1573.74   1181.23
GR   1574.7   1186.2   1575.74  1189.89   1576.74   1194.25   1577.44   1218.28
```

X1	2	14	968.4	1031.6	480	468	300			
X3				929.25		1159.6				
GR	1589.7	929.25	1588.74	935.45	1587.74	945.58	1578	968.40	1577.50	968.50
GR	1577.7	980.45	1577.98	992.40	1578.48	992.50	1578.48	1000.00	1578.48	1007.50
GR	1578.0	1007.60	1577.5	1031.5	1578.00	1031.60	1577.24	1159.6		

X1	3	16	968.4	1031.6	440	453	480			
X3				895.64		1035.73				
GR	1587.7	895.64	1586.74	899.25	1585.74	903.9	1584.74	910	1583.74	915.02
GR	1582.4	968.40	1581.90	968.50	1582.14	980.45	1582.38	992.40	1582.88	992.50
GR	1582.9	1000.00	1582.88	1007.50	1582.38	1007.60	1581.90	1031.50	1582.40	1031.60
GR	1582.3	1035.73								

X1	4	16	968.4	1031.6	420	425	438			
X3				949.61		1044.77				
GR	1589.7	949.61	1588.74	955.27	1587.74	958.53	1586.74	965.32	1586.6	968.40
GR	1586.1	968.50	1586.34	980.45	1586.58	992.40	1587.08	992.50	1587.08	1000.00
GR	1587.1	1007.50	1586.58	1007.60	1586.10	1031.50	1586.60	1031.60	1586.74	1041.76
GR	1587.2	1044.77								

X1	5	17	968.4	1031.6	300	308	324			
X3				953.81		1046.12				
GR	1592.7	953.81	1591.74	957.53	1590.74	961.31	1589.74	965.62	1589.5	968.40
GR	1589.0	968.50	1589.24	980.45	1589.48	992.40	1589.98	992.50	1589.98	1000.00
GR	1590.0	1007.50	1589.48	1007.60	1589.00	1031.50	1589.50	1031.60	1589.74	1034.64
GR	1590.7	1040.49	1590.94	1046.12						

X1	6	15	968.4	1031.6	450	428	386			
X3						1051.59				
GR	1602	800	1599.7	926.89	1598.74	965.15	1598.5	968.40	1598.00	968.50
GR	1598.2	980.45	1598.5	992.40	1598.98	992.50	1598.98	1000.00	1598.98	1007.50
GR	1598.4	1007.60	1598.0	1031.50	1598.50	1031.60	1598.74	1037.94	1599.44	1051.59

```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

CCHV=     .100 CEHV=     .300
*SECNO 1.000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      826.9    1218.3  TYPE=      1  TARGET=      391.360
     1.000      .99   1571.09   1571.09   1571.09   1571.30      .21       .00       .00   1570.60
     178.0     23.8     144.7       9.5      18.1      36.0      5.7        .0        .0   1570.60
       .00     1.31      4.02      1.67      .058      .025     .035      .000   1570.10    857.99
   .009072       0.        0.        0.         0         4        0       .00    133.97   1056.52


*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .75 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000      .75   1577.99   1577.99       .00   1578.17      .18      5.38       .00   1578.00
     200.0       .0      43.5     156.5        .0      12.1     47.0        .5       1.5   1578.00
       .03      .00      3.59      3.33      .000      .025     .035      .000   1577.24    968.40
   .023058     480.      300.      468.         0        19        0       .00    173.20   1159.60


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .77 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.91


3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
1
```



```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


     3.000     1.17   1583.07   1582.97       .00   1583.29      .22      5.11       .01   1582.40
     200.0      8.9     183.8       7.3       9.0      47.7      3.0       1.2       2.9   1582.40
       .07      .99      3.86      2.43      .058      .025     .035      .000   1581.90    941.57
   .006350     440.      480.      453.         6        12        0       .00     94.16   1035.73


*SECNO 4.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
```

```
3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=      95.160
     4.000      1.05   1587.15   1587.15      .00   1587.46      .30      3.62      .03   1586.60
     200.0       3.0     182.6      14.4      2.1      40.0      5.4       1.7      3.7   1586.60
       .09      1.46      4.56      2.64     .058      .025     .035      .000  1586.10    962.53
   .011235      420.      438.      425.        0        15        0       .00    81.92   1044.45

*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=      92.310
     5.000      1.15   1590.15   1590.08      .00   1590.41      .26      2.95      .00   1589.50
     200.0       2.5     192.9       4.6      1.9      46.5      2.1       2.1      4.3   1589.50
       .12      1.33      4.15      2.15     .058      .025     .035      .000  1589.00    963.83
   .007594      300.      324.      308.        4         8        0       .00    73.33   1037.16

*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    1051.6  TYPE=      1  TARGET=     1051.589
     6.000      1.06   1599.06   1599.06      .00   1599.36      .30      3.42      .01   1598.50
     200.0       3.7     188.2       8.1      3.4      41.8      3.8       2.5      5.1   1598.50
       .14      1.07      4.51      2.17     .058      .025     .035      .000  1598.00    952.52
   .010357      450.      386.      428.        0        15        0       .00    91.61   1044.12
```

THIS RUN EXECUTED 06NOV95 15:28:19

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	177.96	1571.09	1571.09
*	1.000	359.75	1571.34	1571.34
*	1.000	713.11	1571.76	1571.76
*	1.000	889.45	1571.91	1571.91
*	1.000	1236.13	1572.16	1572.16
*	1.000	1576.80	1572.38	1572.38
*	1.000	1744.70	1572.48	1572.48
*	1.000	2158.34	1572.73	1572.73
*	1.000	2563.18	1572.91	1572.91
*	2.000	200.00	1577.99	1577.99
*	2.000	400.00	1578.19	1578.19
*	2.000	800.00	1578.52	1578.52
*	2.000	1000.00	1578.65	1578.65
*	2.000	1400.00	1578.89	1578.89
*	2.000	1800.00	1579.11	1579.11
*	2.000	2000.00	1579.21	1579.21
*	2.000	2500.00	1579.46	1579.46
*	2.000	3000.00	1579.69	1579.69
*	3.000	200.00	1583.07	1582.97
*	3.000	400.00	1583.40	1583.33
*	3.000	800.00	1583.89	1583.89
*	3.000	1000.00	1584.11	1584.11
*	3.000	1400.00	1584.48	1584.48
*	3.000	1800.00	1584.82	1584.82
*	3.000	2000.00	1584.98	1584.98
*	3.000	2500.00	1585.35	1585.35
*	3.000	3000.00	1585.71	1585.71
*	4.000	200.00	1587.15	1587.15
*	4.000	400.00	1587.50	1587.50
*	4.000	800.00	1588.06	1588.06
*	4.000	1000.00	1588.28	1588.28
*	4.000	1400.00	1588.72	1588.72
*	4.000	1800.00	1589.10	1589.10
*	4.000	2000.00	1589.28	1589.28
*	4.000	2500.00	1589.71	1589.71
*	4.000	3000.00	1590.10	1590.10
	5.000	200.00	1590.15	1590.08
	5.000	400.00	1590.48	1590.46
*	5.000	800.00	1591.06	1591.06
*	5.000	1000.00	1591.30	1591.30
*	5.000	1400.00	1591.74	1591.74
*	5.000	1800.00	1592.13	1592.13
*	5.000	2000.00	1592.31	1592.31
*	5.000	2500.00	1592.74	1592.74
*	5.000	3000.00	1593.14	1593.14

*	6.000	200.00	1599.06	1599.06
*	6.000	400.00	1599.43	1599.43
*	6.000	800.00	1599.95	1599.95
*	6.000	1000.00	1600.15	1600.15
*	6.000	1400.00	1600.52	1600.52
*	6.000	1800.00	1600.85	1600.85
*	6.000	2000.00	1601.00	1601.00
*	6.000	2500.00	1601.36	1601.36
*	6.000	3000.00	1601.64	1601.64

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE 11/6/95
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology JOB NO. _____

SPLIT FLOW

between x-sec 2 and 3 (Panorama Dr.)

Inflow	Outflow	Spill
200	119	81
400	226	174
800	366	434
1000	439	561
1400	578	822
1800	711	1089
2000	781	1219
2500	939	1561
3000	1112	1888

```
*********************************************
  'EC-2 WATER SURFACE PROFILES              *
                                            *
* Version   4.6.2;  May 1991                *
*                                           *
* RUN DATE    06NOV95    TIME   15:20:13    *
*********************************************
```

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****************************************
* U.S. ARMY CORPS OF ENGINEERS         *
* HYDROLOGIC ENGINEERING CENTER        *
* 609 SECOND STREET, SUITE D           *
* DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X    X             X    X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X    X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06NOV95 15:20:13

```
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
```

SPLIT FLOW BEING PERFORMED

```
SF      Split Flow into Fountain Lake

TW      Right bank between sections 2 and 3
WS      5       2       3       -1      2.7
WC      0 1577.24       140 1590.44     195 1589.74     315 1581.74     480 1582.24
1
```



```
T1      Fountain Lake Hydrology                         File: PN-1SPLT.H2
T1      Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

T2      Multiple run Spill flow into Fountain Lake
T3      Fountain Hills - PANORAMA DRIVE SPILL

T4 GR data from Typical section and 1' countour map KAM
T5 1"=40' 1-feet Contour mapping from KAM
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Other parameters may not be accurate

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                           -1                                    1570.5

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                                                           -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         2                                                          150

NC     .058      .035      .025        .1        .3
QT        9       200       400       800      1000      1400      1800      2000      2500      3000

X1        1        24     968.4    1031.6
X3                                 826.92                1218.28
GR   1572.7    826.92   1571.74    849.42   1570.74    862.54   1572.74    897.66   1571.74    920.16
GR   1570.7    933.28    1570.6    968.40   1570.10    968.50   1570.34    980.45   1570.58    992.40
GR   1571.1    992.50   1571.08   1000.00   1571.08   1007.50   1570.58   1007.60   1570.10   1031.50
GR   1570.6    1031.6   1570.74   1037.16   1571.74   1092.92   1572.74   1140.98   1573.74   1181.23
GR   1574.7    1186.2   1575.74   1189.89   1576.74   1194.25   1577.44   1218.28
```

X1	2	14	968.4	1031.6	480	468	300			
X3				929.25		1159.6				
GR	1589.7	929.25	1588.74	935.45	1587.74	945.58	1578	968.40	1577.50	968.50
GR	1577.7	980.45	1577.98	992.40	1578.48	992.50	1578.48	1000.00	1578.48	1007.50
GR	1578.0	1007.60	1577.5	1031.5	1578.00	1031.60	1577.24	1159.6		

X1	3	16	968.4	1031.6	440	453	480			
X3				895.64		1035.73				
GR	1587.7	895.64	1586.74	899.25	1585.74	903.9	1584.74	910	1583.74	915.02
GR	1582.4	968.40	1581.90	968.50	1582.14	980.45	1582.38	992.40	1582.88	992.50
GR	1582.9	1000.00	1582.88	1007.50	1582.38	1007.60	1581.90	1031.50	1582.40	1031.60
GR	1582.3	1035.73								

X1	4	16	968.4	1031.6	420	425	438			
X3				949.61		1044.77				
GR	1589.7	949.61	1588.74	955.27	1587.74	958.53	1586.74	965.32	1586.6	968.40
GR	1586.1	968.50	1586.34	980.45	1586.58	992.40	1587.08	992.50	1587.08	1000.00
GR	1587.1	1007.50	1586.58	1007.60	1586.10	1031.50	1586.60	1031.60	1586.74	1041.76
GR	1587.2	1044.77								

X1	5	17	968.4	1031.6	300	308	324			
X3				953.81		1046.12				
GR	1592.7	953.81	1591.74	957.53	1590.74	961.31	1589.74	965.62	1589.5	968.40
GR	1589.0	968.50	1589.24	980.45	1589.48	992.40	1589.98	992.50	1589.98	1000.00
GR	1590.0	1007.50	1589.48	1007.60	1589.00	1031.50	1589.50	1031.60	1589.74	1034.64
GR	1590.7	1040.49	1590.94	1046.12						

X1	6	15	968.4	1031.6	450	428	386			
X3						1051.59				
GR	1602	800	1599.7	926.89	1598.74	965.15	1598.5	968.40	1598.00	968.50
GR	1598.2	980.45	1598.5	992.40	1598.98	992.50	1598.98	1000.00	1598.98	1007.50
GR	1598.4	1007.60	1598.0	1031.50	1598.50	1031.60	1598.74	1037.94	1599.44	1051.59

```
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

CCHV=     .100 CEHV=     .300
*SECNO 1.000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      826.9    1218.3  TYPE=      1  TARGET=      391.360
     1.000       .81   1570.91   1570.91   1570.50   1571.12       .21       .00       .00   1570.60
     118.8       9.6     106.4       2.8       9.8      27.4       2.1        .0        .0   1570.60
       .00       .98      3.89      1.29      .058      .025      .035      .000   1570.10    860.31
   .009432        0.        0.        0.         0        16         0       .00    106.12   1046.62


*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .62 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000       .62   1577.86   1577.86       .00   1578.00       .14      5.45       .01   1578.00
     118.8        .0      20.5      98.3        .0       6.8      32.4        .4       1.2   1578.00
       .03       .00      3.02      3.04      .000      .025      .035      .000   1577.24    968.43
   .024608      480.      300.      468.         0        19         0       .00    140.52   1159.60


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .73 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.98


3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
1
```



```
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


     3.000      1.13   1583.03   1582.96       .00   1583.27       .25      5.24       .03   1582.40
     200.0       8.2     184.4       7.3       7.9      44.8       2.8        .9       2.4   1582.40
       .07      1.05      4.12      2.61      .058      .025      .035      .000   1581.90    943.39
   .007875      440.      480.      453.         6        15         0       .00     92.34   1035.73


*SECNO 4.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
```

```
3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=      95.160
     4.000      1.05   1587.15   1587.15      .00   1587.46      .31      4.09      .02   1586.60
     200.0       3.0     182.6      14.4      2.0      39.9      5.4       1.4      3.3   1586.60
       .10      1.47      4.58      2.65     .058      .025     .035      .000  1586.10    962.54
   .011325      420.      438.      425.        0        11        0       .00   81.90   1044.44

*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=      92.310
     5.000      1.15   1590.15   1590.08      .00   1590.41      .26      2.95      .00   1589.50
     200.0       2.5     192.9       4.6      1.9      46.6      2.2       1.7      3.8   1589.50
       .12      1.32      4.14      2.15     .058      .025     .035      .000  1589.00    963.83
   .007543      300.      324.      308.        4         8        0       .00   73.34   1037.17

*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    1051.6  TYPE=      1  TARGET=    1051.589
     6.000      1.06   1599.06   1599.06      .00   1599.36      .30      3.41      .01   1598.50
     200.0       3.7     188.2       8.1      3.4      41.8      3.8       2.2      4.6   1598.50
       .14      1.07      4.51      2.17     .058      .025     .035      .000  1598.00    952.51
   .010344      450.      386.      428.        0        11        0       .00   91.62   1044.13
```


TW Right bank between sections 2 and 3

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
81.24	80.68	.69	81.24	80.68	.69	5	1577.860	1583.027	2.000	3.000

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	118.76	1570.91	1570.91
*	1.000	223.58	1571.15	1571.15
*	1.000	366.33	1571.35	1571.35
*	1.000	438.58	1571.44	1571.44
*	1.000	577.94	1571.60	1571.60
*	1.000	710.67	1571.76	1571.76
*	1.000	781.36	1571.81	1571.81
*	1.000	938.60	1571.94	1571.94
*	1.000	1111.90	1572.08	1572.08
*	2.000	118.76	1577.86	1577.86
*	2.000	223.58	1578.03	1578.03
*	2.000	366.33	1578.16	1578.16
*	2.000	438.58	1578.23	1578.23
*	2.000	577.94	1578.40	1578.40
*	2.000	710.67	1578.49	1578.49
*	2.000	781.36	1578.55	1578.55
*	2.000	938.60	1578.61	1578.61
*	2.000	1111.90	1578.72	1578.72
*	3.000	200.00	1583.03	1582.96
*	3.000	400.00	1583.33	1583.32
*	3.000	800.00	1583.89	1583.89
*	3.000	1000.00	1584.10	1584.10
*	3.000	1400.00	1584.49	1584.49
*	3.000	1800.00	1584.82	1584.82
*	3.000	2000.00	1584.98	1584.98
*	3.000	2500.00	1585.37	1585.37
*	3.000	3000.00	1585.71	1585.71
*	4.000	200.00	1587.15	1587.15
*	4.000	400.00	1587.51	1587.51
*	4.000	800.00	1588.05	1588.05
*	4.000	1000.00	1588.28	1588.28
*	4.000	1400.00	1588.72	1588.72
*	4.000	1800.00	1589.10	1589.10
*	4.000	2000.00	1589.28	1589.28
*	4.000	2500.00	1589.71	1589.71
*	4.000	3000.00	1590.10	1590.10
	5.000	200.00	1590.15	1590.08
	5.000	400.00	1590.47	1590.46
*	5.000	800.00	1591.06	1591.06
*	5.000	1000.00	1591.30	1591.30
*	5.000	1400.00	1591.74	1591.74
*	5.000	1800.00	1592.13	1592.13
*	5.000	2000.00	1592.31	1592.31
*	5.000	2500.00	1592.74	1592.74
*	5.000	3000.00	1593.14	1593.14

*	6.000	200.00	1599.06	1599.06
*	6.000	400.00	1599.43	1599.43
*	6.000	800.00	1599.95	1599.95
*	6.000	1000.00	1600.15	1600.15
*	6.000	1400.00	1600.52	1600.52
*	6.000	1800.00	1600.85	1600.85
*	6.000	2000.00	1601.00	1601.00
*	6.000	2500.00	1601.36	1601.36
*	6.000	3000.00	1601.64	1601.64

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE 11/6/95
CHECK _____ DATE _____

CLIENT Anderson Nabon
JOB NAME Fountain Lake Hydrology
JOB NO. _____

SPLIT FLOW

between x-sec 3 - 4

Inflow	Outflow	Spill
200	~~200~~ 143	57
400	~~399~~ 217	183
800	315	485
1000	358	642
1400	434	966
1800	498	1302
2000	540	1460
2500	623	1877
3000	685	2315

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version   4.6.2;  May 1991           *
*                                       *
*  RUN DATE    06NOV95    TIME   15:07:53 *
*****************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06NOV95 15:07:53

```
************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.2;  May 1991
************************************
```

SPLIT FLOW BEING PERFORMED

SF Split Flow into Fountain Lake

```
TW     Right bank between sections 3 and 4
WS     4       3       4       -1      2.7
WC     0 1582.24      165 1591.14     263 1585.04     438 1587.24
```



```
T1      Fountain Lake Hydrology                         File: PN-3SPLT.H2
T1      Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

        Multiple run Spill flow into Fountain Lake
        Fountain Hills - PANORAMA DRIVE SPILL

T4 GR data from Typical section and 1' countour map KAM
T5 1"=40' 1-feet Contour mapping from KAM
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Other parameters may not be accurate

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

              2                          -1                                 1570.5

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1                                                      -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38       43       1        2                                                     150

NC    .058     .035     .025     .1       .3
NT      9      200      400      800     1000     1400     1800     2000     2500     3000

X1      1       24    968.4   1031.6
X3                            826.92             1218.28
GR  1572.7   826.92   1571.74  849.42  1570.74   862.54  1572.74   897.66  1571.74   920.16
GR  1570.7   933.28    1570.6  968.40  1570.10   968.50  1570.34   980.45  1570.58   992.40
GR  1571.1   992.50   1571.08 1000.00  1571.08  1007.50  1570.58  1007.60  1570.10  1031.50
GR  1570.6  1031.6    1570.74 1037.16  1571.74  1092.92  1572.74  1140.98  1573.74  1181.23
    1574.7  1186.2    1575.74 1189.89  1576.74  1194.25  1577.44  1218.28
```

```
        2        14       968.4    1031.6       468       468       468
X3                                 929.25                 1159.6
GR   1589.7    929.25    1588.74    935.45   1587.74    945.58      1578    968.40   1577.50    968.50
GR   1577.7    980.45    1577.98    992.40   1578.48    992.50   1578.48   1000.00   1578.48   1007.50
GR   1578.0   1007.60     1577.5    1031.5   1578.00   1031.60   1577.24    1159.6
```



```
X1        3        16       968.4    1031.6       453       453       453
X3                                 895.64                 1035.73
GR   1587.7    895.64    1586.74    899.25   1585.74     903.9   1584.74       910   1583.74    915.02
GR   1582.4    968.40    1581.90    968.50   1582.14    980.45   1582.38    992.40   1582.88    992.50
GR   1582.9   1000.00    1582.88   1007.50   1582.38   1007.60   1581.90   1031.50   1582.40   1031.60
GR   1582.3   1035.73

X1        4        16       968.4    1031.6       420       425       438
X3                                 949.61                 1044.77
GR   1589.7    949.61    1588.74    955.27   1587.74    958.53   1586.74    965.32    1586.6    968.40
GR   1586.1    968.50    1586.34    980.45   1586.58    992.40   1587.08    992.50   1587.08   1000.00
GR   1587.1   1007.50    1586.58   1007.60   1586.10   1031.50   1586.60   1031.60   1586.74   1041.76
GR   1587.2   1044.77

X1        5        17       968.4    1031.6       300       308       324
X3                                 953.81                 1046.12
GR   1592.7    953.81    1591.74    957.53   1590.74    961.31   1589.74    965.62    1589.5    968.40
GR   1589.0    968.50    1589.24    980.45   1589.48    992.40   1589.98    992.50   1589.98   1000.00
GR   1590.0   1007.50    1589.48   1007.60   1589.00   1031.50   1589.50   1031.60   1589.74   1034.64
     1590.7   1040.49    1590.94   1046.12

X1        6        15       968.4    1031.6       450       428       386
X3                                                     1051.59
GR     1602       800     1599.7    926.89   1598.74    965.15    1598.5    968.40   1598.00    968.50
GR   1598.2    980.45     1598.5    992.40   1598.98    992.50   1598.98   1000.00   1598.98   1007.50
GR   1598.4   1007.60     1598.0   1031.50   1598.50   1031.60   1598.74   1037.94   1599.44   1051.59
```



```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
*SECNO 1.000

6265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

6470 ENCROACHMENT STATIONS=     826.9    1218.3  TYPE=     1  TARGET=     391.360
   1.000      .87   1570.97   1570.97   1570.50   1571.20      .23       .00       .00   1570.60
   143.3     13.8     124.9       4.5      12.6      30.3      3.2        .0        .0   1570.60
     .00     1.10      4.12      1.43      .058      .025     .035      .000   1570.10    859.50
 .009246       0.        0.        0.         0        19        0       .00    112.28   1050.07
```

```
 *SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .66 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000      .66   1577.90   1577.90      .00   1578.06      .15      6.58      .01   1578.00
     143.3       .0      27.1     116.2       .0       8.4     37.1       .5      1.4   1578.00
       .04      .00      3.22      3.13     .000      .025     .035     .000  1577.24    968.42
   .023926     468.      468.      468.        0        15        0      .00   151.82   1159.60


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .64 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.93


3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
```



```
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

     3.000      1.04   1582.94   1582.78      .00   1583.11      .17      5.05      .00   1582.40
     143.3       4.9     133.1       5.3      5.8      39.1      2.4       1.0      2.7   1582.40
       .08       .86      3.40      2.17     .058      .025     .035     .000  1581.90    946.94
   .006418      453.      453.      453.        4        11        0      .00    88.79   1035.73


*SECNO 4.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=       95.160
     4.000      1.06   1587.16   1587.16      .00   1587.45      .30      3.76      .04   1586.60
     200.0       3.0     182.5      14.4      2.1      40.3      5.5       1.5      3.5   1586.60
       .11      1.45      4.52      2.62     .058      .025     .035     .000  1586.10    962.49
   .010919      420.      438.      425.        0         5        0      .00    81.99   1044.49


*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=       92.310
     5.000      1.15   1590.15   1590.08      .00   1590.41      .26      2.95      .00   1589.50
     200.0       2.4     193.0       4.6      1.8      46.2      2.1       1.8      4.1   1589.50
       .13      1.34      4.18      2.17     .058      .025     .035     .000  1589.00    963.86
   .007772      300.      324.      308.        4         8        0      .00    73.28   1037.13


*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=         .0    1051.6  TYPE=      1  TARGET=     1051.589
     6.000      1.06   1599.06   1599.06      .00   1599.36      .30      3.47      .01   1598.50
     200.0       3.7     188.2       8.1      3.4      41.7      3.7       2.3      4.8   1598.50
       .15      1.07      4.51      2.17     .058      .025     .035     .000  1598.00    952.52
   .010364      450.      386.      428.        0        11        0      .00    91.60   1044.12
```

TW Right bank between sections 3 and 4

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
56.69	56.72	.05	56.69	56.72	.05	6	1582.940	1587.157	3.000	4.000

1
PROFILE FOR STREAM Fountain Hills - PANORAM

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

```
ELEVATION  1570.    1575.    1580.    1585.    1590.    1595.    1600.    1605.    1610.    1615.
   SECNO   CUMDIS

    1.00      0. ILE      .   M   .        .        .        .        .        .        .        .
             50. . IWE    .   M   .        .        .        .        .        .        .        .
            100. .  ILE   .   M   .        .        .        .        .        .        .        .
            150. .    IWE .   M   .        .        .        .        .        .        .        .
            200. .     ILE .  M   .        .        .        .        .        .        .        .
            250. .       IWE  M   .        .        .        .        .        .        .        .
            300. .        ILE M   .        .        .        .        .        .        .        .
            350. .         .IE M  .        .        .        .        .        .        .        .
            400. .         . I E  .        .        .        .        .        .        .        .
            450. .         .  IE  .        .        .        .        .        .        .        .
    2.00    500. .         .  I E .        .        .        .        .        .        .        .
            550. .         .   I E .       .        .        .        .        .        .        .
            600. .         .    IME .      .        .        .        .        .        .        .
            650. .         .     IME.      .        .        .        .        .        .        .
            700. .         .      IME      .        .        .        .        .        .        .
            750. .         .       IME     .        .        .        .        .        .        .
            800. .         .        IMWE   .        .        .        .        .        .        .
            850. .         .        .IMWE  .        .        .        .        .        .        .
            900. .         .         . ICE .        .        .        .        .        .        .
    3.00    950. .         .         .  ICE .       .        .        .        .        .        .
           1000. .         .         .   ICE .      .        .        .        .        .        .
           1050. .         .         .    ICE .     .        .        .        .        .        .
           1100. .         .         .    ILCE.     .        .        .        .        .        .
           1150. .         .         .     ILCE     .        .        .        .        .        .
           1200. .         .         .      ILWE    .        .        .        .        .        .
           1250. .         .         .       ILWE   .        .        .        .        .        .
           1300. .         .         .        ILWE  .        .        .        .        .        .
           1350. .         .         .        .ILWE .        .        .        .        .        .
    4.00   1400. .         .         .        . ILWE .       .        .        .        .        .
           1450. .         .         .        .  ILWE .      .        .        .        .        .
           1500. .         .         .        .   ILWE .     .        .        .        .        .
           1550. .         .         .        .    ILEM .    .        .        .        .        .
           1600. .         .         .        .     ILEM.    .        .        .        .        .
           1650. .         .         .        .     IL EM    .        .        .        .        .
    5.00   1700. .         .         .        .       ILWEM  .        .        .        .        .
           1750. .         .         .        .         ILWEM .        .        .        .        .
           1800. .         .         .        .         . IL EM .      .        .        .        .
           1850. .         .         .        .         .    ILWE .    .        .        .        .
           1900. .         .         .        .         .      ILWE    .        .        .        .
           1950. .         .         .        .         .        IL EM .        .        .        .
           2000. .         .         .        .         .         . ILWE .      .        .        .
           2050. .         .         .        .         .          .  ILWE .    .        .        .
    6.00   2100. .         .         .        .         .          .    ILWE.   .        .        .
```


I1 by AGK Engineers, Inc.
Existing conditions
Fountain Hills (south) - FOUNTAIN CHANEL

```
 ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

            3                          -1                                1570.5

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    2                                                     -1


1
  06NOV95     15:07:53                                                                                    PAGE    8

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
*SECNO 1.000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      826.9    1218.3  TYPE=      1  TARGET=      391.360
     1.000      1.04   1571.14   1571.14   1570.50   1571.39      .25       .00       .00   1570.60
     217.5      31.6     172.3      13.6      20.9      39.3      7.1        .0        .0   1570.60
       .00      1.52      4.39      1.92      .058      .025     .035      .000   1570.10    857.29
   .010637        0.        0.        0         0        23        0       .00    143.99   1059.45

*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .78 FEET

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000       .78   1578.02   1578.01       .00   1578.20      .18      6.80       .01   1578.00
     217.5        .0      49.4     168.1        .0      13.5     50.7        .7       1.7   1578.00
       .04       .00      3.66      3.31      .000      .025     .035      .000   1577.24    968.36
   .021057      468.      468.      468.         3        19        0       .00    176.05   1159.60

*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .79 FEET

7302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.73

3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
     3.000      1.18   1583.08   1583.00       .00   1583.33      .25      5.11       .02   1582.40
     217.5      10.0     199.7       7.9       9.4      48.6      3.0       1.4       3.1   1582.40
       .07      1.05      4.11      2.59      .058      .025     .035      .000   1581.90    940.97
   .007020      453.      453.      453.         5        21        0       .00     94.76   1035.73


  06NOV95     15:07:53                                                                                    PAGE    9

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
```

```
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA      R-BANK ELEV
  TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN    SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST

*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED       .30 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=      95.160
    4.000      1.40   1587.50   1587.50      .00   1587.97      .47      3.79      .07   1586.60
    400.0       8.4     356.1      35.6      4.5      62.1     10.0       2.0      4.0   1586.60
      .09      1.85      5.73      3.54     .058      .025     .035      .000  1586.10    960.15
  .009849      420.      438.      425.        0        11        0       .00    84.62   1044.77

*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=      92.310
    5.000      1.48   1590.48   1590.46      .00   1590.96      .48      2.98      .00   1589.50
    400.0       6.6     380.7      12.7      3.6      67.1      4.3       2.6      4.6   1589.50
      .11      1.84      5.67      2.97     .058      .025     .035      .000  1589.00    962.43
  .008702      300.      324.      308.        2         8        0       .00    76.72   1039.15

*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    1051.6  TYPE=      1  TARGET=     1051.589
    6.000      1.43   1599.43   1599.43      .00   1599.85      .43      3.35      .01   1598.50
    400.0      16.3     357.6      26.2     12.0      65.2      9.7       3.3      5.5   1598.50
      .13      1.35      5.49      2.69     .058      .025     .035      .000  1598.00    937.76
  .008483      450.      386.      428.        0         8        0       .00   113.58   1051.34
```

1


```
TW     Right bank between sections 3 and 4

  ASQ      QCOMP    ERRAC    TASQ     TCQ      TABER    NITER    DSWS     USWS     DSSNO    USSNO
  182.51   182.54     .02    182.51   182.54     .02        5  1583.083  1587.501   3.000    4.000
```

THIS RUN EXECUTED 06NOV95 15:08:03

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	143.31	1570.97	1570.97
*	1.000	217.49	1571.14	1571.14
*	1.000	314.59	1571.28	1571.28
*	1.000	357.50	1571.35	1571.35
*	1.000	434.61	1571.44	1571.44
*	1.000	498.50	1571.51	1571.51
*	1.000	540.20	1571.56	1571.56
*	1.000	623.15	1571.65	1571.65
*	1.000	685.31	1571.73	1571.73
*	2.000	143.31	1577.90	1577.90
	2.000	217.49	1578.02	1578.01
*	2.000	314.59	1578.11	1578.11
*	2.000	357.50	1578.15	1578.15
*	2.000	434.61	1578.23	1578.23
	2.000	498.50	1578.28	1578.28
	2.000	540.20	1578.32	1578.32
*	2.000	623.15	1578.45	1578.45
*	2.000	685.31	1578.47	1578.47
*	3.000	143.31	1582.94	1582.78
*	3.000	217.49	1583.08	1583.00
*	3.000	314.59	1583.26	1583.18
*	3.000	357.50	1583.32	1583.25
*	3.000	434.61	1583.42	1583.38
*	3.000	498.50	1583.49	1583.47
*	3.000	540.20	1583.54	1583.53
*	3.000	623.15	1583.64	1583.64
*	3.000	685.31	1583.76	1583.76
*	4.000	200.00	1587.16	1587.16
*	4.000	400.00	1587.50	1587.50
*	4.000	800.00	1588.05	1588.05
*	4.000	1000.00	1588.28	1588.28
*	4.000	1400.00	1588.72	1588.72
*	4.000	1800.00	1589.10	1589.10
*	4.000	2000.00	1589.28	1589.28
*	4.000	2500.00	1589.71	1589.71
*	4.000	3000.00	1590.10	1590.10
	5.000	200.00	1590.15	1590.08
	5.000	400.00	1590.48	1590.46
*	5.000	800.00	1591.06	1591.06
*	5.000	1000.00	1591.30	1591.30
*	5.000	1400.00	1591.74	1591.74
*	5.000	1800.00	1592.13	1592.13
*	5.000	2000.00	1592.31	1592.31
*	5.000	2500.00	1592.74	1592.74
*	5.000	3000.00	1593.14	1593.14

6.000	200.00	1599.06	1599.06
6.000	400.00	1599.43	1599.43
6.000	800.00	1599.95	1599.95
6.000	1000.00	1600.15	1600.15
6.000	1400.00	1600.52	1600.52
6.000	1800.00	1600.85	1600.85
6.000	2000.00	1601.00	1601.00
6.000	2500.00	1601.36	1601.36
6.000	3000.00	1601.64	1601.64

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE 11/6/95
CHECK _____ DATE _____

CLIENT Anderson Wilson
JOB NAME Fountain Lake Hydrology
JOB NO. _____

SPLIT FLOW

between x-sec 4 and 5 (Panorama Drive)

Inflow	Outflow	Spill
200	200	0
400	399	1
800	785	15
1000	971	29
1400	1284	116
1800	1552	248
2000	1679	321
2500	1980	520
3000	2261	739

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    06NOV95    TIME   15:06:08   *
*********************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 06NOV95 15:06:08

```
**************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.2;  May 1991
**************************************
```

SPLIT FLOW BEING PERFORMED

```
SF      Split Flow into Fountain Lake

TW      Right bank between sections 4 and 5
WS      4       4       5       -1      2.7
WC      0 1587.24     189 1596.74     244 1590.74     324 1591.14
```



```
T1      Fountain Lake Hydrology                         File: PN-4SPLT.H2
T1      Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

        Multiple run Spill flow into Fountain Lake
        Fountain Hills - PANORAMA DRIVE SPILL

T4 GR data from Typical section and 1' countour map KAM
T5 1"=40' 1-feet Contour mapping from KAM
T6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
T7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
T9 for different run-off values.  Other parameters may not be accurate

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2                             -1                                    1570.5

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1                                                           -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38        43        1         2                                                                150

NC     .058      .035      .025       .1        .3
T        9       200       400       800      1000      1400      1800      2000      2500      3000

X1       1        24     968.4    1031.6
X3                               826.92                1218.28
GR   1572.7    826.92   1571.74    849.42   1570.74    862.54   1572.74    897.66   1571.74    920.16
GR   1570.7    933.28    1570.6    968.40   1570.10    968.50   1570.34    980.45   1570.58    992.40
GR   1571.1    992.50   1571.08   1000.00   1571.08   1007.50   1570.58   1007.60   1570.10   1031.50
GR   1570.6    1031.6   1570.74   1037.16   1571.74   1092.92   1572.74   1140.98   1573.74   1181.23
     1574.7    1186.2   1575.74   1189.89   1576.74   1194.25   1577.44   1218.28
```

```
        2        14       968.4     1031.6       468       468       468
X3                                  929.25                 1159.6
GR   1589.7    929.25    1588.74    935.45   1587.74    945.58      1578    968.40   1577.50    968.50
GR   1577.7    980.45    1577.98    992.40   1578.48    992.50   1578.48   1000.00   1578.48   1007.50
GR   1578.0   1007.60     1577.5    1031.5   1578.00   1031.60   1577.24    1159.6
```



```
X1        3        16       968.4     1031.6       453       453       453
X3                                  895.64                 1035.73
GR   1587.7    895.64    1586.74    899.25   1585.74     903.9   1584.74       910   1583.74    915.02
GR   1582.4    968.40    1581.90    968.50   1582.14    980.45   1582.38    992.40   1582.88    992.50
GR   1582.9   1000.00    1582.88   1007.50   1582.38   1007.60   1581.90   1031.50   1582.40   1031.60
GR   1582.3   1035.73

X1        4        16       968.4     1031.6       420       425       438
X3                                  949.61                 1044.77
GR   1589.7    949.61    1588.74    955.27   1587.74    958.53   1586.74    965.32    1586.6    968.40
GR   1586.1    968.50    1586.34    980.45   1586.58    992.40   1587.08    992.50   1587.08   1000.00
GR   1587.1   1007.50    1586.58   1007.60   1586.10   1031.50   1586.60   1031.60   1586.74   1041.76
GR   1587.2   1044.77

X1        5        17       968.4     1031.6       300       308       324
X3                                  953.81                 1046.12
GR   1592.7    953.81    1591.74    957.53   1590.74    961.31   1589.74    965.62    1589.5    968.40
GR   1589.0    968.50    1589.24    980.45   1589.48    992.40   1589.98    992.50   1589.98   1000.00
GR   1590.0   1007.50    1589.48   1007.60   1589.00   1031.50   1589.50   1031.60   1589.74   1034.64
     1590.7   1040.49    1590.94   1046.12

X1        6        15       968.4     1031.6       450       428       386
X3                                                     1051.59
GR     1602       800     1599.7    926.89   1598.74    965.15    1598.5    968.40   1598.00    968.50
GR   1598.2    980.45    1598.5    992.40   1598.98    992.50   1598.98   1000.00   1598.98   1007.50
GR   1598.4   1007.60    1598.0   1031.50   1598.50   1031.60   1598.74   1037.94   1599.44   1051.59
```



```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
*SECNO 1.000

265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=      826.9    1218.3  TYPE=      1  TARGET=      391.360
    1.000      1.03   1571.13   1571.13   1570.50   1571.35       .22       .00       .00   1570.60
    200.0      28.9     158.9      12.2      20.4      38.6       6.8        .0        .0   1570.60
      .00      1.42      4.11      1.80      .058      .025      .035      .000   1570.10    857.42
  .009546        0.        0.        0         0        21         0       .00    143.01   1058.90
```

```
*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .75 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000      .75   1577.99   1577.99      .00   1578.17      .18      6.60      .00   1578.00
     200.0       .0      43.5     156.5       .0      12.1     47.1       .7      1.7   1578.00
       .04      .00      3.59      3.32     .000      .025     .035     .000  1577.24    968.40
   .022944     468.      468.      468.        0        19        0      .00   173.33   1159.60


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .76 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.86


3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090

   06NOV95      15:06:08                                                                                    PAGE    5


    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


     3.000      1.15   1583.05   1582.97      .00   1583.28      .22      5.10      .01   1582.40
     200.0       8.8     184.0       7.3      8.8      47.0      2.9       1.3      3.1   1582.40
       .07      1.00      3.91      2.47     .058      .025     .035     .000  1581.90    941.98
   .006661     453.      453.      453.        5        12        0      .00    93.75   1035.73


*SECNO 4.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=       95.160
     4.000      1.05   1587.15   1587.15      .00   1587.46      .30      3.72      .02   1586.60
     200.0       3.0     182.6      14.4      2.1      40.0      5.4       1.8      4.0   1586.60
       .10      1.47      4.57      2.64     .058      .025     .035     .000  1586.10    962.53
   .011280     420.      438.      425.        0        15        0      .00    81.91   1044.45


*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=       92.310
     5.000      1.15   1590.15   1590.08      .00   1590.41      .26      2.95      .00   1589.50
     200.0       2.5     192.9       4.6      1.9      46.5      2.2       2.2      4.5   1589.50
       .12      1.33      4.14      2.15     .058      .025     .035     .000  1589.00    963.83
   .007568     300.      324.      308.        4         8        0      .00    73.34   1037.17


*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=         .0    1051.6  TYPE=      1  TARGET=     1051.589
     6.000      1.06   1599.06   1599.06      .00   1599.36      .30      3.42      .01   1598.50
     200.0       3.7     188.2       8.1      3.4      41.8      3.8       2.6      5.3   1598.50
       .15      1.07      4.51      2.17     .058      .025     .035     .000  1598.00    952.52
   .010357     450.      386.      428.        0        11        0      .00    91.61   1044.12
```

TW Right bank between sections 4 and 5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
.00	.00	.00	.00	.00	.00	2	1587.151	1590.154	4.000	5.000

1

PROFILE FOR STREAM Fountain Hills - PANORAM

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

```
ELEVATION  1570.    1575.    1580.    1585.    1590.    1595.    1600.    1605.    1610.    1615.
   SECNO   CUMDIS

    1.00      0. ILWE     .   M    .        .        .        .        .        .        .        .
             50. . ILE    .   M    .        .        .        .        .        .        .        .
            100. .  ILE   .   M    .        .        .        .        .        .        .        .
            150. .    IWE .   M    .        .        .        .        .        .        .        .
            200. .     ILE .  M    .        .        .        .        .        .        .        .
            250. .       IWE  M    .        .        .        .        .        .        .        .
            300. .        ILE M    .        .        .        .        .        .        .        .
            350. .         .IWEM   .        .        .        .        .        .        .        .
            400. .         . I E   .        .        .        .        .        .        .        .
            450. .         .  IWE  .        .        .        .        .        .        .        .
    2.00    500. .         .  I E  .        .        .        .        .        .        .        .
            550. .         .   I E .        .        .        .        .        .        .        .
            600. .         .    IME .       .        .        .        .        .        .        .
            650. .         .     IMWE       .        .        .        .        .        .        .
            700. .         .      IMWE      .        .        .        .        .        .        .
            750. .         .       IMWE     .        .        .        .        .        .        .
            800. .         .        IMWE    .        .        .        .        .        .        .
            850. .         .        .IMCE   .        .        .        .        .        .        .
            900. .         .         . ILE  .        .        .        .        .        .        .
    3.00    950. .         .         .  ILE .        .        .        .        .        .        .
           1000. .         .         .   ILE .       .        .        .        .        .        .
           1050. .         .         .    ILE .      .        .        .        .        .        .
           1100. .         .         .    ILME.      .        .        .        .        .        .
           1150. .         .         .     ILME      .        .        .        .        .        .
           1200. .         .         .      ILME     .        .        .        .        .        .
           1250. .         .         .       ILCE    .        .        .        .        .        .
           1300. .         .         .        ILWE   .        .        .        .        .        .
           1350. .         .         .        .ILWE  .        .        .        .        .        .
    4.00   1400. .         .         .        . ILWE .        .        .        .        .        .
           1450. .         .         .        .  ILWE .       .        .        .        .        .
           1500. .         .         .        .   ILWE .      .        .        .        .        .
           1550. .         .         .        .    ILEM .     .        .        .        .        .
           1600. .         .         .        .     ILEM.     .        .        .        .        .
           1650. .         .         .        .     IL EM     .        .        .        .        .
    5.00   1700. .         .         .        .       ILWEM   .        .        .        .        .
           1750. .         .         .        .         ILWEM .        .        .        .        .
           1800. .         .         .        .         . IL EM .      .        .        .        .
           1850. .         .         .        .         .    ILWE .    .        .        .        .
           1900. .         .         .        .         .     ILWE     .        .        .        .
           1950. .         .         .        .         .       IL EM  .        .        .        .
           2000. .         .         .        .         .        . ILWE .        .        .        .
           2050. .         .         .        .         .        .   ILWE .      .        .        .
    6.00   2100. .         .         .        .         .        .    ILWE.       .        .        .
```


I1 by AGK Engineers, Inc.
Existing conditions
Fountain Hills (south) - FOUNTAIN CHANEL

```
   ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                3                           -1                                    1570.5

J2 NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    2                                                           -1


1
   06NOV95      15:06:08                                                                                                PAGE    8

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
*SECNO 1.000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      826.9    1218.3  TYPE=      1  TARGET=      391.360
    1.000      1.29   1571.39   1571.39   1570.50   1571.74      .35       .00       .00   1570.60
    399.1      66.5     295.1      37.5      35.5      55.1     15.8        .0        .0   1570.60
      .00      1.87      5.35      2.37      .058      .025     .035      .000   1570.10    854.00
  .010073        0.        0.        0.         0        25        0       .00    168.85   1073.45

*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED       .95 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
    2.000       .95   1578.19   1578.19       .00   1578.47      .28      6.40       .01   1578.00
    399.1        .0     104.7     294.4        .0      21.7     72.6       1.1       1.9   1578.00
      .03       .04      4.82      4.05      .058      .025     .035      .000   1577.24    967.96
  .019610      468.      468.      468.         0        19        0       .00    176.52   1159.60

*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED      1.08 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.59

3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
   06NOV95      15:06:08                                                                                                PAGE    9

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
```

```
     3.000       1.4
     399.1       26.
       .06       1.4
   .007714       453


*SECNO 4.000
3280 CROSS SECTION

7185 MINIMUM SPECIF
3720 CRITICAL DEPTH

3470 ENCROACHMENT S
     4.000       1.4
     399.1        8.
       .08       1.8
   .009838       420


*SECNO 5.000

3470 ENCROACHMENT S
     5.000       1.4
     400.0        6.
       .09       1.8
   .008723       300


*SECNO 6.000
7185 MINIMUM SPECIF
3720 CRITICAL DEPTH

3470 ENCROACHMENT S
     6.000       1.4
     400.0       16.
       .12       1.3
   .008512       450


   06NOV95       15:


* TW     Right bank

   ASQ       QCOMP
     .91        .9
```

```
    3.000      1.48   1583.38   1583.32      .00   1583.79      .41      5.28      .04   1582.40
    399.1      26.8     358.4      13.9     19.2      67.1      4.3       2.0      3.3   1582.40
      .06      1.40      5.34      3.26     .058      .025     .035      .000  1581.90    929.31
  .007714      453.      453.      453.        4        11        0       .00   106.42   1035.73


*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED       .30 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=      95.160
    4.000      1.40   1587.50   1587.50      .00   1587.97      .47      3.79      .02   1586.60
    399.1       8.3     355.3      35.5      4.5      62.1     10.0       2.9      4.3   1586.60
      .08      1.84      5.72      3.54     .058      .025     .035      .000  1586.10    960.16
  .009838      420.      438.      425.        0        11        0       .00    84.61   1044.77


*SECNO 5.000

3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=      92.310
    5.000      1.48   1590.48   1590.46      .00   1590.96      .48      2.99      .00   1589.50
    400.0       6.6     380.7      12.7      3.6      67.1      4.3       3.4      4.9   1589.50
      .09      1.85      5.68      2.97     .058      .025     .035      .000  1589.00    962.43
  .008723      300.      324.      308.        2         8        0       .00    76.72   1039.15


*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        .0    1051.6  TYPE=      1  TARGET=     1051.589
    6.000      1.43   1599.43   1599.43      .00   1599.85      .43      3.36      .01   1598.50
    400.0      16.2     357.6      26.1     12.0      65.1      9.7       4.2      5.7   1598.50
      .12      1.35      5.49      2.69     .058      .025     .035      .000  1598.00    937.80
  .008512      450.      386.      428.        0         8        0       .00   113.52   1051.32


   06NOV95      15:06:08                                                                    PAGE   10


 TW     Right bank between sections 4 and 5

    ASQ      QCOMP      ERRAC      TASQ       TCQ      TABER     NITER      DSWS      USWS     DSSNO     USSNO
     .91        .91        .28       .91       .91        .28         5  1587.500  1590.479     4.000     5.000
```

THIS RUN EXECUTED 06NOV95 15:06:17

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	200.00	1571.13	1571.13
*	1.000	399.09	1571.39	1571.39
*	1.000	785.03	1571.82	1571.82
*	1.000	970.78	1571.97	1571.97
*	1.000	1283.72	1572.20	1572.20
*	1.000	1551.87	1572.36	1572.36
*	1.000	1679.15	1572.44	1572.44
*	1.000	1980.29	1572.60	1572.60
*	1.000	2261.42	1572.79	1572.79
*	2.000	200.00	1577.99	1577.99
*	2.000	399.09	1578.19	1578.19
*	2.000	785.03	1578.52	1578.52
*	2.000	970.78	1578.63	1578.63
	2.000	1283.72	1578.83	1578.83
	2.000	1551.87	1578.98	1578.98
	2.000	1679.15	1579.05	1579.05
*	2.000	1980.29	1579.20	1579.20
*	2.000	2261.42	1579.34	1579.34
*	3.000	200.00	1583.05	1582.97
*	3.000	399.09	1583.38	1583.32
*	3.000	785.03	1583.88	1583.88
*	3.000	970.78	1584.08	1584.08
*	3.000	1283.72	1584.38	1584.38
*	3.000	1551.87	1584.61	1584.61
*	3.000	1679.15	1584.72	1584.72
*	3.000	1980.29	1584.97	1584.97
*	3.000	2261.42	1585.18	1585.18
*	4.000	200.00	1587.15	1587.15
*	4.000	399.09	1587.50	1587.50
*	4.000	785.03	1588.04	1588.04
*	4.000	970.78	1588.24	1588.24
*	4.000	1283.72	1588.60	1588.60
*	4.000	1551.87	1588.87	1588.87
*	4.000	1679.15	1588.98	1588.98
*	4.000	1980.29	1589.26	1589.26
*	4.000	2261.42	1589.50	1589.50
	5.000	200.00	1590.15	1590.08
	5.000	400.00	1590.48	1590.46
*	5.000	800.00	1591.06	1591.06
*	5.000	1000.00	1591.30	1591.30
*	5.000	1400.00	1591.74	1591.74
*	5.000	1800.00	1592.14	1592.14
*	5.000	2000.00	1592.32	1592.32
*	5.000	2500.00	1592.74	1592.74
*	5.000	3000.00	1593.14	1593.14

THIS RUN EXECUTED 06NOV95 15:06:17

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	200.00	1571.13	1571.13
*	1.000	399.09	1571.39	1571.39
*	1.000	785.03	1571.82	1571.82
*	1.000	970.78	1571.97	1571.97
*	1.000	1283.72	1572.20	1572.20
*	1.000	1551.87	1572.36	1572.36
*	1.000	1679.15	1572.44	1572.44
*	1.000	1980.29	1572.60	1572.60
*	1.000	2261.42	1572.79	1572.79
*	2.000	200.00	1577.99	1577.99
*	2.000	399.09	1578.19	1578.19
*	2.000	785.03	1578.52	1578.52
*	2.000	970.78	1578.63	1578.63
	2.000	1283.72	1578.83	1578.83
	2.000	1551.87	1578.98	1578.98
	2.000	1679.15	1579.05	1579.05
*	2.000	1980.29	1579.20	1579.20
*	2.000	2261.42	1579.34	1579.34
*	3.000	200.00	1583.05	1582.97
*	3.000	399.09	1583.38	1583.32
*	3.000	785.03	1583.88	1583.88
*	3.000	970.78	1584.08	1584.08
*	3.000	1283.72	1584.38	1584.38
*	3.000	1551.87	1584.61	1584.61
*	3.000	1679.15	1584.72	1584.72
*	3.000	1980.29	1584.97	1584.97
*	3.000	2261.42	1585.18	1585.18
*	4.000	200.00	1587.15	1587.15
*	4.000	399.09	1587.50	1587.50
*	4.000	785.03	1588.04	1588.04
*	4.000	970.78	1588.24	1588.24
*	4.000	1283.72	1588.60	1588.60
*	4.000	1551.87	1588.87	1588.87
*	4.000	1679.15	1588.98	1588.98
*	4.000	1980.29	1589.26	1589.26
*	4.000	2261.42	1589.50	1589.50
	5.000	200.00	1590.15	1590.08
	5.000	400.00	1590.48	1590.46
*	5.000	800.00	1591.06	1591.06
*	5.000	1000.00	1591.30	1591.30
*	5.000	1400.00	1591.74	1591.74
*	5.000	1800.00	1592.14	1592.14
*	5.000	2000.00	1592.32	1592.32
*	5.000	2500.00	1592.74	1592.74
*	5.000	3000.00	1593.14	1593.14

6.000	200.00	1599.06	1599.06
6.000	400.00	1599.43	1599.43
6.000	800.00	1599.95	1599.95
6.000	1000.00	1600.15	1600.15
6.000	1400.00	1600.52	1600.52
6.000	1800.00	1600.85	1600.85
6.000	2000.00	1601.00	1601.00
6.000	2500.00	1601.36	1601.36
6.000	3000.00	1601.65	1601.65

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET _____ OF _____
BY HAA DATE 11-6-95
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. _____

SPLIT FLOW

between x-sec 5 and 6 (upstream reach of Panorama Dr.)

Inflow	Outflow	spill
100	100	0
200	183	17
300	247	53
400	296	104
500	335	165
700	401	299
900	453	447
1200	519	681
1500	579	921

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    06NOV95    TIME   15:06:46 *
*******************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 06NOV95 15:06:46

```
************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.2;  May 1991
************************************
```

SPLIT FLOW BEING PERFORMED

```
SF      Split Flow into Fountain Lake

W       Right bank between sections 5 and 6
WS      5       5       6       -1      2.7
WC      0 1591.14       62 1591.74      122 1593.74     257 1595.74     387 1599.44
```



```
1       Fountain Lake Hydrology                         File: PN-5SPLT.H2
1       Prepared for Anderson-Nelson Inc.
T1      by AGK Engineers, Inc.

        Multiple run Spill flow into Fountain Lake
        Fountain Hills - PANORAMA DRIVE SPILL

T4 GR data from Typical section and 1' countour map KAM
5 1"=40' 1-feet Contour mapping from KAM
6 with survey control by Anderson Nelson 12-11-92, field survey Aug 91
7 Spill elevation from KAM 1-foot topo map of Fountain Lake
T9 Subcritical analysis
T9 This model was developed and configured to determine Run-off/flow relations
9 for different run-off values.  Other parameters may not be accurate
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			-1				1570.5	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1						-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	1	2					150	

NC	.058	.035	.025	.1	.3					
T	9	100	200	300	400	500	700	900	1200	1500
X1	1	24	968.4	1031.6						
X3				826.92		1218.28				
GR	1572.7	826.92	1571.74	849.42	1570.74	862.54	1572.74	897.66	1571.74	920.16
GR	1570.7	933.28	1570.6	968.40	1570.10	968.50	1570.34	980.45	1570.58	992.40
GR	1571.1	992.50	1571.08	1000.00	1571.08	1007.50	1570.58	1007.60	1570.10	1031.50
GR	1570.6	1031.6	1570.74	1037.16	1571.74	1092.92	1572.74	1140.98	1573.74	1181.23
	1574.7	1186.2	1575.74	1189.89	1576.74	1194.25	1577.44	1218.28		

```
        2       14      968.4    1031.6      468      468      468
X3                               929.25               1159.6
GR   1589.7   929.25   1588.74   935.45   1587.74   945.58     1578   968.40   1577.50   968.50
GR   1577.7   980.45   1577.98   992.40   1578.48   992.50   1578.48  1000.00   1578.48  1007.50
GR   1578.0  1007.60    1577.5   1031.5   1578.00  1031.60   1577.24   1159.6
```



```
X1       3       16      968.4    1031.6      453      453      453
X3                               895.64               1035.73
GR   1587.7   895.64   1586.74   899.25   1585.74    903.9   1584.74      910   1583.74   915.02
GR   1582.4   968.40   1581.90   968.50   1582.14   980.45   1582.38   992.40   1582.88   992.50
GR   1582.9  1000.00   1582.88  1007.50   1582.38  1007.60   1581.90  1031.50   1582.40  1031.60
GR   1582.3  1035.73

X1       4       16      968.4    1031.6      425      425      425
X3                               949.61               1044.77
GR   1589.7   949.61   1588.74   955.27   1587.74   958.53   1586.74   965.32    1586.6   968.40
GR   1586.1   968.50   1586.34   980.45   1586.58   992.40   1587.08   992.50   1587.08  1000.00
GR   1587.1  1007.50   1586.58  1007.60   1586.10  1031.50   1586.60  1031.60   1586.74  1041.76
GR   1587.2  1044.77

X1       5       17      968.4    1031.6      308      308      308
X3                               953.81               1046.12
GR   1592.7   953.81   1591.74   957.53   1590.74   961.31   1589.74   965.62    1589.5   968.40
GR   1589.0   968.50   1589.24   980.45   1589.48   992.40   1589.98   992.50   1589.98  1000.00
GR   1590.0  1007.50   1589.48  1007.60   1589.00  1031.50   1589.50  1031.60   1589.74  1034.64
     1590.7  1040.49   1590.94  1046.12

X1       6       15      968.4    1031.6      450      428      386
X3                                                1051.59
GR     1602     800    1599.7   926.89   1598.74   965.15   1598.5   968.40   1598.00   968.50
GR   1598.2   980.45   1598.5   992.40   1598.98   992.50  1598.98  1000.00   1598.98  1007.50
GR   1598.4  1007.60   1598.0  1031.50   1598.50  1031.60  1598.74  1037.94   1599.44  1051.59
```



```
SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    L-BANK ELEV
Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA      R-BANK ELEV
TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN    SSTA
SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST

PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
*SECNO 1.000

265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=     826.9    1218.3  TYPE=      1  TARGET=     391.360
    1.000      .76   1570.86   1570.86   1570.50   1571.05      .20      .00      .00   1570.60
    100.0      6.6      91.8       1.7       7.7      24.9      1.4       .0       .0   1570.60
      .00      .86      3.69      1.17      .058      .025     .035     .000  1570.10    861.00
 .009641       0.        0.        0.         0        16        0      .00   100.94   1043.71
```

```
 :NO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED      .58 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .62

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      929.3    1159.6  TYPE=      1  TARGET=      230.350
     2.000       .59   1577.83   1577.82       .00   1577.96       .13      6.90       .01   1578.00
     100.0        .0      15.6      84.4        .0       5.5      28.6        .4       1.2   1578.00
       .04       .00      2.84      2.96      .000      .025      .035      .000   1577.24    968.44
   .025304      468.      468.      468.         3        19         0       .00    130.80   1159.60


*SECNO 3.000

3265 DIVIDED FLOW

3280 CROSS SECTION      3.00 EXTENDED      .45 FEET

1
   06NOV95      15:06:46                                                                                PAGE    5


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 2 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.05

3470 ENCROACHMENT STATIONS=      895.6    1035.7  TYPE=      1  TARGET=      140.090
     3.000       .85   1582.75   1582.65       .00   1582.91       .16      4.94       .01   1582.40
     100.0       1.5      95.7       2.8       2.5      29.4       1.7        .7       2.3   1582.40
       .08       .62      3.26      1.68      .058      .025      .035      .000   1581.90    954.41
   .006049      453.      453.      453.         6        11         0       .00     66.26   1035.73


*SECNO 4.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      949.6    1044.8  TYPE=      1  TARGET=       95.160
     4.000       .76   1586.86   1586.86       .00   1587.09       .23      3.35       .02   1586.60
     100.0        .5      96.8       2.7        .6      24.9       1.9       1.0       2.9   1586.60
       .11       .81      3.89      1.41      .058      .025      .035      .000   1586.10    964.52
   .010722      425.      425.      425.         0        12         0       .00     62.91   1042.53


*SECNO 5.000

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=      953.8    1046.1  TYPE=      1  TARGET=       92.310
     5.000       .80   1589.80   1589.75       .00   1590.00       .20      2.91       .00   1589.50
     100.0        .4      98.9        .7        .5      27.1        .6       1.2       3.3   1589.50
       .14       .75      3.65      1.23      .058      .025      .035      .000   1589.00    965.34
   .008397      308.      308.      308.         4         5         0       .00     54.62   1035.03
```

```
*SECNO 6.000

  5 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
1
  06NOV95      15:06:46                                                                                    PAGE    6

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3470 ENCROACHMENT STATIONS=        .0    1051.6  TYPE=      1  TARGET=     1051.589
    6.000       .73   1598.73   1598.73       .00   1598.97       .25      3.74       .01   1598.50
    100.0        .2      99.0        .7        .4      24.8        .7       1.5       3.8   1598.50
      .17       .64      3.99      1.06      .058      .025      .035      .000   1598.00    965.30
  .011303      450.      386.      428.         0        11         0       .00     57.26   1037.65


1
  06NOV95      15:06:46                                                                                    PAGE    7


TW     Right bank between sections 5 and 6

   ASQ       QCOMP     ERRAC     TASQ      TCQ       TABER     NITER     DSWS      USWS      DSSNO     USSNO
     .00       .00       .00       .00       .00       .00         2  1589.796  1598.729     5.000     6.000
```

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Fountain Hills - PANORAM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS
*	1.000	100.00	1570.86	1570.86
*	1.000	182.87	1571.09	1571.09
*	1.000	247.00	1571.18	1571.18
*	1.000	296.29	1571.26	1571.26
*	1.000	335.33	1571.31	1571.31
*	1.000	400.97	1571.39	1571.39
*	1.000	453.17	1571.46	1571.46
*	1.000	518.58	1571.53	1571.53
*	1.000	579.28	1571.60	1571.60
*	2.000	100.00	1577.83	1577.82
*	2.000	182.87	1577.97	1577.97
	2.000	247.00	1578.05	1578.04
	2.000	296.29	1578.09	1578.09
*	2.000	335.33	1578.13	1578.13
	2.000	400.97	1578.19	1578.19
	2.000	453.17	1578.24	1578.24
*	2.000	518.58	1578.29	1578.29
*	2.000	579.28	1578.40	1578.40
*	3.000	100.00	1582.75	1582.65
*	3.000	182.87	1583.02	1582.92
*	3.000	247.00	1583.14	1583.05
*	3.000	296.29	1583.23	1583.15
	3.000	335.33	1583.29	1583.21
	3.000	400.97	1583.38	1583.32
	3.000	453.17	1583.44	1583.41
*	3.000	518.58	1583.52	1583.50
*	3.000	579.28	1583.58	1583.58
	4.000	100.00	1586.86	1586.86
*	4.000	182.87	1587.11	1587.11
*	4.000	247.00	1587.24	1587.24
	4.000	296.29	1587.33	1587.33
	4.000	335.33	1587.40	1587.40
	4.000	400.97	1587.50	1587.50
*	4.000	453.17	1587.58	1587.58
*	4.000	518.58	1587.68	1587.68
	4.000	579.28	1587.76	1587.76
	5.000	100.00	1589.80	1589.75
	5.000	182.87	1590.11	1590.04
	5.000	247.00	1590.22	1590.18
	5.000	296.29	1590.30	1590.27
	5.000	335.33	1590.36	1590.34
*	5.000	400.97	1590.46	1590.46
*	5.000	453.17	1590.55	1590.55
	5.000	518.58	1590.65	1590.65
	5.000	579.28	1590.75	1590.75

6.000	100.00	1598.73	1598.73
6.000	200.00	1599.06	1599.06
6.000	300.00	1599.25	1599.25
6.000	400.00	1599.42	1599.42
6.000	500.00	1599.57	1599.57
6.000	700.00	1599.83	1599.83
6.000	900.00	1600.06	1600.06
6.000	1200.00	1600.36	1600.36
6.000	1500.00	1600.61	1600.61

APPENDIX E

IMPOUNDMENT AND SPILLWAY INFORMATION

E.1

STAGE - STORAGE RELATIONSHIP AT FOUNTAIN LAKE

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET 1 OF 1
BY HAA DATE 10/20/95
CHECK _____ DATE _____

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. 465-14

Acording to a letter from the town of fountain Hills the operational W.S.E of Fountain Lake is 1-fool below the spillway elevation wich is the culb of El Lago Blvd.

from survey the elevation of the spillway was determine to be 1574.7 (Fountain Hills datum)

NGVD-1929 = Fountain Hills datum − 1.26 ft (Anderson Nelson letter 8/24/92)

	Fountain Hills	NGVD 1929
Spillway Elev	1574.49	1573.23
W.S.E	1573.49	1572.23

AGK ENGINEERS, INC.
2255 North 44th Street • Suite 330 • Phoenix, Arizona 85008 • Phone (602) 244-2566 • FAX (602) 244-8947

July 22, 1993

Mr. Tim Murphy
Flood Control District
of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

FILE COPY

Reference: Fountain Hills FIS, Contract FCD 92-05
AGK Project No. 310.43

Dear Mr. Murphy:

Through telephone conversation this afternoon, Mr. Randy Harrel, Town Engineer for Fountain Hills, gave me the following information that is relevant to this study:

1. The normal operating level for the Fountain Lake is set at one (1) foot below the spillway crest, which is the curb elevation at the road.

2. Each year, between August 1 and October 15, the lake surface is scheduled to drop gradually from the normal operating level to a level four (4) feet below the spillway crest. Then, the lake surface is gradually raised to the normal operating level by April 1.

AGK will incorporate the above information in our Hydrology Report.

Please let us know if you should have any questions.

Very truly yours,

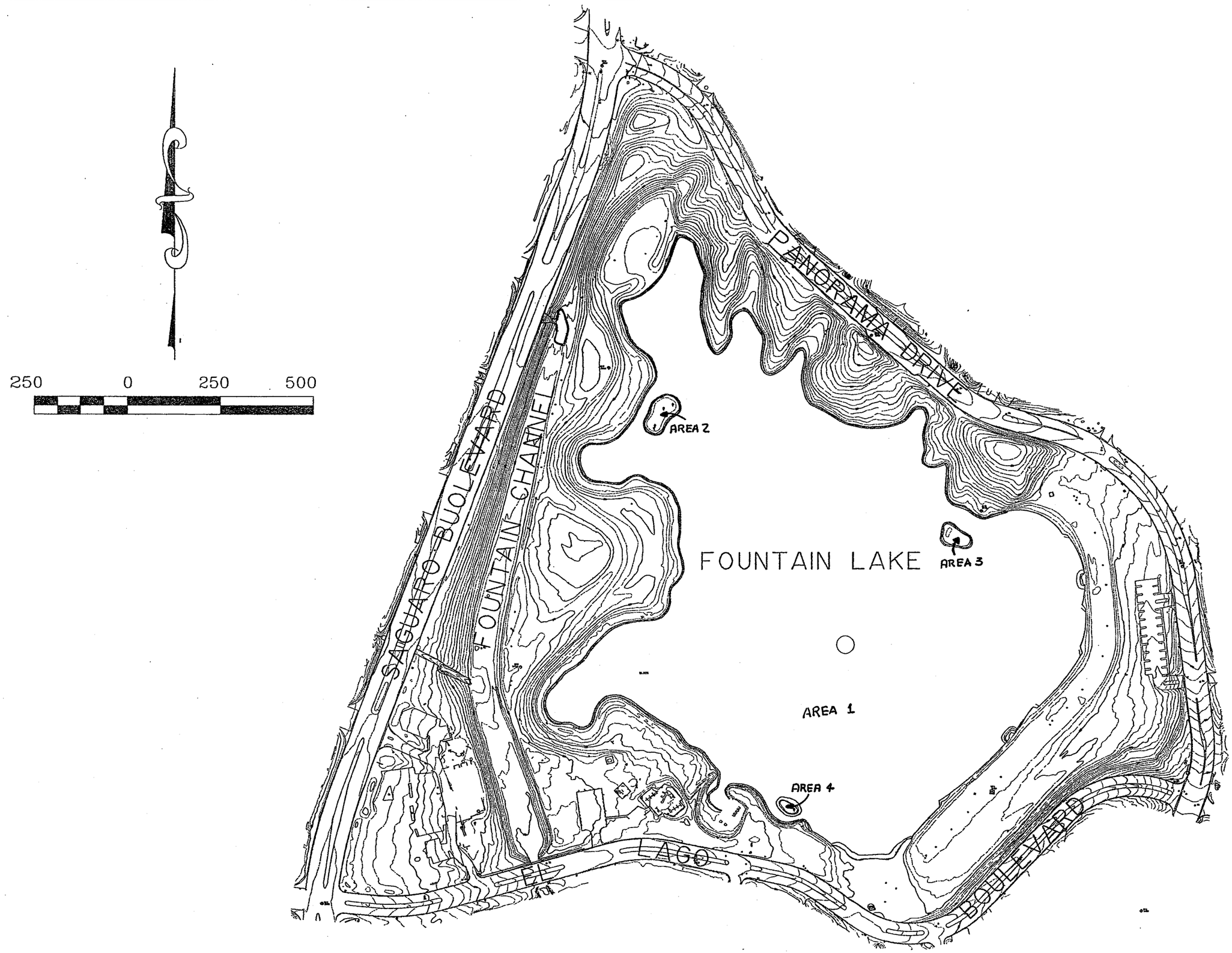
AGK ENGINEERS, INC.

Samuel Kao

Samuel E. Kao, Ph.D., P.E.
Vice President

SEK/kp

cc: Mr. Ray Baldwin, MCO
Mr. Randy Harrel, Town of Fountain Hills


250
0
250
500
PANORAMA DRIVE
SAGUARO BOULEVARD
FOUNTAIN CHANNEL
FOUNTAIN LAKE
AREA 1
AREA 2
AREA 3
AREA 4
EL LAGO
BOULEVARD

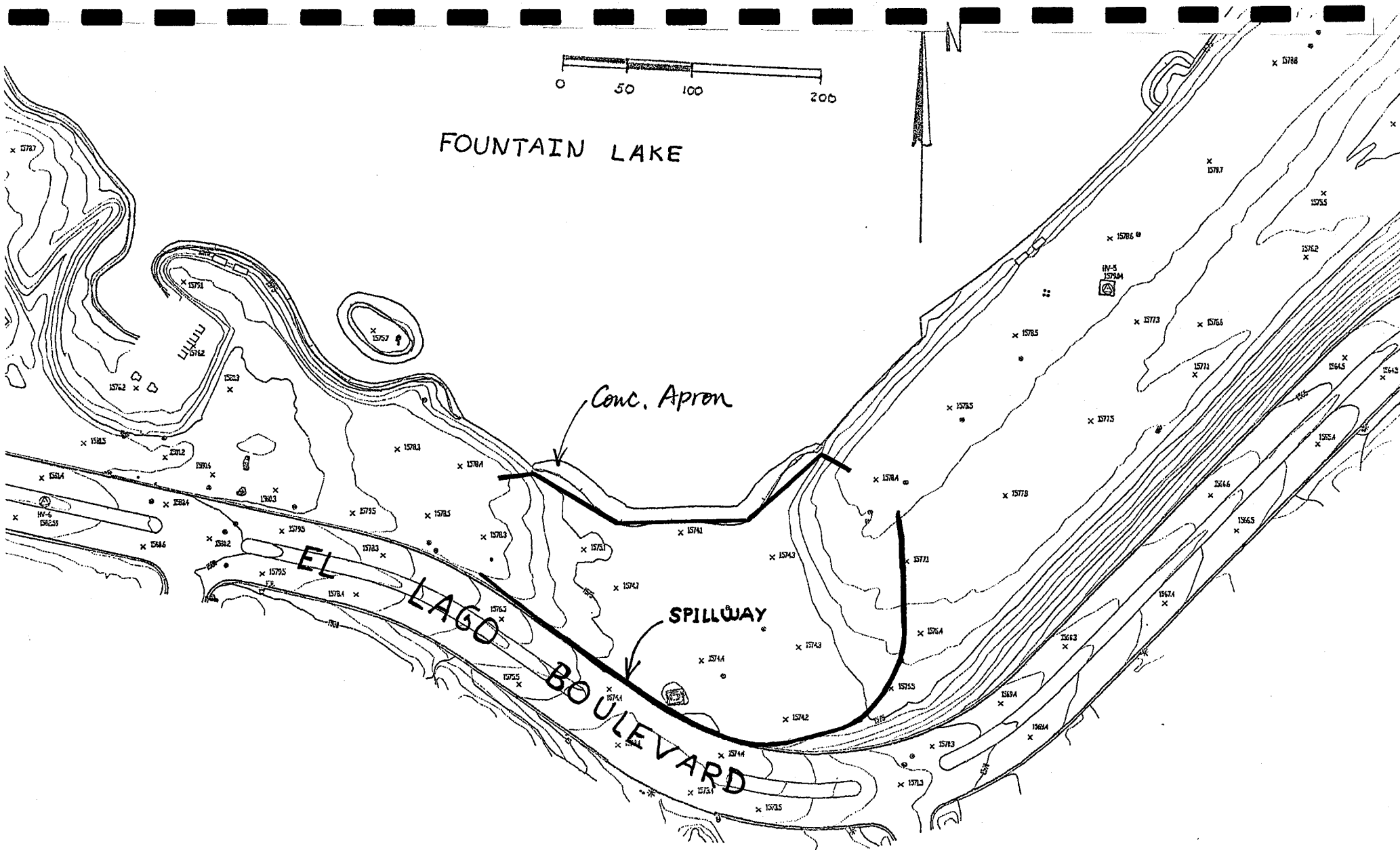
Fountain Lake Stage Area Relationship

Elev.	Area 1 (ft)	Area 2 (ft)	Area 3 (ft)	Area 4 (ft)	Area 1 (acres)	Area 2 (acres)	Area 3 (acres)	Area 4 (acres)
1578	1482621				34.04			
1577	1422533				32.66			
1576	1342212	3969.19	238.98		30.81	0.09	0.01	
1575	1288682	5832.09	2924.72	944.15	29.58	0.13	0.07	0.02
1574	1267055	7006.29	3914.81	1339.37	29.09	0.16	0.09	0.03

Stage		Surface Area (acres)
FH	NGVD	
1578	1576.74	34.04
1577	1575.74	32.66
1576	1574.74	30.72
1575	1573.74	29.36
1574	1572.74	28.81

E.2

STAGE - DISCHARGE RELATIONSHIP AT FOUNTAIN LAKE DAM SPILLWAY


0
50
100
200
N
FOUNTAIN LAKE
Conc. Apron
SPILLWAY
EL LAGO BOULEVARD

ACK ENGINEERS, INC.
2255 N. 44th Street, Ste. 330, Phoenix, AZ 85008 Tel. (602) 244-2566

SHEET 1 OF
BY HVA DATE 11/7/95
CHECK DATE

CLIENT Anderson Nelson
JOB NAME Fountain Lake Hydrology
JOB NO. 465-14

The spillway @ Fountain Lake has a unique geometry. Critical depth calculations were carry out assuming two different control locations:

- At El Lago Blvd. curb
- At inlet Appron

From the critical depth calculation the flows assuming control at El Lago give lower flows that at the appron therefore El Lago is the control.

There is also a catch basin with two 30" pipes just upstream from El Lago boulevard. The flow from thes culvert was ignored because the performance of the culvert is uncertain and ~~there is~~ it is possible that obstruction decrease its capacity.

ACK ENGINEERS, INC.
2265 N. 44th St. Phoenix, AZ • Phone (602) 244-2599

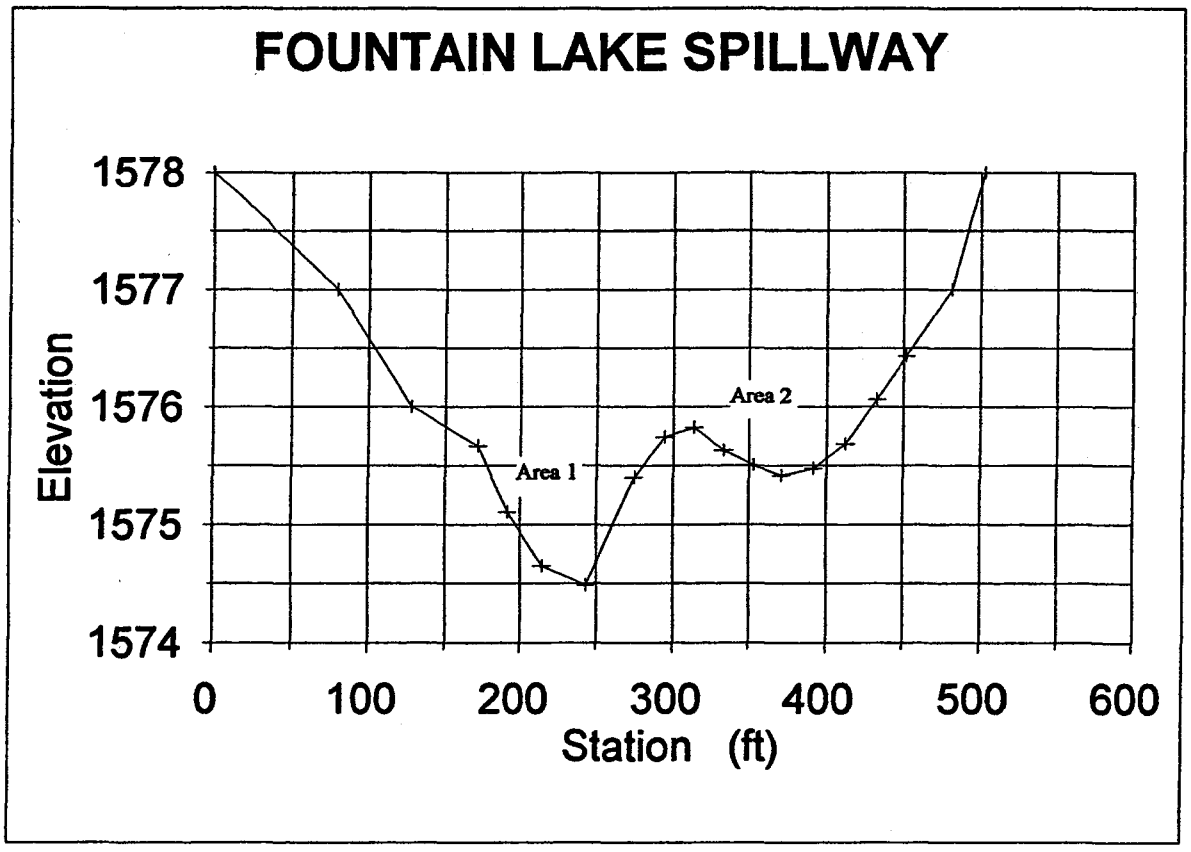
SHEET 2 OF 8

BY HAA DATE 14-Nov-95

CLIENT: Anderson-Nelson, Inc. CHECK _____ DATE _____

JOB: Fountain Lake Rating curve JOB NO. 465.14

LOCATION Fountain Lake (El Lago Blvd curb)
Bottom width = 0 (ft)
Flow line elevation 1574.49 (ft)



Depth yc (ft)	Top widt T (ft)	Area A (ft^2)	Discharge (cfs)	Velocity (fps)	Velocity Head (ft)	Stage (ft)
0.00	0.00	0.00	0	0.00	0.00	1574.49
0.11	17.50	0.96	1	1.33	0.03	1574.63
0.31	46.00	7.31	17	2.26	0.08	1574.88
0.51	65.00	18.41	56	3.02	0.14	1575.14
0.71	79.00	32.81	120	3.66	0.21	1575.41
0.91	96.00	50.31	207	4.11	0.26	1575.66
1.11	169.00	76.22	290	3.81	0.23	1575.83
1.31	260.00	119.12	458	3.84	0.23	1576.03
1.51	302.00	175.32	758	4.32	0.29	1576.29
1.71	321.00	237.62	1160	4.88	0.37	1576.57

* All elevations were based on Fountain Hills survey datum, which is 1.26' higher than the NGVD 1929 datum.

ACK ENGINEERS, INC.
2255 N. 44th St. Phoenix, AZ • Phone (602) 244-2566

SHEET 3 OF 8

BY HAA DATE 14-Nov-95

CLIENT: Anderson-Nelson, Inc. CHECK _____ DATE _____

JOB: Fountain Lake Rating curve JOB NO. 465.14

SPILLWAY TOP WIDTH AND AREA

LOCATION Fountain Lake spillway at El Lago Blvd.

Yc	Critical Stage	Area 1			Arae 2			Total	
		Top Width	incremental Area	Total area	Top Width	Incremental Area	Area	Top width	Arae
0.00	1574.49	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.11	1574.60	17.5	0.96	0.96	0.0	0.00	0.00	17.5	0.96
0.31	1574.80	46.0	6.35	7.31	0.0	0.00	0.00	46.0	7.31
0.51	1575.00	65.0	11.10	18.41	0.0	0.00	0.00	65.0	18.41
0.71	1575.20	79.0	14.40	32.81	0.0	0.00	0.00	79.0	32.81
0.91	1575.40	96.0	17.50	50.31	0.0	0.00	0.00	96.0	50.31
1.11	1575.60	110.0	20.60	70.91	59.0	5.31	5.31	169.0	76.22
1.31	1575.80	160.0	27.00	97.91	100.0	15.90	21.21	260.0	119.12
1.51	1576.00	187.0	34.70	132.61	115.0	21.50	42.71	302.0	175.32
1.71	1576.20	196.0	38.30	170.91	125.0	24.00	66.71	321.0	237.62
1.91	1576.40	206.0	40.20	211.11	136.0	26.10	92.81	342.0	303.92

ACK ENGINEERS, INC.
2265 N. 44th St. Phoenix, AZ · Phone (602) 244-2966

SHEET 4 OF 8

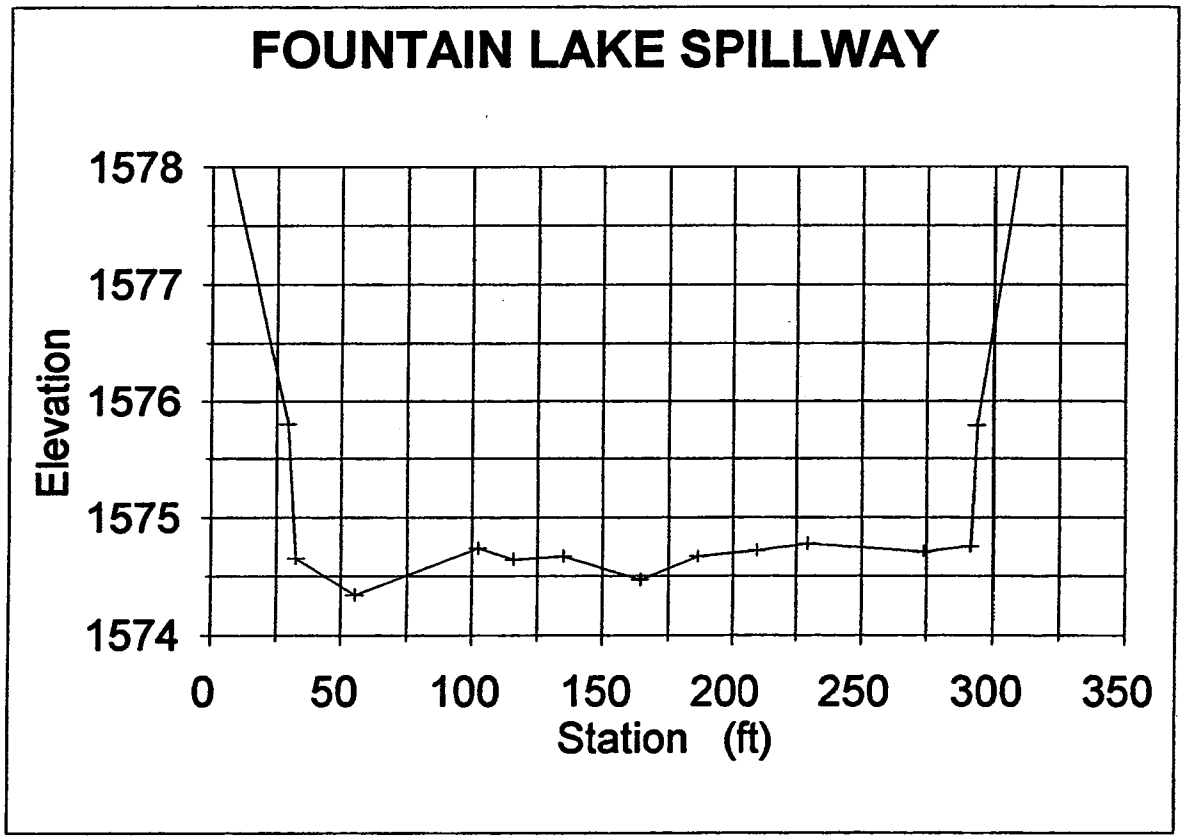
BY HAA DATE 15-Nov-95

CLIENT: Anderson-Nelson, Inc. CHECK _____ DATE _____

JOB: Fountain Lake Rating curve JOB NO. 465.14

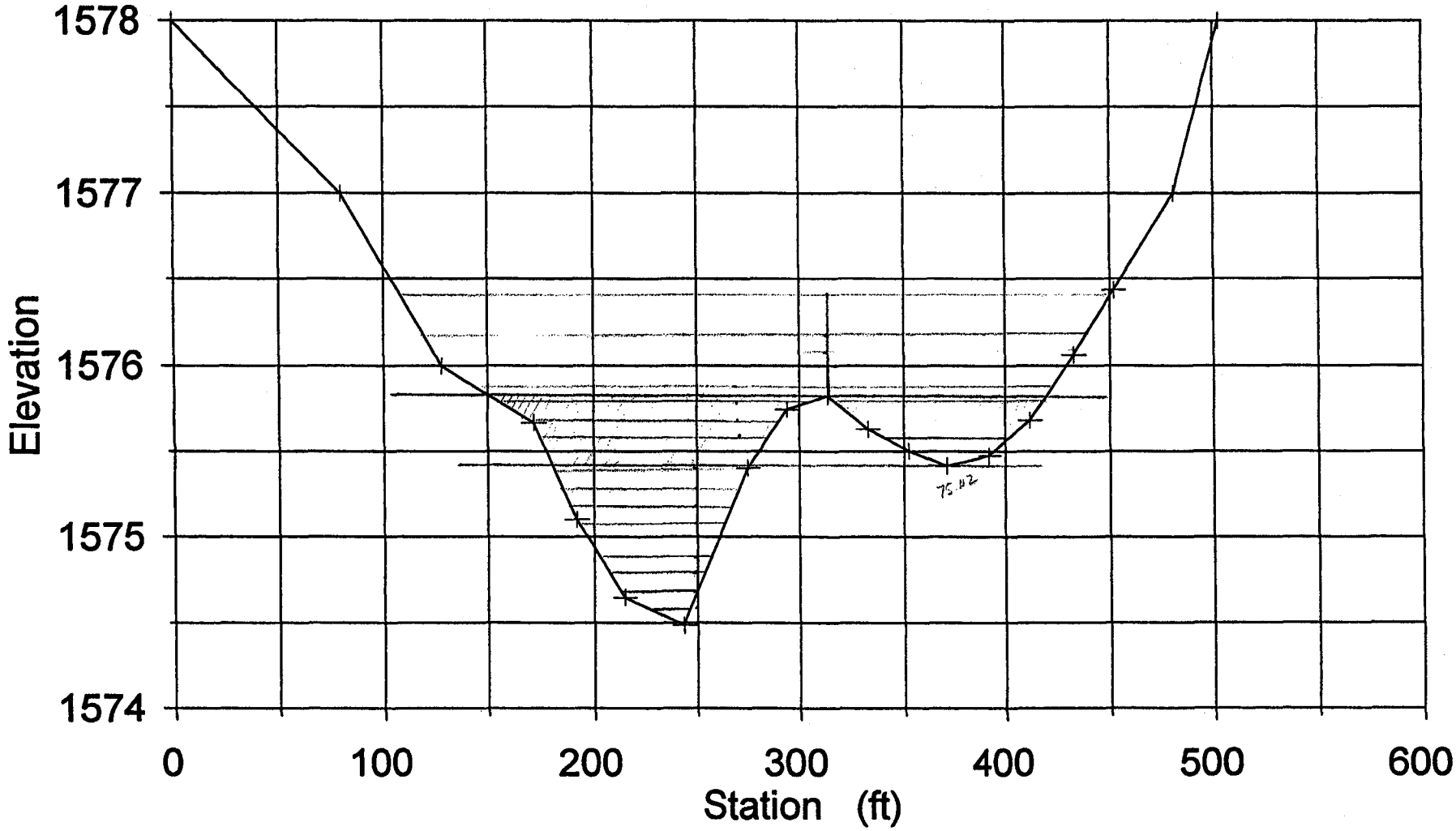
CRITICAL DEPTH/ ENERGY CALCULATIONS

LOCATION Fountain Lake spillway (concrete apron)
Bottom width = 0 (ft)
Flow line elevation 1574.49 (ft)

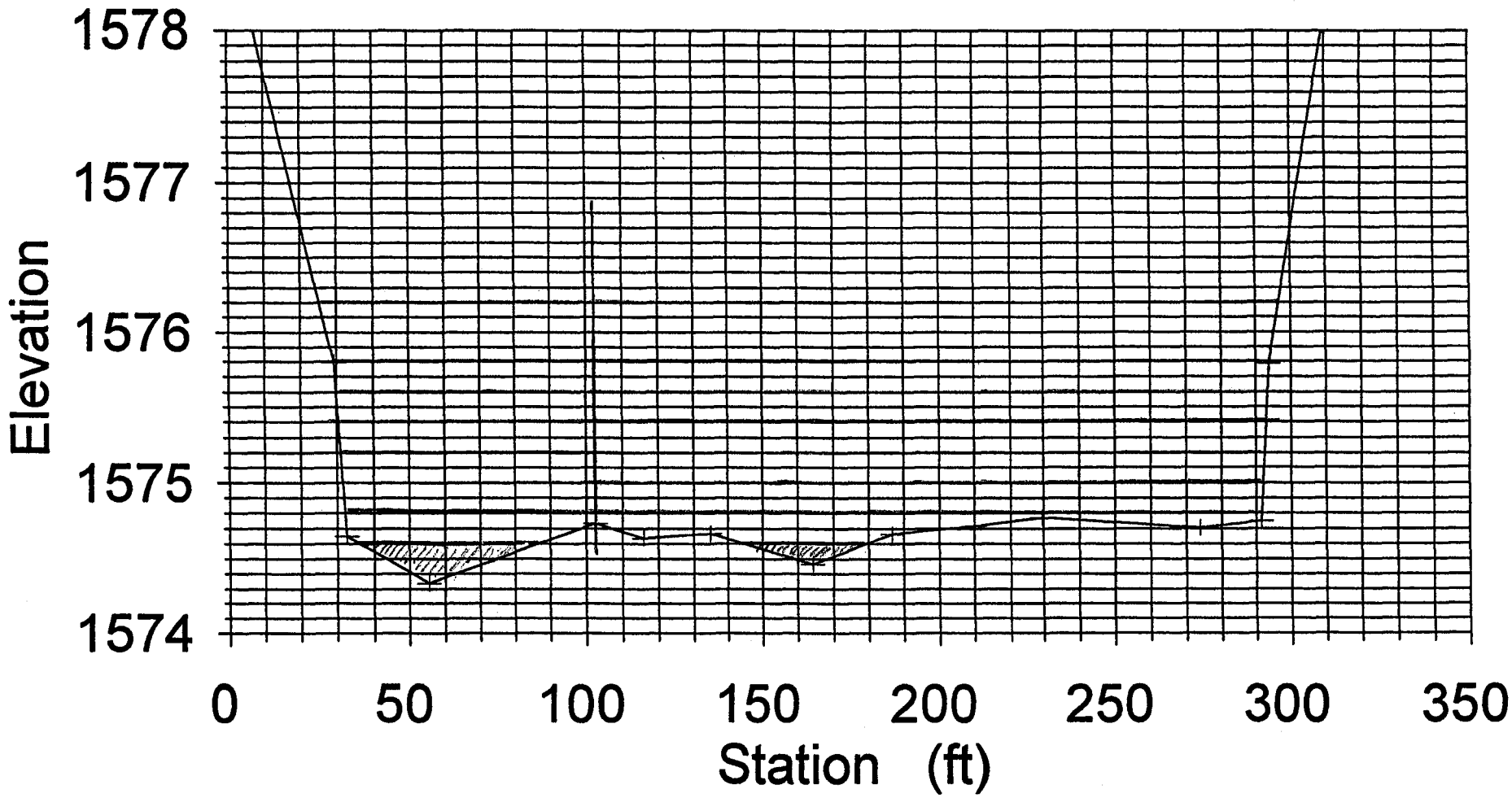


Depth yc (ft)	Top widt T (ft)	Area A (ft^2)	Discharge (cfs)	Velocity (fps)	Velocity Head (ft)	Stage (ft)
0.00	0.00	0.00	0	0.00	0.00	1574.49
0.26	83.80	4.95	7	1.38	0.03	1574.78
0.46	257.60	39.09	86	2.21	0.08	1575.03
0.66	258.80	90.73	305	3.36	0.18	1575.33
0.86	259.80	142.59	599	4.20	0.27	1575.62
1.06	261.20	194.69	954	4.90	0.37	1575.92
1.26	262.10	247.02	1361	5.51	0.47	1576.22
1.46	262.70	299.50	1815	6.06	0.57	1576.52
1.66	267.07	352.48	2298	6.52	0.66	1576.81
1.86	269.30	406.12	2830	6.97	0.75	1577.10

FOUNTAIN LAKE SPILLWAY



FOUNTAIN LAKE SPILLWAY



APPENDIX F

HEC-1 OUTPUTS

F.1

HEC-1 OUTPUT FOR 100-YEAR 24-HOUR STORM

```
****************************************
*                                      *
   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
             MAY   1991                *
          VERSION 4.0.1E               *
*    Lahey F77L-EM/32 version 5.01     *
*      Dodson & Associates, Inc.       *
  RUN DATE  11/20/95  TIME  17:23:01   *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*        DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X    X         XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X    X          X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   ******************************************************************************
  2           ID   **                          FOUNTAIN LAKE                                   **
  3           ID   ******************************************************************************
  4           ID   FUTURE DEVELOPMENT, AGK ENGINEERS, 9-11-95            FILE:   FL-24F.DAT
  5           ID   100-Year 24-Hour storm
  6           ID   Time step at 2 minutes
  7           ID
  8           IT      2                    720
              *DIAGRAM

  9           KK    182G
 10           KM   SUB-BASIN 182G
 11           KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 12           KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 13           IO      5
 14           IN     30
 15           PB      4
 16           KM   ------------------------------------------------------------------------
 17           KM   --------              24 HOUR SCS TYPE II DISTRIBUTION              ---------
 18           KM   ------------------------------------------------------------------------
 19           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 20           PC    .063    .071    .080    .089    .098    .109    .120    .133    .147    .163
 21           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 22           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 23           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 24           KM   ------------------------------------------------------------------------
 25           BA    .048
 26           LG    .061    .250   5.700    .170  82.370
 27           UC    .275    .392
 28           UA       0       5      16      30      65      77      84      90      94      97
 29           UA     100

 30           KK    182I
 31           KM   SUB-BASIN 182I
 32           KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 33           KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 34           BA    .040
 35           LG    .070    .250   5.700    .170  72.940
 36           UC    .267    .346
 37           UA       0       5      16      30      65      77      84      90      94      97
 38           UA     100

 39           KK     FC1
 40           KM   FOUNTAIN CHANNEL CONC. POINT 1 - COMBINE 182G, 182I
 41           HC       2

 42           KK   D-C/P
 43           KM   DIVERSION FROM FOUNTAIN CHANNEL INTO PANORAMA WASH
 44           DT   DOC/P
 45           DI     118     374     732    1177    1700    2294    2953    3673
 46           DQ      56     177     346     556     803    1082    1392    1730
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  47          KK   R-FC1
  48          KM   ROUTE NON DIVERTED FLOW THROUGH SUB-BASIN 182E
  49          RS       1    FLOW       0
  50          RC     .02     .02     .02     570    .012
  51          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
  52          RY    1611  1610.5  1610.5    1610    1610  1610.5  1610.5    1611
  53          KM
  54          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  55          KM   ++++                        FOUNTAIN CHANNEL                        ++++
  56          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  57          KM

  58          KK    182D
  59          KM   SUB-BASIN 182D
  60          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  61          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
  62          BA    .094
  63          LG    .100    .250   5.700    .188  89.780
  64          UC    .217    .173
  65          UA       0       5      16      30      65      77      84      90      94      97
  66          UA     100

  67          KK   R182D
  68          KM   ROUTE 182D THROUGH SUB-BASIN 182E
  69          RS       4    FLOW       0
  70          RC     .02     .02     .02    1994    .021
  71          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
  72          RY    1611  1610.5  1610.5    1610    1610  1610.5  1610.5    1611

  73          KK    182E
  74          KM   SUB-BASIN 182E
  75          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  76          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
  77          BA    .064
  78          LG    .091    .250   5.700    .170  74.290
  79          UC    .221    .187
  80          UA       0       5      16      30      65      77      84      90      94      97
  81          UA     100

  82          KK    182F
  83          KM   SUB-BASIN 182F
  84          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  85          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  86          BA    .015
  87          LG    .050    .250   5.700    .170  65.490
  88          UC    .233    .448
  89          UA       0       5      16      30      65      77      84      90      94      97
  90          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  91          KK     FC2
  92          KM   FOUNTAIN CHANNEL CONC. POINT 2 - COMBINE RFC1, R182D, 182E, 182F
  93          HC       4

  94          KK    SFC2
  95          KM   CATCH BASIN(2X3 AND TRIANGULAR),CULVERT UNDER SAGUARO BLVD AND SPILLWAYS
  96          RS       1    ELEV    1596
  97          SQ       0    10.4      41     181     482     913    3000
  98          SE    1596  1596.2  1596.5    1597  1597.5    1598    1600
  99          SA   0.001    0.48    0.80       1     1.5
 100          SE    1596  1596.5    1597    1598    1600

 101          KK    RFC2
 102          KM   ROUTE SFC2 TO THROUGH SUB-BASIN 182J TO FC3 IN MIDDLE OF 182J
 103          RS       2    FLOW       0
 104          RC     .04     .04     .04    1050    .011
 105          RX    9960    9970    9975    9980   10040   10090   10150   10220
 106          RY  1584.5    1584    1583    1582    1582    1590    1592    1594
 107          KM   %%%%%%%%%%%%%%%%%%%%%%   LAKE DIVERSION  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

 108          KK    DFC2
 109          KM   FLOW SPILL INTO THE LAKE
 110          DT   DOFC2
 111          DI       0     200     400     600     800    1000    1200    1800    2000    2700
 112          DQ       0       0     122     295     478     661     851    1437    1636    2335

 113          KK    182A
 114          KM   SUB-BASIN 182A
 115          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 116          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 117          BA    .050
 118          LG    .150    .250   5.700    .189  90.000
 119          UC    .175    .136
 120          UA       0       5      16      30      65      77      84      90      94      97
 121          UA     100

 122          KK   R182A
 123          KM   ROUTE SUB-BASIN 182A THROUGH SUB-BASIN 182B
 124          RS       4    FLOW       0
 125          RC     .02     .02     .02    1950    .025
 126          RX    9800    9980    9985    9986   10014   10015   10020   12000
 127          RY    1621  1620.5  1620.5    1620    1620  1620.5  1620.5    1621

 128          KK    182B
 129          KM   SUB-BASIN 182B
 130          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 131          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 132          BA    .039
 133          LG    .095    .250   5.700    .170  80.670
 134          UC    .213    .222
 135          UA       0       5      16      30      65      77      84      90      94      97
 136          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  137         KK    FC3A
  138         KM   FOUNTAIN CHANNEL CONC. POINT 3A - COMBINE R182A, 182B
  139         HC       2

  140         KK   SFC3A
  141         KM   CATCH BASIN AND SPILL WAY AT SAGUARO BLVD
  142         RS       1    ELEV    1596
  143         SQ       0     6.4    18.1    45.6    68.2     820    1450
  144         SE    1596  1596.2  1596.4  1596.7    1597    1598  1598.5
  145         SA       0     0.6
  146         SE    1596    1597

  147         KK    182C
  148         KM   SUB-BASIN 182C
  149         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  150         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  151         BA    .022
  152         LG    .078    .250   5.700    .170  83.060
  153         UC    .200    .273
  154         UA       0       5      16      30      65      77      84      90      94      97
  155         UA     100

  156         KK    FC3B
  157         KM   FOUNTAIN CHANNEL CONC. POINT 3B - COMBINE 182C, SFC3A
  158         HC       2

  159         KK   RFC3B
  160         KM   ROUTE FC3B THROUGH 182J TO MAIN CHANNEL IN MIDDLE OF 182J
  161         RS       3    FLOW       0
  162         RC     .03     .02     .03     210   0.067
  163         RX    9900    9950    9993    9996   10004   10007   10050   10100
  164         RY    1583    1582  1581.5    1580    1580  1581.5    1582    1583

  165         KK     FC3
  166         KM   FOUNTAIN CHANNEL CONC. POINT 3 - COMBINE RFC3B, DFC2
  167         HC       2

  168         KK    RFC3
  169         KM   ROUTE FC3 THROUGH REMAINDER OF 182J
  170         RS       1    FLOW       0
  171         RC     .04     .04     .04     572    .009
  172         RX    9960    9970    9975    9980   10040   10090   10150   10220
  173         RY  1584.5    1584    1583    1582    1582    1590    1592    1594

  174         KK    182J
  175         KM   SUB-BASIN 182J
  176         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  177         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  178         BA    .015
  179         LG    .134    .250   5.700    .193  28.330
  180         UC    .237    .330
  181         UA       0       5      16      30      65      77      84      90      94      97
  182         UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  183         KK     FC4
  184         KM   FOUNTAIN CHANNEL CONC. POINT 4 - COMBINE RFC3, 182J
  185         HC       2
  186         KM   %%%%%%%%%%%%%%%%%%%%%%%%%%  LAKE DIVERSIN  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

  187         KK   D-FC4
  188         DT   DOFC4
  189         DI       0     200     500     800    1100    1400    1700    2000    2400    3000
  190         DQ       0       0       0       1      81     230     401     598     896    1405

  191         KK    SFC4
  192         KM   ROUTE FC4 THROUGH 2-4'X10 BOX CULVERTS UNDER EL LAGO BLVD
  193         RS       1    ELEV  1577.4
  194         SQ       0     174     464     774     834     872    1152  2073.6
  195         SE  1577.4  1579.4  1581.4  1583.4 1584.07  1584.4    1585    1586
  196         SA       0     .34       2       4
  197         SE  1577.4    1580    1584    1586
  198         KM
  199         KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  200         KM   +++++                    PANORAMA CHANNEL                                  ++++
  201         KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  202         KM

  203         KK    182H
  204         KM   SUB-BASIN 182H
  205         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  206         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  207         BA    .027
  208         LG    .150    .250   5.700    .207  65.000
  209         UC    .188    .173
  210         UA       0       5      16      30      65      77      84      90      94      97
  211         UA     100

  212         KK   S182H
  213         KM   STORAGE PONDED AREA ON SUB-BASIN 182H
  214         RS       1    ELEV    1601
  215         SQ       0       0       0      82     405
  216         SE    1601    1604    1606    1607    1608
  217         SA       0    0.01    0.06    0.25
  218         SE    1601    1602    1604    1606

  219         KK   R182H
  220         KM   ROUTE S182H THROUGH SUB-BASIN 190A TO CON. POINT PNR1A
  221         RS       1    FLOW       0
  222         RC    0.02    0.02    0.02     290   0.014
  223         RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
  224         RY    1599  1598.5  1598.5    1598    1598  1598.5  1598.5    1599

  225         KK    190A
  226         KM   SUB-BASIN 190A
  227         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  228         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  229         BA    .019
  230         LG    .150    .250   5.700    .207  65.000
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 231          UC    .175    .174
 232          UA       0       5      16      30      65      77      84      90      94      97
 233          UA     100

 234          KK   PNR1A
 235          KM   PANORAMA CONSENTRATION POINT 1A - COMBINE R182H, 190A
 236          HC       2

 237          KK  SPNR1A
 238          KM   STORAGE PONDED AREA ON SUB-BASIN 190A
 239          RS       1    ELEV    1594
 240          SQ       0       0      90    1051
 241          SE    1594    1601    1602    1603
 242          SA       0   0.005    0.08    0.44
 243          SE    1594    1596    1598    1601
 244          KM   ################  STORM DRAIN INLET DIVERTION FLOW ###################

 245          KK  DPNR1A
 246          DT  DRAIN0
 247          DI       0     110     111     200     500     800    1200    3000    5000
 248          DQ       0     110     110     110     110     110     110     110     110

 249          KK   D-C/P
 250          KM   FLOW FROM DIVERSION OUT OF D-C/P AT NORTH END OF FOUNTAIN LAKE
 251          DR   DOC/P

 252          KK     C/P
 253          KM   FOUNTAIN/PANORAMA  CONC. POINT C/P - COMBINE SPNR1A, D-C/P
 254          HC       2

 255          KK  RPNR1A
 256          KM   ROUTE SPNR1A THROUGH SUB-BASIN 190B TO CON. POINT PNR1
 257          RS       2    FLOW       0
 258          RC    0.02    0.02    0.02     567    0.02
 259          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 260          RY    1591  1590.5  1590.5    1590    1590  1590.5  1590.5    1591

 261          KK    190B
 262          KM   SUB-BASIN 190B
 263          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 264          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 265          BA    .007
 266          LG    .150    .250   5.700    .189  65.000
 267          UC    .154    .208
 268          UA       0       5      16      30      65      77      84      90      94      97
 269          UA     100

 270          KK    PNR1
 271          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE RPNR1A, 190B
 272          HC       2
 273          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%    DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%%
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 274          KK  D-PNR1
 275          DT  DOPN-1
 276          DI       0     100     200     300     400     500     700     900    1200    1500
 277          DQ       0       0      17      53     104     165     299     447     681     921
 278          KM   ############################   STORM DRAIN   ############################
 279          KM   Drain flow added in temporaroly

 280          KK  DPNR1A
 281          DR  DRAINO
 282          KM   ROUTE FLOW IN STORM DRAIN

 283          KK  R-DRAO
 284          RK     567     .02    .012             CIR       4

 285          KK    PNR1
 286          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE CP-1 AND DRAIN FLOW
 287          HC       2

 288          KK   D-PN1
 289          KM   DIVERSION TO STORM DRAIN
 290          DT  DRAIN1
 291          DI       0     160     161     200     500     700    1000    2000    2500    3000
 292          DQ       0     160     160     160     160     160     160     160     160     160
 293          KM   ##########################################################################

 294          KK   RPNR1
 295          KM   ROUTE PNR1 THROUGH SUB-BASIN 190C TO CON. POINT PNR2
 296          RS       2    FLOW       0
 297          RC    0.02    0.02    0.02     449    0.01
 298          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 299          RY    1589  1588.5  1588.5    1588    1588  1588.5  1588.5    1589

 300          KK    190C
 301          KM   SUB-BASIN 190C
 302          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 303          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 304          BA    .022
 305          LG    .150    .250   5.700    .189  65.000
 306          UC    .175    .160
 307          UA       0       5      16      30      65      77      84      90      94      97
 308          UA     100

 309          KK    PNR2
 310          KM   PANORAMA CONSENTRATION POINT 2 - COMBINE RPNR1, 190C
 311          HC       2
 312          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%     DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%

 313          KK  D-PNR2
 314          DT  DOPN-2
 315          DI       0     200     400     800    1000    1400    1800    2000    2500    3000
 316          DQ       0       0       1      15      29     116     248     321     520     739
 317          KM   ############################   STORM DRAIN   ############################
 318          KM   Drain flow added in temporaroly
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 319          KK  DPNR2A
 320          DR  DRAIN1
 321          KM   ROUTE FLOW IN STORM DRAIN

 322          KK  R-DRA1
 323          RK     449     .01    .012            CIRC       4

 324          KK    PNR2
 325          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE PNR-2 AND DRAIN FLOW
 326          HC       2

 327          KK   D-PN2
 328          KM   DIVERSION TO STORM DRAIN
 329          DT  DRAIN2
 330          DI       0     180     184     200     300     500     800    1200    2000    3000
 331          DQ       0     180     180     180     180     180     180     180     180     180
 332          KM   ##########################################################################

 333          KK   RPNR2
 334          KM   ROUTE PNR2 THROUGH SUB-BASIN 190I TO CON. POINT PNR3
 335          RS       2    FLOW       0
 336          RC    0.02    0.02    0.02     779   0.012
 337          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 338          RY    1579  1578.5  1578.5    1578    1578  1578.5  1578.5    1579

 339          KK    190I
 340          KM   SUB-BASIN 190I
 341          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 342          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 343          BA    .012
 344          LG    .105    .250   5.700    .174  59.850
 345          UC    .121    .136
 346          UA       0       5      16      30      65      77      84      90      94      97
 347          UA     100

 348          KK    190J
 349          KM   SUB-BASIN 190J
 350          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 351          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 352          BA    .009
 353          LG    .140    .250   5.700    .196  65.000
 354          UC    .167    .221
 355          UA       0       5      16      30      65      77      84      90      94      97
 356          UA     100

 357          KK   *PNR3
 358          KM   CONC. POINT *PNR3 COMBINE R-PNR2, 190J, 190I
 359          HC       3
 360          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%     DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  361         KK   D-PN3
  362         DT  DOPN-3
  363         DI       0     400     800    1600    2000    2800    3600
  364         DQ       0     138     357     919    1203    1788    2391

  365         KK    190D
  366         KM   SUB-BASIN 190D
  367         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  368         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  369         BA    .005
  370         LG    .100    .250   5.700    .189  65.000
  371         UC    .087    .060
  372         UA       0       5      16      30      65      77      84      90      94      97
  373         UA     100

  374         KK   R190D
  375         KM   ROUTE 190D THROUGH SUB-BASIN 190F TO CON. POINT PNR3A
  376         RS       3    FLOW       0
  377         RC    0.04    0.04    0.04     722   0.059
  378         RX    9890    9910    9955    9995   10005   10045   10185   10210
  379         RY    1612    1608    1602    1588    1588    1602    1602    1606

  380         KK    190E
  381         KM   SUB-BASIN 190E
  382         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  383         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  384         BA    .003
  385         LG    .050    .250   5.700    .170  65.000
  386         UC    .112    .228
  387         UA       0       5      16      30      65      77      84      90      94      97
  388         UA     100

  389         KK    190F
  390         KM   SUB-BASIN 190F
  391         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  392         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  393         BA    .006
  394         LG    .100    .250   5.700    .170  65.000
  395         UC    .150    .202
  396         UA       0       5      16      30      65      77      84      90      94      97
  397         UA     100

  398         KK    190G
  399         KM   SUB-BASIN 190G
  400         KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  401         KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  402         BA    .006
  403         LG    .100    .250   5.700    .170  65.000
  404         UC    .167    .279
  405         UA       0       5      16      30      65      77      84      90      94      97
  406         UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 407          KK   PNR3A
 408          KM   PANORAMA CONSENTRATION POINT 3A - COMBINE R190D, 190E, 190F, 190G
 409          HC       4

 410          KK  RPNR3A
 411          KM   ROUTE PNR3A THROUGH SUB-BASIN 190J TO CON. POINT PNR3
 412          RS       1    FLOW       0
 413          RC    0.02    0.02    0.02     287   0.003
 414          RX    9900    9980    9985    9986   10014   10015   10020   11000
 415          RY    1577  1576.6  1576.5    1576    1576  1576.5  1576.6    1577

 416          KK    190H
 417          KM   SUB-BASIN 190H
 418          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 419          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 420          BA    .075
 421          LG    .150    .250   5.700    .207  65.000
 422          UC    .217    .154
 423          UA       0       5      16      30      65      77      84      90      94      97
 424          UA     100

 425          KK   R190H
 426          KM   ROUTE 190H THROUGH SUB-BASIN 190J TO CON. POINT PNR3
 427          RS       2    FLOW       0
 428          RC    0.02    0.02    0.02     660    0.01
 429          RX    9900    9980    9985    9986   10014   10015   10020   11000
 430          RY  1577.2  1576.6  1576.5    1576    1576  1576.5  1576.6  1577.2

 431          KK   PNR-3
 432          KM   PANORAMA CONSENTRATION POINT PNR-3 COMBINE *PNR3, RPNR3A,190-H
 433          HC       3
 434          KM   ############################   STORM DRAIN   ############################
 435          KM   Drain flow added in temporaroly

 436          KK   D-PN2
 437          DR  DRAIN2
 438          KM   ROUTE FLOW IN STORM DRAIN

 439          KK  R-DRA2
 440          RK     779    .012    .012            CIRC       4

 441          KK    PNR3
 442          KM   PANORAMA CONSENTRATION POINT 3 - COMBINE PNR3 AND DRAIN FLOW
 443          HC       2

 444          KK   D-PN3
 445          KM   DIVERSION TO STORM DRAIN
 446          DT  DRAIN3
 447          DI       0     200     201     300     400     800    1000    1500    3000
 448          DQ       0     200     200     200     200     200     200     200     200
 449          KM   ##########################################################################
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 450          KK   RPNR3
 451          KM   ROUTE PNR3 THROUGH SUB-BASIN 190L TO CON. POINT *PNR4
 452          RS       3    FLOW       0
 453          RC    0.02    0.02    0.02    1048   0.022
 454          RX    9900    9963    9968  9968.5 10031.5   10032   10037   11000
 455          RY    1571  1570.6  1570.5    1570    1570  1570.5  1570.6    1571

 456          KK    190K
 457          KM   SUB-BASIN 190K
 458          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 459          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 460          BA    .008
 461          LG    .150    .250   5.700    .207  65.000
 462          UC    .158    .215
 463          UA       0       5      16      30      65      77      84      90      94      97
 464          UA     100

 465          KK   R190K
 466          KM   ROUTE R910K THROUGH SUB-BASIN 190L TO CON. POINT *PNR4
 467          RS       2    FLOW       0
 468          RC    0.02    0.02    0.02     620   0.027
 469          RX    9958    9963    9968  9968.5 10031.5   10032   10037   10042
 470          RY  1570.5  1570.5  1570.5    1570    1570  1570.5  1570.5  1570.5

 471          KK    190L
 472          KM   SUB-BASIN 190L
 473          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 474          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 475          BA    .011
 476          LG    .102    .250   5.400    .218  62.760
 477          UC    .142    .171
 478          UA       0       5      16      30      65      77      84      90      94      97
 479          UA     100

 480          KK   *PNR4
 481          KM   PANORAMA CHANNEL CONC. POINT *4 - RPNR3, R190K, 190L
 482          HC       3
 483          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%     DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

 484          KK  D-PNR4
 485          DT  DOPN-4
 486          DI       0     200     400     800    1000    1400    1800    2000    2500    3000
 487          DQ       0      22      40      87     110     164     223     255     342     437

 488          KK    190M
 489          KM   SUB-BASIN 190M
 490          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 491          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 492          BA    .009
 493          LG    .116    .250   4.600    .311  72.940
 494          UC    .167    .237
 495          UA       0       5      16      30      65      77      84      90      94      97
 496          UA     100
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 537          KK    FL-3
 538          HC       2

 539          KK    LAKE
 540          KM   FOUNTAIN LAKE AREA
 541          BA    .079
 542          LS            100
 543          UD     .03
 544          KM   TOTAL FLOW

 545          KK    FL-4
 546          HC       2

 547          KK   S-FL4
 548          KM   STORAGE ROUTING FOR FOUNTAIN LAKE
 549          KM   ELEVATION BASED ON FOUNTAIN HILLS LOCAL DATUM
 550          KO       3
 551          RS       1    ELEV 1573.49
 552          SQ       0       1      17      56     120     207     290     458     758    1160
 553          SE  1574.5  1574.6  1574.9  1575.1  1575.4  1575.7  1575.8    1576  1576.3  1576.6
 554          SA    27.5   28.81   29.36   30.72   32.66   34.04
 555          SE    1573    1574    1575    1576    1577    1578
 556          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
 NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  9        182G
              .
              .
 30           .        182I
              .           .
              .           .
 39        FC1............
              .
              .
 44           .------->   DOC/P
 42      D-C/P
              V
              V
 47      R-FC1
              .
              .
 58           .        182D
              .           V
              .           V
 67           .       R182D
              .           .
              .           .
 73           .           .        182E
              .           .           .
              .           .           .
 82           .           .           .        182F
              .           .           .           .
              .           .           .           .
 91        FC2.................................
              V
              V
 94       SFC2
              V
              V
101       RFC2
              .
              .
110           .------->   DOFC2
108       DFC2
              .
              .
113           .        182A
              .           V
              .           V
122           .       R182A
              .           .
              .           .
128           .           .        182B
              .           .           .
              .           .           .
137           .        FC3A............
              .           V
              .           V
140           .       SFC3A
              .           .
              .           .
147           .           .        182C
              .           .           .
              .           .           .
156           .        FC3B............
              .           V
              .           V
159           .       RFC3B
              .           .
              .           .
```

```
165        FC3............
             V
             V
168       RFC3
             .
             .
174          .        182J
             .          .
             .          .
183        FC4............
             .
             .
188          .-------->   DOFC4
187      D-FC4
             V
             V
191       SFC4
             .
             .
203          .        182H
             .          V
             .          V
212          .       S182H
             .          V
             .          V
219          .       R182H
             .          .
             .          .
225          .          .        190A
             .          .          .
             .          .          .
234          .       PNR1A............
             .          V
             .          V
237          .      SPNR1A
             .          .
             .          .
246          .          .-------->  DRAINO
245          .      DPNR1A
             .          .
             .          .
251          .          .          .<-------   DOC/P
249          .          .      D-C/P
             .          .          .
             .          .          .
252          .        C/P............
             .          V
             .          V
255          .      RPNR1A
             .          .
             .          .
261          .          .        190B
             .          .          .
             .          .          .
270          .       PNR1............
             .          .
             .          .
275          .          .-------->  DOPN-1
274          .      D-PNR1
             .          .
             .          .
281          .          .          .<-------  DRAINO
280          .          .      DPNR1A
             .          .          V
             .          .          V
283          .          .      R-DRAO
             .          .          .
             .          .          .
285          .       PNR1............
             .          .
             .          .
290          .          .-------->  DRAIN1
```

```
288          .      D-PN1
             .          V
             .          V
294          .      RPNR1
             .          .
             .          .
300          .          .        190C
             .          .          .
             .          .          .
309          .       PNR2............
             .          .
             .          .
314          .          .-------> DOPN-2
313          .     D-PNR2
             .          .
             .          .
320          .          .          .<-------  DRAIN1
319          .          .     DPNR2A
             .          .          V
             .          .          V
322          .          .     R-DRA1
             .          .          .
             .          .          .
324          .       PNR2............
             .          .
             .          .
329          .          .-------> DRAIN2
327          .      D-PN2
             .          V
             .          V
333          .      RPNR2
             .          .
             .          .
339          .          .        190I
             .          .          .
             .          .          .
348          .          .          .       190J
             .          .          .         .
             .          .          .         .
357          .     *PNR3........................
             .          .
             .          .
362          .          .-------> DOPN-3
361          .      D-PN3
             .          .
             .          .
365          .          .        190D
             .          .          V
             .          .          V
374          .          .      R190D
             .          .          .
             .          .          .
380          .          .          .       190E
             .          .          .         .
             .          .          .         .
389          .          .          .         .       190F
             .          .          .         .         .
             .          .          .         .         .
398          .          .          .         .         .       190G
             .          .          .         .         .         .
             .          .          .         .         .         .
407          .          .      PNR3A.................................
             .          .          V
             .          .          V
410          .          .     RPNR3A
             .          .          .
             .          .          .
416          .          .          .       190H
             .          .          .         V
             .          .          .         V
425          .          .          .      R190H
             .          .          .         .
```

```
431          PNR-3.......................
437                        .<-------  DRAIN2
436                   D-PN2
                         V
                         V
439                  R-DRA2
441           PNR3............
446                .------->  DRAIN3
444          D-PN3
                 V
                 V
450          RPNR3
456                    190K
                         V
                         V
465                  R190K
471                            190L
480          *PNR4.......................
485                .------->  DOPN-4
484         D-PNR4
488                    190M
497                            190N
506           PNR4.......................
514                        .<-------   DOFC2
513                   D-FC2
517                                .<-------   DOFC4
516                            D-FC4
519                     FL1............
523                                .<-------  DOPN-1
522                            D-PN1
526                                         .<-------  DOPN-2
525                                     D-PN2
529                                                 .<-------  DOPN-3
528                                             D-PN3
532                                                         .<-------  DOPN-4
531                                                     D-PN4
```

```
534                                  FL-2.................................
537                            FL-3............
539                                  LAKE
545                            FL-4............
                                  V
                                  V
547                            S-FL4
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************                                    *****************************************
*                                       *                                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991               *                                    *    HYDROLOGIC ENGINEERING CENTER      *
*           VERSION 4.0.1E              *                                    *          609 SECOND STREET            *
*     Lahey F77L-EM/32 version 5.01     *                                    *       DAVIS, CALIFORNIA 95616         *
*       Dodson & Associates, Inc.       *                                    *           (916) 551-1748              *
* RUN DATE  11/20/95  TIME  17:23:01    *                                    *                                       *
*****************************************                                    *****************************************

                        ******************************************************************************
                        **                          FOUNTAIN LAKE                                   **
                        ******************************************************************************
                        FUTURE DEVELOPMENT, AGK ENGINEERS, 9-11-95            FILE:   FL-24F.DAT
                        100-Year 24-Hour storm
                        Time step at 2 minutes

    IT          HYDROGRAPH TIME DATA
                      NMIN          2  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ         720  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1    0  ENDING DATE
                    NDTIME       2358  ENDING TIME
                    ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL    0.03 HOURS
                      TOTAL TIME BASE   23.97 HOURS

         ENGLISH UNITS
              DRAINAGE AREA          SQUARE MILES
              PRECIPITATION DEPTH    INCHES
              LENGTH, ELEVATION      FEET
              FLOW                   CUBIC FEET PER SECOND
              STORAGE VOLUME         ACRE-FEET
              SURFACE AREA           ACRES
              TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           **************
           *            *
547 KK     *     S-FL4  *
           *            *
           **************

550 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

551 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC    1573.49  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

554 SA              AREA       27.5     28.8     29.4     30.7     32.7     34.0

555 SE         ELEVATION    1573.00  1574.00  1575.00  1576.00  1577.00  1578.00

552 SQ         DISCHARGE        0.       1.      17.      56.     120.     207.     290.     458.     758.    1160.
```

553 SE	ELEVATION	1574.50	1574.60	1574.90	1575.10	1575.40	1575.70	1575.80	1576.00	1576.30	1576.60

***

COMPUTED STORAGE-ELEVATION DATA

STORAGE	0.00	28.15	57.24	87.27	118.96	152.31
ELEVATION	1573.00	1574.00	1575.00	1576.00	1577.00	1578.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	28.15	42.63	45.54	54.30	57.24	60.18	69.09	78.12	81.16
OUTFLOW	0.00	0.00	0.00	1.00	17.00	36.50	56.00	120.00	207.00	290.00
ELEVATION	1573.00	1574.00	1574.50	1574.60	1574.90	1575.00	1575.10	1575.40	1575.70	1575.80

STORAGE	87.27	96.58	106.05	118.96	152.31
OUTFLOW	458.00	758.00	1160.00	1696.16	3036.49
ELEVATION	1576.00	1576.30	1576.60	1577.00	1578.00

*** *** *** *** ***

HYDROGRAPH AT STATION S-FL4

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	23.97-HR
		(CFS)				
0.	0.03		0.	0.	0.	0.
		(INCHES)	0.000	0.000	0.000	0.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	23.97-HR
35.	23.97	34.	24.	24.	24.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	23.97-HR
1574.23	23.97	1574.20	1573.86	1573.86	1573.86

CUMULATIVE AREA = 0.08 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	182G	65.	12.07	13.	5.	5.	0.05		
HYDROGRAPH AT	182I	56.	12.07	10.	4.	4.	0.04		
2 COMBINED AT	FC1	121.	12.07	24.	8.	8.	0.09		
DIVERSION TO	DOC/P	57.	12.07	19.	7.	7.	0.09		
HYDROGRAPH AT	D-C/P	64.	12.07	5.	1.	1.	0.09		
ROUTED TO	R-FC1	63.	12.10	5.	1.	1.	0.09	1610.28	12.10
HYDROGRAPH AT	182D	168.	12.03	27.	9.	9.	0.09		
ROUTED TO	R182D	166.	12.07	27.	9.	9.	0.09	1610.43	12.07
HYDROGRAPH AT	182E	110.	12.03	17.	6.	6.	0.06		
HYDROGRAPH AT	182F	19.	12.07	4.	1.	1.	0.01		
4 COMBINED AT	FC2	356.	12.07	53.	18.	18.	0.26		
ROUTED TO	SFC2	353.	12.07	53.	18.	18.	0.26	1597.29	12.07
ROUTED TO	RFC2	349.	12.13	53.	18.	18.	0.26	1583.22	12.13
DIVERSION TO	DOFC2	91.	12.13	5.	1.	1.	0.26		
HYDROGRAPH AT	DFC2	258.	12.13	48.	16.	16.	0.26		
HYDROGRAPH AT	182A	93.	12.00	14.	5.	5.	0.05		
ROUTED TO	R182A	92.	12.03	14.	5.	5.	0.05	1620.46	12.03
HYDROGRAPH AT	182B	65.	12.03	11.	4.	4.	0.04		
2 COMBINED AT	FC3A	157.	12.03	25.	9.	9.	0.09		
ROUTED TO	SFC3A	157.	12.07	25.	9.	9.	0.09		

								1597.12	12.07
HYDROGRAPH AT	182C	35.	12.03	6.	2.	2.	0.02		
2 COMBINED AT	FC3B	191.	12.07	31.	11.	11.	0.11		
ROUTED TO	RFC3B	191.	12.07	31.	11.	11.	0.11	1581.08	12.07
2 COMBINED AT	FC3	445.	12.07	79.	27.	27.	0.37		
ROUTED TO	RFC3	444.	12.10	79.	27.	27.	0.37	1583.47	12.10
HYDROGRAPH AT	182J	20.	12.07	3.	1.	1.	0.01		
2 COMBINED AT	FC4	463.	12.10	82.	28.	28.	0.39		
DIVERSION TO	DOFC4	0.	12.10	0.	0.	0.	0.39		
HYDROGRAPH AT	D-FC4	463.	12.10	82.	28.	28.	0.39		
ROUTED TO	SFC4	457.	12.13	82.	28.	28.	0.39	1581.35	12.13
HYDROGRAPH AT	182H	46.	12.03	7.	2.	2.	0.03		
ROUTED TO	S182H	45.	12.07	7.	2.	2.	0.03	1606.55	12.07
ROUTED TO	R182H	45.	12.07	7.	2.	2.	0.03	1598.22	12.07
HYDROGRAPH AT	190A	33.	12.03	5.	2.	2.	0.02		
2 COMBINED AT	PNR1A	78.	12.03	11.	4.	4.	0.05		
ROUTED TO	SPNR1A	75.	12.10	11.	3.	3.	0.05	1601.83	12.10
DIVERSION TO	DRAINO	75.	0.03	11.	3.	3.	0.05		
HYDROGRAPH AT	DPNR1A	0.	0.03	0.	0.	0.	0.05		
HYDROGRAPH AT	D-C/P	57.	12.07	19.	7.	7.	0.00		
2 COMBINED AT	C/P	57.	12.07	19.	7.	7.	0.05		
ROUTED TO	RPNR1A	57.	12.10	19.	7.	7.	0.05	1590.23	12.10

HYDROGRAPH AT	190B	12.	12.03	2.	1.	1.	0.01	
2 COMBINED AT	PNR1	68.	12.07	21.	7.	7.	0.05	
DIVERSION TO	DOPN-1	0.	12.07	0.	0.	0.	0.05	
HYDROGRAPH AT	D-PNR1	68.	12.07	21.	7.	7.	0.05	
HYDROGRAPH AT	DPNR1A	75.	12.10	11.	3.	3.	0.00	
ROUTED TO	R-DRA0	75.	12.10	11.	3.	3.	0.00	
2 COMBINED AT	PNR1	142.	12.07	32.	11.	11.	0.05	
DIVERSION TO	DRAIN1	142.	0.03	32.	11.	11.	0.05	
HYDROGRAPH AT	D-PN1	0.	0.03	0.	0.	0.	0.05	
ROUTED TO	RPNR1	0.	0.03	0.	0.	0.	0.05	1588.00 0.00
HYDROGRAPH AT	190C	38.	12.03	5.	2.	2.	0.02	
2 COMBINED AT	PNR2	38.	12.03	5.	2.	2.	0.08	
DIVERSION TO	DOPN-2	0.	12.03	0.	0.	0.	0.08	
HYDROGRAPH AT	D-PNR2	38.	12.03	5.	2.	2.	0.08	
HYDROGRAPH AT	DPNR2A	142.	12.07	32.	11.	11.	0.00	
ROUTED TO	R-DRA1	142.	12.10	32.	11.	11.	0.00	
2 COMBINED AT	PNR2	179.	12.03	37.	12.	12.	0.08	
DIVERSION TO	DRAIN2	179.	0.03	37.	12.	12.	0.08	
HYDROGRAPH AT	D-PN2	0.	0.03	0.	0.	0.	0.08	
ROUTED TO	RPNR2	0.	0.03	0.	0.	0.	0.08	1578.00 0.00
HYDROGRAPH AT	190I	22.	12.00	3.	1.	1.	0.01	
HYDROGRAPH AT	190J	15.	12.03	2.	1.	1.	0.01	
3 COMBINED AT	*PNR3	36.	12.00	5.	2.	2.	0.10	
DIVERSION TO								

	DOPN-3	12.	12.00	2.	1.	1.	0.10		
HYDROGRAPH AT	D-PN3	24.	12.00	3.	1.	1.	0.10		
HYDROGRAPH AT	190D	9.	12.00	1.	0.	0.	0.00		
ROUTED TO	R190D	9.	12.00	1.	0.	0.	0.00	1588.08	11.90
HYDROGRAPH AT	190E	5.	12.03	1.	0.	0.	0.00		
HYDROGRAPH AT	190F	10.	12.03	2.	0.	0.	0.01		
HYDROGRAPH AT	190G	9.	12.03	2.	0.	0.	0.01		
4 COMBINED AT	PNR3A	33.	12.00	5.	2.	2.	0.02		
ROUTED TO	RPNR3A	33.	12.03	5.	2.	2.	0.02	1576.48	12.03
HYDROGRAPH AT	190H	131.	12.03	19.	6.	6.	0.08		
ROUTED TO	R190H	128.	12.07	19.	6.	6.	0.08	1576.70	12.07
3 COMBINED AT	PNR-3	184.	12.03	27.	9.	9.	0.19		
HYDROGRAPH AT	D-PN2	179.	12.03	37.	12.	12.	0.00		
ROUTED TO	R-DRA2	179.	12.07	37.	12.	12.	0.00		
2 COMBINED AT	PNR3	362.	12.03	64.	21.	21.	0.19		
DIVERSION TO	DRAIN3	200.	12.03	54.	19.	19.	0.19		
HYDROGRAPH AT	D-PN3	162.	12.03	10.	3.	3.	0.19		
ROUTED TO	RPNR3	161.	12.07	10.	3.	3.	0.19	1570.42	12.07
HYDROGRAPH AT	190K	13.	12.03	2.	1.	1.	0.01		
ROUTED TO	R190K	13.	12.07	2.	1.	1.	0.01	1570.09	12.07
HYDROGRAPH AT	190L	19.	12.00	3.	1.	1.	0.01		
3 COMBINED AT	*PNR4	192.	12.07	15.	4.	4.	0.21		
DIVERSION TO	DOPN-4	21.	12.07	2.	0.	0.	0.21		

HYDROGRAPH AT	D-PNR4	171.	12.07	13.	4.	4.	0.21	
HYDROGRAPH AT	190M	14.	12.03	2.	1.	1.	0.01	
HYDROGRAPH AT	190N	31.	12.00	4.	1.	1.	0.02	
3 COMBINED AT	PNR4	214.	12.07	20.	6.	6.	0.24	
HYDROGRAPH AT	D-FC2	91.	12.13	5.	1.	1.	0.00	
HYDROGRAPH AT	D-FC4	0.	0.03	0.	0.	0.	0.00	
2 COMBINED AT	FL1	91.	12.13	5.	1.	1.	0.00	
HYDROGRAPH AT	D-PN1	0.	0.03	0.	0.	0.	0.00	
HYDROGRAPH AT	D-PN2	0.	0.03	0.	0.	0.	0.00	
HYDROGRAPH AT	D-PN3	12.	12.00	2.	1.	1.	0.00	
HYDROGRAPH AT	D-PN4	21.	12.07	2.	0.	0.	0.00	
4 COMBINED AT	FL-2	33.	12.03	3.	1.	1.	0.00	
2 COMBINED AT	FL-3	120.	12.10	8.	2.	2.	0.00	
HYDROGRAPH AT	LAKE	155.	11.70	24.	9.	9.	0.08	
2 COMBINED AT	FL-4	252.	12.00	32.	11.	11.	0.08	
ROUTED TO	S-FL4	0.	0.03	0.	0.	0.	0.08	1574.23 23.97

*** NORMAL END OF HEC-1 ***

F.2

HEC-1 OUTPUT FOR ½ PMF

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             MAY   1991               *
*          VERSION 4.0.1E              *
*    Lahey F77L-EM/32 version 5.01     *
*      Dodson & Associates, Inc.       *
* RUN DATE  11/20/95  TIME  17:23:56   *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   ******************************************************************************
  2           ID   **                              FOUNTAIN LAKE                               **
  3           ID   ******************************************************************************
  4           ID
  5           ID   FUTURE DEVELOPMENT, AGK ENGINEERS, 9-11-95            FILE: D19-PMFF.DAT
  6           ID   Probable Maximum Flow
  7           ID   Time step at 2 minutes
  8           ID
  9           IT       2                    200
              *DIAGRAM
 10           JR    FLOW       1     0.5
 11           ID   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 12           ID   +++++                PANORAMA WASH / FOUNTAIN CHANNEL                  +++++
 13           ID   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 14           KK    182G
 15           KM   SUB-BASIN 182G
 16           KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 17           KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 18           IO       5
 19           IN      15
 20           PB   14.26
 21           KM   ---------------------------------------------------------------------------
 22           KM   --------                        6-HR PMF DISTRIBUTION              ---------
 23           KM   ---------------------------------------------------------------------------
 24           PC    .000   .0007   .0014   .0056   .0113   .0154   .0224   .0288   .0387   .0526
 25           PC   .0701   .0968   .1323   .7290   .8500   .8984   .9387   .9509   .9649   .9762
 26           PC   .9855   .9937   .9993   1.000   1.000
 27           KM   ---------------------------------------------------------------------------
 28           BA    .048
 29           LG    .061    .250   5.700    .170  82.370
 30           UC    .275    .392
 31           UA       0       5      16      30      65      77      84      90      94      97
 32           UA     100

 33           KK    182I
 34           KM   SUB-BASIN 182I
 35           KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 36           KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 37           BA    .040
 38           LG    .070    .250   5.700    .170  72.940
 39           UC    .267    .346
 40           UA       0       5      16      30      65      77      84      90      94      97
 41           UA     100

 42           KK     FC1
 43           KM   FOUNTAIN CHANNEL CONC. POINT 1 - COMBINE 182G, 182I
 44           HC       2

 45           KK   D-C/P
 46           KM   DIVERSION FROM FOUNTAIN CHANNEL INTO PANORAMA WASH
 47           DT   DOC/P
 48           DI     118     374     732    1177    1700    2294    2953    3673
 49           DQ      56     177     346     556     803    1082    1392    1730
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  50          KK   R-FC1
  51          KM   ROUTE NON DIVERTED FLOW THROUGH SUB-BASIN 182E
  52          RS       1    FLOW       0
  53          RC     .02     .02     .02     570    .012
  54          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
  55          RY    1611  1610.5  1610.5    1610    1610  1610.5  1610.5    1611
  56          KM
  57          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  58          KM   ++++                        FOUNTAIN CHANNEL                        ++++
  59          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  60          KM

  61          KK    182D
  62          KM   SUB-BASIN 182D
  63          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  64          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
  65          BA    .094
  66          LG    .100    .250   5.700    .188  89.780
  67          UC    .217    .173
  68          UA       0       5      16      30      65      77      84      90      94      97
  69          UA     100

  70          KK   R182D
  71          KM   ROUTE 182D THROUGH SUB-BASIN 182E
  72          RS       4    FLOW       0
  73          RC     .02     .02     .02    1994    .021
  74          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
  75          RY    1611  1610.5  1610.5    1610    1610  1610.5  1610.5    1611

  76          KK    182E
  77          KM   SUB-BASIN 182E
  78          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  79          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
  80          BA    .064
  81          LG    .091    .250   5.700    .170  74.290
  82          UC    .221    .187
  83          UA       0       5      16      30      65      77      84      90      94      97
  84          UA     100

  85          KK    182F
  86          KM   SUB-BASIN 182F
  87          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
  88          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
  89          BA    .015
  90          LG    .050    .250   5.700    .170  65.490
  91          UC    .233    .448
  92          UA       0       5      16      30      65      77      84      90      94      97
  93          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  94          KK     FC2
  95          KM   FOUNTAIN CHANNEL CONC. POINT 2 - COMBINE RFC1, R182D, 182E, 182F
  96          HC       4

  97          KK    SFC2
  98          KM   CATCH BASIN(2X3 AND TRIANGULAR),CULVERT UNDER SAGUARO BLVD AND SPILLWAYS
  99          RS       1    ELEV    1596
 100          SQ       0    10.4      41     181     482     913    3000
 101          SE    1596  1596.2  1596.5    1597  1597.5    1598    1600
 102          SA   0.001    0.48    0.80       1     1.5
 103          SE    1596  1596.5    1597    1598    1600

 104          KK    RFC2
 105          KM   ROUTE SFC2 TO THROUGH SUB-BASIN 182J TO FC3 IN MIDDLE OF 182J
 106          RS       2    FLOW       0
 107          RC     .04     .04     .04    1050    .011
 108          RX    9960    9970    9975    9980   10040   10090   10150   10220
 109          RY  1584.5    1584    1583    1582    1582    1590    1592    1594
 110          KM   %%%%%%%%%%%%%%%%%%%%   LAKE DIVERSION   %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

 111          KK    DFC2
 112          KM   FLOW SPILL INTO THE LAKE
 113          DT   DOFC2
 114          DI       0     200     400     600     800    1000    1200    1800    2000    2700
 115          DQ       0       0     122     295     478     661     851    1437    1636    2335

 116          KK    182A
 117          KM   SUB-BASIN 182A
 118          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 119          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 120          BA    .050
 121          LG    .150    .250   5.700    .189  90.000
 122          UC    .175    .136
 123          UA       0       5      16      30      65      77      84      90      94      97
 124          UA     100

 125          KK   R182A
 126          KM   ROUTE SUB-BASIN 182A THROUGH SUB-BASIN 182B
 127          RS       4    FLOW       0
 128          RC     .02     .02     .02    1950    .025
 129          RX    9800    9980    9985    9986   10014   10015   10020   12000
 130          RY    1621  1620.5  1620.5    1620    1620  1620.5  1620.5    1621

 131          KK    182B
 132          KM   SUB-BASIN 182B
 133          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 134          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 135          BA    .039
 136          LG    .095    .250   5.700    .170  80.670
 137          UC    .213    .222
 138          UA       0       5      16      30      65      77      84      90      94      97
 139          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 234          UC    .175    .174
 235          UA       0       5      16      30      65      77      84      90      94      97
 236          UA     100

 237          KK   PNR1A
 238          KM   PANORAMA CONSENTRATION POINT 1A - COMBINE R182H, 190A
 239          HC       2

 240          KK  SPNR1A
 241          KM   STORAGE PONDED AREA ON SUB-BASIN 190A
 242          RS       1    ELEV    1594
 243          SQ       0       0      90    1051
 244          SE    1594    1601    1602    1603
 245          SA       0   0.005    0.08    0.44
 246          SE    1594    1596    1598    1601
 247          KM   ################  STORM DRAIN INLET DIVERTION FLOW ##################

 248          KK  DPNR1A
 249          DT  DRAIN0
 250          DI       0     110     111     200     500     800    1200    3000    5000
 251          DQ       0     110     110     110     110     110     110     110     110

 252          KK   D-C/P
 253          KM   FLOW FROM DIVERSION OUT OF D-C/P AT NORTH END OF FOUNTAIN LAKE
 254          DR   DOC/P

 255          KK     C/P
 256          KM   FOUNTAIN/PANORAMA  CONC. POINT C/P - COMBINE SPNR1A, D-C/P
 257          HC       2

 258          KK  RPNR1A
 259          KM   ROUTE SPNR1A THROUGH SUB-BASIN 190B TO CON. POINT PNR1
 260          RS       2    FLOW       0
 261          RC    0.02    0.02    0.02     567    0.02
 262          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 263          RY    1591  1590.5  1590.5    1590    1590  1590.5  1590.5    1591

 264          KK    190B
 265          KM   SUB-BASIN 190B
 266          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 267          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 268          BA    .007
 269          LG    .150    .250   5.700    .189  65.000
 270          UC    .154    .208
 271          UA       0       5      16      30      65      77      84      90      94      97
 272          UA     100

 273          KK    PNR1
 274          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE RPNR1A, 190B
 275          HC       2
 276          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%    DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%%
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 277          KK  D-PNR1
 278          DT  DOPN-1
 279          DI       0     100     200     300     400     500     700     900    1200    1500
 280          DQ       0       0      17      53     104     165     299     447     681     921
 281          KM   ############################   STORM DRAIN   ############################
 282          KM   Drain flow added in temporaroly

 283          KK  DPNR1A
 284          DR  DRAIN0
 285          KM   ROUTE FLOW IN STORM DRAIN

 286          KK  R-DRA0
 287          RK     567     .02    .012             CIR       4

 288          KK    PNR1
 289          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE CP-1 AND DRAIN FLOW
 290          HC       2

 291          KK   D-PN1
 292          KM   DIVERSION TO STORM DRAIN
 293          DT  DRAIN1
 294          DI       0     160     161     200     500     700    1000    2000    2500    3000
 295          DQ       0     160     160     160     160     160     160     160     160     160
 296          KM   ##########################################################################

 297          KK   RPNR1
 298          KM   ROUTE PNR1 THROUGH SUB-BASIN 190C TO CON. POINT PNR2
 299          RS       2    FLOW       0
 300          RC    0.02    0.02    0.02     449    0.01
 301          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 302          RY    1589  1588.5  1588.5    1588    1588  1588.5  1588.5    1589

 303          KK    190C
 304          KM   SUB-BASIN 190C
 305          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 306          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 307          BA    .022
 308          LG    .150    .250   5.700    .189  65.000
 309          UC    .175    .160
 310          UA       0       5      16      30      65      77      84      90      94      97
 311          UA     100

 312          KK    PNR2
 313          KM   PANORAMA CONSENTRATION POINT 2 - COMBINE RPNR1, 190C
 314          HC       2
 315          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%    DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%

 316          KK  D-PNR2
 317          DT  DOPN-2
 318          DI       0     200     400     800    1000    1400    1800    2000    2500    3000
 319          DQ       0       0       1      15      29     116     248     321     520     739
 320          KM   ############################   STORM DRAIN   ############################
 321          KM   Drain flow added in temporaroly
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 322          KK  DPNR2A
 323          DR  DRAIN1
 324          KM   ROUTE FLOW IN STORM DRAIN

 325          KK  R-DRA1
 326          RK     449     .01    .012            CIRC       4

 327          KK    PNR2
 328          KM   PANORAMA CONSENTRATION POINT 1 - COMBINE PNR-2 AND DRAIN FLOW
 329          HC       2

 330          KK   D-PN2
 331          KM   DIVERSION TO STORM DRAIN
 332          DT  DRAIN2
 333          DI       0     180     184     200     300     500     800    1200    2000    3000
 334          DQ       0     180     180     180     180     180     180     180     180     180
 335          KM   ######################################################################

 336          KK   RPNR2
 337          KM   ROUTE PNR2 THROUGH SUB-BASIN 190I TO CON. POINT PNR3
 338          RS       2    FLOW       0
 339          RC    0.02    0.02    0.02     779   0.012
 340          RX    9800    9963    9968  9968.5 10031.5   10032   10037   12000
 341          RY    1579  1578.5  1578.5    1578    1578  1578.5  1578.5    1579

 342          KK    190I
 343          KM   SUB-BASIN 190I
 344          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 345          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 346          BA    .012
 347          LG    .105    .250   5.700    .174  59.850
 348          UC    .121    .136
 349          UA       0       5      16      30      65      77      84      90      94      97
 350          UA     100

 351          KK    190J
 352          KM   SUB-BASIN 190J
 353          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 354          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 355          BA    .009
 356          LG    .140    .250   5.700    .196  65.000
 357          UC    .167    .221
 358          UA       0       5      16      30      65      77      84      90      94      97
 359          UA     100

 360          KK   *PNR3
 361          KM   CONC. POINT *PNR3 COMBINE R-PNR2, 190J, 190I
 362          HC       3
 363          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%    DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%%
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 364          KK   D-PN3
 365          DT  DOPN-3
 366          DI       0     400     800    1600    2000    2800    3600
 367          DQ       0     138     357     919    1203    1788    2391

 368          KK    190D
 369          KM   SUB-BASIN 190D
 370          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 371          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 372          BA    .005
 373          LG    .100    .250   5.700    .189  65.000
 374          UC    .087    .060
 375          UA       0       5      16      30      65      77      84      90      94      97
 376          UA     100

 377          KK   R190D
 378          KM   ROUTE 190D THROUGH SUB-BASIN 190F TO CON. POINT PNR3A
 379          RS       3    FLOW       0
 380          RC    0.04    0.04    0.04     722   0.059
 381          RX    9890    9910    9955    9995   10005   10045   10185   10210
 382          RY    1612    1608    1602    1588    1588    1602    1602    1606

 383          KK    190E
 384          KM   SUB-BASIN 190E
 385          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 386          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 387          BA    .003
 388          LG    .050    .250   5.700    .170  65.000
 389          UC    .112    .228
 390          UA       0       5      16      30      65      77      84      90      94      97
 391          UA     100

 392          KK    190F
 393          KM   SUB-BASIN 190F
 394          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 395          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 396          BA    .006
 397          LG    .100    .250   5.700    .170  65.000
 398          UC    .150    .202
 399          UA       0       5      16      30      65      77      84      90      94      97
 400          UA     100

 401          KK    190G
 402          KM   SUB-BASIN 190G
 403          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 404          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 405          BA    .006
 406          LG    .100    .250   5.700    .170  65.000
 407          UC    .167    .279
 408          UA       0       5      16      30      65      77      84      90      94      97
 409          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 410          KK   PNR3A
 411          KM   PANORAMA CONSENTRATION POINT 3A - COMBINE R190D, 190E, 190F, 190G
 412          HC       4

 413          KK  RPNR3A
 414          KM   ROUTE PNR3A THROUGH SUB-BASIN 190J TO CON. POINT PNR3
 415          RS       1    FLOW       0
 416          RC    0.02    0.02    0.02     287   0.003
 417          RX    9900    9980    9985    9986   10014   10015   10020   11000
 418          RY    1577  1576.6  1576.5    1576    1576  1576.5  1576.6    1577

 419          KK    190H
 420          KM   SUB-BASIN 190H
 421          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 422          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF .999
 423          BA    .075
 424          LG    .150    .250   5.700    .207  65.000
 425          UC    .217    .154
 426          UA       0       5      16      30      65      77      84      90      94      97
 427          UA     100

 428          KK   R190H
 429          KM   ROUTE 190H THROUGH SUB-BASIN 190J TO CON. POINT PNR3
 430          RS       2    FLOW       0
 431          RC    0.02    0.02    0.02     660    0.01
 432          RX    9900    9980    9985    9986   10014   10015   10020   11000
 433          RY  1577.2  1576.6  1576.5    1576    1576  1576.5  1576.6  1577.2

 434          KK   PNR-3
 435          KM   PANORAMA CONSENTRATION POINT PNR-3 COMBINE *PNR3, RPNR3A,190-H
 436          HC       3
 437          KM   ############################   STORM DRAIN   ############################
 438          KM   Drain flow added in temporaroly

 439          KK   D-PN2
 440          DR  DRAIN2
 441          KM   ROUTE FLOW IN STORM DRAIN

 442          KK  R-DRA2
 443          RK     779    .012    .012            CIRC       4

 444          KK    PNR3
 445          KM   PANORAMA CONSENTRATION POINT 3 - COMBINE PNR3 AND DRAIN FLOW
 446          HC       2

 447          KK   D-PN3
 448          KM   DIVERSION TO STORM DRAIN
 449          DT  DRAIN3
 450          DI       0     200     201     300     400     800    1000    1500    3000
 451          DQ       0     200     200     200     200     200     200     200     200
 452          KM   ##########################################################################
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 453          KK   RPNR3
 454          KM   ROUTE PNR3 THROUGH SUB-BASIN 190L TO CON. POINT *PNR4
 455          RS       3    FLOW       0
 456          RC    0.02    0.02    0.02    1048   0.022
 457          RX    9900    9963    9968  9968.5 10031.5   10032   10037   11000
 458          RY    1571  1570.6  1570.5    1570    1570  1570.5  1570.6    1571

 459          KK    190K
 460          KM   SUB-BASIN 190K
 461          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 462          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 463          BA    .008
 464          LG    .150    .250   5.700    .207  65.000
 465          UC    .158    .215
 466          UA       0       5      16      30      65      77      84      90      94      97
 467          UA     100

 468          KK   R190K
 469          KM   ROUTE R910K THROUGH SUB-BASIN 190L TO CON. POINT *PNR4
 470          RS       2    FLOW       0
 471          RC    0.02    0.02    0.02     620   0.027
 472          RX    9958    9963    9968  9968.5 10031.5   10032   10037   10042
 473          RY  1570.5  1570.5  1570.5    1570    1570  1570.5  1570.5  1570.5

 474          KK    190L
 475          KM   SUB-BASIN 190L
 476          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 477          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 478          BA    .011
 479          LG    .102    .250   5.400    .218  62.760
 480          UC    .142    .171
 481          UA       0       5      16      30      65      77      84      90      94      97
 482          UA     100

 483          KK   *PNR4
 484          KM   PANORAMA CHANNEL CONC. POINT *4 - RPNR3, R190K, 190L
 485          HC       3
 486          KM   %%%%%%%%%%%%%%%%%%%%%%%%%%    DIVERSION TO LAKE   %%%%%%%%%%%%%%%%%%%%%%%%%%%%

 487          KK  D-PNR4
 488          DT  DOPN-4
 489          DI       0     200     400     800    1000    1400    1800    2000    2500    3000
 490          DQ       0      22      40      87     110     164     223     255     342     437

 491          KK    190M
 492          KM   SUB-BASIN 190M
 493          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 494          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 495          BA    .009
 496          LG    .116    .250   4.600    .311  72.940
 497          UC    .167    .237
 498          UA       0       5      16      30      65      77      84      90      94      97
 499          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 500          KK    190N
 501          KM   SUB-BASIN 190N
 502          KM   6-HOUR RAINFALL, PATTERN NO. 1.00 WAS USED TO FIND TC & R FOR THIS BASIN
 503          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF1.000
 504          BA    .018
 505          LG    .150    .250   5.700    .207  65.000
 506          UC    .167    .160
 507          UA       0       5      16      30      65      77      84      90      94      97
 508          UA     100

 509          KK    PNR4
 510          KM   PANORAMA CONSENTRATION POINT 3 - COMBINE (RPNR3, R190K, 190L), 190M, 190N
 511          HC       3
 512          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 513          KM   +++++                        FLOW TO FUUNTAIN LAKE                      ++++++
 514          KM   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 515          KM   FLOW FROM FOUNTAIN CHANNEL (UPSTREAM REACH)

 516          KK   D-FC2
 517          DR   DOFC2
 518          KM   FLOW FROM FOUNTAIN CHANNEL (DOWNSTREAM REACH)

 519          KK   D-FC4
 520          DR   DOFC4
 521          KM   TOTAL FLOW FROM FOUNTAIN CHANNEL

 522          KK     FL1
 523          HC       2
 524          KM   FLOW FROM PANORAMA DRIVE

 525          KK   D-PN1
 526          DR  DOPN-1
 527          KM   FLOW FROM PANORAMA DRIVE

 528          KK   D-PN2
 529          DR  DOPN-2
 530          KM   FLOW FROM PANORAMA DRIVE

 531          KK   D-PN3
 532          DR  DOPN-3
 533          KM   FLOW FROM PANORAMA DRIVE

 534          KK   D-PN4
 535          DR  DOPN-4
 536          KM   TOTAL FLOW FROM PANORAMA DRIVE

 537          KK    FL-2
 538          HC       4
 539          KM   TOTAL INFLOW TO FOUNTAIN LAKE
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 540          KK    FL-3
 541          HC       2

 542          KK    LAKE
 543          KM   FOUNTAIN LAKE AREA
 544          BA    .079
 545          LS             100
 546          UD     .03
 547          KM   TOTAL FLOW

 548          KK    FL-4
 549          HC       2

 550          KK   S-FL4
 551          KM   STORAGE ROUTING FOR FOUNTAIN LAKE
 552          KM   ELEVATIONS BASED ON FOUNTAIN HILLS LOCAL DATUM
 553          KO       3
 554          RS       1    ELEV 1573.49
 555          SQ       0       1      17      56     120     207     290     458     758    1160
 556          SE  1574.5  1574.6  1574.9  1575.1  1575.4  1575.7  1575.8    1576  1576.3  1576.6
 557          SA    27.5   28.81   29.36   30.72   32.66   34.04
 558          SE    1573    1574    1575    1576    1577    1578
 559          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  14        182G
               .
               .
  33           .        182I
               .          .
               .          .
  42         FC1............
               .
               .
  47           .-------->   DOC/P
  45       D-C/P
              V
              V
  50       R-FC1
               .
               .
  61           .        182D
               .          V
               .          V
  70           .      R182D
               .          .
               .          .
  76           .          .        182E
               .          .          .
               .          .          .
  85           .          .          .        182F
               .          .          .          .
               .          .          .          .
  94         FC2.................................
              V
              V
  97       SFC2
              V
              V
 104       RFC2
               .
               .
 113           .-------->   DOFC2
 111       DFC2
               .
               .
 116           .        182A
               .          V
               .          V
 125           .      R182A
               .          .
               .          .
 131           .          .        182B
               .          .          .
               .          .          .
 140           .       FC3A............
               .          V
               .          V
 143           .      SFC3A
               .          .
               .          .
 150           .          .        182C
               .          .          .
               .          .          .
 159           .       FC3B............
               .          V
               .          V
 162           .      RFC3B
               .          .
               .          .
```

```
168        FC3............
             V
             V
171       RFC3
             .
             .
177          .        182J
             .           .
             .           .
186        FC4............
             .
             .
191          .-------->  DOFC4
190      D-FC4
             V
             V
194       SFC4
             .
             .
206          .        182H
             .           V
             .           V
215          .       S182H
             .           V
             .           V
222          .       R182H
             .           .
             .           .
228          .           .        190A
             .           .           .
             .           .           .
237          .       PNR1A............
             .           V
             .           V
240          .      SPNR1A
             .           .
             .           .
249          .           .-------->  DRAIN0
248          .      DPNR1A
             .           .
             .           .
254          .           .           .<-------   DOC/P
252          .           .       D-C/P
             .           .           .
             .           .           .
255          .         C/P............
             .           V
             .           V
258          .      RPNR1A
             .           .
             .           .
264          .           .        190B
             .           .           .
             .           .           .
273          .        PNR1............
             .           .
             .           .
278          .           .-------->  DOPN-1
277          .      D-PNR1
             .           .
             .           .
284          .           .           .<-------  DRAIN0
283          .           .      DPNR1A
             .           .           V
             .           .           V
286          .           .      R-DRA0
             .           .           .
             .           .           .
288          .        PNR1............
             .           .
             .           .
293          .           .-------->  DRAIN1
```

```
291          .      D-PN1
             .        V
             .        V
297          .      RPNR1
             .        .
             .        .
303          .        .        190C
             .        .          .
             .        .          .
312          .      PNR2............
             .        .
             .        .
317          .        .-------> DOPN-2
316          .    D-PNR2
             .        .
             .        .
323          .        .          .<-------  DRAIN1
322          .        .     DPNR2A
             .        .          V
             .        .          V
325          .        .     R-DRA1
             .        .          .
             .        .          .
327          .      PNR2............
             .        .
             .        .
332          .        .-------> DRAIN2
330          .      D-PN2
             .        V
             .        V
336          .      RPNR2
             .        .
             .        .
342          .        .        190I
             .        .          .
             .        .          .
351          .        .          .        190J
             .        .          .          .
             .        .          .          .
360          .    *PNR3........................
             .        .
             .        .
365          .        .-------> DOPN-3
364          .    D-PN3
             .        .
             .        .
368          .        .        190D
             .        .          V
             .        .          V
377          .        .      R190D
             .        .          .
             .        .          .
383          .        .          .        190E
             .        .          .          .
             .        .          .          .
392          .        .          .          .        190F
             .        .          .          .          .
             .        .          .          .          .
401          .        .          .          .          .        190G
             .        .          .          .          .          .
             .        .          .          .          .          .
410          .        .      PNR3A.................................
             .        .          V
             .        .          V
413          .        .     RPNR3A
             .        .          .
             .        .          .
419          .        .          .        190H
             .        .          .          V
             .        .          .          V
428          .        .          .       R190H
             .        .          .          .
```

```
434        PNR-3.......................

440                 .<-------  DRAIN2
439            D-PN2
                  V
                  V
442            R-DRA2
                  .
                  .
444         PNR3............
                  .
                  .
449               .------->  DRAIN3
447        D-PN3
              V
              V
453        RPNR3
                  .
                  .
459                190K
                     V
                     V
468            R190K
                     .
                     .
474                  .        190L
                     .          .
                     .          .
483       *PNR4........................
                  .
                  .
488               .------->  DOPN-4
487       D-PNR4
                  .
                  .
491                190M
                     .
                     .
500                  .        190N
                     .          .
                     .          .
509         PNR4........................
                  .
                  .
517                 .<-------   DOFC2
516            D-FC2
                     .
                     .
520                  .          .<-------   DOFC4
519                  .       D-FC4
                     .          .
                     .          .
522                FL1............
                     .
                     .
526                  .          .<-------  DOPN-1
525                  .       D-PN1
                     .          .
                     .          .
529                  .          .          .<-------  DOPN-2
528                  .          .       D-PN2
                     .          .          .
                     .          .          .
532                  .          .          .          .<-------  DOPN-3
531                  .          .          .       D-PN3
                     .          .          .          .
                     .          .          .          .
535                  .          .          .          .          .<-------  DOPN-4
534                  .          .          .          .       D-PN4
                     .          .          .          .          .
```

```
537                                  FL-2.....................................
                                     .
540                            FL-3.............
                                     .
542                                  LAKE
                                     .
548                            FL-4.............
                                     V
                                     V
550                            S-FL4
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*           VERSION 4.0.1E              *
*     Lahey F77L-EM/32 version 5.01     *
*       Dodson & Associates, Inc.       *
*  RUN DATE  11/20/95  TIME  17:23:56   *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
*******************************************************************************
**                                FOUNTAIN LAKE                                **
*******************************************************************************

FUTURE DEVELOPMENT, AGK ENGINEERS, 9-11-95            FILE: D19-PMFF.DAT
Probable Maximum Flow
Time step at 2 minutes

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++                PANORAMA WASH / FOUNTAIN CHANNEL                     +++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

  IT          HYDROGRAPH TIME DATA
                    NMIN          2  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1    0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        200  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      1    0  ENDING DATE
                  NDTIME       0638  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.03 HOURS
                   TOTAL TIME BASE    6.63 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT

  JP          MULTI-PLAN OPTION
                 NPLAN           1  NUMBER OF PLANS

  JR          MULTI-RATIO OPTION
                RATIOS OF RUNOFF
              1.00      0.50

** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
550 KK    *    S-FL4   *
          *            *
          **************

553 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

554 RS          STORAGE ROUTING
                     NSTPS           1  NUMBER OF SUBREACHES
```

ITYP	ELEV	TYPE OF INITIAL CONDITION	
RSVRIC	1573.49	INITIAL CONDITION	
X	0.00	WORKING R AND D COEFFICIENT	

557 SA	AREA	27.5	28.8	29.4	30.7	32.7	34.0				
558 SE	ELEVATION	1573.00	1574.00	1575.00	1576.00	1577.00	1578.00				
555 SQ	DISCHARGE	0.	1.	17.	56.	120.	207.	290.	458.	758.	1160.
556 SE	ELEVATION	1574.50	1574.60	1574.90	1575.10	1575.40	1575.70	1575.80	1576.00	1576.30	1576.60

***

COMPUTED STORAGE-ELEVATION DATA

STORAGE	0.00	28.15	57.24	87.27	118.96	152.31
ELEVATION	1573.00	1574.00	1575.00	1576.00	1577.00	1578.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	28.15	42.63	45.54	54.30	57.24	60.18	69.09	78.12	81.16
OUTFLOW	0.00	0.00	0.00	1.00	17.00	36.50	56.00	120.00	207.00	290.00
ELEVATION	1573.00	1574.00	1574.50	1574.60	1574.90	1575.00	1575.10	1575.40	1575.70	1575.80

STORAGE	87.27	96.58	106.05	118.96	152.31
OUTFLOW	458.00	758.00	1160.00	1696.16	3036.49
ELEVATION	1576.00	1576.30	1576.60	1577.00	1578.00

*** *** *** *** ***

HYDROGRAPH AT STATION S-FL4
FOR PLAN 1, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	6.63-HR
		(CFS)				
2486.	3.67		359.	325.	325.	325.
		(INCHES)	42.302	42.302	42.302	42.302
		(AC-FT)	178.	178.	178.	178.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	6.63-HR
139.	3.67	57.	53.	53.	53.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	6.63-HR
1577.59	3.67	1574.95	1574.81	1574.81	1574.81

CUMULATIVE AREA = 0.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION S-FL4
FOR PLAN 1, RATIO = 0.50

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	6.63-HR
		(CFS)				
389.	3.87		82.	74.	74.	74.
		(INCHES)	9.628	9.628	9.628	9.628
		(AC-FT)	41.	41.	41.	41.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	6.63-HR

(AC-FT)	(HR)				
85.	3.87	46.	43.	43.	43.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	6.63-HR
(FEET)	(HR)				
1575.92	3.87	1574.59	1574.49	1574.49	1574.49

CUMULATIVE AREA = 0.08 SQ MI

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 0.50
HYDROGRAPH AT	182G	0.05	1	FLOW	469.	234.
				TIME	3.37	3.37
HYDROGRAPH AT	182I	0.04	1	FLOW	422.	211.
				TIME	3.37	3.37
2 COMBINED AT	FC1	0.09	1	FLOW	891.	445.
				TIME	3.37	3.37
DIVERSION TO	DOC/P	0.09	1	FLOW	421.	211.
				TIME	3.37	3.37
HYDROGRAPH AT	D-C/P	0.09	1	FLOW	470.	235.
				TIME	3.37	3.37
ROUTED TO	R-FC1	0.09	1	FLOW	451.	226.
				TIME	3.43	3.43
			** PEAK STAGES IN FEET **			
			1	STAGE	1610.70	1610.58
				TIME	3.43	3.43
HYDROGRAPH AT	182D	0.09	1	FLOW	1431.	715.
				TIME	3.33	3.33
ROUTED TO	R182D	0.09	1	FLOW	1328.	646.
				TIME	3.43	3.47
			** PEAK STAGES IN FEET **			
			1	STAGE	1610.84	1610.72
				TIME	3.43	3.47
HYDROGRAPH AT	182E	0.06	1	FLOW	942.	471.
				TIME	3.33	3.33
HYDROGRAPH AT	182F	0.01	1	FLOW	137.	68.
				TIME	3.37	3.37
4 COMBINED AT	FC2	0.26	1	FLOW	2696.	1306.
				TIME	3.40	3.43
ROUTED TO	SFC2	0.26	1	FLOW	2682.	1306.
				TIME	3.43	3.43
			** PEAK STAGES IN FEET **			
			1	STAGE	1599.69	1598.38
				TIME	3.43	3.43
ROUTED TO	RFC2	0.26	1	FLOW	2675.	1300.
				TIME	3.43	3.47

2 COMBINED AT						
+	FC4	0.39	1	FLOW	1989.	1135.
				TIME	3.43	3.43
)IVERSION TO						
	DOFC4	0.39	1	FLOW	591.	99.
				TIME	3.43	3.43
IYDROGRAPH AT						
	D-FC4	0.39	1	FLOW	1398.	1037.
				TIME	3.43	3.43
ROUTED TO						
	SFC4	0.39	1	FLOW	1368.	968.
				TIME	3.50	3.57
			** PEAK STAGES IN FEET **			
			1	STAGE	1585.23	1584.61
				TIME	3.50	3.57
HYDROGRAPH AT						
	182H	0.03	1	FLOW	416.	208.
				TIME	3.30	3.30
ROUTED TO						
+	S182H	0.03	1	FLOW	411.	206.
				TIME	3.33	3.33
			** PEAK STAGES IN FEET **			
			1	STAGE	1608.02	1607.38
				TIME	3.33	3.33
OUTED TO						
+	R182H	0.03	1	FLOW	402.	202.
				TIME	3.37	3.33
			** PEAK STAGES IN FEET **			
			1	STAGE	1598.67	1598.54
				TIME	3.37	3.33
YDROGRAPH AT						
	190A	0.02	1	FLOW	294.	147.
				TIME	3.30	3.30
2 COMBINED AT						
	PNR1A	0.05	1	FLOW	685.	344.
				TIME	3.33	3.33
ROUTED TO						
	SPNR1A	0.05	1	FLOW	684.	345.
				TIME	3.33	3.33
			** PEAK STAGES IN FEET **			
			1	STAGE	1602.62	1602.27
				TIME	3.33	3.33
DIVERSION TO						
+	DRAINO	0.05	1	FLOW	110.	110.
				TIME	3.13	3.20
HYDROGRAPH AT						
+	DPNR1A	0.05	1	FLOW	574.	235.
				TIME	3.33	3.33
/DROGRAPH AT						
+	D-C/P	0.00	1	FLOW	421.	211.
				TIME	3.37	3.37
2 COMBINED AT						
	C/P	0.05	1	FLOW	984.	441.
				TIME	3.33	3.33

```
2 COMBINED AT
+                FC4       0.39    1   FLOW        1989.    1135.
                                      TIME         3.43     3.43

)IVERSION TO
                 DOFC4     0.39    1   FLOW         591.      99.
                                      TIME         3.43     3.43

IYDROGRAPH AT
                 D-FC4     0.39    1   FLOW        1398.    1037.
                                      TIME         3.43     3.43

ROUTED TO
                 SFC4      0.39    1   FLOW        1368.     968.
                                      TIME         3.50     3.57

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE     1585.23  1584.61
                                       TIME         3.50     3.57

HYDROGRAPH AT
+                182H      0.03    1   FLOW         416.     208.
                                      TIME         3.30     3.30

ROUTED TO
+                S182H     0.03    1   FLOW         411.     206.
                                      TIME         3.33     3.33

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE     1608.02  1607.38
                                       TIME         3.33     3.33

OUTED TO
+                R182H     0.03    1   FLOW         402.     202.
                                      TIME         3.37     3.33

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE     1598.67  1598.54
                                       TIME         3.37     3.33

YDROGRAPH AT
                 190A      0.02    1   FLOW         294.     147.
                                      TIME         3.30     3.30

2 COMBINED AT
                 PNR1A     0.05    1   FLOW         685.     344.
                                      TIME         3.33     3.33

ROUTED TO
                 SPNR1A    0.05    1   FLOW         684.     345.
                                      TIME         3.33     3.33

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE     1602.62  1602.27
                                       TIME         3.33     3.33

DIVERSION TO
+                DRAINO    0.05    1   FLOW         110.     110.
                                      TIME         3.13     3.20

HYDROGRAPH AT
+                DPNR1A    0.05    1   FLOW         574.     235.
                                      TIME         3.33     3.33

/DROGRAPH AT
+                D-C/P     0.00    1   FLOW         421.     211.
                                      TIME         3.37     3.37

2 COMBINED AT
+                C/P       0.05    1   FLOW         984.     441.
                                      TIME         3.33     3.33
```

```
 OUTED TO
+                RPNR1A      0.05     1   FLOW        971.     431.
                                          TIME       3.40     3.40

                                     ** PEAK STAGES IN FEET **
                                     1   STAGE    1590.79  1590.65
                                          TIME       3.40     3.40

 YDROGRAPH AT
                 190B        0.01     1   FLOW        101.      50.
                                          TIME       3.30     3.30

  2 COMBINED AT
                 PNR1        0.05     1   FLOW       1055.     472.
                                          TIME       3.37     3.40

DIVERSION TO
                 DOPN-1      0.05     1   FLOW        568.     148.
                                          TIME       3.37     3.40

 HYDROGRAPH AT
                 D-PNR1      0.05     1   FLOW        487.     324.
                                          TIME       3.37     3.40

 HYDROGRAPH AT
+                DPNR1A      0.00     1   FLOW        110.     110.
                                          TIME       3.13     3.20

 OUTED TO
+                R-DRA0      0.00     1   FLOW        110.     110.
                                          TIME       3.17     3.23

  2 COMBINED AT
+                PNR1        0.05     1   FLOW        597.     434.
                                          TIME       3.37     3.40

  IVERSION TO
                 DRAIN1      0.05     1   FLOW        160.     160.
                                          TIME       3.10     3.17

  YDROGRAPH AT
                 D-PN1       0.05     1   FLOW        437.     274.
                                          TIME       3.37     3.40

  OUTED TO
                 RPNR1       0.05     1   FLOW        433.     269.
                                          TIME       3.43     3.43

                                     ** PEAK STAGES IN FEET **
                                     1   STAGE    1588.71  1588.63
                                          TIME       3.43     3.43

 HYDROGRAPH AT
                 190C        0.02     1   FLOW        352.     176.
                                          TIME       3.30     3.30

  2 COMBINED AT
+                PNR2        0.08     1   FLOW        720.     402.
                                          TIME       3.37     3.37

DIVERSION TO
+                DOPN-2      0.08     1   FLOW         12.       1.
                                          TIME       3.37     3.37

 /DROGRAPH AT
+                D-PNR2      0.08     1   FLOW        708.     401.
                                          TIME       3.37     3.37

 DROGRAPH AT
+                DPNR2A      0.00     1   FLOW        160.     160.
                                          TIME       3.10     3.17
```

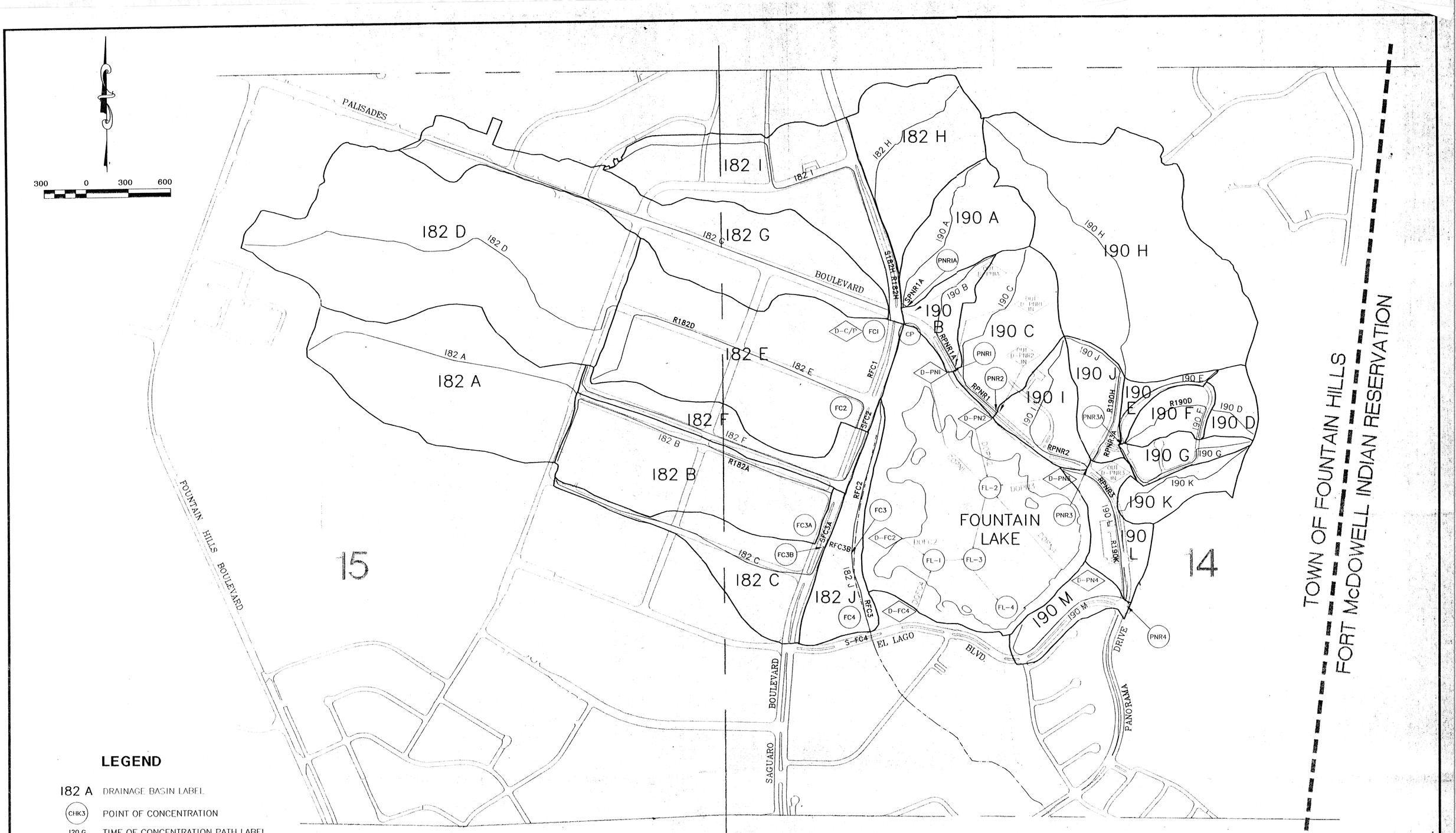
```
ROUTED TO
+                RPNR3A      0.02    1   FLOW        286.     141.
                                        TIME        3.33     3.33

                                 ** PEAK STAGES IN FEET **
                                 1   STAGE     1576.93  1576.81
                                     TIME        3.33     3.33

HYDROGRAPH AT
                 190H        0.08    1   FLOW       1191.     595.
                                        TIME        3.30     3.30

ROUTED TO
                 R190H       0.08    1   FLOW       1165.     578.
                                        TIME        3.37     3.37

                                 ** PEAK STAGES IN FEET **
                                 1   STAGE     1577.15  1576.99
                                     TIME        3.37     3.37

3 COMBINED AT
                 PNR-3       0.19    1   FLOW       1911.    1007.
                                        TIME        3.37     3.37

HYDROGRAPH AT
+                D-PN2       0.00    1   FLOW        180.     180.
                                        TIME        3.07     3.13

ROUTED TO
+                R-DRA2      0.00    1   FLOW        180.     180.
                                        TIME        3.10     3.17

2 COMBINED AT
+                PNR3        0.19    1   FLOW       2091.    1187.
                                        TIME        3.37     3.37

DIVERSION TO
                 DRAIN3      0.19    1   FLOW        200.     200.
                                        TIME        2.87     3.10

HYDROGRAPH AT
                 D-PN3       0.19    1   FLOW       1891.     987.
                                        TIME        3.37     3.37

ROUTED TO
                 RPNR3       0.19    1   FLOW       1866.     965.
                                        TIME        3.40     3.43

                                 ** PEAK STAGES IN FEET **
                                 1   STAGE     1571.06  1570.90
                                     TIME        3.40     3.43

HYDROGRAPH AT
                 190K        0.01    1   FLOW        113.      57.
                                        TIME        3.30     3.30

ROUTED TO
+                R190K       0.01    1   FLOW        112.      56.
                                        TIME        3.33     3.33

                                 ** PEAK STAGES IN FEET **
                                 1   STAGE     1570.31  1570.21
                                     TIME        3.33     3.33

HYDROGRAPH AT
+                190L        0.01    1   FLOW        173.      87.
                                        TIME        3.30     3.30

5 COMBINED AT
+                *PNR4       0.21    1   FLOW       2096.    1073.
                                        TIME        3.40     3.40
```

DIVERSION TO						
+	DOPN-4	0.21	1	FLOW	272.	120.
				TIME	3.40	3.40
HYDROGRAPH AT						
	D-PNR4	0.21	1	FLOW	1824.	954.
				TIME	3.40	3.40
HYDROGRAPH AT						
	190M	0.01	1	FLOW	121.	60.
				TIME	3.30	3.30
HYDROGRAPH AT						
	190N	0.02	1	FLOW	289.	145.
				TIME	3.30	3.30
3 COMBINED AT						
	PNR4	0.24	1	FLOW	2161.	1116.
				TIME	3.37	3.40
HYDROGRAPH AT						
+	D-FC2	0.00	1	FLOW	2310.	948.
				TIME	3.43	3.47
HYDROGRAPH AT						
+	D-FC4	0.00	1	FLOW	591.	99.
				TIME	3.43	3.43
2 COMBINED AT						
+	FL1	0.00	1	FLOW	2901.	1044.
				TIME	3.43	3.47
HYDROGRAPH AT						
+	D-PN1	0.00	1	FLOW	568.	148.
				TIME	3.37	3.40
HYDROGRAPH AT						
	D-PN2	0.00	1	FLOW	12.	1.
				TIME	3.37	3.37
HYDROGRAPH AT						
	D-PN3	0.00	1	FLOW	432.	179.
				TIME	3.37	3.40
HYDROGRAPH AT						
	D-PN4	0.00	1	FLOW	272.	120.
				TIME	3.40	3.40
4 COMBINED AT						
	FL-2	0.00	1	FLOW	1280.	448.
				TIME	3.40	3.40
2 COMBINED AT						
	FL-3	0.00	1	FLOW	4124.	1469.
				TIME	3.43	3.43
HYDROGRAPH AT						
+	LAKE	0.08	1	FLOW	1735.	868.
				TIME	3.20	3.20
2 COMBINED AT						
+	FL-4	0.08	1	FLOW	4479.	1646.
				TIME	3.43	3.43
OUTED TO						
+	S-FL4	0.08	1	FLOW	2486.	389.
				TIME	3.67	3.87

** PEAK STAGES IN FEET **

1	STAGE	1577.59	1575.92
	TIME	3.67	3.87

** NORMAL END OF HEC-1 ***



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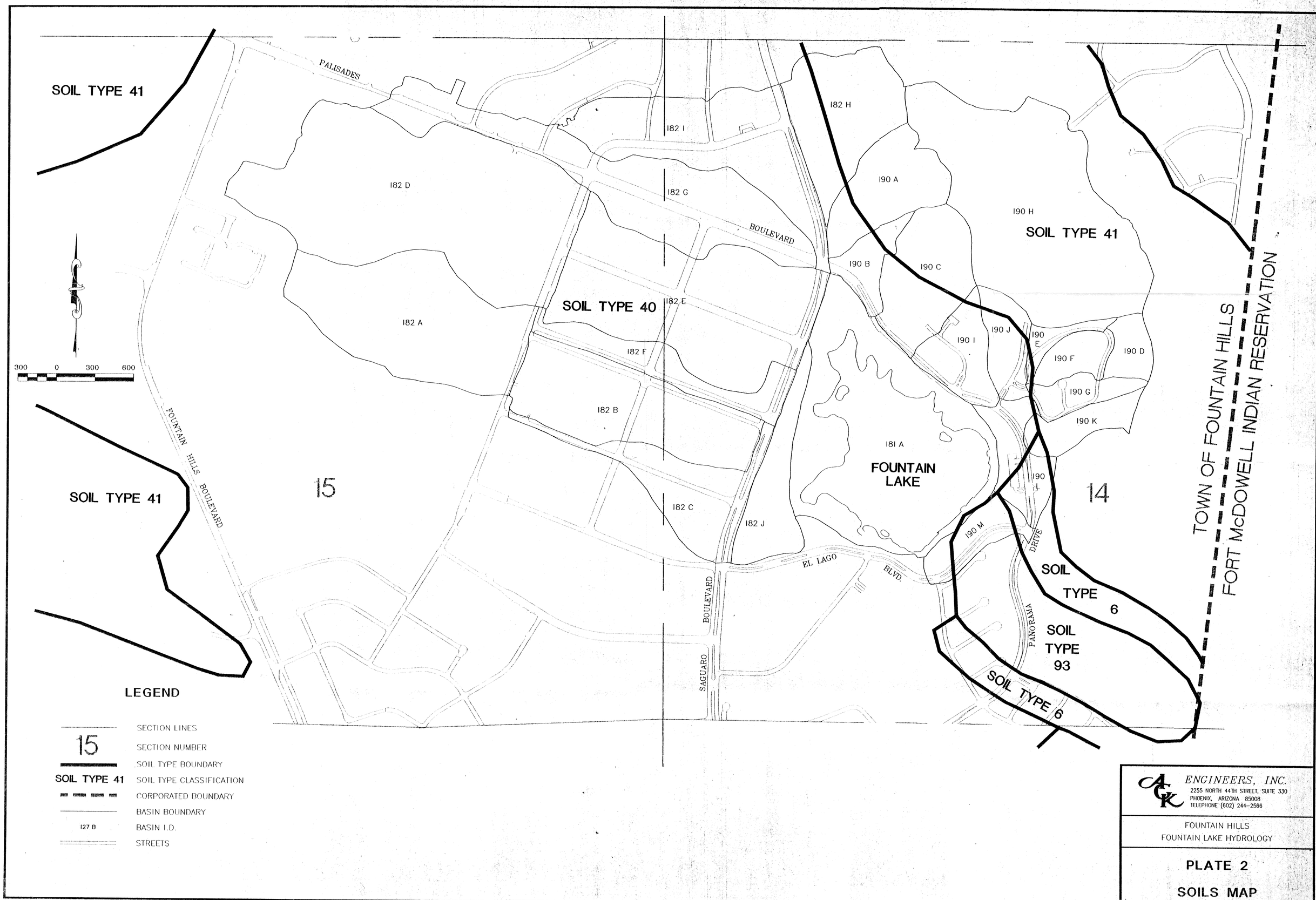
FOUNTAIN HILLS
FOUNTAIN LAKE HYDROLOGY

PLATE 1

HYDROLOGY MAP

FILE: FL-HYD DATE: 11/16/95



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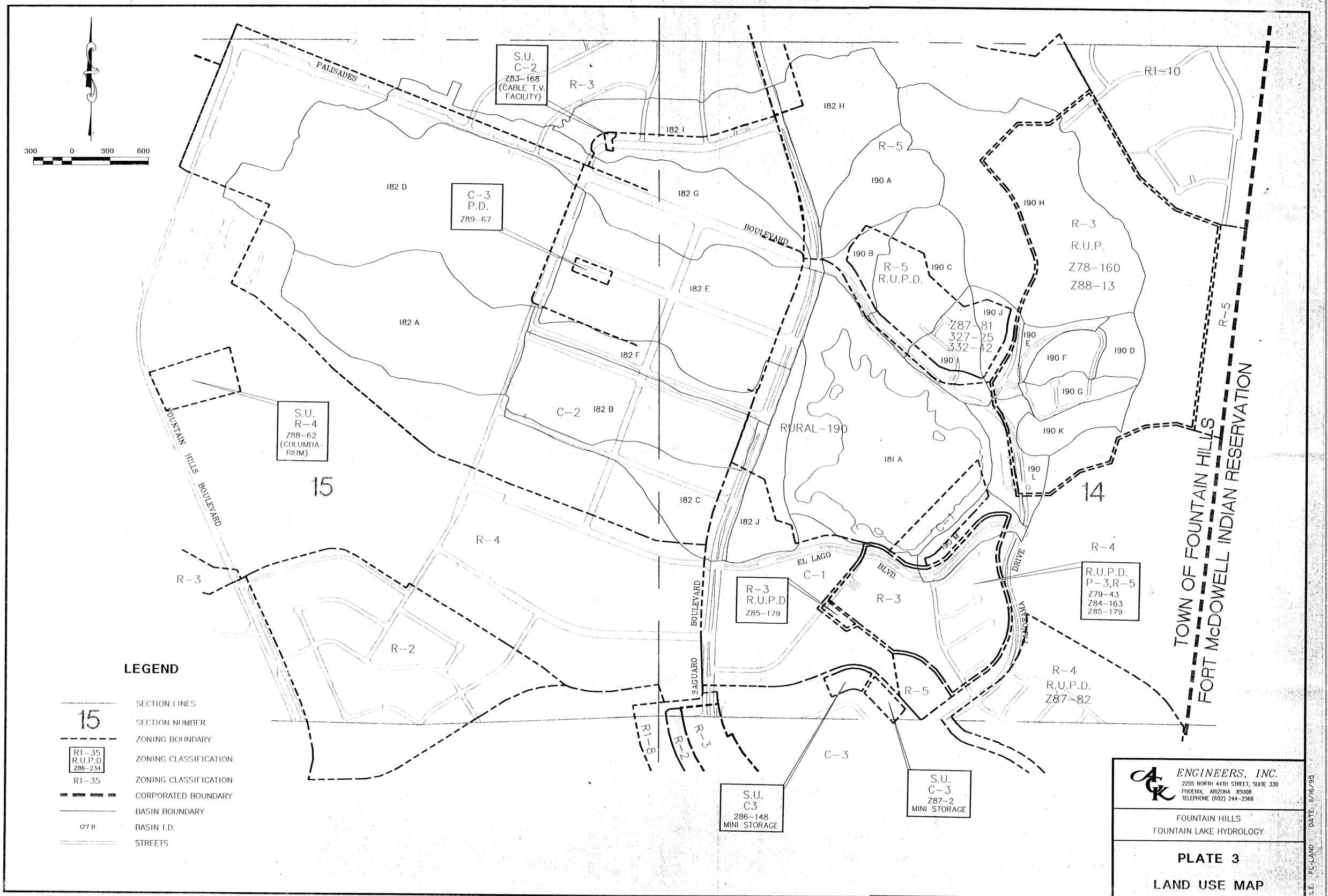
FOUNTAIN HILLS
FOUNTAIN LAKE HYDROLOGY

PLATE 2

SOILS MAP

FILE: FL-SOIL DATE: 11/16/95



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FOUNTAIN HILLS
FOUNTAIN LAKE HYDROLOGY

PLATE 3

LAND USE MAP

FILE: FL-LAND DATE: 11/16/95