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Hydrologic Investigation
Emergency Action Plan
Signal Butte FRS
Buckhorn-Mesa W/S

United States
Department of
Agriculture

Soil
Conservation
Service

Room 3008 Federal Building
230 North First Avenue
Phoenix, Arizona 85025

6-30-84
REVI

Lee Sacle
JH

Subject: ENG-Review of Signal Butte FRS
Buckhorn-Mesa Watershed

Date: August 28, 1984

To: Jack Stevenson, Head Engineering Staff, WNTC

File Code: 210

Attached is the breach routings of the above structure for the Emergency Action Plan.

We are sending this material for your information and use in the review process.

Ralph M. Arrington
State Conservation Engineer

cc: Verne M. Bathurst
Wayne Killgore
Joe Knisley

Room 3008 Federal Building
230 North First Avenue
Phoenix, Arizona 85025

April 3, 1984

Dan E. Sagramoso, P. E.
Chief Engineer & General Manager
Flood Control District of Maricopa County
3535 West Durango Street
Phoenix, Arizona 85009

Dear Dan:

Several flood routings were made to develop inundation maps for the Signal Butte FRS, for an Emergency Action Plan. These consisted of the Emergency Spillway Hydrograph, The Freeboard Hydrograph and Breach Hydrographs based on two different breach locations, peak flows and flood volumes. Cross sections used for routing were taken from planning surveys consisting of 4-foot contour interval topo maps, scale 1"=400'. Plotted copies of the cross sections are enclosed for your information.

The Emergency Spillway Outflow Hydrograph (ESH) was routed using the TR-20 Program and assuming that the flow would be confined to the channel until it crosses Signal Butte Road. From this point downstream the flow was allowed to spread to where water surface elevations where approximately equal to the elevation of the natural ground, i.e., the flow was basically confined to the low flow areas.

The routing for the Freeboard Hydrograph was accomplished in a similar manner, except the lengths of the cross sections used in the routing were much longer. The flow depths were allowed to rise approximately one foot above the contour elevation selected to align the cross section. For instance Cross Section No. 1 was aligned using contour elevation 1702.0, and the maximum computed water surface elevation for the Freeboard Storm at this location was 1702.9.

For the Breach Routings, the maximum peak discharges were developed using Figure 1 in TR-66 (TR-66 is a simplified Dam Breach Routing procedure developed by the SCS), and assuming the water surface to be at top of dam. The first breach was assummed to occur at or near Station 213+00. This gave a maximum depth of 30 feet and Q_{max} = 35000 CFS. This hydrograph(s) was run using the TR-66 computer program and assumming two volumes: 2822 acre-feet and 7930 acre-feet. The first volume assumes no inflow to the dam at the time of the breach and is equal to maximum storage to the top of dam. The second volume is equal to the total runoff from the Freeboard Storm. These are the extreme conditions (with respect to volumes) for the assumed breach.

The final hydrographs were based on a breach at or near Station 228+00. This gave a maximum water depth of 38.0 feet to the top of dam, and a Q_{max} = 55000 CFS from Figure 1, TR-66. The same two volumes described above were used with

this peak to develop hydrographs for routing. For both breaches, the hydrographs were assummed to be curvilinear (SCS, TR-66), since the flow in the valley immediately downstream of the dam was calculated to be subcritical.

The same cross sections were used for both breach locations, although in actuality, they would be somewhat different; at least this is true for the cross section located at the dam, or Cross Section No. 1. Also, since a breach could occur at any point along the dam centerline, the total width of the dam is shown as flood plain. Overflow depths for all locations along the dam would be similar to those calculated at Cross Section No. 1 for the breach at station 213+00.

The results of all the routings are shown in the attached table and on the flood inundation map(s). As can be seen, there is not much difference in the depths or elevations of the various floods, but the width of the flooded area increases greatly as the magnitude of the flood increases. There is, however, approximately 0.5 feet difference in depth due to the increase in volumes assummed for the breach routings. For instance at Cross Section No. 4 with Q_{max} = 55000 CFS, the computed elevation for Vol = 2822 acre-feet is 1580.3 as compared to 1580.8 computed using the larger Vol = 7930 acre-feet. Similar differences can be noted at the other cross sections, and for the conditions where Q_{max} = 35000 CFS.

Velocities are generally low being less than 4.0 ft/sec in most areas, except possibly in the channels or other low lying areas. Velocities are generally higher in the vicinity of Cross Section No. 1, where flow is basically confined to channel; and then decrease in a downstream direction as the flow spreads out over a much wider area. Velocities in the range of 1 to 3 feet per second can be expected in the vicinity of Cross Section No. 4, depending on the magnitude of the flood.

It should be noted that in all routings, the effect of Apache Trails Road was ignored, although some increase in the depth of flooding will occur at this location due to the fill on the road. There is also a possibility that it will divert some of the flow further to the west than indicated on the inundation map(s). Other effects on downstream flows, however, should be minor, since the road will be overtopped with the freeboard and the routed breach hydrographs.

In conclusion, variations in depths or elevations of flooding in a given area for different storms will be slight, usually less than one-foot; but the width of the flooded area will increase greatly as the magnitude of the flood increases. The width generally tends to increase in a downstream direction; whereas depth and peak discharges will decrease. Although flooding will continue for some distance downstream of Apache Trails, flood conditions will be similar to those experienced on the immediate downstream side of this location. Apache Trails Road will cause some ponding upstream, and could cause some diversion of flow to the west. The major areas of concern will be the channels or other low lying areas upstream of Apache Trails where depths could be as much as four feet in some locations. As the flood progresses downstream, depths will tend to decrease with maximum depths being in the 1 to 3 feet range. The greater depths again will be in small drainage ditches or channels that traverse the downstream area.

The TR-20 Routings, WSP-2 calclulations and other documentation are available for inspection at our office, or if the need arises copies can be made availaable for your files. Should you desire additional information, please let us know.

Sincerely,

Acting For

VERNE M BATHURST
State Conservationist

Enclosure

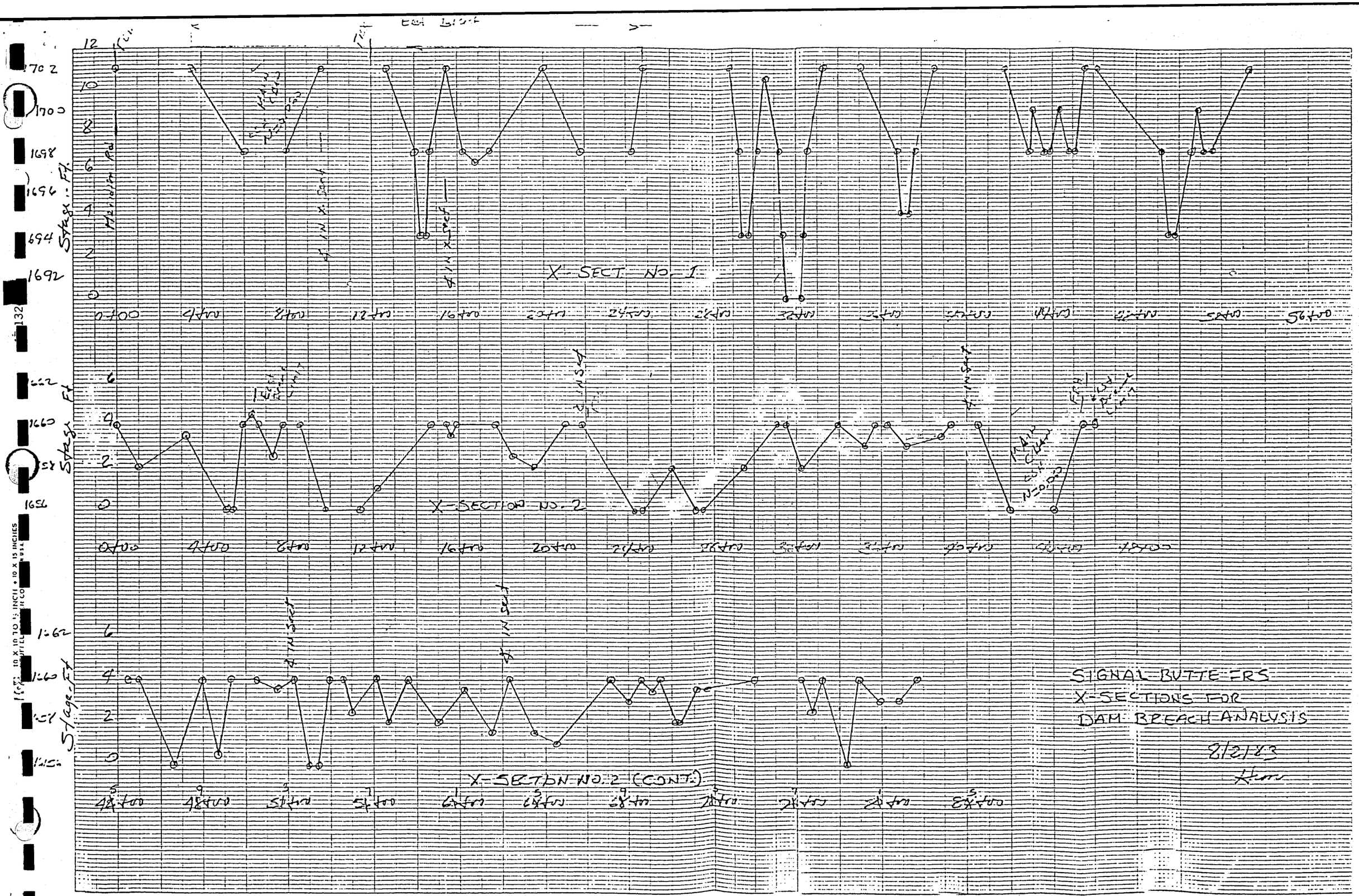
bcc: W. Wayne Killgore, ASTC(W), SCS, Phoenix, AZ
Ralph M. Arrington, SCE, SCS, Phoenix, AZ

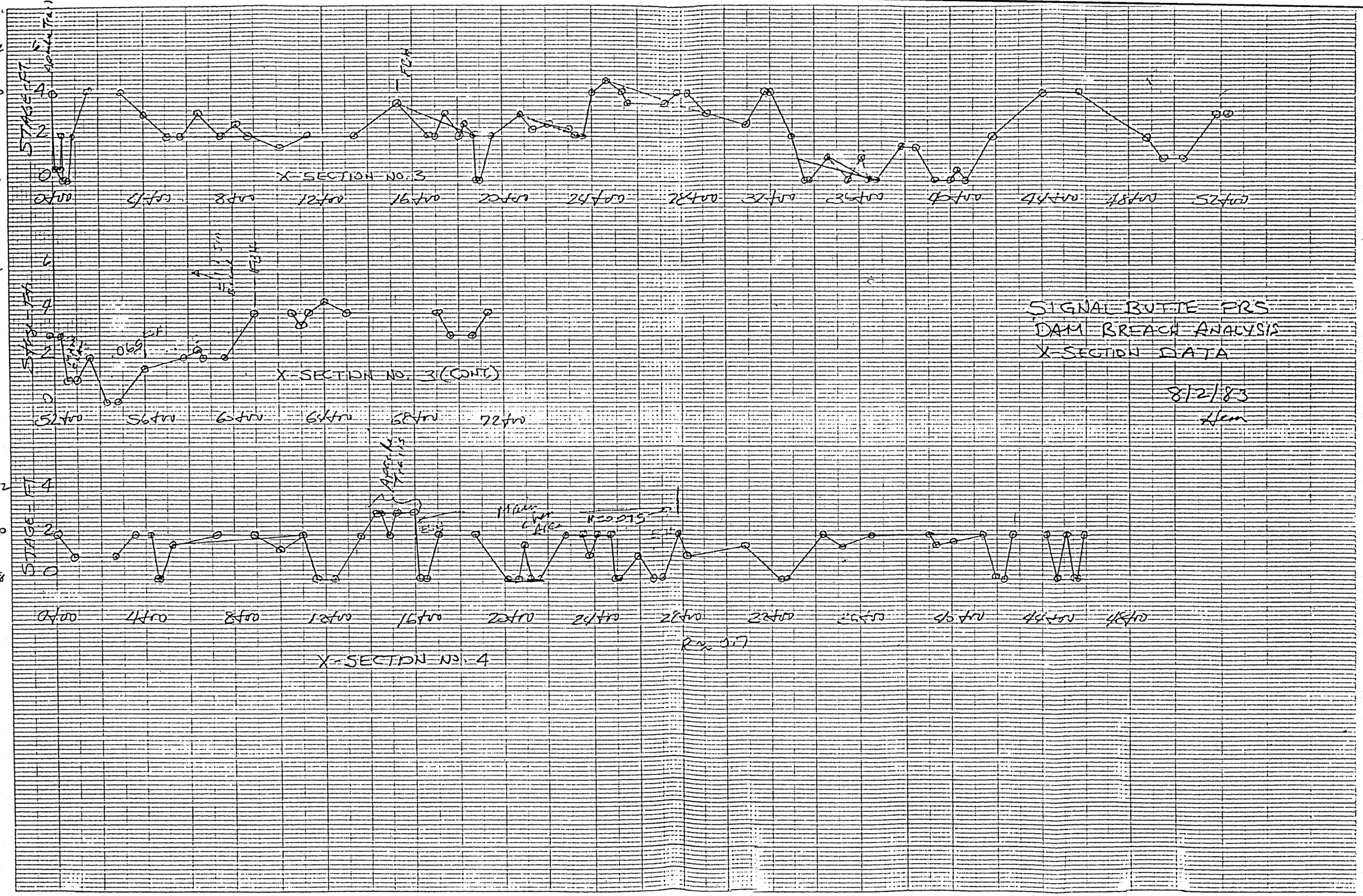
HCMILLSAPS:bjp

SIGNAL BUTTE FRS B 213 D 220

ESH, FBH AND BREACH ANALYSIS FOR EMERGENCY ACTION PLAN

X-Sect	Bankfull Elevation	Emer. Spy Hyd			Freeboard Hyd			Dam Breach			Dam Breach			Dam Breach			Dam Breach		
No.	MSL	Qmax = 2450 V = 1850 (Disc)	(Elev)	(Width)	Qmax = 11309 V = 6514 (Disc)	(Elev)	(Width)	Qmax = 35000 V = 2822 (Disc)	(Elev)	(Width	Qmax = 35000 V = 7930 (Disc)	(Elev)	(Width)	Qmax = 55000 V = 2822 (Disc)	(Elev)	(Width)	Qmax = 55000 V = 7930 (Disc)	(Elev)	(Width)
1	1702	2450	1700.3	620	11309	1702.9	1270	35000	--	2135	35000	--	2135	55000	--	2135	55000	--	2135
2	1660	2441	1658.6	450	11140	1659.9	2370	25000	1660.6	3920	30000	1660.9	3920	36100	1661.2	3920	45300	1661.5	3920
3	1620	2401	1618.8	870	10915	1619.1	4570	19000	1619.5	6100	26200	1619.8	6100	25900	1619.8	6100	38000	1620.3	6100
4	1580	2369	1580.0	1180	10630	1580.5	5390	14800	1580.1	8790	23000	1580.5	8790	19000	1580.3	8790	32500	1580.8	8790


X-SECT. NO. 1
X-SECTION NO. 2
X-SECTION NO. 2 (CONT.)
Stage - Ft.
Elevation Ft.
SIGNAL BUTTE FRS
X-SECTIONS FOR
DAM BREACH ANALYSIS
8/2/83


SIGNAL BUTTE FRS
DAM BREACH ANALYSIS
X SECTION DATA
8/12/83
Hem
X-SECTION NO. 3
X-SECTION NO. 3 (CONT.)
X-SECTION NO. 4
STAGE - FEET
1622
1620
1618
1616
1582
1580
1578
0+00
4+00
8+00
12+00
16+00
20+00
24+00
28+00
32+00
36+00
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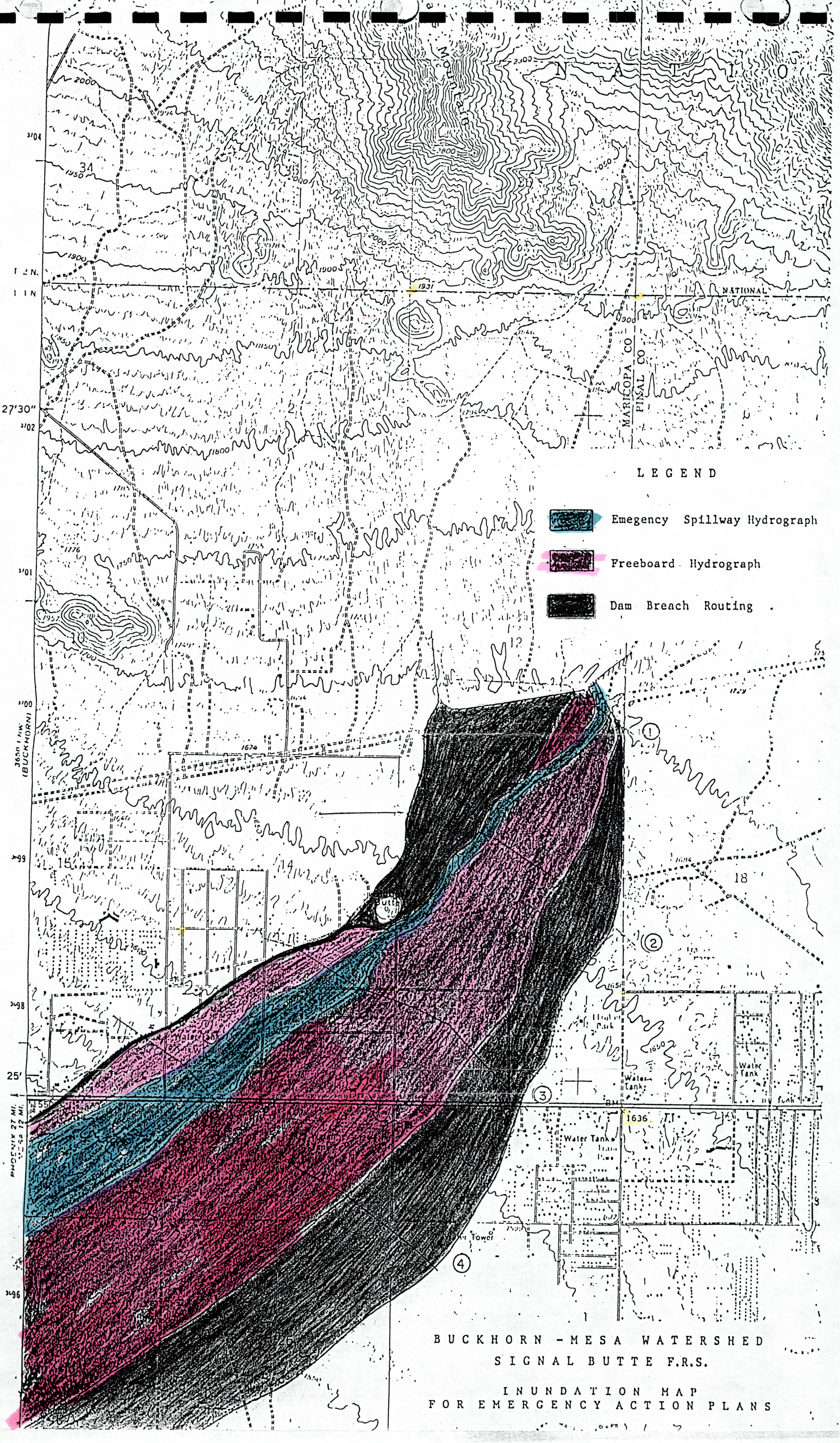
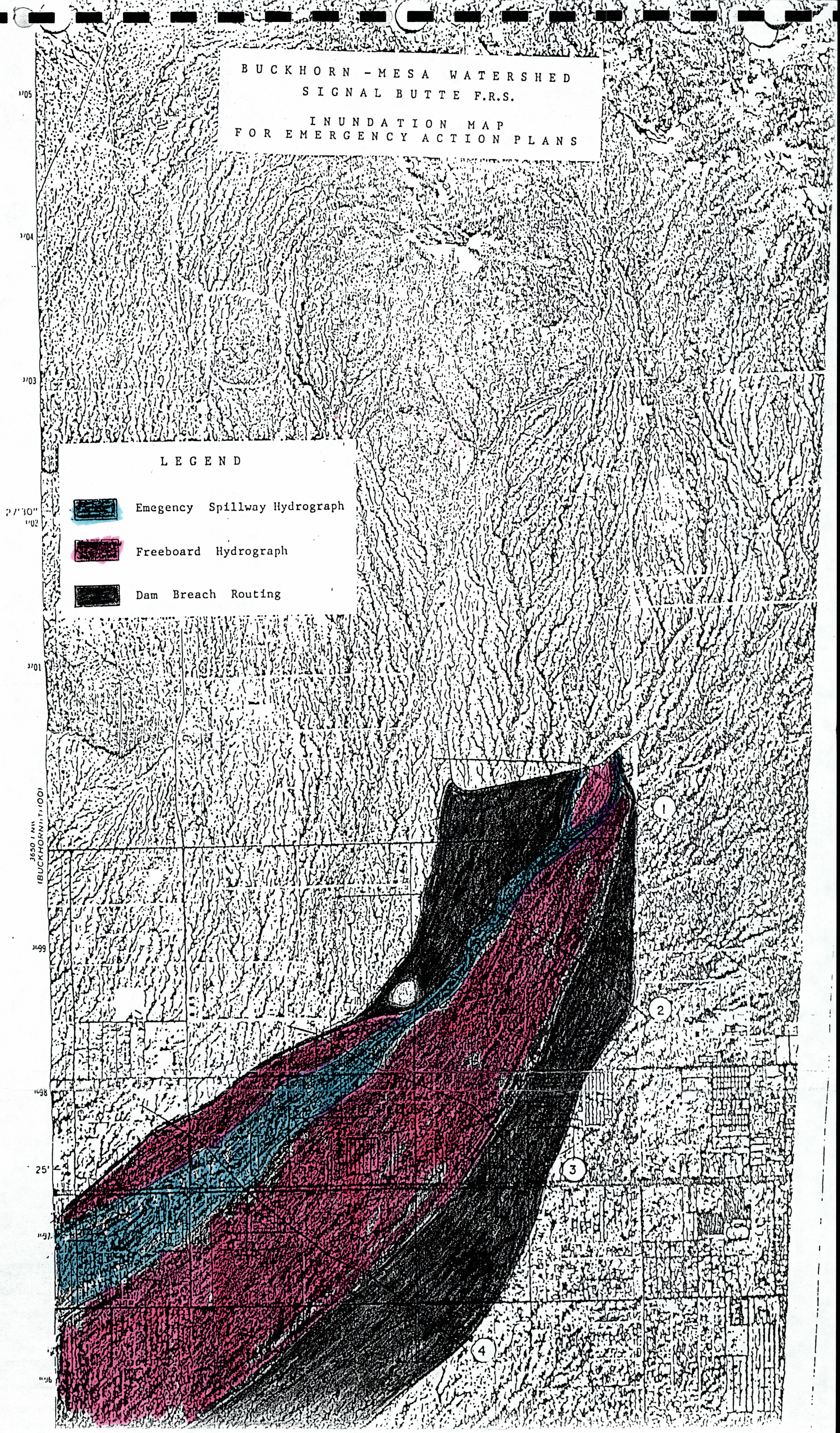

LEGEND
Emegency Spillway Hydrograph
Freeboard Hydrograph
Dam Breach Routing
MARICOPA CO
PINAL CO
NATIONAL
Water Tank
Tower
BUCKHORN - MESA WATERSHED
SIGNAL BUTTE F.R.S.
INUNDATION MAP
FOR EMERGENCY ACTION PLANS


BUCKHORN - MESA WATERSHED
SIGNAL BUTTE F.R.S.
INUNDATION MAP
FOR EMERGENCY ACTION PLANS
LEGEND
Emegency Spillway Hydrograph
Freeboard Hydrograph
Dam Breach Routing
1
2
3
4

NOV 01 1984

MEMO TO: Roy B. Bluhm, Director Civil Defense

ATTN: Robert H. Bishop, Chief, Readiness Division

FROM: Stanley L. Smith, Deputy Chief Engineer

SUBJECT: Signal Butte Flood Retarding Structure Emergency Action Plan

Our office has compiled the enclosed inundations maps for the proposed Signal Butte Flood Retarding Structure. The maps were derived from information and mapping supplied by the Soil Conservation Service.

As part of the State dam licensing process an emergency action plan must be made for each dam. We request that you compile an emergency action plan based on the three scenarios indicated on the enclosed maps.

If additional input from our office is needed please contact Dave Johnson.

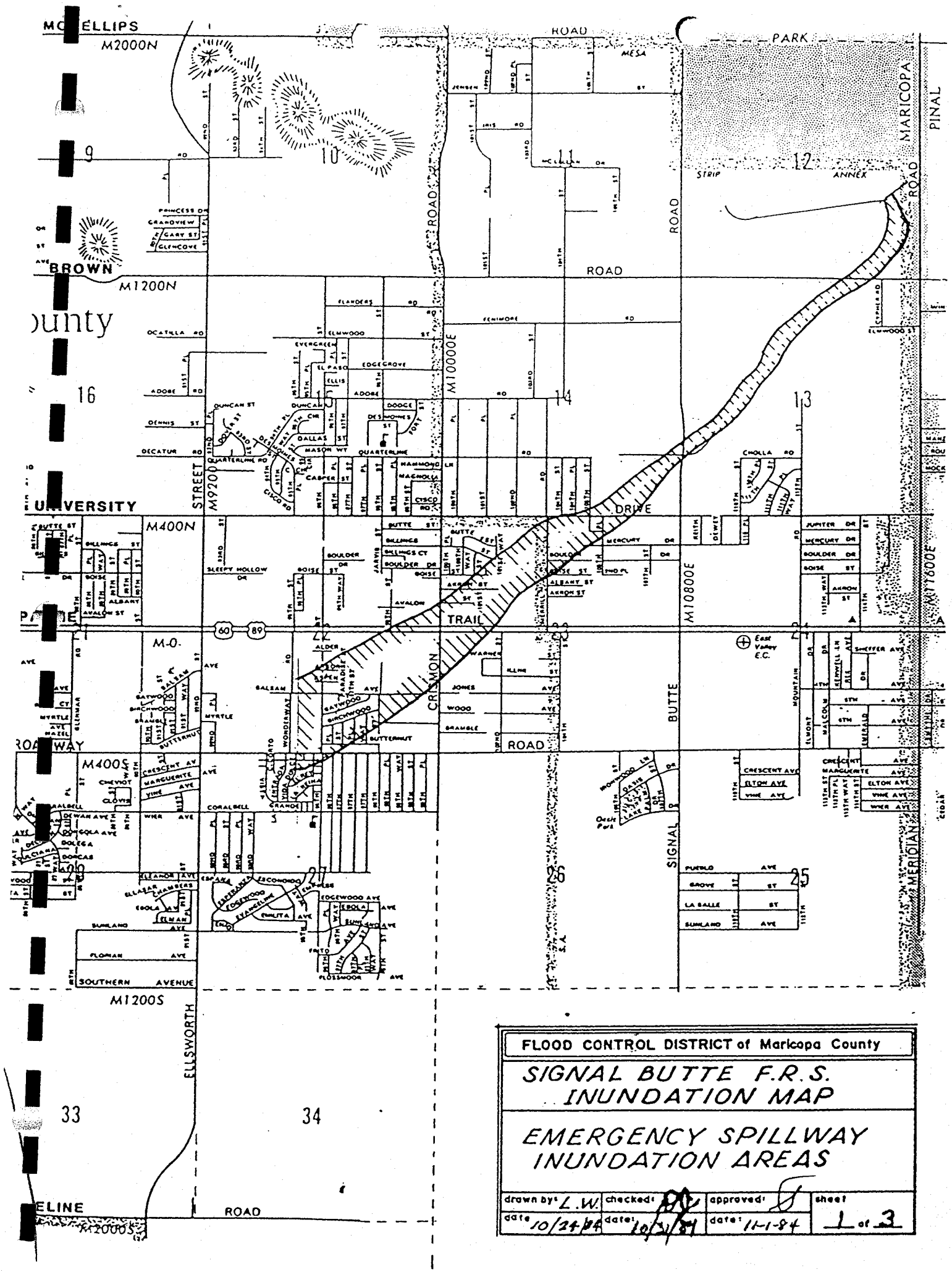
Stanley L. Smith

Enclosure

SLS/DRJ/ho

COORD: DRJ

INFO: CGF
NPK
DES

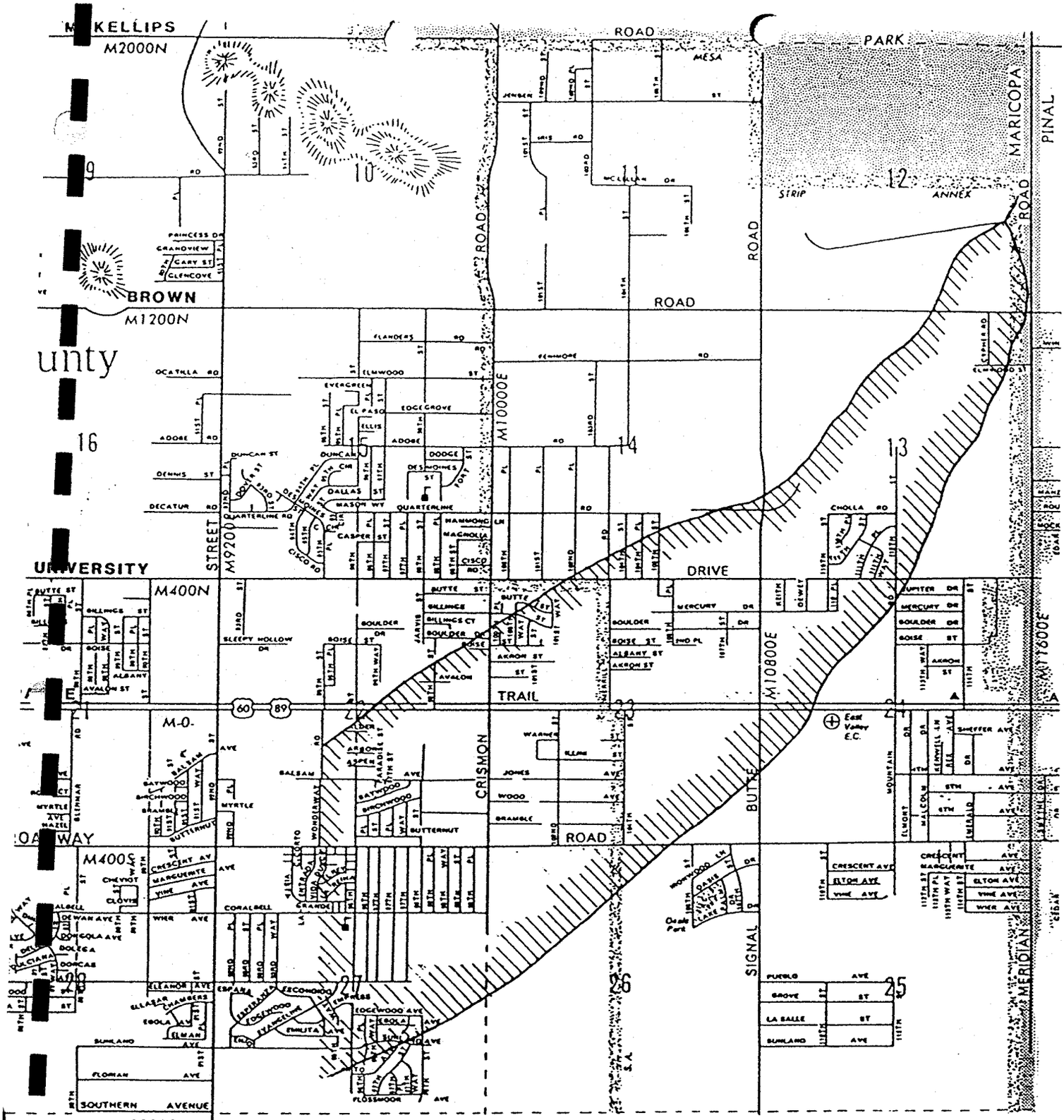


FLOOD CONTROL DISTRICT of Maricopa County

SIGNAL BUTTE F.R.S.
INUNDATION MAP

EMERGENCY SPILLWAY
INUNDATION AREAS

drawn by: L.W.	checked:	approved:	sheet
date: 10/24/84	date: 10/31/84	date: 11-1-84	1 of 3

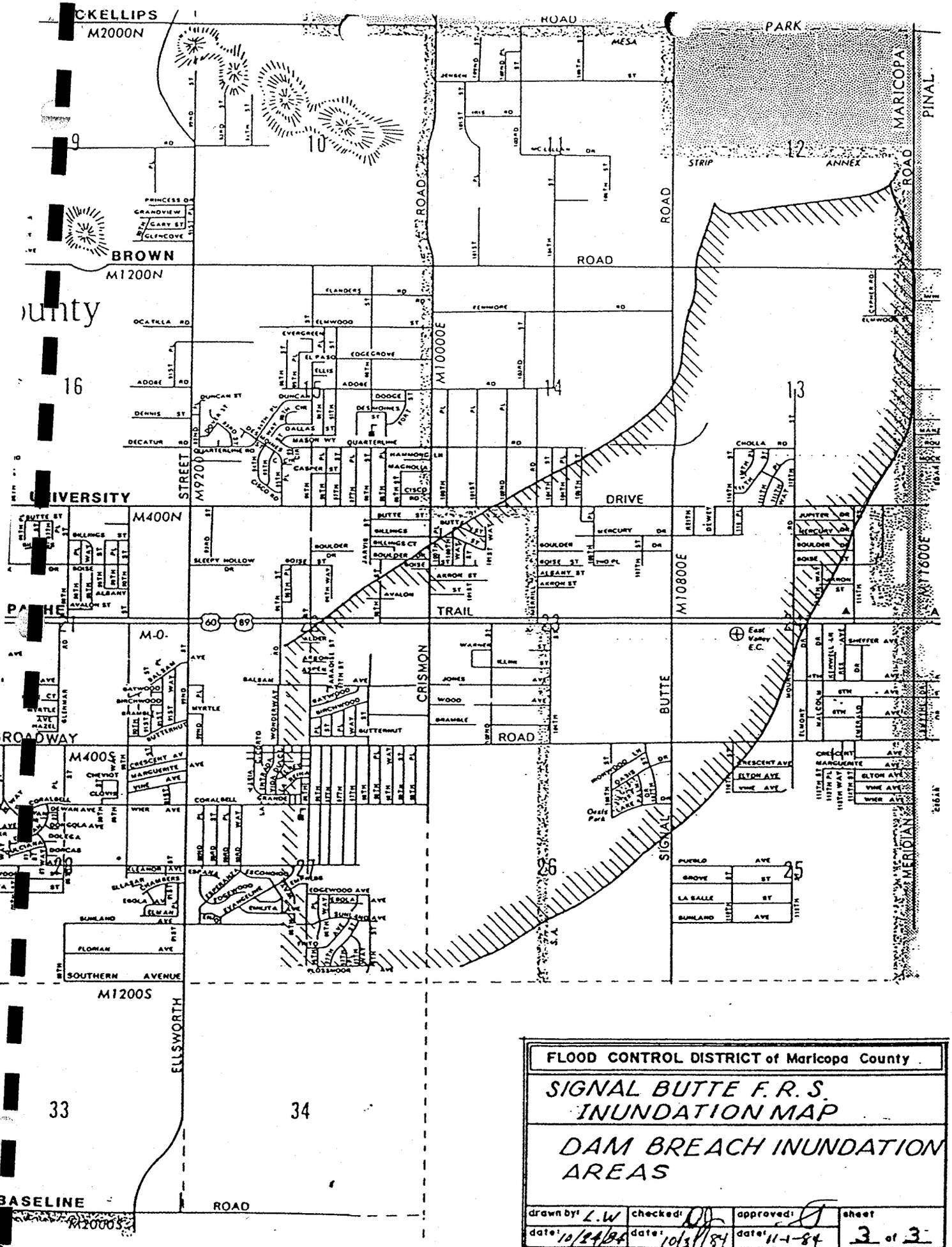


FLOOD CONTROL DISTRICT of Maricopa County

SIGNA BUTTE F.R.S.
INUNDATION MAP

EMERGENCY SPILLWAY MAXIMUM
OUTFLOW INUNDATION AREA

drawn by: L.W.	checked:	approved:	sheet
date: 10/24/84	date: 10/31/84	date: 11-1-84	2 of 3



FLOOD CONTROL DISTRICT of Maricopa County			
SIGNAL BUTTE F.R.S. INUNDATION MAP			
DAM BREACH INUNDATION AREAS			
drawn by: L.W	checked:	approved:	sheet
date: 10/24/84	date: 10/31/84	date: 11-1-84	3 of 3

Effect of CAP Canal on Emergency Spillway

and Breached Hydrographs

Signal Butte FRS, Buckhorn Mesa Watershed

It is ~~somewhat~~ difficult to determine the exact effect of the Central Arizona Project Canal on the emergency spillway and breach hydrographs of the Signal Butte FRS. The analysis has to be based on certain basic assumptions. For instance, will the CAP embankments fail (i.e. breach) when and if they are overtopped? At what location is it most likely to fail? What is the capacity of the failed section? How much flood storage is available in the CAP Canal? etc?

In this analysis, the assumptions varied based on the magnitude of the flood analized. For the ESH, it was assumed that the overchutes at Station 427+15, 429+20 and 456+50 would function at an average rate of about 1000 cfs (Note, total design capacity of these structures is 1400 cfs) 1/ for about 12 hours based on the computed hydrograph at X-Section No. 4. This gives a total volume of: (12 hrs)(1000 cfs)(.08264) = 992 ac-ft. The available storage capacity in the Canal was estimated at 982 ac-ft. This latter volume was computed assuming a freeboard depth of 10 feet 2/ and an effective canal length of about nine miles, i.e., the distance between the control gate located at mile post 197.999 (near University) and the one to the southeast at mile post 207.214. The total controlled volume then is 1974 acre feet and

1/ See attached Table 7-3
2/ See attached Exhibit 7-4

exceeds the total volume (1850 ac. ft.) of the ESH. Thus it is theorized that with the ESH, the CAP would control the total discharge from the FRS and limit flows passing downstream of the CAP to overchutes at Stations 427+15, 429+20, 456+50, with a maximum discharge of 1400 cfs. Ponding, of course, would occur upstream of the overchutes causing overtopping of the upstream Canal embankment in the vicinity of Stations 427+15 and 429+20. This analysis assumes "non-storm" conditions downstream of the dam.

For the FBH, the conditions would be very similar to that described above except the total volume (6514 ac-ft) could neither be stored in the CAP nor pass through the overchute structures. The flow estimated to pass through the ovechutes was calculated at about 3250 ac-ft based on the capacities of the overchutes located at Stations 427+15, 429+20, 456+50 and 471+03. The total capacity of these structures is about 2885 cfs (Table 7-3), with a flow duration of 10 to 12 hours at maximum capacity and continuing several more hours at a lesser rate. Thus, the CAP would regluate about 4232 acre-feet, but nearly 2300 acre-feet would overtop the Canal on its south side and continue downstream. Exactly where the overtopping will occur is hard to perdict, but the most logical point would be near Station 456+50 since there is a major bend in the Canal at this point and ponding will tend to occur upstream of Canal at this location due to its alignment. This is also the location where water exited the CAP during the historical flood of July 17-18, 1984. Ponded depths near Station 456+50 could be as much as 10 to 12 feet. The area inundated downstream of the Canal would not be much different than that projected ignoring the effects of the CAP, although the total peak might be attenduated to some extent due to the available storage in the CAP.

It should be recognized, however, should the CAP Canal breach at Station 456+50 due to the overtopping, a large volume (at least 858 acre-feet, which

is the storage below normal depth between the two designated control gates) could be added to the downstream hydrograph. A breach would also tend to concentrate the flow rather the than it being spread out over a wide area.

With reference to the FRS breach hydrographs, the effect of the CAP on flows downstream of the Canal is dependent to some extent on the total volume assumed to be under in the hydrograph; that is conditions assuming flow or no inflow into the structure. Under the "without" inflow conditions, the total volume to the top of dam is only about 2822 ac-ft. About one-third of this volume could be stored in the Canal. This could attenduate the peak discharge to some extent if it was assumed that the downstream canal embankment did not fail. With a 19000 cfs peak discharge at X-Section No. 4, however, I believe it is more logical to assume that the Canal will be overtopped and breached and flow will continue downstream almost unimpeded. The exact location of the breach is again hard to predict, but Station 456+50 is a logical location. The breach would cause the volume to increase under the hydrograph, but its effect I think would be minimal with reference to depth or area inundated due to the unconfined conditions of the flow. Thus, under this condition (i.e. with flow through the overchutes and the projected overtopping) the area inundated downstream of the Canal would be about the same as that delineated ignoring the effect of the Canal. Depths immediately downstream of the CAP breach might be somewhat greater, but these would soon be disipated as the water spreads out over a wide area. The area of major depths and damages would be similar to that experienced below the CAP during the July 17-18, 1984 flood.

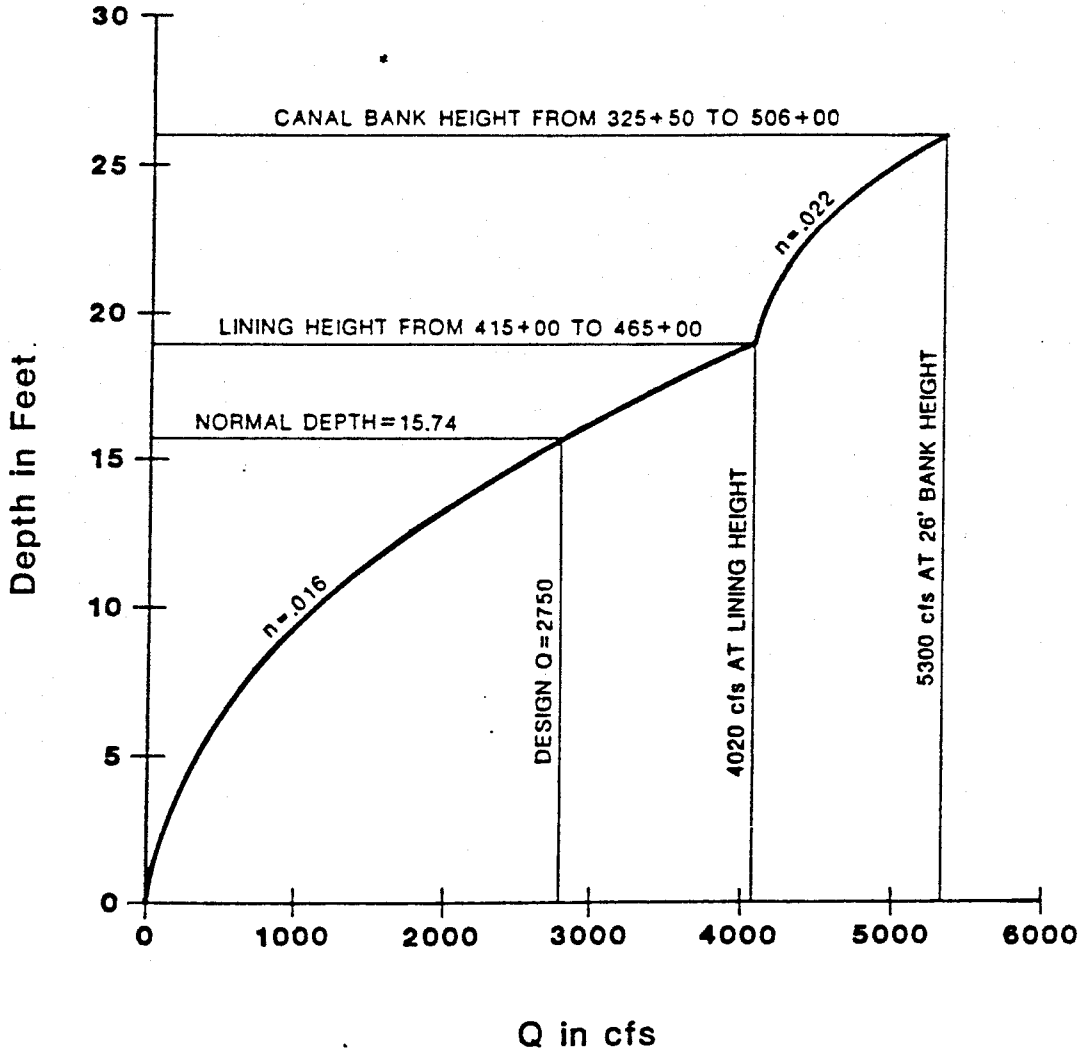
Should inflow to the FRS be assumed with the breach, the only difference in the above discription would be to remove any doubt about overtopping and breaching of the CAP Canal. With the larger volume of water, breaching of the

CAP would almost be a certainity. Again the area inundated downstream of the Canal would be about the same as presently delineated, although it could be enlarged due to the spreading effect of the CAP. Water could be transported by the CAP to the southeast and overtop the Canal at a point further downstream. However, to predict a location is almost impossible, therefore, I suggest leaving the inundation map as originally delineated.

In conclusion, the CAP Canal definitely will have some effect on any emergency spillway or breach hydrograph discharge occurring from the Signal Butte FRS. The effect on the ESH will be to limit discharges downstream of the CAP to those which will pass through the overchutes structures located at Stations 427+15, 429+20 and 456+50. The total design capacity of these structures is 1400 cfs. Although this is a decrease from the 2369 cfs estimated at X-Section No. 4, the area inundated downstream of the CAP should remain about the same, although the depths will be decreased to some extent. Since the maximum capacity at Station 456+50 is only 270 cfs, this flow should be contain within the channel downstream of the CAP, and not inundate any additional land. Some minor ponding also will occur upstream of the CAP in the vicinity of the designated structures under this flow condition.

For the FBH and breach hydrographs, it is assumed that the CAP embankments will overtop and breach near Station 456+50 and at other possible locations. Thus, with flow through the overchutes, the area inundated downstream of the CAP will be almost the same as estimated ignoring the effect of the Canal. Ponding will occur upstream of the CAP to the height of the maintence road embankment with average depths of about 4 feet, but with possible depths as high as 10 to 12 feet in the vicinity of Station 456+50.

AQUEDUCT RATING CURVE



Source: U.S. Bureau of Reclamation, "Assessment of Flood Damages, Salt-Gila Aqueduct Reach 1B, July 17-18, 1985", by International Engineering Co. Inc.

EXHIBIT 7-4

TABLE 7-3

CASE III

DISCHARGE HYDROGRAPHS

Structure		Case III				Bureau[1] Original Design		
		Drainage Area		Discharge		Drainage Area	Discharge	
No.	Station	Designation	Area (sq mi)	Peak (cfs)	Volume (ac-ft)	(sq mi)	Peak (cfs)	Volume (ac-ft)
1	345+30	1A	0.40	436	31	0.40	460	27
2	374+00	2A	0.87	887	67	0.82	870	60
3	396+40	3A	0.76	762	58	0.76	800	51
4	427+15	4A+4B+4D	1.88	530*	72*	1.73	565*	59*
5	429+20							
6	456+50	10A	0.19	286	15	0.19	270	13
7	471+03	5A	1.67	889	128	1.67	910	113
8	479+00	6A	2.28	543*	87*	2.26	575*	52*
9	504+25					Total	3460 CFS	
10	529+50	7A	3.17	803*	121*	3.10	840*	105*
11	542+50							
12	552+50	8A	4.06	778*	154*	3.99	760*	135*
13	563+50							
14	574+50	9A	0.66	401	50	0.62	400	42

OVER Hide Capacities Breach outflows

Source: U.S. Bureau of Reclamation, "Assessment of Flood Damages, Salt-Gila Aqueduct Reach 1B, July 17-18, 1984," by International Engineering Co. Inc.

(1) Reference 7

* per each structure

ARIZ Buckhorn Mesa W/S

Item 4/30/85

Signal Butte Floodway Breach Analysis

Available Storage Volume of CAP Aqueduct.

1. Estimate Vol. of Available Freeboard Storage Bet Control Gate @ Mile Post 197.999 and Mile 207.214 (i.e. From Stat. University Dr. Southeast 9.215 miles)

Given:

CAP BW = 24'

S:S = 1½:1

Nor Depth = 15.74' (use 16')

Total Depth = 26' (To top of Main. Rd)

Find Vol to D = 16'

A = 768.0 □'

TW = 72'

$$Vol = \frac{(768\ \square')(9.215\ miles)(5280\ ft/mi)}{43560\ ft^2/Ac\text{-}ft} = 858\ Ac\text{-}FT$$

Find Vol to D = 26'

A = 1638 □'

TW = 102'

$$Vol = \frac{(1638)(9.215)(5280)}{43,560} = 1830\ Ac\text{-}FT$$

Therefore Available Storage:

Vol = 1830 − 858 = 982 Ac-FT

United States Department of Agriculture

Soil Conservation Service

Water Resources Planning Staff
Suite 326, Arizona Title Building
111 West Monroe Street
Phoenix, Arizona 85003

Subject: ENG - Signal Butte Floodwater Retard Structure- Inundation Maps for Emergency Action Plan

Date: August 31, 1983

To: Ralph Arrington
State Conservation Engineer
Phoenix, Arizona

File Code: 210-13-15

Several flood routings were made to develop inundation maps for the Signal Butte FRS. These consisted of the Emergency Spillway Hydrograph, The Freeboard Hydrgraph and Breach Hydrographs based on two different breach locations, peak flows and flood volumes.

The Emergency Spillway Outflow Hydrograph (ESH) was routed using the TR-20 Program and assuming that the flow would be confined to the channel until it crosses Signal Butte Road. From this point downstream the flow was allowed to spread to where water surface elevations where approximately equal to the elevation of the natural ground, i.e., the flow was basically confined to the low flow areas.

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In conclusion, variations in depths or elevations of flooding in a given area for different storms will be slight, usually less than one-foot; but the width of the flooded area will increase greatly as the magnitude of the flood increases. The width generally tends to increase in a downstream direction; whereas depth and peak discharges will decrease. Although flooding will continue for some distance downstream of Apache Trails, flood conditions will be similar to those experienced on the immediate downstream side of this location. Apache Trails Road will cause some ponding upstream, and could cause some diversion of flow to the west. The major areas of concern will be the channels or other low lying areas upstream of Apache Trails where depths could be as much as four feet in some locations. As the flood progresses downstream, depths will tend to decrease with maximum depths being in the 1 to 3 feet range. The greater depths again will be in small drainage ditches or channels that traverse the downstream area.

Johnny Williams for

HARRY C. MILLSAPS
Hydraulic Engineer

Enclosure

Room 3008 Federal Building
230 North First Avenue
Phoenix, Arizona 85025

April 3, 1984

Dan E. Sagramoso, P. E.
Chief Engineer & General Manager
Flood Control District of Maricopa County
3535 West Durango Street
Phoenix, Arizona 85009

Dear Dan:

Several flood routings were made to develop inundation maps for the Signal Butte FRS, for an Emergency Action Plan. These consisted of the Emergency Spillway Hydrograph, The Freeboard Hydrograph and Breach Hydrographs based on two different breach locations, peak flows and flood volumes. Cross sections used for routing were taken from planning surveys consisting of 4-foot contour interval topo maps, scale 1"=400'. Plotted copies of the cross sections are enclosed for your information.

The Emergency Spillway Outflow Hydrograph (ESH) was routed using the TR-20 Program and assuming that the flow would be confined to the channel until it crosses Signal Butte Road. From this point downstream the flow was allowed to spread to where water surface elevations where approximately equal to the elevation of the natural ground, i.e., the flow was basically confined to the low flow areas.

The routing for the Freeboard Hydrograph was accomplished in a similar manner, except the lengths of the cross sections used in the routing were much longer. The flow depths were allowed to rise approximately one foot above the contour elevation selected to align the cross section. For instance Cross Section No. 1 was aligned using contour elevation 1702.0, and the maximum computed water surface elevation for the Freeboard Storm at this location was 1702.9.

For the Breach Routings, the maximum peak discharges were developed using Figure 1 in TR-66 (TR-66 is a simplified Dam Breach Routing procedure developed by the SCS), and assuming the water surface to be at top of dam. The first breach was assummed to occur at or near Station 213+00. This gave a maximum depth of 30 feet and Q_{max} = 35000 CFS. This hydrograph(s) was run using the TR-66 computer program and assumming two volumes: 2822 acre-feet and 7930 acre-feet. The first volume assumes no inflow to the dam at the time of the breach and is equal to maximum storage to the top of dam. The second volume is equal to the total runoff from the Freeboard Storm. These are the extreme conditions (with respect to volumes) for the assumed breach.

The final hydrographs were based on a breach at or near Station 228+00. This gave a maximum water depth of 38.0 feet to the top of dam, and a Q_{max} = 55000 CFS from Figure 1, TR-66. The same two volumes described above were used with

this peak to develop hydrographs for routing. For both breaches, the hydrographs were assummed to be curvilinear (SCS, TR-66), since the flow in the valley immediately downstream of the dam was calculated to be subcritical.

The same cross sections were used for both breach locations, although in actuality, they would be somewhat different; at least this is true for the cross section located at the dam, or Cross Section No. 1. Also, since a breach could occur at any point along the dam centerline, the total width of the dam is shown as flood plain. Overflow depths for all locations along the dam would be similar to those calculated at Cross Section No. 1 for the breach at station 213+00.

The results of all the routings are shown in the attached table and on the flood inundation map(s). As can be seen, there is not much difference in the depths or elevations of the various floods, but the width of the flooded area increases greatly as the magnitude of the flood increases. There is, however, approximately 0.5 feet difference in depth due to the increase in volumes assummed for the breach routings. For instance at Cross Section No. 4 with Q_{max} = 55000 CFS, the computed elevation for Vol = 2822 acre-feet is 1580.3 as compared to 1580.8 computed using the larger Vol = 7930 acre-feet. Similar differences can be noted at the other cross sections, and for the conditions where Q_{max} = 35000 CFS.

Velocities are generally low being less than 4.0 ft/sec in most areas, except possibly in the channels or other low lying areas. Velocities are generally higher in the vicinity of Cross Section No. 1, where flow is basically confined to channel; and then decrease in a downstream direction as the flow spreads out over a much wider area. Velocities in the range of 1 to 3 feet per second can be expected in the vicinity of Cross Section No. 4, depending on the magnitude of the flood.

It should be noted that in all routings, the effect of Apache Trails Road was ignored, although some increase in the depth of flooding will occur at this location due to the fill on the road. There is also a possibility that it will divert some of the flow further to the west than indicated on the inundation map(s). Other effects on downstream flows, however, should be minor, since the road will be overtopped with the freeboard and the routed breach hydrographs.

In conclusion, variations in depths or elevations of flooding in a given area for different storms will be slight, usually less than one-foot; but the width of the flooded area will increase greatly as the magnitude of the flood increases. The width generally tends to increase in a downstream direction; whereas depth and peak discharges will decrease. Although flooding will continue for some distance downstream of Apache Trails, flood conditions will be similar to those experienced on the immediate downstream side of this location. Apache Trails Road will cause some ponding upstream, and could cause some diversion of flow to the west. The major areas of concern will be the channels or other low lying areas upstream of Apache Trails where depths could be as much as four feet in some locations. As the flood progresses downstream, depths will tend to decrease with maximum depths being in the 1 to 3 feet range. The greater depths again will be in small drainage ditches or channels that traverse the downstream area.

The TR-20 Routings, WSP-2 calclulations and other documentation are available for inspection at our office, or if the need arises copies can be made availaable for your files. Should you desire additional information, please let us know.

Sincerely,

Acting For

VERNE M BATHURST
State Conservationist

Enclosure

bcc: W. Wayne Killgore, ASTC(W), SCS, Phoenix, AZ
Ralph M. Arrington, SCE, SCS, Phoenix, AZ

HCMILLSAPS:bjp

SIGNAL BUTTE FRS

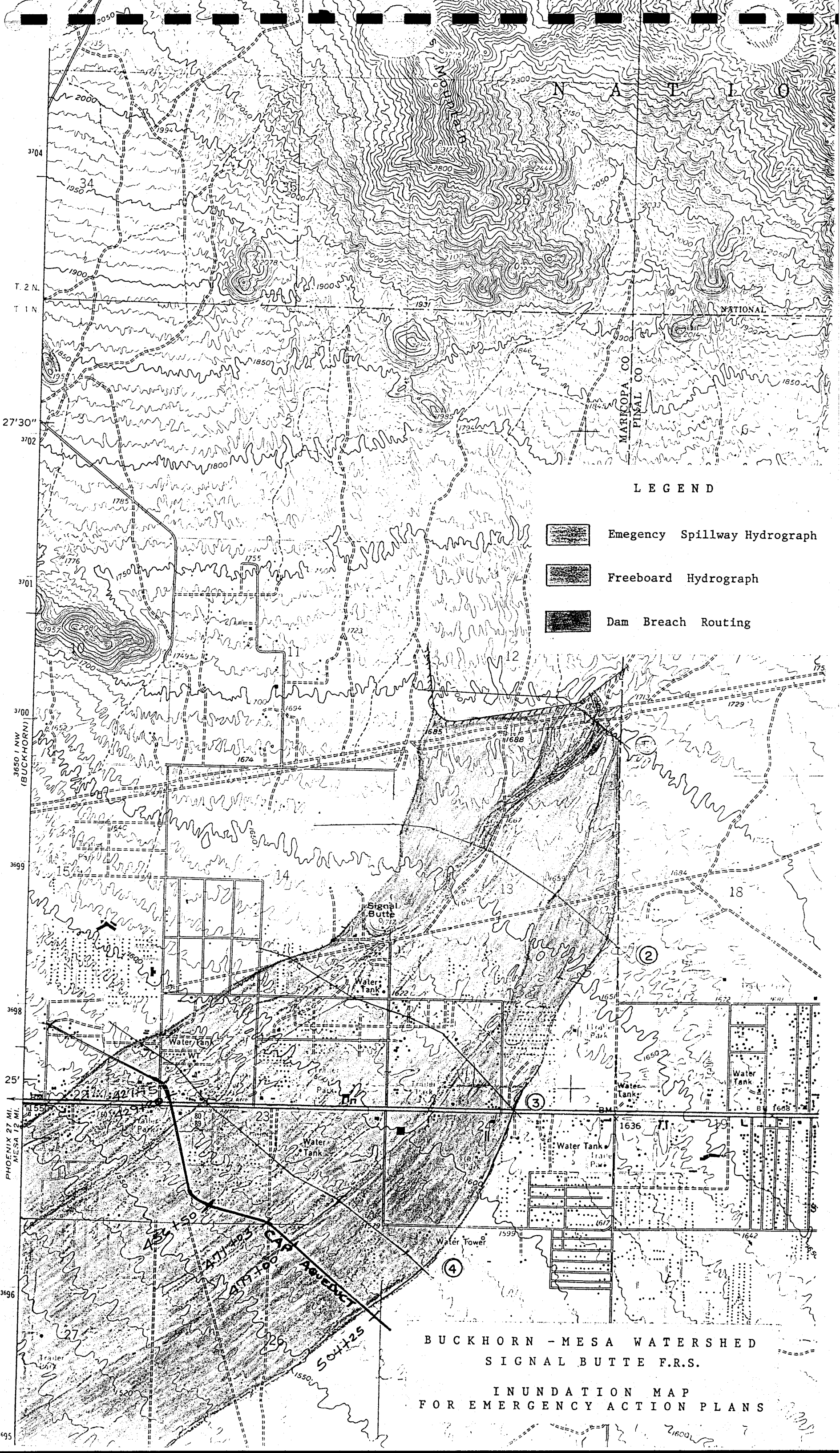
ESH, FBH AND BREACH ANALYSIS FOR EMERGENCY ACTION PLAN

X-Sect	Bankfull Elevation	Emer. Spy Hyd			Freeboard Hyd			Dam Breach			Dam Breach			Dam Breach			Dam Breach		
No.	MSL	Qmax = 2450 (Disc)	V = 1850 (Elev)	(Width)	Qmax = 11309 (Disc)	V = 6514 (Elev)	(Width)	Qmax = 35000 (Disc)	V = 2822 (Elev)	(Width	Qmax = 35000 (Disc)	V = 7930 (Elev)	(Width)	Qmax = 55000 (Disc)	V = 2822 (Elev)	(Width)	Qmax = 55000 (Disc)	V = 7930 (Elev)	(Width)
1	1702	2450	1700.3	620	11309	1702.9	1270	35000	--	2135	35000	--	2135	55000	--	2135	55000	--	2135
2	1660	2441	1658.6	450	11140	1659.9	2370	25000	1660.6	3920	30000	1660.9	3920	36100	1661.2	3920	45300	1661.5	3920
3	1620	2401	1618.8	870	10915	1619.1	4570	19000	1619.5	6100	26200	1619.8	6100	25900	1619.8	6100	38000	1620.3	6100
4	1580	2369	1580.0	1180	10630	1580.5	5390	14800	1580.1	8790	23000	1580.5	8790	19000	1580.3	8790	32500	1580.8	8790

SIGNAL BUTTE FRS

ANALYSIS FOR EMERGENCY ACTION PLAN

Dam Breach			Dam Breach			Dam Breach			Dam Breach		
ax = 35000 V = 2822			Qmax = 35000 V = 7930			Qmax = 55000 V = 2822			Qmax = 55000 V = 7930		
isc)	(Elev)	(Width	(Disc)	(Elev)	(Width)	(Disc)	(Elev)	(Width)	(Disc)	(Elev)	(Width)
000	--	2135	35000	--	2135	55000	--	2135	55000	--	2135
000	1660.6	3920	30000	1660.9	3920	36100	1661.2	3920	45300	1661.5	3920
000	1619.5	6100	26200	1619.8	6100	25900	1619.8	6100	38000	1620.3	6100
800	1580.1	8790	23000	1580.5	8790	19000	1580.3	8790	32500	1580.8	8790

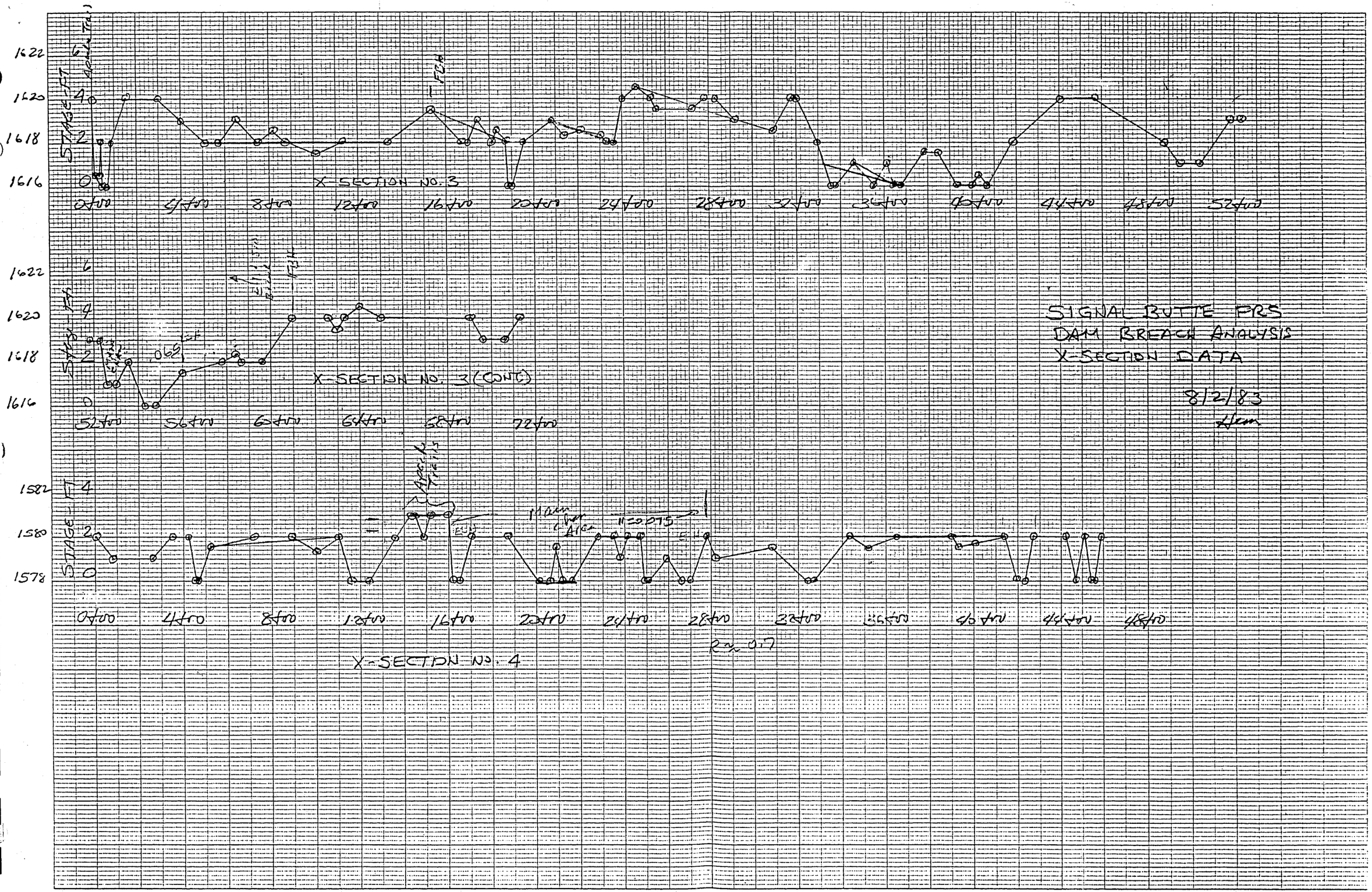

N A T I O
Mountain
NATIONAL
MARICOPA CO
PINAL CO
T. 2 N.
T 1 N
27'30"
25'
PHOENIX 27 MI.
MESA 12 MI.
3650 I NW
(BUCKHORN)
LEGEND
Emegency Spillway Hydrograph
Freeboard Hydrograph
Dam Breach Routing
Signal Butte
Water Tank
Water Tower
CAP AQUEDUCT
BUCKHORN - MESA WATERSHED
SIGNAL BUTTE F.R.S.
INUNDATION MAP
FOR EMERGENCY ACTION PLANS

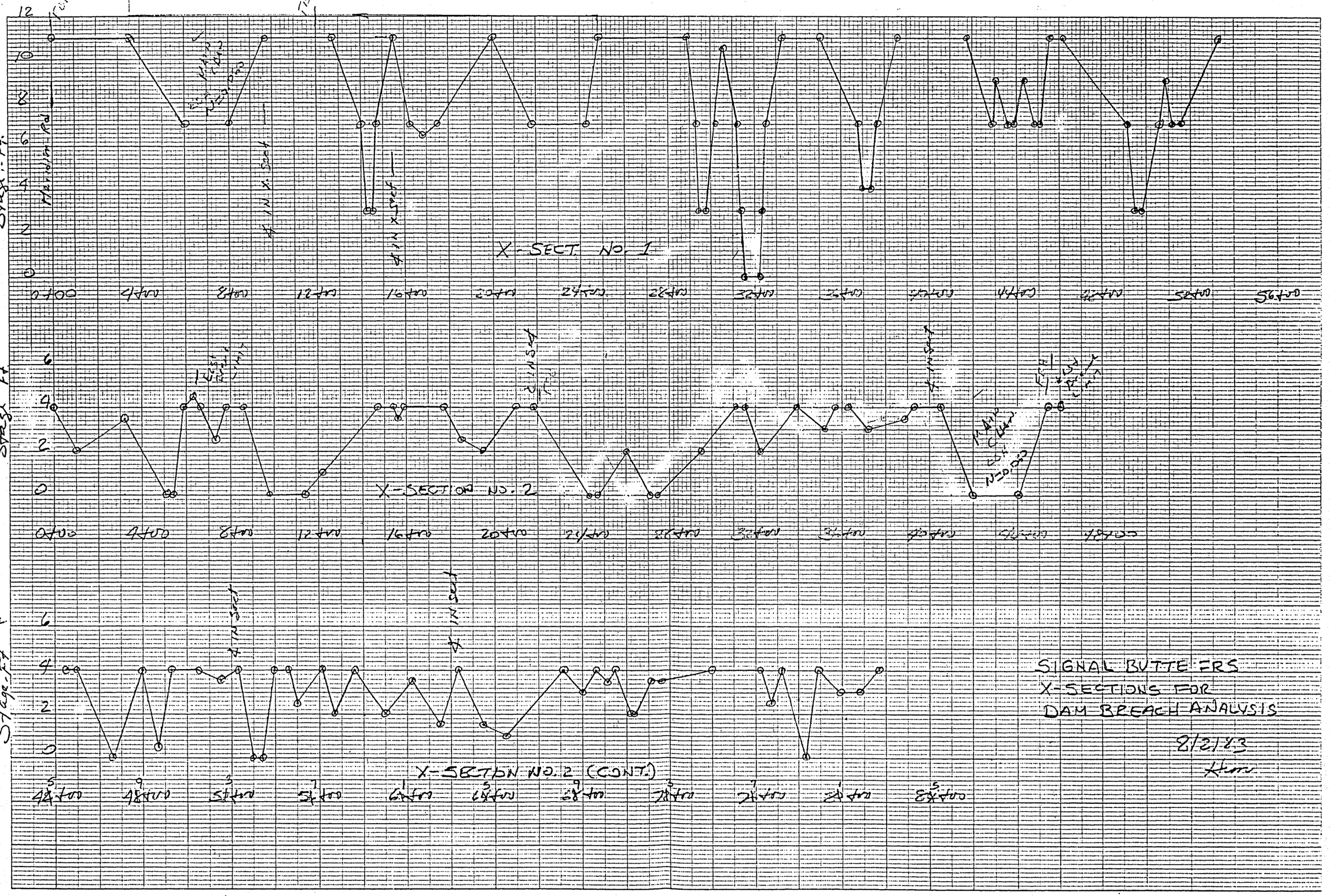
SIGNAL BUTTE

ESH, FBH AND BREACH ANNALYSIS FOR EMER. ACTION PLAN

8/17/83
Hem

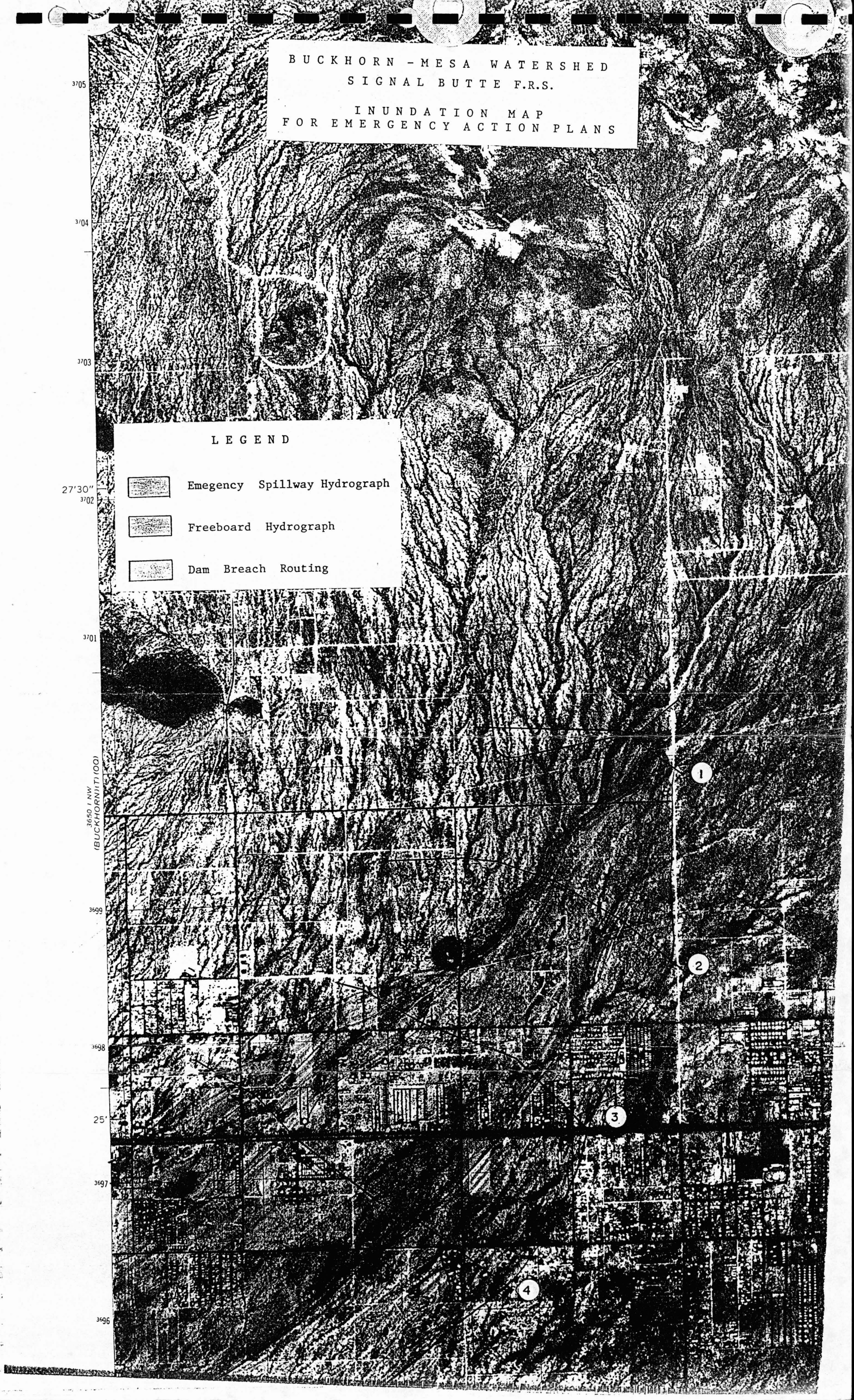
X-SECT	BANKFULL ELEV	EMER SPL HYD Qmax=2450 V=1850 (DISC)	(ELEV)	(WIDTH)	FREEBOARD HYD Qmax=11309 V=6514 (DISC)	(ELEV)	(WIDTH)	DAM BREACH Qmax=35,000; V=2822 (DISC)	(ELEV)	(WIDTH)	DAM BREACH QMAX=35,000 V=7930 (DISC)	(ELEV)	(WIDTH)	DAM BREACH QMAX=55000 V=2822 (DISC)	(ELEV)	(WIDTH)	DAM BREACH QMAX=55,000 V=7930 (DISC)	(ELEV)	(WIDTH)
1	1702	2450	1700.3	620	11309	1702.9	1270	35000	—	2135	35000	—	2135	55000	—	2135	55,000	—	2135
2	1660	2441	1658.6	450	11140	1659.9	2370	25000	1660.6	3920	30000	1660.9	3920	36,100	1661.2	3920	45300	1661.5	3920
3	1620	2401	1618.8	870	10915	1619.1	4570	19000	1619.5	6100	26200	1619.8	6100	25,900	1619.8	6100	38000	1620.3	6100
4	1580	2369	1580.0	1180	10620	1580.5	5390	14800	1580.1	8790	23000	1580.5	8790	19,000	1580.3	8790	32,500	1580.8	8790

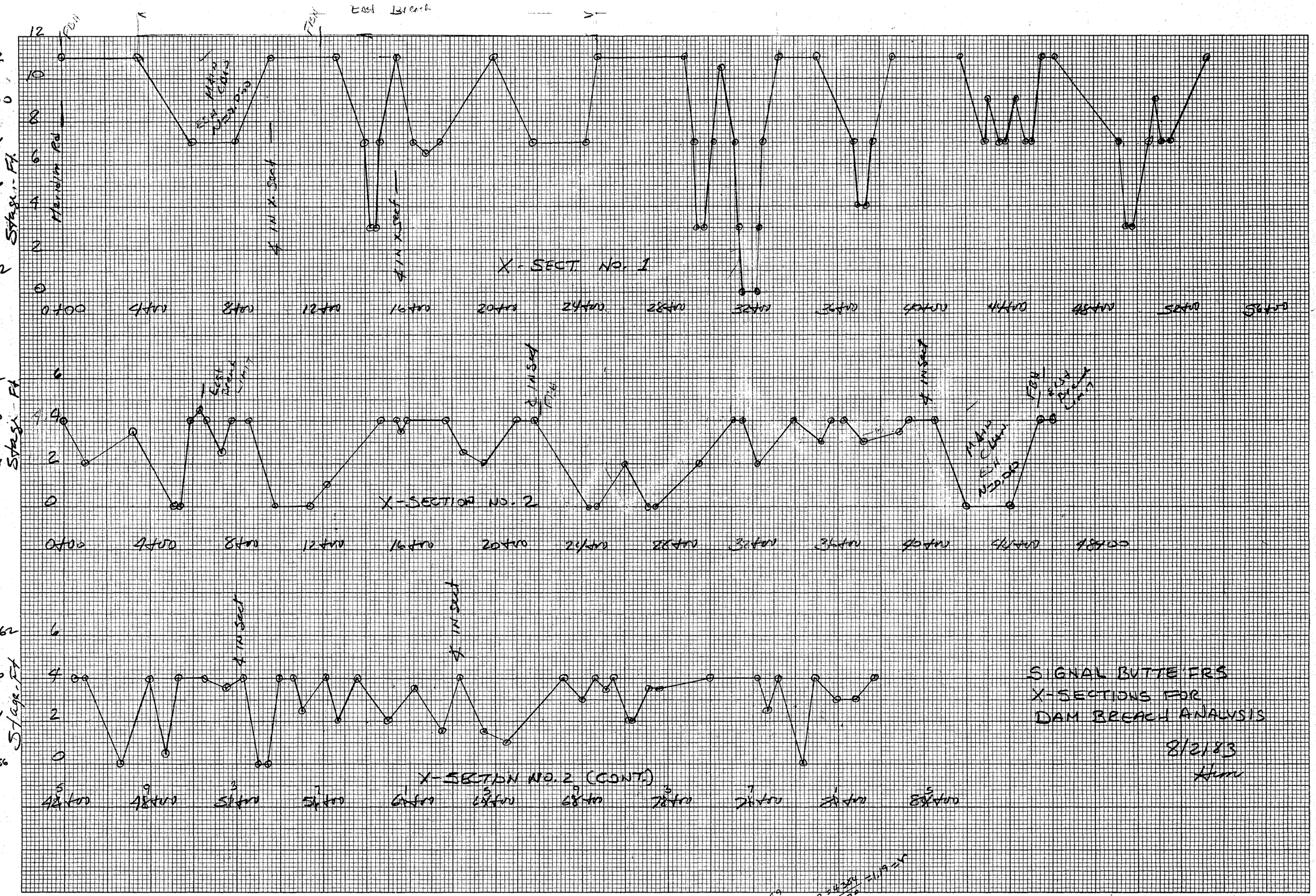

STAGE - FT
1622
1620
1618
1616
0+00
4+00
8+00
12+00
16+00
20+00
24+00
28+00
32+00
36+00
40+00
44+00
48+00
52+00
X-SECTION NO. 3
STAGE - FT
1622
1620
1618
1616
52+00
56+00
60+00
64+00
68+00
72+00
X-SECTION NO. 3 (CONT'D)
STAGE - FT
1582
1580
1578
0+00
4+00
8+00
12+00
16+00
20+00
24+00
28+00
32+00
36+00
40+00
44+00
48+00
X-SECTION NO. 4
SIGNAL BUTTE PRS
DAM BREACH ANALYSIS
X-SECTION DATA
8/2/83



SIGNAL BUTTE ERS
X-SECTIONS FOR
DAM BREACH ANALYSIS

8/21/83
Hm

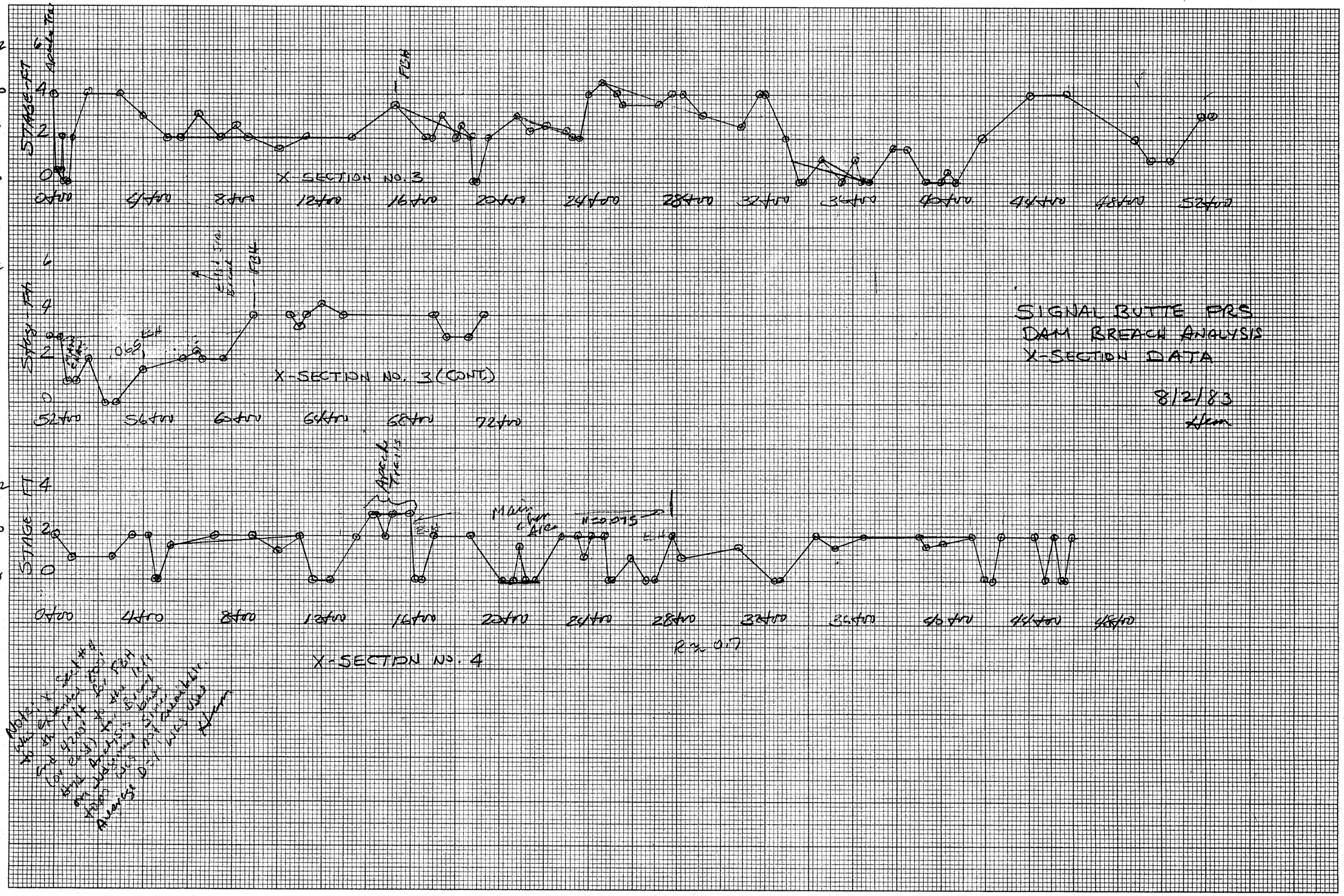

BUCKHORN - MESA WATERSHED
SIGNAL BUTTE F.R.S.
INUNDATION MAP
FOR EMERGENCY ACTION PLANS
LEGEND
Emegency Spillway Hydrograph
Freeboard Hydrograph
Dam Breach Routing
3705
3704
3703
27'30"
3702
3701
3650 I NW
(BUCKHORN II) (OO)
3699
3698
25'
3697
3696
1
2
3
4



SIGNAL BUTTERS
X-SECTIONS FOR
DAM BREACH ANALYSIS

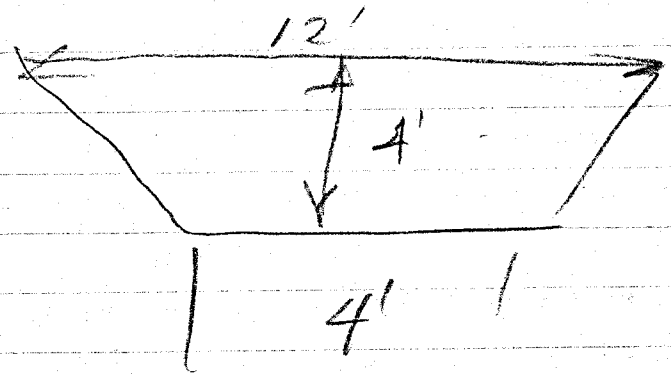
8/21/83

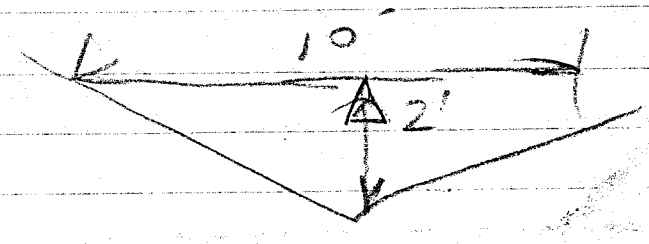
47 1320
K+E 10 X 10 TO ½ INCH • 10 X 15 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.


SIGNAL BUTTE PRS
DAM BREACH ANALYSIS
X-SECTION DATA
8/2/83
STAGE FT
X-SECTION NO. 3
X-SECTION NO. 3 (CONT)
STAGE FT
X-SECTION NO. 4
Rm 0.7

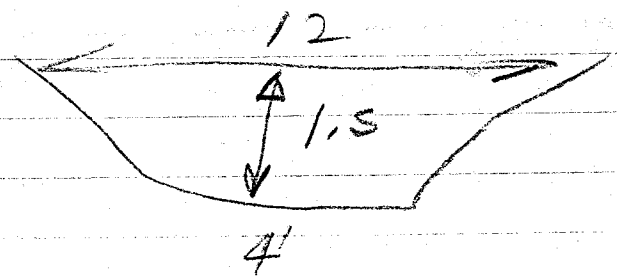
2.25

CS-14

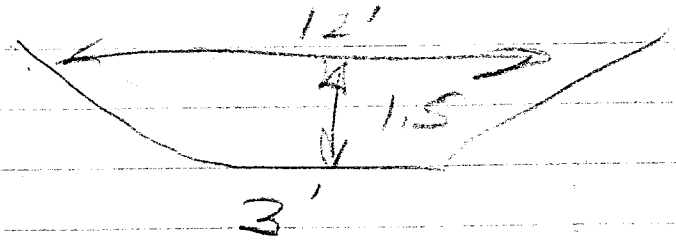




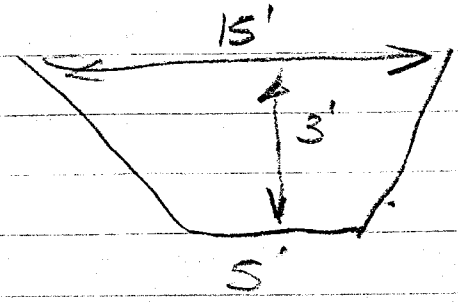
CS-15



CS-16



Meridian
CS-17



CS-1
along side 114 St
Bob's Tractor Park

7/25/83

Note 54 100' to the left when plotted on Gether Agreement w/Survey Dwg

Signal Butte Fts
℄ of Dam From
4' CI, 1"=400' Topo
L to R Looking D.S.

	Sta	Elev	Stage	
196+50	0+00	1719		Meridian Rd
197+25	0+75	1718		
200+50	4+00	1714		
202+65	6+15	1710		
205+00	8+50	1706		℄ of E. Spy
209+50	13+00	1702		
211+40	14+90	1698		
21[illegible]+00	15+50	1694		
2[illegible]+80	16+30	1694		
213+20	16+70	1695		
213+60	17+10	1694		
214+40	17+90	1694		
214+60	18+10	1698		
215+60	19+10	1698		
2[illegible]+70	23+20	1694		
220+00	23+50	1690		
220+35	23+85	1690		
223+30	26+80	1694		
226+80	30+30	1694		
228+50	32+00	1690		
228+80	32+30	1686		
[illegible]+30	32+80	1686		
229+95	33+45	1690		
230+90	34+40	1692		

Sta	Elev	Stage
232+00 35+50	1690	
232+50 36+00	1690	
232+90 36+40	1690	
233+70 37+20	1686	
234+10 37+60	1690	
235+00 38+50	1692	
239+35 42+85	1690	
239+85 43+35	1686	
240+80 44+30	1686	
241+50 45+00	1688	
241+50 46+00	1686	
2[illegible]+50 48+00	1686	℄ in ℄
245+30 48+80	1690	
246+50 50+00	1692	
~~248+55 51+75~~	~~1690~~	
249+80 53+30	1694	
252+70 56+20	1694	
243+50 57+00	1698	
254+80 58+30	1702	
256+50 60+00	1706	
260+00 63+50	1710	

7/25/83
Hm

Signal Butte FRS
℄ OF DAM From
7½ - Minute Quad Sheet
L to R Looking D.S.

Sta		Elev	Stage	Remarks
196+50	0+00	1718		Meridian Rd
204+00	7+50	1710		
209+50	13+00	1700		TB ℄ IN ℄
209+75	13+25	1692		
210+75	14+25	1692		
211+00	14+50	1695		TB
211+25	14+75	1692		
212+25	15+75	1692		
212+50	16+00	1700		TB
214+50	18+00	1700		
218+00	21+50	1692		
222+50	26+00	1692		
224+50	28+00	1696		
226+00	29+50	1687		
227+50	31+00	1687		
230+00	33+50	1693		
231+00	34+50	1690		
232+00	35+50	1688		
233+00	36+50	1690		
233+50	37+00	1692		
234+70	37+60	1690		
235+00	38+50	1690		
235+70	39+20	1690		

Sta	Elev	Stage	Remarks
237+50 41+00	1692		
238+50 42+00	1690		
239+50 43+00	1687		
240+70 44+20	1690		
242+50 46+00	1690		℄ 1A E
245+50 49+00	1700		
249+50 53+00	1700		
250+00 53+50	1698		
251+50 55+00	1700		
254+50 58+00	1705		
256+50 60+00	1710		

7/26/83
Hem

Signal Butte FRS
X-Sect #1 (Nr ℄ of Dam
From 1"=400', CI=4' Topo
of Str. Area (L To R)
From Design Surveys

Sta	Elev	Depth	Remarks
-6+00	1702	11	
0+00	1702	11	℄ Meridian Rd
3+50	1702	11	
6+00	1698	7	
8+00	1698	7	
9+70	1702	11	⊥ in X. Sect
12+70	1702	11	≈ ℄ of Dam
14+00	1698	7	
14+25	1694	3	
14+50	1694	3	
14+70	1698	7	
15+50	1702	11	⊥ in X-Sect
16+25	1698	7	
16+80	1697.5	6.5	
17+50	1698	7	
20+00	1702	11	
21+75	1698	7	
24+30	1698	7	
24+85	1702	11	
28+90	1702	11	
29+30	1698	7	
29+45	1694	3	
29+75	1694	3	

Sta	Elev	Depth	Remarks
30+25	1698	7	
30+60	1701.5	10.5	
31+25	1698	7	
31+40	1694	3	
31+50	1691	0	
32+20	1691	0	
32+30	1694	3	
32+50	1698	7	
34+30	1702	11	
35+10	1702	11	
36+80	1698	7	
37+80	1695	4	
37+40	1695	4	
37+65	1698	7	
38+60	1702	11	
41+85	1702	11	
42+90	1698	7	
43+10	1700	9	
43+60	1698	7	
43+90	1698	7	
44+40	1700	9	
44+80	1698	7	
45+10	1698	7	
45+60	1702	11	
46+20	1702	11	
49+20	1698	7	
49+50	1694	3	
49+80	1694	3	
50+60	1698	7	
50+90	1700	9	
51+20	1698	7	
51+60	1698	7	
53+30	1702	11	

CS-2 (University Site)

0+00	3.5	
0+03	6.0	N = 0.075
0+09	6.0	
0+12	3.9	

CS-3

0+00	3.3	
0+03	5.8	N = 0.075
0+05	5.8	
0+07	3.6	

CS-4

LOW SWALE
D = 1' TW = 25'

CS-5 (Swale)

0+00	4.0	
0+40	5.3	N = 0.080
1+15	4.2	

CS-6 (Main channel @ Signal Butte & [illegible]

0+00	0.3	
0+12	5.4	N = 0.055
0+37	5.4	
0+49	2.0	

CS-7 (Brewers Rd)

0+00	3.8
0+40	7.2
1+00	3.7

N = 0.065

CS-8

0+00	2.8
0+65	5.4
0+73	6.7
0+80	6.7
0+86	5.4
1+48	2.5

N = 0.070

CS-8A

0+00	3.5
0+25	5.5
0+28	6.7
0+31	6.7
0+34	5.4
0+60	2.3

N = 0.070

CS-9

0+00	0.0
0+35	3.7
0+38	5.7
0+41	5.7
0+44	3.7
1+00	

CS - 10 Brooks Rd

0+00	1.3	
0+25	5.0	
1+20	5.3	
1+25	6.8	N=0.065
1+35	6.8	
1+45	5.5	
1+48	5.5	
1+53	6.0	
1+57	6.0	
1+72	1.7	

CS ~~-10~~ 11A Brooks Rd.

		N=0.080
0+00	1.5	
0+53	5.3	—
0+58	6.9	N=0.060
0+83	6.9	
0+88	5.5	—
1+68	3.9	N=0.080
2+00	0.0	

64
10
00

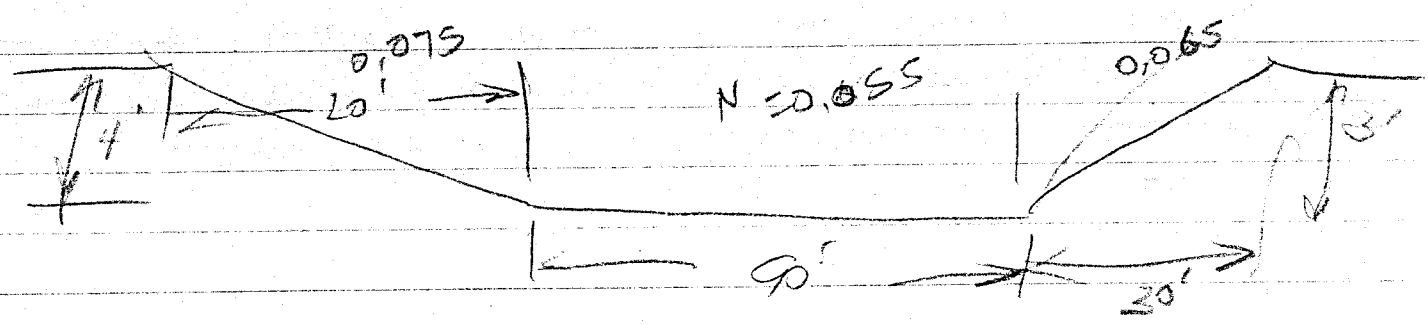
CS-11

0+00	2.0
0+15	5.7
0+25	5.7
0+80	1.0

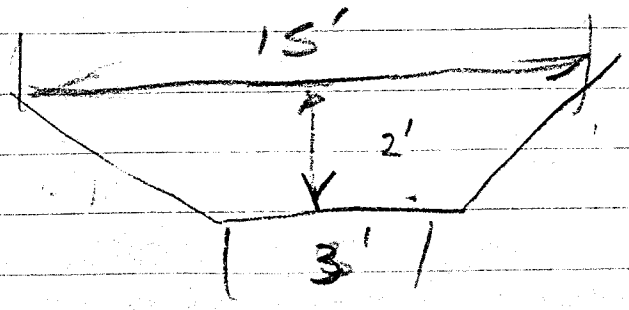
CS-12

0+00	1.0	—
0+15	5.7	0.065
0+20	5.7	—
0+24	3.7	0.075
0+54	3.7	—
0+65	5.7	0.065
0+65	5.7	—
1+65	4.7	0.075
2+05	1.7	

CS-12A



CS-13



DATA TAKEN FROM 4'-GI TOPO SCALE 1"=400' (PLANNING SURVEYS)

8/1/83

Signal Butte FRS
Dam Breach Analysis
X-Section No. 2
(L to R Looking D.S.)

Sta	Elev	Stage	Remarks
0+00	1660	4.0	
1+00	58	2.0	
3+20	59.5	3.5	
5+10	56	0.0	
5+40	56	0.0	
5+90	60	4.0	
6+30	60.5	4.5	
6+60	60	4.0	
7+30	58.5	2.5	
7+80	60	4.0	
8+60	60	4.0	
9+80	56	0.0	
11+40	58.5	2.5	
12+20	57	1.0	
14+70	60	4.0	
15+40	60	4.0	
15+60	59.5	3.5	
15+90	60	4.0	
17+70	60	4.0	
18+50	58.5	2.5	
19+55	58	2.0	
21+00	60	4.0	
21+80	60	4.0	4 in Sect
23+30	56	0.0	
23+70	56	0.0	
23+00	58	2.0	

X-Sect 2

8/1/83

Sta	Elev	Stage	Remarks
27+75	1656	0.0	
27+40	56	0.0	
27+50	58	2.0	
31+00	60	4.0	
31+50	60	4.0	
31+20	58	2.0	
31+90	60	4.0	
31+20	59	3.0	
31+70	60	4.0	
31+30	60	4.0	
31+20	59	3.0	
31+90	59.5	3.5	
31+30	60	4.0	
31+50	60	4.0	¢ IN Sect.
41+00	56	0.0	
41+00	56	0.0	
41+50	60	4.0	
41+00	60	4.0	
41+60	56	0.0	
41+00	60	4.0	
41+70	56.5	0.5	
41+30	60	4.0	
51+50	60	4.0	
51+50	59.5	3.5	
51+30	60	4.0	
51+00	56	0.0	
51+40	56	0.0	
51+00	60	4.0	¢ IN Sect.
51+60	60	4.0	

X-Sect #2 8/1/83

Sta	Elev	Stage	Remarks
5 6 +00	1658.5	2.5	
5 7 +10	60	4.0	
5 7 +70	58	2.0	
5 8 +60	60	4.0	
5 9 +10	58	2.0	
6 1 +20	59.5	3.5	
6 2 +50	57.5	1.5	
6 3 +30	60	4.0	↓ in Sect
6 4 +50	57.5	1.5	
6 5 +50	57	1.0	
6 8 +20	60	4.0	
6 9 +10	59	3.0	
6 9 +60	60	4.0	
7 0 +10	59.5	3.5	
7 0 +50	60	4.0	
7 1 +20	58	2.0	
7 2 +40	58	2.0	
7 3 +10	59.5	3.5	
7 3 +40	59.5	3.5	
7 5 +10	60	4.0	
7 7 +20	60	4.0	
7 7 +70	58.5	2.5	
7 8 +20	60	4.0	
7 9 +30	56	0.0	
7 9 +90	60	4.0	
8 0 +90	59	3.0	
8 1 +80	59	3.0	
8 2 +70	60	4.0	

DATA TAKEN FROM 4' C.I. TOPO SCALE 1" = 400' (PLANNING SURVEYS)

8/2/83
Hem

Signal Butte FRS
Dam Breach Analysis
X-Section No. 3
(L TO R, looking D.S.)

Sta	Elev	Stage	Remarks
0+00	1620	4.0	Apache Rd
0+10	1618 ~~18~~ 16.5	0.5	
0+30	1618 ~~18~~ 16.5	0.5	
0+35	1618	2.0	
0+40	1616	0.0	
0+60	1616	0.0	
0+80	1618	2.0	
1+50	1620	4.0	
3+00	1620	4.0	
4+00	1619	3.0	
5+10	1618	2.0	
5+70	1618	2.0	
6+50	1619	3.0	
7+50	1618	2.0	
8+20	1618.5	2.5	
8+70	1618	2.0	
10+10	1617.5	1.5	
11+30	1618	2.0	
13+40	1618	2.0	
15+30	1619.5	3.5	
16+70	1618	2.0	
17+00	1618	2.0	
17+40	1619	3.0	
18+10	1618	2.0	
18+30	1618.5	2.5	
18+70	1618	2.0	

X-Sect #3

Sta	Elev	Stage	Remarks
18+80	1616	0.0	
19+00	1616	0.0	
19+50	1618	2.0	
20+80	1619	3.0	
21+40	1618.3	2.3	
22+10	1618.5	2.5	
23+00	1618.3	2.3	⊄ IN Section
23+30	1618	2.0	
23+60	1618	2.0	
24+00	1620	4.0	
24+60	1620.5	4.5	
25+30	1620	4.0	
25+60	1619.5	3.5	
27+20	1619.5	3.5	
27+80	1620	4.0	
28+30	1620	4.0	
29+20	1619	3.0	
30+90	1618.5	2.5	
31+80	1620	4.0	
32+00	1620	4.0	⊄ IN Section
33+00	1618	2.0	
33+60	1616	0.0	
33+80	1616	0.0	
34+60	1617	1.0	
35+50	1616	0.0	
36+10	1617	1.0	
36+40	1616	0.0	
36+80	1616	0.0	

X-Sect #3

Sta	Elev	Stage	Remarks
37+80	1617.5	1.5	
38+50	1617.5	1.5	
39+30	1616.	0.0	
40+00	1616	0.0	
40+30	1616.5	0.5	
40+70	1616	0.0	
41+80	1618	2.0	
44+00	1620	4.0	
45+70	1620	4.0	℄ IN X-sect
48+80	1618	2.0	
49+50	1617	1.0	
50+40	1617	1.0	
51+80	1619	3.0	
52+30	1619	3.0	
52+60	1617	1.0	
53+00	1617	1.0	
53+60	1618	2.0	
54+30	1616	0.0	
54+60	1616	0.0	
56+00	1617.5	1.5	
57+80	1618	2.0	
58+40	1618.3	2.3	
58+70	1618	2.0	
59+20	1618	2.0	
61+00	1620	4.0	℄ IN X-sect.
62+60	1620	4.0	
63+00	1619.5	3.5	
63+30	1620	4.0	
64+00	1620.5	4.5	
65+00	1620	4.0	

X-Section #3

Sta	Elev	Stag
69+00	1620	4.0
69+60	1619	3.0
70+60	1619	3.0
71+30	1620	4.0

DATA TAKEN
4' C.I. TOPO
SCALE 1"=400'
(PLANNING SURVEYS)

8/2/83
Hem

Signal Butte FRS
DAM Breach Analysis
X-Section No. 4
(L to R, Looking D.S.)

Sta	Elev	Stage	Remarks
0+00	1580	2.0	
0+80	1579	1.0	
2+60	1579	1.0	
3+50	1580	2.0	
4+20	1580	2.0	
4+50	1578	0.0	
4+65	1578	0.0	
5+20	1579.5	1.5	
7+20	1580	2.0	
8+90	1580	2.0	
10+00	1579.3	1.3	
11+00	1580	2.0	
11+60	1578	0.0	
12+40	1578	0.0	
13+60	1580	2.0	
14+30	1581	3.0	
14+50	1581	3.0	
14+90	1580	2.0	
15+20	1581	3.0	
16+00	1581	3.0	
16+20	1578	0.0	
16+50	1578	0.0	
17+10	1580	2.0	
18+20	1580	2.0	

Approach TRAILS

℄ IN Sect

X-Section # 4 8/22/83 Hm

Sta	Elev	Stage	Remarks
20+10	1578	0.0	
20+60	1578	0.0	
20+90	1579.5	1.5	
21+20	1578	0.0	
21+60	1578	0.0	
22+80	1580	2.0	
23+50	1580	2.0	
23+80	1579	1.0	
24+10	1580	2.0	
24+70	1580	2.0	
24+90	1578	0.0	
25+10	1578	0.0	
25+90	1579	1.0	
26+60	1578	0.0	
27+00	1578	0.0	
27+80	1580	2.0	℄ IN Section
29+20	1579	1.0	
30+80	1579.5	1.5	
32+90	1578	0.0	
32+90	1578	0.0	
34+30	1580	2.0	
35+20	1579.5	1.5	
36+50	1580	2.0	
39+00	1580	2.0	
39+30	1579.5	1.5	
40+10	1579.7	1.7	
41+40	1580	2.0	
41+90	1578	0.0	

X-Section #4 8/2/83

Sta.	Elev.	Stage
42+30	1578	0.0
42+75	1580	2.0
44+20	1580	2.0
44+70	1578	0.0
45+10	1580	2.0
45+40	1578	0.0
45+55	1578	0.0
45+90	1580	2.0

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Buckhorn Hole
SIGNAL BUTTE FIRS, ESH
(JOB OR PROJECT)

BY Hem CHECKED DATE 8/3/83

	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1	REACH	4.0	500.	0.0	0.0	0.0		8
2	REACH	3.0	500.	4100.	4100.	4100.		9
3	REACH	2.0	500.	4600.	4600.	4600.		10
4	REACH	1.0	500.	4100.	4100.	4100.		11

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CROSS SECTION DATA

Signal Butte FRS - [illegible] BY [illegible] CHECKED _____ DATE 8/31/77
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	4.0						12
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	1600.	1581.	1620.	1578.	1650.	1578.	13
	1710.	1580.	1870.	1580.	2010.	1578.	14
	2060.	1578.	2090.	1579.5	2120.	1578.	15
	2160.	1578.	2280.	1580.	2350.	1580.	16
	2380.	1579.	2410.	1580.	2470.	1580.	17
	2490.	1578.	2510.	1578.	2590.	1579.	18
	2660.	1578.	2700.	1578.	2780.	1580.	19
	2780.	1581.					20
ENDTABLE							21
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FW-E4 BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	4.0	1	C	2780.	1581.		22
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.075						23
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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CROSS SECTION DATA

SIGNAL BUTTE FRS-ESH (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	3.0						24
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	5230.	1620.	5230.	1619.	5260.	1617.	25
	5300.	1617.	5360.	1618.	5430.	1616	26
	5460.	1616.	5600.	1617.5	5780.	1618.	27
	5840.	1618.3	5870.	1618.	5960.	1618.	28
	6100.	1620.					29
ENDTABLE							30
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte Fr. - Ck
(JOB OR PROJECT) BY _____ CHECKED _____ DATE _____

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	3.0	1.	C	6100.			31
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.065						32
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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CROSS SECTION DATA

Signal Butte FPS - EST (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	2.0						33
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	4050.	1660.	4200.	1656.	4400.	1656.	34
	4500.	1660.					35
ENDTABLE							36
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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WATER SURFACE PROFILE INPUT DATA

Signal Bulk. FAS-ESU (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	2.0	1	C	4500.	1660.		37
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.060						38
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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CROSS SECTION DATA

Signal Butte FRS-ESW (JOB OR PROJECT) BY Hem CHECKED _____ DATE 7/19/23

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	1.0						39
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	350.	1702.	600.	1696.	800.	1698.	40
	970.	1702.					41
ENDTABLE							42
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE.	LAST STATION	LAST ELEV		
SEGMENT	1.0	1	C	970.			43
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.060						44
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n' –'r' VALUES IS THE MAXIMUM

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WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS-ESID (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	FROM XSEC	TO XSEC	STARTING XSEC				
COMPUTE	4.0	1.0	4.0				45
TITLE							
COMPUTE							
TITLE							
COMPUTE							
COMPUTE							
LINK							
	FILE NAME	FROM (XSEC)	TO (XSEC)				
CHANGE							
END							
ENDJOB							46
ENDRUN							47

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(DES/WSP2. SBFB)

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS - FBH BY Hom CHECKED _____ DATE 8/3/83
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	DELTA ELEV.						
WSP2	10.0						1
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY NOT BE CHANGED IN JOB						
TITLE	BUCKHORN MESA W/S SIGNAL BUTTE FRS.						2
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY BE CHANGED AT ANY TIME						
TITLE	WSP'S FOR FREEBOARD HYD. ROUTING						3
	TOTAL D. A.	CSM	CSM	CSM	CSM	CSM	
DISCHARGE	-1.	1.0	2.0	4.0	6.0	8.0	5
DISCHARGE	-1	10.0	12.0				6
DISCHARGE							
	XSEC NAME	SLOPE	SLOPE	SLOPE	SLOPE	SLOPE	
STARTS	4.0	.00975	.00975	.00975	.00975	.00975	7
STARTS	4.0	.00975	.00975				8
STARTS							
	XSEC NAME	ELEVATION	ELEVATION	ELEVATION	ELEVATION	ELEVATION	
STARTE							
STARTE							
STARTE							
	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	
TRIB							
TRIB							
TRIB							
TRIB							
	OUTPUT OPTIONS						
OUTPUT	PSK						8a
	ANY ALPHAMERIC MESSAGE						
COMMENT	PROFILES IGNORE EFFECT OF APACHE TRAILS RD.						4
	SAME AS COMMENT						
*							

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

GENERAL INPUT DATA

Signal Butte FRS - PBH BY Hm CHECKED _____ DATE 8/3/83
(JOB OR PROJECT)

	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1	REACH	4.0	1000.	0.0	0.0	0.0		9
2	REACH	3.0	1000.	4100.	4100.	4100.		10
3	REACH	2.0	1000.	4600.	4200.	4200.		11
4	REACH	1.0	1000.	4100.	4100.	4100.		12
5								
6								
7								
8								
9								
10								
11								
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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte Res - FXH (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	4.0						13
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	-800.	1581.	-800.	1579.	-600.	1579.	14
	-600.	1578.	-570.	1578.	-570.	1580.	15
	0.0	1580.	80.	1579.	260.	1579.	16
	350.	1580.	420.	1580.	450.	1578.	17
	465.	1578.	520.	1579.5	1100.	1580.	18
	1160.	1578.	1240.	1578.	1360.	1580.	19
	1430.	1581.	1600.	1581.	1620.	1578.	20
	1650.	1578.	1710.	1580.	1870.	1580.	21
	2010.	1578.	2160.	1578.	2280.	1580.	22
	2470.	1580.	2490.	1578.	2510.	1578.	23
	2590.	1579.	2660.	1578.	2700.	1578.	24
	2780.	1580.	2980.	1579.	3080.	1579.5	25
	3240.	1578.	3270.	1578.	3430.	1580.	26
	4140.	1580.	4150.	1578	4230.	1578.	27
	4270.	1580.	4420.	1580.	4470.	1578.	28
	4510.	1580.	4540.	1578	4590.	1581.	29
ENDTABLE							30
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	4.0	1	C	4590.			31
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.080						32
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n' –'r' VALUES IS THE MAXIMUM

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte Res. - FDN (JOB OR PROJECT) BY Hen CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	30						33
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	1530.	1621.	1530.	1619.5	1870.	1618.	34
	1880.	1616.	1900.	1616.	1950.	1618.	35
	2080.	1619.	2330.	1618.	2360.	1618.	36
	2400.	1620.	2460.	1620.5	2530.	1620.	37
	2560.	1619.5	2720.	1619.5	2780.	1620.	38
	2830.	1620.	2920.	1619.	3090.	1618.5	39
	3180.	1620.	3200.	1620.	3300.	1618.	40
	3360.	1616.	3380.	1616	3460.	1617	41
	3640.	1616.	3680.	1616.	3780.	1617.5	42
	3850.	1617.5	3930.	1616.	4070.	1616.	43
	4180.	1618.	4400.	1620.	4570.	1620.	44
	4880.	1618.	4950.	1617.	5040.	1617.	45
	5180.	1619.	5230.	1619.	5260.	1617.	46
	5300.	1617.	5360.	1618.	5430.	1616.	47
	5460.	1616.	5600.	1617.5	5780.	1618.	48
	5960.	1618.	6100.	1620.	6100.	1621.	49
ENDTABLE							50
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	3.0	1	G	6100.	1621.		51
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.075						52
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte FRS - FB4 (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	2.0						53
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	2180.	1661.	2180.	1660.	2430.	1656	54
	2470.	1656.	2600.	1658.	2740.	1656	55
	2950.	1658.	3100.	1660.	3150.	1660.	56
	3220.	1658.	3390.	1660.	3520.	1659.	57
	3570.	1660.	3630.	1660.	3720.	1659.	58
	3890.	1659.5	3930.	1660.	4050.	1660.	59
	4200.	1656.	4400.	1656.	4550.	1660.	60
	4550.	1661.					61
ENDTABLE							62
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS - PZH (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	2,0	1	C	4550,	1661,		63
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0,075						64
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte Trks - FRB BY Hem CHECKED DATE 8/4/83
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	1.0						65
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	0.0	1704.	0.0	1702.	350.	1702.	66
	600.	1698.	800.	1698.	900.	1702.	67
	1200.	1702.	1200.	1704.			68
ENDTABLE							69
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	1.0	1	C	1220.	1204.		70
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.065						71
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n' –'r' VALUES IS THE MAXIMUM

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ (JOB OR PROJECT) BY _____ CHECKED _____ DATE _____

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	FROM XSEC	TO XSEC	STARTING XSEC				
COMPUTE	4.0	1.0	4.0				72
TITLE							
COMPUTE							
TITLE							
COMPUTE							
COMPUTE							
LINK							
	FILE NAME	FROM (XSEC)	TO (XSEC)				
CHANGE							
END							
ENDJOB							73
ENDRUN							74

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(DES/WSP2. SBDB)

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS East Breach (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	DELTA ELEV.						
WSP2	10.0						1
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY NOT BE CHANGED IN JOB						
TITLE	Buckhorn Mesa W/S, Signal Butte FRS						2
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY BE CHANGED AT ANY TIME						
TITLE	WSP'S FOR Breach, EAST END OF DAM						3
	TOTAL D. A.	CSM	CSM	CSM	CSM	CSM	
DISCHARGE	-1	1.0	2.0	4.0	6.0	8.0	5
DISCHARGE	-1	12.0	16.0	20.0	24.0	28.0	6
DISCHARGE							
	XSEC NAME	SLOPE	SLOPE	SLOPE	SLOPE	SLOPE	
STARTS	4.0	0.00975	0.00975	0.00975	0.00975	0.00975	7
STARTS	4.0	0.00975	0.00975	0.00975	0.00975	0.00975	8
STARTS							
	XSEC NAME	ELEVATION	ELEVATION	ELEVATION	ELEVATION	ELEVATION	
STARTE							
STARTE							
STARTE							
	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	
TRIB							
TRIB							
TRIB							
TRIB							
	OUTPUT OPTIONS						
OUTPUT	PSK						9
	ANY ALPHAMERIC MESSAGE						
COMMENT	PROFILES IGNORE EFFECT OF APACHE TRAILS RD.						4
	SAME AS COMMENT						
*							

PAGE _____ OF _____

GENERAL | IT DATA

Signal Butte FRS - FRH BY Hm CHECKED DATE 8/3/03
(JOB OR PROJECT)

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
REACH	4.0	2000.	00	00	0.0		P
REACH	3.0	2000.	4100.	4100.	4100.		11
REACH	2.0	2000.	4100.	4200.	4200.		12
REACH	1.0	2000.	4100.	4100.	4100.		13

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Top not available to extend all the way across valley floor at high water stage. Cross section for 4.0 was only available length where available. Hem

Signal Butte FRS - ~~[illegible]~~ Breach, East Side
(JOB OR PROJECT)

BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	4.0						1314
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	~~-800~~ -200	1581.	~~-800~~ -200.	1579.	-600.	1579.	1415
	-600.	1578.	-570.	1578.	-570.	1580.	1516
	0.0	1580.	80.	1579.	260.	1579.	1617
	350.	1580.	420.	1580.	450.	1578.	1718
	465.	1578.	520.	1579.5	1100.	1580.	1819
	1160.	1578.	1240.	1578.	1360.	1580.	1920
	1430.	1581.	1600.	1581.	1620.	1578.	2021
	1650.	1578.	1710.	1580.	1870.	1580.	2122
	2010.	1578.	2160.	1578.	2280.	1580.	2223
	2470.	1580.	2490.	1578.	2510.	1578.	2324
	2590.	1579.	2660.	1578.	2700.	1578.	2425
	2780.	1580.	2920.	1579.	3080.	1579.5	2526
	3240.	1578.	3270.	1578.	3430.	1580.	2627
	4140.	1580.	4190.	1578	4230.	1578.	2728
	4270.	1580.	4420.	1580.	4470.	1578.	2829
	4510.	1580.	4540.	1578	4590.	1581.	2930
ENDTABLE							3031
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte Fr's Branch (East Side) BY [illegible] CHECKED _____ DATE 8/4/83
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	40	1	C	4590.			~~31~~ 32
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.080						~~32~~ 33
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte Res Breach E. Side (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	3.0						34
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	0.0	1622.0	8.0	1620.	10.	1616.5	35
	40.	1616.	60.	1616.	80.	1618.	36
	150.	1620.	300.	1620.	510.	1618.	37
	1340.	1618.	1530.	1619.5	1870.	1618.	38
	1880.	1616.	1900.	1616.	1950.	1618.	39
	2080.	1619.	2360.	1618.	2400.	1620.	40
	2460.	1620.5	2920.	1619	3090.	1618.5	41
	3180.	1620.	3200.	1620.	3300.	1618.	42
	3380.	1617.	3680.	1616.	3780.	1617.5	43
	3850.	1617.5	3930.	1616.	4070.	1616.	44
	4180.	1618.	4400.	1620.	4570.	1620.	45
	4880.	1618.	4950.	1617.	5040.	1617.	46
	5180.	1619.	5230.	1619.	5260.	1617.	47
	5300.	1617.	5360.	1618.	5430.	1616.	48
	5460.	1616.	5600.	1617.5	5780.	1618	49
	5960.	1618.	6100.	1620.	6100.	1622.	50
ENDTABLE							51
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS, Breach East Side (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	3.0	1	C	6100.	1622.		52
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.075						53
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte FRS, Brand East Side (JOB OR PROJECT) BY Hum CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	2.0						54
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	630.	1662.0	630.	1660.5	660.	1660.	55
	730.	1658.5	780.	1660.0	860.	1660.	56
	980.	1656.	1140.	1658.5	1200.	1657.	57
	1470.	1660.	1540.	1660.	1560.	1659.5	58
	1590.	1660.	1790.	1660.	1850.	1658.5	59
	1950.	1658.	2100.	1660.	2180.	1660.	60
	2430.	1656.	2470.	1658.	2600.	1658.	61
	2710.	1656.	2940.	1656.	2950.	1658	62
	3100.	1660.	3150.	1660.	3220.	1658	63
	3390.	1660.	3580.	1659.	3570.	1660.	64
	3630.	1660.	3720.	1659.	3890.	1659.5	65
	3930.	1660.	4050.	1660.	4200.	1656.	66
	4400.	1656	4550.	1660.	4550.	1662.	67
ENDTABLE							68
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Second Butte Fgs Break East Side
(JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE.	LAST STATION	LAST ELEV		
SEGMENT	2,0	1	C	4550.	1662.		69
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	0.075						70
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n'–'r' VALUES IS THE MAXIMUM

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SOIL CONSERVATION SERVICE

CROSS SECTION DATA

Signal Butte Frs, Brenk EXDt Sd — BY Hem — CHECKED _____ — DATE 8/4/83
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION	1.0						71
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
	350.	1704.	350.	1702.	600.	1698.	72
	800.	1698.	970.	1702.	1220.	1702	73
	1425.	1698.	1425.	1694	1450.	1694.	74
	1470.	1698.	1550.	1702.	1625.	1698.	75
	1680.	1697.5	1750.	1698	2000.	1702.	76
	2175.	1698.	2430.	1698.	2485.	1702.	77
	2485.	1704.					78
ENDTABLE							79
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED						

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SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte Fls Brook ECSV Sta
(JOB OR PROJECT) BY [illegible] CHECKED _____ DATE 8/4/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV		
SEGMENT	1.0	1	C	2485.	1704.		80
	'n'	'r'	'n'	'r'	'n'	'r'	
NVALUE	.065						81
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2N VALUE CARDS CAN BE USED PER SEGMENT –4 SETS OF 'n' –'r' VALUES IS THE MAXIMUM

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SCS-ENG-20
JAN. 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte FRS - Breach East Side BY Hum CHECKED _____ DATE 8/19/83
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	FROM XSEC	TO XSEC	STARTING XSEC				
COMPUTE	4.0	1.0	4.0				82
TITLE							
COMPUTE							
TITLE							
COMPUTE							
COMPUTE							
LINK							
	FILE NAME	FROM (XSEC)	TO (XSEC)				
CHANGE							
END							
ENDJOB							83
ENDRUN							84

PAGE ____ OF ____

```
 SSSSSSSS        CCCCCCCC        SSSSSSSS          0000            44  44      WW        WW
SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000         44  44      WW        WW
SS        SS    CC        CC    SS        SS    000    000       44  44      WW        WW
SSS       SS    CC        CC    SSS       SS   000    00000     44  44      WW        WW
  SSS           CC              SSS            00    00  00   44  44      WW        WW
    SSS         CC                SSS          00    00  00   4444444444   WW   WW   WW
      SSS       CC                  SSS        00  00    00   4444444444   WW  WWWW  WW
        SSS     CC                    SSS      00 00     00        44      WW WWWWWW WW
SS        SS    CC        CC    SS        SS   0000     000       44      WWWWW  WWWWW
SS        SS    CC        CC    SS        SS    000    000        44      WWWW    WWWW
 SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000         44      WWW      WWW
  SSSSSSSS        CCCCCCCC        SSSSSSSS          0000            44      WW        WW
```

(1)

Buckhorn MCI w/s
Signal Both FRS
WSP's for FRH
8/8/83

* * * * * * UNIVAC 1100 TIME/SHARING EXEC --- MULTI-PROCESSOR SYSTEM --- LEV. SB-37R2C-2F SITE * FCCC-B * * * * * *

(DEV/WSP 2. SBFB)

RUNID * SCS04W USER ID * SCS0401 PART NUMBER * 00 INPUT DEVICE * CR0904 OUTPUT DEVICE * PR0904

FILE NAME * PR@000SCS04W CREATED AT: 11:57:42 AUG 08,1983 PRINTED AT: 11:57:49 AUG 08,1983

```
@RUN,P SCS04W,1604000101  /SCS0401,SCS04,60,5000/1000 . AZ-WSP

@SYM PRINT$,1,FCB904

@XQT   SCS76*ABS.WSP2
```

2

EXECUTION STARTED AT 11:57:44

3

4

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2       10.0                                                                  1
TITLE      BUCKHORN MESA W/S ,SIGNAL BUTTE FRS                                   2
TITLE      WSP'S FOR FREEBOARD HYDROGRAPH ROUTING                                3
COMMENT    PROFILES IGNORE EFFECT OF APACHE TRAILS ROAD                          4
DISCHARGE  -1         1.0        2.0        4.0        6.0        8.0           5
DISCHARGE  -1         10.0       12.0                                            6
STARTS     4.0        0.00975    0.00975    0.00975    0.00975    0.00975       7
STARTS     4.0        0.00975    0.00975                                         8
OUTPUT     PSK                                                                   8A
REACH      4.0        1000.      0.0        0.0        0.0                       9
REACH      3.0        1000.      4100.      4100.      4100.                    10
REACH      2.0        1000.      4600.      4200.      4200.                    11
REACH      1.0        1000.      4100.      4100.      4100.                    12
SECTION    4.0                                                                  13
           -800       1581.      -800.      1579.      -600.      1579.         14
           -600.      1578.      -570.      1578.      -570.      1580.         15
           0.0        1580.      80.        1579.      260.       1579.         16
           350.       1580.      420.       1580.      450.       1578.         17
           465.       1578.      520.       1579.5     1100.      1580.         18
           1160.      1578.      1240.      1578.      1360.      1580.         19
           1430.      1581.      1600.      1581.      1620.      1578.         20
           1650.      1578.      1710.      1580.      1870.      1580.         21
           2010.      1578.      2160.      1578.      2280.      1580.         22
           2470.      1580.      2490.      1578.      2510.      1578.         23
           2590.      1579.      2660.      1578.      2700.      1578.         24
           2780.      1580.      2920.      1579.      3080.      1579.5        25
           3240.      1578.      3270.      1578.      3430.      1580.         26
           4140.      1580.      4190.      1578.      4230.      1578.         27
           4270.      1580.      4420.      1580.      4470.      1578.         28
           4510.      1580.      4540.      1578.      4590.      1581.         29
ENDTABLE                                                                        30
SEGMENT    4.0        1          C          4590.                               31
NVALUE     0.080                                                                32
SECTION    3.0                                                                  33
           1530.      1621.      1530.      1619.5     1870.      1618.         34
           1880.      1616.      1900.      1616.      1950.      1618.         35
           2080.      1619.      2330.      1618.      2360.      1618.         36
           2400.      1620.      2460.      1620.5     2530.      1620.         37
           2560.      1619.5     2720.      1619.5     2780.      1620.         38
           2830.      1620.      2920.      1619.      3090.      1618.5        39
           3180.      1620.      3200.      1620.      3300.      1618.         40
           3360.      1616.      3380.      1616.      3460.      1617.         41
           3640.      1616.      3680.      1616.      3780.      1617.5        42
           3850.      1617.5     3930.      1616.      4070.      1616.         43
           4180.      1618.      4400.      1620.      4570.      1620.         44
```

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```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          4880.     1618.     4950.     1617.     5040.     1617.          45
          5180.     1619.     5230.     1619.     5260.     1617.          46
          5300.     1617.     5360.     1618.     5430.     1616.          47
          5460.     1616.     5600.     1617.5    5780.     1618.          48
          5960.     1618.     6100.     1620.     6100.     1621.          49
ENDTABLE                                                                   50
SEGMENT   3.0       1         C         6100.     1621.                    51
NVALUE    0.075                                                            52
SECTION   2.0                                                              53
          2180.     1661.     2180.     1660.     2430.     1656.          54
          2470.     1656.     2600.     1658.     2740.     1656.          55
          2950.     1658.     3100.     1660.     3150.     1660.          56
          3220.     1658.     3390.     1660.     3520.     1659.          57
          3570.     1660.     3630.     1660.     3720.     1659.          58
          3890.     1659.5    3930.     1660.     4050.     1660.          59
          4200.     1656.     4400.     1656.     4550.     1660.          60
          4550.     1661.                                                  61
ENDTABLE                                                                   62
SEGMENT   2.0       1         C         4550.     1661.                    63
NVALUE    0.075                                                            64
SECTION   1.0                                                              65
          0.0       1704.     0.0       1702.     350.      1702.          66
          600.      1698.     800.      1698.     970.      1702.          67
          1270.     1702.     1270.     1704.                              68
SEGMENT   1.0       1         C         1270.     1704.                    70
NVALUE    0.065                                                            71
COMPUTE   4.0       1.0       4.0                                          72
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 4.0 1.0 4.0 72

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----------STARTING DATA FROM GIVEN SLOPES----------

7

RATING TABLE FOR SECTION 4.0 DA=1000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1578.0	0.0	0.0						
1	1578.9	824.3	1000.0	.00	.00	.00	1.00	1578.5	.00906
2	1579.3	1451.1	2000.0	.00	.00	.00	2.00	1578.7	.00932
3	1579.7	2437.8	4000.0	.00	.00	.00	4.00	1579.0	.00948
4	1580.0	3341.8	6000.0	.00	.00	.00	6.00	1579.2	.00969
5	1580.2	4474.3	8000.0	.00	.00	.00	8.00	1579.4	.00954
6	1580.4	5355.8	10000.0	.00	.00	.00	10.00	1579.6	.00970
7	1580.6	6096.3	12000.0	.00	.00	.00	12.00	1579.7	.00942

SEGMENT TABLE FOR SECTION 4.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	1000.	1000.
1.	VELOCITY FPS	1.24	1.21
2	DISCHARGE CFS	2000.	2000.
2.	VELOCITY FPS	1.40	1.38
3	DISCHARGE CFS	4000.	4000.
4.	VELOCITY FPS	1.66	1.64
4	DISCHARGE CFS	6000.	6000.
6.	VELOCITY FPS	1.81	1.80
5	DISCHARGE CFS	8000.	8000.
8.	VELOCITY FPS	1.82	1.79
6	DISCHARGE CFS	10000.	10000.
10.	VELOCITY FPS	1.88	1.87
7	DISCHARGE CFS	12000.	12000.
12.	VELOCITY FPS	2.02	1.97
1	ELEV 1578.9 KD	10505.	10505.
2	ELEV 1579.3 KD	20715.	20715.
3	ELEV 1579.7 KD	41081.	41081.
4	ELEV 1580.0 KD	60945.	60945.
5	ELEV 1580.2 KD	81915.	81915.
6	ELEV 1580.4 KD	101517.	101517.
7	ELEV 1580.6 KD	123636.	123636.

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KD TABLE FOR CROSS SECTION 4.0

ELEVATION	AREA	KD	KD BY SEGMENT
1578.00	0.		
1579.	902.	11635.	11635.
1580.	3210.	58769.	58769.
1581.	8384.	213446.	213446.
1582.	13576.	573858.	573858.
1583.	18768.	1235845.	1235845.
1584.	23960.	2312997.	2312997.
1585.	29152.	3929399.	3929399.

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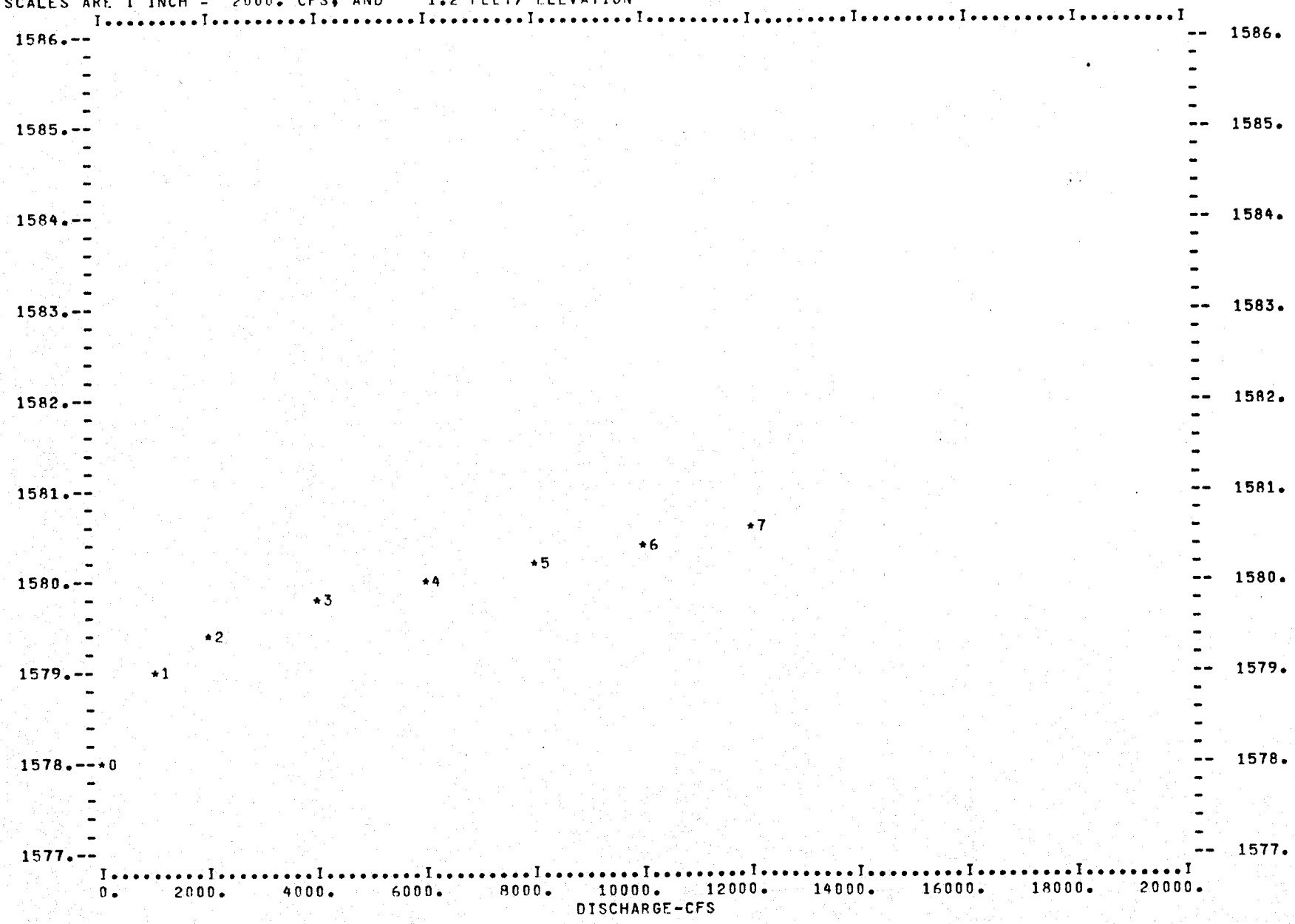
CROSS SECTION 4.0

SCALES ARE 1 INCH = 2000. CFS, AND 1.2 FEET/ ELEVATION



(10)

RATING TABLE FOR SECTION 3.0 DA=1000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1616.0	0.0	0.0						
1	1617.2	786.7	1000.0	.00	.00	.00	1.00	1616.6	.00669
2	1617.6	1236.5	2000.0	.00	.00	.00	2.00	1616.9	.00803
3	1618.0	2001.9	4000.0	.00	.00	.00	4.00	1617.2	.00889
4	1618.5	3004.5	6000.0	.00	.00	.00	6.00	1617.5	.00813
5	1618.7	3613.7	8000.0	.00	.00	.00	8.00	1617.7	.00931
6	1619.0	4381.2	10000.0	.00	.00	.00	10.00	1617.9	.00878
7	1619.1	4951.3	12000.0	.00	.00	.00	12.00	1618.0	.00929

SEGMENT TABLE FOR SECTION 3.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	1000.	1000.
1.	VELOCITY FPS	1.27	1.27
2	DISCHARGE CFS	2000.	2000.
2.	VELOCITY FPS	1.62	1.62
3	DISCHARGE CFS	4000.	4000.
4.	VELOCITY FPS	2.01	2.00
4	DISCHARGE CFS	6000.	6000.
6.	VELOCITY FPS	2.01	2.00
5	DISCHARGE CFS	8000.	8000.
8.	VELOCITY FPS	2.25	2.21
6	DISCHARGE CFS	10000.	10000.
10.	VELOCITY FPS	2.29	2.28
7	DISCHARGE CFS	12000.	12000.
12.	VELOCITY FPS	2.45	2.42
1	ELEV 1617.2 KD	12227.	12227.
2	ELEV 1617.6 KD	22319.	22319.
3	ELEV 1618.0 KD	42419.	42419.
4	ELEV 1618.5 KD	66534.	66534.
5	ELEV 1618.7 KD	82892.	82892.
6	ELEV 1619.0 KD	106744.	106744.
7	ELEV 1619.1 KD	124502.	124502.

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KD TABLE FOR CROSS SECTION 3.0

ELEVATION	AREA	KD	KD BY SEGMENT
1616.00	0.		
1617.	587.	8238.	8238.
1618.	1908.	40410.	40410.
1619.	4441.	108755.	108755.
1620.	8243.	249695.	249695.
1621.	12721.	502066.	502066.
1622.	17272.	898893.	898893.
1623.	21822.	1470860.	1470860.
1624.	26373.	2253347.	2253347.
1625.	30923.	3282739.	3282739.

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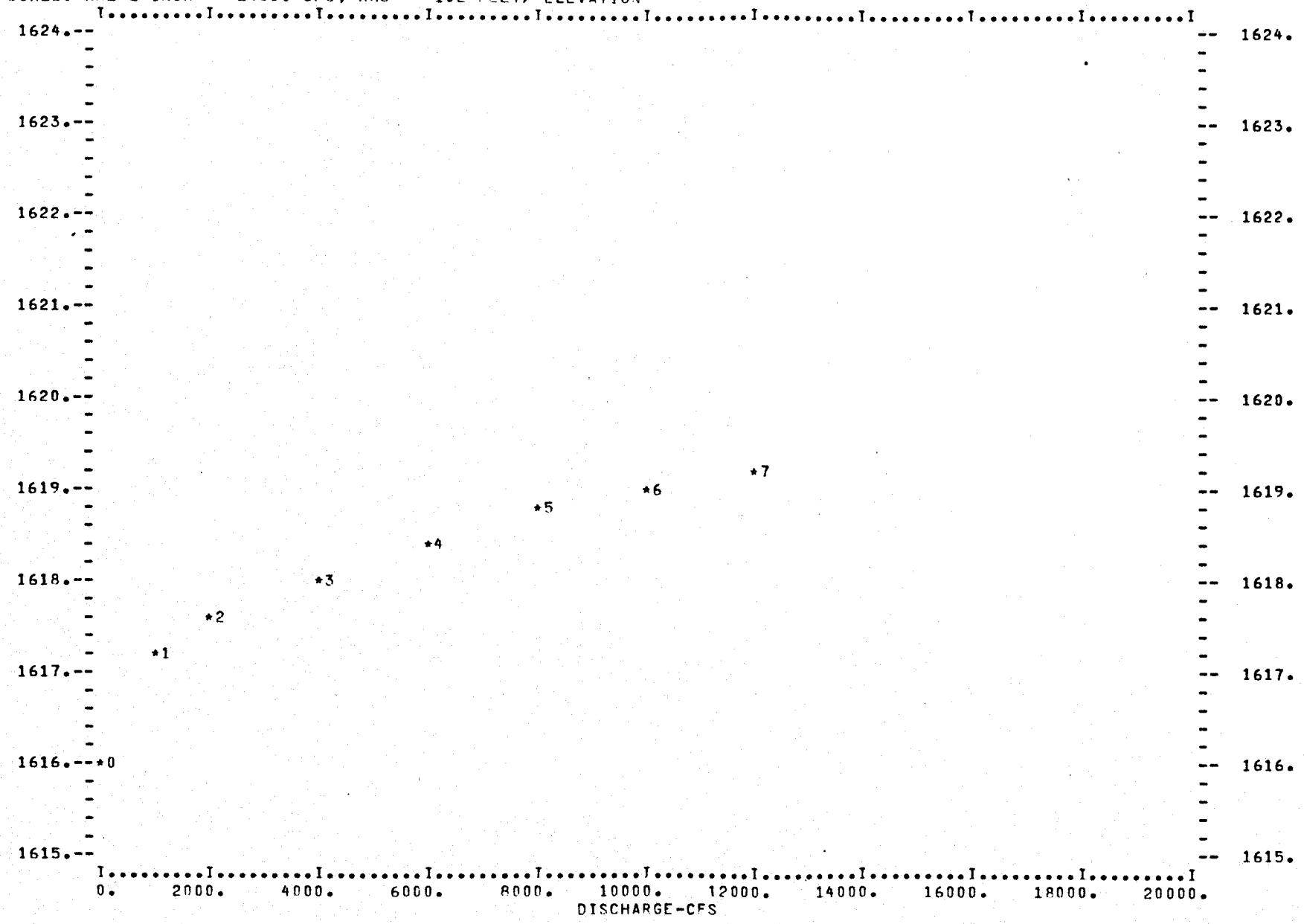
CROSS SECTION 3.0

SCALES ARE 1 INCH = 2000. CFS, AND 1.2 FEET/ ELEVATION



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RATING TABLE FOR SECTION 2.0 DA=1000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1656.0	0.0	0.0						
1	1657.3	613.9	1000.0	.00	.00	.00	1.00	1656.7	.00853
2	1657.8	1026.2	2000.0	.00	.00	.00	2.00	1657.0	.00841
3	1658.4	1649.7	4000.0	.00	.00	.00	4.00	1657.4	.00900
4	1658.9	2326.8	6000.0	.00	.00	.00	6.00	1657.7	.00792
5	1659.4	3073.5	8000.0	.00	.00	.00	8.00	1658.0	.00795
6	1659.7	3663.8	10000.0	.00	.00	.00	10.00	1658.2	.00851
7	1660.1	4318.5	12000.0	.00	.00	.00	12.00	1658.5	.00833

SEGMENT TABLE FOR SECTION 2.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	1000.	1000.
1.	VELOCITY FPS	1.64	1.63
2	DISCHARGE CFS	2000.	2000.
2.	VELOCITY FPS	1.96	1.95
3	DISCHARGE CFS	4000.	4000.
4.	VELOCITY FPS	2.43	2.42
4	DISCHARGE CFS	6000.	6000.
6.	VELOCITY FPS	2.59	2.58
5	DISCHARGE CFS	8000.	8000.
8.	VELOCITY FPS	2.62	2.60
6	DISCHARGE CFS	10000.	10000.
10.	VELOCITY FPS	2.74	2.73
7	DISCHARGE CFS	12000.	12000.
12.	VELOCITY FPS	2.79	2.78
1	ELEV 1657.3 KD	10829.	10829.
2	ELEV 1657.8 KD	21811.	21811.
3	ELEV 1658.4 KD	42170.	42170.
4	ELEV 1658.9 KD	67434.	67434.
5	ELEV 1659.4 KD	89713.	89713.
6	ELEV 1659.7 KD	108374.	108374.
7	ELEV 1660.1 KD	131502.	131502.

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KD TABLE FOR CROSS SECTION 2.0

ELEVATION	AREA	KD	KD BY SEGMENT
1656.00	0.		
1657.	436.	6694.	6694.
1658.	1235.	28261.	28261.
1659.	2396.	70394.	70394.
1660.	4211.	127535.	127535.
1661.	6533.	257122.	257122.
1662.	8903.	472463.	472463.
1663.	11273.	790260.	790260.
1664.	13643.	1233928.	1233928.
1665.	16013.	1828044.	1828044.

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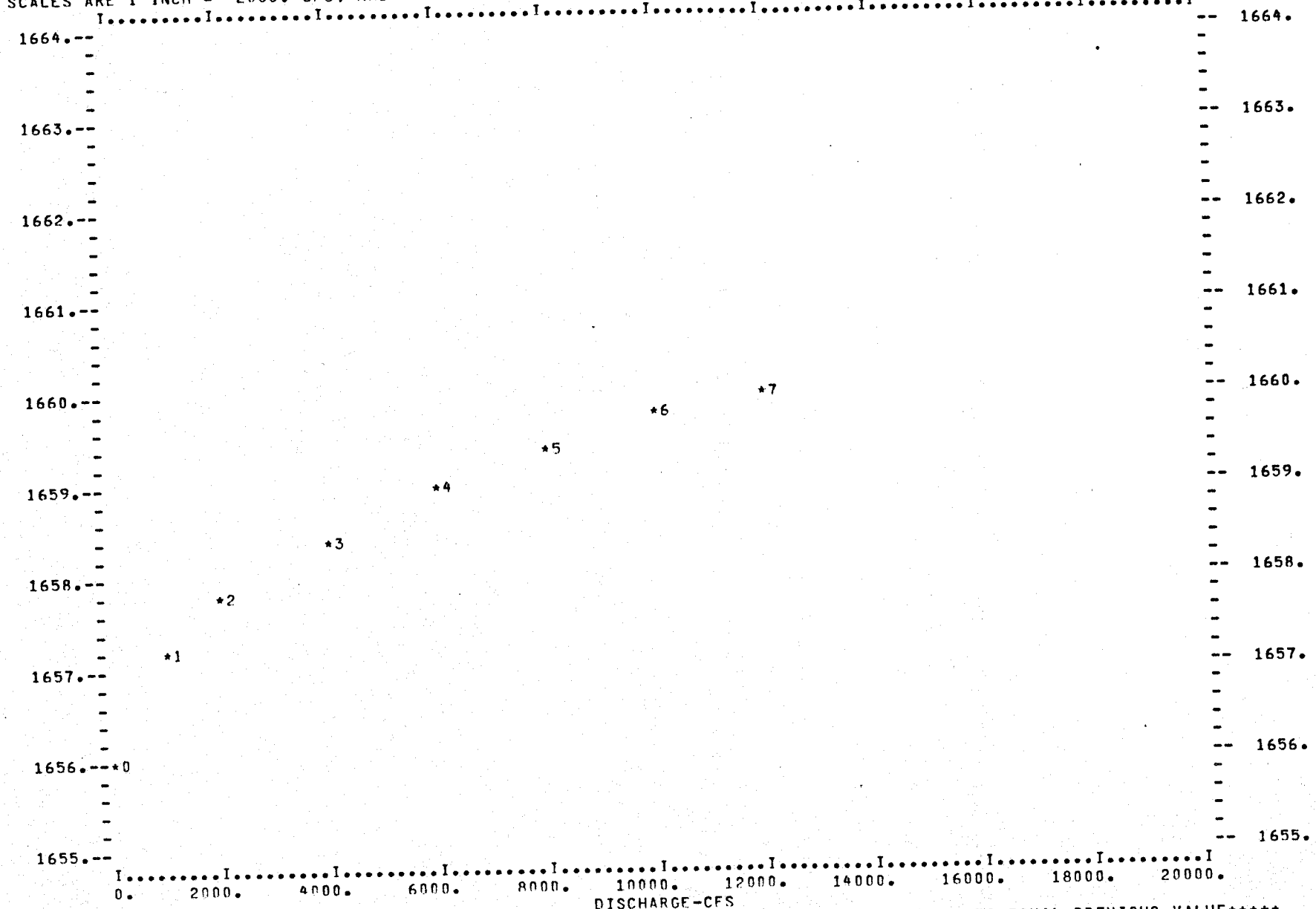
CROSS SECTION 2.0

SCALES ARE 1 INCH = 2000. CFS, AND 1.2 FEET/ ELEVATION



*****SECT.1.0 KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 1702.20 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

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RATING TABLE FOR SECTION 1.0 DA=1000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1698.0	0.0	0.0						
1	1699.4	400.1	1000.0	.00	.00	.00	1.00	1698.8	.01020
2	1700.1	647.1	2000.0	.00	.00	.00	2.00	1699.3	.01030
3	1701.0	1091.3	4000.0	.00	.00	.00	4.00	1699.9	.00955
4	1702.2	1857.9	6000.0	.00	.00	.00	6.00	1700.4	.01079
5	1702.5	2326.1	8000.0	.00	.00	.00	8.00	1700.8	.01020
6	1702.8	2660.5	10000.0	.00	.00	.00	10.00	1701.2	.01010
7	1703.0	2958.4	12000.0	.00	.00	.00	12.00	1701.5	.01042

SEGMENT TABLE FOR SECTION 1.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	1000.	1000.
1.	VELOCITY FPS	2.51	2.50
2	DISCHARGE CFS	2000.	2000.
2.	VELOCITY FPS	3.10	3.09
3	DISCHARGE CFS	4000.	4000.
4.	VELOCITY FPS	3.67	3.67
4	DISCHARGE CFS	6000.	6000.
6.	VELOCITY FPS	3.26	3.23
5	DISCHARGE CFS	8000.	8000.
8.	VELOCITY FPS	3.49	3.44
6	DISCHARGE CFS	10000.	10000.
10.	VELOCITY FPS	3.76	3.76
7	DISCHARGE CFS	12000.	12000.
12.	VELOCITY FPS	4.11	4.06
1	ELEV 1699.4 KD	9902.	9902.
2	ELEV 1700.1 KD	19709.	19709.
3	ELEV 1701.0 KD	40922.	40922.
4	ELEV 1702.2 KD	57764.	57764.
5	ELEV 1702.5 KD	79205.	79205.
6	ELEV 1702.8 KD	99491.	99491.
7	ELEV 1703.0 KD	117546.	117546.

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KD TABLE FOR CROSS SECTION 1.0

ELEVATION	AREA	KD	KD BY SEGMENT
1698.00	0.		
1699.	255.	5102.	5102.
1700.	610.	18176.	18176.
1701.	1073.	39992.	39992.
1702.	1729.	57764.	57764.
1703.	2910.	114466.	114466.
1704.	4180.	216577.	216577.
1705.	5450.	371326.	371326.
1706.	6720.	592353.	592353.
1707.	7990.	894304.	894304.

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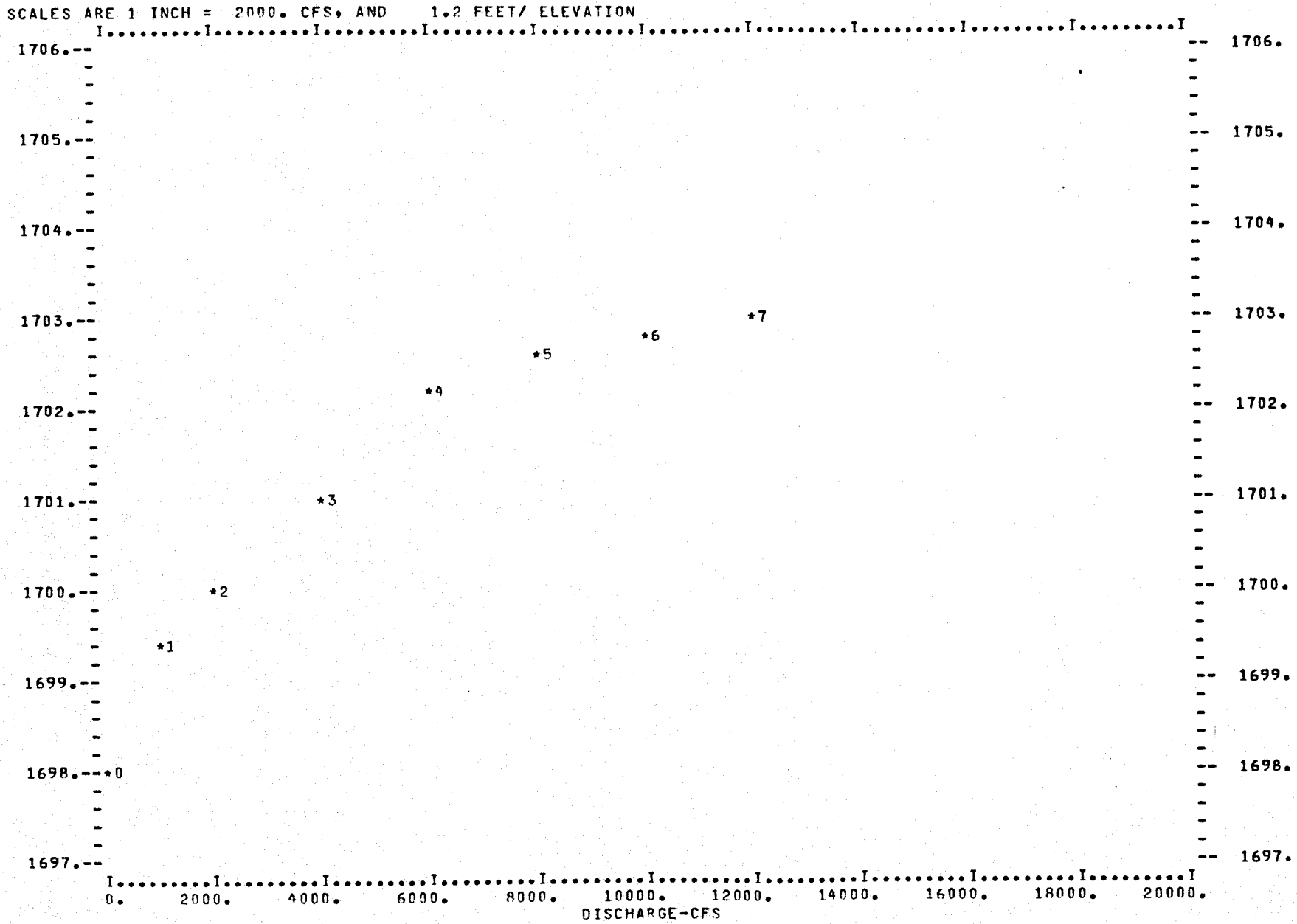
CROSS SECTION 1.0

SCALES ARE 1 INCH = 2000. CFS, AND 1.2 FEET/ ELEVATION



(19)

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDJOB                                                                        73


******************************NORMAL END OF JOB-----------------------------
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20

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDRUN                                                                        74

@END
@END IGNORED - IN CONTROL MODE

@FIN
```

21

```
RUNID: SCS04W   ACCT: 1604000101     PROJECT: SCS04

***** DISPLAYED LOG ENTRY SECTION *****
11:57:48        SCS04W FIN

***** RESOURCE UTILIZATION SECTION *****
  RESOURCE                                                AVG
    TIME          CPU          IO           CCER        SIZE   QUALIFIER     FILENAME      PROGRAM     VERSION
------------ ------------ ------------ ------------ ----  ------------ ------------ ------------ ------------
00:00:26.130 00:00:01.857 00:00:08.462 00:00:08.800  42K  SCS76         ABS          WSP2
00:00:00.410 00:00:00.000 00:00:00.351 00:00:03.718   3K  RESOURCES USED IN CONTROL MODE
============ ============ ============ ============ ====
00:00:26.540 00:00:01.857 00:00:08.813 00:00:12.518  35K  SUMMARY

IMAGES  READ:   80        PAGES:  20

START:    11:57:42 AUG 08,1983    FIN:  11:57:48 AUG 08,1983

***** COST SECTION *****

CHARGES BASED ON   BATCH  RUN  AT P PRIORITY
RT  ($000.45/MIN)   :$000000.20
CPU ($000.96/MIN)   :$000000.02
IO  ($000.50/MIN)   :$000000.07
CCER($000.96/MIN)   :$000000.20
                     ----------

ESTIMATED TOTAL COST:$000000.50   (MINIMUM CHARGE FOR BATCH)
                     ==========
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P2
TITLE      .CKHORN MESA W/S ,SIGNAL BUTTE FRS                                  2045
TITLE      WSP'S FOR BREACH 'EAST END OF DAM                                   3045
COMMENT PROFILES IGNORE EFFECT OF APACHE TRAILS ROAD                           4047
DISCHARGE -1        1.0        2.0        4.0        6.0        8.0           5046
DISCHARGE -1        12.0       16.0       20.0       24.0       28.0          6046
STARTS    4.0       0.00975    0.00975    0.00975    0.00975    0.00975       7065
STARTS    4.0       0.00975    0.00975    0.00975    0.00975    0.00975       8065
OUTPUT    PSK                                                                  9047
REACH     4.0       2000.      0.0        0.0        0.0                      10005
REACH     3.0       2000.      4100.      4100.      4100.                    11005
REACH     2.0       2000.      4600.      4200.      4200.                    12005
REACH     1.0       2000.      4100.      4100.      4100.                    13005
SECTION   4.0                                                                  14048
          -4200.    1581.      -4200.     1579.      -600.      1579.         15049
          -600.     1578.      -570.      1578.      -570.      1580.         16049
          0.0       1580.      80.        1579.      260.       1579.         17049
          350.      1580.      420.       1580.      450.       1578.         18049
          465.      1578.      520.       1579.5     1100.      1580.         19049
          1160.     1578.      1240.      1578.      1360.      1580.         20049
          1430.     1581.      1600.      1581.      1620.      1578.         21049
          1650.     1578.      1710.      1580.      1870.      1580.         22049
          2010.     1578.      2160.      1578.      2280.      1580.         23049
          2470.     1580.      2490.      1578.      2510.      1578.         24049
          2590.     1579.      2660.      1578.      2700.      1578.         25049
          2780.     1580.      2920.      1579.      3080.      1579.5        26049
          3240.     1578.      3270.      1578.      3430.      1580.         27049
          4140.     1580.      4190.      1578.      4230.      1578.         28049
          4270.     1580.      4420.      1580.      4470.      1578.         29049
          4510.     1580.      4540.      1578.      4590.      1581.         30049
ENDTABLE                                                                       31050
SEGMENT   4.0       1          C          4590.                                32008
NVALUE    0.080                                                                33009
SECTION   3.0                                                                  34048
          0.0       1622.      0.0        1620.      10.        1616.5        35049
          40.       1616.      60.        1616.      80.        1618.         36049
          150.      1620.      300.       1620.      510.       1618.         37049
          1340.     1618.      1530.      1619.5     1870.      1618.         38049
          1880.     1616.      1900.      1616.      1950.      1618.         39049
          2080.     1619.      2360.      1618.      2400.      1620.         40049
          2460.     1620.5     2920.      1619.      3090.      1618.5        41049
          3180.     1620.      3200.      1620.      3300.      1618.         42049
          3330.     1617.      3680.      1616.      3780.      1617.5        43049
          3850.     1617.5     3930.      1616.      4070.      1616.         44049
          4180.     1618.      4400.      1620.      4570.      1620.         45049
          4880.     1618.      4950.      1617.      5040.      1617.         46049
          5180.     1619.      5230.      1619.      5260.      1617.         47049
          5300.     1617.      5360.      1618.      5430.      1616.         48049
          5460.     1616.      5600.      1617.5     5780.      1618.         49049
          5960.     1618.      6100.      1620.      6100.      1622.         50049
ENDTABLE                                                                       51050
SEGMENT   3.0       1          C          6100.      1622.                    52008
NVALUE    0.075                                                                53009
SECTION   2.0                                                                  54048
          630.      1662.      630.       1660.5     660.       1660.         55049
          730.      1658.5     780.       1660.      860.       1660.         56049
          980.      1656.      1140.      1658.5     1220.      1657.         57049
          1470.     1660.      1540.      1660.      1560.      1659.5        58049
          1590.     1660.      1790.      1660.      1850.      1658.5        59049
          1950.     1658.      2100.      1660.      2180.      1660.         60049
```

```
                2430.    1656.    2470.    1656.    2600.    1658.
                [redacted]
                3100.    1660.    3150.    1660.    3220.    16[redacted]
                3390.    1660.    3520.    1659.    3570.    166[redacted]
                3630.    1660.    3720.    1659.    3890.    1659.5
                3930.    1660.    4050.    1660.    4200.    1656.
                4400.    1656.    4550.    1660.    4550.    1662.
ENDTABLE
SEGMENT         2.0      1        C        4550.    1662.
NVALUE          0.075
SECTION         1.0
                350.     1704.    350.     1702.    600.     1698.
                800.     1698.    970.     1702.    1270.    1702.
                1425.    1698.    1425.    1694.    1450.    1694.
                1470.    1698.    1550.    1702.    1625.    1698.
                1680.    1697.5   1750.    1698.    2000.    1702.
                2175     1698.    2430.    1698.    2485.    1702.
                2485.    1704.
ENDTABLE
SEGMENT         1.0      1        C        2485.    1704.
NVALUE          0.065
COMPUTE         4.0      1.0      4.0
ENDJOB
ENDRUN
```

```
61049
[redacted]
63049
64049
65049
66049
67049
.68050
69008
70009
71048
72049
73049
74049
75049
76049
77049
78049
79050
80008
81009
82007
83067
84067
```

2

(1)

```
 SSSSSSSS        CCCCCCCC        SSSSSSSS          0000            44  44      XX        XX
SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000         44  44       XX      XX
SS      SS      CC      CC      SS      SS      000    000        44  44        XX    XX
SSS     SS      CC      CC      SSS     SS     000    00000      44  44         XX  XX
  SSS           CC                SSS          00    00  00    44  44           XXXX
    SSS         CC                  SSS        00   00   00   44444444444        XX
      SSS       CC                    SSS      00  00    00  444444444444        XX
        SSS     CC                      SSS    00 00     00            44        XXXX
SS      SS      CC      CC      SS      SS     0000     000            44        XX  XX
SS      SS      CC      CC      SS      SS      000    000             44       XX    XX
SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000              44      XX      XX
 SSSSSSSS        CCCCCCCC        SSSSSSSS          0000               44      XX      XX
```

BUCKHORN MESA MTS
SIGNAL BUTTE FRS
WSP'S FOR ECH
3/8/82

* * * * * * UNIVAC 1100 TIME/SHARING EXEC --- MULTI-PROCESSOR SYSTEM --- LEV. SB-37R2C-2F SITE * FCCC-B * * * * * *

(DES/WSP2. SBES)

RUNID * SCS04X USER ID * SCS0401 PART NUMBER * 00 INPUT DEVICE * CR0904 OUTPUT DEVICE * PR0904

FILE NAME * PR@000SCS04X CREATED AT: 11:46:43 AUG 08,1983 PRINTED AT: 11:47:59 AUG 08,1983

```
@RUN,P SCS04W,1604000101  /SCS0401,SCS04,60,5000/1000 . AZ-WSP

@SYM PRINT$,1,FCB904

@XQT   SCS76*ABS.WSP2
```

3

```
EXECUTION STARTED AT   11:46:44
```

4

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2        10.0                                                                1
TITLE       BUCKHORN MESA W/S, SIGNAL BUTTE FRS                                 2
TITLE       WSP'S FOR EMER. SPY. HYD. ROUTING                                   3
COMMENT     PROFILES IGNORE EFFECT OF APACHE TRAILS ROAD                        4
DISCHARGE   -1          1.0         2.0         3.0         4.0         5.0     5
STARTS      4.0         0.00975     0.00975     0.00975     0.00975     0.00975 6
OUTPUT      PSK                                                                 7
REACH       4.0         500.        0.0         0.0         0.0                 8
REACH       3.0         500.        4100.       4100.       4100.               9
REACH       2.0         500.        4600.       4600.       4600.               10
REACH       1.0         500.        4100.       4100.       4100.               11
SECTION     4.0                                                                 12
            1600.       1581.       1620.       1578.       1650.       1578.   13
            1710.       1580.       1870.       1580.       2010.       1578.   14
            2060.       1578.       2090.       1579.5      2120.       1578.   15
            2160.       1578.       2280.       1580.       2350.       1580.   16
            2380.       1579.       2410.       1580.       2470.       1580.   17
            2490.       1578.       2510.       1578.       2590.       1579.   18
            2660.       1578.       2700.       1578.       2780.       1580.   19
            2780.       1581.                                                   20
ENDTABLE                                                                        21
SEGMENT     4.0         1           C           2780.       1581.               22
NVALUE      0.075                                                               23
SECTION     3.0                                                                 24
            5230.       1620.       5230.       1619.       5260.       1617.   25
            5300.       1617.       5360.       1618.       5430.       1616.   26
            5460.       1616.       5600.       1617.5      5780.       1618.   27
            5840.       1618.3      5870.       1618.       5960.       1618.   28
            6100.       1620.                                                   29
ENDTABLE                                                                        30
SEGMENT     3.0         1           C           6100.                           31
NVALUE      0.065                                                               32
SECTION     2.0                                                                 33
            4050.       1660.       4200.       1656.       4400.       1656.   34
            4500.       1660.                                                   35
ENDTABLE                                                                        36
SEGMENT     2.0         1           C           4500.       1660.               37
NVALUE      0.060                                                               38
SECTION     1.0                                                                 39
            350.        1702.       600.        1698.       800.        1698.   40
            970.        1702.                                                   41
ENDTABLE                                                                        42
SEGMENT     1.0         1           C           970.                            43
NVALUE      0.060                                                               44
COMPUTE     4.0         1.0         4.0                                         45
```

BUCKHORN MESA W/S, SIGNAL BUTTE FRS
WSP'S FOR FMER. SPY. HYD. ROUTING

----------80/80 LIST OF INPUT DATA----------
----------END OF 80/80 LIST----------

COMPUTE 4.0 1.0 4.0 45

----------STARTING DATA FROM GIVEN SLOPES----------

RATING TABLE FOR SECTION 4.0 DA= 500.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1578.0	0.0	0.0						
1	1579.0	366.0	500.0	.00	.00	.00	1.00	1578.5	.00896
2	1579.3	586.0	1000.0	.00	.00	.00	2.00	1578.7	.00939
3	1579.6	769.9	1500.0	.00	.00	.00	3.00	1578.9	.00963
4	1579.8	952.5	2000.0	.00	.00	.00	4.00	1579.0	.00949
5	1580.0	1102.4	2500.0	.00	.00	.00	5.00	1579.2	.00969

SEGMENT TABLE FOR SECTION 4.0

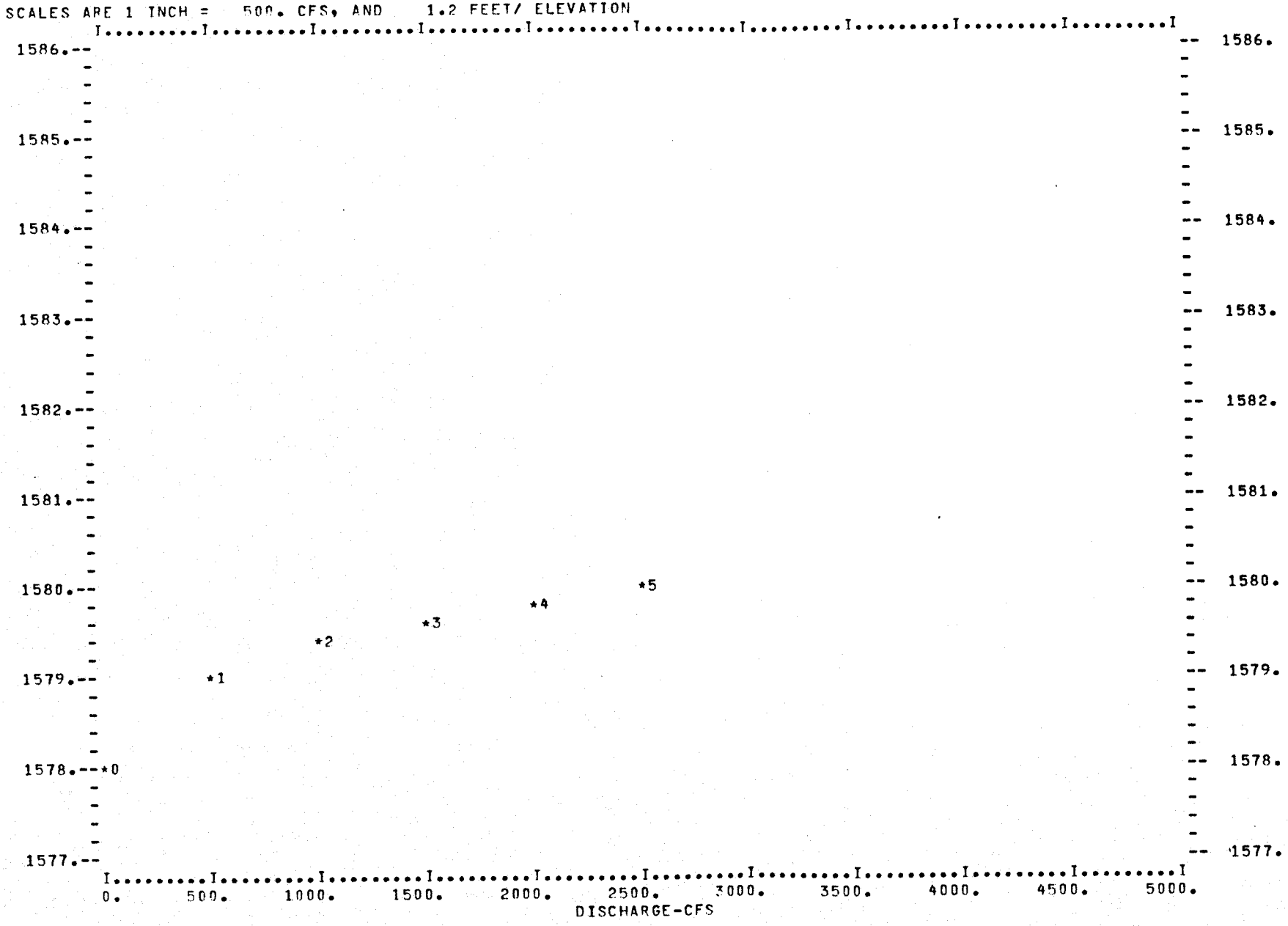
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	500.	500.
1.	VELOCITY FPS	1.39	1.37
2	DISCHARGE CFS	1000.	1000.
2.	VELOCITY FPS	1.72	1.71
3	DISCHARGE CFS	1500.	1500.
3.	VELOCITY FPS	1.95	1.95
4	DISCHARGE CFS	2000.	2000.
4.	VELOCITY FPS	2.12	2.10
5	DISCHARGE CFS	2500.	2500.
5.	VELOCITY FPS	2.27	2.27
1	ELEV 1579.0 KD	5283.	5283.
2	ELEV 1579.3 KD	10320.	10320.
3	ELEV 1579.6 KD	15281.	15281.
4	ELEV 1579.8 KD	20534.	20534.
5	ELEV 1580.0 KD	25396.	25396.

KD TABLE FOR CROSS SECTION 4.0

ELEVATION	AREA	KD	KD BY SEGMENT
1578.00	0.		
1579.	391.	5788.	5788.
1580.	1123.	26118.	26118.
1581.	2300.	71062.	71062.
1582.	3478.	155907.	155907.
1583.	4656.	286776.	286776.
1584.	5834.	471846.	471846.
1585.	7012.	718858.	718858.

CROSS SECTION 4.0

SCALES ARE 1 INCH = 500. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 3.0 DA= 500.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1616.0	0.0	0.0						
1	1617.7	289.7	500.0	.00	.00	.00	1.00	1617.1	.00878
2	1618.2	541.0	1000.0	.00	.00	.00	2.00	1617.5	.00835
3	1618.4	722.6	1500.0	.00	.00	.00	3.00	1617.7	.00877
4	1618.6	884.5	2000.0	.00	.00	.00	4.00	1617.9	.00861
5	1618.8	998.5	2500.0	.00	.00	.00	5.00	1618.1	.00911

SEGMENT TABLE FOR SECTION 3.0

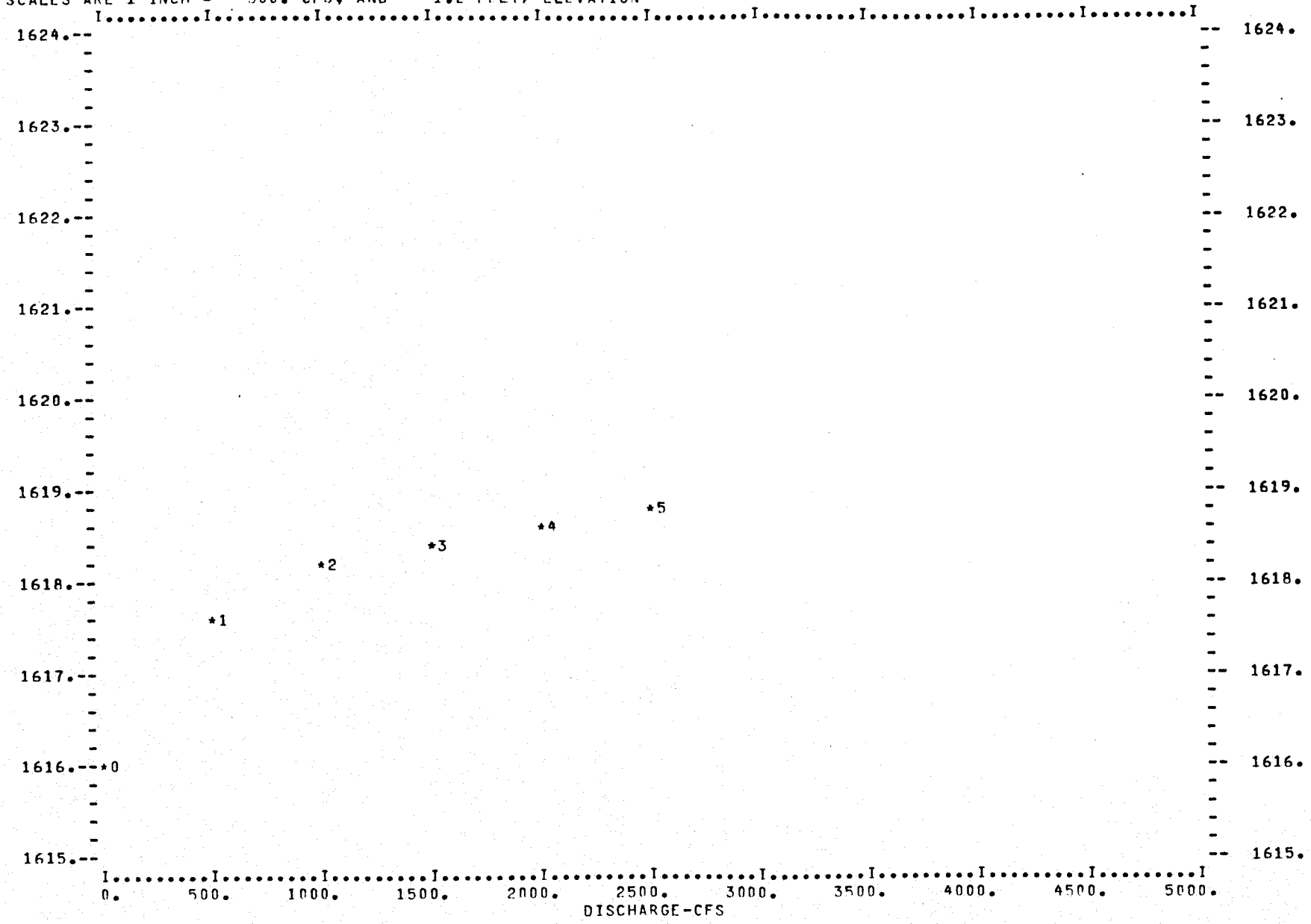
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	500.	500.
1.	VELOCITY FPS	1.75	1.73
2	DISCHARGE CFS	1000.	1000.
2.	VELOCITY FPS	1.89	1.85
3	DISCHARGE CFS	1500.	1500.
3.	VELOCITY FPS	2.09	2.08
4	DISCHARGE CFS	2000.	2000.
4.	VELOCITY FPS	2.33	2.26
5	DISCHARGE CFS	2500.	2500.
5.	VELOCITY FPS	2.57	2.50
1	ELEV 1617.7 KD	5336.	5336.
2	ELEV 1618.2 KD	10947.	10947.
3	ELEV 1618.4 KD	16020.	16020.
4	ELEV 1618.6 KD	21550.	21550.
5	ELEV 1618.8 KD	26187.	26187.

KD TABLE FOR CROSS SECTION 3.0

ELEVATION	AREA	KD	KD BY SEGMENT
1616.00	0.		
1617.	101.	1484.	1484.
1618.	428.	8414.	8414.
1619.	1172.	34538.	34538.
1620.	1993.	82328.	82328.
1621.	2813.	161497.	161497.
1622.	3634.	280060.	280060.
1623.	4455.	446063.	446063.

CROSS SECTION 3.0

SCALES ARE 1 INCH = 500. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 2.0 DA= 500.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1656.0	0.0	0.0						
1	1657.1	247.8	500.0	.00	.00	.00	1.00	1656.6	.00740
2	1657.6	390.9	1000.0	.00	.00	.00	2.00	1656.9	.00745
3	1657.9	501.5	1500.0	.00	.00	.00	3.00	1657.1	.00805
4	1658.2	607.7	2000.0	.00	.00	.00	4.00	1657.3	.00819
5	1658.6	715.4	2500.0	.00	.00	.00	5.00	1657.6	.00801

SEGMENT TABLE FOR SECTION 2.0

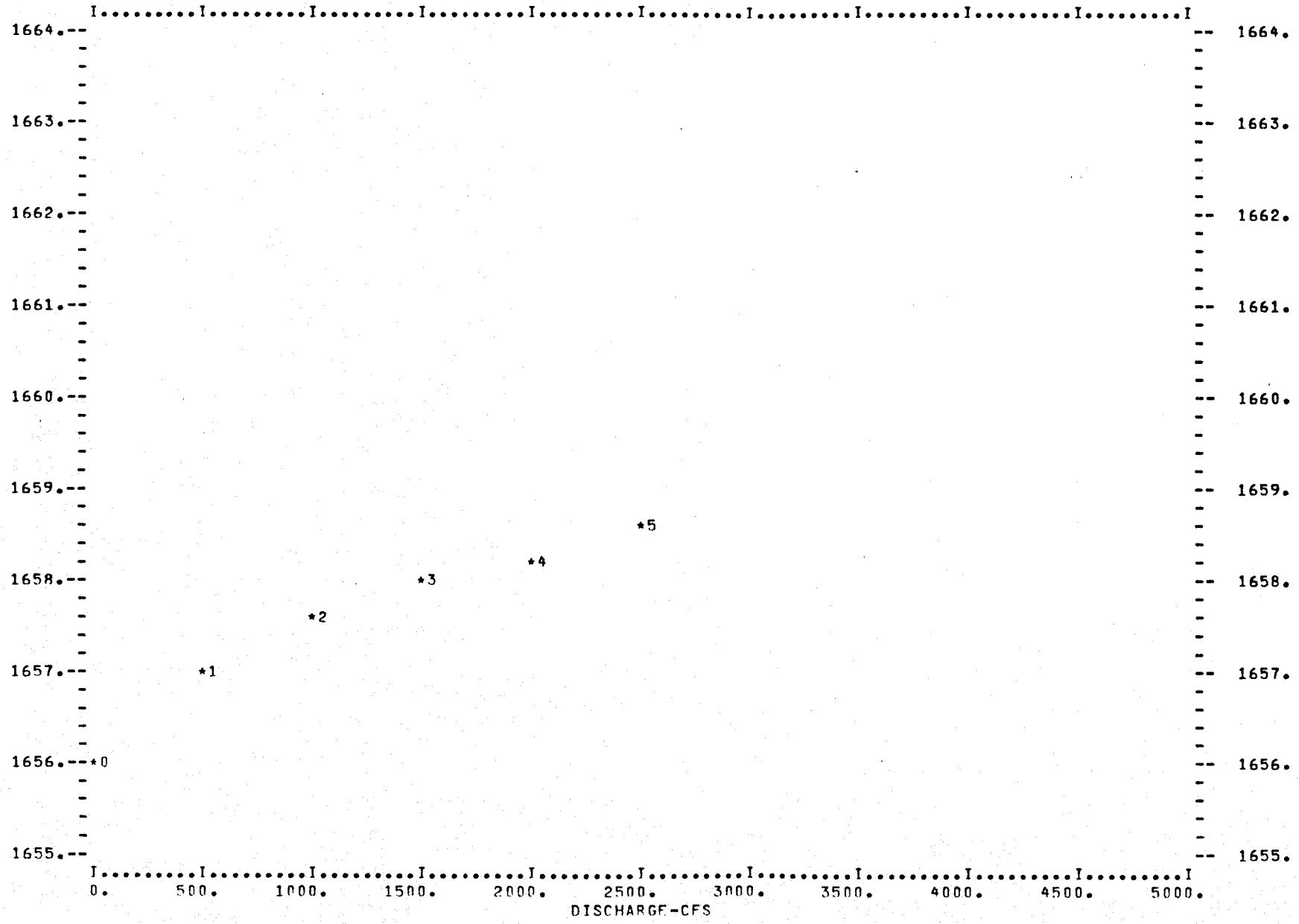
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	500.	500.
1.	VELOCITY FPS	2.03	2.02
2	DISCHARGE CFS	1000.	1000.
2.	VELOCITY FPS	2.56	2.56
3	DISCHARGE CFS	1500.	1500.
3.	VELOCITY FPS	3.00	2.99
4	DISCHARGE CFS	2000.	2000.
4.	VELOCITY FPS	3.30	3.29
5	DISCHARGE CFS	2500.	2500.
5.	VELOCITY FPS	3.50	3.49
1	ELEV 1657.1 KD	5813.	5813.
2	ELEV 1657.6 KD	11585.	11585.
3	ELEV 1657.9 KD	16713.	16713.
4	ELEV 1658.2 KD	22095.	22095.
5	ELEV 1658.6 KD	27927.	27927.

KD TABLE FOR CROSS SECTION 2.0

ELEVATION	AREA	KD	KD BY SEGMENT
1656.00	0.		
1657.	232.	5270.	5270.
1658.	525.	17901.	17901.
1659.	881.	37748.	37748.
1660.	1287.	65106.	65106.
1661.	1694.	99365.	99365.
1662.	2100.	140366.	140366.
1663.	2506.	187977.	187977.

CROSS SECTION 2.0

SCALES ARE 1 INCH = 500. CFS, AND 1.2 FEET/ ELEVATION



RATING TABLE FOR SECTION 1.0 DA= 500.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1698.0	0.0	0.0						
1	1698.9	238.1	500.0	.00	.00	.00	1.00	1698.5	.00998
2	1699.4	400.1	1000.0	.00	.00	.00	2.00	1698.8	.00869
3	1699.8	523.4	1500.0	.00	.00	.00	3.00	1699.1	.00904
4	1700.1	647.1	2000.0	.00	.00	.00	4.00	1699.3	.00877
5	1700.3	725.3	2500.0	.00	.00	.00	5.00	1699.5	.00996

SEGMENT TABLE FOR SECTION 1.0

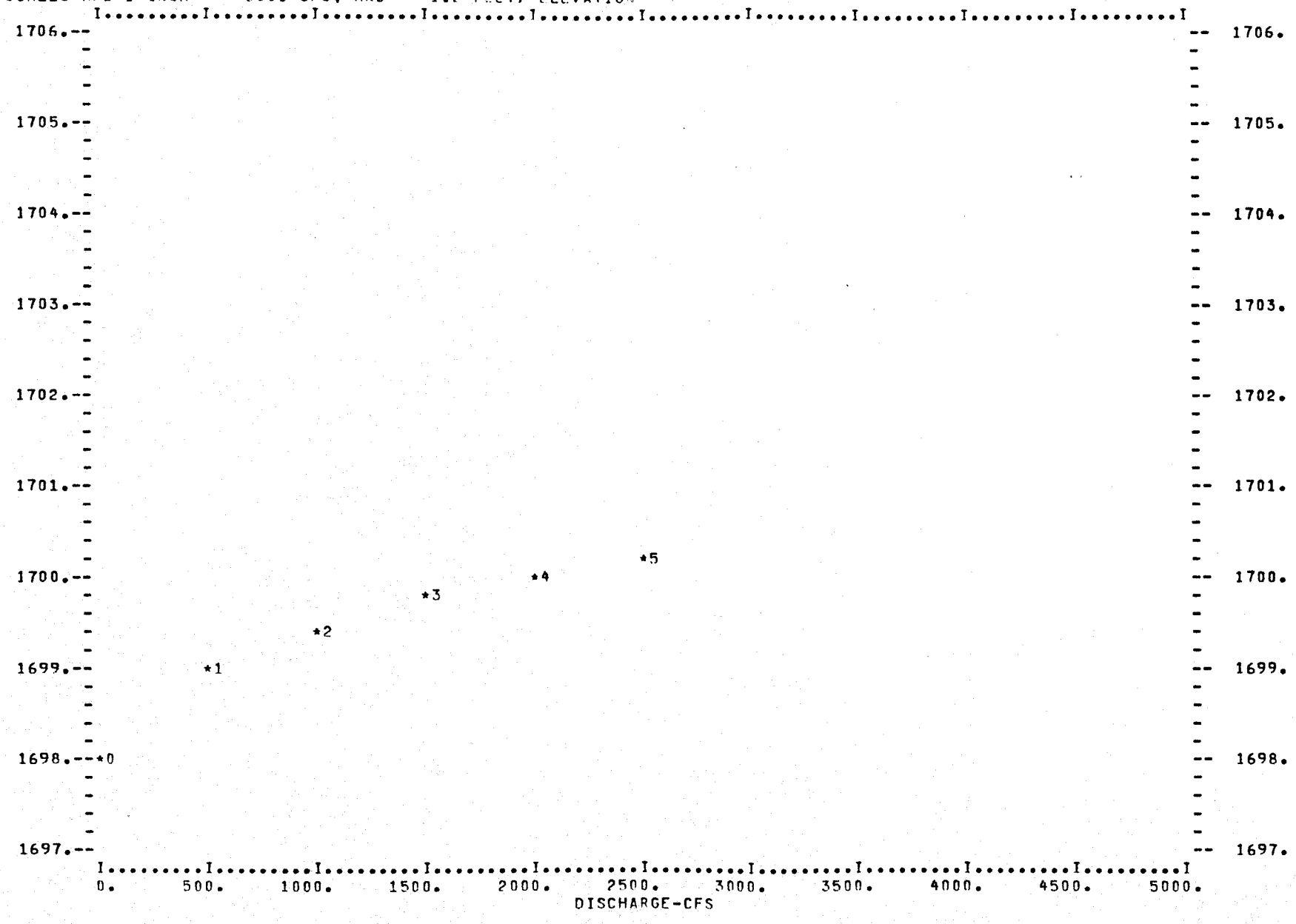
CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	500.	500.
1.	VELOCITY FPS	2.12	2.10
2	DISCHARGE CFS	1000.	1000.
2.	VELOCITY FPS	2.51	2.50
3	DISCHARGE CFS	1500.	1500.
3.	VELOCITY FPS	2.88	2.87
4	DISCHARGE CFS	2000.	2000.
4.	VELOCITY FPS	3.10	3.09
5	DISCHARGE CFS	2500.	2500.
5.	VELOCITY FPS	3.46	3.45
1	ELEV 1698.9 KD	5006.	5006.
2	ELEV 1699.4 KD	10727.	10727.
3	ELEV 1699.8 KD	15778.	15778.
4	ELEV 1700.1 KD	21351.	21351.
5	ELEV 1700.3 KD	25054.	25054.

KD TABLE FOR CROSS SECTION 1.0

ELEVATION	AREA	KD	KD BY SEGMENT
1698.00	0.		
1699.	255.	5527.	5527.
1700.	610.	19691.	19691.
1701.	1073.	43324.	43324.
1702.	1619.	77395.	77395.
1703.	2165.	121386.	121386.
1704.	2712.	175333.	175333.
1705.	3258.	239269.	239269.

CROSS SECTION 1.0

SCALES ARE 1 INCH = 500. CFS, AND 1.2 FEET/ ELEVATION



----------80/80 LIST OF INPUT DATA----------

```
ENDJOB                                                                  46
```

**********NORMAL END OF JOB----------

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDRUN

@END
@END IGNORED - IN CONTROL MODE

@FIN
```

RUNID: SCS04W ACCT: 1604000101 PROJECT: SCS04

***** DISPLAYED LOG ENTRY SECTION *****
11:46:53 SCS04X FIN

***** RESOURCE UTILIZATION SECTION *****

RESOURCE TIME	CPU	IO	CCER	AVG SIZE	QUALIFIER	FILENAME	PROGRAM	VERSION
00:00:24.734	00:00:01.395	00:00:07.949	00:00:08.753	42K	SCS76	ABS	WSP2	
00:00:00.410	00:00:00.000	00:00:00.351	00:00:03.718	3K	RESOURCES USED IN CONTROL MODE			
00:00:25.144	00:00:01.395	00:00:08.300	00:00:12.472	35K	SUMMARY			

IMAGES READ: 53 PAGES: 20

START: 11:46:43 AUG 08,1983 FIN: 11:46:53 AUG 08,1983

***** COST SECTION *****

CHARGES BASED ON BATCH RUN AT P PRIORITY
RT ($000.45/MIN) :$000000.18
CPU ($000.96/MIN) :$000000.02
IO ($000.50/MIN) :$000000.06
CCER($000.96/MIN) :$000000.19

ESTIMATED TOTAL COST:$000000.50 (MINIMUM CHARGE FOR BATCH)

```
@RUN,P SCS04W,1604000101  /SCS0401,SCS04,60,5000/1000 . AZ-WSP

@SYM PRINT$,1,FCB904

@XQT   SCS76*ABS.WSP2
```

(1)

BUCKHORN MESA W/S
SIGNAL BUTTE FRS
WSP'S FOR DAM BREACH ANALYSIS, East End of Dam)
8/8/82
Hm

(DES/WSP2. SBDB)

EXECUTION STARTED AT 13:24:07

2

(3)

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2       10.0
TITLE      BUCKHORN MESA W/S ,SIGNAL BUTTE FRS                                    2
TITLE      WSP'S FOR BREACH 'EAST END OF DAM                                      3
COMMENT PROFILES IGNORE EFFECT OF APACHE TRAILS ROAD                              4
DISCHARGE -1          1.0        2.0        4.0        6.0        8.0            5
DISCHARGE -1          12.0       16.0       20.0       24.0       28.0           6
STARTS     4.0        0.00975    0.00975    0.00975    0.00975    0.00975        7
STARTS     4.0        0.00975    0.00975    0.00975    0.00975    0.00975        8
OUTPUT     PSK                                                                   9
REACH      4.0        2000.      0.0        0.0        0.0                       10
REACH      3.0        2000.      4100.      4100.      4100.                     11
REACH      2.0        2000.      4600.      4200.      4200.                     12
REACH      1.0        2000.      4100.      4100.      4100.                     13
SECTION    4.0                                                                   14
           -4200.     1581.      -4200.     1579.      -600.      1579.          15
           -600.      1578.      -570.      1578.      -570.      1580.          16
           0.0        1580.      80.        1579.      260.       1579.          17
           350.       1580.      420.       1580.      450.       1578.          18
           465.       1578.      520.       1579.5     1100.      1580.          19
           1160.      1578.      1240.      1578.      1360.      1580.          20
           1430.      1581.      1600.      1581.      1620.      1578.          21
           1650.      1578.      1710.      1580.      1870.      1580.          22
           2010.      1578.      2160.      1578.      2280.      1580.          23
           2470.      1580.      2490.      1578.      2510.      1578.          24
           2590.      1579.      2660.      1578.      2700.      1578.          25
           2780.      1580.      2920.      1579.      3080.      1579.5         26
           3240.      1578.      3270.      1578.      3430.      1580.          27
           4140.      1580.      4190.      1578.      4230.      1578.          28
           4270.      1580.      4420.      1580.      4470.      1578.          29
           4510.      1580.      4540.      1578.      4590.      1581.          30
ENDTABLE                                                                          31
SEGMENT    4.0        1          C          4590.                                32
NVALUE     0.080                                                                 33
SECTION    3.0                                                                   34
           0.0        1622.      0.0        1620.      10.        1616.5         35
           40.        1616.      60.        1616.      80.        1618.          36
           150.       1620.      300.       1620.      510.       1618.          37
           1340.      1618.      1530.      1619.5     1870.      1618.          38
           1880.      1616.      1900.      1616.      1950.      1618.          39
           2080.      1619.      2360.      1618.      2400.      1620.          40
           2460.      1620.5     2920.      1619.      3090.      1618.5         41
           3180.      1620.      3200.      1620.      3300.      1618.          42
           3330.      1617.      3680.      1616.      3780.      1617.5         43
           3850.      1617.5     3930.      1616.      4070.      1616.          44
           4180.      1618.      4400.      1620.      4570.      1620.          45
```

4570
4200
4170

(4)

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          4880.     1618.     4950.     1617.     5040.     1617.
          5180.     1619.     5230.     1619.     5260.     1617.
          5300.     1617.     5360.     1618.     5430.     1616.
          5460.     1616.     5600.     1617.5    5780.     1618.
          5960.     1618.     6100.     1620.     6100.     1622.
ENDTABLE
SEGMENT   3.0       1         C         6100.     1622.
NVALUE    0.075
SECTION   2.0
          630.      1662.     630.      1660.5    660.      1660.
          730.      1658.5    780.      1660.     860.      1660.
          980.      1656.     1140.     1658.5    1220.     1657.
          1470.     1660.     1540.     1660.     1560.     1659.5
          1590.     1660.     1790.     1660.     1850.     1658.5
          1950.     1658.     2100.     1660.     2180.     1660.
          2430.     1656.     2470.     1656.     2600.     1658.
          2710.     1656.     2740.     1656.     2950.     1658.
          3100.     1660.     3150.     1660.     3220.     1658.
          3390.     1660.     3520.     1659.     3570.     1660.
          3630.     1660.     3720.     1659.     3890.     1659.5
          3930.     1660.     4050.     1660.     4200.     1656.
          4400.     1656.     4550.     1660.     4550.     1662.
ENDTABLE
SEGMENT   2.0       1         C         4550.     1662.
NVALUE    0.075
SECTION   1.0
          350.      1704.     350.      1702.     600.      1698.
          800.      1698.     970.      1702.     1270.     1702.
          1425.     1698.     1425.     1694.     1450.     1694.
          1470.     1698.     1550.     1702.     1625.     1698.
          1680.     1697.5    1750.     1698.     2000.     1702.
          2175      1698.     2430.     1698.     2485.     1702.
          2485.     1704.
ENDTABLE
SEGMENT   1.0       1         C         2485.     1704.
NVALUE    0.065
COMPUTE   4.0       1.0       4.0
-----------------------------END OF 80/80 LIST-----------------------------
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COMPUTE 4.0 1.0 4.0 82

----------STARTING DATA FROM GIVEN SLOPES----------

5

6

RATING TABLE FOR SECTION 4.0 DA=2000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1578.0	0.0	0.0						
1	1579.2	2145.7	2000.0	.00	.00	.00	1.00	1578.7	.00936
2	1579.5	3395.3	4000.0	.00	.00	.00	2.00	1579.0	.00906
3	1579.8	5168.6	8000.0	.00	.00	.00	4.00	1579.3	.00938
4	1580.0	6599.3	12000.0	.00	.00	.00	6.00	1579.4	.00974
5	1580.2	8448.7	16000.0	.00	.00	.00	8.00	1579.5	.00952
6	1580.5	11237.3	24000.0	.00	.00	.00	12.00	1579.7	.00948
7	1580.8	13396.2	32000.0	.00	.00	.00	16.00	1579.9	.00943
8	1581.0	15070.3	40000.0	.00	.00	.00	20.00	1580.0	.00972
ZERO DAMG	1581.0	15183.8	40663.0	.00	.00	.00			
9	1581.1	16438.8	48000.0	.00	.00	.00	24.00	1580.2	.01017
10	1581.3	17595.9	56000.0	.00	.00	.00	28.00	1580.3	.01069

**********PROFILE NO 9 EXCEEDS SURVEY DATA**********
**********PROFILE NO 10 EXCEEDS SURVEY DATA**********

SEGMENT TABLE FOR SECTION 4.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	2000.	2000.
1.	VELOCITY FPS	.98	.93
2	DISCHARGE CFS	4000.	4000.
2.	VELOCITY FPS	1.25	1.18
3	DISCHARGE CFS	8000.	8000.
4.	VELOCITY FPS	1.58	1.55
4	DISCHARGE CFS	12000.	12000.
6.	VELOCITY FPS	1.82	1.82
5	DISCHARGE CFS	16000.	16000.
8.	VELOCITY FPS	1.92	1.89
6	DISCHARGE CFS	24000.	24000.
12.	VELOCITY FPS	2.17	2.14
7	DISCHARGE CFS	32000.	32000.
16.	VELOCITY FPS	2.43	2.39
8	DISCHARGE CFS	40000.	40000.
20.	VELOCITY FPS	2.66	2.65
9	DISCHARGE CFS	48000.	48000.
24.	VELOCITY FPS	2.87	2.92
10	DISCHARGE CFS	56000.	56000.
28.	VELOCITY FPS	3.06	3.18
1	ELEV 1579.2 KD	20671.	20671.
2	ELEV 1579.5 KD	42025.	42025.
3	ELEV 1579.8 KD	82623.	82623.
4	ELEV 1580.0 KD	121572.	121572.
5	ELEV 1580.2 KD	163961.	163961.
6	ELEV 1580.5 KD	246541.	246541.
7	ELEV 1580.8 KD	329608.	329608.
8	ELEV 1581.0 KD	405705.	405705.
9	ELEV 1581.1 KD	476081.	476081.
10	ELEV 1581.3 KD	541666.	541666.

(8)

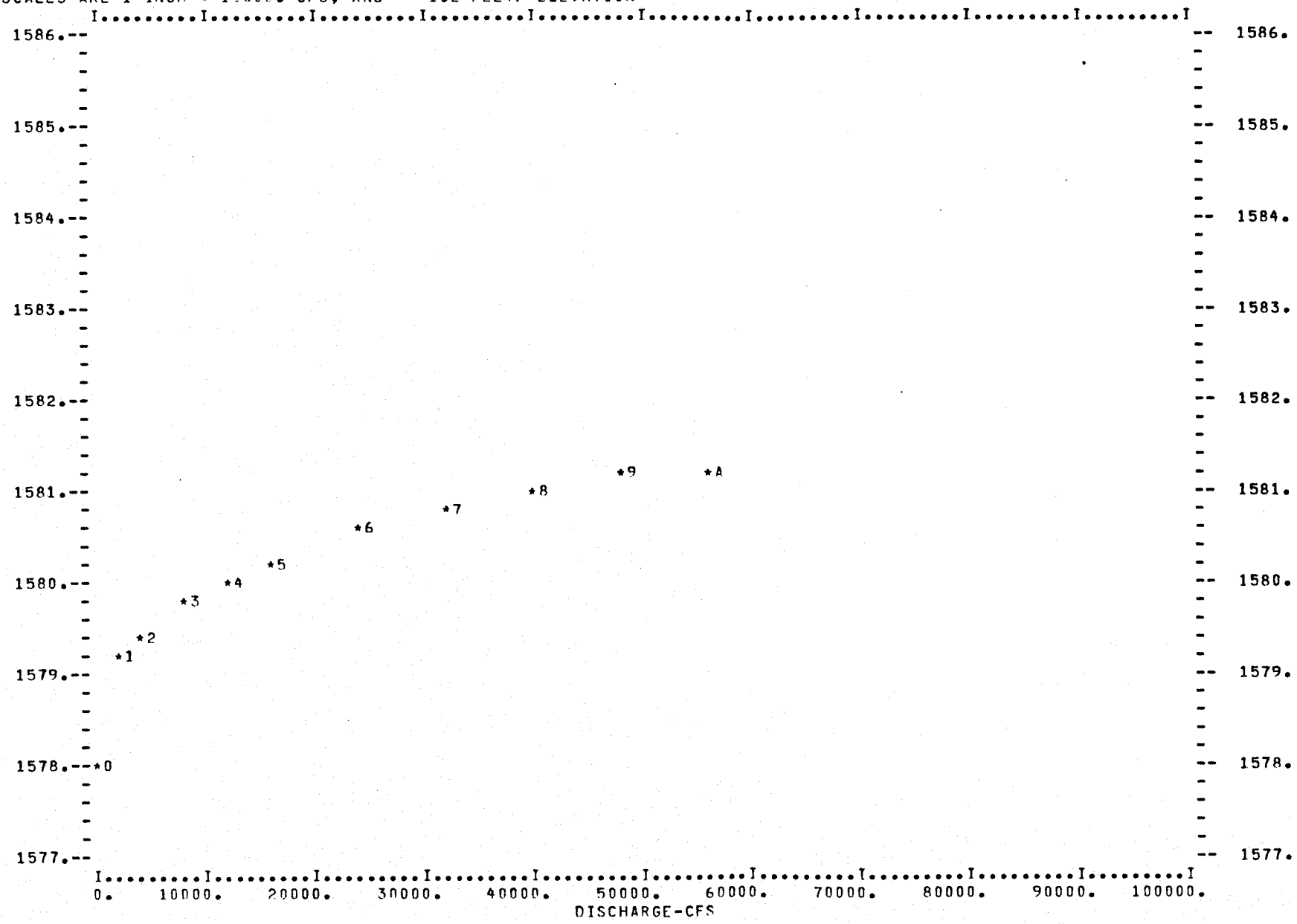
KD TABLE FOR CROSS SECTION 4.0

ELEVATION	AREA	KD	KD BY SEGMENT
1578.00	0.		
1579.	1242.	12058.	12058.
1580.	6610.	121916.	121916.
1581.	15184.	411251.	411251.
1582.	23776.	997234.	997234.
1583.	32368.	1982378.	1982378.
1584.	40960.	3475267.	3475267.
1585.	49552.	5586240.	5586240.

9

CROSS SECTION 4.0

SCALES ARE 1 INCH = 10000. CFS, AND 1.2 FEET/ ELEVATION



(10)

RATING TABLE FOR SECTION 3.0 DA=2000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1616.0	0.0	0.0						
1	1617.6	1288.1	2000.0	.00	.00	.00	1.00	1616.9	.00746
2	1618.0	2080.2	4000.0	.00	.00	.00	2.00	1617.2	.00844
3	1618.7	4287.7	8000.0	.00	.00	.00	4.00	1617.7	.00821
4	1619.0	5580.7	12000.0	.00	.00	.00	6.00	1618.0	.00863
5	1619.3	6862.3	16000.0	.00	.00	.00	8.00	1618.3	.00886
6	1619.7	9054.0	24000.0	.00	.00	.00	12.00	1618.6	.00896
7	1620.1	11139.5	32000.0	.00	.00	.00	16.00	1618.9	.00897
8	1620.4	13041.1	40000.0	.00	.00	.00	20.00	1619.1	.00867
9	1620.6	14166.4	48000.0	.00	.00	.00	24.00	1619.3	.00955
10	1620.9	15900.8	56000.0	.00	.00	.00	28.00	1619.5	.00886

11

SEGMENT TABLE FOR SECTION 3.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	2000.	2000.
1.	VELOCITY FPS	1.56	1.55
2	DISCHARGE CFS	4000.	4000.
2.	VELOCITY FPS	1.94	1.92
3	DISCHARGE CFS	8000.	8000.
4.	VELOCITY FPS	1.91	1.87
4	DISCHARGE CFS	12000.	12000.
6.	VELOCITY FPS	2.15	2.15
5	DISCHARGE CFS	16000.	16000.
8.	VELOCITY FPS	2.37	2.33
6	DISCHARGE CFS	24000.	24000.
12.	VELOCITY FPS	2.67	2.65
7	DISCHARGE CFS	32000.	32000.
16.	VELOCITY FPS	2.89	2.87
8	DISCHARGE CFS	40000.	40000.
20.	VELOCITY FPS	3.09	3.07
9	DISCHARGE CFS	48000.	48000.
24.	VELOCITY FPS	3.42	3.39
10	DISCHARGE CFS	56000.	56000.
28.	VELOCITY FPS	3.54	3.52
1	ELEV 1617.6 KD	23151.	23151.
2	ELEV 1618.0 KD	43540.	43540.
3	ELEV 1618.7 KD	88281.	88281.
4	ELEV 1619.0 KD	129148.	129148.
5	ELEV 1619.3 KD	169980.	169980.
6	ELEV 1619.7 KD	253498.	253498.
7	ELEV 1620.1 KD	337892.	337892.
8	ELEV 1620.4 KD	429623.	429623.
9	ELEV 1620.6 KD	491296.	491296.
10	ELEV 1620.9 KD	595072.	595072.

(12)

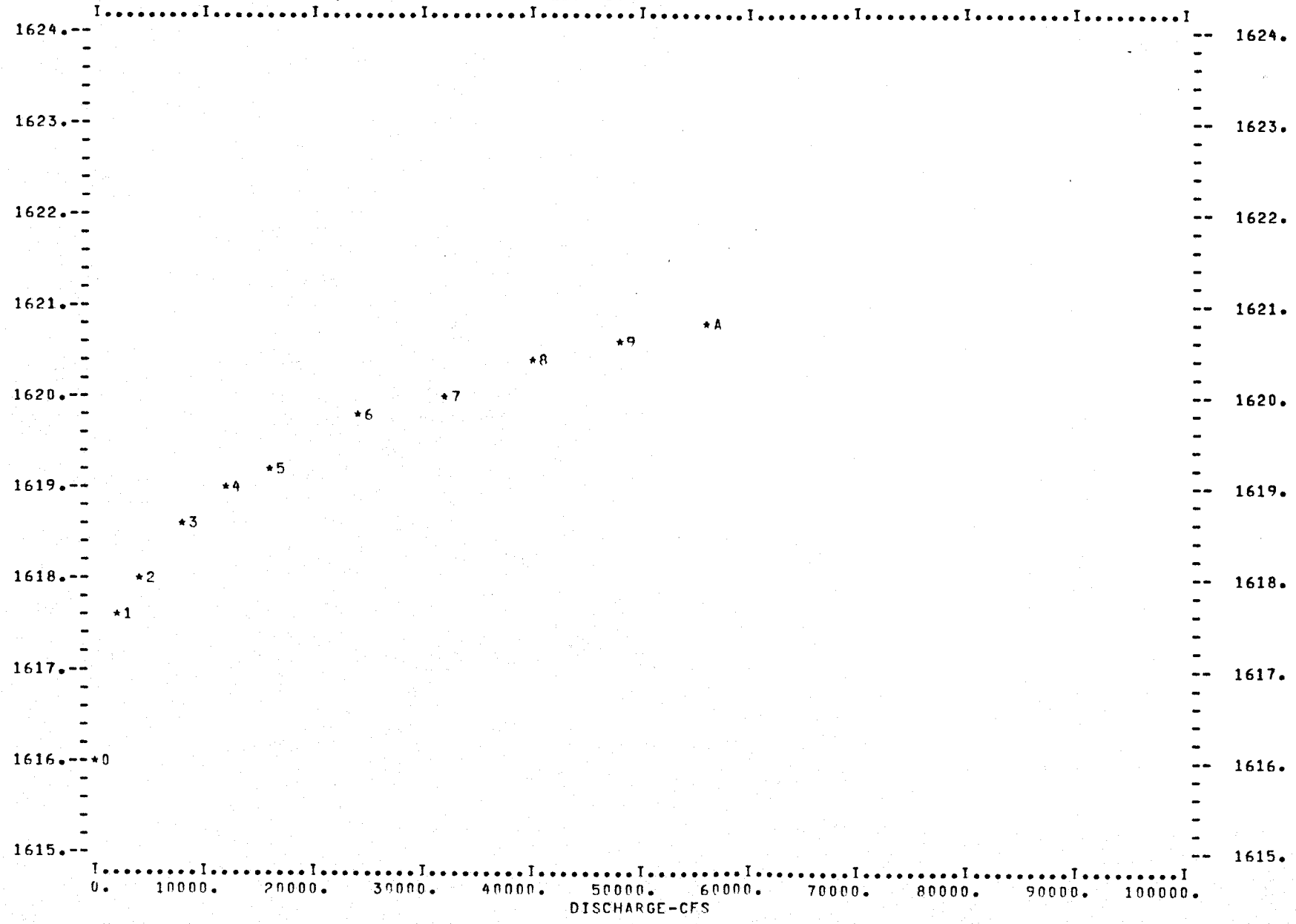
KD TABLE FOR CROSS SECTION 3.0

ELEVATION	AREA	KD	KD BY SEGMENT
1616.00	0.		
1617.	605.	8319.	8319.
1618.	1993.	42271.	42271.
1619.	5551.	128281.	128281.
1620.	10671.	317531.	317531.
1621.	16643.	640244.	640244.
1622.	22743.	1100683.	1100683.
1623.	28843.	1740282.	1740282.
1624.	34943.	2588001.	2588001.
1625.	41043.	3672681.	3672681.

(13)

CROSS SECTION 3.0

SCALES ARE 1 INCH = 10000. CFS, AND 1.2 FEET/ ELEVATION



(14)

RATING TABLE FOR SECTION 2.0 DA=2000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1656.0	0.0	0.0						
1	1657.7	1165.9	2000.0	.00	.00	.00	1.00	1656.9	.00747
2	1658.3	1989.9	4000.0	.00	.00	.00	2.00	1657.3	.00768
3	1659.1	3366.5	8000.0	.00	.00	.00	4.00	1657.9	.00786
4	1659.6	4786.8	12000.0	.00	.00	.00	6.00	1658.3	.00803
5	1660.1	6195.7	16000.0	.00	.00	.00	8.00	1658.6	.00844
6	1660.6	8054.4	24000.0	.00	.00	.00	12.00	1659.1	.00881
7	1661.0	9685.6	32000.0	.00	.00	.00	16.00	1659.5	.00843
8	1661.3	11057.4	40000.0	.00	.00	.00	20.00	1659.8	.00850
9	1661.6	12308.0	48000.0	.00	.00	.00	24.00	1660.1	.00841
10	1661.9	13483.4	56000.0	.00	.00	.00	28.00	1660.3	.00819

15

SEGMENT TABLE FOR SECTION 2.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	2000.	2000.
1.	VELOCITY FPS	1.73	1.72
2	DISCHARGE CFS	4000.	4000.
2.	VELOCITY FPS	2.02	2.01
3	DISCHARGE CFS	8000.	8000.
4.	VELOCITY FPS	2.39	2.38
4	DISCHARGE CFS	12000.	12000.
6.	VELOCITY FPS	2.51	2.51
5	DISCHARGE CFS	16000.	16000.
8.	VELOCITY FPS	2.60	2.58
6	DISCHARGE CFS	24000.	24000.
12.	VELOCITY FPS	3.02	2.98
7	DISCHARGE CFS	32000.	32000.
16.	VELOCITY FPS	3.33	3.30
8	DISCHARGE CFS	40000.	40000.
20.	VELOCITY FPS	3.66	3.62
9	DISCHARGE CFS	48000.	48000.
24.	VELOCITY FPS	3.90	3.90
10	DISCHARGE CFS	56000.	56000.
28.	VELOCITY FPS	4.07	4.15
1	ELEV 1657.7 KD	23141.	23141.
2	ELEV 1658.3 KD	45652.	45652.
3	ELEV 1659.1 KD	90247.	90247.
4	ELEV 1659.6 KD	133920.	133920.
5	ELEV 1660.1 KD	174151.	174151.
6	ELEV 1660.6 KD	255695.	255695.
7	ELEV 1661.0 KD	348471.	348471.
8	ELEV 1661.3 KD	433944.	433944.
9	ELEV 1661.6 KD	523566.	523566.
10	ELEV 1661.9 KD	618741.	618741.

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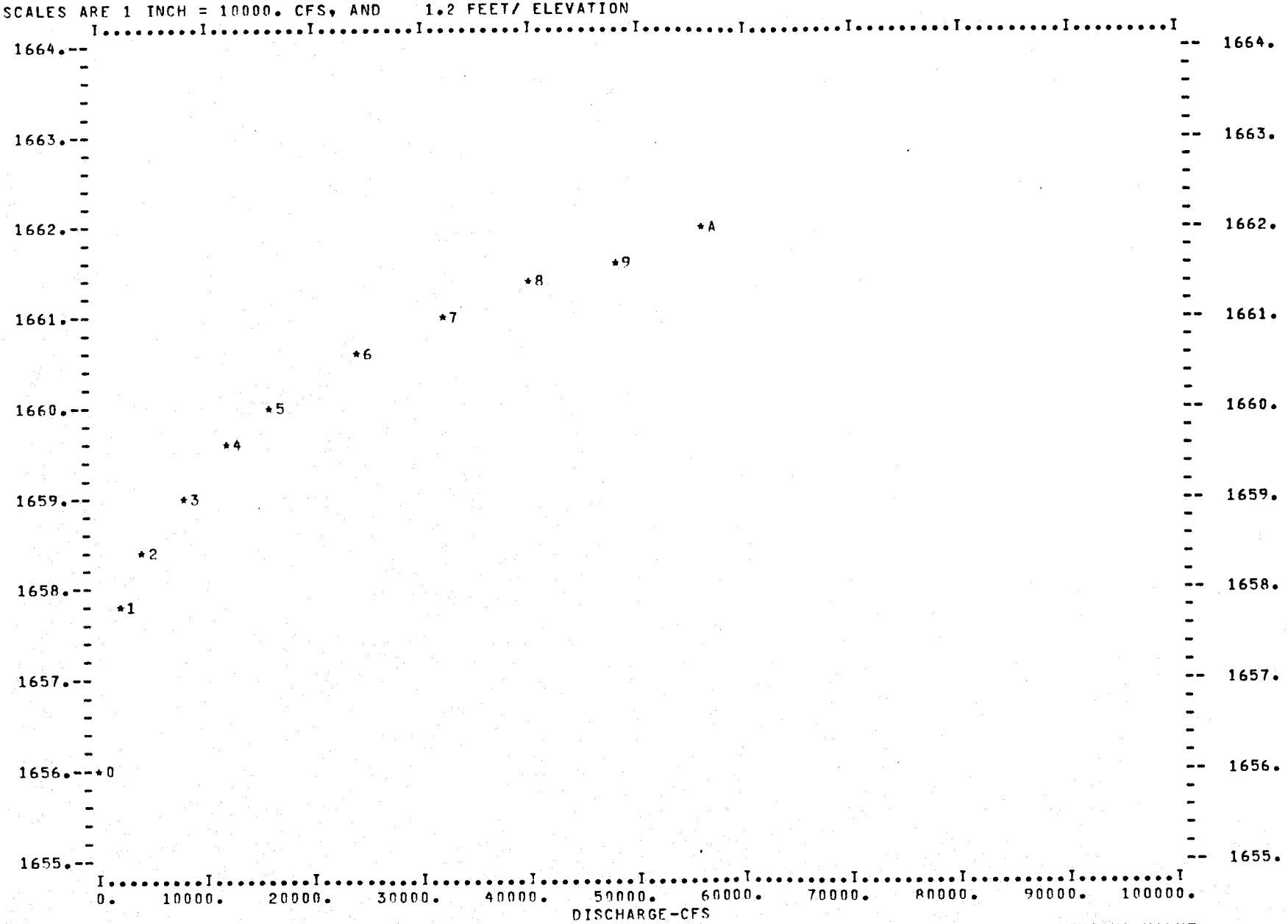
KD TABLE FOR CROSS SECTION 2.0

ELEVATION	AREA	KD	KD BY SEGMENT
1656.00	0.		
1657.	509.	7653.	7653.
1658.	1521.	33139.	33139.
1659.	3235.	86643.	86643.
1660.	6018.	168735.	168735.
1661.	9813.	355843.	355843.
1662.	13733.	640336.	640336.
1663.	17653.	1052285.	1052285.
1664.	21573.	1618093.	1618093.
1665.	25493.	2365020.	2365020.

17

CROSS SECTION 2.0

SCALES ARE 1 INCH = 10000. CFS, AND 1.2 FEET/ ELEVATION



*****SECT.1.0 KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 1698.20 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

(18)

RATING TABLE FOR SECTION 1.0 DA=2000.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1694.0	0.0	0.0						
1	1699.0	940.2	2000.0	.00	.00	.00	1.00	1698.4	.00960
2	1699.6	1538.0	4000.0	.00	.00	.00	2.00	1698.8	.00845
3	1700.3	2405.4	8000.0	.00	.00	.00	4.00	1699.3	.00980
4	1700.9	3322.9	12000.0	.00	.00	.00	6.00	1699.7	.00906
5	1701.4	4018.3	16000.0	.00	.00	.00	8.00	1700.1	.00944
6	1702.1	5351.9	24000.0	.00	.00	.00	12.00	1700.7	.00966
7	1702.7	6550.1	32000.0	.00	.00	.00	16.00	1701.2	.00994
8	1703.2	7632.4	40000.0	.00	.00	.00	20.00	1701.6	.00976
9	1703.6	8493.8	48000.0	.00	.00	.00	24.00	1702.0	.00989
10	1704.0	9336.1	56000.0	.00	.00	.00	28.00	1702.3	.00968

19

SEGMENT TABLE FOR SECTION 1.0

CSM		TOTAL	SEG NO 1 C
1	DISCHARGE CFS	2000.	2000.
1.	VELOCITY FPS	2.24	2.13
2	DISCHARGE CFS	4000.	4000.
2.	VELOCITY FPS	2.62	2.60
3	DISCHARGE CFS	8000.	8000.
4.	VELOCITY FPS	3.37	3.33
4	DISCHARGE CFS	12000.	12000.
6.	VELOCITY FPS	3.66	3.61
5	DISCHARGE CFS	16000.	16000.
8.	VELOCITY FPS	4.01	3.98
6	DISCHARGE CFS	24000.	24000.
12.	VELOCITY FPS	4.51	4.48
7	DISCHARGE CFS	32000.	32000.
16.	VELOCITY FPS	4.94	4.89
8	DISCHARGE CFS	40000.	40000.
20.	VELOCITY FPS	5.28	5.24
9	DISCHARGE CFS	48000.	48000.
24.	VELOCITY FPS	5.71	5.65
10	DISCHARGE CFS	56000.	56000.
28.	VELOCITY FPS	6.00	6.00
1	ELEV 1699.0 KD	20416.	20416.
2	ELEV 1699.6 KD	43505.	43505.
3	ELEV 1700.3 KD	80796.	80796.
4	ELEV 1700.9 KD	126050.	126050.
5	ELEV 1701.4 KD	164694.	164694.
6	ELEV 1702.1 KD	244168.	244168.
7	ELEV 1702.7 KD	321025.	321025.
8	ELEV 1703.2 KD	404962.	404962.
9	ELEV 1703.6 KD	482752.	482752.
10	ELEV 1704.0 KD	569250.	569250.

20

KD TABLE FOR CROSS SECTION 1.0

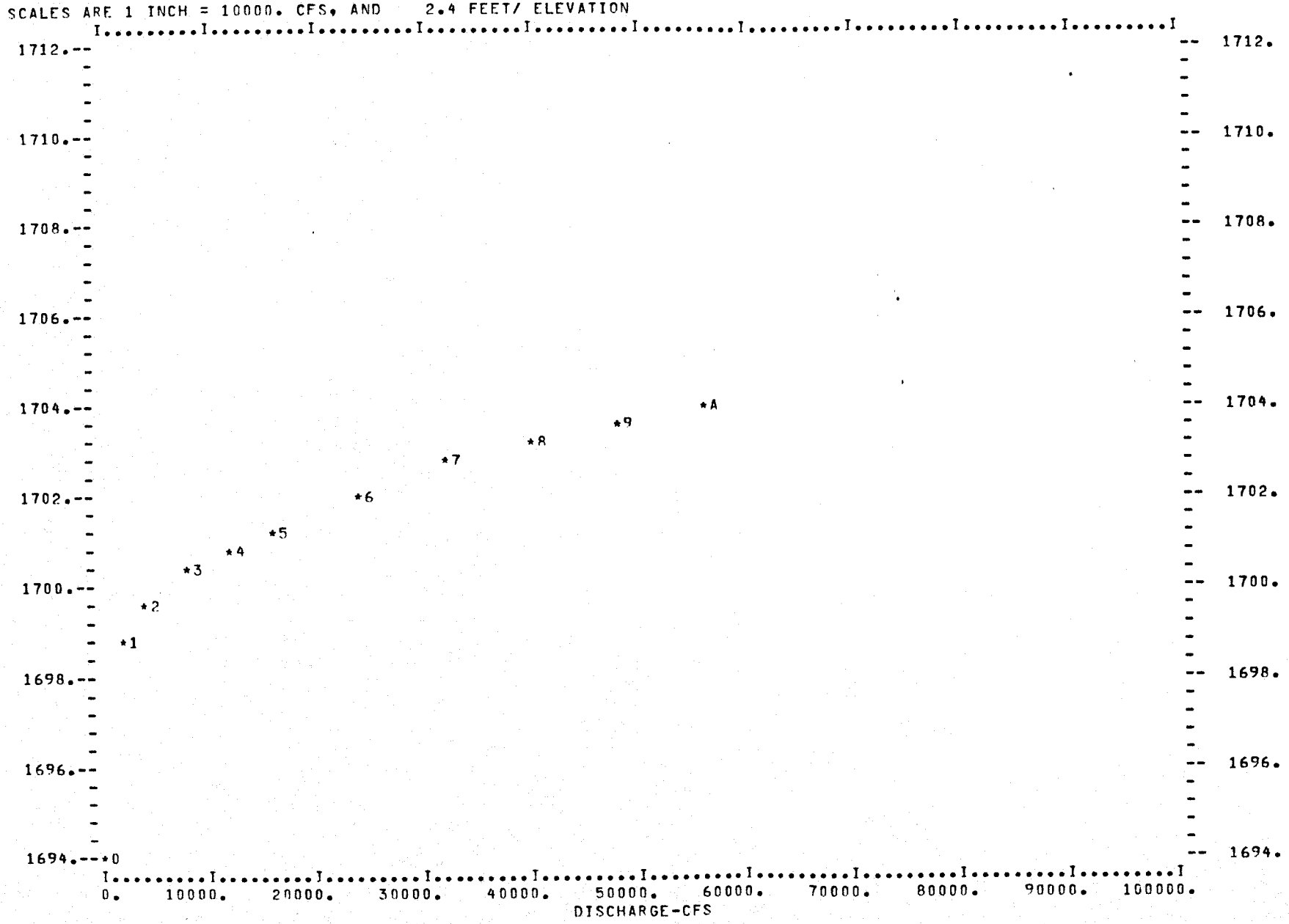
ELEVATION	AREA	KD	KD BY SEGMENT
1694.00	0.		
1695.	28.	580.	580.
1696.	60.	1887.	1887.
1697.	98.	3830.	3830.
1698.	243.	4057.	4057.
1699.	966.	21122.	21122.
1700.	2050.	63502.	63502.
1701.	3426.	131805.	131805.
1702.	5091.	229486.	229486.
1703.	7226.	371758.	371758.
1704.	9361.	572004.	572004.
1705.	11496.	844671.	844671.
1706.	13631.	1205690.	1205690.
1707.	15766.	1672653.	1672653.

BUCKHORN MESA W/S *SIGNAL BUTTE FRS
WSP*S FOR BREACH *EAST END OF DAM

21

CROSS SECTION 1.0

SCALES ARE 1 INCH = 10000. CFS, AND 2.4 FEET/ ELEVATION



----------80/80 LIST OF INPUT DATA----------

```
ENDJOB                                                                  83
```

22

**********NORMAL END OF JOB----------

23

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDRUN                                                                        84

@END
@END IGNORED - IN CONTROL MODE

@FIN
```

RUNID: SCS04W ACCT: 1604000101 PROJECT: SCS04

24

***** DISPLAYED LOG ENTRY SECTION *****
13:24:16 SCS04W FIN

***** RESOURCE UTILIZATION SECTION *****

RESOURCE TIME	CPU	IO	CCER	AVG SIZE	QUALIFIER	FILENAME	PROGRAM	VERSION
00:00:27.110	00:00:02.257	00:00:08.738	00:00:08.841	42K	SCS76	ABS	WSP2	
00:00:00.409	00:00:00.000	00:00:00.351	00:00:03.714	3K	RESOURCES USED IN CONTROL MODE			
00:00:27.520	00:00:02.257	00:00:09.089	00:00:12.555	35K	SUMMARY			

IMAGES READ: 90 PAGES: 24

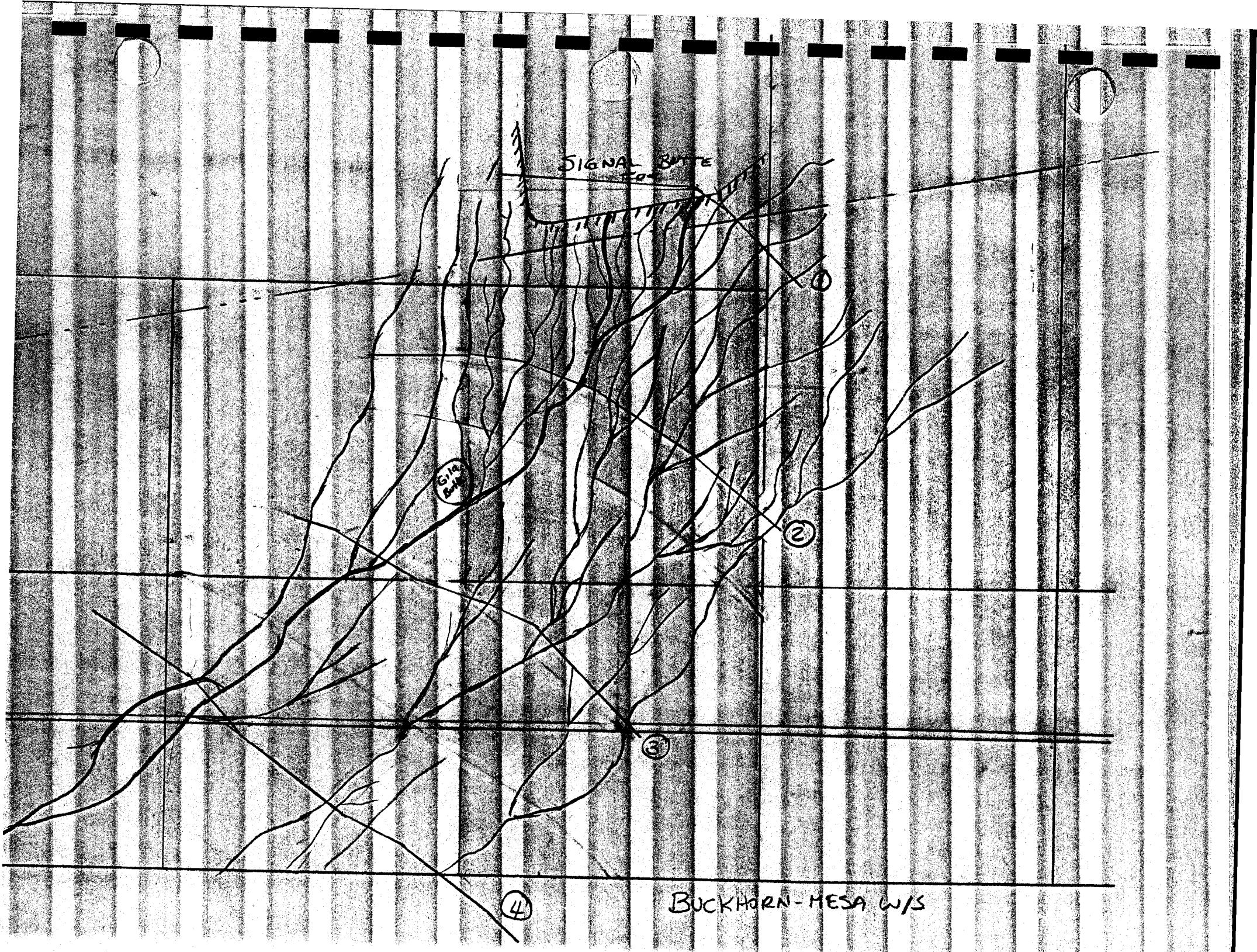
START: 13:24:02 AUG 08,1983 FIN: 13:24:16 AUG 08,1983

***** COST SECTION *****

CHARGES BASED ON BATCH RUN AT P PRIORITY

RT ($000.45/MIN)	:$000000.21
CPU ($000.96/MIN)	:$000000.03
IO ($000.50/MIN)	:$000000.07
CCER($000.96/MIN)	:$000000.20

ESTIMATED TOTAL COST	:$000000.51
	==========


SIGNAL BUTTE
Gila Butte
1
2
3
4
BUCKHORN-MESA W/S

(DES/WSP2. SBES)

SCS-ENG-16
REV. DEC. 1974

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

Signal Butte ESW (JOB OR PROJECT) BY Hem CHECKED _____ DATE 8/3/83

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	DELTA ELEV.						
WSP2	10.0						1
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY NOT BE CHANGED IN JOB						
TITLE	BUCKHORN MESA W/S, SIGNAL BUTTE FRS						2
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY BE CHANGED AT ANY TIME						
TITLE	WSP'S FOR EMER, SPY HYD, Routing.						3
	TOTAL D. A.	CSM	CSM	CSM	CSM	CSM	
DISCHARGE	-1	1.0	2.0	3.0	4.0	5.0	5
DISCHARGE							
DISCHARGE							
	XSEC NAME	SLOPE	SLOPE	SLOPE	SLOPE	SLOPE	
STARTS	4.0	0.00975	.00975	.00975	.00975	.00975	6
STARTS							
STARTS							
	XSEC NAME	ELEVATION	ELEVATION	ELEVATION	ELEVATION	ELEVATION	
STARTE							
STARTE							
STARTE							
	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	
TRIB							
TRIB							
TRIB							
TRIB							
	OUTPUT OPTIONS						
OUTPUT	PSK						7
	ANY ALPHAMERIC MESSAGE						
COMMENT	PROFILES INCLUDE EFFECT OF APACHE TRAILS ROAD						4
	SAME AS COMMENT						
*							

PAGE _____ OF _____

H

1

```
 SSSSSSSS        CCCCCCCC        SSSSSSSS          0000            44  44      MM        MM
SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000         44  44      MMM      MMM
SS      SS      CC      CC      SS      SS      000    000       44  44      MMMM    MMMM
SSS     SS      CC      CC      SSS     SS     000     00000    44  44      MMMMM  MMMMM
  SSS           CC                SSS          00     00  00   44  44      MM MMMMMM MM
    SSS         CC                  SSS        00   00    00   44444444444 MM  MMMM  MM
      SSS       CC                    SSS      00  00     00   444444444444 MM   MM   MM
        SSS     CC                      SSS    00 00      00            44  MM       MM
SS      SS      CC      CC      SS      SS     0000      000            44  MM       MM
SS      SS      CC      CC      SS      SS      000    000             44  MM       MM
SSSSSSSSSS      CCCCCCCCCC      SSSSSSSSSS       00000000              44  MM       MM
 SSSSSSSS        CCCCCCCC        SSSSSSSS          0000                44  MM       MM
```

TR-20 INPUT
FOR DEVELOPING
ESH & FBH
FOR SIGNAL BUTTE FRS

* * * * * * UNIVAC 1100 TIME/SHARING EXEC --- MULTI-PROCESSOR SYSTEM --- LEV. SB-37R2A-30 SITE * SITEID * * * * * *

RUNID * SCS04M USER ID * SCS0401 PART NUMBER * 00 INPUT DEVICE * CR0904 OUTPUT DEVICE * PR0904

FILE NAME * PRQ000SCS04M CREATED AT: 08:35:06 NOV 23,1982 PRINTED AT: 08:35:35 NOV 23,1982

2

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@RUN,L SCS04M,1604000101  /SCS0401,SCS04,5,5000/1000

@SYM PRINT1,1,FCR904

@ASG,T 25.,F///50

@ASG,T 23.,F///50

@ASG,T 22.,F///50

@XQT   SCS76*ABS.TR20
```

PASS Mtn Diversion W/99 AC.FT of Additional Sediment
Crest of Ema Spy @ 1712.6
W/ Channel FB

Hyatt Regency
Monday -

(952-9200)

John McCafferty
415 - 922-3900
will be
@ 7 all week

3

BUCKHORN-MESA SIGNAL BUTTE FRS W/PASS MTN DIVER 11/16/82

TR-20 HYDROLOGY

PROGRAM DATE - FEB. 14, 1974 S/360

*********TABLE TYPE 3 HAS BEEN REPLACED FOR THIS RUN.

EXECUTIVE CONTROL CARD 122 OPERATION LIST

LISTING OF DATA IN CORE

D BUCKHORN-MESA SIGNAL BUTTE FRS W/PASS MTN DIVER

		VELOCITY INCREMENT				
1	CTABLE		.2000			
8		.0000	.0800	.1800	.2500	.3200
8		.3700	.4100	.4500	.4900	.5100
8		.5400	.5700	.5900	.6100	.6300
8		.6500	.6600	.6700	.6900	.7000
8		.7100	.7200	.7300	.7400	.7500
8		.7600	.7700	.7700	.7800	.7900
8		.7900	.8000	.8100	.8100	.8200
8		.8200	.8300	.8300	.8400	.8400
8		.8400	.8500	.8500	.8600	.8600
8		.8600	.8600	.8700	.8700	.8700
8		.8800	.8800	.8800	.8900	.8900
8		.8900	.8900	.8900	.8900	.9000
8		.9000	.9000	.9000	.9000	.9100
8		.9100	.9100	.9100	.9100	.9100
8		.9200	.9200	.9200	.9200	.9200
8		.9200	.9200	.9200	.9300	.9300
9	ENDTBL					

		XSECTN NO.	DRAINAGE AREA
2	XSECTN	104	1.0000

	ELEVATION	DISCHARGE	END AREA
8	.0000	.0000	.0000
8	2.0000	450.0000	40.0000
8	3.0000	838.0000	60.0000
8	4.0000	1288.0000	80.0000
8	5.0000	1782.0000	120.0000
8	6.0000	2314.0000	120.0000
8	7.0000	2875.0000	140.0000
8	8.0000	3454.0000	160.0000
9	ENDTBL		

		XSECTN NO.	DRAINAGE AREA
2	XSECTN	106	1.0000

	ELEVATION	DISCHARGE	END AREA
8	.0000	.0000	.0000
8	1.5000	441.0000	45.0000
8	2.5000	995.0000	75.0000

8	3.5000	1682.0000	105.0000
8	4.5000	2468.0000	135.0000
8	5.5000	3339.0000	165.0000
8	6.5000	4272.0000	195.0000
8	7.5000	5258.0000	225.0000
8	8.5000	6296.0000	255.0000
9 ENDTBL			

XSECTN NO. DRAINAGE AREA
2 XSECTN 107 1.0000

	ELEVATION	DISCHARGE	END AREA
8	1749.0000	.0000	.0000
8	1750.0000	38.5300	23.0000
8	1751.0000	130.5200	52.0000
8	1752.0000	273.1800	87.0000
8	1753.0000	470.9800	128.0000
8	1754.0000	706.8600	187.0000
8	1755.0000	1005.6200	240.0000
8	1756.0000	1369.4200	299.0000
8	1757.0000	1801.8000	364.0000
8	1758.0000	2305.5000	435.0000
8	1759.0000	2892.8000	512.0000
8	1760.0000	3558.1000	595.0000
8	1761.0000	4316.0400	684.0000
8	1762.0000	5156.9800	779.0000
9 ENDTBL			

XSECTN NO. DRAINAGE AREA
2 XSECTN 108 1.0000

	ELEVATION	DISCHARGE	END AREA
8	1753.7000	.0000	.0000
8	1754.7000	61.9300	23.0000
8	1755.7000	209.3500	52.0000
8	1756.7000	438.9100	87.0000
8	1757.7000	757.0100	128.0000
8	1758.7000	1167.4100	175.0000
8	1759.7000	1678.5600	228.0000
8	1760.7000	2302.3900	287.0000
8	1761.7000	3038.9100	352.0000
8	1762.7000	3894.7400	435.0000
8	1763.7000	4647.7600	512.0000
9 ENDTBL			

q=3623
V=5.4

XSECTN NO. DRAINAGE AREA
2 XSECTN 109 1.0000

	ELEVATION	DISCHARGE	END AREA
8	1763.6000	.0000	.0000
8	1764.6000	27.4700	23.0000
8	1765.6000	92.8700	52.0000
8	1766.6000	194.7000	87.0000
8	1767.6000	335.8000	128.0000

422=q
8.13=A V~5.2

M20 7

8	1768.6000	503.2200	187.0000
8	1769.6000	715.7800	240.0000
8	1770.6000	974.8100	295.0000

9 ENDTBL

Apache Junction?

3 STRUCT STRUCT NO. 1

	ELEVATION	DISCHARGE	STORAGE
8	1794.1000	.0000	.0000
8	1794.5000	26.3000	35.3700
8	1795.0000	74.4000	70.7500
8	1795.1400	91.2000	81.1100
8	1796.0000	96.1600	141.5000
8	1797.1400	102.4200	222.3500
8	1798.4200	113.9100	437.2700
8	1801.7200	1650.0000	684.1200
8	1804.0000	7700.0000	1020.4600
8	1806.2800	15200.0000	1382.5800
8	1808.5700	26200.0000	1835.7000

9 ENDTBL

3 STRUCT STRUCT NO. 2 SB. FRS 1

	ELEVATION	DISCHARGE	STORAGE
8	1684.0000	.0000	.0220
8	1688.0000	.0000	2.9400
8	1692.0000	.0000	16.8200
8	1696.0000	.0000	69.9000
8	1700.0000	.0000	206.1400
8	1701.4000	.0000	281.0000
8	1704.0000	121.8000	450.8600
8	1708.0000	138.4000	816.4600
8	1710.0000	145.9000	1046.1600
8	1710.5000	147.7000	1089.3000
8	1711.5000	151.4000	1175.5000
8	1712.2000	154.0000	1335.1500
8	1712.5000	155.0000	1380.4600
8	1712.6000	156.0000	1390.0000
8	1713.5000	390.0000	1531.5000
8	1714.5000	820.0000	1682.5400
8	1716.0000	1950.0000	1909.1000
8	1720.0000	6600.0000	2624.1000
8	1722.0000	9500.0000	3040.5900
8	1724.0000	12400.0000	3457.1000

9 ENDTBL

3 STRUCT STRUCT NO. 3 Pass Mtn.

	ELEVATION	DISCHARGE	STORAGE
8	1765.1000	.0000	100.0000
8	1765.7600	31.1500	114.6000

TR-20 INPUT
FOR DEVELOPING
ESH & FBH
FOR SIGNAL BUTTE FRS

```
8                    1766.4200     52.3000    130.6900
8                    1767.0700     68.7400    149.6000
8                    1767.7300     87.7800    171.5100
8                    1768.3900    101.7900    200.5900
8                    1769.0500    104.8800    227.4500
8                    1769.7100    108.2100    256.3600
8                    1770.3600    110.3800    278.5100
8                    1771.0200    113.3600    310.6100
8                    1771.6800    116.4500    343.9100
8                    1772.3400    117.9600    366.5200
8                    1773.0000    120.1100    402.6300
8                    1773.6500    501.9900    439.9000
8                    1774.3000   1043.4300    492.8600
8                    1775.4700   2512.2600    570.9300
8                    1776.9000   4839.3600    686.3000
8                    1779.5000  10327.5699    921.6600
8                    1782.7500  18894.0100   1300.2400
8                    1786.0000  28877.7000   1781.8500
9 ENDTBL

                  TIME INCREMENT
4 DIMHYD

8                .0000       .0300       .1000       .1900       .3100
8                .4700       .6600       .8200       .9300       .9900
8               1.0000       .9900       .9300       .8600       .7800
8                .6800       .5600       .4600       .3900       .3300
8                .2800       .2410       .2070       .1740       .1470
8                .1260       .1070       .0910       .0770       .0660
8                .0550       .0470       .0400       .0340       .0290
8                .0250       .0210       .0180       .0150       .0130
8                .0110       .0090       .0080       .0070       .0060
8                .0050       .0040       .0030       .0020       .0010
8                .0000       .0000       .0000       .0000       .0000
9 ENDTBL

  COMPUTED PEAK K FACTOR =  484.00


                  TIME INCREMENT
5 RAINFL 1                 .5000

8                .0000       .0080       .0170       .0260       .0350
8                .0450       .0550       .0650       .0760       .0870
8                .0990       .1120       .1250       .1400       .1560
8                .1740       .1940       .2190       .2540       .3030
8                .5150       .5830       .6240       .6540       .6820
8                .7050       .7270       .7480       .7670       .7840
8                .8000       .8160       .8300       .8440       .8570
8                .8700       .8820       .8930       .9050       .9160
8                .9260       .9360       .9460       .9550       .9650
8                .9740       .9830       .9920      1.0000      1.0000
9 ENDTBL
```

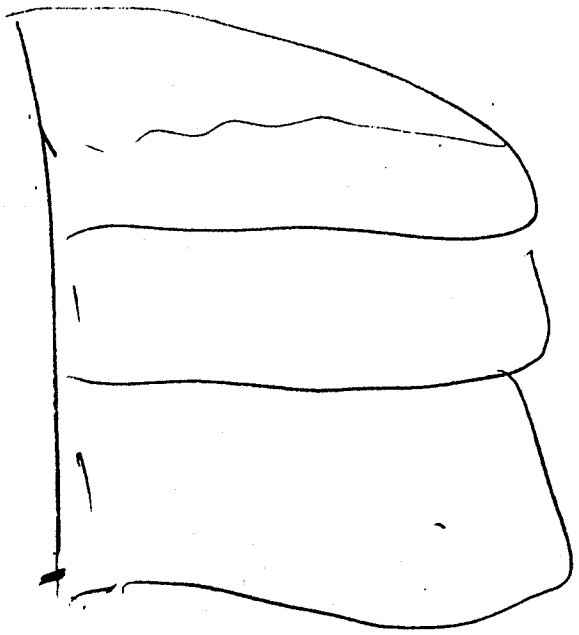
```
                    TIME INCREMENT
5 RAINFL 2                .5000

8                 .0000     .0050     .0110     .0160     .0220
8                 .0280     .0350     .0410     .0480     .0560
8                 .0630     .0710     .0800     .0890     .0980
8                 .1090     .1200     .1330     .1470     .1630
8                 .1810     .2040     .2350     .2830     .6630
8                 .7350     .7720     .7990     .8200     .8380
8                 .8540     .8680     .8800     .8910     .9020
8                 .9120     .9210     .9290     .9370     .9450
8                 .9520     .9590     .9650     .9720     .9780
8                 .9840     .9890     .9950    1.0000    1.0000
9 ENDTBL

                    TIME INCREMENT
5 RAINFL 3               2.4000

8                 .0000     .0020     .0040     .0060     .0080
8                 .0100     .0120     .0140     .0160     .0180
8                 .0200     .0220     .0250     .0270     .0300
8                 .0320     .0350     .0380     .0400     .0430
8                 .0460     .0490     .0520     .0550     .0580
8                 .0610     .0640     .0690     .0720     .0760
8                 .0800     .0840     .0890     .0930     .0980
8                 .1020     .1080     .1140     .1210     .1270
8                 .1330     .1430     .1530     .1640     .1740
8                 .1840     .1980     .2150     .2380     .2750
8                 .7070     .7650     .7930     .8130     .8290
8                 .8410     .8490     .8560     .8630     .8710
8                 .8790     .8840     .8890     .8950     .9000
8                 .9050     .9090     .9130     .9180     .9220
8                 .9260     .9290     .9320     .9360     .9390
8                 .9420     .9450     .9480     .9510     .9540
8                 .9570     .9590     .9620     .9640     .9670
8                 .9690     .9710     .9730     .9760     .9780
8                 .9800     .9820     .9840     .9870     .9890
8                 .9910     .9930     .9960     .9980    1.0000
9 ENDTBL

                    TIME INCREMENT
5 RAINFL 4                .2500

8                 .0000     .0060     .0110     .0170     .0280
8                 .0410     .0570     .0750     .0900     .5620
8                 .6970     .7630     .8070     .8390     .8730
8                 .9070     .9370     .9480     .9580     .9680
8                 .9790     .9840     .9890     .9950    1.0000
9 ENDTBL

                    TIME INCREMENT
5 RAINFL 5                .5000

8                 .0000     .0040     .0080     .0110     .0160
```

```
8          .0210     .0270     .0340     .0440     .0550
8          .0700     .0880     .1080     .1370     .1720
8          .2170     .2730     .3410     .4200     .4920
8          .5600     .6180     .6720     .7170     .7530
8          .7820     .8070     .8270     .8450     .8600
8          .8730     .8850     .8950     .9030     .9130
8          .9210     .9300     .9350     .9420     .9490
8          .9540     .9600     .9670     .9720     .9780
8          .9820     .9890     .9930    1.0000    1.0000
9 ENDTBL
```

STANDARD CONTROL INSTRUCTIONS

6	RUNOFF	1	101			5	1.8600	80.0000	1.21001	0	0	1	0	1
6	RUNOFF	1	1			6	1.2000	79.0000	.67001	0	0	1	0	1
6	ADDHYD	4	1	5	6	7			1	0	0	1	0	1
6	REACH	3	102	7		5	2500.0000	.6500	.00000	0	0	0	0	0
6	RUNOFF	1	2			6	1.2400	75.0000	.59001	0	0	1	0	1
6	ADDHYD	4	2	5	6	7			1	0	0	1	0	1
6	REACH	3	103	7		5	2500.0000	.6500	.00000	0	0	0	0	0
6	RUNOFF	1	3			6	1.8500	80.0000	.91001	0	0	1	0	1
6	ADDHYD	4	3	5	6	7			1	1	0	1	0	1
6	SAVMOV	5		1	7	6								
6	RESVOR	2		1	6	7	1794.1000		1	1	0	1	0	1
6	DIVERT	6		1	7	4	1	115.0000	.0000	.00000	0	0	0	0	0
6	REACH	3	104	4		5	6700.0000	.0000	.00001	0	0	1	0	1
6	RUNOFF	1	4			6	2.5400	80.0000	.54001	0	0	1	0	1
6	ADDHYD	4	4	5	6	7			1	0	0	1	0	1
6	DIVERT	6	104	7	5	2	3454.0000	1.0000	.00000	0	0	0	0	0
6	ADDHYD	4	104	1	2	4			0	0	0	0	0	0
6	REACH	3	106	5		3	3700.0000	.0000	.00001	0	0	1	0	1
6	RUNOFF	1	5			6	2.0000	82.0000	.43001	0	0	1	0	1
6	ADDHYD	4	5	3	6	7			1	0	0	1	0	1
6	DIVERT	6	106	7	5	2	6296.0000	1.0000	.00000	0	0	0	0	0
6	RUNOFF	1	6			6	1.1400	79.0000	.42001	0	0	1	0	1
6	ADDHYD	4	6	5	6	7			1	0	0	1	0	1
6	SAVMOV	5	6	7		5								
6	ADDHYD	4	106	4	2	7			1	1	0	1	0	1
6	SAVMOV	5	106	7		1								
6	RUNOFF	1	7			6	.9600	75.0000	.23001	0	0	1	0	1
6	ADDHYD	4	7	5	6	7			1	1	0	1	0	1
6	SAVMOV	5	7	7		2								
6	RUNOFF	1	10			7	.6700	78.0000	.89001	0	0	1	0	1
6	DIVERT	6	110	7	5	3	820.0000	1.0000	.00000	0	0	0	0	0
6	REACH	3	109	5		4	2700.0000	.0000	.00001	0	0	1	0	1
6	RUNOFF	1	9			6	1.3900	82.0000	.55001	0	0	1	0	1
6	ADDHYD	4	109	4	6	7			1	0	0	1	0	1
6	DIVERT	6	109	7	5	4	2546.0000	1.0000	.00000	0	0	0	0	0
6	REACH	3	108	5		6	2100.0000	.0000	.00001	0	0	1	0	1
6	RUNOFF	1	8			5	1.9200	84.0000	.42001	0	0	1	0	1
6	ADDHYD	4	108	5	6	7			1	1	0	1	0	1
6	ADDHYD	4	109	3	4	5			1	1	0	1	0	1
6	SAVMOV	5	109	5		3								
6	DIVERT	6	108	7	5	4	5253.0000	1.0000	.00000	0	0	0	0	0
6	REACH	3	107	5		6	5300.0000	.0000	.00001	1	0	1	0	1
6	SAVMOV	5	107	2		5								
6	ADDHYD	4	107	5	6	7			1	1	0	1	0	1
6	SAVMOV	5		2	7	6								
6	RESVOR	2		2	6	7	1701.4000		1	1	0	1	0	1
	ENDATA													

END OF LISTING



TR-20 PROGRAM

(Note, This data was used as INPUT TO DAMS 2 program And DAMS 2 Runs were used in Final Design.

(47)

24-Hrs @ SIGNR FBH BUTTE TRS

INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
9.27	14371.046	1772.96
17.09	2105.872	1757.60
17.95	1964.604	1757.32
19.46	1569.715	1756.46
21.05	1501.185	1756.30
21.99	1329.074	1755.89
23.11	1387.293	1756.04
24.00	1373.400	1756.01
28.50	115.028	1750.83

HYDROGRAPH, TZERO= .00 DELTA T= .20 DRAINAGE AREA= 10.62

TIME											
.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2.00	DISCHG	.00	.00	.00	.00	.00	.09	1.86	11.03	31.51	73.21
4.00	DISCHG	141.36	229.17	329.87	440.68	600.22	789.45	1002.89	1243.36	1480.79	1731.18
6.00	DISCHG	1975.91	2351.73	2891.09	3439.44	4052.10	4618.41	5299.06	6113.99	6897.81	7892.59
8.00	DISCHG	8836.20	9874.15	11001.97	12010.96	13169.29	14099.83	14351.65	14310.78	14258.98	14112.70
10.00	DISCHG	13988.39	13623.95	13047.53	12581.06	12138.84	11795.39	11299.99	10654.56	10061.87	9288.61
12.00	DISCHG	8606.31	7937.99	7278.82	6762.57	6273.06	5888.56	5486.15	5055.91	4712.62	4416.67
14.00	DISCHG	4198.41	3965.84	3711.38	3499.87	3281.07	3103.51	2958.36	2836.33	2732.83	2577.73
16.00	DISCHG	2433.02	2272.50	2098.71	1987.63	2019.96	2097.83	2092.93	2003.73	1926.58	1928.60
18.00	DISCHG	1959.59	1854.82	1625.67	1443.97	1433.45	1491.85	1541.58	1568.13	1561.96	1461.23
20.00	DISCHG	1346.39	1299.44	1317.78	1357.26	1430.13	1497.95	1477.86	1380.03	1298.66	1298.52
22.00	DISCHG	1328.91	1289.01	1181.26	1113.68	1218.58	1366.79	1374.26	1249.27	1151.67	1238.37
24.00	DISCHG	1373.39	1243.78	871.29	538.50	339.16	235.93	182.14	152.44	135.92	126.72
26.00	DISCHG	121.62	118.78	117.17	116.24	115.69	115.37	115.17	115.07	115.00	115.00
28.00	DISCHG	115.00	115.00	115.00	115.00	114.77	114.09	113.77	113.65	113.55	113.45
30.00	DISCHG	113.35	113.25	113.15	113.05	112.95	112.85	112.75	112.65	112.55	112.45
32.00	DISCHG	112.35	112.25	112.15	112.05	111.95	111.86	111.76	111.66	111.56	111.46
34.00	DISCHG	111.36	111.26	111.17	111.07	110.97	110.87	110.77	110.68	110.58	110.48
36.00	DISCHG	110.38	110.29	110.19	110.09	109.99	109.90	109.80	109.70	109.61	109.51
38.00	DISCHG	109.41	109.32	109.22	109.12	109.03	108.93	108.83	108.74	108.64	108.55
40.00	DISCHG	108.45	108.35	108.26	108.16	108.07	107.97	107.88	107.78	107.69	107.59
42.00	DISCHG	107.50	107.40	107.31	107.21	107.12	107.02	106.93	106.83	106.74	106.64
44.00	DISCHG	106.55	106.46	106.36	106.27	106.17	106.08	105.99	105.89	105.80	105.71
46.00	DISCHG	105.61	105.52	105.43	105.33	105.24	105.15	105.05	104.96	104.87	104.78
48.00	DISCHG	104.68	104.59	104.50	104.41	104.31	104.22	104.13	104.04	103.95	103.85
50.00	DISCHG	103.76	103.67	103.58	103.49	103.40	103.30	103.21	103.12	103.03	102.94
52.00	DISCHG	102.85	102.76	102.67	102.58	102.48	102.38	102.25	102.12	101.99	101.86
54.00	DISCHG	101.73	101.60	101.47	101.34	101.21	101.08	100.95	100.82	100.70	100.57
56.00	DISCHG	100.44	100.31	100.18	100.05	99.93	99.80	99.67	99.54	99.42	99.29
58.00	DISCHG	99.16	99.03	98.91	98.78	98.65	98.53	98.40	98.28	98.15	98.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 14.0009 CFS-HRS= 95959.41 ACRE-FT= 7930.09

SUBROUTINE SAVMOV STRUCTURE 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 6

SUBROUTINE RESVOP STRUCTURE 2
SURFACE ELEVATION= 1701.40

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.54	10237.179	1722.51

HYDROGRAPH, TZERO= .00 DELTA T= .20 DRAINAGE AREA= 10.62

TIME											
.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2.00	DISCHG	.00	.00	.00	.00	.00	.00	.01	.09	.34	.95
4.00	DISCHG	2.20	4.36	7.60	12.05	18.04	26.02	36.27	49.07	64.55	82.71
6.00	DISCHG	103.57	122.18	124.06	126.34	129.06	132.21	135.83	139.56	142.99	147.19
8.00	DISCHG	152.01	154.66	393.95	966.12	1886.47	3066.61	4204.98	5237.99	6160.89	7004.89
10.00	DISCHG	7771.65	8428.37	8962.43	9381.62	9705.73	9951.82	10125.49	10218.18	10233.42	10172.68
12.00	DISCHG	10039.35	9847.04	9603.42	9322.36	9017.14	8697.59	8369.99	8032.74	7690.10	7349.96
14.00	DISCHG	7018.86	6699.26	6401.22	6116.04	5837.99	5568.10	5309.28	5063.23	4830.78	4608.85
16.00	DISCHG	4394.27	4186.01	3981.94	3784.16	3602.54	3445.07	3307.38	3178.94	3055.12	2940.10
18.00	DISCHG	2838.49	2743.49	2641.15	2528.29	2417.14	2319.77	2237.84	2168.17	2106.64	2045.94
20.00	DISCHG	1980.44	1921.56	1873.03	1830.63	1796.04	1769.75	1747.43	1722.22	1691.90	1660.76
22.00	DISCHG	1633.28	1607.60	1578.11	1544.02	1514.10	1496.57	1486.59	1472.75	1451.19	1430.91
24.00	DISCHG	1421.01	1412.10	1384.03	1330.26	1259.68	1182.71	1105.62	1031.32	961.08	895.38
26.00	DISCHG	834.32	795.48	764.34	734.56	706.12	678.97	653.05	628.32	604.72	582.21
28.00	DISCHG	560.73	540.24	520.69	502.03	484.23	467.23	450.99	435.48	420.69	406.56
30.00	DISCHG	393.08	384.26	376.95	369.84	362.91	356.17	349.61	343.22	337.00	330.95
32.00	DISCHG	325.05	319.32	313.73	308.30	303.00	297.85	292.83	287.95	283.19	278.56
34.00	DISCHG	274.06	269.67	265.40	261.24	257.18	253.24	249.40	245.66	242.02	238.47
36.00	DISCHG	235.02	231.66	228.38	225.20	222.09	219.07	216.12	213.25	210.46	207.74
38.00	DISCHG	205.09	202.51	199.99	197.54	195.16	192.83	190.57	188.37	186.22	184.12
40.00	DISCHG	182.08	180.10	178.16	176.28	174.44	172.65	170.90	169.20	167.54	165.93
42.00	DISCHG	164.35	162.82	161.32	159.86	158.44	157.06	155.98	155.90	155.81	155.73
44.00	DISCHG	155.64	155.56	155.47	155.39	155.30	155.22	155.13	155.05	154.99	154.97
46.00	DISCHG	154.96	154.94	154.92	154.90	154.88	154.87	154.85	154.83	154.81	154.79
48.00	DISCHG	154.77	154.76	154.74	154.72	154.70	154.68	154.66	154.65	154.63	154.61
50.00	DISCHG	154.59	154.57	154.55	154.53	154.52	154.50	154.48	154.46	154.44	154.42
52.00	DISCHG	154.40	154.38	154.37	154.35	154.33	154.31	154.29	154.27	154.25	154.23
54.00	DISCHG	154.21	154.19	154.18	154.16	154.14	154.12	154.10	154.08	154.06	154.04
56.00	DISCHG	154.02	154.00	153.99	153.97	153.96	153.94	153.93	153.91	153.90	153.88
58.00	DISCHG	153.87	153.85	153.84	153.82	153.81	153.80	153.78	153.77	153.75	153.74

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 12.1690 CFS-HRS= 83404.47 ACRE-FT= 6892.55

ENDCMP

SUMMARY TABLE 1

ALT	STORM	ID	DA SQ-MI.	RAIN TBLE	AMC	DELTA-T HRS.	TZERO HRS.	PRECIP IN.	PRECIP DURATION	PEAK-Q CFS	PEAK-TIME	PEAK-ELEV	RUNOFF IN.	CSM	
5	1	101	1.86	2	2	.20	.00	3.94	24.00	996.75	12.61	.00	1.99	535.89	
5	1	1	1.20	2	2	.20	.00	3.94	24.00	901.00	12.25	.00	1.91	750.83	
5	1	1	3.06	2	2	.20	.00	3.94	24.00	1735.75	12.40	.00	1.96	567.24	
5	1	2	1.24	2	2	.20	.00	3.94	24.00	825.90	12.22	.00	1.62	666.05	
5	1	2	4.30	2	2	.20	.00	3.94	24.00	2180.79	12.47	.00	1.86	507.16	
5	1	3	1.85	2	2	.20	.00	3.94	24.00	1200.94	12.41	.00	1.99	649.16	
5	1	3	6.15	2	2	.20	.00	3.94	24.00	3115.79	12.59	.00	1.90	506.63	
5	1	-1	6.15	2	2	.20	.00	3.94	24.00	229.97	18.48	1799.59	1.47	37.39	
5	1	104	.00	2	2	.20	.00	3.94	24.00	115.04	25.30	.51	.00	.00	
5	1	4	2.54	2	2	.20	.00	3.94	24.00	2223.46	12.18	.00	1.99	875.38	
5	1	4	2.54	2	2	.20	.00	3.94	24.00	2254.45	12.19	~~.00~~	5.11	887.58	
5	1	106	2.54	2	2	.20	.00	3.94	24.00	2149.41	12.24	4.09	5.11	846.22	
5	1	5	2.00	2	2	.20	.00	3.94	24.00	2052.39	12.10	.00	2.16	1026.19	
5	1	5	4.54	2	2	.20	.00	3.94	24.00	4107.81	12.17	.00	3.81	904.80	
5	1	6	1.14	2	2	.20	.00	3.94	24.00	1039.29	12.11	.00	1.92	911.66	
5	1	6	5.68	2	2	.20	.00	3.94	24.00	5129.79	12.16	.00	3.43	903.13	
5	1	106	6.15	2	2	.20	.00	3.94	24.00	114.97	18.48	.39	.18	18.69	
5	1	7	.96	2	2	.20	.00	3.94	24.00	910.17	11.99	.00	1.61	948.09	
5	1	7	6.64	2	2	.20	.00	3.94	24.00	5744.61	12.12	.00	3.17	865.15	
5	1	10	.67	2	2	.20	.00	3.94	24.00	402.49	12.41	.00	1.84	600.73	
5	1	109	.67	2	2	.20	.00	3.94	24.00	365.06	12.69	1767.77	1.84	544.87	
5	1	9	1.39	2	2	.20	.00	3.94	24.00	1307.43	12.18	.00	2.15	940.60	
5	1	109	2.06	2	2	.20	.00	3.94	24.00	1484.53	12.22	1772.57	2.05	720.65	
5	1	108	2.06	2	2	.20	.00	3.94	24.00	1408.33	12.29	1759.17	2.05	683.65	
5	1	8	1.92	2	2	.20	.00	3.94	24.00	2152.81	12.09	.00	2.32	1121.26	
5	1	108	3.98	2	2	.20	.00	3.94	24.00	3387.93	12.16	1762.11	2.18	851.24	
Diverted Hyd 5	1	109	.00	2	2	.20	.00	3.94	24.00	.00	.00	.00	.00	.00	
5	1	107	3.98	2	2	.20	.00	3.94	24.00	3170.66	12.41	1759.42	2.17	796.65	
5	1	107	10.62	2	2	.20	.00	3.94	24.00	8164.11	12.21	1765.58	2.79	768.75	
5	1	-2	10.62	2	2	.20	.00	3.94	24.00	157.95	24.82	1712.61	1.08	14.87	— crest En. Spwy.
5	4	101	1.86	5	2	.20	.00	7.06	24.00	905.93	10.27	.00	4.74	487.06	
5	4	1	1.20	5	2	.20	.00	7.06	24.00	589.74	9.90	.00	4.63	491.45	
5	4	1	3.06	5	2	.20	.00	7.06	24.00	1490.07	10.13	.00	4.70	486.95	
5	4	2	1.24	5	2	.20	.00	7.06	24.00	554.26	9.98	.00	4.19	446.98	
5	4	2	4.30	5	2	.20	.00	7.06	24.00	2028.76	10.20	.00	4.55	471.80	
5	4	3	1.85	5	2	.20	.00	7.06	24.00	919.90	10.04	.00	4.74	497.25	
5	4	3	6.15	5	2	.20	.00	7.06	24.00	2923.00	10.31	.00	4.61	475.29	
5	4	-1	6.15	5	2	.20	.00	7.06	24.00	1794.12	12.69	1801.77	4.15	291.73	
5	4	104	.00	5	2	.20	.00	7.06	24.00	115.04	26.70	.51	.00	.00	
5	4	4	2.54	5	2	.20	.00	7.06	24.00	1281.82	9.64	.00	4.74	504.65	
5	4	4	2.54	5	2	.20	.00	7.06	24.00	1386.02	9.71	.00	8.17	545.68	
5	4	106	2.54	5	2	.20	.00	7.06	24.00	1385.61	9.81	3.07	8.17	545.52	
5	4	5	2.00	5	2	.20	.00	7.06	24.00	1070.72	9.24	.00	4.96	535.36	
5	4	5	4.54	5	2	.20	.00	7.06	24.00	2442.24	9.61	.00	6.76	537.94	
5	4	6	1.14	5	2	.20	.00	7.06	24.00	564.99	9.27	.00	4.63	495.61	
5	4	6	5.68	5	2	.20	.00	7.06	24.00	3006.65	9.61	.00	6.33	529.34	
5	4	106	6.15	5	2	.20	.00	7.06	24.00	1679.12	12.69	3.50	2.73	273.03	
5	4	7	.96	5	2	.20	.00	7.06	24.00	436.83	9.93	.00	4.19	455.03	
5	4	7	6.64	5	2	.20	.00	7.06	24.00	3439.74	9.61	.00	6.02	518.03	
5	4	10	.67	5	2	.20	.00	7.06	24.00	318.26	10.11	.00	4.52	475.01	
5	4	109	.67	5	2	.20	.00	7.06	24.00	316.12	10.39	1767.46	4.52	471.83	
5	4	9	1.39	5	2	.20	.00	7.06	24.00	734.72	9.51	.00	4.96	528.58	
5	4	109	2.06	5	2	.20	.00	7.06	24.00	1034.76	9.96	1770.83	4.82	502.31	

5	4	108	2.06	5	2	.20	.00	7.06	24.00	1033.06	10.03	1758.37	4.82	501.48
5	4	8	1.92	5	2	.20	.00	7.06	24.00	1079.21	9.21	.00	5.19	562.09
5	4	108	3.98	5	2	.20	.00	7.06	24.00	2070.17	9.71	1760.33	5.00	520.14
5	4	109	.00	5	2	.20	.00	7.06	24.00	.00	.00	.00	.00	.00
5	4	107	3.98	5	2	.20	.00	7.06	24.00	2069.74	10.11	1757.53	5.00	520.04
5	4	107	10.62	5	2	.20	.00	7.06	24.00	5492.68	9.92	1762.40	5.64	517.20
5	4	-2	10.62	5	2	.20	.00	7.06	24.00	2184.16	13.42	1716.20	3.82	205.66
5	5	101	1.86	5	2	.20	.00	15.80	24.00	2468.85	9.99	.00	13.13	1327.34
5	5	1	1.20	5	2	.20	.00	15.80	24.00	1643.64	9.41	.00	12.98	1369.70
5	5	1	3.06	5	2	.20	.00	15.80	24.00	4069.52	9.84	.00	13.07	1329.91
5	5	2	1.24	5	2	.20	.00	15.80	24.00	1634.49	9.31	.00	12.38	1318.14
5	5	2	4.30	5	2	.20	.00	15.80	24.00	5635.43	9.94	.00	12.87	1310.57
5	5	3	1.85	5	2	.20	.00	15.80	24.00	2510.23	9.68	.00	13.13	1356.88
5	5	3	6.15	5	2	.20	.00	15.80	24.00	8079.30	10.04	.00	12.95	1313.71
5	5	-1	6.15	5	2	.20	.00	15.80	24.00	7419.61	10.88	1803.89	12.45	1206.44
5	5	104	.00	5	2	.20	.00	15.80	24.00	115.04	28.50	.51	.00	.00
5	5	4	2.54	5	2	.20	.00	15.80	24.00	3567.67	9.25	.00	13.13	1404.59
5	5	4	2.54	5	2	.20	.00	15.80	24.00	3682.67	9.25	.00	16.70	1449.87
5	5	106	2.54	5	2	.20	.00	15.80	24.00	3460.84	9.90	5.63	16.60	1362.54
5	5	5	2.00	5	2	.20	.00	15.80	24.00	2890.47	9.14	.00	13.41	1445.23
5	5	5	4.54	5	2	.20	.00	15.80	24.00	6340.94	9.19	.00	15.20	1396.68
5	5	6	1.14	5	2	.20	.00	15.80	24.00	1602.61	9.15	.00	12.98	1405.80
5	5	6	5.68	5	2	.20	.00	15.80	24.00	7899.83	9.15	.00	14.75	1390.82
5	5	106	6.15	5	2	.20	.00	15.80	24.00	7304.61	10.88	9.47	11.01	1187.74
5	5	7	.96	5	2	.20	.00	15.80	24.00	1320.59	9.00	.00	12.37	1375.62
5	5	7	6.64	5	2	.20	.00	15.80	24.00	9247.12	9.09	.00	14.41	1392.64
5	5	10	.67	5	2	.20	.00	15.80	24.00	893.01	9.68	.00	12.83	1332.86
5	5	109	.67	5	2	.20	.00	15.80	24.00	820.05	10.32	1770.00	12.66	1223.96
5	5	9	1.39	5	2	.20	.00	15.80	24.00	1986.81	9.25	.00	13.41	1429.36
5	5	109	2.06	5	2	.20	.00	15.80	24.00	2768.49	9.39	1777.52	13.17	1343.93
5	5	108	2.06	5	2	.20	.00	15.80	24.00	2547.57	10.10	1761.03	13.00	1236.69
5	5	8	1.92	5	2	.20	.00	15.80	24.00	2825.52	9.12	.00	13.70	1471.63
5	5	108	3.98	5	2	.20	.00	15.80	24.00	5364.58	9.17	1764.65	13.34	1347.88
5	5	109	.00	5	2	.20	.00	15.80	24.00	286.51	9.47	1767.25	.00	.00
5	5	107	3.98	5	2	.20	.00	15.80	24.00	5249.70	9.59	1762.11	13.32	1319.02
5	5	107	10.62	5	2	.20	.00	15.80	24.00	14371.05	9.27	1772.96	14.00	1353.21
5	5	-2	10.62	5	2	.20	.00	15.80	24.00	10237.18	11.54	1722.51	12.17	963.95 — top dam. (a/b)

— 157 ##

10,080.00 cfs.

use 10,000 cfs. ←

discharge to chan. from emergency spillway.

SUMMARY TABLE 3

100-yr (24-hr) ES18 (24-hr) FBH (24-hr)

DISCHARGE,CFS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
XSEC/STRUC NO. -2 ALTERNATE 5	157.95	2184.16	10237.18	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. -1 ALTERNATE 5	229.97	1794.12	7419.61	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 1 ALTERNATE 5	1735.75	1490.07	4069.52	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 2 ALTERNATE 5	2180.79	2028.76	5635.43	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 3 ALTERNATE 5	3115.79	2923.00	8079.30	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 4 ALTERNATE 5	2254.45	1386.02	3682.67	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 5 ALTERNATE 5	4107.81	2442.24	6340.94	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 6 ALTERNATE 5	5129.79	3006.65	7899.83	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 7 ALTERNATE 5	5744.61	3439.74	9247.12	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 8 ALTERNATE 5	2152.81	1079.21	2825.52	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 9 ALTERNATE 5	1307.[illegible]	[illegible]34.72	1986.81	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO. 10 ALTERNATE 5	402.49	318.26	893.01	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO.101 ALTERNATE 5	996.75	905.93	2468.85	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO.104 ALTERNATE 5	115.04	115.04	115.04	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO.106 ALTERNATE 5	114.97	1679.12	7304.61	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO.107 ALTERNATE 5	8164.11	5492.68	14371.05	.00	.00	.00	.00	.00	.00	.00
XSEC/STRUC NO.108 ALTERNATE 5	3387.93	2070.17	5364.58	.00	.00	.00	.00	.00	.00	.00

XSEC/STRUC NO.10[illegible]										
ALTERNATE 5	.00	.00	286.51	.00	.00	.00	.00	.00	.00	.00

ENDJOB CARD ENCOUNTERED. END OF JOB.

********** 80-80 LIST OF INPUT DATA **********

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DAMS2     12/03/82  SIGNAL BUTTE FRS W/PM DIVERSION
COMMENT   THIS IS THE FINAL DESIGN HYDROLOGY FOR SIGNAL BUTTE FRS
COMMENT   WHICH INCLUDES APACHE JUNCTION FRS, BULLDOG DIVERSION, AND
COMMENT   PASS MOUNTAIN DIVERSION WITH OUTLET CHANNEL.
COMMENT   THE HYDROGRAPHS FROM THE DIVERSIONS INCLUDE FREEBOARD
COMMENT   DISCHARGE QUANTITIES.  SEDIMENT FROM PASS MOUNTAIN WILL
COMMENT   INCLUDE MOST FINE-GRAINED SEDIMENT, BUT NO COARSE-GRAINED
COMMENT   SEDIMENT.  THIS IS IN ADDITION TO THE WORK PLAN SEDIMENT
COMMENT   STORAGE REQUIREMENT.
COMMENT   PRELIMINARY DESIGN SHOWED THAT THE 100-YR STORM SET THE
COMMENT   EMERGENCY SPILLWAY CREST.  THIS WILL BE VARIFIED.
CLPROFILE                    OLD CL DAM TO MERIDIAN RD THEN NORTH
          19076     1722.36  19108     1721.01   19208     1711.3
          19308     1717.6   19408     1719.08   19540     1717.9
          19570     1717.6   19650     1717.5    19700     1715.06
          19725     1716.7   19800     1715.94   20600     1704.05
          20650     1703.6   20700     1704.97   20750     1703.8
          20800     1704.09  20850     1702.4    21000     1701.25
          21070     1700.2   21070     1694.2    21100     1691.88
          21146.79  1693.95  21250     1694.1    21270     1691.1
          21300     1692.59  21320     1693.8    21350     1692.1
          21400     1698.72  21700     1694.85   21750     1695.8
          21875     1695.0   21925     1688.8    22000     1693.14
          22650     1693.8   22700     1692.42   22750     1691.4
          22760     1690.5   22772     1682.8    22795     1682.9
          22900     1686.7   22930     1691.0    22950     1691.2
          23000     1692.06  23050     1690.8    23070     1692.2
          23100     1691.3   23135     1688.6    23150     1689.5
          23170     1691.7   23190     1692.2    23200     1690.21
          23210     1687.9   23240     1687.9    23250     1686.3
          23255     1685.9   23400     1692.99   23550     1690.5
          23600     1691.7   23700     1690.4    23750     1691.7
          23800     1692.22  23900     1687.76   23910     1687.5
          23925     1684.1   23940     1686.3    23950     1686.5
          23980     1687.7   23995     1685.0    24000     1686.23
          24025     1689.3   24150     1687.5    24165     1685.8
          24175     1687.2   24200     1688.53   24232.27  1688.99
          24267     1686.79  24300     1687.44   24350     1688.9
          24390     1687.7   24400     1686.3    24700     1694.01
          24800     1693.69  25000     1698.36   25050     1695.8
          25100     1697.1   25150     1695.9    25200     1695.04
          25350     1700.6   25400     1703.16   26500     1720.00
          26550     1719.8   26600     1720.5    26650     1721.7
          26700     1722.4   26750     1723.3    26800     1723.5
ENDTABLE
STRUCTURE SBFRS     SIGNAL BUTTE FRS BUCKHORN-MESA WPP
                    1684      0.09      0.0       0.0       0.022
                    1688      1.36      6.4       0.0       2.94
                    1692      5.58      7.9       0.0       16.82
```

Yes.

PSH &
100-YR, 24-HR
DAMS 2 ROUTINGS

********** 80-80 LIST OF INPUT DATA **********

```
                    1696      20.96     9.2       0.0       69.9                51
                    1701      54.5      10.5      0.0       265.                52
                    1704      75.2      121.3     0.0       450.86              53
                    1708      107.6     138.4     0.0       816.46              54
                    1710      122.1     145.9     0.0       1046.16             55
                    1712      136.7     153.2     0.0       1304.94             56
                    1716      165.4     166.7     0.0       1909.1              57
                    1720      192.5     179.5     0.0       2624.9              58
                    1724      223.6     191.5     0.0       3457.1              59
ENDTABLE                                                                        59
POOLDATA  ELEV      1684.     1684.     1700.75                                 61
HYD       PS                PRINCIPAL SPILLWAY HYDROGRAPH                      X
                    1.0
                    .00       12.41     14.30     14.84     15.28
                    15.68     16.06     16.42     16.75     17.07
                    17.37     17.65     17.91     18.16     18.39
                    18.61     18.81     19.01     19.19     19.36
                    19.52     19.67     19.81     19.95     20.07
                    20.19     20.30     25.82     27.47     26.43
                    21.83     21.34     27.32     28.48     24.80
                    22.34     22.07     28.24     29.18     29.46
                    29.68     28.37     23.65     23.05     28.93
                    29.99     30.24     30.42     30.58     30.73
                    30.87     31.00     31.12     31.24     31.35
                    31.45     31.55     31.64     31.73     31.81
                    31.88     31.96     32.02     42.91     46.07
                    43.90     34.54     33.45     39.34     40.43
                    40.72     40.93     41.12     41.30     41.46
                    47.03     48.73     47.73     43.18     42.74
                    48.76     49.95     46.31     43.88     43.70
                    56.04     57.96     58.53     58.99     60.93
                    66.24     67.40     62.04     61.48     61.69
                    61.95     62.31     87.26     91.25     92.55
                    93.62     96.10     101.97    104.11    99.89
                    100.30    101.31    102.27    103.21    128.91
                    133.87    152.47    159.36    171.82    204.24
                    212.05    300.73    321.88    1923.57   2966.63
                    3097.10   829.15    542.33    358.83    314.50
                    297.16    257.94    253.01    228.86    224.80
                    208.18    197.46    195.73    170.87    167.43
                    161.46    159.67    159.13    158.75    158.39
                    163.95    164.57    164.33    164.00    163.58
                    144.91    142.20    141.64    141.24    142.38
                    146.83    147.06    140.83    139.51    139.04
                    138.66    138.25    131.78    130.63    130.09
                    129.55    130.50    134.81    134.89    128.50
                    127.02    126.40    125.87    125.32    118.68
                    117.37    116.75    116.18    117.12    121.41
                    121.47    115.08    113.58    112.93    112.39
```

3

********** 80-80 LIST OF INPUT DATA **********

106.05	97.37	90.26	84.16	78.72
73.87	69.53	65.65	62.19	59.09
56.32	53.85	51.61	43.41	40.64
44.74	45.25	43.16	37.56	36.13
41.23	41.56	37.10	33.91	32.93
32.26	31.65	31.08	30.54	31.55
35.98	36.31	30.18	28.88	28.41
28.02	27.67	27.33	27.02	26.72
26.44	27.69	32.36	32.91	26.98
25.87	25.57	25.36	25.16	24.98
24.80	30.05	31.45	30.18	25.35
24.65	24.47	24.32	22.38	22.49
11.78	9.50	9.05	8.54	8.03
7.55	7.10	6.68	6.28	5.91
5.55	5.22	4.91	4.62	4.34
4.08	3.84	3.61	3.40	3.19
3.00	2.82	2.66	2.50	2.35
2.21	2.08	1.95	1.84	1.73
1.62	1.53	1.44	1.35	1.27
1.19	1.12	1.06	.99	.93
.88	.83	.78	.73	.69
.65	.61	.57	.54	.51
.48	.45	.42	.40	.37
.35	.33	.31	.29	.27

ENDTABLE

GO,HYD SLP

HYD 100Y TR20 HYDROGRAPH 100YR STORM

Checked x x
w/ routing begun Elev. 1700.75,
same output results.
Stu

0.2				
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.00
0.0	0.01	0.26	1.21	2.8
5.31	8.83	13.68	20.07	28.2
38.32	50.21	64.4	79.97	97.74
118.3	144.	178.75	218.95	275.76
342.8	439.83	581.44	1013.27	3287.48
6690.89	8158.16	7034.78	5319.26	3867.81
2896.3	2267.67	1845.33	1570.44	1359.16
1208.42	1097.09	1010.92	949.52	895.95
854.86	816.75	779.14	747.66	710.97
679.28	652.68	629.45	613.07	603.66
598.72	590.05	576.96	564.22	547.2
531.73	515.17	497.55	484.06	476.05
471.88	469.78	468.76	466.44	455.71
443.63	435.06	430.36	426.08	414.19

********** 80-80 LIST OF INPUT DATA **********

401.55	399.03	406.39	412.83	407.52
398.27	391.09	387.1	383.24	371.49
358.79	356.36	363.68	370.10	364.67
354.56	314.41	248.29	191.9	157.0
138.21	128.19	122.59	119.17	116.67
115.27	114.55	114.09	113.79	113.56
113.39	113.25	113.12	113.01	112.91
112.81	112.71	112.61	112.51	112.41
112.31	112.21	112.11	112.01	111.91
111.82	111.72	111.62	111.52	111.42
111.32	111.22	111.13	111.03	110.93
110.83	110.73	110.64	110.54	110.44
110.34	110.25	110.15	110.05	109.95
109.86	109.76	109.66	109.57	109.47
109.37	109.28	109.18	109.08	108.99
108.89	108.79	108.7	108.6	108.51
108.41	108.31	108.22	108.12	108.03
107.93	107.84	107.74	107.65	107.55
107.46	107.36	107.27	107.17	107.08
106.98	106.89	106.79	106.7	106.6
106.51	106.42	106.32	106.23	106.13
106.04	105.95	105.85	105.76	105.67
105.57	105.48	105.39	105.29	105.20
105.11	105.02	104.92	104.83	104.74
104.64	104.55	104.46	104.37	104.28
104.18	104.09	104.00	103.91	103.82
103.72	103.63	103.54	103.45	103.36
103.27	103.18	103.08	102.99	102.9
102.81	102.72	102.63	102.54	102.44
102.33	102.2	102.07	101.94	101.81
101.68	101.55	101.42	101.29	101.16
101.03	100.9	100.77	100.64	100.51
100.39	100.26	100.13	100.00	99.87
99.74	99.62	99.49	99.36	99.24
99.11	98.98	98.86	98.73	98.6
98.48	98.35	98.22	98.1	97.97
97.85	97.72	97.6	97.47	97.35
97.22	97.1	96.98	96.85	96.73
96.6	96.48	96.36	96.23	96.11

ENDTABLE X
GO,HYD SLP X
ENDJOB

checked w/ routing started elev. 1200.75, same output results.

****

THIS IS THE FINAL DESIGN HYDROLOGY FOR SIGNAL BUTTE FRS WHICH INCLUDES APACHE JUNCTION FRS, BULLDOG DIVERSION, AND PASS MOUNTAIN DIVERSION WITH OUTLET CHANNEL.

THE HYDROGRAPHS FROM THE DIVERSIONS INCLUDE FREEBOARD DISCHARGE QUANTITIES. SEDIMENT FROM PASS MOUNTAIN WILL INCLUDE MOST FINE-GRAINED SEDIMENT, BUT NO COARSE-GRAINED SEDIMENT. THIS IS IN ADDITION TO THE WORK PLAN SEDIMENT STORAGE REQUIREMENT.

PRELIMINARY DESIGN SHOWED THAT THE 100-YR STORM SET THE EMERGENCY SPILLWAY CREST. THIS WILL BE VARIFIED. yes.

********** BASIC DATA **********

****NOT DEFINED CLIMATE AREA DESIGN CLASS ****NOT DEFINED

STORM DISTRIBUTION.....PRINCIPAL SPILLWAY HYDROGRAPH

Q-PS1 DAY	Q-PS10 DAY	Q-ES	Q-FR	CN	DA-SM	TC/L	-/H
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONDUITS	COND L	D/W	-/H	PS N	KI	WEIR L	TW EL
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PERM POOL	CREST PS	FP SED	ORF	2ND STG	ORF H	ORF L	START ES
1684.00	1684.00	1700.75	0.0	0.0	0.0	0.0	0.0
BASEFLOW	INITIAL EL	EXTRA VOL.					
0.0	0.0	0.0					
ES1	ES2	ES3	ES4	ES5	Z ES	EXIT N	EXIT S
0.0	0.0	0.0	0.0	0.0	0.0	0.040	0.0
ES TYPE	ES L	ES N	BW1	BW2	BW3	BW4	BW5
0	0	0.0	0.0	0.0	0.0	0.0	0.0

PERM POOL	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
CREST PS	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
SED ACCUM	1700.75 FT	255.2 ACFT	52.82 AC	10.4 CFS

****

RATING TABLE DEVELOPED
WITH PS GIVEN AND NO EMG DATA GIVEN

RATING TABLE NUMBER 2

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	1684.00	0.0	0.0	0.02	0.09
2	1688.00	6.40	6.40	2.94	1.36
3	1692.00	7.90	7.90	16.82	5.58
4	1696.00	9.20	9.20	69.90	20.96
5	1701.00	10.50	10.50	265.00	54.50
6	1704.00	121.30	121.30	450.86	75.20
7	1708.00	138.40	138.40	816.46	107.60
8	1710.00	145.90	145.90	1046.16	122.10
9	1712.00	153.20	153.20	1304.94	136.70
10	1716.00	166.70	166.70	1909.10	165.40
11	1720.00	179.50	179.50	2624.90	192.50
12	1724.00	191.50	191.50	3457.10	223.60

PSH

FLOOD HYD D= 0.0 HR P= 0.0 IN Q= 0.0 IN
TC= 0.0 HR CN= 0.0 VOL= 0.0 ACFT
PEAK 3097.1 CFS AT 120.00 HRS

ROUTED RESULTS - HYD TYPE	EMAX	VOL-MAX	AMAX	QMAX
FLOOD HYD	1711.65 FT	1259.4 ACFT	134.13 AC	151.9 CFS

lower than 100-yr. storm routing, so not used. Sme

PS STORAGE 1004.2 ACFT BETWEEN ES CREST AND SED ACCUM ELEVATIONS

PLOT 1 IN = 500. CFS EXIT SLOPE = 0.0

T	I	O	E	VOL	A	0. T	500. I	1000. I	1500. I	2000. I	2500. I	3000. I	3500. I	EXIT VEL
0.0	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.00	12.4	12.4	1701.1	268.2	54.9	.								0.0
2.00	14.3	10.4	1700.8	255.4	52.8	.								0.0
3.00	14.8	10.4	1700.8	255.7	52.9	.								0.0
4.00	15.3	10.4	1700.8	256.1	53.0	.								0.0
5.00	15.7	10.4	1700.8	256.5	53.0	.								0.0
6.00	16.1	10.4	1700.8	257.0	53.1	.								0.0
7.00	16.4	10.4	1700.8	257.5	53.2	.								0.0
8.00	16.8	10.5	1700.8	258.0	53.3	.								0.0
9.00	17.1	10.5	1700.8	258.5	53.4	.								0.0
10.00	17.4	10.5	1700.8	259.1	53.5	.								0.0
11.00	17.6	10.5	1700.9	259.7	53.6	.								0.0
12.00	17.9	10.5	1700.9	260.3	53.7	.								0.0
13.00	18.2	10.5	1700.9	260.9	53.8	.								0.0
14.00	18.4	10.5	1700.9	261.5	53.9	.								0.0
15.00	18.6	10.5	1700.9	262.2	54.0	.								0.0
16.00	18.8	10.5	1700.9	262.9	54.1	.								0.0
17.00	19.0	10.5	1701.0	263.6	54.3	.								0.0
18.00	19.2	10.5	1701.0	264.3	54.4	.								0.0

20.00	19.	10.0	1701.	266.4	54.7	.	0.0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
22.00		11.7	1701.	267.	54.		0.0
23.00		12.1	1701.0	267.8	54.8	.	0.0
24.00	20.1	12.5	1701.1	268.4	54.9	.	0.0
25.00	20.2	12.9	1701.1	269.0	54.9	.	0.0
26.00	20.3	13.2	1701.1	269.6	55.0	.	0.0
27.00	25.8	13.7	1701.1	270.4	55.1	.I	0.0
28.00	27.5	14.3	1701.1	271.4	55.2	.I	0.0
29.00	26.4	14.9	1701.1	272.4	55.3	.I	0.0
30.00	21.8	15.4	1701.1	273.2	55.4	.	0.0
31.00	21.3	15.7	1701.1	273.7	55.5	.	0.0
32.00	27.3	16.1	1701.2	274.4	55.5	.I	0.0
33.00	28.5	16.7	1701.2	275.3	55.7	.I	0.0
34.00	24.8	17.1	1701.2	276.1	55.7	.	0.0
35.00	22.3	17.5	1701.2	276.7	55.8	.	0.0
36.00	22.1	17.7	1701.2	277.0	55.8	.	0.0
37.00	28.2	18.0	1701.2	277.6	55.9	.I	0.0
38.00	29.2	18.6	1701.2	278.5	56.0	.I	0.0
39.00	29.5	19.1	1701.2	279.4	56.1	.I	0.0
40.00	29.7	19.6	1701.2	280.2	56.2	.I	0.0
41.00	28.4	20.0	1701.3	281.0	56.3	.I	0.0
42.00	23.6	20.3	1701.3	281.5	56.3	.	0.0
43.00	23.0	20.5	1701.3	281.7	56.4	.	0.0
44.00	28.9	20.7	1701.3	282.2	56.4	.I	0.0
45.00	30.0	21.1	1701.3	282.9	56.5	.I	0.0
46.00	30.2	21.6	1701.3	283.6	56.6	.I	0.0
47.00	30.4	22.0	1701.3	284.3	56.6	.I	0.0
48.00	30.6	22.4	1701.3	285.0	56.7	.I	0.0
49.00	30.7	22.8	1701.3	285.6	56.8	.I	0.0
50.00	30.9	23.2	1701.3	286.3	56.9	.I	0.0
51.00	31.0	23.6	1701.4	286.9	56.9	.I	0.0
52.00	31.1	23.9	1701.4	287.5	57.0	.I	0.0
53.00	31.2	24.3	1701.4	288.1	57.1	.I	0.0
54.00	31.3	24.6	1701.4	288.7	57.1	.I	0.0
55.00	31.4	24.9	1701.4	289.2	57.2	.I	0.0
56.00	31.5	25.2	1701.4	289.7	57.3	.P	0.0
57.00	31.6	25.6	1701.4	290.3	57.3	.P	0.0
58.00	31.7	25.8	1701.4	290.7	57.4	.P	0.0
59.00	31.8	26.1	1701.4	291.2	57.4	.P	0.0
60.00	31.9	26.4	1701.4	291.7	57.5	.P	0.0
61.00	32.0	26.7	1701.4	292.1	57.5	.P	0.0
62.00	32.0	26.9	1701.4	292.6	57.6	.P	0.0
63.00	42.9	27.4	1701.5	293.4	57.7	.P	0.0
64.00	46.1	28.3	1701.5	294.8	57.8	.P	0.0
65.00	43.9	29.1	1701.5	296.1	58.0	.P	0.0
66.00	34.5	29.5	1701.5	297.0	58.1	.P	0.0
67.00	33.4	29.8	1701.5	297.3	58.1	.P	0.0
68.00	39.3	30.1	1701.5	297.8	58.2	.P	0.0
69.00	40.4	30.6	1701.5	298.6	58.2	.P	0.0
70.00	40.7	31.0	1701.6	299.4	58.3	.P	0.0
71.00	40.9	31.5	1701.6	300.2	58.4	.P	0.0
72.00	41.1	32.0	1701.6	301.0	58.5	.P	0.0
73.00	41.3	32.4	1701.6	301.7	58.6	.P	0.0
74.00	41.5	32.8	1701.6	302.5	58.7	.P	0.0
75.00	47.0	33.4	1701.6	303.4	58.8	.P	0.0

76[redacted]	[redacted]	[redacted]	[redacted]01.6	[redacted]04.	[redacted]8.9	[redacted]	0.0
77.00	.7	34.8	1701.7	305.7	59.0	.P	[redacted]
78.00	43.2	35.3	1701.7	306.6	59.1	.P	0.0
79.00	42.7	35.6	1701.7	307.2	59.2	.P	0.0
80.00	48.8	36.1	1701.7	308.0	59.3	.P	0.0
81.00	49.9	36.8	1701.7	309.1	59.4	.P	0.0
82.00	46.3	37.3	1701.7	310.0	59.5	.P	0.0
83.00	43.9	37.7	1701.7	310.6	59.6	.P	0.0
84.00	43.7	38.0	1701.7	311.1	59.6	.P	0.0
85.00	56.0	38.6	1701.8	312.1	59.7	.P	0.0
86.00	58.0	39.4	1701.8	313.5	59.9	.P	0.0
87.00	58.5	40.3	1701.8	315.1	60.1	.P	0.0
88.00	59.0	41.2	1701.8	316.5	60.2	.P	0.0
89.00	60.9	42.1	1701.9	318.1	60.4	.P	0.0
90.00	66.2	43.2	1701.9	319.8	60.6	.P	0.0
91.00	67.4	44.3	1701.9	321.7	60.8	.P	0.0
92.00	62.0	45.3	1701.9	323.3	61.0	.P	0.0
93.00	61.5	46.1	1702.0	324.7	61.1	.P	0.0
94.00	61.7	46.8	1702.0	325.9	61.3	.P	0.0
95.00	61.9	47.5	1702.0	327.1	61.4	.P	0.0
96.00	62.3	48.2	1702.0	328.3	61.5	.P	0.0
97.00	87.3	49.5	1702.1	330.4	61.8	.PI	0.0
98.00	91.3	51.4	1702.1	333.7	62.1	.PI	0.0
99.00	92.5	53.4	1702.2	336.9	62.5	.PI	0.0
100.00	93.6	55.3	1702.2	340.1	62.9	.PI	0.0
101.00	96.1	57.2	1702.3	343.3	63.2	.PI	0.0
102.00	102.0	59.2	1702.3	346.7	63.6	.PI	0.0
103.00	104.1	61.3	1702.4	350.2	64.0	.PI	0.0
104.00	99.9	63.3	1702.4	353.5	64.4	.PI	0.0
105.00	100.3	65.0	1702.5	356.5	64.7	.PI	0.0
106.00	101.3	66.8	1702.5	359.4	65.0	.PI	0.0
107.00	102.3	68.4	1702.6	362.2	65.3	.PI	0.0
108.00	103.2	70.1	1702.6	365.0	65.6	.PI	0.0
109.00	128.9	72.3	1702.7	368.7	66.0	.P I	0.0
110.00	133.9	75.1	1702.7	373.4	66.6	. PI	0.0
111.00	152.5	78.4	1702.8	378.9	67.2	. PI	0.0
112.00	159.4	82.1	1702.9	385.2	67.9	. PI	0.0
113.00	171.8	86.1	1703.0	391.9	68.6	. PI	0.0
114.00	204.2	91.0	1703.2	400.1	69.5	. P I	0.0
115.00	212.0	96.7	1703.3	409.6	70.6	. P I	0.0
116.00	300.7	104.4	1703.5	422.4	72.0	. P I	0.0
117.00	321.9	114.3	1703.8	439.1	73.9	. P I	0.0
118.00	1923.6	124.6	1704.8	522.0	81.5	. P	0.0
119.00	2966.6	133.6	1706.9	713.5	98.5	. P	0.0
120.00	3097.1	142.8	1709.2	952.6	116.2	. P	0.0
121.00	829.1	147.5	1710.4	1102.8	125.3	. P	0.0
122.00	542.3	148.8	1710.8	1147.3	127.8	. P	0.0
123.00	358.8	149.5	1711.0	1172.2	129.2	. P	0.0
124.00	314.5	149.9	1711.1	1187.6	130.1	. P I	0.0
125.00	297.2	150.3	1711.2	1200.5	130.8	. P I	0.0
126.00	257.9	150.6	1711.3	1211.0	131.4	. P I	0.0
127.00	253.0	150.8	1711.3	1219.7	131.9	. P I	0.0
128.00	228.9	151.0	1711.4	1227.1	132.3	. P I	0.0
129.00	224.8	151.2	1711.4	1233.4	132.7	. PI	0.0
130.00	208.2	151.3	1711.5	1238.8	133.0	. PI	0.0
131.00	197.5	151.5	1711.5	1243.0	133.2	. PI	0.0
132.00	195.7	151.6	1711.6	1246.7	133.4	. PI	0.0
133.00	170.9	151.6	1711.6	1249.4	133.6	. P	0.0
134.00	167.4	151.7	1711.6	1250.8	133.6	. P	0.0
135.00	161.5	151.7	1711.6	1251.9	133.7	. P	0.0
136.00	159.7	151.7	1711.6	1252.6	133.7	. P	0.0
137.00	159.1	151.7	1711.6	1253.2	133.8	. P	0.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	. P	0.0

141.00	[illegible]	[illegible]1.8	1711.6	1256.2	133.9	.	P	
[illegible]	[illegible]	[illegible]	[illegible]711.[illegible]	[illegible]1257.[illegible]	[illegible]134.0	[illegible]	P	0.0
143.00	[illegible]	[illegible]51.9	1711.6	1258.[illegible]	134.1	.	P	0.0
144.00	163.6	151.9	1711.6	1259.2	134.1	.	P	0.0
145.00	144.9	151.9	1711.6	1259.4	134.1	.	X	0.0
146.00	142.2	151.9	1711.6	1258.7	134.1	.	P	0.0
147.00	141.6	151.9	1711.6	1257.9	134.0	.	P	0.0
148.00	141.2	151.8	1711.6	1257.0	134.0	.	P	0.0
149.00	142.4	151.8	1711.6	1256.2	134.0	.	P	0.0
150.00	146.8	151.8	1711.6	1255.6	133.9	.	P	0.0
151.00	147.1	151.8	1711.6	1255.2	133.9	.	P	0.0
152.00	140.8	151.8	1711.6	1254.6	133.9	.	P	0.0
153.00	139.5	151.8	1711.6	1253.6	133.8	.	P	0.0
154.00	139.0	151.7	1711.6	1252.6	133.7	.	P	0.0
155.00	138.7	151.7	1711.6	1251.5	133.7	.	P	0.0
156.00	138.2	151.7	1711.6	1250.4	133.6	.	P	0.0
157.00	131.8	151.6	1711.6	1249.1	133.5	.	P	0.0
158.00	130.6	151.6	1711.6	1247.4	133.5	.	P	0.0
159.00	130.1	151.5	1711.5	1245.6	133.4	.	P	0.0
160.00	129.5	151.5	1711.5	1243.8	133.3	.	P	0.0
161.00	130.5	151.4	1711.5	1242.1	133.2	.	P	0.0
162.00	134.8	151.4	1711.5	1240.5	133.1	.	P	0.0
163.00	134.9	151.3	1711.5	1239.1	133.0	.	P	0.0
164.00	128.5	151.3	1711.5	1237.5	132.9	.	P	0.0
165.00	127.0	151.2	1711.5	1235.6	132.8	.	P	0.0
166.00	126.4	151.2	1711.4	1233.5	132.7	.	P	0.0
167.00	125.9	151.1	1711.4	1231.5	132.6	.	P	0.0
168.00	125.3	151.1	1711.4	1229.4	132.4	.	P	0.0
169.00	118.7	151.0	1711.4	1227.0	132.3	.	IP	0.0
170.00	117.4	150.9	1711.4	1224.3	132.1	.	IP	0.0
171.00	116.7	150.8	1711.4	1221.5	132.0	.	IP	0.0
172.00	116.2	150.8	1711.3	1218.6	131.8	.	IP	0.0
173.00	117.1	150.7	1711.3	1215.8	131.7	.	IP	0.0
174.00	121.4	150.6	1711.3	1213.2	131.5	.	IP	0.0
175.00	121.5	150.5	1711.3	1210.8	131.4	.	IP	0.0
176.00	115.1	150.5	1711.3	1208.1	131.2	.	IP	0.0
177.00	113.6	150.4	1711.2	1205.2	131.1	.	IP	0.0
178.00	112.9	150.3	1711.2	1202.1	130.9	.	IP	0.0
179.00	112.4	150.2	1711.2	1199.0	130.7	.	IP	0.0
180.00	106.0	150.1	1711.2	1195.6	130.5	.	IP	0.0
181.00	97.4	150.0	1711.1	1191.6	130.3	.	IP	0.0
182.00	90.3	149.9	1711.1	1187.0	130.0	.	IP	0.0
183.00	84.2	149.7	1711.0	1181.8	129.8	.	IP	0.0
184.00	78.7	149.6	1711.0	1176.2	129.4	.	IP	0.0
185.00	73.9	149.4	1711.0	1170.1	129.1	.I	P	0.0
186.00	69.5	149.2	1710.9	1163.7	128.7	.I	P	0.0
187.00	65.6	149.0	1710.9	1157.0	128.4	.I	P	0.0
188.00	62.2	148.8	1710.8	1149.9	128.0	.I	P	0.0
189.00	59.1	148.6	1710.7	1142.6	127.5	.I	P	0.0
190.00	56.3	148.4	1710.7	1135.1	127.1	.I	P	0.0
191.00	53.8	148.2	1710.6	1127.4	126.7	.I	P	0.0
192.00	51.6	148.0	1710.6	1119.6	126.2	.I	P	0.0
193.00	43.4	147.7	1710.5	1111.3	125.8	.I	P	0.0
194.00	40.6	147.5	1710.4	1102.5	125.3	.I	P	0.0
195.00	44.7	147.2	1710.4	1093.9	124.8	.I	P	0.0

196.00	[redacted]	147.0	1710.3	1085.4	124.3	.I	P	0.0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0
198.00	37.6	146.5	1710.2	1068.2	123.3	.I	P	0.0
199.00	36.1	146.3	1710.1	1059.1	122.8	.I	P	0.0
200.00	41.2	146.0	1710.0	1050.2	122.3	.I	P	0.0
201.00	41.6	145.8	1710.0	1041.6	121.8	.I	P	0.0
202.00	37.1	145.5	1709.9	1032.8	121.3	.I	P	0.0
203.00	33.9	145.2	1709.8	1023.7	120.7	.I	P	0.0
204.00	32.9	144.9	1709.7	1014.5	120.1	.I	P	0.0
205.00	32.3	144.6	1709.6	1005.3	119.5	.I	P	0.0
206.00	31.6	144.3	1709.6	996.0	118.9	.I	P	0.0
207.00	31.1	144.0	1709.5	986.6	118.3	.I	P	0.0
208.00	30.5	143.7	1709.4	977.3	117.8	.I	P	0.0
209.00	31.5	143.3	1709.3	968.0	117.2	.I	P	0.0
210.00	36.0	143.1	1709.2	959.0	116.6	.I	P	0.0
211.00	36.3	142.8	1709.2	950.1	116.0	.I	P	0.0
212.00	30.2	142.5	1709.1	941.1	115.5	.I	P	0.0
213.00	28.9	142.2	1709.0	931.8	114.9	.I	P	0.0
214.00	28.4	141.9	1708.9	922.4	114.3	.I	P	0.0
215.00	28.0	141.6	1708.8	913.0	113.7	.I	P	0.0
216.00	27.7	141.2	1708.8	903.6	113.1	.I	P	0.0
217.00	27.3	140.9	1708.7	894.3	112.5	.I	P	0.0
218.00	27.0	140.6	1708.6	884.9	111.9	.I	P	0.0
219.00	26.7	140.3	1708.5	875.5	111.3	.I	P	0.0
220.00	26.4	140.0	1708.4	866.1	110.7	.I	P	0.0
221.00	27.7	139.7	1708.4	856.8	110.1	.I	P	0.0
222.00	32.4	139.4	1708.3	847.7	109.6	.I	P	0.0
223.00	32.9	139.1	1708.2	838.9	109.0	.I	P	0.0
224.00	27.0	138.8	1708.1	829.9	108.4	.I	P	0.0
225.00	25.9	138.5	1708.0	820.6	107.9	.I	P	0.0
226.00	25.6	138.2	1707.9	811.3	107.1	.I	P	0.0
227.00	25.4	137.7	1707.8	802.0	106.3	.I	P	0.0
228.00	25.2	137.3	1707.7	792.7	105.5	.I	P	0.0
229.00	25.0	136.9	1707.6	783.5	104.7	.	P	0.0
230.00	24.8	136.4	1707.5	774.2	103.9	.	P	0.0
231.00	30.0	136.0	1707.4	765.2	103.1	.I	P	0.0
232.00	31.4	135.6	1707.3	756.6	102.3	.I	P	0.0
233.00	30.2	135.2	1707.2	747.9	101.5	.I	P	0.0
234.00	25.3	134.8	1707.2	739.1	100.7	.I	P	0.0
235.00	24.6	134.4	1707.1	730.0	99.9	.	P	0.0
236.00	24.5	133.9	1707.0	720.9	99.1	.	P	0.0
237.00	24.3	133.5	1706.9	711.9	98.3	.	P	0.0
238.00	22.4	133.1	1706.8	702.8	97.5	.	P	0.0
239.00	22.5	132.7	1706.7	693.7	96.7	.	P	0.0
240.00	11.8	132.2	1706.6	684.2	95.9	.	P	0.0
241.00	9.5	131.7	1706.4	674.1	95.0	.	P	0.0
242.00	9.0	131.3	1706.3	664.0	94.1	.	P	0.0
243.00	8.5	130.8	1706.2	653.9	93.2	.	P	0.0
244.00	8.0	130.3	1706.1	643.8	92.3	.	P	0.0
245.00	7.5	129.9	1706.0	633.7	91.4	.	P	0.0
246.00	7.1	129.4	1705.9	623.6	90.5	.	P	0.0
247.00	6.7	128.9	1705.8	613.5	89.6	.	P	0.0
248.00	6.3	128.4	1705.7	603.4	88.7	.	P	0.0
249.00	5.9	128.0	1705.6	593.3	87.8	.	P	0.0
250.00	5.5	127.5	1705.4	583.2	86.9	.	P	0.0
251.00	5.2	127.0	1705.3	573.2	86.0	.	P	0.0
252.00	4.9	126.6	1705.2	563.1	85.1	.	P	0.0
253.00	4.6	126.1	1705.1	553.1	84.3	.	P	0.0
254.00	4.3	125.6	1705.0	543.0	83.4	.	P	0.0
255.00	4.1	125.1	1704.9	533.0	82.5	.	P	0.0
256.00	3.8	124.7	1704.8	523.0	81.6	.	P	0.0
257.00	3.6	124.2	1704.7	513.0	80.7	.	P	0.0
258.00	3.4	123.7	1704.6	503.1	79.8	.	P	0.0

262.00	[illegible]	121.9	1704.1	463.5	76.3	.	P	0.0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		P	0.0 [redacted]
264.00	[illegible]	117.2	1703.9	444.0	74.4	.	P	0.0
265.00	2.2	111.7	1703.7	434.7	73.4	.	P	0.0
266.00	2.1	106.4	1703.6	425.9	72.4	.	P	0.0
267.00	1.9	101.4	1703.5	417.5	71.5	.	P	0.0
268.00	1.8	96.6	1703.3	409.4	70.6	.	P	0.0
269.00	1.7	92.0	1703.2	401.8	69.7	.	P	0.0
270.00	1.6	87.7	1703.1	394.5	68.9	.	P	0.0
271.00	1.5	83.6	1703.0	387.5	68.1	.	P	0.0
272.00	1.4	79.6	1702.9	380.9	67.4	.	P	0.0
273.00	1.3	75.8	1702.8	374.6	66.7	.	P	0.0
274.00	1.3	72.3	1702.7	368.6	66.0	.	P	0.0
275.00	1.2	68.8	1702.6	362.9	65.4	.	P	0.0
276.00	1.1	65.6	1702.5	357.4	64.8	.	P	0.0
277.00	1.1	62.5	1702.4	352.2	64.2	.	P	0.0
278.00	1.0	59.5	1702.3	347.3	63.7	.	P	0.0
279.00	0.9	56.7	1702.3	342.5	63.1	.	P	0.0
280.00	0.9	54.0	1702.2	338.0	62.6	.	P	0.0
281.00	0.8	51.5	1702.1	333.7	62.2	.	P	0.0
282.00	0.8	49.0	1702.0	329.7	61.7	.	P	0.0
283.00	0.7	46.7	1702.0	325.8	61.3	.	P	0.0
284.00	0.7	44.5	1701.9	322.0	60.9	.	P	0.0
285.00	0.7	42.4	1701.9	318.5	60.5	.	P	0.0
286.00	0.6	40.4	1701.8	315.1	60.1	.	P	0.0
287.00	0.6	38.5	1701.8	311.9	59.7	.	P	0.0
288.00	0.5	36.7	1701.7	308.9	59.4	.	P	0.0
289.00	0.5	34.9	1701.7	306.0	59.1	.	P	0.0
290.00	0.5	33.3	1701.6	303.2	58.8	.	P	0.0
291.00	0.5	31.7	1701.6	300.5	58.5	.	P	0.0
292.00	0.4	30.2	1701.5	298.0	58.2	.	P	0.0
293.00	0.4	28.7	1701.5	295.6	57.9	.	P	0.0
294.00	0.4	27.4	1701.5	293.3	57.7	.	P	0.0
295.00	0.4	26.1	1701.4	291.1	57.4	.	P	0.0
296.00	0.3	24.8	1701.4	289.1	57.2	.		0.0
297.00	0.3	23.7	1701.4	287.1	57.0	.		0.0
298.00	0.3	22.5	1701.3	285.2	56.7	.		0.0
299.00	0.3	21.5	1701.3	283.4	56.6	.		0.0
300.00	0.0	20.4	1701.3	281.7	56.4	.		0.0
T	I	O	E	VOL	A	I	I	VEL
						0. 500. 1000. 1500. 2000. 2500. 3000. 3500.		EXIT

********** NO INPUT DATA GIVEN FOR EMG. SPILLWAY CREST AND/OR EMG. BOTTOM WIDTH. NO ROUTINGS PERFORMED.

(13)

********** BASIC DATA **********

****NOT DEFINED CLIMATE AREA DESIGN CLASS ****NOT DEFINED

STORM DISTRIBUTION.....TR20 HYDROGRAPH 100YR STORM

Q-PS1 DAY	Q-PS10 DAY	Q-ES	Q-FB	CN	DA-SM	TC/L	-/H
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONDUITS	COND L	D/W	-/H	PS N	KI	WEIR L	TW EL
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PERM POOL	CREST PS	FP SED	QRF	2ND STG	ORF H	ORF L	START ES
1684.00	1684.00	1700.75	0.0	0.0	0.0	0.0	0.0
BASEFLOW	INITIAL EL	EXTRA VOL.					
0.0	0.0	0.0					
ES1	ES2	ES3	ES4	ES5	Z ES	EXIT N	EXIT S
0.0	0.0	0.0	0.0	0.0	0.0	0.040	0.0
ES TYPE	ES L	ES N	BW1	BW2	BW3	BW4	BW5
0	0	0.0	0.0	0.0	0.0	0.0	0.0

PERM POOL	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
CREST PS	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
SED ACCUM	1700.75 FT	255.2 ACFT	52.82 AC	10.4 CFS

****

RATING TABLE DEVELOPED
WITH PS GIVEN AND NO EMG DATA GIVEN

RATING TABLE NUMBER 2

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	1684.00	0.0	0.0	0.02	0.09
2	1688.00	6.40	6.40	2.94	1.36
3	1692.00	7.90	7.90	16.82	5.58
4	1696.00	9.20	9.20	69.90	20.96
5	1701.00	10.50	10.50	265.00	54.50
6	1704.00	121.30	121.30	450.86	75.20
7	1708.00	138.40	138.40	816.46	107.60
8	1710.00	145.90	145.90	1046.16	122.10
9	1712.00	153.20	153.20	1304.94	136.70
10	1716.00	166.70	166.70	1909.10	165.40
11	1720.00	179.50	179.50	2624.90	192.50
12	1724.00	191.50	191.50	3457.10	223.60

100-yr.
24-hr storm

FLOOD HYD D= 0.0 HR P= 0.0 IN Q= 0.0 IN
TC= 0.0 HR CN= 0.0 VOL= 0.0 ACFT
PEAK 8158.2 CFS AT 12.20 HRS

ROUTED RESULTS -	HYD TYPE	EMAX	VOL-MAX	AMAX	QMAX
	FLOOD HYD	1712.40 FT	1365.6 ACFT	139.58 AC	154.6 CFS

Sets em. spwy. crest

PS STORAGE 1110.3 ACFT BETWEEN ES CREST AND SED ACCUM ELEVATIONS

PLOT 1 IN = 2000. CFS EXIT SLOPE = 0.0

T	I	O	E	VOL	A	0. I	2000. I	4000. I	6000. I	8000. I	10000. I	12000. I	14000. I	EXIT VEL
0.0	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
3.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
3.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
3.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
3.60	0.0	0.0	1684.0	0.0	0.1	.								0.0

4.40	[illegible]	0.0	1684.0	0.0	0.1	.	0.0
[illegible].60	[illegible]	[illegible]	16[illegible]	[illegible]	[illegible]	.	0.0
4.80	[illegible]	0.0	1684.0	0.0	0.1	.	0.0
5.00	0.0	0.0	1684.0	0.0	0.1	.	0.0
5.20	0.0	0.0	1684.0	0.0	0.1	.	0.0
5.40	0.0	0.0	1684.0	0.0	0.1	.	0.0
5.60	0.0	0.0	1684.0	0.0	0.1	.	0.0
5.80	0.0	0.0	1684.0	0.0	0.1	.	0.0
6.00	0.0	0.0	1684.0	0.0	0.1	.	0.0
6.20	0.0	0.0	1684.0	0.0	0.1	.	0.0
6.40	0.0	0.0	1684.0	0.0	0.1	.	0.0
6.60	0.0	0.0	1684.0	0.0	0.1	.	0.0
6.80	0.0	0.0	1684.0	0.0	0.1	.	0.0
7.00	0.0	0.0	1684.0	0.0	0.1	.	0.0
7.20	0.0	0.0	1684.0	0.0	0.1	.	0.0
7.40	0.3	0.3	1684.2	0.1	0.1	.	0.0
7.60	1.2	1.2	1684.8	0.6	0.3	.	0.0
7.80	2.8	2.8	1685.7	1.3	0.6	.	0.0
8.00	5.3	5.3	1687.3	2.4	1.1	.	0.0
8.20	8.8	8.8	1694.9	54.8	16.6	.	0.0
8.40	13.7	10.4	1700.8	255.3	52.8	.	0.0
8.60	20.1	10.4	1700.8	255.4	52.8	.	0.0
8.80	28.2	10.4	1700.8	255.6	52.9	.	0.0
9.00	38.3	10.4	1700.8	256.0	52.9	.	0.0
9.20	50.2	10.4	1700.8	256.5	53.0	.	0.0
9.40	64.4	10.4	1700.8	257.3	53.2	.	0.0
9.60	80.0	10.5	1700.8	258.3	53.4	.	0.0
9.80	97.7	10.5	1700.9	259.6	53.6	.	0.0
10.00	118.3	10.5	1700.9	261.2	53.9	.I	0.0
10.20	144.0	10.5	1701.0	263.2	54.2	.I	0.0
10.40	178.7	10.9	1701.0	265.7	54.6	.I	0.0
10.60	218.9	12.8	1701.1	268.8	54.9	.I	0.0
10.80	275.8	15.1	1701.1	272.7	55.4	.I	0.0
11.00	342.8	18.0	1701.2	277.5	55.9	. I	0.0
11.20	439.8	21.6	1701.3	283.7	56.6	. I	0.0
11.40	581.4	26.4	1701.4	291.7	57.5	. I	0.0
11.60	1013.3	34.0	1701.6	304.4	58.9	. I	0.0
11.80	3287.5	54.7	1702.2	339.2	62.8	. I	0.0
12.00	6690.9	103.1	1703.5	420.3	71.8	.P I	0.0
12.20	8158.2	125.5	1705.0	541.2	83.2	.P X	0.0
12.40	7034.8	131.3	1706.3	664.6	94.1	.P I	0.0
12.60	5319.3	136.0	1707.4	764.5	103.0	.P I	0.0
12.80	3867.8	139.1	1708.2	838.2	109.0	.P I	0.0
13.00	2896.3	140.9	1708.7	891.7	112.4	.P I	0.0
13.20	2267.7	142.2	1709.0	932.1	114.9	.P I	0.0
13.40	1845.3	143.2	1709.3	963.7	116.9	.P I	0.0
13.60	1570.4	144.1	1709.5	989.6	118.5	.P I	0.0
13.80	1359.2	144.8	1709.7	1011.4	119.9	.P I	0.0
14.00	1208.4	145.4	1709.9	1030.2	121.1	.P I	0.0
14.20	1097.1	145.9	1710.0	1046.9	122.1	.P I	0.0
14.40	1010.9	146.3	1710.1	1061.9	123.0	.P I	0.0
14.60	949.5	146.7	1710.2	1075.7	123.8	.P I	0.0
14.80	895.9	147.1	1710.3	1088.5	124.5	.P I	0.0
15.00	854.9	147.4	1710.4	1100.5	125.2	.P I	0.0

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	.P	[redacted]	[redacted]
15.40	[illegible]	148.1	1710.6	1122.6	126.4	.P	I	0.0
15.60	747.7	148.3	1710.7	1132.8	127.0	.P	I	0.0
15.80	711.0	148.6	1710.7	1142.4	127.5	.P	I	0.0
16.00	679.3	148.9	1710.8	1151.4	128.0	.P	I	0.0
16.20	652.7	149.1	1710.9	1160.0	128.5	.P	I	0.0
16.40	629.4	149.3	1710.9	1168.1	129.0	.P	I	0.0
16.60	613.1	149.6	1711.0	1175.9	129.4	.P	I	0.0
16.80	603.7	149.8	1711.1	1183.5	129.8	.P	I	0.0
17.00	598.7	150.0	1711.1	1190.9	130.3	.P	I	0.0
17.20	590.0	150.2	1711.2	1198.3	130.7	.P	I	0.0
17.40	577.0	150.4	1711.2	1205.4	131.1	.P	I	0.0
17.60	564.2	150.6	1711.3	1212.4	131.5	.P	I	0.0
17.80	547.2	150.8	1711.3	1219.1	131.9	.P	I	0.0
18.00	531.7	151.0	1711.4	1225.5	132.2	.P	I	0.0
18.20	515.2	151.1	1711.4	1231.7	132.6	.P	I	0.0
18.40	497.5	151.3	1711.5	1237.5	132.9	.PI		0.0
18.60	484.1	151.5	1711.5	1243.1	133.2	.PI		0.0
18.80	476.0	151.6	1711.6	1248.6	133.5	.PI		0.0
19.00	471.9	151.8	1711.6	1253.9	133.8	.PI		0.0
19.20	469.8	151.9	1711.6	1259.2	134.1	.PI		0.0
19.40	468.8	152.1	1711.7	1264.4	134.4	.PI		0.0
19.60	466.4	152.2	1711.7	1269.6	134.7	.PI		0.0
19.80	455.7	152.3	1711.8	1274.7	135.0	.PI		0.0
20.00	443.6	152.5	1711.8	1279.6	135.3	.PI		0.0
20.20	435.1	152.6	1711.8	1284.4	135.5	.PI		0.0
20.40	430.4	152.8	1711.9	1289.0	135.8	.PI		0.0
20.60	426.1	152.9	1711.9	1293.6	136.1	.PI		0.0
20.80	414.2	153.0	1711.9	1298.0	136.3	.PI		0.0
21.00	401.5	153.1	1712.0	1302.2	136.5	.PI		0.0
21.20	399.0	153.2	1712.0	1306.3	136.8	.PI		0.0
21.40	406.4	153.3	1712.0	1310.4	137.0	.PI		0.0
21.60	412.8	153.4	1712.1	1314.6	137.2	.PI		0.0
21.80	407.5	153.5	1712.1	1318.9	137.4	.PI		0.0
22.00	398.3	153.6	1712.1	1323.0	137.6	.PI		0.0
22.20	391.1	153.7	1712.1	1327.0	137.7	.PI		0.0
22.40	387.1	153.8	1712.2	1330.9	137.9	.PI		0.0
22.60	383.2	153.9	1712.2	1334.7	138.1	.PI		0.0
22.80	371.5	153.9	1712.2	1338.4	138.3	.PI		0.0
23.00	358.8	154.0	1712.2	1341.9	138.5	.PI		0.0
23.20	356.4	154.1	1712.3	1345.2	138.6	.PI		0.0
23.40	363.7	154.2	1712.3	1348.6	138.8	.PI		0.0
23.60	370.1	154.3	1712.3	1352.2	138.9	.PI		0.0
23.80	364.7	154.3	1712.3	1355.7	139.1	.PI		0.0
24.00	354.6	154.4	1712.4	1359.1	139.3	.PI		0.0
24.20	314.4	154.5	1712.4	1362.1	139.4	.PI		0.0
24.40	248.3	154.5	1712.4	1364.2	139.5	.P		0.0
24.60	191.9	154.5	1712.4	1365.2	139.6	.P		0.0
24.80	157.0	154.6	1712.4	1365.6	139.6	.X		0.0
25.00	138.2	154.6	1712.4	1365.4	139.6	.P		0.0
25.20	128.2	154.5	1712.4	1365.1	139.6	.P		0.0
25.40	122.6	154.5	1712.4	1364.6	139.5	.P		0.0
25.60	119.2	154.5	1712.4	1364.1	139.5	.P		0.0
25.80	116.7	154.5	1712.4	1363.5	139.5	.P		0.0
26.00	115.3	154.5	1712.4	1362.8	139.4	.P		0.0
26.20	114.5	154.5	1712.4	1362.2	139.4	.P		0.0
26.40	114.1	154.5	1712.4	1361.5	139.4	.P		0.0
26.60	113.8	154.4	1712.4	1360.8	139.4	.P		0.0
26.80	113.6	154.4	1712.4	1360.2	139.3	.P		0.0
27.00	113.4	154.4	1712.4	1359.5	139.3	.P		0.0
27.20	113.2	154.4	1712.4	1358.8	139.3	.P		0.0
27.40	113.1	154.4	1712.4	1358.1	139.2	.P		0.0
27.60	113.0	154.4	1712.3	1357.4	139.2	.P		0.0

28.00	112.[illegible]	[illegible].3	1712.3	1356.1	139.1	.P		
28[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0	
28.40	[illegible]	[illegible].3	1712.3	1354.7	[illegible].1	[redacted]	[redacted]	
28.60	1[illegible]	154.3	1712.3	1354.0	139.0	.P	0.0	
28.80	112.4	154.3	1712.3	1353.3	139.0	.P	0.0	
29.00	112.3	154.3	1712.3	1352.6	139.0	.P	0.0	
29.20	112.2	154.2	1712.3	1351.9	138.9	.P	0.0	
29.40	112.1	154.2	1712.3	1351.2	138.9	.P	0.0	
29.60	112.0	154.2	1712.3	1350.5	138.9	.P	0.0	
29.80	111.9	154.2	1712.3	1349.8	138.8	.P	0.0	
30.00	111.8	154.2	1712.3	1349.1	138.8	.P	0.0	
30.20	111.7	154.2	1712.3	1348.4	138.8	.P	0.0	
30.40	111.6	154.2	1712.3	1347.7	138.7	.P	0.0	
30.60	111.5	154.1	1712.3	1347.0	138.7	.P	0.0	
30.80	111.4	154.1	1712.3	1346.3	138.7	.P	0.0	
31.00	111.3	154.1	1712.3	1345.6	138.6	.P	0.0	
31.20	111.2	154.1	1712.3	1344.9	138.6	.P	0.0	
31.40	111.1	154.1	1712.3	1344.2	138.6	.P	0.0	
31.60	111.0	154.1	1712.3	1343.5	138.5	.P	0.0	
31.80	110.9	154.0	1712.3	1342.8	138.5	.P	0.0	
32.00	110.8	154.0	1712.2	1342.1	138.5	.P	0.0	
32.20	110.7	154.0	1712.2	1341.3	138.4	.P	0.0	
32.40	110.6	154.0	1712.2	1340.6	138.4	.P	0.0	
32.60	110.5	154.0	1712.2	1339.9	138.4	.P	0.0	
32.80	110.4	154.0	1712.2	1339.2	138.3	.P	0.0	
33.00	110.3	153.9	1712.2	1338.5	138.3	.P	0.0	
33.20	110.3	153.9	1712.2	1337.7	138.3	.P	0.0	
33.40	110.1	153.9	1712.2	1337.0	138.2	.P	0.0	
33.60	110.0	153.9	1712.2	1336.3	138.2	.P	0.0	
33.80	109.9	153.9	1712.2	1335.6	138.2	.P	0.0	
34.00	109.9	153.9	1712.2	1334.8	138.1	.P	0.0	
34.20	109.8	153.9	1712.2	1334.1	138.1	.P	0.0	
34.40	109.7	153.8	1712.2	1333.4	138.1	.P	0.0	
34.60	109.6	153.8	1712.2	1332.7	138.0	.P	0.0	
34.80	109.5	153.8	1712.2	1331.9	138.0	.P	0.0	
35.00	109.4	153.8	1712.2	1331.2	137.9	.P	0.0	
35.20	109.3	153.8	1712.2	1330.5	137.9	.P	0.0	
35.40	109.2	153.8	1712.2	1329.7	137.9	.P	0.0	
35.60	109.1	153.7	1712.2	1329.0	137.8	.P	0.0	
35.80	109.0	153.7	1712.2	1328.2	137.8	.P	0.0	
36.00	108.9	153.7	1712.1	1327.5	137.8	.P	0.0	
36.20	108.8	153.7	1712.1	1326.8	137.7	.P	0.0	
36.40	108.7	153.7	1712.1	1326.0	137.7	.P	0.0	
36.60	108.6	153.7	1712.1	1325.3	137.7	.P	0.0	
36.80	108.5	153.6	1712.1	1324.5	137.6	.P	0.0	
37.00	108.4	153.6	1712.1	1323.8	137.6	.P	0.0	
37.20	108.3	153.6	1712.1	1323.0	137.6	.P	0.0	
37.40	108.2	153.6	1712.1	1322.3	137.5	.P	0.0	
37.60	108.1	153.6	1712.1	1321.5	137.5	.P	0.0	
37.80	108.0	153.6	1712.1	1320.8	137.5	.P	0.0	
38.00	107.9	153.5	1712.1	1320.0	137.4	.P	0.0	
38.20	107.8	153.5	1712.1	1319.3	137.4	.P	0.0	
38.40	107.7	153.5	1712.1	1318.5	137.3	.P	0.0	
38.60	107.6	153.5	1712.1	1317.8	137.3	.P	0.0	
38.80	107.5	153.5	1712.1	1317.0	137.3	.P	0.0	
39.00	107.5	153.5	1712.1	1316.2	137.2	.P	0.0	

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0
39.40	[redacted]	153.4	1712.1	1314.7	137.2	.P	[redacted]	[redacted]
39.60	107.2	153.4	1712.1	1313.9	137.1	.P		0.0
39.80	107.1	153.4	1712.1	1313.2	137.1	.P		0.0
40.00	107.0	153.4	1712.0	1312.4	137.1	.P		0.0
40.20	106.9	153.3	1712.0	1311.7	137.0	.P		0.0
40.40	106.8	153.3	1712.0	1310.9	137.0	.P		0.0
40.60	106.7	153.3	1712.0	1310.1	136.9	.P		0.0
40.80	106.6	153.3	1712.0	1309.3	136.9	.P		0.0
41.00	106.5	153.3	1712.0	1308.6	136.9	.P		0.0
41.20	106.4	153.3	1712.0	1307.8	136.8	.P		0.0
41.40	106.3	153.2	1712.0	1307.0	136.8	.P		0.0
41.60	106.2	153.2	1712.0	1306.2	136.8	.P		0.0
41.80	106.1	153.2	1712.0	1305.5	136.7	.P		0.0
42.00	106.0	153.2	1712.0	1304.7	136.7	.P		0.0
42.20	105.9	153.2	1712.0	1303.9	136.6	.P		0.0
42.40	105.8	153.1	1712.0	1303.1	136.6	.P		0.0
42.60	105.8	153.1	1712.0	1302.3	136.6	.P		0.0
42.80	105.7	153.1	1712.0	1301.6	136.5	.P		0.0
43.00	105.6	153.1	1712.0	1300.8	136.5	.P		0.0
43.20	105.5	153.1	1712.0	1300.0	136.4	.P		0.0
43.40	105.4	153.0	1712.0	1299.2	136.4	.P		0.0
43.60	105.3	153.0	1711.9	1298.4	136.3	.P		0.0
43.80	105.2	153.0	1711.9	1297.6	136.3	.P		0.0
44.00	105.1	153.0	1711.9	1296.8	136.2	.P		0.0
44.20	105.0	152.9	1711.9	1296.0	136.2	.P		0.0
44.40	104.9	152.9	1711.9	1295.2	136.2	.P		0.0
44.60	104.8	152.9	1711.9	1294.5	136.1	.P		0.0
44.80	104.7	152.9	1711.9	1293.7	136.1	.P		0.0
45.00	104.6	152.9	1711.9	1292.9	136.0	.P		0.0
45.20	104.5	152.8	1711.9	1292.1	136.0	.P		0.0
45.40	104.5	152.8	1711.9	1291.3	135.9	.P		0.0
45.60	104.4	152.8	1711.9	1290.5	135.9	.P		0.0
45.80	104.3	152.8	1711.9	1289.7	135.8	.P		0.0
46.00	104.2	152.7	1711.9	1288.9	135.8	.P		0.0
46.20	104.1	152.7	1711.9	1288.1	135.7	.P		0.0
46.40	104.0	152.7	1711.9	1287.3	135.7	.P		0.0
46.60	103.9	152.7	1711.9	1286.4	135.7	.P		0.0
46.80	103.8	152.7	1711.9	1285.6	135.6	.P		0.0
47.00	103.7	152.6	1711.8	1284.8	135.6	.P		0.0
47.20	103.6	152.6	1711.8	1284.0	135.5	.P		0.0
47.40	103.5	152.6	1711.8	1283.2	135.5	.P		0.0
47.60	103.4	152.6	1711.8	1282.4	135.4	.P		0.0
47.80	103.4	152.5	1711.8	1281.6	135.4	.P		0.0
48.00	103.3	152.5	1711.8	1280.8	135.3	.P		0.0
48.20	103.2	152.5	1711.8	1280.0	135.3	.P		0.0
48.40	103.1	152.5	1711.8	1279.1	135.2	.P		0.0
48.60	103.0	152.4	1711.8	1278.3	135.2	.P		0.0
48.80	102.9	152.4	1711.8	1277.5	135.2	.P		0.0
49.00	102.8	152.4	1711.8	1276.7	135.1	.P		0.0
49.20	102.7	152.4	1711.8	1275.9	135.1	.P		0.0
49.40	102.6	152.4	1711.8	1275.0	135.0	.P		0.0
49.60	102.5	152.3	1711.8	1274.2	135.0	.P		0.0
49.80	102.4	152.3	1711.8	1273.4	134.9	.P		0.0
50.00	102.3	152.3	1711.7	1272.6	134.9	.P		0.0
50.20	102.2	152.3	1711.7	1271.7	134.8	.P		0.0
50.40	102.1	152.2	1711.7	1270.9	134.8	.P		0.0
50.60	101.9	152.2	1711.7	1270.1	134.7	.P		0.0
50.80	101.8	152.2	1711.7	1269.3	134.7	.P		0.0
51.00	101.7	152.2	1711.7	1268.4	134.6	.P		0.0
51.20	101.5	152.1	1711.7	1267.6	134.6	.P		0.0
51.40	101.4	152.1	1711.7	1266.7	134.5	.P		0.0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		0.0

52.00	[redacted]	52.1	1711.7	1264.2	134.4	.P												0.0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]												0.0
52.40	[redacted]	152.0	1711.7	1262.5	134.3	.P												0.0
52.60	100.6	152.0	1711.7	1261.7	134.3	.P												0.0
52.80	100.5	152.0	1711.7	1260.8	134.2	.P												0.0
53.00	100.4	151.9	1711.7	1260.0	134.2	.P												0.0
53.20	100.3	151.9	1711.6	1259.1	134.1	.P												0.0
53.40	100.1	151.9	1711.6	1258.3	134.1	.P												0.0
53.60	100.0	151.9	1711.6	1257.4	134.0	.P												0.0
53.80	99.9	151.8	1711.6	1256.6	134.0	.P												0.0
54.00	99.7	151.8	1711.6	1255.7	133.9	.P												0.0
54.20	99.6	151.8	1711.6	1254.8	133.9	.P												0.0
54.40	99.5	151.8	1711.6	1254.0	133.8	.P												0.0
54.60	99.4	151.7	1711.6	1253.1	133.8	.P												0.0
54.80	99.2	151.7	1711.6	1252.2	133.7	.P												0.0
55.00	99.1	151.7	1711.6	1251.4	133.7	.P												0.0
55.20	99.0	151.7	1711.6	1250.5	133.6	.P												0.0
55.40	98.9	151.6	1711.6	1249.6	133.6	.P												0.0
55.60	98.7	151.6	1711.6	1248.8	133.5	.P												0.0
55.80	98.6	151.6	1711.6	1247.9	133.5	.P												0.0
56.00	98.5	151.6	1711.6	1247.0	133.4	.P												0.0
56.20	98.3	151.5	1711.5	1246.1	133.4	.P												0.0
56.40	98.2	151.5	1711.5	1245.3	133.3	.P												0.0
56.60	98.1	151.5	1711.5	1244.4	133.3	.P												0.0
56.80	98.0	151.5	1711.5	1243.5	133.2	.P												0.0
57.00	97.8	151.4	1711.5	1242.6	133.2	.P												0.0
57.20	97.7	151.4	1711.5	1241.7	133.1	.P												0.0
57.40	97.6	151.4	1711.5	1240.8	133.1	.P												0.0
57.60	97.5	151.4	1711.5	1239.9	133.0	.P												0.0
57.80	97.3	151.3	1711.5	1239.0	133.0	.P												0.0
58.00	97.2	151.3	1711.5	1238.2	132.9	.P												0.0
58.20	97.1	151.3	1711.5	1237.3	132.9	.P												0.0
58.40	97.0	151.3	1711.5	1236.4	132.8	.P												0.0
58.60	96.8	151.2	1711.5	1235.5	132.8	.P												0.0
58.80	96.7	151.2	1711.5	1234.6	132.7	.P												0.0
59.00	96.6	151.2	1711.4	1233.7	132.7	.P												0.0
59.20	96.5	151.2	1711.4	1232.8	132.6	.P												0.0
59.40	96.4	151.1	1711.4	1231.9	132.6	.P												0.0
59.60	96.2	151.1	1711.4	1230.9	132.5	.P												0.0
59.80	96.1	151.1	1711.4	1230.0	132.5	.P												0.0
60.00	0.0	151.0	1711.4	1228.3	132.4	.P												0.0
T	I	O	E	VOL	A	I	I	I	I	I	I	I	I	I	I	I	I	VEL
						0.	2000.	4000.	6000.	8000.	10000.	12000.	14000.					EXIT

********** NO INPUT DATA GIVEN FOR EMG. SPILLWAY CREST AND/OR EMG. BOTTOM WIDTH. NO ROUTINGS PERFORMED.

A CONT 2101 SCS54DAM 0001 0001 R0167 AZ-DAMS2 CC RJ167 3.53.32 PM 01 JUN 83 R167.PR1 SYS M303 CONT A

A CONT 2101 SCS54DAM 0001 0001 R0167 AZ-DAMS2 CC RJ167 3.53.32 PM 01 JUN 83 R167.PR1 SYS M303 CONT A

****

****

WCC SECURITY MESSAGE
UNDER THE PRIVACY ACT OF 1974, ALL DATA OF A PRIVACY NATURE MUST BE PROTECTED FROM UNAUTHORIZED DISCLOSURE. YOU ARE RESPONSIBLE FOR THE PRIVACY OF THIS DATA.

****

****

DAMS 2

(1)

Emergency Spillway &
Freeboard Dam Buildings
140' width.

SIGNAL BU[illegible]
DAM [illegible]
ESH + FLH
USED IN FINAL DESIGN

```
13.33.47 JOB 2101  $HASP373 SCS54DAM STARTED - INIT 10 - CLASS D - SYS M303
13.33.56 JOB 2101   **** 83152                PJ167  SCS54DAM  COST---$        .92 ****
13.33.56 JOB 2101  $HASP395 SCS54DAM ENDED

------ JES2 JOB STATISTICS ------

 01 JUN 83 JOB EXECUTION DATE

       204 CARDS READ

       896 SYSOUT PRINT RECORDS

         0 SYSOUT PUNCH RECORDS

      0.15 MINUTES EXECUTION TIME
```

2

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1     'SCS54DAM JOB (          ,RJ167),'AZ-DAMS2',TIME=(2,00),CLASS=D,        JOB 2101
      PR[redacted],MS[redacted]EL=[redacted]
      LOGONID  SCS54      $ACF1770 LOGONID SUCCESSFULLY SC[redacted]
      ***PASSWORD  $ACF1770 PASSWORD(S) SUCCESSFULLY SCANNED
      ***ROUTE  PRINT RMT167
2     //STEP1 EXEC SCSDAMS2
3     XXSCSDAMS2 PROC NAME='SCS03.MF.ALLPGM.LOAD',CORE=400K,PROC=DAMS2          00000020
      ***                                                                       00000030
      ***                          ( SCSDAMS2 )                                 00000040
      ***                                                                       00000050
      ***    PROC REVISION DATE   -  01/06/83                                   00000060
      ***    PROGRAM REVISION DATE  - 12/03/82  OR  DP21203                     00000070
      ***                                                                       00000080
      *** ************************************************************          00000090
      *** PROC CREATED BY       -   SOIL CONSERVATION SERVICE                   00000100
      ***                           SERVICE DOCUMENTATION CENTER (SDC)          00000110
      ***                           MANAGEMENT SERVICES,LANHAM,MD.              00000120
      ***                                                                       00000130
      ***      CONTACTS         -   RICHARD ROBERTS, CARMIE WEAVER              00000140
      ***                           FTS/COM  (202) 436-6676                     00000150
      *** ************************************************************          00000160
      ***                                                                       00000170
      ***       THESE ARE THE JCL'S FOR THE CURRENT OFFICIAL SDC                00000180
      ***      SCS VERSION OF THE STRUCTURE SITE ANALYSIS  (DAMS2)              00000190
      ***      COMPUTER PROGRAM.   AS VERSIONS OF THIS PROGRAM CHANGE           00000200
      ***      THIS PROC WILL REFLECT THE NEW VERSION.                          00000210
      ***                                                                       00000220
      ***      TO EXECUTE THIS PROC CREATE THE FOLLOWING JCL'S :                00000230
      ***                                                                       00000240
      ***      //STEP1  EXEC SCSDAMS2                                           00000250
      ***      //DAMS2.INPUT DD *                                               00000260
      ***            *************                                              00000270
      ***           *   DATA     *                                              00000280
      ***           *   HERE     *                                              00000290
      ***           **************                                              00000300
      ***      /*                                                               00000310
      ***      //                                                               00000320
      ***                                                                       00000330
      *** ************************************************************          00000340
      ***                                                                       00000350
4     XXDAMS2   EXEC PGM=&PROG,REGION=$CORE,TIME=10                             00000360
5     XXSTEPLIB DD DSN=&NAME,DISP=SHR                                           00000370
6     XXFT05F001 DD DSN=SCS03.MF.DAMS2.ESFILE.D821203.DATA,DISP=SHR,            00000380
      XX          LABEL=(,,,IN)                                                 00000381
7     XX          DD DDNAME=INPUT                                               00000390
8     XXFT06F001 DD SYSOUT=A                                                    00000400
9     XXFT07F001 DD SYSOUT=B                                                    00000410
10    XXFT03F001 DD UNIT=SYSDA,DISP=(NEW,DELETE),SPACE=(840,(200,100)),         00000420
      XX             DCB=(RECFM=FB,LRECL=84,BLKSIZE=840)                        00000430
11    XXFT04F001 DD UNIT=SYSDA,DISP=(NEW,DELETE),SPACE=(644,(50,1)),            00000440
      XX             DCB=(RECFM=VBS,LRECL=64,BLKSIZE=644)                       00000450
12    //DAMS2.INPUT DD *
      //
```

3

```
STMT NO. MESSAGE
    4       IEF653I SUBSTITUTION JCL - PGM=DAMS2,REGION=400K,TIME=
    5       IEF653I SUBSTITUTION JCL - DSN=SCS03.MF.ALLPGM.LOAD,DISP=SHR
IEF236I ALLOC. FOR SCS54DAM DAMS2 STEP1
IEF237I 1A8  ALLOCATED TO STEPLIB
IEF237I 132  ALLOCATED TO SYS01650
IEF237I 122  ALLOCATED TO FT05F001
IEF237I JES2 ALLOCATED TO
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I JES2 ALLOCATED TO FT07F001
IEF237I 124  ALLOCATED TO FT03F001
IEF237I 40C  ALLOCATED TO FT04F001
IEF142I SCS54DAM DAMS2 STEP1 - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SCS03.MF.ALLPGM.LOAD                          KEPT
IEF285I   VOL SER NOS= STOR05.
IEF285I   SYSCTLG.VSYSM02                               KEPT
IEF285I   VOL SER NOS= SYSM02.
IEF285I   SCS03.MF.DAMS2.FSFILE.D821203.DATA            KEPT
IEF285I   VOL SER NOS= STOR44.
IEF285I   JES2.JOB02101.S00101                          SYSIN
IEF285I   JES2.JOB02101.S00102                          SYSOUT
IEF285I   JES2.JOB02101.S00103                          SYSOUT
IEF285I   SYS83152.T133347.RA000.SCS54DAM.R0000001      DELETED
IEF285I   VOL SER NOS= WORK04.
IEF285I   SYS83152.T133347.RA000.SCS54DAM.R0000002      DELETED
IEF285I   VOL SER NOS= WORK03.
IEF373I STEP /DAMS2   / START 83152.1333
IEF374I STEP /DAMS2   / STOP  83152.1333 CPU    0MIN 01.45SEC SRB    0MIN 00.05SEC VIRT   312K SYS   264K
IEF375I  JOB /SCS54DAM/ START 83152.1333
IEF376I  JOB /SCS54DAM/ STOP  83152.1333 CPU    0MIN 01.45SEC SRB    0MIN 00.05SEC
****** $        .02  APPROXIMATE JOB COST -- RATES AS OF  OCT  1, 1982              **3033**
JOB LOG NUMBER -- 17304851 83152
```

4

5

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****************************** 80-80 LIST OF INPUT DATA ******  ******************

DAMS2      12/03/82  SIGNAL BUTTE FRS W/PM DIVERSION
COMMENT    THIS IS THE FINAL DESIGN HYDROLOGY FOR SIGNAL BUTTE FRS
COMMENT    WHICH INCLUDES APACHE JUNCTION FRS, BULLDOG DIVERSION, AND
COMMENT    PASS MOUNTAIN DIVERSION WITH OUTLET CHANNEL.
COMMENT    THE HYDROGRAPHS FROM THE DIVERSIONS INCLUDE FREEBOARD
COMMENT    DISCHARGE QUANTITIES.  SEDIMENT FROM PASS MOUNTAIN WILL
COMMENT    INCLUDE MOST FINE-GRAINED SEDIMENT, BUT NO COARSE-GRAINED
COMMENT    SEDIMENT.  THIS IS IN ADDITION TO THE WORK PLAN SEDIMENT
COMMENT    STORAGE REQUIREMENT.
COMMENT    THE 100-YR STORM SET THE EMERGENCY SPILLWAY CREST AT 1712.4.
CLPROFILE                        OLD CL DAM TO MERIDIAN RD THEN NORTH
           19076     1722.36   19108     1721.01   19208     1711.3
           19300     1717.6    19408     1719.08   19540     1717.9
           19570     1717.6    19650     1717.5    19700     1715.06
           19725     1716.7    19800     1715.94   20600     1704.05
           20650     1703.6    20700     1704.97   20750     1703.8
           20800     1704.09   20850     1702.4    21000     1701.25
           21070     1700.2    21070     1694.2    21100     1691.88
           21146.79  1693.95   21250     1694.1    21270     1691.1
           21300     1692.59   21320     1693.8    21350     1699.1
           21400     1698.72   21700     1694.85   21750     1695.8
           21875     1695.0    21925     1698.8    22000     1693.14
           22650     1693.8    22700     1692.42   22750     1691.4
           22760     1690.5    22772     1692.8    22795     1682.9
           22900     1686.7    22930     1691.0    22950     1691.2
           23000     1692.06   23050     1690.8    23070     1692.2
           23100     1691.3    23135     1686.6    23150     1689.5
           23170     1691.7    23190     1692.2    23200     1690.21
           23210     1687.9    23240     1697.8    23250     1686.3
           23255     1685.9    23400     1692.99   23550     1690.5
           23600     1691.7    23700     1690.4    23750     1691.7
           23800     1692.22   23900     1687.76   23910     1687.5
           23925     1684.1    23940     1686.3    23950     1686.5
           23980     1687.7    23995     1685.0    24000     1686.23
           24025     1689.3    24150     1687.5    24165     1685.8
           24175     1687.2    24200     1688.53   24232.27  1688.99
           24267     1686.79   24300     1689.44   24350     1698.9
           24390     1687.7    24400     1686.3    24700     1694.01
           24800     1693.69   25000     1698.36   25050     1695.8
           25100     1697.1    25150     1695.9    25200     1695.04
           25350     1700.6    25400     1703.16   26500     1720.00
           26550     1719.8    26600     1720.5    26650     1721.7
           26700     1722.4    26750     1723.3    26800     1723.5
ENDTABLE
STRUCTURE SBFRS      SIGNAL BUTTE FRS BUCKHORN-MESA WDP
                     1684      0.09      0.0       0.0       0.022
                     1688      1.36      6.4       0.0       2.94
                     1692      5.58      7.9       0.0       16.82
                     1696      20.96     9.2       0.0       69.9
```

********** 80-80 LIST OF INPUT DATA **********

(6)

		1701	54.5	10.5	0.0	265.	52
		1704	75.2	121.3	0.0	450.86	53
		1708	107.6	138.4	0.0	816.46	54
		1710	122.1	145.9	0.0	1046.16	55
		1712	136.7	153.2	0.0	1304.94	56
		1716	165.4	166.7	0.0	1909.1	57
		1720	192.5	179.5	0.0	2624.9	58
		1724	223.6	191.5	0.0	3457.1	59
							59
ENDTABLE							61
POOLDATA	ELEV	1684.	1684.	1700.75			61
ESCREST	ELEV	1712.4					70
STMWIDTH	FEET	140.					63
ESDATA	45	10	0.011	0	0.011	0.5	X
ESRATING	45	1.0	FUJIMOTO ENTRANCE BAFFLED APRON DROP				X
ESRATING	2.34	6.62	14.11	22.24	34.44	45.21	X
ESRATING	57.04	71.95	85.86	100.56	116.02	132.19	X
HYD	EMSPY		TR20 HYDROGRAPH, EM. SPY. STORM (24 HR)				X
		0.2					
		.00	.00	.00	.00	.00	
		.00	.00	.00	.00	.00	
		.00	.00	.00	.00	.00	
		.00	.00	.00	.00	.00	
		.00	.00	.00	.00	.25	
		4.54	18.64	45.98	88.62	144.69	
		212.22	304.06	435.98	587.09	769.08	
		960.55	1193.74	1478.19	1774.43	2150.09	
		2534.55	2972.28	3458.60	3919.47	4437.61	
		4915.95	5227.07	5377.27	5460.15	5476.27	
		5484.01	5395.20	5219.64	5062.48	4905.15	
		4768.57	4613.63	4393.13	4168.01	3973.13	
		3613.69	3350.73	3089.10	2882.43	2681.68	
		2524.54	2359.31	2185.07	2045.34	1920.59	
		1829.19	1730.76	1626.62	1539.77	1446.10	
		1374.23	1312.47	1260.31	1216.40	1152.37	
		1093.71	1027.24	955.71	909.02	917.42	
		944.03	941.57	908.55	879.18	878.11	
		889.22	846.35	757.69	696.04	676.69	
		694.24	712.52	723.97	722.41	683.17	
		638.73	618.71	623.05	636.94	665.98	
		693.18	686.41	649.93	618.61	616.71	
		626.46	610.09	568.52	541.98	581.11	
		636.84	640.76	595.28	558.87	590.80	
		640.85	589.76	446.57	315.50	229.10	
		178.84	151.93	136.66	127.74	122.47	
		119.39	117.57	116.50	115.87	115.50	
		115.09	114.35	113.91	113.74	113.62	
		113.52	113.42	113.32	113.22	113.12	
		113.02	112.92	112.82	112.72	112.62	
		112.52	112.42	112.32	112.22	112.12	

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***** ********** 80-80 LIST OF INPUT DATA ***** **********

112.02	111.93	111.83	111.73	111.63
111.53	111.43	111.33	111.24	111.14
111.04	110.94	110.84	110.75	110.65
110.55	110.45	110.35	110.26	110.16
110.06	109.96	109.87	109.77	109.67
109.58	109.48	109.38	109.29	109.19
109.09	109.00	108.90	108.80	108.71
108.61	108.52	108.42	108.33	108.23
108.13	108.04	107.94	107.85	107.75
107.66	107.56	107.47	107.37	107.28
107.18	107.09	106.99	106.90	106.80
106.71	106.62	106.52	106.43	106.33
106.24	106.15	106.05	105.96	105.86
105.77	105.68	105.58	105.49	105.40
105.31	105.21	105.12	105.03	104.93
104.84	104.75	104.66	104.56	104.47
104.38	104.29	104.19	104.10	104.01
103.92	103.83	103.73	103.64	103.55
103.46	103.37	103.28	103.19	103.10
103.00	102.91	102.82	102.73	102.64
102.55	102.45	102.34	102.21	102.08
101.95	101.82	101.69	101.56	101.43
101.30	101.17	101.04	100.92	100.79
100.66	100.53	100.40	100.27	100.14
100.02	99.89	99.76	99.63	99.50
99.38	99.25	99.12	99.00	98.87
98.74	98.62	98.49	98.37	98.24
98.11	97.99	97.86	97.74	97.61
97.49	97.36	97.24	97.11	96.99

```
ENDTABLE                                                    F1
GO,HYD     LP                                                X
HYD        FRBD
```

TP20 HYDROGRAPH,FREEBOARD STORM 24 HR

0.2				
.00	.00	.00	.00	.00
.00	.00	.00	.00	.00
.00	.00	.00	.00	.00
.09	1.86	11.03	31.51	73.21
141.36	229.17	329.87	440.68	600.22
789.45	1002.89	1243.36	1480.79	1731.18
1975.91	2351.73	2891.09	3439.44	4052.10
4618.41	5299.06	6113.99	6897.81	7892.59
8836.20	9874.15	11001.97	12010.96	13169.29
14099.83	14351.65	14310.78	14258.98	14112.70
13998.39	13623.95	13047.53	12591.06	12138.84
11795.39	11299.99	10654.56	10061.87	9288.61
8606.31	7937.99	7278.82	6762.57	6273.06
5888.56	5486.15	5055.91	4712.62	4416.67
4159.41	3965.84	3711.38	3499.87	3291.07
3103.51	2958.36	2836.33	2732.83	2577.73

********** 80-80 LIST OF INPUT DATA ********** [redacted]

(3)

2433.02	2272.50	2098.71	1987.63	2019.96
2097.83	2092.83	2003.73	1926.58	1928.60
1959.59	1854.82	1625.67	1443.97	1433.45
1491.85	1541.58	1568.13	1561.96	1461.23
1346.39	1299.44	1317.78	1357.26	1430.13
1497.95	1477.86	1390.03	1298.65	1298.52
1328.91	1289.01	1191.26	1113.68	1218.58
1366.79	1374.26	1249.27	1151.67	1238.37
1373.39	1243.78	871.29	539.50	339.16
235.93	192.14	152.44	135.92	126.72
121.62	118.78	117.17	116.24	115.69
115.37	115.17	115.07	115.00	115.00
115.00	115.00	115.00	115.00	114.77
114.09	113.77	113.65	113.55	113.45
113.35	113.25	113.15	113.05	112.95
112.85	112.75	112.65	112.55	112.45
112.35	112.25	112.15	112.05	111.95
111.86	111.76	111.66	111.56	111.46
111.36	111.26	111.17	111.07	110.97
110.87	110.77	110.68	110.58	110.48
110.38	110.29	110.19	110.09	109.99
109.90	109.80	109.70	109.61	109.51
109.41	109.32	109.22	109.12	109.03
108.93	108.83	108.74	108.64	108.55
108.45	108.35	108.26	108.16	108.07
107.97	107.88	107.78	107.69	107.59
107.50	107.40	107.31	107.21	107.12
107.02	106.93	106.83	106.74	106.64
106.55	106.46	106.36	106.27	106.17
106.08	105.99	105.89	105.80	105.71
105.61	105.52	105.43	105.33	105.24
105.15	105.05	104.96	104.87	104.78
104.68	104.59	104.50	104.41	104.31
104.22	104.13	104.04	103.95	103.85
103.76	103.67	103.58	103.49	103.40
103.30	103.21	103.12	103.03	102.94
102.85	102.76	102.67	102.58	102.48
102.38	102.25	102.12	101.99	101.86
101.73	101.60	101.47	101.34	101.21
101.08	100.95	100.82	100.70	100.57
100.44	100.31	100.18	100.05	99.93
99.80	99.67	99.54	99.42	99.29
99.16	99.03	98.91	98.78	98.65
98.53	98.40	98.28	98.15	98.03

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ENDTABLE
GO,HYD    LP
ENDJOB
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9

THIS IS THE FINAL DESIGN HYDROLOGY FOR SIGNAL BUTTE FRS WHICH INCLUDES APACHE JUNCTION FRS, BULLDOG DIVERSION, AND PASS MOUNTAIN DIVERSION WITH OUTLET CHANNEL.

THE HYDROGRAPHS FROM THE DIVERSIONS INCLUDE FREEBOARD DISCHARGE QUANTITIES. SEDIMENT FROM PASS MOUNTAIN WILL INCLUDE MOST FINE-GRAINED SEDIMENT, BUT NO COARSE-GRAINED SEDIMENT. THIS IS IN ADDITION TO THE WORK PLAN SEDIMENT STORAGE REQUIREMENT.

THE 100-YR STORM SET THE EMERGENCY SPILLWAY CREST AT 1712.4.

********** BASIC DATA **********

****NOT DEFINED CLIMATE AREA

DESIGN CLASS ****NOT DEFINED

STORM DISTRIBUTION.....TR20 HYDROGRAPH, EM. SPY. STORM (24 HR)

Q-PS1 DAY	Q-PS10 DAY	Q-ES	Q-FP	CN	DA-SM	TC/L	-/H
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONDUITS	COND L	D/W	-/H	PS N	KI	WEIR L	TW EL
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PERM POOL	CREST PS	FP SED	ORF	2ND STG	ORF H	ORF L	START ES
1684.00	1684.00	1700.75	0.0	0.0	0.0	0.0	0.0
BASEFLOW	INITIAL EL	EXTRA VOL.					
0.0	0.0	0.0					
ES1	ES2	ES3	ES4	ES5	Z ES	EXIT N	EXIT S
1712.40	0.0	0.0	0.0	0.0	0.0	0.011	0.500
ES TYPE	ES L	ES N	BW1	BW2	BW3	BW4	BW5
45	10	0.011	140.00	0.0	0.0	0.0	0.0

****NOTE THIS IS ONLY A PRELIMINARY EMG RATING CURVE OF DISCHARGE/FT OF WIDTH AND DOES NOT INCLUDE SIDESLOPE CORRECTION OR REVISED RATING USING ACTUAL EMG. CONFIGURATION.

ES CODE	INCREMENT			Q1	Q2	Q3	Q4
45	1.000			2.340	6.620	14.110	22.240
Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
34.440	45.210	57.040	71.960	85.860	100.560	116.020	132.190

PERM POOL	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
CREST PS	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
SED ACCUM	1700.75 FT	255.2 ACFT	52.82 AC	14.2 CFS
ES CREST	1712.40 FT	1365.3 ACFT	139.57 AC	154.5 CFS
PS STORAGE	1110.1 ACFT	BETWEEN ES CREST AND SED ACCUM ELEVATIONS		
STARTING E	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS

****

RATING TABLE DEVELOPED
WITH PS GIVEN AND ESRATING FOR EMG

RATING TABLE NUMBER 2

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	1684.00	0.0	0.0	0.02	0.09
2	1686.37	3.79	3.79	1.75	0.84
3	1688.73	6.67	6.67	5.48	2.13
4	1691.10	7.56	7.56	13.69	4.63
5	1693.47	8.38	8.38	36.27	11.22
6	1695.83	9.15	9.15	67.67	20.32
7	1698.20	9.77	9.77	155.69	35.71
8	1700.57	10.39	10.39	248.03	51.58
9	1702.93	81.84	81.84	384.67	67.83
10	1705.30	126.85	126.85	569.51	85.71
11	1707.66	136.97	136.97	785.80	104.88
12	1710.03	146.01	146.01	1050.17	122.33
13	1712.40	154.54	154.54	1364.97	139.55
14	1712.98	345.73	156.50	1452.59	143.71
15	1713.56	580.56	158.46	1540.20	147.88
16	1714.60	1300.50	161.98	1697.92	155.37
17	1715.88	2686.06	166.29	1890.70	164.53
18	1718.20	6199.80	173.74	2302.56	180.30
19	1721.10	11618.35	182.80	2853.62	201.05
20	1724.00	17792.80	191.50	3457.10	223.60

21
16
50

65A

TYPE	BW	EMAX	VOL-MAX	AMAX	HP	VOL-ES	Q-PS	Q-ES	Q-TOT	D/C	V/C	S/C	S/C.25	D-ES	DE/B
FLOOD HYD	140.0	1715.66	1857.8	163.0	3.26	492.8	165.6	2284.0	2449.6	2.02	8.07	0.001	0.002	27.2	10.7

PLOT 1 IN = 1000. CFS EXIT SLOPE = 0.500

T	I	O	E	VOL	A	0. I	1000. I	2000. I	3000. I	4000. I	5000. I	6000. I	7000. I	EXIT VEL
0.0	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.40	0.0	0.0	1684.0	0.0	0.1	.								0.0

3.00	[illegible]	0.0	1684.0	0.0	0.1	.	0.0
[illegible].20	[illegible]	[illegible]	16[illegible]	[illegible]	[illegible]	.	0.[illegible]
3.40	[illegible]	0.0	1684.0	0.0	0.1	.	0.0
3.60	[illegible]	0.0	1684.0	0.0	0.1	.	0.0
3.80	0.0	0.0	1684.0	0.0	0.1	.	0.0
4.00	0.0	0.0	1684.0	0.0	0.1	.	0.0
4.20	0.0	0.0	1684.0	0.0	0.1	.	0.0
4.40	0.0	0.0	1684.0	0.0	0.1	.	0.0
4.60	0.0	0.0	1684.0	0.0	0.1	.	0.0
4.80	0.3	0.3	1684.2	0.1	0.1	.	0.0
5.00	4.5	4.5	1687.7	2.7	1.3	.	0.0
5.20	18.6	14.2	1700.8	255.3	52.8	.	0.0
5.40	46.0	14.3	1700.8	255.6	52.9	.	0.0
5.60	88.6	14.8	1700.8	256.5	53.0	.I	0.0
5.80	144.7	15.7	1700.8	258.1	53.3	.I	0.0
6.00	212.2	17.1	1700.8	260.8	53.8	. I	0.0
6.20	304.1	19.1	1701.0	264.9	54.5	. I	0.0
6.40	436.0	22.2	1701.1	270.5	55.1	. I	0.0
6.60	597.1	26.4	1701.2	278.6	56.0	. I	0.0
6.80	769.1	32.0	1701.4	289.3	57.2	. I	0.0
7.00	960.5	39.1	1701.6	303.0	58.7	. I	0.0
7.20	1193.7	48.1	1701.5	320.1	60.6	. I	0.0
7.40	1478.2	59.2	1702.2	341.3	63.0	.P I	0.0
7.60	1774.4	72.7	1702.6	367.1	65.9	.P I	0.0
7.80	2150.1	85.1	1703.2	398.2	69.3	.P I	0.0
8.00	2534.5	94.2	1703.8	435.5	73.5	.P I	0.0
8.20	2972.3	104.9	1704.3	479.3	77.7	.P I	0.0
8.40	3458.6	117.4	1704.9	530.6	82.3	.P I	0.0
8.60	3919.5	127.8	1705.5	589.6	87.5	.P I	0.0
8.80	4437.6	130.9	1706.2	656.5	93.4	.P I	0.0
9.00	4915.9	134.4	1707.1	731.6	100.1	.P I	0.0
9.20	5227.1	137.9	1708.0	813.2	107.3	.P I	0.0
9.40	5377.3	140.8	1708.7	898.5	112.9	.P I	0.0
9.60	5460.1	143.8	1709.5	985.8	118.3	.P I	0.0
9.80	5476.3	146.7	1710.2	1073.7	123.7	.P I	0.0
10.00	5484.0	149.0	1710.9	1161.9	128.6	.P X	0.0
10.20	5395.2	151.4	1711.6	1249.3	133.6	. P I	0.0
10.40	5219.6	153.7	1712.2	1334.5	138.1	. P I	0.0
10.60	5062.5	265.9	1712.7	1416.0	142.0	. E I	14.02
10.80	4905.1	452.6	1713.2	1492.5	145.6	. E I	20.78
11.00	4788.6	685.4	1713.7	1563.2	149.0	. F I	26.20
11.20	4613.6	977.3	1714.1	1627.1	152.0	. E I	31.23
11.40	4383.1	1233.3	1714.5	1683.2	154.7	. E I	34.82
11.60	4168.0	1538.1	1714.9	1731.0	156.9	. F I	38.47
11.80	3873.1	1816.5	1715.1	1769.7	158.8	. E I	41.40
12.00	3613.7	2032.5	1715.3	1799.8	160.2	. E I	43.48
12.20	3350.7	2195.1	1715.4	1822.4	161.3	. E I	44.94
12.40	3089.1	2310.0	1715.5	1838.4	162.0	. E I	45.96
12.60	2882.4	2385.8	1715.6	1848.9	162.5	. E I	46.58
12.80	2681.7	2430.2	1715.6	1855.1	162.8	. E I	46.96
13.00	2524.5	2449.6	1715.7	1857.8	163.0	. XI	47.13
13.20	2359.3	2448.7	1715.7	1857.7	163.0	. E	47.11
13.40	2185.1	2428.9	1715.6	1854.9	162.8	. I E	46.95
13.60	2045.3	2393.8	1715.6	1850.0	162.6	. I E	46.67

13.40	1927	2347.7	1715.6	1843.6	162.3	.	46.27
[redacted]	001	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14.20	17[redacted]	236.8	1715.5	1828.2	161.6	.	45.32
14.40	1626.6	2174.3	1715.4	1819.5	161.1	.	44.76
14.60	1539.8	2106.0	1715.3	1810.3	160.7	.	44.17
14.80	1449.1	2039.1	1715.3	1800.7	160.2	.	43.54
15.00	1374.2	1968.7	1715.2	1790.9	159.8	.	42.90
15.20	1312.5	1898.6	1715.2	1781.1	159.3	.	42.23
15.40	1260.3	1829.9	1715.1	1771.6	158.9	.	41.53
15.60	1216.4	1763.6	1715.0	1762.3	158.4	.	40.88
15.80	1152.4	1698.6	1715.0	1753.3	158.0	.	40.20
16.00	1093.7	1634.1	1714.9	1744.3	157.6	.	39.52
16.20	1027.2	1569.8	1714.8	1735.4	157.1	.	38.82
16.40	955.7	1504.9	1714.8	1726.4	156.7	.	38.09
16.60	905.0	1440.7	1714.7	1717.4	156.3	.	37.37
16.80	917.4	1381.6	1714.7	1709.2	155.9	.	36.65
17.00	944.0	1331.0	1714.6	1702.2	155.6	.	36.04
17.20	941.6	1292.1	1714.6	1696.1	155.3	.	35.57
17.40	908.5	1265.4	1714.6	1690.2	155.0	.	35.23
17.60	879.2	1238.4	1714.5	1684.3	154.7	.	34.88
17.80	879.1	1212.2	1714.5	1678.6	154.4	.	34.54
18.00	888.2	1188.3	1714.4	1673.3	154.2	.	34.22
18.20	846.3	1164.9	1714.4	1668.2	154.0	.	33.91
18.40	757.7	1138.5	1714.4	1662.4	153.7	.	33.57
18.60	686.0	1108.2	1714.3	1655.8	153.4	.	33.16
18.80	676.7	1077.2	1714.3	1649.0	153.0	.	32.70
19.00	694.2	1049.7	1714.2	1642.8	152.7	.	32.30
19.20	712.5	1023.6	1714.2	1637.3	152.5	.	31.92
19.40	724.0	1001.4	1714.2	1632.4	152.3	.	31.59
19.60	722.4	981.2	1714.1	1628.0	152.0	.	31.30
19.80	683.2	960.9	1714.1	1623.5	151.9	.	31.00
20.00	638.7	939.1	1714.1	1618.8	151.6	.	30.65
20.20	618.7	916.6	1714.0	1613.8	151.4	.	30.29
20.40	623.0	895.1	1714.0	1609.1	151.1	.	29.97
20.60	639.9	875.8	1714.0	1604.9	150.9	.	29.63
20.80	666.0	859.5	1714.0	1601.3	150.8	.	29.35
21.00	693.2	846.4	1713.9	1598.4	150.6	.	29.14
21.20	686.4	835.0	1713.9	1595.9	150.5	.	28.96
21.40	649.9	822.9	1713.9	1593.3	150.4	.	28.77
21.60	618.6	809.2	1713.9	1590.3	150.3	.	28.52
21.80	616.7	795.2	1713.9	1587.2	150.1	.	28.26
22.00	626.5	782.6	1713.9	1584.5	150.0	.	28.05
22.20	610.1	770.7	1713.9	1581.9	149.9	.	27.81
22.40	565.5	757.5	1713.9	1579.0	149.7	.	27.60
22.60	542.0	742.8	1713.8	1575.7	149.6	.	27.31
22.80	581.1	729.6	1713.8	1572.9	149.4	.	27.05
23.00	636.8	720.8	1713.8	1570.9	149.3	.	26.92
23.20	640.8	714.9	1713.8	1569.6	149.3	.	26.78
23.40	555.3	707.8	1713.7	1568.1	149.2	.	26.66
23.60	558.9	698.3	1713.7	1566.0	149.1	.	26.47
23.80	590.8	689.3	1713.7	1564.0	149.0	.	26.27
24.00	640.8	684.0	1713.7	1562.9	149.0	.	26.16
24.20	589.8	679.0	1713.7	1561.8	148.9	.	26.07
24.40	446.6	667.3	1713.7	1559.2	148.8	.	25.87
24.60	315.5	646.5	1713.7	1554.6	148.6	.	25.43
24.80	225.1	619.2	1713.6	1548.7	148.3	.	24.85
25.00	179.8	589.0	1713.6	1542.1	148.0	.	24.21
25.20	151.9	567.2	1713.5	1535.2	147.6	.	23.70
25.40	136.7	548.9	1713.5	1528.4	147.3	.	23.26
25.60	127.7	530.8	1713.4	1521.7	147.0	.	22.82
25.80	122.5	513.3	1713.4	1515.1	146.7	.	22.39
26.00	119.4	496.3	1713.3	1508.7	146.4	.	21.97
26.20	117.6	479.9	1713.3	1502.6	146.1	.	21.53
26.40	116.5	464.2	1713.2	1496.9	145.8	.	21.12

13

27.00	[illegible]	[illegible]	420.8	1713.2	1480.6	145.0	.I	E
[redacted]								
27.40	[illegible]		394.8	1713.1	1470.5	144.6	.I	E
27.60	113.7	382.6	1713.1	1466.4	144.4	.I	E
27.80	113.6	371.0	1713.0	1462.0	144.2	.I	E
28.00	113.5	359.8	1713.0	1457.8	144.0	.I	E
28.20	113.4	349.1	1713.0	1453.9	143.8	.I	E
28.40	113.3	340.2	1713.0	1450.0	143.6	.I	E
28.60	113.2	332.1	1712.9	1446.3	143.4	.I	E
28.80	113.1	324.4	1712.9	1442.8	143.2	.I	E
29.00	113.0	316.9	1712.9	1439.4	143.1	.I	E
29.20	112.9	309.6	1712.8	1436.1	142.9	.I	E
29.40	112.8	302.7	1712.8	1432.9	142.8	.I	E
29.60	112.7	295.9	1712.8	1429.8	142.6	.I	E
29.80	112.6	289.5	1712.8	1426.8	142.5	.I	E
30.00	112.5	283.2	1712.8	1423.9	142.4	.I	E
30.20	112.4	277.1	1712.8	1421.2	142.2	.I	E
30.40	112.3	271.3	1712.8	1418.5	142.1	.I	E
30.60	112.2	265.7	1712.7	1415.9	142.0	.I	E
30.80	112.1	260.2	1712.7	1413.4	141.9	.I	E
31.00	112.0	255.0	1712.7	1411.0	141.7	.I	E
31.20	111.9	249.9	1712.7	1408.7	141.6	.IE	
31.40	111.8	245.0	1712.7	1406.4	141.5	.IE	
31.60	111.7	240.3	1712.7	1404.3	141.4	.IE	
31.80	111.6	235.7	1712.6	1402.2	141.3	.IE	
32.00	111.5	231.3	1712.6	1400.2	141.2	.IE	
32.20	111.4	227.1	1712.6	1398.2	141.1	.IE	
32.40	111.3	223.0	1712.6	1396.3	141.0	.IE	
32.60	111.2	219.0	1712.6	1394.5	141.0	.IE	
32.80	111.1	215.2	1712.6	1392.8	140.9	.IE	
33.00	111.0	211.5	1712.6	1391.1	140.8	.IE	
33.20	110.9	208.0	1712.6	1389.5	140.7	.IE	
33.40	110.8	204.5	1712.5	1387.9	140.6	.IE	
33.60	110.8	201.2	1712.5	1386.4	140.6	.IE	
33.80	110.6	198.0	1712.5	1384.9	140.5	.IE	
34.00	110.5	194.9	1712.5	1383.5	140.4	.IE	
34.20	110.4	191.9	1712.5	1382.1	140.4	.IE	
34.40	110.3	189.0	1712.5	1380.8	140.3	.IE	
34.60	110.3	186.2	1712.5	1379.5	140.2	.IE	
34.80	110.2	183.5	1712.5	1378.3	140.2	.IE	
35.00	110.1	180.9	1712.5	1377.1	140.1	.IE	
35.20	110.0	178.4	1712.5	1375.9	140.1	.IE	
35.40	109.9	176.0	1712.5	1374.8	140.0	.IE	
35.60	109.8	173.6	1712.5	1373.7	140.0	.IE	
35.80	109.7	171.4	1712.4	1372.7	139.9	.IE	
36.00	109.6	169.2	1712.4	1371.7	139.9	.IE	
36.20	109.5	167.1	1712.4	1370.7	139.8	.IE	
36.40	109.4	165.0	1712.4	1369.8	139.8	.IE	
36.60	109.3	163.1	1712.4	1368.9	139.7	.IE	
36.80	109.2	161.2	1712.4	1368.0	139.7	.IE	
37.00	109.1	159.3	1712.4	1367.2	139.7	.IE	
37.20	109.0	157.5	1712.4	1366.3	139.6	.IE	
37.40	108.9	155.8	1712.4	1365.6	139.6	.IE	
37.60	108.8	154.5	1712.4	1364.8	139.5	.IP	

20.27
19.89
[redacted]
19.10
18.65
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3.30
2.46
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14

T I C E VOL A I I I I I I I VEL

0. 1000. 2000. 3000. 4000. 5000. 6000. 7000. EXIT

15

16

********** BASIC DATA **********

****NOT DEFINED CLIMATE AREA DESIGN CLASS ****NOT DEFINED

STORM DISTRIBUTION.....TR20 HYDROGRAPH,FREEBOARD STORM 24 HR

Q-PS1 DAY	Q-PS10 DAY	Q-ES	Q-FB	CN	DA-SM	TC/L	-/H
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONDUITS	COND L	D/W	-/H	PS N	KI	WEIR L	TW EL
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PERM POOL	CREST PS	FB SED	ORF	2ND STG	ORF H	ORF L	START ES
1694.00	1694.00	1700.75	0.0	0.0	0.0	0.0	0.0
BASEFLOW	INITIAL EL	EXTRA VOL.					
0.0	0.0	0.0					
ES1	ES2	ES3	ES4	ES5	Z ES	EXIT N	EXIT S
1712.40	0.0	0.0	0.0	0.0	0.0	0.011	0.500
ES TYPE	ES L	ES N	BW1	BW2	BW3	BW4	BW5
45	10	0.011	140.00	0.0	0.0	0.0	0.0

****NOTE THIS IS ONLY A PRELIMINARY EMG RATING CURVE OF DISCHARGE/FT OF WIDTH AND DOES NOT INCLUDE SIDESLOPE CORRECTION OR REVISED RATING USING ACTUAL EMG. CONFIGURATION.

ES CODE	INCREMENT			Q1	Q2	Q3	Q4
45	1.000			2.340	6.620	14.110	22.240
Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
34.440	45.210	57.040	71.960	85.860	100.560	116.020	132.190

FRM POOL	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
CREST PS	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS
SED ACCUM	1700.75 FT	255.2 ACFT	52.82 AC	14.2 CFS
ES CREST	1712.40 FT	1365.3 ACFT	139.57 AC	154.5 CFS
PS STORAGE	1110.1 ACFT	BETWEEN ES CREST AND SED ACCUM ELEVATIONS		
STARTING E	1684.00 FT	0.0 ACFT	0.09 AC	0.0 CFS

****

RATING TABLE DEVELOPED
WITH PS GIVEN AND ESRATING FOR EMG

RATING TABLE NUMBER 2

	ELEV FEET	Q-TOTAL CFS	Q-PS CFS	VOLUME AC-FT	AREA ACRE
1	1684.00	0.0	0.0	0.02	0.09
2	1686.37	3.79	3.79	1.75	0.84
3	1688.73	6.67	6.67	5.48	2.13
4	1691.10	7.56	7.56	13.69	4.63
5	1693.47	8.38	8.38	36.27	11.22
6	1695.83	9.15	9.15	67.67	20.32
7	1698.20	9.77	9.77	155.69	35.71
8	1700.57	10.39	10.39	248.03	51.58
9	1702.93	91.84	91.84	394.67	67.83
10	1705.30	126.85	126.85	569.51	85.71
11	1707.66	136.97	136.97	785.80	104.88
12	1710.03	146.01	146.01	1050.17	122.33
13	1712.40	154.54	154.54	1364.97	139.55
14	1712.98	345.73	156.50	1452.59	143.71
15	1713.56	580.56	158.46	1540.20	147.88
16	1714.60	1300.50	161.98	1697.92	155.37
17	1715.88	2686.06	166.29	1890.70	164.53
18	1718.20	6199.80	173.74	2302.56	180.30
19	1721.10	11618.35	182.80	2853.62	201.05
20	1724.00	17792.80	191.50	3457.10	223.60

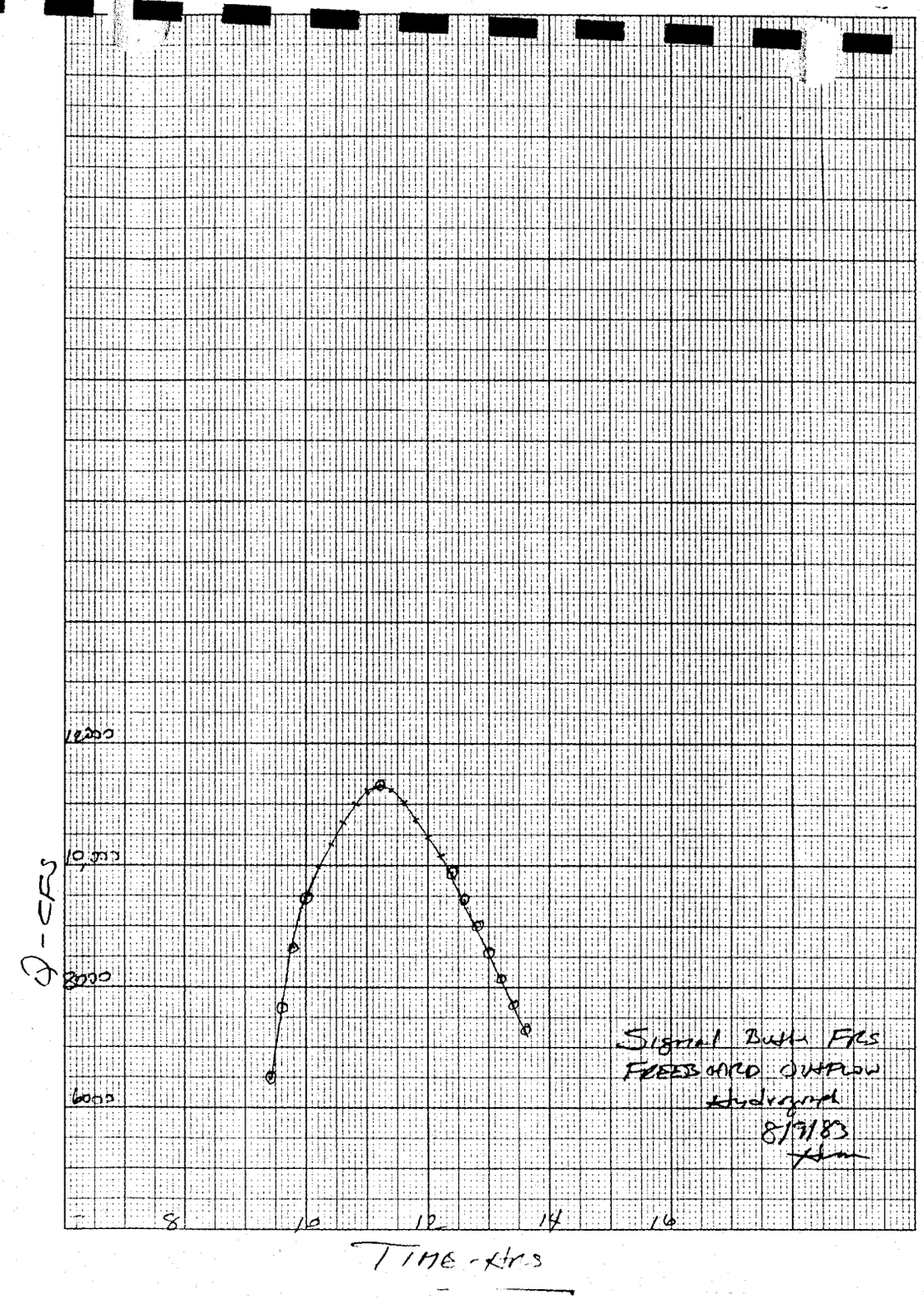
FBA

TYPE	BW	EMAX	VOL-MAX	AMAX	HP	VOL-ES	Q-PS	Q-ES	Q-TOT	D/C	V/C	S/C	S/C.25	D-ES	OE/B
FLOOD HYD	140.0	1720.95	2822.1	199.9	8.55	1457.2	182.3	11126.5	11308.8	5.81	13.67	0.001	0.001	31.4	44.2

PLOT 1 IN = 5000. CFS EXIT SLOPE = 0.500

T	I	O	E	VOL	A	0. I	5000. I	10000. I	15000. I	20000. I	25000. I	30000. I	35000. I	EXIT VEL
0.0	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
0.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.40	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.60	0.0	0.0	1684.0	0.0	0.1	.								0.0
1.80	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.00	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.20	0.0	0.0	1684.0	0.0	0.1	.								0.0
2.40	0.0	0.0	1684.0	0.0	0.1	.								0.0

3.00	[illegible].1	[illegible].1	1684.1	0.1	0.1	.
3[redacted]	1[redacted]	1.[redacted]	25.2[redacted]	0.[redacted]	0.5[redacted]	
3.40	11.[illegible]	[illegible].0	1700.6	249.3	51.9	.
3.60	31.5	14.2	1700.8	255.4	52.8	.
3.80	73.2	14.6	1700.8	256.0	53.0	.
4.00	141.4	15.4	1700.8	257.5	53.2	.
4.20	229.2	16.9	1700.9	260.3	53.7	.
4.40	329.9	19.1	1701.0	264.7	54.4	.I
4.60	440.7	22.2	1701.1	270.7	55.1	.I
4.80	600.2	26.5	1701.2	278.9	56.0	.I
5.00	789.4	32.3	1701.4	289.9	57.3	. I
5.20	1002.9	39.7	1701.6	304.1	58.9	. I
5.40	1243.4	49.0	1701.9	321.9	60.8	. I
5.60	1480.8	60.3	1702.3	343.5	63.2	. I
5.80	1731.2	73.6	1702.7	369.0	66.1	. I
6.00	1975.9	85.2	1703.2	398.3	69.3	. I
6.20	2351.7	93.5	1703.7	432.6	73.2	. I
6.40	2891.1	103.7	1704.3	474.3	77.3	. I
6.60	3439.4	115.0	1704.9	524.9	81.8	. I
6.80	4052.1	127.6	1705.5	584.7	87.1	. I
7.00	4618.4	130.9	1706.2	654.2	93.2	. I
7.20	5299.1	134.5	1707.1	734.0	100.3	. I
7.40	6114.0	138.3	1708.1	826.1	108.2	. I
7.60	6897.8	141.9	1709.0	931.3	114.8	. I
7.80	7892.6	146.0	1710.0	1051.1	122.4	.
8.00	8836.2	149.7	1711.1	1186.9	130.0	.
8.20	9874.1	153.8	1712.2	1339.1	138.3	.
8.40	******	489.6	1713.3	1506.3	146.3	.E
8.60	******	1229.0	1714.5	1692.3	154.6	. E
8.80	******	2464.2	1715.7	1859.8	163.1	. E
9.00	******	3896.9	1716.7	2032.6	170.1	. E
9.20	******	5257.5	1717.6	2192.1	176.1	. E
9.40	******	6488.4	1718.4	2331.9	181.4	. E
9.60	******	7660.3	1719.0	2451.1	185.9	.
9.80	******	8641.2	1719.6	2550.9	189.7	.
10.00	******	9454.3	1720.0	2633.5	192.8	.
10.20	**********		1720.4	2700.1	195.3	.
10.40	**********		1720.6	2749.4	197.2	.
10.60	**********		1720.8	2783.3	198.4	.
10.80	**********		1720.8	2805.2	199.2	.
11.00	**********		1720.9	2817.8	199.7	.
11.20	**********		1720.9	2822.1	199.9	.
11.40	**********		1720.9	2817.1	199.7	.
11.60	**********		1720.9	2803.3	199.2	.
11.80	9288.6	******	1720.9	2781.2	198.3	.
12.00	8606.3	******	1720.6	2751.2	197.2	.
12.20	7938.0	******	1720.4	2715.5	195.9	.
12.40	7278.8	9861.3	1720.2	2674.9	194.4	.
12.60	6762.6	9434.3	1720.0	2631.5	192.7	.
12.80	6273.1	8995.9	1719.8	2586.9	191.1	.
13.00	5888.6	8557.7	1719.5	2542.4	189.4	.
13.20	5486.1	8126.3	1719.3	2498.5	187.7	.
13.40	5055.9	7697.1	1719.0	2454.9	186.1	.
13.60	4712.6	7274.3	1718.8	2411.8	184.4	.



13.80443[illegible]	76867.0	1718.6	2370.4	182.9	. I E	72.43
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14.20[illegible]	6131.2	1718.2	2294.5	180.0	. I E	69.15
14.40373[illegible]	45829.2	1718.0	2259.1	178.7	. I E	67.72
14.603449	95536.3	1717.8	2224.8	177.4	. I E	66.30
14.803241	15253.6	1717.6	2191.7	176.1	. I E	64.88
15.003133	54982.1	1717.4	2159.8	174.9	. I E	63.49
15.202958	44725.1	1717.2	2129.7	173.8	. I E	62.10
15.402836	34484.3	1717.1	2101.5	172.7	. I E	60.77
15.602732	84260.4	1716.9	2075.2	171.7	. I E	59.48
15.802577	74049.0	1716.8	2050.5	170.8	. I E	58.25
16.002433	03845.6	1716.7	2026.6	169.8	. I E	57.00
16.202272	53649.0	1716.5	2003.6	169.0	. I E	55.77
16.402098	73456.2	1716.4	1981.0	168.1	. I E	54.50
16.601987	63270.1	1716.3	1958.2	167.3	. I E	53.27
16.802020	03183.3	1716.2	1939.6	166.6	. I E	52.10
17.002097	82965.7	1716.1	1923.5	165.9	. I E	51.10
17.202092	92851.1	1716.0	1910.0	165.4	. I E	50.27
17.402003	72745.3	1715.9	1897.6	164.9	. IE	49.46
17.601926	62649.0	1715.8	1885.5	164.3	. IE	48.72
17.801928	62568.1	1715.0	1874.3	163.7	. IE	48.09
18.001959	62498.1	1715.7	1864.6	163.3	. IE	47.51
18.201854	82431.9	1715.6	1855.3	162.8	. IE	46.97
18.401625	72354.3	1715.6	1844.5	162.3	. I E	46.32
18.601444	02262.4	1715.5	1831.9	161.7	. I E	45.53
18.801433	42170.1	1715.4	1818.9	161.1	. IE	44.74
19.001491	82090.7	1715.3	1807.9	160.6	. IE	44.02
19.201541	62026.4	1715.3	1798.9	160.2	. IE	43.42
19.401568	11973.5	1715.2	1791.6	159.8	. IE	42.94
19.601562	01927.7	1715.2	1785.2	159.5	. IE	42.50
19.801461	21881.0	1715.1	1778.7	159.2	. IE	42.04
20.001346	41827.5	1715.1	1771.2	158.9	. IE	41.52
20.201299	41770.9	1715.0	1763.4	158.5	. IE	40.95
20.401317	81719.1	1715.0	1756.2	158.1	. E	40.43
20.601357	31676.3	1714.9	1750.2	157.9	. E	39.96
20.801430	11644.6	1714.9	1745.8	157.6	. E	39.64
21.001497	91624.4	1714.9	1743.0	157.5	. E	39.43
21.201477	91609.1	1714.9	1740.8	157.4	. E	39.25
21.401390	01588.9	1714.9	1738.0	157.3	. E	39.04
21.601298	71560.9	1714.8	1734.1	157.1	. E	38.72
21.801298	51531.5	1714.8	1730.1	156.9	. E	38.41
22.001328	91507.0	1714.8	1726.7	156.7	. E	38.13
22.201289	01484.8	1714.8	1723.6	156.6	. E	37.86
22.401161	31456.9	1714.7	1719.7	156.4	. IE	37.54
22.601113	71422.1	1714.7	1714.8	156.2	. IE	37.14
22.801219	61393.4	1714.7	1710.8	156.0	. IE	36.82
23.001366	81382.1	1714.7	1709.3	155.9	. E	36.67
23.201374	31380.8	1714.7	1709.1	155.9	. E	36.66
23.401249	31373.1	1714.7	1708.0	155.8	. IE	36.58
23.601151	71353.7	1714.7	1705.3	155.7	. IE	36.34
23.801238	41335.9	1714.6	1702.8	155.6	. IE	36.12
24.001373	41332.6	1714.6	1702.4	155.6	. E	36.07
24.201243	81329.9	1714.6	1702.0	155.6	. IE	36.03
24.40 871	31299.7	1714.6	1697.8	155.4	. IE	35.65
24.60 530	51256.5	1714.5	1688.3	154.9	.I E	35.13
24.80 335	21197.0	1714.5	1675.3	154.3	.IE	34.36
25.00 235	91130.9	1714.4	1660.8	153.6	. E	33.46
25.20 182	11063.9	1714.3	1646.1	152.9	. E	32.52
25.40 152	4 998.7	1714.2	1631.8	152.2	. E	31.58
25.60 135	9 936.6	1714.1	1618.2	151.6	. E	30.60
25.80 126	7 878.0	1714.0	1605.4	151.0	. E	29.66
26.00 121	6 823.2	1713.9	1593.4	150.4	. E	28.74
26.20 118	8 772.1	1713.8	1582.2	149.9	. E	27.84
26.40 117	2 724.5	1713.8	1571.7	149.4	.E	26.97

27.00	115.4	601.2	1713.6	1544.7	148.1	.E
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
27.40	[illegible]	552.[illegible]	1713.5	1529.6	147.4	.E
27.60	115.0	533.1	1713.4	1522.5	147.0	.E
27.80	115.0	515.[illegible]	1713.4	1515.7	146.7	.E
28.00	115.0	497.6	1713.4	1509.3	146.4	.E
28.20	115.0	481.0	1713.3	1503.1	146.1	.E
28.40	115.0	465.2	1713.3	1497.1	145.8	.E
28.60	115.0	450.0	1713.2	1491.5	145.6	.E
28.80	114.8	435.5	1713.2	1486.1	145.3	.E
29.00	114.1	421.6	1713.2	1480.9	145.1	.E
29.20	113.8	408.2	1713.1	1475.9	144.8	.E
29.40	113.6	395.5	1713.1	1471.1	144.6	.E
29.60	113.5	383.2	1713.1	1466.6	144.4	.E
29.80	113.4	371.5	1713.0	1462.2	144.2	.E
30.00	113.3	360.4	1713.0	1458.0	144.0	.E
30.20	113.2	349.7	1713.0	1454.0	143.8	.E
30.40	113.1	340.6	1713.0	1450.2	143.6	.E
30.60	113.0	332.5	1712.9	1446.5	143.4	.E
30.80	112.9	324.7	1712.9	1443.0	143.3	.E
31.00	112.8	317.2	1712.9	1439.5	143.1	.E
31.20	112.7	310.0	1712.9	1436.2	142.9	.E
31.40	112.6	303.0	1712.8	1433.0	142.8	.E
31.60	112.5	296.2	1712.8	1429.9	142.6	.E
31.80	112.4	289.7	1712.8	1426.9	142.5	.E
32.00	112.3	283.4	1712.8	1424.0	142.4	.E
32.20	112.2	277.4	1712.8	1421.3	142.2	.E
32.40	112.1	271.5	1712.8	1418.6	142.1	.E
32.60	112.0	265.8	1712.7	1416.0	142.0	.E
32.80	111.9	260.4	1712.7	1413.5	141.9	.E
33.00	111.9	255.2	1712.7	1411.1	141.7	.E
33.20	111.8	250.1	1712.7	1408.8	141.6	.E
33.40	111.7	245.2	1712.7	1406.5	141.5	.
33.60	111.6	240.4	1712.7	1404.3	141.4	.
33.80	111.5	235.9	1712.6	1402.2	141.3	.
34.00	111.4	231.5	1712.6	1400.2	141.2	.
34.20	111.3	227.2	1712.6	1398.3	141.1	.
34.40	111.2	223.1	1712.6	1396.4	141.0	.
34.60	111.1	219.1	1712.6	1394.6	141.0	.
34.80	111.0	215.3	1712.6	1392.8	140.9	.
35.00	110.9	211.6	1712.6	1391.1	140.8	.
35.20	110.8	208.0	1712.6	1389.5	140.7	.
35.40	110.7	204.6	1712.5	1387.9	140.6	.
35.60	110.6	201.3	1712.5	1386.4	140.6	.
35.80	110.5	198.0	1712.5	1384.9	140.5	.
36.00	110.4	194.9	1712.5	1383.5	140.4	.
36.20	110.3	191.9	1712.5	1382.1	140.4	.
36.40	110.2	189.0	1712.5	1380.8	140.3	.
36.60	110.1	186.2	1712.5	1379.5	140.2	.
36.80	110.0	183.5	1712.5	1378.3	140.2	.
37.00	109.9	180.9	1712.5	1377.1	140.1	.
37.20	109.8	178.4	1712.5	1375.9	140.1	.
37.40	109.7	176.0	1712.5	1374.8	140.0	.
37.60	109.6	173.6	1712.5	1373.7	140.0	.

24.45
23.[redacted]
23.[redacted]
22.89
22.47
22.03
21.58
21.15
20.71
20.30
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19.50
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18.70
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17.96
17.57
17.23
16.93
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16.06
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9.37
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8.83
8.48
8.21
7.94
7.57
7.29
7.00

37.80	109.5	171.4	1712.4	1372.7	139.9	.	6.58
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
38.20	[redacted]	167.1	1712.4	1370.7	139.8	.	5.89
38.40	109.2	165.3	1712.4	1369.8	139.8	.	5.49
38.60	109.1	163.0	1712.4	1368.9	139.7	.	5.03
38.80	109.0	161.1	1712.4	1368.0	139.7	.	4.60
39.00	108.9	159.3	1712.4	1367.1	139.7	.	4.05
39.20	108.8	157.5	1712.4	1366.3	139.6	.	3.41
39.40	108.7	155.8	1712.4	1365.5	139.6	.	2.34
39.60	108.6	154.5	1712.4	1364.8	139.5	.	0.0
T	I	Q	E	VOL	A	I	VEL

I 0. I 5000. I 10000. I 15000. I 20000. I 25000. I 30000. I 35000. EXIT

[redacted]2... [redacted] 1 C[redacted]ETE[redacted]

SIGNAL BUTTE FRS W/PM DIVERSION

1 STRUCTURE(S) ANALYZED

2 HYDROGRAPHS ROUTED

0 TRIAL ROUTINGS

****

DAYS?.....DELETE

(DES/TR20.SLEP)

SCS-ENG.-264 DRAFT
REV. May 1982

TR-20
JOB & TITLE

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Buckhorn Creek Butte Hydrologist Hem Date 8/8/82 SHEET 1 OF 16

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
	HOLDOUT	ECON	FULLPRINT	PASS=XXX	SUMMARY	NOPLOTS	ENDPLOT
JOB TR-20			FULLPRINT		SUMMARY		
TITLE	BUCKHORN, MEA WS						1
TITLE	SIGNAL BUTTE, EMER. ACTION PLAN ANALYSIS						2A

JOB Record (required)

Columns 1-3	JOB
Columns 5-9	TR-20
Columns 11-17	HOLDOUT Use only if a hydrograph is desired.
Columns 21-24	ECON Use only if peak discharge output for ECON2/URB1 is desired. Locations for this output must be selected for inclusion in Summary Tables 1 and 3 also. Such designation can be made using summary option explained below (columns 51-57) or on Standard Control (column 71).
Columns 31-39	FULLPRINT — Gives all peak & vol output w/o Summary or Standard Control, but not Hydrographs Use only if FULLPRINT option is desired.
Columns 41-48	PASS=XXX Repeat pass loop Use only if PASS number, XXX, is greater than 1. XXX is an integer, right justified.
Columns 51-57	SUMMARY Use only if Summary Tables 1 and 3 are to include all Standard Control operations (except SAVMOV). Replace Summary Tables 1 and 3 with Standard Control
Columns 61-67	NOPLOTS Use if no cross section rating plots are desired. Blank = end cross plots ENDPLOT Use if only cross section rating plots are desired with no routings.
Columns 73-80	Optional user information, printed at top of input listing.

TITLE Records (one required, second is optional)

Columns 1-5	TITLE
Columns 7-9	XXX (first TITLE record only). An optional user file number, XXX, is an integer, right justified.
Columns 11-80	Both titles may be any characters desired.

Not for sum but rate and tot

ESP

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION NO. 001

Watershed: [illegible] Hydrologist: [illegible] Date: [illegible] SHEET 2 OF 16

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME	DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

		X SECTION I.D. (001-200)	Drainage Area, Sq. Mi.	Bankfull Elevation, Ft.		
2	XSECTN	001	1.0	1700.0		3

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

		Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8		1698.0	0.0	0.0		4
8		1698.9	500.	238.1		5
8		1699.4	1000.	400.1		6
8		1699.8	1500.	523.4		7
8		1700.1	2000.	647.1		8
8		1700.3	2500.	725.3		9
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9	ENDTBL	NOTE: This record must be the last record of this table.	10

ESP

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. 02

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed: Signal Butte Fr. Hydrologist: Hem Date: 7/8/82 SHEET 3 OF 16

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE / TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

		X SECTION ID. (001-200)	Drainage Area, Sq.Mi.	Bankfull Elevation, Ft.			
2	XSECTN	002	1.0	1660.0			11

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

	Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8	1656.0	0.0	0.0		12
8	1657.1	500.	342.8		13
8	1657.6	1000.	2907		14
8	1657.9	1500.	5015		15
8	1658.2	2000.	6[illegible]		16
8	1658.6	2500.	7[illegible]		17
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9	ENDTBL	NOTE: This record must be the last record of this table.	18

ESP

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. 2

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed [illegible] Hydrologist [illegible] Date [illegible] SHEET 4 OF 16

1-10		11-20		21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME			DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

		X SECTION I.D. (001-200)	Drainage Area, Sq. Mi.	Bankfull Elevation, Ft.		
2	XSECTN	[illegible]	1.0	1620.0		10

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

		Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8		1616.0	0.0	0.0		20
8		1617.7	500.	[illegible]		21
8		1618.2	1000.	511.0		22
8		1618.4	1500.	[illegible]		23
8		1618.6	2000.	781.5		24
8		1618.8	2500.	928.5		25
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9	ENDTBL	NOTE: This record must be the last record of this table.	26

TR-20

STREAM CROSS SECTION DATA

SCS-ENG.-270 DRAFT
REV. May 1982

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION NO. 4

Watershed [illegible] Hydrologist [illegible] Date [illegible] SHEET 5 OF 16

1-10		11-20		21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME			DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

			X SECTION ID. (001-200)	Drainage Area, Sq. Mi.	Bankfull Elevation, Ft.			
2	XSECTN		004	1.0	1580.0			27

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

			Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8			1578.0	0.0	0.0		28
8			1579.0	500.	[illegible]		29
8			1579.3	1000.	[illegible]		30
8			1579.6	1500.	[illegible]		31
8			1579.8	2000.	958.2		32
8			1580.0	2500.	1102.4		33
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9	ENDTBL		NOTE: This record must be the last record of this table.	34

SCS-ENG.-273A DRAFT
REV. May 1982

TR-20
STANDARD CONTROL FOR WATERSHED
CONTINUATION SHEET

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte Fr. Hydrologist Hem Date 8/8/82 SHEET 6 OF 10

CODE (1-10)	OPERATION (11-20)	XSEC (21-30)	STRUC (31-40)	HYD. NO. (41-50)	DATA FIELD NO. 1 (51-60)	DATA FIELD NO. 2 (61-70)	DATA FIELD NO. 3 (71-80)	OUTPUT OPTIONS	RECORD ID.
		(Right justify these fields)			IMPORTANT: Data Fields No 1, 2, and 3 require decimal points.				
6	REACH	3	0.01	6 7	900.			1 1 1 1	35
6	REACH	3	0.02	7 5	4100.			1 1 1 1	36
6	REACH	3	0.03	5 7	4600.			1 1 1 1	37
6	REACH	3	0.04	7 5	4100.			1 1 1 1	38
	ENDATA								39

SCS-ENG.-276 DRAFT
REV. May 1982

READ DISCHARGE HYDROGRAPH

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Emer. Spillway Hydrograph
From DAMS2 Routing

Watershed [illegible] Hydrologist [illegible] Date 2/8/82 SHEET 7 OF 16

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME	DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3	DATA FIELD NO. 4	DATA FIELD NO. 5		RECORD IDENT.
		IMPORTANT: Line out unused lines. Data fields require decimal points.						
		HYDROGRAPH NO.						
7	READHD	8						244
		STARTING TIME, HRS.	TIME INCREMENT, HRS.	DRAINAGE AREA, SQ. MI.	BASE FLOW, CFS			
7	READHD	9	4.6	0.20	10.62	—		40
		Enter successive entries left to right with first entry for time = 0. Fill last row of data with last entry of table.						
8			0.0	0.3	1.5	14.2	14.3	41
8			14.8	15.7	10.1	19.1	22.2	42
8			26.4	32.0	37.1	48.1	59.2	43
8			72.7	85.1	94.2	101.0	117.4	44
8			127.2	130.9	134.4	139.7	140.8	45
8			143.8	146.7	149.0	151.4	153.7	46
8			745.9	1152.6	645.4	[illegible]	1282.3	47
8			1536.1	1716.5	2032.5	2125.1	2310.0	48
8			2325.2	2430.2	2449.6	2464.7	2472.9	49
8			2293.2	2340.1	2[illegible].6	2[illegible].1	2178.3	50
8			2108.0	2039.1	1968.7	1898.6	1829.9	51
8			1763.6	1698.6	1634.1	1572.8	1504.9	52
8			1440.7	1381.6	1331.0	1292.1	1245.4	53
8			1238.4	1212.2	1188.3	1164.2	1138.5	54
8			1108.2	1077.2	1048.7	1023.6	1001.4	55
9	ENDTBL		NOTE: This record must be the last record of this table.					

TR - 20

SCS - ENG. - 276 DRAFT
REV. May 1982

READ DISCHARGE HYDROGRAPH

ESH (24 hr)

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte Hydrologist Hum Date 8/2/82 SHEET 8 OF 16

1-10			11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3	DATA FIELD NO. 4	DATA FIELD NO. 5		RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

HYDROGRAPH NO.

7	READHD	8							

			STARTING TIME, HRS.	TIME INCREMENT, HRS.	DRAINAGE AREA, SQ. MI.	BASE FLOW, CFS			
7	READHD	9							

Enter successive entries left to right with first entry for time = 0. Fill last row of data with last entry of table.

8			981.2	960.9	939.1	916.6	895.1		56
8			875.9	859.5	[illegible]	835.0	822.9		57
8			809.2	795.2	782.6	770.0	757.5		58
8			742.8	729.6	720.8	714.9	707.8		59
8			698.3	689.3	681.0	670.0	667.3		60
8			646.5	619.2	589.0	559.2	548.9		61
8			530.8	512.3	494.2	479.9	464.2		62
8			449.1	434.6	420.8	407.5	394.8		63
8			382.6	371.0	359.8	349.1	340.2		64
8			332.1	324.4	316.9	309.6	302.7		65
8			295.9	289.5	283.2	277.1	271.3		66
8			265.7	260.2	255.0	249.9	245.0		67
8			240.3	235.7	231.3	227.1	223.0		68
8			219.0	215.2	211.5	208.0	204.5		69
8			201.2	198.0	194.9	191.9	189.0		70

9	ENDTBL		NOTE: This record must be the last record of this table.						71

F-21

ESH

SCS-ENG.-274 DRAFT
REV. May 1982

TR-20
EXECUTIVE CONTROL FOR WATERSHED

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte FRS Hydrologist Hm Date 8/9/83 SHEET 9 OF 16

DATA CODE	OPERATION		DATA FIELD #1	DATA FIELD #2	DATA FIELD #3		RECORD IDENT.
7	LIST	This record is used for printout of tabular data and standard control list that are currently effective.					EXAMPLES DO NOT ENTER
7	BASFLØ	5	NEW BASE FLOW, CFS or VOLUME IN INCHES	IF VOLUME IS IN DATA FIELD No. 1. PEAK TIME, HOURS	BASE TIME, HOURS		
7	INCREM	6	MAIN TIME INCREMENT, HRS.	This increment is required for initial computations. Remains in force until new increment is entered.			
7	CØMPUT	7	STARTING TIME HOURS	RAINFALL DEPTH INCHES (Set depth and duration to LO for actual rainfall)	RAINFALL DURATION HOURS	RAIN TABLE NO. / AMC / ALTERNATE NO. / STROM NO.	
	ENDCMP	1	This record is required at "end" of a watershed, it may follow a series of COMPUT records				
	ENDJØB	2	This record terminates routing computation and precedes the PEAKS record, if any.				

Right justify these fields — IMPORTANT: Data Fields No. 1, 2, and 3 require decimal points.

			FROM (XSECT. OR STRUCT.)	THRU (XSECT. OR STRUCT.)								
7	LIST											72
7	INCREM	6			0.20							73
7	COMPUT	7	001	004	0.0	7.06	24.0	6	2	01	01	74
	ENDCMP	1										79

Insert Bas Hyd for ESH Here

F-3H

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. 001

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte Fr'c Hydrologist [illegible] Date 2/9/83 SHEET 10 OF 10

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE / TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

			X SECTION I.D. (001-200)	Drainage Area, Sq. Mi.	Bankfull Elevation, Ft.			
2	XSECTN		001	1.0	1702.0			76

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

			Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8			1698.0	0.0	0.0		77
8			1699.4	1000.	400.1		78
8			1700.1	2000.	672.1		79
8			1701.0	4000.	1091.3		80
8			1702.2	6000.	1857.9		81
8			1702.5	8000.	2326.1		82
8			1702.8	10000.	2660.5		83
8			1703.0	12000.	2958.4		84
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9	ENDTBL		NOTE: This record must be the last record of this table.	85

FBH

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. 002

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte FRS Hydrologist Hem Date 8/19/83 SHEET 11 OF 16

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME			DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3	RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

			X SECTION I.D. (001-200)	Drainage Area, Sq. Mi.	Bankfull Elevation, Ft.		
2	XSECTN		002	1.0	1660.0		84

(Use 1.0 unless discharge in CSM.)

NOTE: Maximum of 20 data records allowed.

		Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8		1656.0	0.0	0.0		87
8		1657.3	1000.	613.9		88
8		1657.8	2000.	1026.2		89
8		1658.4	4000.	1649.7		90
8		1658.9	6000.	2326.8		91
8		1659.4	8000.	3073.5		92
8		1659.7	10000.	[illegible]		93
8		1660.1	12000.	4318.5		94
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9	ENDTBL	NOTE: This record must be the last record of this table. 95

F-B4

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. 003

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Signal Butte FRS Hydrologist [illegible] Date 7/19/83 SHEET 12 OF 16

1-10		11-20		21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME			DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.
		X SECTION I.D. (001-200)		IMPORTANT: Line out unused lines. Data fields require decimal points. Drainage Area, Sq.Mi.	Bankfull Elevation, Ft.				
2	XSECTN	003		1.0	1620.0				96
				(Use 1.0 unless discharge in CSM.)					
				NOTE: Maximum of 20 data records allowed.					
				Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.			
8				1616.0	0.0	0.0			97
8				1617.2	1000.	786.7			98
8				1617.6	2000.	1236.5			99
8				1618.0	4000.	2501.9			100
8				1618.5	6000.	3904.5			101
8				1618.7	8000.	3613.7			102
8				1619.0	10000.	4371.2			103
8				1619.1	12000.	4951.3			104
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9	ENDTBL			NOTE: This record must be the last record of this table.					105

FBH

TR-20

STREAM CROSS SECTION DATA

CROSS SECTION NO. 004

SCS-ENG.-270 DRAFT
REV. May 1982

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Tujunga Basin 7 & 2 Hydrologist [illegible] Date [illegible] SHEET 13 OF 16

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.
		X SECTION I.D. (001-200)	IMPORTANT: Line out unused lines. Data fields require decimal points. Drainage Area, Sq.Mi.	Bankfull Elevation, Ft.				
2	XSECTN	004	1.0	1580.0				10
			(Use 1.0 unless discharge in CSM.)					
			NOTE: Maximum of 20 data records allowed.					
			Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.			
8			1578.0	0.0	0.0			102
8			1578.9	1000.	2243			108
8			1579.3	2000.	1451.1			109
8			1579.7	4000.	2457.8			110
8			1580.0	6000	3411.8			111
8			1580.2	8000.	4474.3			112
8			1580.4	10000	5255.4			113
8			1580.6	12000.	6076.2			114
8								
8								
8								
8								
8								
8								
8								
9	ENDTBL		NOTE: This record must be the last record of this table.					115

F-20

SCS-ENG.-276 DRAFT
REV. May 1982

READ DISCHARGE HYDROGRAPH

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Second Butte Fork Hydrologist [illegible] Date 8/9/82 SHEET 14 OF 16

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME	DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3	DATA FIELD NO. 4	DATA FIELD NO. 5		RECORD IDENT.
		IMPORTANT: Line out unused lines. Data fields require decimal points.						
		HYDROGRAPH NO.						
7	READHD	6						116
		STARTING TIME, HRS.	TIME INCREMENT, HRS.	DRAINAGE AREA, SQ. MI.	BASE FLOW, CFS			
7	READHD	2.8	0.20	10.62	—			116A
		Enter successive entries left to right with first entry for time = 0. Fill last row of data with last entry of table.						
8		0.0	0.1	1.9	11.0	14.2		117
8		14.6	15.4	16.8	19.1	22.2		118
8		26.5	32.3	39.7	49.0	60.3		119
8		73.6	85.2	98.5	103.7	116.0		120
8		127.6	130.8	134.5	137.3	141.9		121
8		146.0	149.7	153.8	487.1	1229.0		122
8		2464.2	3896.9	5257.5	6488.4	7660.3		123
8		8641.2	9454.3	10000.0	10550.	10700.		124
8		11000.0	11200.0	11308.8	11230.0	11020.0		125
8		10750.0	10470.0	10150.0	9863.3	9454.3		126
8		8995.9	8557.7	8126.3	7692.1	7274.3		127
8		6867.0	6482.3	6131.2	5739.2	5536.3		128
8		5253.6	4982.1	4725.1	4484.3	4260.4		129
8		4049.0	3845.6	3649.0	3456.2	3270.2		130
8		3103.3	2965.7	2851.1	2745.3	2649.0		131
9	ENDTBL	NOTE: This record must be the last record of this table.						

TR - 20

SCS - ENG. - 276 DRAFT
REV. May 1982

READ DISCHARGE HYDROGRAPH

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Second Butte Fk. Hydrologist Hum Date 8/7/17 SHEET 15 OF 16

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME	DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3	DATA FIELD NO. 4	DATA FIELD NO. 5		RECORD IDENT.

IMPORTANT: Line out unused lines. Data fields require decimal points.

HYDROGRAPH NO.

7	READHD	8					

			STARTING TIME, HRS.	TIME INCREMENT, HRS.	DRAINAGE AREA, SQ. MI.	BASE FLOW, CFS	
7	READHD	9					

Enter successive entries left to right with first entry for time = 0. Fill last row of data with last entry of table.

8			2568.1	2498.1	2431.9	2354.3	2262.4	13
8			2170.1	2090.7	2026.4	1973.5	1927.7	13
8			1881.0	1827.5	1770.9	1719.0	1676.3	13
8			1644.6	1624.4	1609.1	1586.9	1560.9	13
8			1531.5	1509.0	1484.8	1456.8	1422.1	13
8			1393.4	1382.1	1380.8	1373.1	1353.7	13
8			1335.9	1332.6	1329.9	1299.7	1251.5	13
8			1197.0	1130.9	1063.9	998.7	936.6	13
8			878.0	823.2	772.1	724.5	680.3	13
8			639.3	601.2	571.8	552.0	533.1	13
8			515.0	497.6	481.0	465.2	450.0	13
8			435.5	421.6	408.2	395.5	383.2	13
8			371.5	360.4	349.7	340.6	332.5	13
8			324.7	317.2	310.0	303.0	296.2	13
8			289.7	283.4	277.4	271.5	265.9	13

9	ENDTBL		NOTE: This record must be the last record of this table.	

FBH

SCS-ENG.-274 DRAFT
REV. May 1982

TR-20
EXECUTIVE CONTROL FOR WATERSHED

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed Seymour Branch FY3 Hydrologist [illegible] Date 7/19/83 SHEET 16 OF 16

DATA CODE	OPERATION		DATA FIELD #1	DATA FIELD #2	DATA FIELD #3		RECORD IDENT.
7	LIST	This record is used for printout of tabular data and standard control list that are currently effective					
7	BASFLO 5		NEW BASE FLOW, CFS or VOLUME IN INCHES	IF VOLUME IS IN DATA FIELD No. 1. PEAK TIME, HOURS	BASE TIME, HOURS		
7	INCREM 6		MAIN TIME INCREMENT, HRS.	This increment is required for initial computations. Remains in force until new increment is entered.			

EXAMPLES DO NOT ENTER

		FROM (OR XSECT. / STRUCT.)	THRU (OR XSECT. / STRUCT.)	STARTING TIME HOURS	RAINFALL DEPTH INCHES (Set depth and duration to 1.0 for actual rainfall)	RAINFALL DURATION HOURS	RAIN TABLE NO.	AMC	ALTERNATE NO.	STROM NO.	EXAMPLES DO NOT ENTER
7 COMPUT 7											
ENDCMP 1	This record is required at "end" of a watershed, it may follow a series of COMPUT records										
ENDJOB 2	This record terminates routing computation and precedes the PEAKS record, if any.										

Right justify these fields | IMPORTANT: Data Fields No. 1, 2, and 3 require decimal points.

7 LIST											149
7 INCREM 6				0.20							149
7 COMPUT 7	001	004	0.0	15.0	24.0	6	2	01	02		150
ENDCMP 1											151
ENDJOB 2											152

INSERT FBH RERO-DISC. HYY HOW

F-17

```
*****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

JOB TR-20                          FULLPRINT          SUMMARY                    1
TITLE     BUCKHORN MESA WATERSHED                                          2
TITLE     SIGNAL BUTTE FRS,EMER. ACTION PLAN ANALYSIS                       2A
 2 XSECTN   001          1.0          1702.0                                  3
 8                       1698.        0.0          0.0                        4
 8                       1698.9       500.         238.1                      5
 8                       1699.4       1000.        400.1                      6
 8                       1699.8       1500.        523.4                      7
 8                       1700.1       2000.        647.1                      8
 8                       1700.3       2500.        725.3                      9
 9 ENDTBL                                                                     10
 2 XSECTN   002          1.0          1660.                                   11
 8                       1656.0       0.0          0.0                        12
 8                       1657.1       500.         247.8                      13
 8                       1657.6       1000.        390.9                      14
 8                       1657.9       1500.        501.5                      15
 8                       1658.2       2000.        607.7                      16
 8                       1658.6       2500.        715.4                      17
 9 ENDTBL                                                                     18
 2 XSECTN   003          1.0          1620.0                                  19
 8                       1616.        0.0          0.0                        20
 8                       1617.7       500.         289.7                      21
 8                       1618.2       1000.        541.0                      22
 8                       1618.4       1500.        722.6                      23
 8                       1618.6       2000.        884.5                      24
 8                       1618.8       2500.        998.5                      25
 9 ENDTBL                                                                     26
 2 XSECTN   004          1.0          1580.0                                  27
 8                       1578.0       0.0          0.0                        28
 8                       1579.0       500.         366.                       29
 8                       1579.3       1000.        586.                       30
 8                       1579.6       1500.        769.9                      31
 8                       1579.8       2000.        952.5                      32
 8                       1580.0       2500.        1102.4                     33
 9 ENDTBL                                                                     34
 6 REACH  3 001   6   7 900.                                 1 1   1   1      35
 6 REACH  3 002   7   5 4100.                                1 1   1   1      36
 6 REACH  3 003   5   7 4600.                                1 1   1   1      37
 6 REACH  3 004   7   5 4100.                                1 1   1   1      38
   ENDATA                                                                     39
 7 READHD 8     6                                                            39A
 7 READHD 9 4.60         0.20         10.62                                   40
 8          0.0          0.3          4.5          14.2         14.3          41
 8          14.8         15.7         17.1         19.1         22.2          42
 8          26.4         32.0         39.1         48.1         59.2          43
 8          72.7         85.1         94.2         104.9        117.4         44
```

1

SIGNAL BUTTE FRS
TR-20

ESH + FBH
DOWNSTREAM FLOOD ROUTING

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 8          127.8       130.9       134.4       137.9       140.8              45
 8          143.8       146.7       149.0       151.4       153.7              46
 8          265.9       452.6       685.4       977.3       1233.3             47
 8          1538.1      1816.5      2032.5      2195.1      2310.0             48
 8          2385.8      2430.2      2449.6      2448.7      2428.9             49
 8          2393.8      2347.7      2294.6      2236.8      2174.3             50
 8          2108.0      2039.1      1968.7      1898.6      1829.9             51
 8          1763.6      1698.6      1634.1      1569.8      1504.9             52
 8          1440.7      1381.6      1331.0      1292.1      1265.4             53
 8          1238.4      1212.2      1188.3      1164.2      1138.5             54
 8          1108.2      1077.2      1048.7      1023.6      1001.4             55
 8          981.2       960.9       939.1       916.6       895.1              56
 8          875.8       859.5       846.4       835.0       822.9              57
 8          809.2       795.2       782.6       770.7       757.5              58
 8          742.8       729.6       720.8       714.9       707.8              59
 8          698.3       689.3       684.0       679.0       667.3              60
 8          646.5       619.2       589.0       567.2       548.9              61
 8          530.8       513.3       496.3       479.9       464.2              62
 8          449.1       434.6       420.8       407.5       394.8              63
 8          382.6       371.0       359.8       349.1       340.2              64
 8          332.1       324.4       316.9       309.6       302.7              65
 8          295.9       289.5       283.2       277.1       271.3              66
 8          265.7       260.2       255.0       249.9       245.0              67
 8          240.3       235.7       231.3       227.1       223.0              68
 8          219.0       215.2       211.5       208.0       204.5              69
 8          201.2       198.0       194.9       191.9       189.0              70
 9 ENDTBL                                                                      71
 7 LIST                                                                        72
 7 INCREM 6             0.20                                                   73
 7 COMPUT 7 001    004  0.0         7.06        24.         6 2  01  01       74
   ENDCMP 1                                                                    75
 2 XSECTN   001         1.0         1702.0                                     76
 8                      1698.0      0.0         0.0                            77
 8                      1699.4      1000.       400.1                          78
 8                      1700.1      2000.       647.1                          79
 8                      1701.0      4000.       1091.3                         80
 8                      1702.2      6000.       1857.9                         81
 8                      1702.5      8000.       2326.1                         82
 8                      1702.8      10000.      2660.5                         83
 8                      1703.0      12000.      2958.4                         84
 9 ENDTBL                                                                      85
 2 XSECTN   002         1.0         1660.0                                     86
 8                      1656.0      0.0         0.0                            87
 8                      1657.3      1000.       613.9                          88
 8                      1657.8      2000.       1026.2                         89
 8                      1658.4      4000.       1649.7                         90
```

2

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**********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

 8                      1658.9      6000.       2326.8                        91
 8                      1659.4      8000.       3073.5                        92
 8                      1659.7      10000.      3663.8                        93
 8                      1660.1      12000.      4318.5                        94
 9 ENDTBL                                                                     95
 2 XSECTN    003        1.0         1620.0                                    96
 8                      1616.0      0.0         0.0                           97
 8                      1617.2      1000.       786.7                         98
 8                      1617.6      2000.       1236.5                        99
 8                      1618.0      4000.       2001.9                       100
 8                      1618.5      6000.       3004.5                       101
 8                      1618.7      8000.       3613.7                       102
 8                      1619.0      10000.      4381.2                       103
 8                      1619.1      12000.      4951.3                       104
 9 ENDTBL                                                                    105
 2 XSECTN    004        1.0         1580.0                                   106
 8                      1578.0      0.0         0.0                          107
 8                      1578.9      1000.       824.3                        108
 8                      1579.3      2000.       1451.2                       109
 8                      1579.7      4000.       2437.8                       110
 8                      1580.0      6000.       3341.8                       111
 8                      1580.2      8000.       4474.3                       112
 8                      1580.4      10000.      5355.8                       113
 8                      1580.6      12000.      6096.3                       114
 9 ENDTBL                                                                    115
 7 READHD 8      6                                                           116
 7 READHD 9 2.80        0.20        10.62                                   116A
 8          0.0         0.1         1.9         11.0        14.2            117
 8          14.6        15.4        16.8        19.1        22.2            118
 8          26.5        32.3        39.7        49.0        60.3            119
 8          73.6        85.2        93.5        103.7       116.0           120
 8          127.6       130.8       134.5       138.3       141.9           121
 8          146.0       149.7       153.8       489.6       1229.0          122
 8          2464.2      3896.9      5257.5      6488.4      7660.3          123
 8          8641.2      9454.3      10000.0     10350.0     10700.0         124
 8          11000.0     11200.0     11308.8     11230.0     11020.0         125
 8          10750.0     10470.0     10150.0     9861.3      9434.3          126
 8          8995.9      8557.7      8126.3      7697.1      7274.3          127
 8          6867.0      6482.3      6131.2      5829.2      5536.3          128
 8          5253.6      4982.1      4725.1      4484.3      4260.4          129
 8          4049.0      3845.6      3649.0      3456.2      3270.2          130
 8          3103.3      2965.7      2851.1      2745.3      2649.0          131
 8          2568.1      2498.1      2431.9      2354.3      2262.4          132
 8          2170.1      2090.7      2026.4      1973.5      1927.7          133
 8          1881.0      1827.5      1770.9      1719.0      1676.3          134
 8          1644.6      1624.4      1609.1      1588.9      1560.9          135
```

```
**********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 8          1531.5      1507.0      1484.8      1456.8      1422.1          136
 8          1393.4      1382.1      1380.8      1373.1      1353.7          137
 8          1335.9      1332.6      1329.9      1299.7      1256.5          138
 8          1197.0      1130.9      1063.9      998.7       936.6           139
 8          878.0       823.2       772.1       724.5       680.3           140
 8          639.3       601.2       571.8       552.0       533.1           141
 8          515.0       497.6       481.0       465.2       450.0           142
 8          435.5       421.6       408.2       395.5       383.2           143
 8          371.5       360.4       349.7       340.6       332.5           144
 8          324.7       317.2       310.0       303.0       296.2           145
 8          289.7       283.4       277.4       271.5       265.9           145
 9 ENDTBL                                                                   147
 7 LIST                                                                     148
 7 INCREM 6             0.20                                                149
 7 COMPUT 7 001   004   0.0         15.80       24.0        6 2  01  02     150
   ENDCMP 1                                                                 151
   ENDJOB 2                                                                 152

*******************************END OF 80-80 LIST*******************************
```

4

5

COMPUTER PROGRAM FOR PROJECT FORMULATION - HYDROLOGY USER NOTES

THE USERS MANUAL FOR THIS PROGRAM IS THE MAY 1982 DRAFT OF TR-20. CHANGES FROM THE 2/14/74 VERSION INCLUDE:

REACH ROUTING - THE MODIFIED ATT-KIN ROUTING PROCEDURE REPLACES THE CONVEX METHOD. INPUT DATA PREPARED FOR PREVIOUS PROGRAM VERSIONS USING CONVEX ROUTING COEFFICIENTS WILL NOT RUN ON THIS VERSION.

THE PREFERRED TYPE OF DATA ENTRY IS CROSS SECTION DATA REPRESENTATIVE OF A REACH. IT IS RECOMMENDED THAT THE OPTIONAL CROSS SECTION DISCHARGE-AREA PLOTS BE OBTAINED WHENEVER NEW CROSS SECTION DATA IS ENTERED. THE PLOTS SHOULD BE CHECKED FOR REASONABLENESS AND ADEQUACY OF INPUT DATA FOR THE COMPUTATION OF "M" VALUES USED IN THE ROUTING PROCEDURE.

GUIDELINES FOR DETERMINING OR ANALYZING REACH LENGTHS AND COEFFICIENTS (X,M) ARE AVAILABLE IN THE USERS MANUAL. SUMMARY TABLE 2 DISPLAYS REACH ROUTING RESULTS AND ROUTING PARAMETERS FOR COMPARISON AND CHECKING.

HYDROGRAPH GENERATION - THE PROCEDURE TO CALCULATE THE INTERNAL TIME INCREMENT AND PEAK TIME OF THE UNIT HYDROGRAPH HAVE BEEN IMPROVED. PEAK DISCHARGES AND TIMES MAY DIFFER FROM THE PREVIOUS VERSION. OUTPUT HYDROGRAPHS ARE STILL INTERPOLATED, PRINTED, AND ROUTED AT THE USER SELECTED MAIN TIME INCREMENT.

INTERMEDIATE PEAKS - METHOD ADDED TO PROVIDE DISCHARGES AT INTERMEDIATE POINTS WITHIN REACHES WITHOUT ROUTING.

OTHER - THIS VERSION CONTAINS SOME ADDITIONS TO THE INPUT AND NUMEROUS MODIFICATIONS TO THE OUTPUT. USER OPTIONS HAVE BEEN MODIFIED AND AUGMENTED ON THE JOB RECORD, RAINTABLES ADDED, ERROR AND WARNING MESSAGES EXPANDED, AND THE SUMMARY TABLES COMPLETELY REVISED. THE HOLDOUT OPTION IS NOT OPERATIONAL AT THIS TIME.

PROGRAM QUESTIONS OR PROBLEMS SHOULD BE DIRECTED TO HYDRAULIC ENGINEERS AT THE SCS NATIONAL TECHNICAL CENTERS:

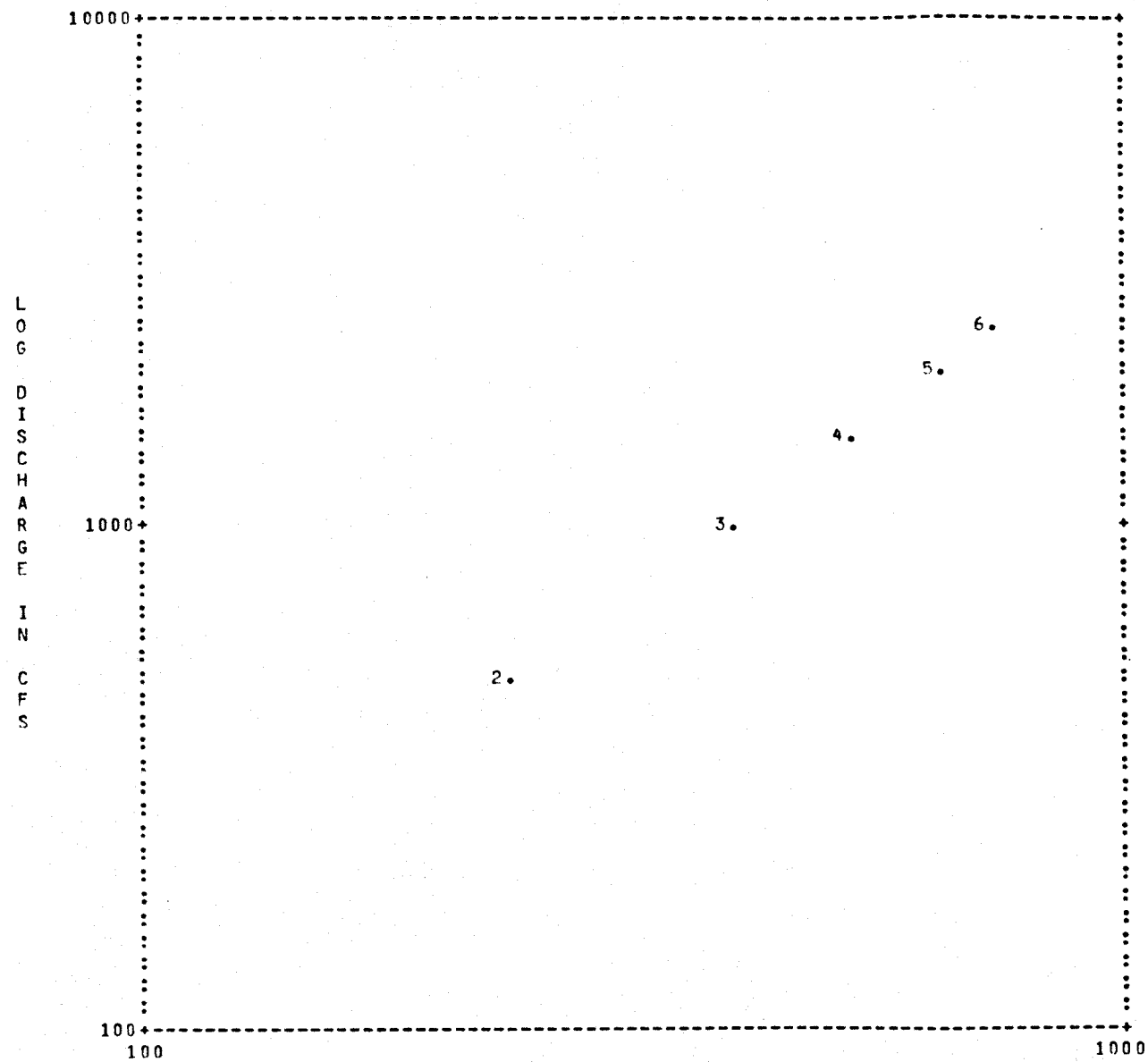
BROOMALL, PA (NORTHEAST) -- 489-3229 (FTS), FORT WORTH, TX (SOUTH) -- 334-5242 (FTS)
LINCOLN, NB (MIDWEST) -- 541-5318 (FTS), PORTLAND, OR (WEST) -- 423-4099 (FTS)
OR HYDROLOGY UNIT, ENGINEERING DIVISION, LANHAM, MD -- 436-7383 (FTS).

PROGRAM CHANGES SINCE MAY 1982:

12/17/82 - CORRECT PEAK RATE FACTOR FOR USER ENTERED DIMHYD
CORRECT REACH ROUTING PEAK TRAVEL TIME PRINTED WITH FULLPRINT OPTION
5/02/83 - CORRECT COMPUTATIONS FOR ---
1. DIVISION OF BASEFLOW IN DIVERT OPERATION
2. HYDROGRAPH VOLUME SPLIT BETWEEN BASEFLOW AND ABOVE BASEFLOW
3. CROSS SECTION DATA PLOTTING POSITION
4. INTERMEDIATE PEAK WHEN "FROM" AREA IS LARGER THAN "THRU" AREA
5. STORAGE ROUTED REACH TRAVEL TIME FOR MULTIPEAK HYDROGRAPH
6. ORDERING "FLOW-FREQ" FILE FROM SUMMARY TABLE #3 DATA
7. BASEFLOW ENTERED WITH READHYD
8. LOW FLOW SPLIT DURING DIVERT PROCEDURE #2 WHEN SECTION RATINGS START AT DIFFERENT ELEVATIONS
ENHANCEMENTS ---
1. REPLACE USER MANUAL ERROR CODES (PAGE 4-9 TO 4-11) WITH MESSAGES
2. LABEL OUTPUT HYDROGRAPH FILES WITH CROSS SECTION/STRUCTURE, ALTERNATE AND STORM NO'S

***BANKFUL ELEVATION(1702.00)EXCEEDS TABLE VALUES FOR XSECTION 1

(6)



CROSS SECTION 1 END AREA VS DISCHARGE

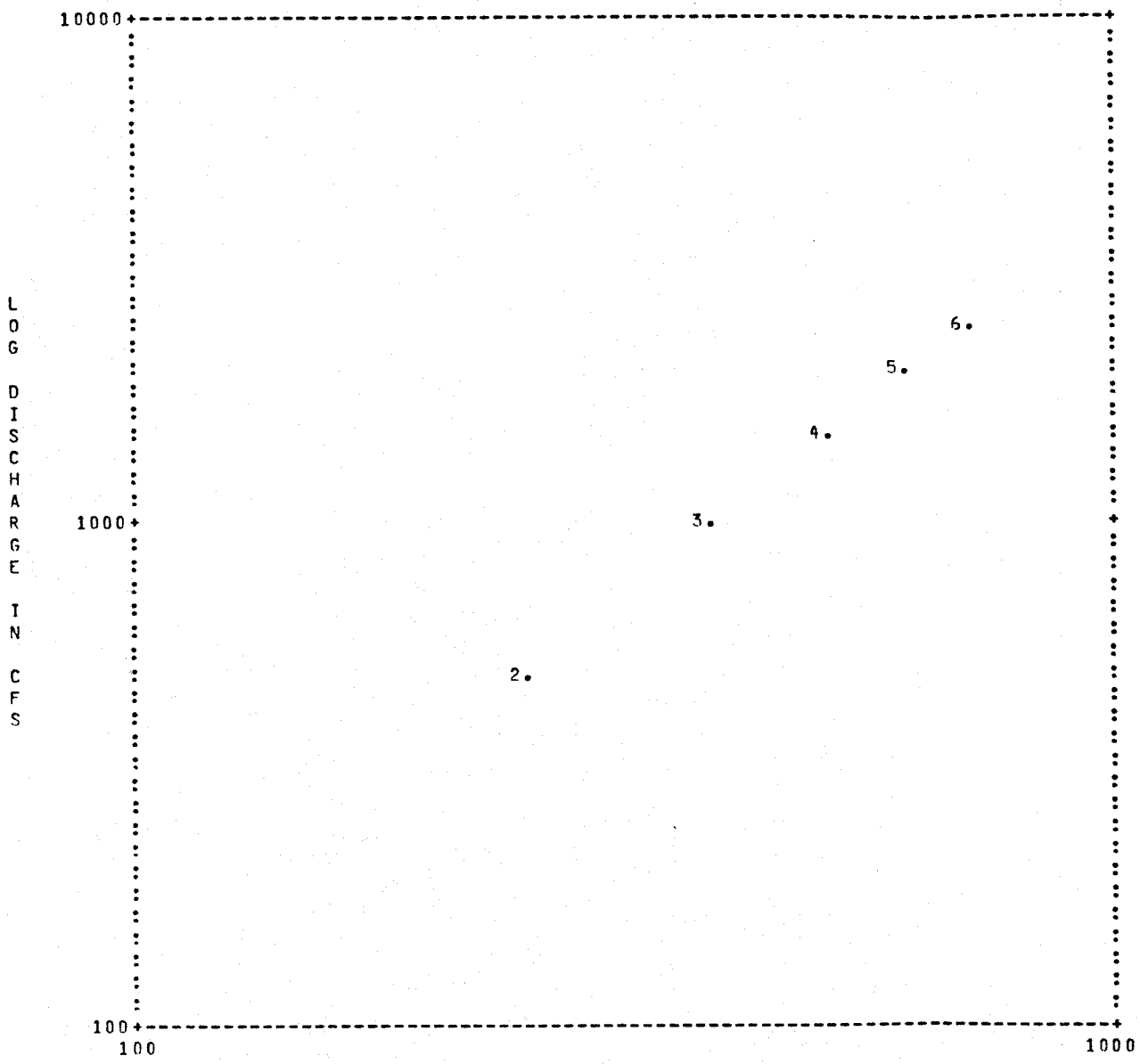
REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.34
2	500.00	238.10	1.34
3	1000.00	400.10	1.34
4	1500.00	523.40	1.39
5	2000.00	647.10	1.38
6	2500.00	725.30	1.50

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

***BANKFUL ELEVATION(1660.00)EXCEEDS TABLE VALUES FOR XSECTION 2

7



CROSS SECTION 2 END AREA VS DISCHARGE

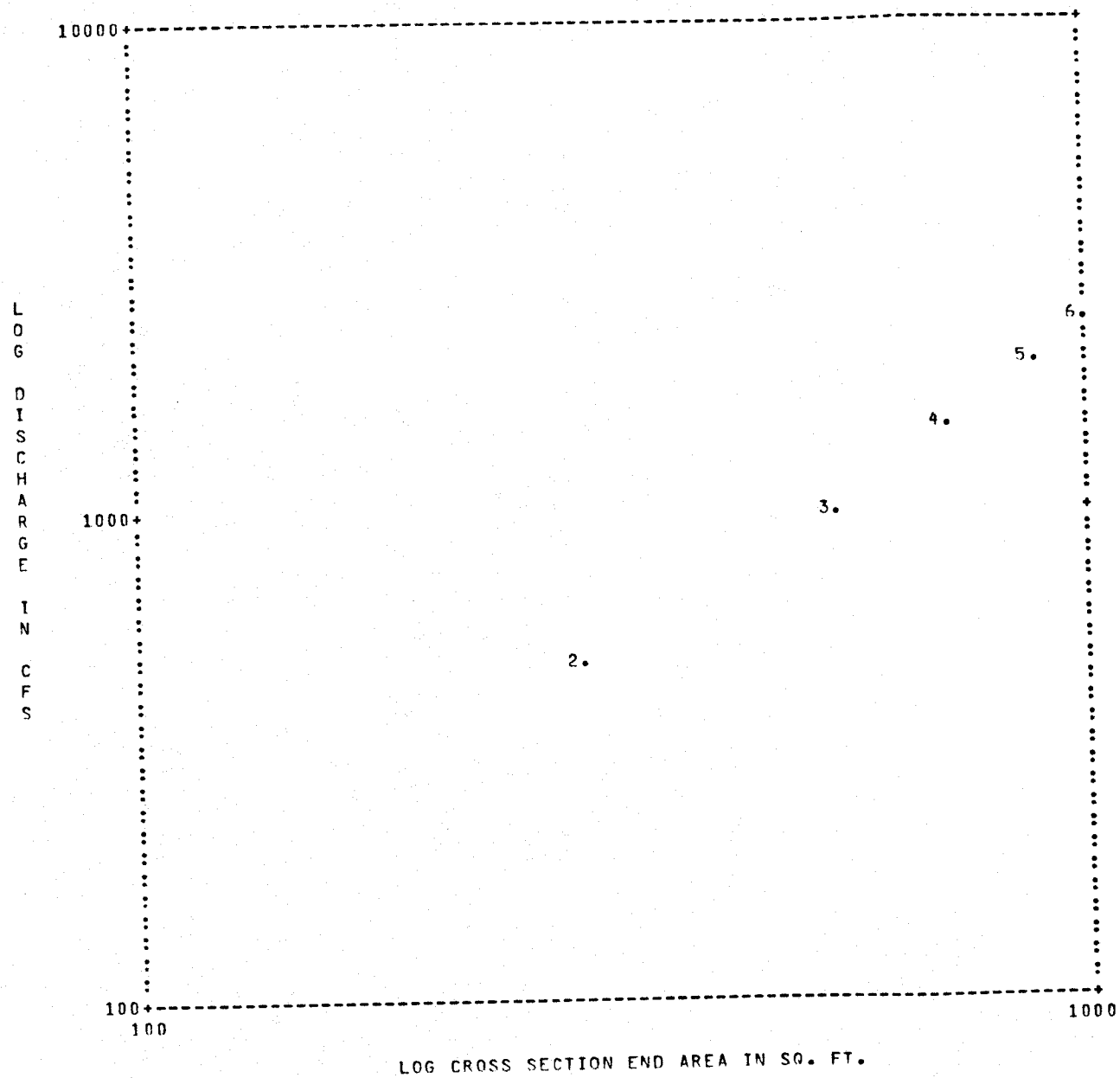
REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.52
2	500.00	247.80	1.52
3	1000.00	390.90	1.52
4	1500.00	501.50	1.56
5	2000.00	607.70	1.54
6	2500.00	715.40	1.51

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

***BANKFUL ELEVATION(1620.00)EXCEEDS TABLE VALUES FOR XSECTION 3

8



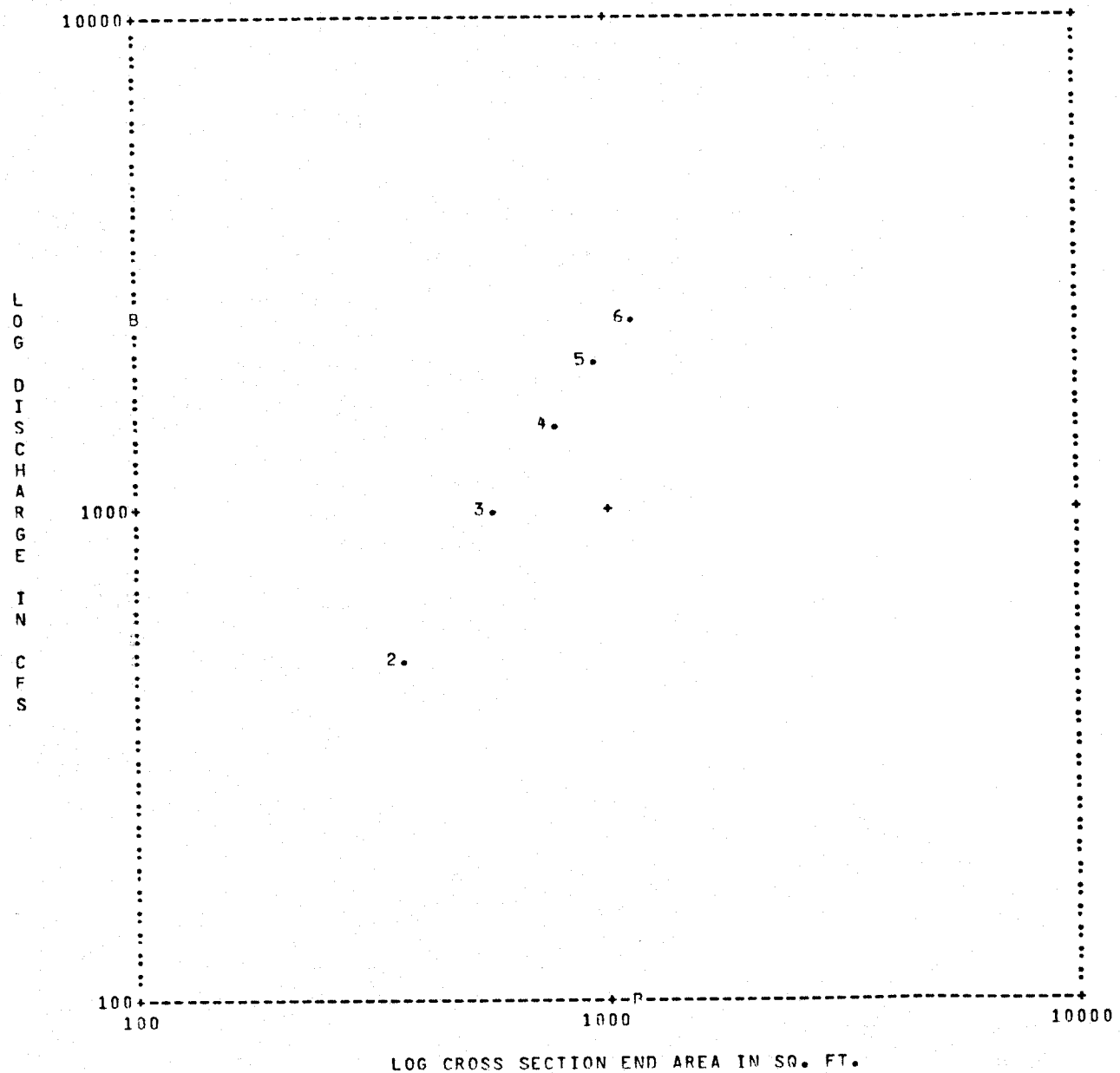
CROSS SECTION 3 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.11
2	500.00	289.70	1.11
3	1000.00	541.00	1.11
4	1500.00	722.60	1.21
5	2000.00	884.50	1.26
6	2500.00	998.50	1.38

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

9



CROSS SECTION 4 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.47
2	500.00	366.00	1.47
3	1000.00	586.00	1.47
4	1500.00	769.90	1.48
5	2000.00	952.50	1.45
6	2500.00	1102.40	1.46

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS
AREA=1102.4 SQ FT DISCHARGE= 2500.0 CFS

EXECUTIVE CONTROL OPERATION READHD DISCHARGE HYDROGRAPH, HYDROGRAPH LOCATION 6 RECORD ID 39A

STARTING TIME= 4.60 TIME INCREMENT= .20 DRAINAGE AREA= 10.62 BASE FLOW= .00

(10)

8	.00	.30	4.50	14.20	14.30
8	14.80	15.70	17.10	19.10	22.20
8	26.40	32.00	39.10	48.10	59.20
8	72.70	85.10	94.20	104.90	117.40
8	127.80	130.90	134.40	137.90	140.80
8	143.80	146.70	149.00	151.40	153.70
8	265.90	452.60	685.40	977.30	1233.30
8	1538.10	1816.50	2032.50	2195.10	2310.00
8	2385.80	2430.20	2449.60	2448.70	2428.90
8	2393.80	2347.70	2294.60	2236.80	2174.30
8	2108.00	2039.10	1968.70	1898.60	1829.90
8	1763.60	1698.60	1634.10	1569.80	1504.90
8	1440.70	1381.60	1331.00	1292.10	1265.40
8	1238.40	1212.20	1188.30	1164.20	1138.50
8	1108.20	1077.20	1048.70	1023.60	1001.40
8	981.20	960.90	939.10	916.60	895.10
8	875.80	859.50	846.40	835.00	822.90
8	809.20	795.20	782.60	770.70	757.50
8	742.80	729.60	720.80	714.90	707.80
8	698.30	689.30	684.00	679.00	667.30
8	646.50	619.20	589.00	567.20	548.90
8	530.80	513.30	496.30	479.90	464.20
8	449.10	434.60	420.80	407.50	394.80
8	382.60	371.00	359.80	349.10	340.20
8	332.10	324.40	316.90	309.60	302.70
8	295.90	289.50	283.20	277.10	271.30
8	265.70	260.20	255.00	249.90	245.00
8	240.30	235.70	231.30	227.10	223.00
8	219.00	215.20	211.50	208.00	204.50
8	201.20	198.00	194.90	191.90	189.00

9 ENDTBL

EXECUTIVE CONTROL OPERATION LIST RECORD ID 72

LISTING OF CURRENT DATA

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	XSECTN NO.	DRAINAGE AREA
2 XSECTN	1	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1698.00	.00	.00
8	1698.90	500.00	238.10
8	1699.40	1000.00	400.10
8	1699.80	1500.00	523.40
8	1700.10	2000.00	647.10
8	1700.30	2500.00	725.30
9 ENDTBL			

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	2	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1656.00	.00	.00
8	1657.10	500.00	247.80
8	1657.60	1000.00	390.90
8	1657.90	1500.00	501.50
8	1658.20	2000.00	607.70
8	1658.60	2500.00	715.40
9 ENDTBL			

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	3	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1616.00	.00	.00
8	1617.70	500.00	289.70
8	1618.20	1000.00	541.00
8	1618.40	1500.00	722.60
8	1618.60	2000.00	884.50
8	1618.80	2500.00	998.50
9 ENDTBL			

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          XSECTN NO.      DRAINAGE AREA
2 XSECTN     4               1.0000

                          ELEVATION   DISCHARGE    END AREA
8                          1578.00        .00          .00
8                          1579.00     500.00       366.00
8                          1579.30    1000.00       586.00
8                          1579.60    1500.00       769.90
8                          1579.80    2000.00       952.50
8                          1580.00    2500.00      1102.40
9 ENDTBL

                     TIME INCREMENT
4 DIMHYD                   .0200     (INPUT VALUE OF   .020 NOT EQUAL TO COMPUTED VALUE; COMPUTED VALUE USED.)

8                 .0000      .0300      .1000      .1900      .3100
8                 .4700      .6600      .8200      .9300      .9900
8                1.0000      .9900      .9300      .8600      .7800
8                 .6800      .5600      .4600      .3900      .3300
8                 .2800      .2410      .2070      .1740      .1470
8                 .1260      .1070      .0910      .0770      .0660
8                 .0550      .0470      .0400      .0340      .0290
8                 .0250      .0210      .0180      .0150      .0130
8                 .0110      .0090      .0080      .0070      .0060
8                 .0050      .0040      .0030      .0020      .0010
8                 .0000      .0000      .0000      .0000      .0000
9 ENDTBL

  COMPUTED PEAK RATE FACTOR =  484.00

     TABLE NO.        TIME INCREMENT
5 RAINFL 1                  .5000

8                 .0000      .0080      .0170      .0260      .0350
8                 .0450      .0550      .0650      .0760      .0870
8                 .0990      .1120      .1260      .1400      .1560
8                 .1740      .1940      .2190      .2540      .3030
8                 .5150      .5830      .6240      .6550      .6820
8                 .7060      .7280      .7480      .7660      .7830
8                 .7990      .8150      .8300      .8440      .8570
8                 .8700      .8820      .8930      .9050      .9160
8                 .9260      .9360      .9460      .9560      .9650
8                 .9740      .9830      .9920     1.0000     1.0000
9 ENDTBL
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     TABLE NO.        TIME INCREMENT
5 RAINFL 2                    .2500

8                  .0000       .0020       .0050       .0080       .0110
8                  .0140       .0170       .0200       .0230       .0260
8                  .0290       .0320       .0350       .0380       .0410
8                  .0440       .0480       .0520       .0560       .0600
8                  .0640       .0680       .0720       .0760       .0800
8                  .0850       .0900       .0950       .1000       .1050
8                  .1100       .1150       .1200       .1260       .1330
8                  .1400       .1470       .1550       .1630       .1720
8                  .1810       .1910       .2030       .2180       .2360
8                  .2570       .2830       .3870       .6630       .7070
8                  .7350       .7580       .7760       .7910       .8040
8                  .8150       .8250       .8340       .8420       .8490
8                  .8560       .8630       .8690       .8750       .8810
8                  .8870       .8930       .8980       .9030       .9080
8                  .9130       .9180       .9220       .9260       .9300
8                  .9340       .9380       .9420       .9460       .9500
8                  .9530       .9560       .9590       .9620       .9650
8                  .9680       .9710       .9740       .9770       .9800
8                  .9830       .9860       .9890       .9920       .9950
8                  .9980      1.0000      1.0000      1.0000      1.0000
9 ENDTBL

     TABLE NO.        TIME INCREMENT
5 RAINFL 3                    .5000

8                  .0000       .0100       .0220       .0360       .0510
8                  .0670       .0830       .0990       .1160       .1350
8                  .1560       .1790       .2040       .2330       .2680
8                  .3100       .4250       .4800       .5200       .5500
8                  .5770       .6010       .6230       .6440       .6640
8                  .6830       .7010       .7190       .7360       .7530
8                  .7690       .7850       .8000       .8150       .8300
8                  .8440       .8580       .8710       .8840       .8960
8                  .9080       .9200       .9320       .9440       .9560
8                  .9670       .9780       .9890      1.0000      1.0000
9 ENDTBL

     TABLE NO.        TIME INCREMENT
5 RAINFL 4                    .5000

8                  .0000       .0040       .0080       .0120       .0160
8                  .0200       .0250       .0300       .0350       .0400
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8                .0450       .0500       .0550       .0600       .0650
8                .0700       .0750       .0810       .0870       .0930
8                .0990       .1050       .1110       .1180       .1250
8                .1320       .1400       .1480       .1560       .1650
8                .1740       .1840       .1950       .2070       .2200
8                .2360       .2550       .2770       .3030       .4090
8                .5150       .5490       .5830       .6050       .6240
8                .6400       .6550       .6690       .6820       .6940
8                .7050       .7160       .7270       .7380       .7480
8                .7580       .7670       .7760       .7840       .7920
8                .8000       .8080       .8160       .8230       .8300
8                .8370       .8440       .8510       .8580       .8640
8                .8700       .8760       .8820       .8880       .8940
8                .9000       .9060       .9110       .9160       .9210
8                .9260       .9310       .9360       .9410       .9460
8                .9510       .9560       .9610       .9660       .9710
8                .9760       .9800       .9840       .9880       .9920
8                .9960      1.0000      1.0000      1.0000      1.0000
9 ENDTBL

     TABLE NO.       TIME INCREMENT
5 RAINFL 5                .5000

8                .0000       .0020       .0050       .0080       .0110
8                .0140       .0170       .0200       .0230       .0260
8                .0290       .0320       .0350       .0380       .0410
8                .0440       .0470       .0510       .0550       .0590
8                .0630       .0670       .0710       .0750       .0790
8                .0840       .0890       .0940       .0990       .1040
8                .1090       .1140       .1200       .1260       .1330
8                .1400       .1470       .1540       .1620       .1710
8                .1810       .1920       .2040       .2170       .2330
8                .2520       .2770       .3180       .6380       .6980
8                .7290       .7520       .7700       .7850       .7980
8                .8090       .8190       .8290       .8380       .8460
8                .8540       .8610       .8680       .8740       .8800
8                .8860       .8920       .8970       .9020       .9070
8                .9120       .9170       .9210       .9250       .9290
8                .9330       .9370       .9410       .9450       .9490
8                .9530       .9570       .9600       .9630       .9660
8                .9690       .9720       .9750       .9780       .9810
8                .9840       .9870       .9900       .9930       .9960
8                .9980      1.0000      1.0000      1.0000      1.0000
9 ENDTBL
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     TABLE NO.        TIME INCREMENT
5 RAINFL 6                  .0200

8                  .0000      .0080      .0162      .0246      .0333
8                  .0425      .0524      .0630      .0743      .0863
8                  .0990      .1124      .1265      .1420      .1595
8                  .1800      .2050      .2550      .3450      .4370
8                  .5300      .6030      .6330      .6600      .6840
8                  .7050      .7240      .7420      .7590      .7750
8                  .7900      .8043      .8180      .8312      .8439
8                  .8561      .8678      .8790      .8898      .9002
8                  .9103      .9201      .9297      .9391      .9483
8                  .9573      .9661      .9747      .9832      .9916
8                 1.0000     1.0000     1.0000     1.0000     1.0000
9 ENDTBL
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STANDARD CONTROL INSTRUCTIONS

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6 REACH  3   1   6   7     900.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   2   7   5    4100.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   3   5   7    4600.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   4   7   5    4100.0000        .0000        .00001 1 0 1 0 1
  ENDATA
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END OF LISTING

EXECUTIVE CONTROL OPERATION INCREM MAIN TIME INCREMENT = .20 HOURS RECORD ID 73

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO XSECTION 4 RECORD ID 74
STARTING TIME = .00 RAIN DEPTH = 7.06 RAIN DURATION= 24.00 RAIN TABLE NO.= 6 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = .20 HOURS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
LENGTH = 900.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .14 M= 1.49

MODIFIED ATT-KIN ROUTING COEFFICIENT = 1.00 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.29	2451.71	1700.28

TIME(HRS) FIRST HYDROGRAPH POINT = 4.60 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

4.60	DISCHG	.00	.00	.30	4.50	14.20	14.30	14.80	15.70	17.10	19.10
6.60	DISCHG	22.20	26.40	32.00	39.10	48.10	59.20	72.70	85.10	94.20	104.90
8.60	DISCHG	117.40	127.80	130.90	134.40	137.90	140.80	143.80	146.70	149.00	151.40
10.60	DISCHG	153.70	265.90	452.60	685.40	977.30	1233.30	1538.10	1816.50	2032.50	2195.10
12.60	DISCHG	2310.00	2385.80	2430.20	2449.60	2448.70	2428.90	2393.80	2347.70	2294.60	2236.80
14.60	DISCHG	2174.30	2108.00	2039.10	1968.70	1898.60	1829.90	1763.60	1698.60	1634.10	1569.80
16.60	DISCHG	1504.90	1440.70	1381.60	1331.00	1292.10	1265.40	1238.40	1212.20	1188.30	1164.20
18.60	DISCHG	1138.50	1108.20	1077.20	1048.70	1023.60	1001.40	981.20	960.90	939.10	916.60
20.60	DISCHG	895.10	875.80	859.50	846.40	835.00	822.90	809.20	795.20	782.60	770.70
22.60	DISCHG	757.50	742.80	729.60	720.80	714.90	707.80	698.30	689.30	684.00	679.00
24.60	DISCHG	667.30	646.50	619.20	589.00	567.20	548.90	530.80	513.30	496.30	479.90
26.60	DISCHG	464.20	449.10	434.60	420.80	407.50	394.80	382.60	371.00	359.80	349.10
28.60	DISCHG	340.20	332.10	324.40	316.90	309.60	302.70	295.90	289.50	283.20	277.10
30.60	DISCHG	271.30	265.70	260.20	255.00	249.90	245.00	240.30	235.70	231.30	227.10
32.60	DISCHG	223.00	219.00	215.20	211.50	208.00	204.50	201.20	198.00	194.90	191.90
34.60	DISCHG	189.00	.00								

RUNOFF VOLUME ABOVE BASEFLOW = 3.27 WATERSHED INCHES, 22390.36 CFS-HRS, 1850.34 ACRE-FEET; BASEFLOW = .00 CFS

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OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 5
LENGTH = 4100.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .12 M= 1.51

MODIFIED ATT-KIN ROUTING COEFFICIENT = .63 PEAK TRAVEL TIME = .40 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.62	2441.35	1658.55

TIME(HRS) FIRST HYDROGRAPH POINT = 4.60 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

4.60	DISCHG	.00	.00	.00	.19	2.91	10.03	12.72	14.03	15.08	16.35
6.60	DISCHG	18.09	20.68	24.29	29.15	35.43	43.42	53.38	65.57	77.89	88.18
8.60	DISCHG	98.73	110.51	121.42	127.40	131.81	135.65	138.90	141.99	144.96	147.51
10.60	DISCHG	149.96	152.32	223.97	368.21	568.31	826.33	1083.07	1370.13	1651.73	1891.94
12.60	DISCHG	2083.19	2226.28	2326.91	2392.07	2428.36	2441.19	2433.44	2408.43	2370.12	2322.47
14.60	DISCHG	2268.42	2209.04	2145.30	2078.30	2009.16	1939.41	1870.32	1802.99	1737.13	1672.13
16.60	DISCHG	1607.57	1542.80	1478.39	1417.33	1362.87	1318.22	1284.90	1255.56	1228.20	1203.03
18.60	DISCHG	1178.53	1153.28	1124.84	1094.78	1065.71	1039.14	1015.33	993.80	973.04	951.63
20.60	DISCHG	929.53	907.81	887.61	869.88	855.07	842.41	830.10	816.91	803.21	790.21
22.60	DISCHG	777.90	765.03	751.00	737.50	726.96	719.35	712.06	703.38	694.50	687.87
24.60	DISCHG	682.27	672.83	656.22	632.86	605.19	581.22	560.83	541.88	523.85	506.47
26.60	DISCHG	489.71	473.61	458.15	443.29	429.10	415.47	402.43	389.92	377.98	366.51
28.60	DISCHG	355.53	345.86	337.18	329.12	321.41	313.96	306.86	299.94	293.35	286.95
30.60	DISCHG	280.73	274.78	269.05	263.47	258.13	252.94	247.93	243.12	238.44	233.93
32.60	DISCHG	229.62	225.44	221.38	217.48	213.71	210.11	206.57	203.18	199.91	196.75
34.60	DISCHG	193.69	190.73	70.40	25.99	9.59	3.54	1.31	.48	.18	.06
36.60	DISCHG	.02	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 3.27 WATERSHED INCHES, 22394.75 CFS-HRS, 1850.70 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 7
LENGTH = 4600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .20 M= 1.36

MODIFIED ATT-KIN ROUTING COEFFICIENT = .42 PEAK TRAVEL TIME = .60 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
14.16	2400.65	1618.76

TIME(HRS) FIRST HYDROGRAPH POINT = 4.60 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

4.60	DISCHG	.00	.00	.00	.00	.08	1.26	4.93	8.19	10.63	12.49
6.60	DISCHG	14.11	15.77	17.82	20.53	24.13	28.86	34.95	42.65	52.23	62.96
8.60	DISCHG	73.51	84.05	95.11	106.11	115.01	122.04	127.73	132.40	136.41	139.99
10.60	DISCHG	143.13	145.99	148.63	180.14	258.79	388.23	571.43	785.39	1029.92	1289.96
12.60	DISCHG	1541.70	1768.15	1959.73	2113.28	2229.87	2312.88	2366.54	2394.51	2400.33	2387.70
14.60	DISCHG	2360.42	2321.95	2274.73	2220.60	2161.09	2097.55	2031.42	1964.05	1896.70	1829.97
16.60	DISCHG	1763.96	1698.56	1633.42	1568.59	1505.33	1445.75	1392.42	1347.46	1309.03	1275.23
18.60	DISCHG	1245.03	1217.22	1190.48	1163.03	1134.49	1105.73	1077.88	1051.72	1027.50	1004.73

20.60	DISCHG	982.52	960.36	938.38	917.15	897.38	879.69	864.10	849.88	836.09	822.34
22.60	DISCHG	808.90	795.94	783.01	769.63	756.19	743.97	733.67	724.64	715.75	706.86
24.60	DISCHG	698.92	691.96	683.96	672.36	655.84	634.66	612.31	590.78	570.33	550.89
26.60	DISCHG	532.32	514.50	497.40	480.98	465.22	450.12	435.63	421.75	408.44	395.70
28.60	DISCHG	383.49	371.80	360.95	351.01	341.85	333.30	325.21	317.54	310.18	303.14
30.60	DISCHG	296.37	289.83	283.54	277.48	271.62	265.97	260.52	255.25	250.18	245.27
32.60	DISCHG	240.53	235.97	231.57	227.30	223.20	219.23	215.41	211.71	208.14	204.70
34.60	DISCHG	201.38	198.16	195.05	142.93	94.02	58.71	35.64	21.28	12.58	7.39
36.60	DISCHG	4.33	2.53	1.47	.86	.50	.29	.17	.10	.06	.03
38.60	DISCHG	.02	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 3.27 WATERSHED INCHES, 22390.43 CFS-HRS, 1850.35 ACRE-FEET; BASEFLOW = .00 CFS

(18)

OPERATION REACH CROSS SECTION 4
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 5
LENGTH = 4100.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .09 M= 1.46

MODIFIED ATT-KIN ROUTING COEFFICIENT = .45 PEAK TRAVEL TIME = .40 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
14.66	2369.43	1579.95

TIME(HRS) FIRST HYDROGRAPH POINT = 4.60 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

4.60	DISCHG	.00	.00	.00	.00	.00	.03	.58	2.52	5.04	7.53
6.60	DISCHG	9.74	11.68	13.50	15.43	17.70	20.56	24.26	29.02	35.09	42.72
8.60	DISCHG	51.74	61.43	71.50	82.02	92.75	102.66	111.29	118.61	124.75	129.94
10.60	DISCHG	134.42	138.30	141.72	144.80	160.54	204.29	286.20	413.22	578.96	779.79
12.60	DISCHG	1006.98	1245.11	1478.03	1692.55	1879.91	2035.76	2159.17	2251.51	2315.19	2353.11
14.60	DISCHG	2368.51	2364.91	2345.78	2314.14	2272.48	2222.88	2167.07	2106.66	2043.15	1977.93
16.60	DISCHG	1912.04	1846.10	1780.39	1714.94	1649.77	1585.45	1523.24	1464.98	1412.64	1366.50
18.60	DISCHG	1325.85	1289.86	1257.51	1227.66	1198.88	1170.20	1141.49	1113.16	1085.80	1059.84
20.60	DISCHG	1035.29	1011.79	988.89	966.40	944.47	923.50	903.99	886.22	870.04	854.92
22.60	DISCHG	840.41	826.38	812.82	799.55	786.22	772.85	759.99	748.27	737.74	727.95
24.60	DISCHG	718.56	709.81	701.86	693.89	684.30	671.63	655.16	636.08	615.91	595.61
26.60	DISCHG	575.70	556.38	537.73	519.77	502.50	485.90	469.96	454.67	440.01	425.95
28.60	DISCHG	412.48	399.57	387.20	375.51	364.60	354.47	345.04	336.21	327.89	320.00
30.60	DISCHG	312.49	305.31	298.42	291.79	285.42	279.27	273.35	267.64	262.12	256.80
32.60	DISCHG	251.66	246.70	241.92	237.31	232.85	228.55	224.40	220.40	216.53	212.79
34.60	DISCHG	209.19	205.71	202.35	199.10	174.08	138.43	102.93	72.96	49.95	33.31
36.60	DISCHG	21.77	14.00	8.89	5.59	3.48	2.15	1.32	.81	.49	.30
38.60	DISCHG	.18	.11	.06	.03	.02	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 3.27 WATERSHED INCHES, 22391.54 CFS-HRS, 1850.44 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 1 RECORD ID 75

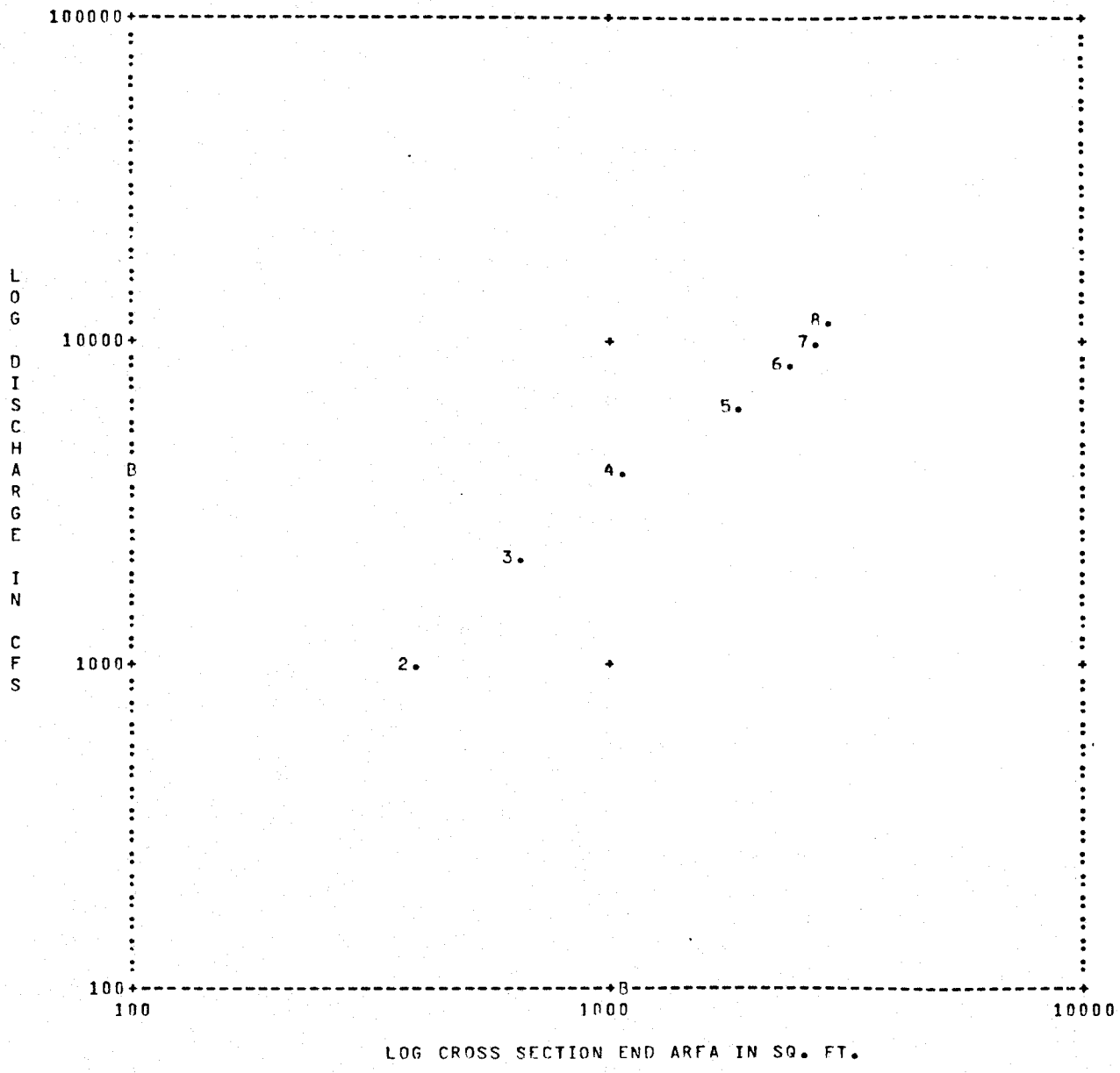
CHANGES TO TABULAR DATA FOLLOW

(19)

CROSS-SECTION DATA, CROSS-SECTION NO. 1 DRAINAGE AREA= 1.00 BANKFULL ELEV.= 1702.00

	ELEVATION	DISCHARGE	END AREA
8	1698.00	.00	.00
8	1699.40	1000.00	400.10
8	1700.10	2000.00	647.10
8	1701.00	4000.00	1091.30
8	1702.20	6000.00	1857.90
8	1702.50	8000.00	2326.10
8	1702.80	10000.00	2660.50
8	1703.00	12000.00	2958.40

9 ENDTBL



CROSS SECTION 1 END AREA VS DISCHARGE

20

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.44
2	1000.00	400.10	1.44
3	2000.00	647.10	1.44
4	4000.00	1091.30	1.38
5	6000.00	1857.90	1.18
6	8000.00	2326.10	1.20
7	10000.00	2660.50	1.29
8	12000.00	2958.40	1.36

LEGEND

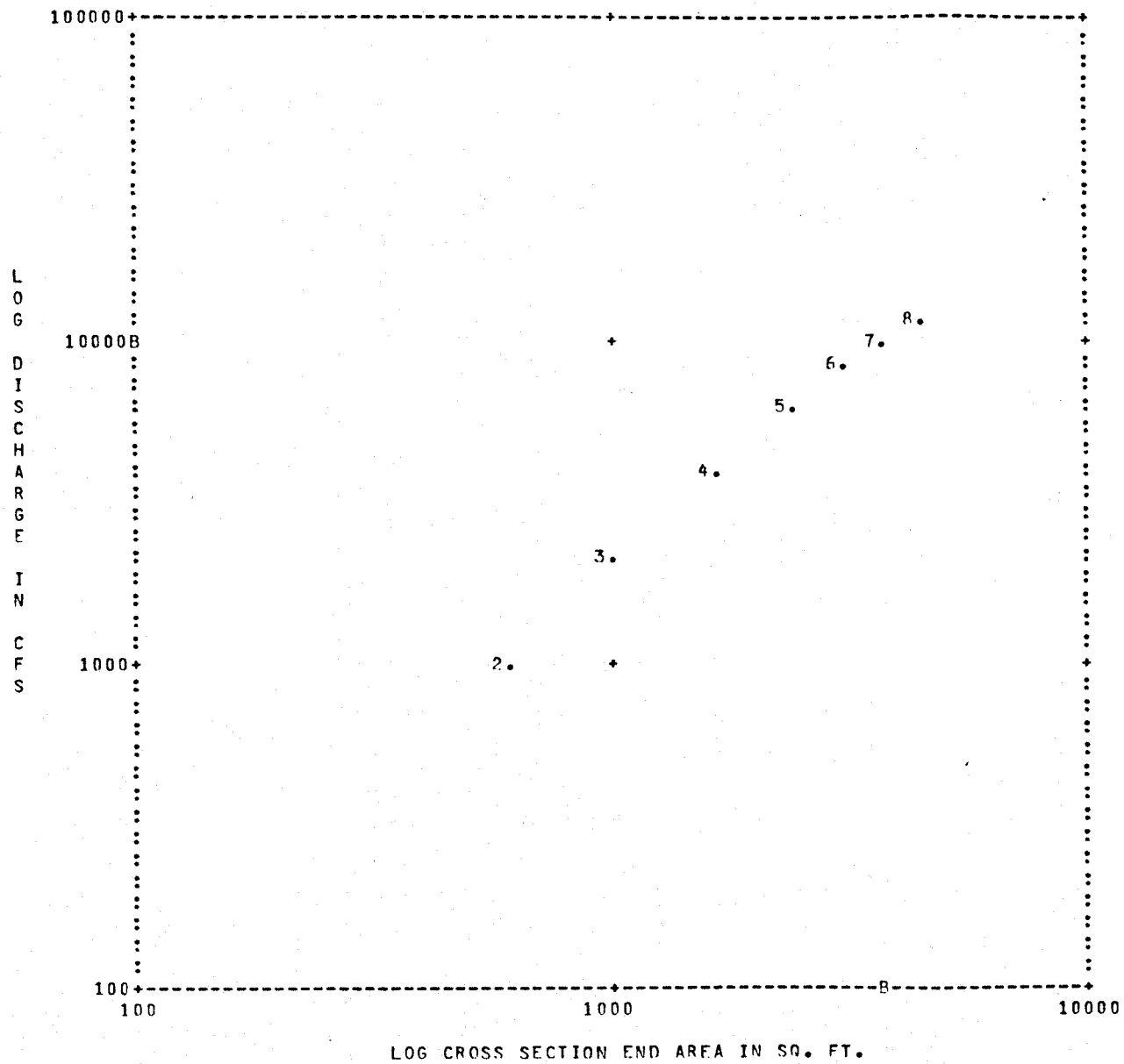
+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS.
AREA=1091.3 SQ FT DISCHARGE= 4000.0 CFS

CROSS-SECTION DATA, CROSS-SECTION NO. 2 DRAINAGE AREA= 1.00 BANKFULL ELEV.= 1660.00

	ELEVATION	DISCHARGE	END AREA
8	1656.00	.00	.00

8	1658.40	4000.00	1649.70
[redacted]	[redacted]	[redacted]	[redacted]
8	1659.40	8000.00	3073.50
8	1659.70	10000.00	3663.80
8	1660.10	12000.00	4318.50
9 ENDTBL			

21



CROSS SECTION 2 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.35
2	1000.00	613.90	1.35
3	2000.00	1026.20	1.35
4	4000.00	1649.70	1.40
5	6000.00	2326.80	1.33
6	8000.00	3073.50	1.26
7	10000.00	3663.80	1.26
8	12000.00	4318.50	1.23

22

LEGEND

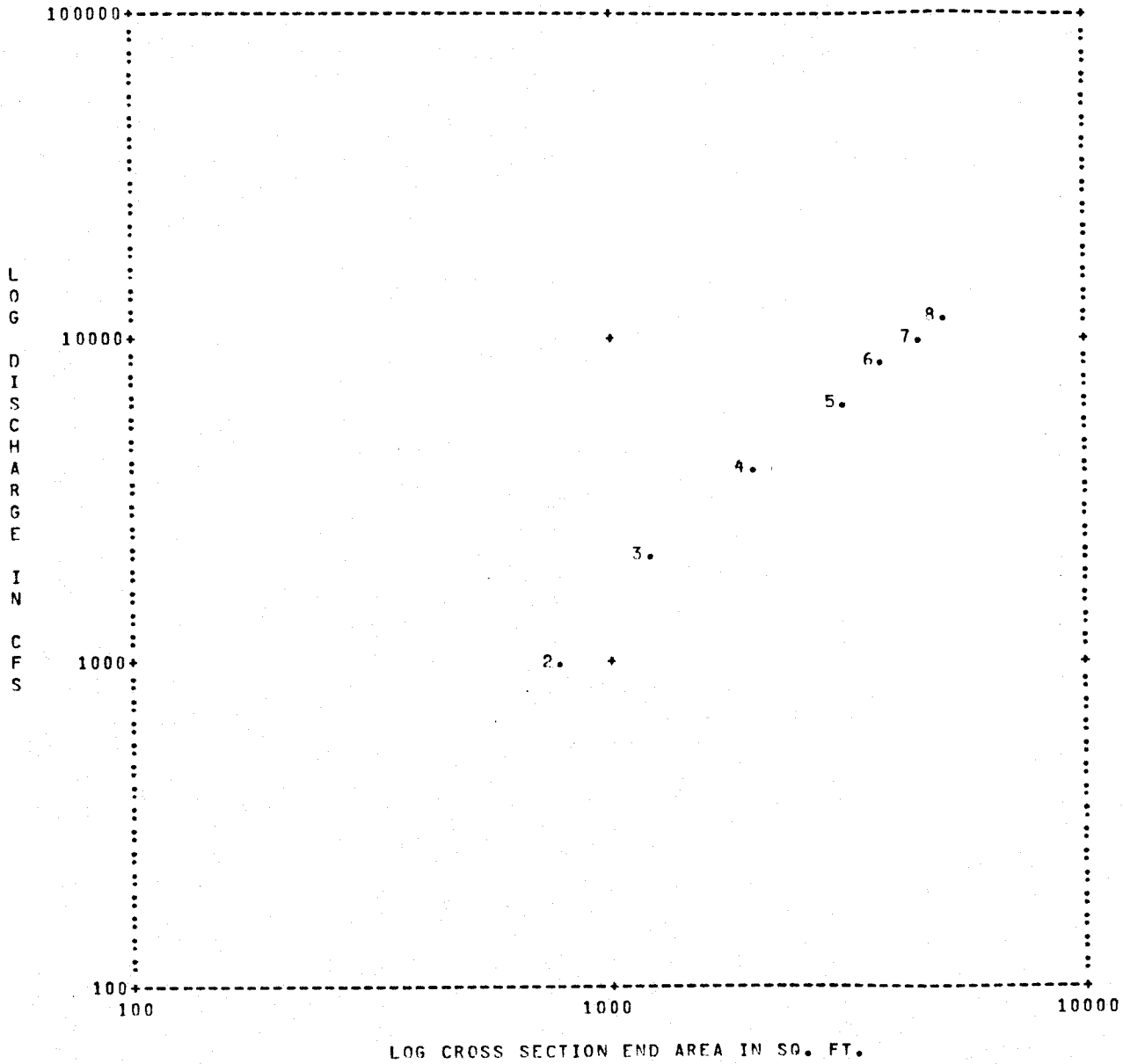
+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS
AREA=3663.8 SQ FT DISCHARGE=10000.0 CFS

CROSS-SECTION DATA, CROSS-SECTION NO. 3 DRAINAGE AREA= 1.00 BANKFULL ELEV.= 1620.00

	ELEVATION	DISCHARGE	END AREA
8	1616.00	.00	.00

```
8                    1618.00     4000.00     2001.90
8                    1618.50     6000.00     3004.50
8                    1618.70     8000.00     3813.[illegible]
8                    1619.00    10000.00     4381.20
8                    1619.10    12000.00     4951.30
9 ENDTBL
***BANKFUL ELEVATION( 1620.00)EXCEEDS TABLE VALUES FOR XSECTION    3
```

23



CROSS SECTION 3 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.53
2	1000.00	786.70	1.53
3	2000.00	1236.50	1.53
4	4000.00	2001.90	1.49
5	6000.00	3004.50	1.32
6	8000.00	3613.70	1.38
7	10000.00	4381.20	1.34
8	12000.00	4951.30	1.36

24

LEGEND

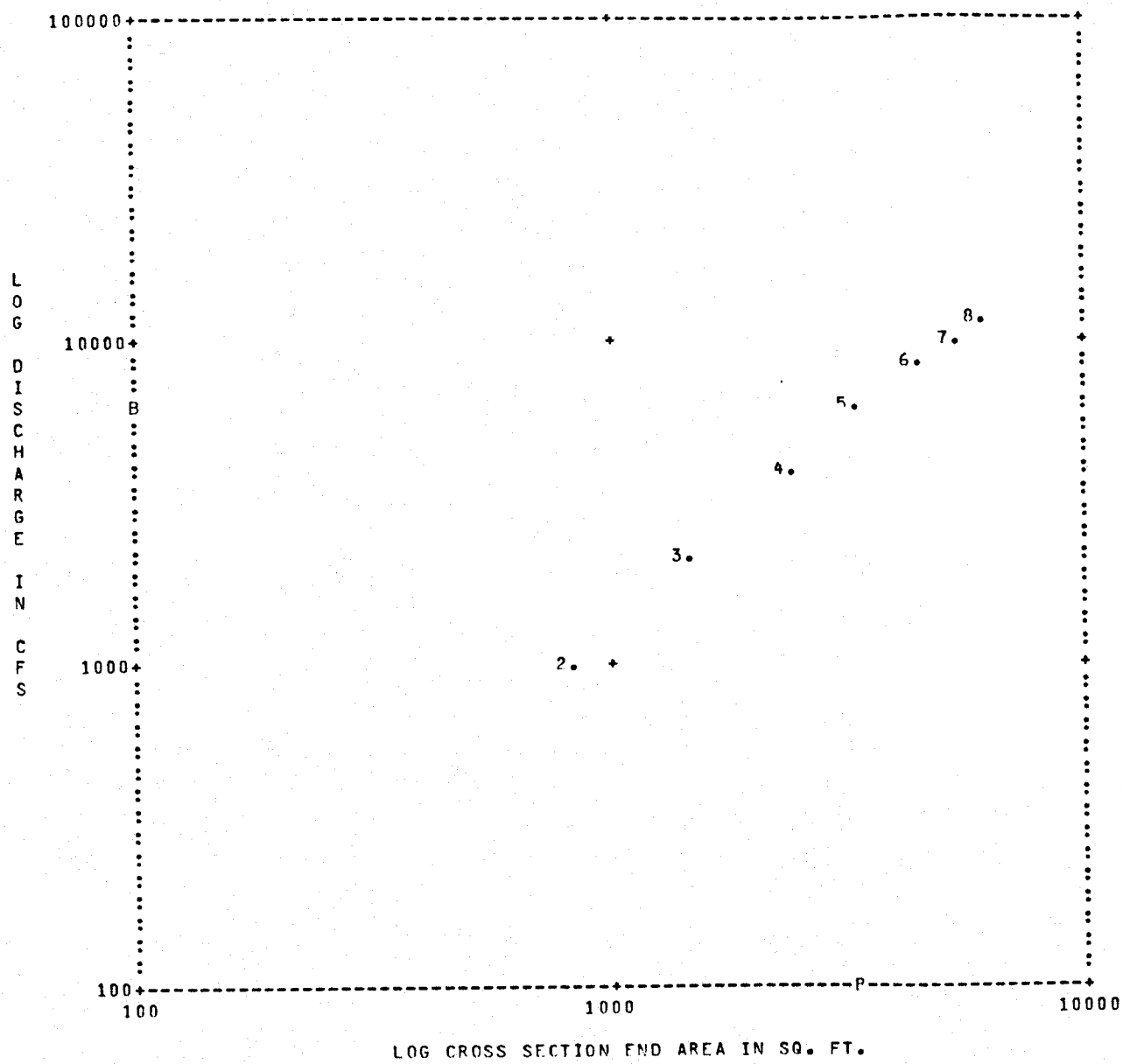
+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

CROSS-SECTION DATA, CROSS-SECTION NO. 4 DRAINAGE AREA= 1.00 BANKFULL ELEV.= 1580.00

	ELEVATION	DISCHARGE	END AREA
8	1578.00	.00	.00

8	1579.70	4000.00	2437.80
8	1580.00	6000.00	3341.80
8	1580.20	8000.00	4174.30
8	1580.40	10000.00	5355.80
8	1580.60	12000.00	6096.30
9 ENDTBL			

26



CROSS SECTION 4 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.23
2	1000.00	824.30	1.23
3	2000.00	1451.20	1.23
4	4000.00	2437.80	1.28
5	6000.00	3341.80	1.28
6	8000.00	4474.30	1.21
7	10000.00	5355.80	1.21
8	12000.00	6096.30	1.25

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS
AREA=3341.8 SQ FT DISCHARGE= 6000.0 CFS

EXECUTIVE CONTROL OPERATION READHD DISCHARGE HYDROGRAPH, HYDROGRAPH LOCATION 6 RECORD ID 116

STARTING TIME= 2.80 TIME INCREMENT= .20 DRAINAGE AREA= 10.62 BASE FLOW= .00

8	.00	.10	1.90	11.00	14.20
8	14.60	15.40	16.80	19.10	22.20
8	26.50	32.30	39.70	49.00	60.30
8	73.60	85.20	93.50	103.70	116.00
8	127.60	130.80	134.50	138.30	141.90
8	146.00	149.70	153.80	489.60	1229.00
8	2464.20	3896.90	5257.50	6488.40	7660.30
8	8641.20	9454.30	10000.00	10350.00	10700.00
8	11000.00	11200.00	11308.80	11230.00	11020.00
8	10750.00	10470.00	10150.00	9861.30	9434.30
8	8995.90	8557.70	8126.30	7697.10	7274.30
8	6867.00	6482.30	6131.20	5829.20	5536.30
8	5253.60	4982.10	4725.10	4484.30	4260.40
8	4049.00	3845.60	3649.00	3456.20	3270.20
8	3103.30	2965.70	2851.10	2745.30	2649.00
8	2568.10	2498.10	2431.90	2354.30	2262.40
8	2170.10	2090.70	2026.40	1973.50	1927.70
8	1881.00	1827.50	1770.90	1719.00	1676.30
8	1644.60	1624.40	1609.10	1588.90	1560.90
8	1531.50	1507.00	1484.80	1456.80	1422.10
8	1393.40	1382.10	1380.80	1373.10	1353.70
8	1335.90	1332.60	1329.90	1299.70	1256.50
8	1197.00	1130.90	1063.90	998.70	936.60
8	878.00	823.20	772.10	724.50	680.30
8	639.30	601.20	571.80	552.00	533.10
8	515.00	497.60	481.00	465.20	450.00
8	435.50	421.60	408.20	395.50	383.20
8	371.50	360.40	349.70	340.60	332.50
8	324.70	317.20	310.00	303.00	296.20
8	289.70	283.40	277.40	271.50	265.90

9 ENDTBL

27

RECORD ID 148

EXECUTIVE CONTROL OPERATION LIST

LISTING OF CURRENT DATA

28

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	1	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1698.00	.00	.00
8	1699.40	1000.00	400.10
8	1700.10	2000.00	647.10
8	1701.00	4000.00	1091.30
8	1702.20	6000.00	1857.90
8	1702.50	8000.00	2326.10
8	1702.80	10000.00	2660.50
8	1703.00	12000.00	2958.40

9 ENDTBL

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	2	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1656.00	.00	.00
8	1657.30	1000.00	613.90
8	1657.80	2000.00	1026.20
8	1658.40	4000.00	1649.70
8	1658.90	6000.00	2326.80
8	1659.40	8000.00	3073.50
8	1659.70	10000.00	3663.80
8	1660.10	12000.00	4318.50

9 ENDTBL

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	3	1.0000

	ELEVATION	DISCHARGE	END AREA
8	1616.00	.00	.00
8	1617.20	1000.00	786.70
8	1617.60	2000.00	1236.50
8	1618.00	4000.00	2001.90
8	1618.50	6000.00	3004.50

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8                    1618.70     8000.00     3613.70
8                    1619.00    10000.00     4381.20
8                    1619.10    12000.00     4951.30
9 ENDTBL


        XSECTN NO.      DRAINAGE AREA
2 XSECTN     4              1.0000

                        ELEVATION   DISCHARGE    END AREA
8                        1578.00         .00         .00
8                        1578.90     1000.00      824.30
8                        1579.30     2000.00     1451.20
8                        1579.70     4000.00     2437.80
8                        1580.00     6000.00     3341.80
8                        1580.20     8000.00     4474.30
8                        1580.40    10000.00     5355.80
8                        1580.60    12000.00     6096.30
9 ENDTBL

                    TIME INCREMENT
4 DIMHYD                  .0200     (INPUT VALUE OF    .020 NOT EQUAL TO COMPUTED VALUE; COMPUTED VALUE USED.)

8                .0000      .0300      .1000      .1900      .3100
8                .4700      .6600      .8200      .9300      .9900
8               1.0000      .9900      .9300      .8600      .7800
8                .6800      .5600      .4600      .3900      .3300
8                .2800      .2410      .2070      .1740      .1470
8                .1260      .1070      .0910      .0770      .0660
8                .0550      .0470      .0400      .0340      .0290
8                .0250      .0210      .0180      .0150      .0130
8                .0110      .0090      .0080      .0070      .0060
8                .0050      .0040      .0030      .0020      .0010
8                .0000      .0000      .0000      .0000      .0000
9 ENDTBL

  COMPUTED PEAK RATE FACTOR =  484.00


     TABLE NO.      TIME INCREMENT
5 RAINFL 1                .5000

8                .0000      .0080      .0170      .0260      .0350
8                .0450      .0550      .0650      .0760      .0870
8                .0990      .1120      .1260      .1400      .1560
8                .1740      .1940      .2190      .2540      .3030
8                .5150      .5830      .6240      .6550      .6820
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8                .7060      .7280      .7480      .7660      .7830
8                .7990      .8150      .8300      .8440      .8570
8                .8700      .8820      .8930      .9050      .9160
8                .9260      .9360      .9460      .9560      .9650
8                .9740      .9830      .9920     1.0000     1.0000
9 ENDTBL

     TABLE NO.       TIME INCREMENT
5 RAINFL 2                  .2500

8                .0000      .0020      .0050      .0080      .0110
8                .0140      .0170      .0200      .0230      .0260
8                .0290      .0320      .0350      .0380      .0410
8                .0440      .0480      .0520      .0560      .0600
8                .0640      .0680      .0720      .0760      .0800
8                .0850      .0900      .0950      .1000      .1050
8                .1100      .1150      .1200      .1260      .1330
8                .1400      .1470      .1550      .1630      .1720
8                .1810      .1910      .2030      .2180      .2360
8                .2570      .2830      .3870      .6630      .7070
8                .7350      .7580      .7760      .7910      .8040
8                .8150      .8250      .8340      .8420      .8490
8                .8560      .8630      .8690      .8750      .8810
8                .8870      .8930      .8980      .9030      .9080
8                .9130      .9180      .9220      .9260      .9300
8                .9340      .9380      .9420      .9460      .9500
8                .9530      .9560      .9590      .9620      .9650
8                .9680      .9710      .9740      .9770      .9800
8                .9830      .9860      .9890      .9920      .9950
8                .9980     1.0000     1.0000     1.0000     1.0000
9 ENDTBL

     TABLE NO.       TIME INCREMENT
5 RAINFL 3                  .5000

8                .0000      .0100      .0220      .0360      .0510
8                .0670      .0830      .0990      .1160      .1350
8                .1560      .1790      .2040      .2330      .2680
8                .3100      .4250      .4800      .5200      .5500
8                .5770      .6010      .6230      .6440      .6640
8                .6830      .7010      .7190      .7360      .7530
8                .7690      .7850      .8000      .8150      .8300
8                .8440      .8580      .8710      .8840      .8960
8                .9080      .9200      .9320      .9440      .9560
8                .9670      .9780      .9890     1.0000     1.0000
9 ENDTBL
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(31)

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     TABLE NO.        TIME INCREMENT
5 RAINFL 4                  .5000

8                  .0000       .0040       .0080       .0120       .0160
8                  .0200       .0250       .0300       .0350       .0400
8                  .0450       .0500       .0550       .0600       .0650
8                  .0700       .0750       .0810       .0870       .0930
8                  .0990       .1050       .1110       .1180       .1250
8                  .1320       .1400       .1480       .1560       .1650
8                  .1740       .1840       .1950       .2070       .2200
8                  .2360       .2550       .2770       .3030       .4090
8                  .5150       .5490       .5830       .6050       .6240
8                  .6400       .6550       .6690       .6820       .6940
8                  .7050       .7160       .7270       .7380       .7480
8                  .7580       .7670       .7760       .7840       .7920
8                  .8000       .8080       .8160       .8230       .8300
8                  .8370       .8440       .8510       .8580       .8640
8                  .8700       .8760       .8820       .8880       .8940
8                  .9000       .9060       .9110       .9160       .9210
8                  .9260       .9310       .9360       .9410       .9460
8                  .9510       .9560       .9610       .9660       .9710
8                  .9760       .9800       .9840       .9880       .9920
8                  .9960      1.0000      1.0000      1.0000      1.0000
9 ENDTBL

     TABLE NO.        TIME INCREMENT
5 RAINFL 5                  .5000

8                  .0000       .0020       .0050       .0080       .0110
8                  .0140       .0170       .0200       .0230       .0260
8                  .0290       .0320       .0350       .0380       .0410
8                  .0440       .0470       .0510       .0550       .0590
8                  .0630       .0670       .0710       .0750       .0790
8                  .0840       .0890       .0940       .0990       .1040
8                  .1090       .1140       .1200       .1260       .1330
8                  .1400       .1470       .1540       .1620       .1710
8                  .1810       .1920       .2040       .2170       .2330
8                  .2520       .2770       .3180       .6380       .6980
8                  .7290       .7520       .7700       .7850       .7980
8                  .8090       .8190       .8290       .8380       .8460
8                  .8540       .8610       .8680       .8740       .8800
8                  .8860       .8920       .8970       .9020       .9070
8                  .9120       .9170       .9210       .9250       .9290
8                  .9330       .9370       .9410       .9450       .9490
8                  .9530       .9570       .9600       .9630       .9660
8                  .9690       .9720       .9750       .9780       .9810
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8                .9840      .9870      .9900      .9930      .9960
8                .9980     1.0000     1.0000     1.0000     1.0000
9 ENDTBL

     TABLE NO.      TIME INCREMENT
5 RAINFL 6                .0200

8                .0000      .0080      .0162      .0246      .0333
8                .0425      .0524      .0630      .0743      .0863
8                .0990      .1124      .1265      .1420      .1595
8                .1800      .2050      .2550      .3450      .4370
8                .5300      .6030      .6330      .6600      .6840
8                .7050      .7240      .7420      .7590      .7750
8                .7900      .8043      .8180      .8312      .8439
8                .8561      .8678      .8790      .8898      .9002
8                .9103      .9201      .9297      .9391      .9483
8                .9573      .9661      .9747      .9832      .9916
8               1.0000     1.0000     1.0000     1.0000     1.0000
9 ENDTBL
```

32

STANDARD CONTROL INSTRUCTIONS

```
6 REACH  3   1   6   7     900.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   2   7   5    4100.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   3   5   7    4600.0000        .0000        .00001 1 0 1 0 1
6 REACH  3   4   7   5    4100.0000        .0000        .00001 1 0 1 0 1
  ENDATA
```

33

END OF LISTING

EXECUTIVE CONTROL OPERATION INCREM MAIN TIME INCREMENT = .20 HOURS RECORD ID 149

EXECUTIVE CONTROL OPERATION COMPUT FROM XSECTION 1 TO XSECTION 4 RECORD ID 150
STARTING TIME = .00 RAIN DEPTH = 15.80 RAIN DURATION= 24.00 RAIN TABLE NO.= 6 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 2 MAIN TIME INCREMENT = .20 HOURS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
LENGTH = 900.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .26 M= 1.34

MODIFIED ATT-KIN ROUTING COEFFICIENT = 1.00 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.42	11309.40	1702.93

FIRST HYDROGRAPH POINT = 2.80 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

TIME(HRS)											
2.80	DISCHG	.00	.00	.10	1.90	11.00	14.20	14.60	15.40	16.80	19.10
4.80	DISCHG	22.20	26.50	32.30	39.70	49.00	60.30	73.60	85.20	93.50	103.70
6.80	DISCHG	116.00	127.60	130.80	134.50	138.30	141.90	146.00	149.70	153.80	489.60
8.80	DISCHG	1229.00	2464.20	3896.90	5257.50	6488.40	7660.30	8641.20	9454.30	10000.00	10350.00
10.80	DISCHG	10700.00	11000.00	11200.00	11308.80	11230.00	11020.00	10750.00	10470.00	10150.00	9861.30
12.80	DISCHG	9434.30	8995.90	8557.70	8126.30	7697.10	7274.30	6867.00	6482.30	6131.20	5829.20
14.80	DISCHG	5536.30	5253.60	4982.10	4725.10	4484.30	4260.40	4049.00	3845.60	3649.00	3456.20
16.80	DISCHG	3270.20	3103.30	2965.70	2851.10	2745.30	2649.00	2568.10	2498.10	2431.90	2354.30
18.80	DISCHG	2262.40	2170.10	2090.70	2026.40	1973.50	1927.70	1881.00	1827.50	1770.90	1719.00
20.80	DISCHG	1676.30	1644.60	1624.40	1609.10	1588.90	1560.90	1531.50	1507.00	1484.80	1456.80
22.80	DISCHG	1422.10	1393.40	1382.10	1380.80	1373.10	1353.70	1335.90	1332.60	1329.90	1299.70
24.80	DISCHG	1256.50	1197.00	1130.90	1063.90	998.70	936.60	878.00	823.20	772.10	724.50
26.80	DISCHG	680.30	639.30	601.20	571.80	552.00	533.10	515.00	497.60	481.00	465.20
28.80	DISCHG	450.00	435.50	421.60	408.20	395.50	383.20	371.50	360.40	349.70	340.60
30.80	DISCHG	332.50	324.70	317.20	310.00	303.00	296.20	289.70	283.40	277.40	271.50
32.80	DISCHG	265.90	.00								

RUNOFF VOLUME ABOVE BASEFLOW = 11.50 WATERSHED INCHES, 78820.99 CFS-HRS, 6513.77 ACRE-FEET; BASEFLOW = .00 CFS

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OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 5
LENGTH = 4100.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .37 M= 1.24

MODIFIED ATT-KIN ROUTING COEFFICIENT = .46 PEAK TRAVEL TIME = .40 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.82	11139.94	1659.93

TIME(HRS) FIRST HYDROGRAPH POINT = 2.80 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

2.80	DISCHG	.00	.00	.00	.05	.90	5.58	9.57	11.90	13.52	15.04
4.80	DISCHG	16.92	19.36	22.67	27.13	32.95	40.38	49.60	60.71	72.05	81.98
6.80	DISCHG	92.03	103.13	114.45	122.02	127.80	132.66	136.94	141.13	145.10	149.13
8.80	DISCHG	306.73	733.66	1534.74	2628.20	3845.33	5068.83	6268.44	7366.81	8333.13	9104.74
10.80	DISCHG	9681.18	10152.80	10544.97	10848.19	11061.41	11139.45	11084.16	10929.47	10716.78	10454.41
12.80	DISCHG	10179.85	9834.73	9446.43	9035.03	8614.37	8189.76	7765.98	7349.84	6948.24	6570.03
14.80	DISCHG	6227.09	5907.32	5604.70	5316.49	5042.73	4784.23	4541.74	4313.65	4096.98	3889.61
16.80	DISCHG	3688.98	3495.12	3313.74	3152.63	3013.05	2889.10	2777.96	2680.81	2596.23	2520.16
18.80	DISCHG	2443.38	2359.60	2271.88	2188.01	2113.20	2048.53	1992.60	1940.94	1888.43	1834.02
20.80	DISCHG	1780.78	1732.41	1691.76	1660.58	1636.75	1614.60	1589.74	1562.78	1536.96	1512.81
22.80	DISCHG	1486.88	1456.89	1427.50	1406.48	1394.59	1384.64	1370.32	1354.38	1344.30	1337.63
24.80	DISCHG	1320.07	1290.64	1247.29	1193.41	1133.46	1071.08	1008.83	948.26	890.37	835.62
26.80	DISCHG	784.18	736.09	691.29	649.58	613.58	585.07	561.01	539.71	520.22	502.06
28.80	DISCHG	485.00	468.80	453.38	438.67	424.56	411.11	398.19	385.83	374.06	362.78
30.80	DISCHG	352.51	343.25	334.66	326.58	318.90	311.54	304.44	297.62	291.03	284.72
32.80	DISCHG	278.60	272.72	146.48	78.67	42.25	22.69	12.19	6.55	3.51	1.89
34.80	DISCHG	1.01	.54	.29	.16	.08	.04	.02	.01	.01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 11.50 WATERSHED INCHES, 78810.72 CFS-HRS, 6512.92 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 7
LENGTH = 4600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .12 M= 1.35

MODIFIED ATT-KIN ROUTING COEFFICIENT = .40 PEAK TRAVEL TIME = .60 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	10915.49	1619.05

TIME(HRS) FIRST HYDROGRAPH POINT = 2.80 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

2.80	DISCHG	.00	.00	.00	.00	.02	.37	2.46	5.30	7.94	10.17
4.80	DISCHG	12.12	14.04	16.17	18.77	22.11	26.45	32.03	39.06	47.73	57.46
6.80	DISCHG	67.28	77.19	87.57	98.34	107.82	115.82	122.56	128.32	133.45	138.11
8.80	DISCHG	142.52	208.27	418.64	865.53	1571.31	2481.84	3517.68	4619.10	5719.30	6765.89
10.80	DISCHG	7702.38	8494.70	9158.61	9713.72	10167.97	10525.70	10771.45	10896.66	10909.80	10832.51
12.80	DISCHG	10681.12	10480.41	10221.88	9911.38	9560.48	9181.65	8784.49	8376.67	7965.52	7558.20
14.80	DISCHG	7162.53	6787.97	6435.35	6102.76	5787.93	5489.55	5207.13	4940.71	4689.63	4452.33
16.80	DISCHG	4227.01	4011.58	3804.79	3608.17	3425.77	3260.51	3111.80	2978.13	2859.08	2753.83

18.80	DISCHG	2660.27	2573.43	2487.81	2401.35	2315.93	2234.75	2160.19	2093.08	2032.16	1974.61
20.80	DISCHG	1918.32	1863.24	1810.86	1763.17	1722.09	1687.92	1658.56	1631.00	1603.69	1576.97
22.80	DISCHG	1551.28	1525.49	1498.03	1469.79	1444.44	1424.48	1408.53	1393.23	1377.68	1364.31
24.80	DISCHG	1353.63	1340.19	1320.35	1291.10	1251.98	1204.53	1151.09	1094.13	1035.72	977.52
26.80	DISCHG	920.70	866.04	814.01	764.87	718.71	676.61	639.96	608.35	580.86	556.58
28.80	DISCHG	534.75	514.83	496.40	479.17	462.95	447.58	432.98	419.05	405.75	393.06
30.80	DISCHG	380.94	369.55	359.02	349.27	340.18	331.66	323.60	315.93	308.60	301.56
32.80	DISCHG	294.82	288.32	282.08	227.78	168.08	117.69	79.65	52.64	34.18	21.90
34.80	DISCHG	13.89	8.73	5.45	3.39	2.09	1.29	.79	.48	.29	.18
36.80	DISCHG	.11	.06	.04	.02	.01	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 11.50 WATERSHED INCHES, 78811.06 CFS-HRS, 6512.95 ACRE-FEET; BASEFLOW = .00 CFS

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OPERATION REACH CROSS SECTION 4
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 5
LENGTH = 4100.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH

COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .26 M= 1.23

MODIFIED ATT-KIN ROUTING COEFFICIENT = .34 PEAK TRAVEL TIME = .60 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.97	10630.60	1580.46

TIME(HRS) FIRST HYDROGRAPH POINT = 2.80 HOURS TIME INCREMENT = .20 HOURS DRAINAGE AREA = 10.62 SQ.MI.

2.80	DISCHG	.00	.00	.00	.00	.00	.01	.13	.93	2.43	4.32
4.80	DISCHG	6.32	8.31	10.27	12.29	14.51	17.12	20.32	24.33	29.38	35.67
6.80	DISCHG	43.14	51.41	60.25	69.61	79.46	89.18	98.31	106.62	114.06	120.70
8.80	DISCHG	126.67	132.10	158.21	247.47	459.30	840.43	1403.00	2127.78	2981.65	3919.94
10.80	DISCHG	4895.36	5857.43	6761.32	7582.96	8313.25	8948.93	9489.35	9928.77	10260.50	10483.04
12.80	DISCHG	10602.82	10629.65	10578.50	10456.27	10269.52	10026.50	9736.94	9410.50	9056.17	8682.36
14.80	DISCHG	8297.07	7908.22	7524.27	7151.05	6791.76	6447.71	6119.31	5806.67	5509.88	5228.74
16.80	DISCHG	4962.64	4710.51	4470.96	4242.64	4025.18	3819.74	3628.07	3451.13	3289.01	3141.66
18.80	DISCHG	3008.73	2889.30	2781.04	2680.54	2584.85	2492.68	2404.28	2320.62	2242.63	2170.50
20.80	DISCHG	2103.36	2039.94	1979.38	1921.62	1867.31	1817.54	1773.11	1733.85	1698.60	1666.07
22.80	DISCHG	1635.53	1606.65	1578.84	1551.14	1523.26	1496.24	1471.65	1450.01	1430.55	1412.43
24.80	DISCHG	1395.94	1381.43	1367.30	1351.21	1330.61	1303.66	1269.68	1229.04	1182.80	1132.39
26.80	DISCHG	1079.31	1024.95	970.48	916.85	864.76	814.70	767.37	723.70	684.17	648.76
28.80	DISCHG	617.17	588.92	563.52	540.52	519.49	500.11	482.11	465.27	449.43	434.46
30.80	DISCHG	420.27	406.79	394.03	382.03	370.80	360.30	350.49	341.27	332.59	324.36
32.80	DISCHG	316.55	309.10	301.98	295.16	272.06	236.42	195.73	155.95	120.54	90.94
34.80	DISCHG	67.28	48.98	35.18	24.99	17.59	12.28	8.51	5.86	4.02	2.74
36.80	DISCHG	1.86	1.26	.85	.57	.38	.25	.17	.11	.07	.05
38.80	DISCHG	.03	.02	.01	.01	.00					

RUNOFF VOLUME ABOVE BASEFLOW = 11.50 WATERSHED INCHES, 78810.91 CFS-HRS, 6512.93 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 2 RECORD ID 151

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID 152

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SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

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SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 1													
XSECTION 1	REACH	10.62	6	2	.20	4.6	.00	.00	3.27	1700.28	13.29	2451.71	230.9
XSECTION 2	REACH	10.62	6	2	.20	4.6	.00	.00	3.27	1658.55	13.62	2441.35	229.9
XSECTION 3	REACH	10.62	6	2	.20	4.6	.00	.00	3.27	1618.76	14.16	2400.65	226.0
XSECTION 4	REACH	10.62	6	2	.20	4.6	.00	.00	3.27	1579.95	14.66	2369.43	223.1
ALTERNATE 1 STORM 2													
XSECTION 1	REACH	10.62	6	2	.20	2.8	.00	.00	11.50	1702.93	11.42	11309.40	1064.9
XSECTION 2	REACH	10.62	6	2	.20	2.8	.00	.00	11.50	1659.93	11.82	11139.94	1049.0
XSECTION 3	REACH	10.62	6	2	.20	2.8	.00	.00	11.50	1619.05	12.33	10915.49	1027.8
XSECTION 4	REACH	10.62	6	2	.20	2.8	.00	.00	11.50	1580.46	12.97	10630.60	1001.0

SUMMARY TABLE 2 - SELECTED MODIFIED ATT-KIN REACH ROUTINGS IN ORDER OF STANDARD EXECUTIVE CONTROL INSTRUCTIONS
(A STAR(*) AFTER VOLUME ABOVE BASE(IN) INDICATES A HYDROGRAPH TRUNCATED AT A VALUE EXCEEDING BASE + 10% OF PEAK)

		HYDROGRAPH INFORMATION							ROUTING PARAMETERS										
		INFLOW		OUTFLOW		OUTFLOW+ INTERV.AREA						Q AND A EQUATION						PEAK TRAVEL TIME	
XSEC ID	REACH LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	BASE-FLOW (CFS)	VOLUME ABOVE BASE (IN)	MAIN TIME INCR (HR)	ITER-ATION #	COFFF (X)	POWER (M)	LENGTH FACTOR (K*)	PEAK RATIO O/I (Q*)	S/Q @PEAK (K) (SEC)	ATT-KIN COEFF (C)	STOR-AGE (HR)	KINE-MATIC (HR)
ALTERNATE 1 STORM 1																			
1	900	2450	13.0	2450	13.2	---	---	0	3.26	.20	1	.138	1.49	.001	1.000	177	1.00	.20	.05
2	4100	2450	13.2	2441	13.6	---	---	0	3.27	.20	1	.123	1.51	.007	.997	781	.63	.40	.22
3	4600	2441	13.6	2400	14.2	---	---	0	3.27	.20	1	.202	1.36	.020	.983	1362	.42	.60	.38
4	4100	2400	14.2	2369	14.6	---	---	0	3.27	.20	1	.091	1.46	.014	.987	1257	.45	.40	.35
ALTERNATE 1 STORM 2																			
1	900	11309	11.2	11309	11.4	---	---	0	11.49	.20	1	.261	1.34	.002	1.000	170	1.00	.20	.05
2	4100	11309	11.4	11139	11.8	---	---	0	11.50	.20	1	.371	1.24	.030	.985	1195	.46	.40	.33
3	4600	11139	11.8	10910	12.4	---	---	0	11.50	.20	1	.120	1.35	.031	.979	1438	.40	.60	.40
4	4100	10910	12.4	10630	13.0	---	---	0	11.50	.20	1	.262	1.23	.046	.974	1741	.34	.60	.48

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SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
XSECTION 1	10.62		
ALTERNATE 1		2451.71	11309.40
XSECTION 2	10.62		
ALTERNATE 1		2441.35	11139.94
XSECTION 3	10.62		
ALTERNATE 1		2400.65	10915.49
XSECTION 4	10.62		
ALTERNATE 1		2369.43	10630.60

```
END OF   '  'OBS IN THIS RUN

@END
@END IGNORED - IN CONTROL MODE

@FIN
```

RUNID: SCS04M ACCT: 1604000101 PROJECT: SCS04

***** DISPLAYED LOG ENTRY SECTION *****
09:18:32 SCS04M FIN

***** RESOURCE UTILIZATION SECTION *****

RESOURCE TIME	CPU	IO	CCER	AVG SIZE	QUALIFIER	FILENAME	PROGRAM	VERSION
00:00:59.936	00:00:03.847	00:00:09.375	00:00:08.142	86K	SCS76	ABS	TR20	
00:00:00.375	00:00:00.000	00:00:00.351	00:00:03.723	3K	RESOURCES USED IN CONTROL MODE			
00:01:00.311	00:00:03.847	00:00:09.727	00:00:11.865	73K	SUMMARY			

IMAGES READ: 162 PAGES: 43

START: 09:18:17 AUG 10,1983 FIN: 09:18:32 AUG 10,1983

***** COST SECTION *****

CHARGES BASED ON BATCH RUN AT L PRIORITY
RT ($000.68/MIN) :$000000.68
CPU ($001.44/MIN) :$000000.09
IO ($000.75/MIN) :$000000.12
CCER($001.44/MIN) :$000000.28

ESTIMATED TOTAL COST:$000001.17

41

42

* * * * * * UNIVAC 1100 TIME/SHARING EXEC --- MULTI-PROCESSOR SYSTEM --- LEV. SB-37R2C-2G SITE * FCCC-B * * * * * *

(DES/TR66.SBDB)

DAM-BREACH ROUTING - INPUT FORM I

Sheet ___ of ___

Site

Date

1	11	21	31	41	51	61	71
Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7	

Identifying Alphameric Data (center within 72 columns)

BUCKHORN MESA WATERSHED	1
SIGNAL MUTTER FIRE + DAM BREACH ANALYSIS	2

Flow Volume (Ac Ft)	Q_{max} (CFS)
7930.	35000.

Total Ft storm runoff

Enter 0. in field 2 if Q_{max} is not furnished.

23
35

3

If Q_{max} is furnished, go to Input Form II; otherwise, continue.

Water Depth at Failure (Ft)	Reservoir Storage at Failure (Ac Ft)	Dam X-Sectional Area (Sq Ft)

Enter 0. in field 3 if x-sectional area is not furnished.

If x-sectional area is furnished, go to Input Form II, otherwise, continue.

Number of sets of X and Y coordinates defining dam x-section.

X(Ft)	Y(Ft)	X(Ft)	Y(Ft)	X(Ft)	Y(Ft)

Go to Input Form II.

DAM-BREACH ROUTING - INPUT FORM II

Sheet ___ of ___

Site

Date

1	11	21	31	41	51	61
Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7

Number of sets of depth (or elev.) and top width, TW, values for the valley section at the dam and indicator of whether depths or elevations are furnished.

No. of sets of D(or El) vs. TW	Indicator Depths = 0. Elevations = 1.
11.	1.

D or El(Ft)	TW(Ft)	D or El(Ft)	TW(Ft)	D or El(Ft)	TW(Ft)	
1694.	0.	1695.	35.	1696.	45.	4
1697.	60.	1698.	640.	1699.	915.	5
1700.	1220.	1701.	1520.	1702.	2140.	6
1703.	2140.	1704.	2140.			7

Total number of valley sections.

4. 8

Go to Input Form III.

DAM-BREACH ROUTING - INPUT FORM III

Sheet ___ of ___

Site

Date

1	11	21	31	41	51	61
Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7

Valley Section Number	Distance to Immediately Upstream Section (Ft)	No. of Sets of D(or El), X-Sect. Area, and Q
1.	0.	11.

9

D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	
1694.	0.0	0.0	1698.	940.2	2000.	10
1699.6	1588.0	4000.	1700.3	2405.4	8000.	11
1700.9	3322.9	12000.	1701.4	4018.3	16000.	12
1702.1	5351.9	24000.	1702.2	6550.1	32000.	13
1703.2	7632.4	40000.	1703.6	8493.8	48000.	14
1704.0	9336.1	56000.				15

If there are additional valley sections, go to another Input Form III.
If all valley section data is entered, continue.
If depths are furnished, this is end of data entry.
If elevations are furnished, continue.
Number of valley sections at tributaries. Enter 0. if no off-channel storage considered.

—

If no off-channel storage, this is end of data entry.
If off-channel storage is considered, go to Input Form IV.

DAM-BREACH ROUTING - INPUT FORM III

Sheet ___ of ___

Site

Date

Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7
	11	21	31	41	51	61

Valley Section Number	Distance to Immediately Upstream Section (Ft)	No. of Sets of D(or El), X-Sect. Area, and Q
2.	4100.	11.

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D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	
1656.	0.0	0.0	1657.7	1165.9	2000.	17
1658.3	1989.9	4000.	1659.1	3366.5	8000.	18
1659.6	4786.8	12000.	1660.1	6195.7	16000.	19
1660.6	8054.4	24000.	1661.0	9685.6	32000.	20
1661.3	11052.4	40000.	1661.6	12308.0	48000.	21
1661.9	13483.4	56000.				22

If there are additional valley sections, go to another Input Form III.
If all valley section data is entered, continue.
If depths are furnished, this is end of data entry.
If elevations are furnished, continue.
Number of valley sections at tributaries. Enter 0. if no off-channel storage considered.

—

If no off-channel storage, this is end of data entry.
If off-channel storage is considered, go to Input Form IV.

DAM-BREACH ROUTING - INPUT FORM III

Sheet ___ of ___

Site

Date

1	11	21	31	41	51	61
Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 7

Valley Section Number	Distance to Immediately Upstream Section (Ft)	No. of Sets of D(or El), X-Sect. Area, and Q
3.	4200.	11.

23

D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	
1616.0	0.0	0.0	1617.6	1288.1	2000.	24
1618.0	2058.2	4000.	1618.7	4287.7	8000.	25
1619.0	5580.7	12000	1619.3	6862.3	16000.	26
1619.7	9054.0	24000.	1620.1	11139.5	32000.	27
1620.4	13041.1	40000.	1620.6	14166.4	48000.	28
1620.9	15400.8	56000.				29

If there are additional valley sections, go to another Input Form III.
If all valley section data is entered, continue.
If depths are furnished, this is end of data entry.
If elevations are furnished, continue.
Number of valley sections at tributaries. Enter 0. if no off-channel storage considered.

If no off-channel storage, this is end of data entry.
If off-channel storage is considered, go to Input Form IV.

DAM-BREACH ROUTING - INPUT FORM III

Sheet ___ of ___

Site

Date

Field 1	Field 2 (11)	Field 3 (21)	Field 4 (31)	Field 5 (41)	Field 6 (51)	Field 7 (61)

Valley Section Number	Distance to Immediately Upstream Section (Ft)	No. of Sets of D(or El), X-Sect. Area, and Q
4.0	4100.	11.

30

D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	D or El (Ft)	X-Sect. Area (Sq Ft)	Discharge (CFS)	
1578.0	0.0	0.0	1579.2	2145.7	2000.	31
1579.5	3395.3	4000.	1579.8	5168.6	8000.	32
1580.0	6599.3	12000.	1580.2	8448.7	16000.	33
1580.5	11237.3	24000.	1580.8	13396.2	32000.	34
1581.0	15000.3	40000.	1581.1	16438.8	48000.	35
1581.3	17595.9	56000.				36

If there are additional valley sections, go to another Input Form III.
If all valley section data is entered, continue.
If depths are furnished, this is end of data entry.
If elevations are furnished, continue.
Number of valley sections at tributaries. Enter 0. if no off-channel storage considered.

0.0 37

If no off-channel storage, this is end of data entry.
If off-channel storage is considered, go to Input Form IV.

DAM-BREACH ROUTING
ROUTING USES PROCEDURES IN TR-66 (REV. 1)

COMPUTER PROGRAM PREPARED BY THE DESIGN UNIT, NATIONAL ENGINEERING STAFF AT LANHAM, MARYLAND

(1)

EXECUTION DATE: 08/10/83

SIGNAL BUTTE
TR-66
QMAX = 35000 CFS
VOL = 2822 AC-FT
(MAX. VOL TO TOP OF DAM)

PRINTOUT OF INPUT

BUCKHORN MESA WATERSHED 1

SIGNAL BUTTE FRS -DAM BREACH ANALYSIS 2

THE MAXIMUM BREACH DISCHARGE = 35000. CFS

THE ASSUMED TOTAL VOLUME OF FLOW FROM THE BREACH = 2822. ACRE FEET

---------- ELEVATION VS TOP WIDTH FOR VALLEY SECTION AT THE DAM ----------

ELEV.(FT)	TOP WIDTH(FT)
1694.0	0.
1695.0	35.
1696.0	45.
1697.0	60.
1698.0	640.
1699.0	915.
1700.0	1220.
1701.0	1520.
1702.0	2140.
1703.0	2140.
1704.0	2140.

---------- ELEVATIONS, X-SECTIONAL AREAS, AND DISCHARGES FOR VALLEY SECTIONS ----------

VALLEY SECTION # 1
SECTION AT THE DAM

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1694.0	0.	0.
1699.0	940.	2000.
1699.6	1538.	4000.
1700.3	2405.	8000.
1700.9	3323.	12000.
1701.4	4018.	16000.
1702.1	5352.	24000.
1702.7	6550.	32000.
1703.2	7632.	40000.
1703.6	8494.	48000.
1704.0	9336.	56000.

VALLEY SECTION # 2
DISTANCE SECT 1 TO 2 = 4100. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1656.0	0.	0.
1657.5	1166.	2000.
1658.3	1990.	4000.
1659.1	3367.	8000.
1659.6	4787.	12000.
1660.1	6196.	16000.
1660.6	8054.	24000.
1661.0	9686.	32000.
1661.3	11057.	40000.
1661.6	12308.	48000.
1661.9	13483.	56000.

VALLEY SECTION # 3
DISTANCE SECT 2 TO 3 = 4200. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1616.0	0.	0.
1617.6	1288.	2000.
1618.0	2080.	4000.
1618.7	4288.	8000.
1619.0	5581.	12000.
1619.3	6862.	16000.
1619.7	9054.	24000.
1620.1	11140.	32000.
1620.4	13041.	40000.
1620.6	14166.	48000.
1620.9	15901.	56000.

VALLEY SECTION # 4
DISTANCE SECT 3 TO 4 = 4100. FT

1578.0	0.	0.
157[redacted]	[redacted]146[redacted]	[redacted]0.
1579.5	3395.	4000.
1579.8	5169.	8000.
1580.0	6599.	12000.
1580.2	8449.	16000.
1580.5	11237.	24000.
1580.8	13396.	32000.
1581.0	15070.	40000.
1581.1	16439.	48000.
1581.3	17596.	56000.

CALCULATED RESULTS

THE FLOW IN THE VALLEY IMMEDIATELY DOWNSTREAM FROM THE DAM IS SUBCRITICAL.

RESULTS OF DAM-BREACH ROUTING

SECTION NO.	PEAK DISCHARGE AT THE SECTION (CFS)	MAXIMUM ELEVATION OF WATER SURFACE AT SECTION (FEET)	IN RELATION Q = K*S**M	
			M	K
1	35000.			
2	25000.	1660.6	1.522	1.1533E-07
3	19000.	1619.5	1.462	9.4792E-08
4	14800.	1580.1	1.452	5.4438E-08

DAM-BREACH ROUTING
ROUTING USES PROCEDURES IN TR-66 (REV. 1)

COMPUTER PROGRAM PREPARED BY THE DESIGN UNIT, NATIONAL ENGINEERING STAFF AT LANHAM, MARYLAND

SIGNAL BUTTE
TR-66
Q_{max} = 35000 CFS
VOL = 7930 AC-FT
(INCLUDES TOTAL INFLOW FOR FBH)

1

EXECUTION DATE: 08/10/83

PRINTOUT OF INPUT

BUCKHORN MESA WATERSHED 1

SIGNAL BUTTE FRS -DAM BREACH ANALYSIS 2

THE MAXIMUM BREACH DISCHARGE = 35000. CFS

THE ASSUMED TOTAL VOLUME OF FLOW FROM THE BREACH = 7930. ACRE FEET

---------- ELEVATION VS TOP WIDTH FOR VALLEY SECTION AT THE DAM ----------

ELEV.(FT)	TOP WIDTH(FT)
1694.0	0.
1695.0	35.
1696.0	45.
1697.0	60.
1698.0	640.
1699.0	915.
1700.0	1220.
1701.0	1520.
1702.0	2140.
1703.0	2140.
1704.0	2140.

---------- ELEVATIONS, X-SECTIONAL AREAS, AND DISCHARGES FOR VALLEY SECTIONS ----------

VALLEY SECTION # 1
SECTION AT THE DAM

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1694.0	0.	0.
1699.0	940.	2000.
1699.6	1538.	4000.
1700.3	2405.	8000.
1700.9	3323.	12000.
1701.4	4018.	16000.
1702.1	5352.	24000.
1702.7	6550.	32000.
1703.2	7632.	40000.
1703.6	8494.	48000.
1704.0	9336.	56000.

VALLEY SECTION # 2
DISTANCE SECT 1 TO 2 = 4100. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1656.0	0.	0.
1657.5	1166.	2000.
1658.3	1990.	4000.
1659.1	3367.	8000.
1659.6	4787.	12000.
1660.1	6196.	16000.
1660.6	8054.	24000.
1661.0	9686.	32000.
1661.3	11057.	40000.
1661.6	12308.	48000.
1661.9	13483.	56000.

VALLEY SECTION # 3
DISTANCE SECT 2 TO 3 = 4200. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1616.0	0.	0.
1617.6	1288.	2000.
1618.0	2080.	4000.
1618.7	4288.	8000.
1619.0	5581.	12000.
1619.3	6862.	16000.
1619.7	9054.	24000.
1620.1	11140.	32000.
1620.4	13041.	40000.
1620.6	14166.	48000.
1620.9	15901.	56000.

VALLEY SECTION # 4
DISTANCE SECT 3 TO 4 = 4100. FT

ELEV.(FT)	AREA(SQ.FT)	VOLUME
1578.0	0.	0.
157[redacted]	[redacted]214[redacted]	[redacted]0.
1579.	3395.	4000.
1579.8	5169.	8000.
1580.0	6599.	12000.
1580.2	8449.	16000.
1580.5	11237.	24000.
1580.8	13396.	32000.
1581.0	15070.	40000.
1581.1	16439.	48000.
1581.3	17596.	56000.

2

CALCULATED RESULTS

THE FLOW IN THE VALLEY IMMEDIATELY DOWNSTREAM FROM THE DAM IS SUBCRITICAL.

RESULTS OF DAM-BREACH ROUTING

SECTION NO.	PEAK DISCHARGE AT THE SECTION (CFS)	MAXIMUM ELEVATION OF WATER SURFACE AT SECTION (FEET)	IN RELATION Q = K*S**M	
			M	K
1	35000.			
2	30000.	1660.9	1.543	7.9119E-08
3	26200.	1619.8	1.467	8.5988E-08
4	23000.	1580.5	1.496	2.4175E-08

```
*A  END  JOB 4620 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.23.17 PM 10 AUG 83  R167.PR1  SYS M303  END   A*
*A  END  [redacted] 4620 SCS[redacted]66 0[redacted] 0001 [redacted]0167 [redacted]AZ T[redacted] [redacted] [redacted]C R[redacted] 12.23.17 [redacted] 10 A[redacted] 83 [redacted].PR1 [redacted]S [redacted] [redacted] A* [redacted]
*A  END  [redacted] 4620 SCS[redacted]66 0[redacted] 0001 [redacted]0167 [redacted]AZ T[redacted] [redacted] [redacted]C R[redacted] 12[redacted].17 [redacted] 10 A[redacted] 83 [redacted].PR1 [redacted]S [redacted] [redacted] A* [redacted]
*A  END  [redacted] 4620 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.23.17 PM 10 AUG 83  R167.PR1  SYS M303  [redacted] A*
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(3)

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*A START JOB 4628 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.23.28 PM 10 AUG 83  R167.PR1  SYS M303 START  A*
[redacted]
*A STAR[illegible] 4628 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.23.28 PM 10 AUG 83  R167.PR1  SYS M303 [illegible]  A*
*A START[illegible] 4628 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.23.28 PM 10 AUG 83  R167.PR1  SYS M303 [illegible]RT  A*
*****************************************************************
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WCC SECURITY MESSAGE

UNDER THE PRIVACY ACT OF 1974, ALL DATA OF A PRIVACY NATURE MUST BE PROTECTED FROM UNAUTHORIZED DISCLOSURE. YOU ARE RESPONSIBLE FOR THE PRIVACY OF THIS DATA.

4

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

06/22/83-1235-#3403
WCC CLASSES - "INTRODUCTION TO SAS"
              DATE:    AUGUST 16-19, 1983
              TIME:    1230-1630 HOURS
              PLACE:   WCC CONFERENCE ROOM S-165
              TUITION: $180 PER STUDENT
*RESERVATIONS CAN BE MADE AT THE HELP DESK ON 447-7975*

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

1

SIGNAL LITTLE FIS
TR-66
Q_{max} = 55,000 CFS
VOL = 7930 AC-FT
(INCLUDES TOTAL INFLOW
OF FBH)

(NOTE THE RUN WITH:
Q_{max} = 55000 CFS
VOL = 2824 AC-FT
IS ALSO A PART
OF THIS OUTPUT

DAM-BREACH ROUTING
ROUTING USES PROCEDURES IN TR-66 (REV. 1)

COMPUTER PROGRAM PREPARED BY THE DESIGN UNIT, NATIONAL ENGINEERING STAFF AT LANHAM, MARYLAND

EXECUTION DATE: 08/10/83

PRINTOUT OF INPUT

BUCKHORN MESA WATERSHED 1

SIGNAL BUTTE FRS -DAM BREACH ANALYSIS 2

(2)

THE MAXIMUM BREACH DISCHARGE = 55000. CFS

THE ASSUMED TOTAL VOLUME OF FLOW FROM THE BREACH = 7930. ACRE FEET

---------- ELEVATION VS TOP WIDTH FOR VALLEY SECTION AT THE DAM ----------

ELEV.(FT)	TOP WIDTH(FT)
1694.0	0.
1695.0	35.
1696.0	45.
1697.0	60.
1698.0	640.
1699.0	915.
1700.0	1220.
1701.0	1520.
1702.0	2140.
1703.0	2140.
1704.0	2140.

---------- ELEVATIONS, X-SECTIONAL AREAS, AND DISCHARGES FOR VALLEY SECTIONS ----------

VALLEY SECTION # 1
SECTION AT THE DAM

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1694.0	0.	0.
1699.0	940.	2000.
1699.6	1538.	4000.
1700.3	2405.	8000.
1700.9	3323.	12000.
1701.4	4018.	16000.
1702.1	5352.	24000.
1702.7	6550.	32000.
1703.2	7632.	40000.
1703.6	8494.	48000.
1704.0	9336.	56000.

VALLEY SECTION # 2
DISTANCE SECT 1 TO 2 = 4100. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1656.0	0.	0.
1657.5	1166.	2000.
1658.3	1990.	4000.
1659.1	3367.	8000.
1659.6	4787.	12000.
1660.1	6196.	16000.
1660.6	8054.	24000.
1661.0	9686.	32000.
1661.3	11057.	40000.
1661.6	12308.	48000.
1661.9	13483.	56000.

VALLEY SECTION # 3
DISTANCE SECT 2 TO 3 = 4200. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1616.0	0.	0.
1617.6	1288.	2000.
1618.0	2080.	4000.
1618.7	4288.	8000.
1619.0	5581.	12000.
1619.3	6862.	16000.
1619.7	9054.	24000.
1620.1	11140.	32000.
1620.4	13041.	40000.
1620.6	14166.	48000.
1620.9	15901.	56000.

VALLEY SECTION # 4
DISTANCE SECT 3 TO 4 = 4100. FT

1578.0	0.	0.
1579.2	2146.	2000.
15[illegible]	339[illegible]	[illegible]0.
1579.[illegible]	5169.	8000.
1580.0	6599.	12000.
1580.2	8449.	16000.
1580.5	11237.	24000.
1580.8	13396.	32000.
1581.0	15070.	40000.
1581.1	16439.	48000.
1581.3	17596.	56000.

3

CALCULATED RESULTS

THE FLOW IN THE VALLEY IMMEDIATELY DOWNSTREAM FROM THE DAM IS SUBCRITICAL.

RESULTS OF DAM-BREACH ROUTING

SECTION NO.	PEAK DISCHARGE AT THE SECTION (CFS)	MAXIMUM ELEVATION OF WATER SURFACE AT SECTION (FEET)	IN RELATION Q = K*S**M	
			M	K
1	55000.			
2	45300.	1661.5	1.680	7.3156E-09
3	38000.	1620.3	1.763	3.8908E-10
4	32500.	1580.8	1.596	3.7432E-09

```
*A  END  JOB 4628 SCS54T66 0001 0001 R0167   AZ TR-66   WCC RJ167  12.23.56 PM 10 AUG 83  R167.PR1  SYS M303  END  A*
*A  END  JOB 4628 SCS54T66 0001 0001 R0167   AZ TR-66   WCC RJ167  12.23.56 PM 10 AUG 83  R167.PR1  SYS M303  END  A*
*A  END  JOB 4628 SCS54T66 0001 0001 R0167   AZ TR-66   WCC RJ167  12.23.56 PM 10 AUG 83  R167.PR1  SYS M303  END  A*
*A  END  JOB 4628 SCS54T66 0001 0001 R0167   AZ TR-66   WCC RJ167  12.23.56 PM 10 AUG 83  R167.PR1  SYS M303  END  A*
*A  END  JOB 4628 SCS54T66 0001 0001 R0167   AZ TR-66   WCC RJ167  12.23.56 PM 10 AUG 83  R167.PR1  SYS M303  END  A*
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4

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*A START JOB 4632 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.24.15 PM 10 AUG 83  R167.PR1  SYS M303 START  A*
[redacted]
*A STAR      4632 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.24.15 PM 10 AUG 83  R167.PR1  SYS M303        A*
*A START     4632 SCS54T66 0001 0001 R0167    AZ TR-66          WCC RJ167  12.24.15 PM 10 AUG 83  R167.PR1  SYS M303        A*
*****************************************************************
*****************************************************************
```

WCC SECURITY MESSAGE

UNDER THE PRIVACY ACT OF 1974, ALL DATA OF A PRIVACY
NATURE MUST BE PROTECTED FROM UNAUTHORIZED DISCLOSURE.
YOU ARE RESPONSIBLE FOR THE PRIVACY OF THIS DATA.

5

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

06/22/83-1235-#3403
WCC CLASSES - "INTRODUCTION TO SAS"
              DATE:     AUGUST 16-19, 1983
              TIME:     1230-1630 HOURS
              PLACE:    WCC CONFERENCE ROOM S-165
              TUITION:  $180 PER STUDENT
*RESERVATIONS CAN BE MADE AT THE HELP DESK ON 447-7975*

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

```
12.24.10      4632  $HASP373 SCS54T66 STARTED - INIT  2 - CLASS C1   VS M303
12.24.12 JOB 4632   **** 83222                RJ167  SCS54T66  COST---$        .16 ****
12.24.12 JOB 4632  $HASP395 SCS54T66 ENDED

------ JES2 JOB STATISTICS ------

 10 AUG 83 JOB EXECUTION DATE

        47 CARDS READ

       197 SYSOUT PRINT RECORDS

         0 SYSOUT PUNCH RECORDS

      0.03 MINUTES EXECUTION TIME
```

6

```
1   //SCS54166 JOB (                    ,RJIG7),'AZ TK-66',TIME=(0,25),CLASS=C,
     PRTY=3,MSGLEVEL=(1,1)
    [redacted]NID [redacted]S54[redacted] $A[redacted]70 L[redacted]ID [redacted]ESS[redacted] S([redacted])
    *PASSWORD  $ACF1770 PASSWORD(S) SUCCESSFULLY SCANNED
    ***ROUTE  PRINT RMT167
2   //STEP1 EXEC SCSDAMBR
3   XXSCSDAMBR PROC NAME='SCS05.OPEN.DAMBRECH.LOAD',PROG=DAMBRECH
    ***
    ***                          ( SCSDAMBR )
    ***
    ***
    *** ************************************************************
    *** PROC REVISION DATE  -  05/27/82
    *** PROC CREATED BY     -  SOIL CONSERVATION SERVICE
    ***                        SERVICE DOCUMENTATION CENTER (SDC)
    ***                        MANAGEMENT SERVICES STAFF
    ***                        LANHAM , MARYLAND  (NATIONAL OFF.)
    ***
    ***      CONTACTS       -  RICHARD ROBERTS, CAMILLE WEAVER
    ***                        FTS/COM  (301) 436-6676
    *** ************************************************************
    ***
    ***       THESE ARE THE JCL'S FOR THE DESIGN UNIT, NATIONAL
    ***      ENGINEERING STAFF VERSION OF THE PROGRAM FOR
    ***      DAM-BREACH ROUTING ACCORDING TO TR-66 (REV. 1).  THE
    ***      PROGRAM WILL BE KNOWN AS (DAMBR).  AS THIS PROGRAM CHANGES,
    ***      THIS PROC WILL REFLECT THE NEW VERSION.
    *** ************************************************************
    ***
    ***      TO EXECUTE THIS PROC, CREATE THE FOLLOWING JCL'S :
    ***
    ***      //STEP1  EXEC  SCSDAMBR
    ***      //DAMBR.INPUT DD *
    ***           ***************
    ***          *   DATA       *
    ***          *   HERE       *
    ***           ***************
    ***      /*
    ***      //
    ***
    *** ************************************************************
    ***
4   XXDAMBR EXEC PGM=&PROG
5   XXSTEPLIB DD DSN=&NAME,DISP=SHR
6   XXFT05F001 DD DDNAME=INPUT
7   XXFT06F001 DD SYSOUT=A
8   XXFT08F001 DD SYSOUT=A
9   //DAMBR.INPUT DD *
    //
```

7

```
 STMT NO  MESSAGE
    4       IEF653I SUBSTITUTION JCL - PGM=DAMBRECH
    5       IEF653I SUBSTITUTION JCL - DSN=SCS05.OPEN.DAMBRECH.LOAD,DISP=SHR
IEF236I ALLOC. FOR SCS54T66 DAMBR STEP1
IEF237I 403  ALLOCATED TO STEPLIB
IEF237I 1B5  ALLOCATED TO SYS00464
IEF237I JES2 ALLOCATED TO FT05F001
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I JES2 ALLOCATED TO FT08F001
IEF142I SCS54T66 DAMBR STEP1 - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SCS05.OPEN.DAMBRECH.LOAD                        KEPT
IEF285I   VOL SER NOS= STOR42.
IEF285I   SYSCTLG.VSYSM06                                 KEPT
IEF285I   VOL SER NOS= SYSM06.
IEF285I   JES2.JOB04632.STO101                            SYSIN
IEF285I   JES2.JOB04632.S00102                            SYSOUT
IEF285I   JES2.JOB04632.S00103                            SYSOUT
IEF373I STEP /DAMBR   / START 83222.1224
IEF374I STEP /DAMBR   / STOP  83222.1224 CPU    0MIN 00.14SEC SRB    0MIN 00.01SEC VIRT   156K SYS   216K
IEF375I  JOB /SCS54T66/ START 83222.1224
IEF376I  JOB /SCS54T66/ STOP  83222.1224 CPU    0MIN 00.14SEC SRB    0MIN 00.01SEC
****** $       .16  APPROXIMATE JOB COST -- RATES AS OF  OCT  1, 1982            **3033**
JOB LOG NUMBER -- 12235581 83222
```

DAM-BREACH ROUTING
ROUTING USES PROCEDURES IN TR-66 (REV. 1)

COMPUTER PROGRAM PREPARED BY THE DESIGN UNIT, NATIONAL ENGINEERING STAFF AT LANHAM, MARYLAND

(9)

EXECUTION DATE: 08/10/83

SIGNAL BUTTE FRS
TR-66
Qmax = 55,000 CFS
VOL = 2822 AC FT
(MAX VOL TO TOP OF DAM)

PRINTOUT OF INPUT

BUCKHORN MESA WATERSHED 1

SIGNAL BUTTE FRS -DAM BREACH ANALYSIS 2

THE MAXIMUM BREACH DISCHARGE = 55000. CFS

THE ASSUMED TOTAL VOLUME OF FLOW FROM THE BREACH = 2822. ACRE FEET

ELEVATION VS TOP WIDTH FOR VALLEY SECTION AT THE DAM

ELEV.(FT)	TOP WIDTH(FT)
1694.0	0.
1695.0	35.
1696.0	45.
1697.0	60.
1698.0	640.
1699.0	915.
1700.0	1220.
1701.0	1520.
1702.0	2140.
1703.0	2140.
1704.0	2140.

ELEVATIONS, X-SECTIONAL AREAS, AND DISCHARGES FOR VALLEY SECTIONS

VALLEY SECTION # 1
SECTION AT THE DAM

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1694.0	0.	0.
1699.0	940.	2000.
1699.6	1538.	4000.
1700.3	2405.	8000.
1700.9	3323.	12000.
1701.4	4018.	16000.
1702.1	5352.	24000.
1702.7	6550.	32000.
1703.2	7632.	40000.
1703.6	8494.	48000.
1704.0	9336.	56000.

VALLEY SECTION # 2
DISTANCE SECT 1 TO 2 = 4100. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1656.0	0.	0.
1657.5	1166.	2000.
1658.3	1990.	4000.
1659.1	3367.	8000.
1659.6	4787.	12000.
1660.1	6196.	16000.
1660.6	8054.	24000.
1661.0	9686.	32000.
1661.3	11057.	40000.
1661.6	12308.	48000.
1661.9	13483.	56000.

VALLEY SECTION # 3
DISTANCE SECT 2 TO 3 = 4200. FT

ELEV.(FT)	AREA(SQ FT)	Q(CFS)
1616.0	0.	0.
1617.6	1288.	2000.
1618.0	2080.	4000.
1618.7	4288.	8000.
1619.0	5581.	12000.
1619.3	6862.	16000.
1619.7	9054.	24000.
1620.1	11140.	32000.
1620.4	13041.	40000.
1620.6	14166.	48000.
1620.9	15901.	56000.

VALLEY SECTION # 4
DISTANCE SECT 3 TO 4 = 4100. FT

1578.0	0.	0.
1[redacted]	[redacted] 21[redacted]	[redacted]00.
1579.[redacted]	3395.	4000.
1579.6	5169.	8000.
1580.0	6599.	12000.
1580.2	8449.	16000.
1580.5	11237.	24000.
1580.8	13396.	32000.
1581.0	15070.	40000.
1581.1	16439.	48000.
1581.3	17596.	56000.

10

CALCULATED RESULTS

THE FLOW IN THE VALLEY IMMEDIATELY DOWNSTREAM FROM THE DAM IS SUBCRITICAL.

RESULTS OF DAM-BREACH ROUTING

SECTION NO.	PEAK DISCHARGE AT THE SECTION (CFS)	MAXIMUM ELEVATION OF WATER SURFACE AT SECTION (FEET)	IN RELATION Q = K*S**M	
			M	K
1	55000.			
2	36100.	1661.2	1.610	2.4676E-08
3	25900.	1619.8	1.476	7.3712E-08
4	19000.	1580.3	1.461	4.6287E-08

Effect of CAP Canal on Emergency Spillway

and Breached Hydrographs

Signal Butte FRS, Buckhorn Mesa Watershed

It is ~~somewhat~~ difficult to determine the exact effect of the Central Arizona Project Canal on the emergency spillway and breach hydrographs of the Signal Butte FRS. The analysis has to be based on certain basic assumptions. For instance, will the CAP embankments fail (i.e. breach) when and if they are overtopped? At what location is it most likely to fail? What is the capacity of the failed section? How much flood storage is available in the CAP Canal? etc?

In this analysis, the assumptions varied based on the magnitude of the flood analized. For the ESH, it was assumed that the overchutes at Station 427+15, 429+20 and 456+50 would function at an average rate of about 1000 cfs (Note, total design capacity of these structures is 1400 cfs) 1/ for about 12 hours based on the computed hydrograph at X-Section No. 4. This gives a total volume of: (12 hrs)(1000 cfs)(.08264) = 992 ac-ft. The available storage capacity in the Canal was estimated at 982 ac-ft. This latter volume was computed assuming a freeboard depth of 10 feet 2/ and an effective canal length of about nine miles, i.e., the distance between the control gate located at mile post 197.999 (near University) and the one to the southeast at mile post 207.214. The total controlled volume then is 1974 acre feet and

1/ See attached Table 7-3
2/ See attached Exhibit 7-4

exceeds the total volume (1850 ac. ft.) of the ESH. Thus it is theorized that with the ESH, the CAP would control the total discharge from the FRS and limit flows passing downstream of the CAP to overchutes at Stations 427+15, 429+20, 456+50, with a maximum discharge of 1400 cfs. Ponding, of course, would occur upstream of the overchutes causing overtopping of the upstream Canal embankment in the vicinity of Stations 427+15 and 429+20. This analysis assumes "non-storm" conditions downstream of the dam.

For the FBH, the conditions would be very similar to that described above except the total volume (6514 ac-ft) could neither be stored in the CAP nor pass through the overchute structures. The flow estimated to pass through the ovechutes was calculated at about 3250 ac-ft based on the capacities of the overchutes located at Stations 427+15, 429+20, 456+50 and 471+03. The total capacity of these structures is about 2885 cfs (Table 7-3), with a flow duration of 10 to 12 hours at maximum capacity and continuing several more hours at a lesser rate. Thus, the CAP would regluate about 4232 acre-feet, but nearly 2300 acre-feet would overtop the Canal on its south side and continue downstream. Exactly where the overtopping will occur is hard to perdict, but the most logical point would be near Station 456+50 since there is a major bend in the Canal at this point and ponding will tend to occur upstream of Canal at this location due to its alignment. This is also the location where water exited the CAP during the historical flood of July 17-18, 1984. Ponded depths near Station 456+50 could be as much as 10 to 12 feet. The area inundated downstream of the Canal would not be much different than that projected ignoring the effects of the CAP, although the total peak might be attenduated to some extent due to the available storage in the CAP.

It should be recognized, however, should the CAP Canal breach at Station 456+50 due to the overtopping, a large volume (at least 858 acre-feet, which

is the storage below normal depth between the two designated control gates) could be added to the downstream hydrograph. A breach would also tend to concentrate the flow rather the than it being spread out over a wide area.

With reference to the FRS breach hydrographs, the effect of the CAP on flows downstream of the Canal is dependent to some extent on the total volume assumed to be under in the hydrograph; that is conditions assuming flow or no inflow into the structure. Under the "without" inflow conditions, the total volume to the top of dam is only about 2822 ac-ft. About one-third of this volume could be stored in the Canal. This could attenduate the peak discharge to some extent if it was assumed that the downstream canal embankment did not fail. With a 19000 cfs peak discharge at X-Section No. 4, however, I believe it is more logical to assume that the Canal will be overtopped and breached and flow will continue downstream almost unimpeded. The exact location of the breach is again hard to predict, but Station 456+50 is a logical location. The breach would cause the volume to increase under the hydrograph, but its effect I think would be minimal with reference to depth or area inundated due to the unconfined conditions of the flow. Thus, under this condition (i.e. with flow through the overchutes and the projected overtopping) the area inundated downstream of the Canal would be about the same as that delineated ignoring the effect of the Canal. Depths immediately downstream of the CAP breach might be somewhat greater, but these would soon be disipated as the water spreads out over a wide area. The area of major depths and damages would be similar to that experienced below the CAP during the July 17-18, 1984 flood.

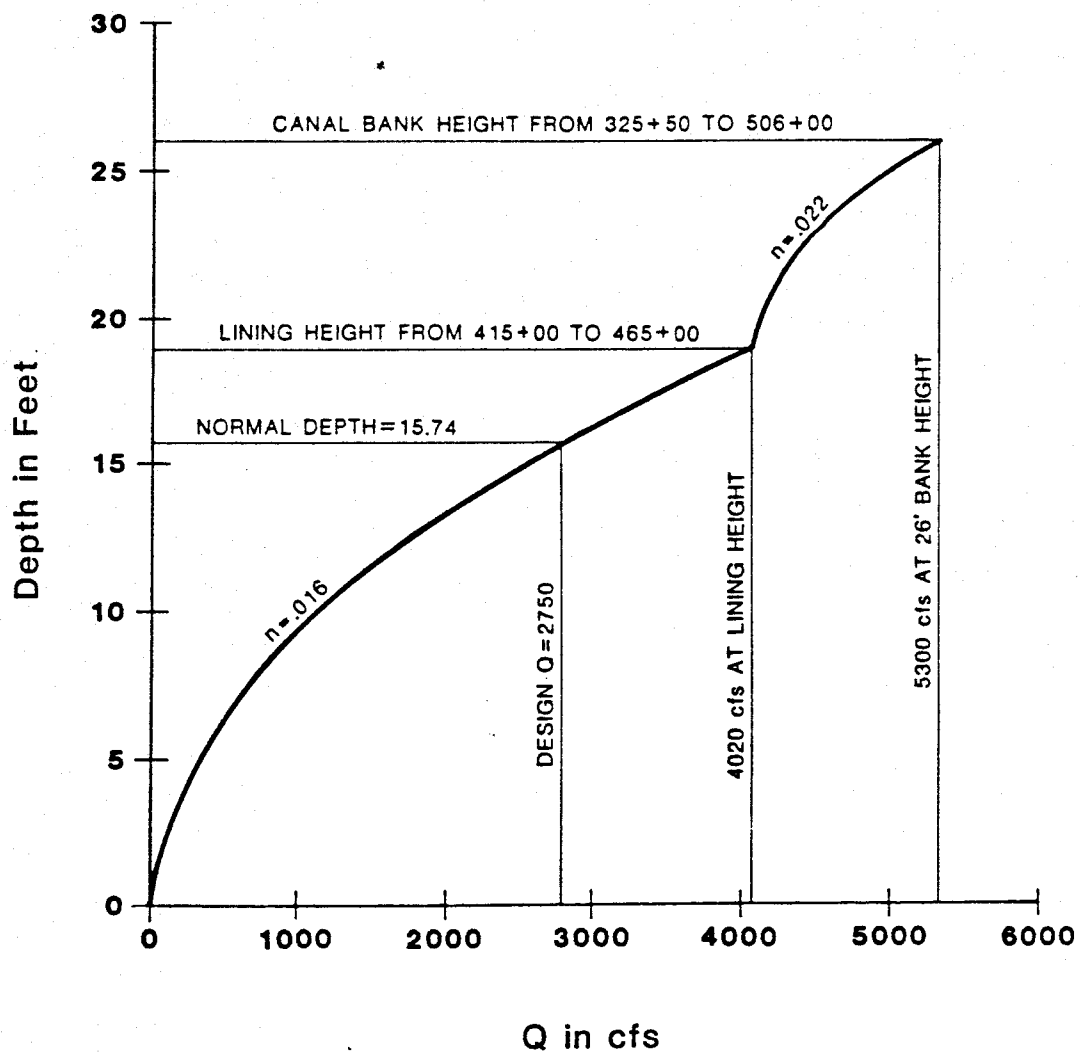
Should inflow to the FRS be assumed with the breach, the only difference in the above discription would be to remove any doubt about overtopping and breaching of the CAP Canal. With the larger volume of water, breaching of the

CAP would almost be a certainity. Again the area inundated downstream of the Canal would be about the same as presently delineated, although it could be enlarged due to the spreading effect of the CAP. Water could be transported by the CAP to the southeast and overtop the Canal at a point further downstream. However, to predict a location is almost impossible, therefore, I suggest leaving the inundation map as originally delineated.

In conclusion, the CAP Canal definitely will have some effect on any emergency spillway or breach hydrograph discharge occurring from the Signal Butte FRS. The effect on the ESH will be to limit discharges downstream of the CAP to those which will pass through the overchutes structures located at Stations 427+15, 429+20 and 456+50. The total design capacity of these structures is 1400 cfs. Although this is a decrease from the 2369 cfs estimated at X-Section No. 4, the area inundated downstream of the CAP should remain about the same, although the depths will be decreased to some extent. Since the maximum capacity at Station 456+50 is only 270 cfs, this flow should be contain within the channel downstream of the CAP, and not inundate any additional land. Some minor ponding also will occur upstream of the CAP in the vicinity of the designated structures under this flow condition.

For the FBH and breach hydrographs, it is assumed that the CAP embankments will overtop and breach near Station 456+50 and at other possible locations. Thus, with flow through the overchutes, the area inundated downstream of the CAP will be almost the same as estimated ignoring the effect of the Canal. Ponding will occur upstream of the CAP to the height of the maintence road embankment with average depths of about 4 feet, but with possible depths as high as 10 to 12 feet in the vicinity of Station 456+50.

AQUEDUCT RATING CURVE



Source: U.S. Bureau of Reclamation, "Assessment of Flood Damages, Salt-Gila Aqueduct Reach 1B, July 17-18, 1985", by International Engineering Co. Inc.

EXHIBIT 7-4

TABLE 7-3

CASE III

DISCHARGE HYDROGRAPHS

Structure		Case III				Bureau[1] Original Design		
		Drainage Area *		Discharge		Drainage Area	Discharge	
No.	Station	Designation	Area (sq mi)	Peak (cfs)	Volume (ac-ft)	(sq mi)	Peak (cfs)	Volume (ac-ft)
1	345+30	1A	0.40	436	31	0.40	460	27
2	374+00	2A	0.87	887	67	0.82	870	60
3	396+40	3A	0.76	762	58	0.76	800	51
4	427+15	4A+4B+4D	1.88	530*	72*	1.73	565*	59*
5	429+20							
6	456+50	10A	0.19	286	15	0.19	270	13
7	471+03	5A	1.67	889	128	1.67	910	113
8	479+00	6A	2.28	543*	87*	2.26	575*	52*
9	504+25							
10	529+50	7A	3.17	803*	121*	3.10	840*	105*
11	542+50							
12	552+50	8A	4.06	778*	154*	3.99	760*	135*
13	563+50							
14	574+50	9A	0.66	401	50	0.62	400	42

Total 3460 CFS

Effected by Sigma Butte Breach outflows

Source: U.S. Bureau of Reclamation, "Assessment of Flood Damages, Salt-Gila Aqueduct Reach 1B, July 17-18, 1984," by International Engineering Co. Inc.

(1) Reference 7

* per each structure

COMPUTATION SHEET
SCS-ENG-5220
Rev. 8-69

SOIL CONSERVATION SERVICE

STATE: Ariz
PROJECT: Buckhorn Mesa W/S
BY: Hem
DATE: 4/30/85
CHECKED BY:
DATE:
SUBJECT: Sisters Butte Floodway Breach Analysis
SHEET ___ OF ___

Available Storage Volume of CAP Aqueduct.

1. Esti Vol. of Available Freeboard Storage Bet Control Gate @ Mile Post 197.999 and Mile 207.214 (i.e. From Stv. Nv. University Dr. Southeast 9.215 miles)

Given:

CAP BW = 24'
S:S = 1½:1
Nor Depth = 15.74' (use 16')
Total Depth = 26' (To top of Main. Rd)

Find Vol to D = 16'

A = 768.0 □'
TW = 72'

$$Vol = \frac{(768\ \square')(9.215\ miles)(5280\ ft/mi)}{43560\ ft/Ac\ ft} = 858\ AC\ FT$$

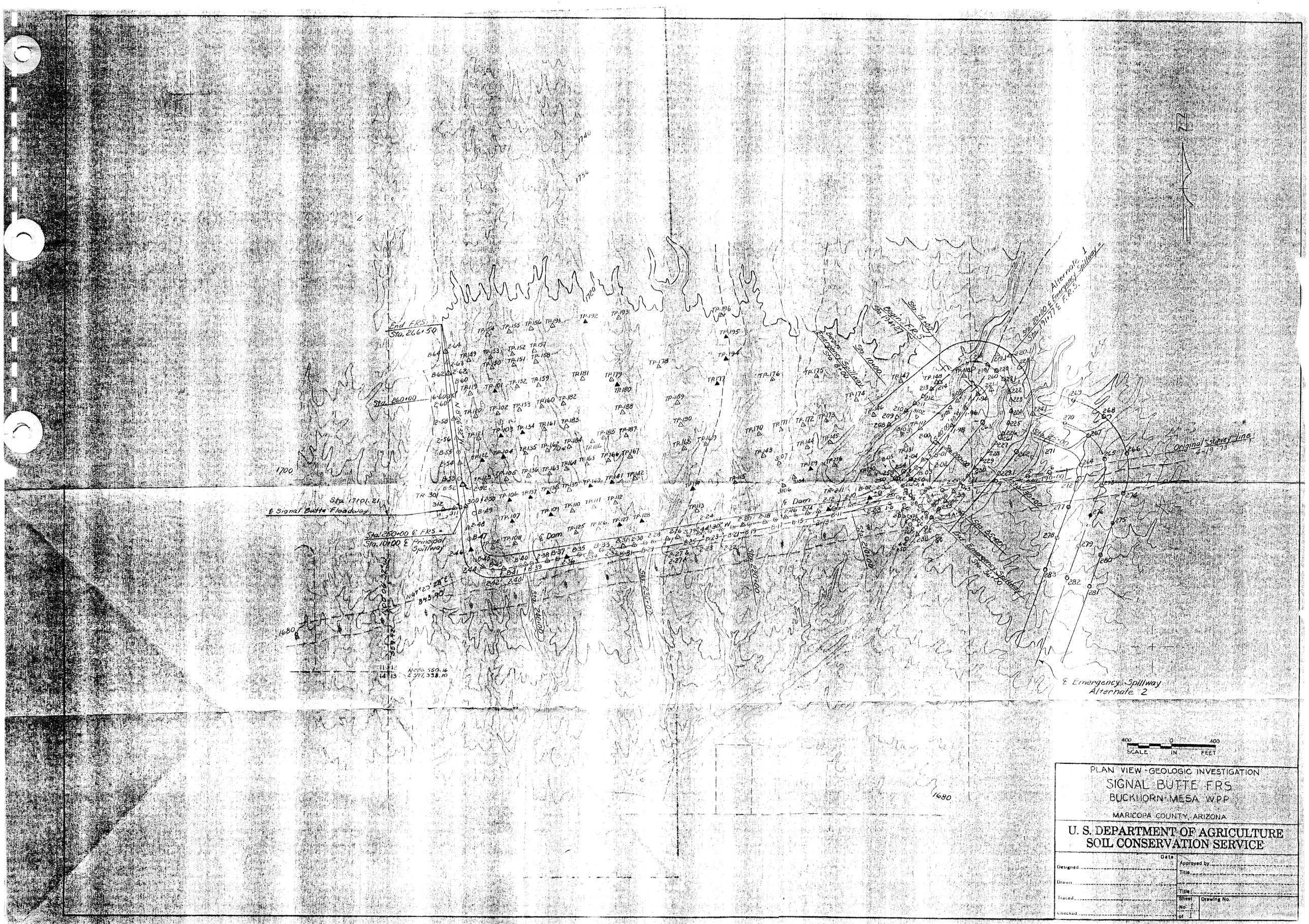
Find Vol to D = 26'

A = 1638 □'
TW = 102'

$$Vol = \frac{(1638)(9.215)(5280)}{43,560} = 1830\ AC\ FT$$

Therefore Available Storage:

Vol = 1830 − 858 = 982 AC FT



PLAN VIEW - GEOLOGIC INVESTIGATION
SIGNAL BUTTE FRS
BUCKHORN-MESA WPP
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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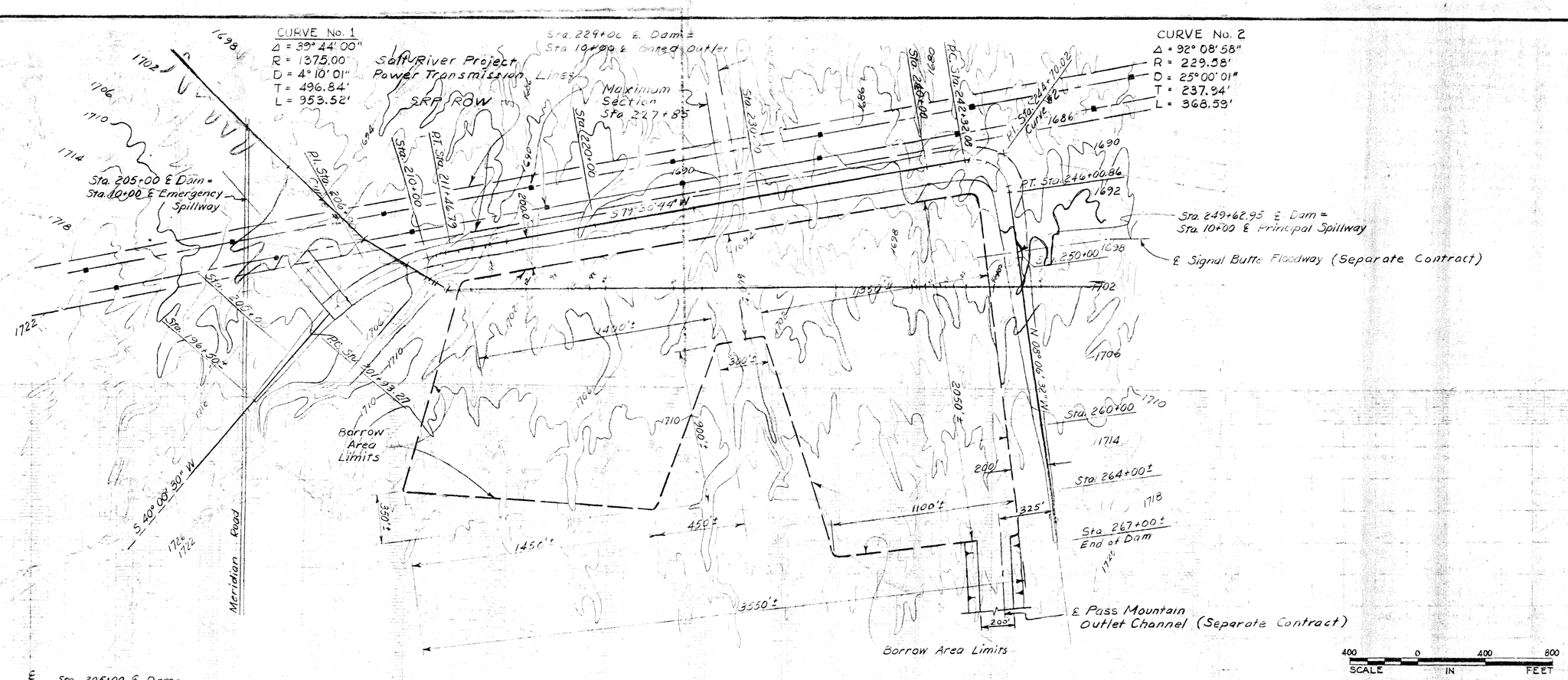
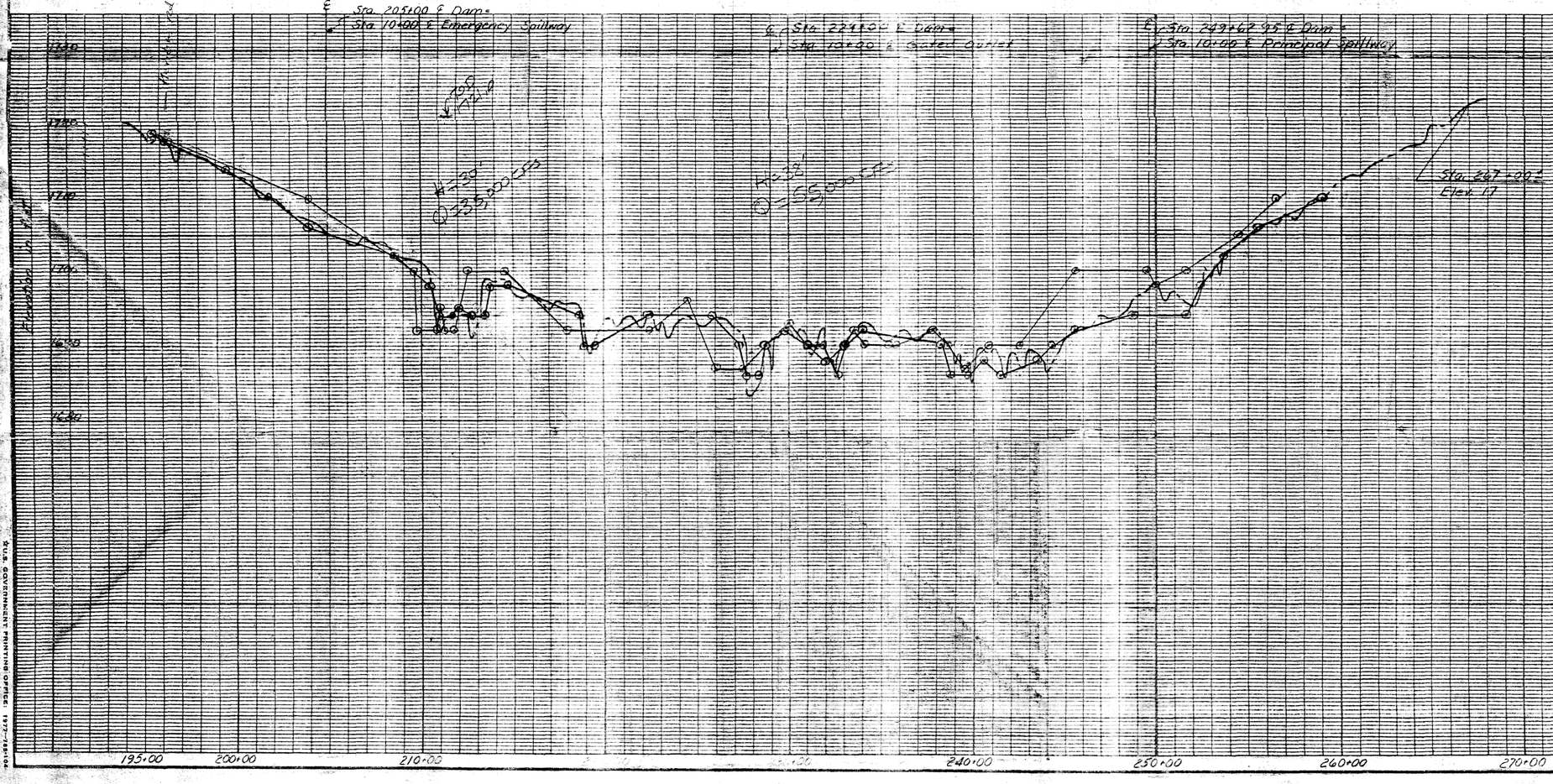
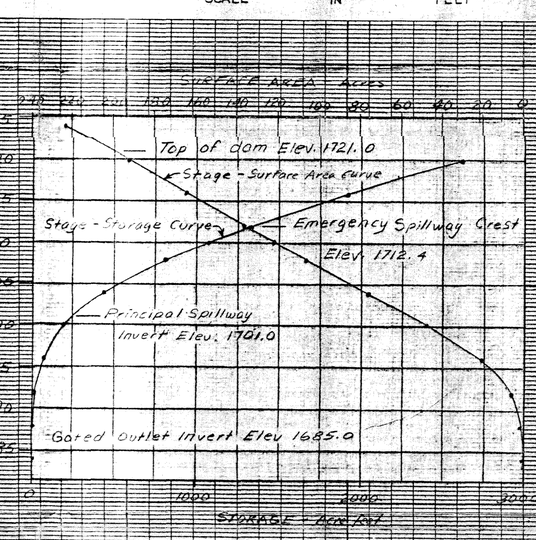
Drawn		Title	
Traced		Title	
Checked		Sheet No. 1 of 1	Drawing No.

FORM SCS-313C







STAGE STORAGE & SURFACE AREA CURVES

RESERVOIR BORROW AREA LIMITS

SIGNAL BUTTE F.R.S.
BUCKHORN-MESA W.P.P.
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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Checked		Sheet No. of	Drawing No.

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