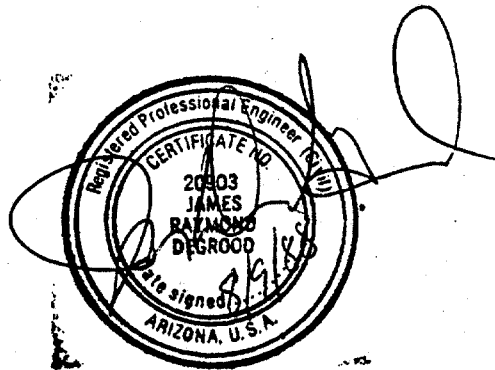


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Hydrologic and Hydraulic Report
for
Sutherland Wash
Pima County, Arizona

Pima County Department of Transportation
and Flood Control District



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INTRODUCTION:

This report summarizes the hydrologic and hydraulic conditions for a portion of Sutherland Wash between the western boundary line of the Coronado National Forest and the northern boundary of Catalina State Park. The project area is located in portions of sections 14 and 23 of Township 11 South, Range 14 East (figure 1). The Sutherland Valley, as the study reach is called, is a broad, geologically-controlled floodplain which fans out between the narrow canyon reaches of the National Forest and the State Park (figure 2).

At the present time, the Sutherland Valley is sparsely developed. Several homes have already been built on the east side of the valley. Two homes exist in the valley itself. The floodplain of the Sutherland supports a dense mesquite bosque and grassland which has historically been used to graze cattle. The valley is traversed by two privately maintained dirt roads, Quarterhorse Place to the north, and an unnamed road to the south.

The Federal Insurance Rate Maps prepared by the Federal Emergency Management Agency (figure 3) show the entire Sutherland Valley in Zone A (flood prone; flood depth unknown). This study attempts to quantify the depth and extent of flooding within the mapped FIRM A Zone so that floodplain permits can be issued for development which meets local and federal restrictions.

METHODOLOGY:

Hydrology.

Pima County has not, to date, officially adopted a regulatory discharge for Sutherland Wash. Therefore, a 100-year (1%) discharge of 13656 cfs, at the northern boundary of Catalina State Park, was determined using the procedures outlined in the Pima County Hydrology Manual. Hydrologic data sheets for the Pima County method are attached to this report as Appendix 1. Because the watershed area of Sutherland Wash exceeds 10 square miles, and thus exceeds the normal range of the Pima County method, the USDA Soil Conservation Service computer hydrologic routing model TR-20 was used to verify the discharges obtained using the Pima County method. The discharges obtained by both methods are summarized in Table 1 below.

Table 1. Peak Discharges for Sutherland Wash at the Catalina State Park Boundary

Recurrence Interval	PCP	TR-20		
	Pima Co. 1 hr. storm	1 hr. storm	24 hr. storm	6 hr. storm
Q-2	904	1509	2170	1962
Q-10	4507	1752	3174	2552
Q-25	7315	-	-	-
Q-50	10349	-	-	-
Q-100	13656	12497	20642	17923
Q-500*	19550	-	-	-

*obtained by logarithmic (LP-III) extrapolation of lower recurrence interval peaks

The TR-20 model generally predicts lower peak discharges than the Pima County method due to its channel routing capability and its ability to treat subwatersheds individually. However, it is important to note that TR-20 predicts much higher discharges when wet antecedent moisture conditions are specified. Values shown in Table 1 represent average antecedent moisture conditions. Full hydrographs and peak discharge values for wet and dry antecedent moisture conditions are included in Appendix 2.

Required input for TR-20 includes geometric basin parameters, rainfall depth and distribution, time of concentration, and routing parameters. Basin geometry (figure 4) was obtained by analysis of topographic maps and aerial photographs. Rainfall depths were obtained from isohyetal maps published in NOAA Atlas II. The SCS Type IIA rainfall distributions were used in the TR-20 model for the 6- and the 24-hour storms. The rainfall distribution for the 1-hour storm was obtained from published studies conducted at the Walnut Gulch Experimental Watershed by the Agricultural Research Station. These rainfall parameters were checked against the City of Tucson rainfall distribution. The resulting distribution is shown as Rainfall Table One in the TR-20 output included in Appendix 2. Time of concentration was obtained

using the iterative procedure outlined in the Pima County Hydrology Manual.

Basin response to the 6- and 24-hour storms was modelled because the time of concentration was significantly larger than one hour. Due to the size of the Sutherland Wash watershed, the 24- and the 6-hour storms may be more likely to cause floods than a 1-hour storm, particularly for low recurrence interval rainfall depths, and thus, these events should be considered in management of the Sutherland floodplain. However, as per Pima County Floodplain Management Ordinance 1988-FC1, only the 100-year, 1-hour storm was used when mapping the floodplain.

TR-20 has the capability to generate hydrographs at specified points within the watershed. This feature was used to determine the duration of flooding at the principal access route through the Sutherland Valley, hereafter called Golder Residence Road. Full output from the TR-20 runs can be found in Appendix 2.

Hydraulics.

Once peak discharges were established, flood water surface profiles for the 2-, 10-, 25-, 50-, 100-, 500-, 100(P=24hr.)-, and 100(P=6 hr.)-year floods were determined using the US Army Corps of Engineers computer model HEC-2. HEC-2 computes water surface profiles using discharges and cross section geometry input by the user. Water surface profiles were determined for subcritical and supercritical flow regimes for Sutherland Wash proper as well as for the major tributary (hereafter called Golder Wash) up to the National Forest boundary. A split flow analysis was used to determine the amount of break-over flow from Golder Wash into Sutherland Wash proper. The final mapped water surface elevation reflects routed additions to flow from Golder Wash to Sutherland Wash, and subtractions of flow from the regulatory discharge in Golder Wash.

The HEC-2 results indicate that the Sutherland Wash, within the study reach, flows close to critical depth with true flow conditions probably transitional. However, in keeping with FEMA standards, subcritical flow depths were used as regulatory flood depths. Copies of the HEC-2 output can be found in Appendix 3.

Golder Wash does not have sufficient capacity for the regulatory discharge. Therefore, some of the 100-year flow spills over the slight divide which separates Golder Wash from Sutherland Wash within Sutherland Valley. The maximum depth of water overflow is approximately 1 foot. Due to the extreme relative roughness of the thick grasses and brush on the divide, the normal depth option of the HEC-2 split flow subroutine, rather than the weir option, was used to model the breakout. The depth of this breakout flow, once it crosses the

divide, was not modelled. However, since the depth at the divide, which has essentially no slope, is less than or equal to one foot, the depth on the steeper slopes off the divide should be less than one foot. Local depressions and rivulets may concentrate depths greater than one foot, but not significantly greater.

Below cross section 16 flow in Golder Wash and Sutherland Wash freely intermixes and thus is modelled as a single channel, though two low flow paths exist. A low island separates flow between cross sections 11 and 10.5 for lower recurrence interval flows, but is inundated by less than a foot of flow during the regulatory flood and therefore was not modelled as an island. Care was taken to ensure that reasonable flow distributions around the island were maintained.

A velocity profile of the 100-year flood at cross section 21, the location of Golder Residence Road, was calculated using equation 148 in Rouse (1946) in order to determine the maximum velocity possible on the only access road for the homes located on the east side of the Sutherland Valley. Average velocity was taken from the HEC-2 output. As shown in figure 5, the maximum velocity at the free water surface is approximately 14 feet per second (fps).

General and local scour was also determined using equations given in Highways in the River Environment (1975). The results of the scour analysis is given the Safety of Access section below.

RESULTS:

Floodplain Delineation.

The floodplain of the Sutherland Wash is shown on figure 6. At the upstream end of the project reach at the mouth of the narrow canyon, flood flow rapidly changes from a deep, high velocity profile to that of wide, less deep, poorly defined flow. This pattern can be seen on the aerial photograph (figure 2) as the sandy (light-colored) wash in the confined reach disappears into a downstream-directed dendritic pattern with no significant continuous flow path. A quick field investigation further substantiates the calculated flow pattern. The sediment size changes from sand with cobbles and boulders in the confined reach to sandy silt in the broad floodplain, and so reflects the change in sediment transport capacity at the transition. Sediment transport capacity can be directly related to velocity and depth of flow.

This flow transition at the mouth of the canyon makes mapping of the floodplain somewhat complex. The existing

(albeit poorly) defined flow paths within the upstreammost part of the fan area would not be likely to be preserved in the event of a large flood. High velocity erosive flows coming out of the canyon would scour a new channel parallel to the exit flow direction, rather than make the 90 degree turn of the present channel configuration. Because of the potential to create a new channel during flooding, the unconfined reach downstream is mapped as an alluvial fan as per the FEMA (Dawdy) Method. For this reason, finished floor elevations should be based on flood depths (depth in the migrating channel), rather than on the calculated water surface elevation as in the defined reaches downstream. The average depth of flow in the channels within the alluvial fan reach is 3.5 (cross sections 24 - 32). Therefore, the alluvial fan reach is mapped as an AO-3 zone.

Further downstream, just above Golder Residence Road, the Sutherland becomes better defined and a single main channel is present, although significant overbank flooding still occurs. However, the east overbank area above the regulatory water surface elevation of Sutherland Wash main channel is impacted by break-over flow from Golder Wash (figure 4), and thus, the area is not entirely flood free. However, the depth of this break-over flow is less than 1 foot at the breakout divide. Therefore, except in minor depressions where the flow depths may be up to 1 foot, the flooding is shallow and unconcentrated. Flood water from the main channel of the Sutherland does not break into Golder Wash. Therefore, the area below the divide, but out of Sutherland Wash regulatory floodplain is mapped as an AO-1 zone (depths = 0.5 -1.5 ft.).

Finally, just above Catalina State Park, flow from Golder Wash and Sutherland Wash join and enter the canyon reach within the state park. Flooding in this subreach is characterized by fast flowing channel flow and shallow overbank flow. Due to increased channel capacity and high velocity the potential for lateral bank erosion is high.

The portions of the floodplain not mapped as AO zones are mapped as zone A with the water surface elevation given. Zone A carries higher insurance premiums than AO zones, and represents the zone of higher flood risk. Water surface elevations should be used in conjunction with topographic elevations to determine the actual depth of flooding at each individual building site. Channel velocities are given in the insert on figure 6. Overbank velocities can be found in the HEC-2 output in Appendix 3. The depth-velocity squared product can then be used to determine if a given building site can be permitted as per Article IX, paragraph B2.g of the Floodplain Management Ordinance.

Floodway Delineation.

A regulatory floodway was not mapped for Sutherland Wash for several reasons. First, in the broad floodplain area downstream of the narrow canyon reach near the National Forest boundary and above Golder Residence Road, the wash behaves more like an active alluvial fan than a typical stream with shallow overbank areas. Because of the main flow channel's tendency to migrate across the fan, a single defined floodway would not be meaningful. That is, after any given flow event, the main channel could have migrated entirely outside a floodway defined at the time of mapping. Second, a floodway encroachment analysis performed for the more channelized reaches below Golder Residence Rd. showed that the floodway fringe on the west overbank was of insignificant width. As per FEMA requirements, if the width of the floodway fringe is not significant it is generally not mapped. The allowable encroachment on the east overbank is complicated by breakout flow from Golder Wash, and thus does not strictly meet the criteria for the floodway fringe. Further, the regulatory erosion hazard setback is more restrictive than the floodway limit in this reach. Therefore, rather than map a floodway, the depth and velocity of flow (depth x velocity squared) and the erosion hazard setback should be used to establish areas within the floodplain acceptable for development. Finally, in the reach just above the canyon which enters Catalina State Park, two distinct, significant channels exist at each side of the floodplain, with a low, barely inundated island in between. This channel configuration results little floodway fringe on the periphery of floodplain and the least hazardous flooding in the center of the floodplain.

Geomorphology.

Pima County Floodplain Management Ordinance 1988-FC1 requires that development of the floodplain not disturb the sediment balance of the watercourse. Therefore, as a whole, Sutherland Wash is neither aggrading nor degrading. The wide, alluvial fan reach is locally depositional due to the rapid expansion and consequent loss of sediment transport capacity. As a result, local steepening or flattening occur as the low flow channel migrates across the fan apex. However, no long term slope adjustments are evident or likely. Bedrock acts as a grade control at both the upstream and downstream ends of the study reach, limiting the amount of degradation possible.

Golder Wash, the main tributary, has experienced some significant headcutting due to an unpermitted sand and gravel mining operation at the "elbow" bend where the tributary enters the Sutherland Valley. A 2 - 3 feet deep scour hole has

developed downstream of the Golder Residence Road. This scour hole threatens the access road, though some dumped rip-rap has been placed in the hole to prevent its failure. A special erosion hazard setback should be enforced downstream of the gravel pit due to the potential for bank collapse from undercutting.

Analysis of aerial photographs dating back to the early 1970's indicates that prior to the degradation of Golder Wash tributary, floods originating in the tributary watershed spread out over the Sutherland Valley in an alluvial fan pattern. The HEC-2 profile of the tributary (cross sections 200 - 340) shows that a secondary channel could develop in the right overbank of Golder Wash. This secondary channel would discharge directly west into the Sutherland valley at cross section 21 (see figure 4). Historic aerial photographs indicate that, at one time, this overflow path may have been a primary channel. Future development should account for the possibility of re-establishing the overflow channel during a large flood. Such a scenario would result in a third hazardous dip crossing for the homes on the north side of Golder Wash.

CONCLUSIONS

Floodplain Management/Permitting.

As shown on figure 6, there are several areas within the Sutherland Valley floodplain that are not suitable for development or construction of habitable structures. First, the alluvial fan area, because it is subject to depths averaging 3.5 feet and channel velocities averaging 7.71 fps, cannot be developed as per Article IX, Section B.2g of the Floodplain Management Ordinance. Second, because the regulatory discharge of Sutherland Wash within the study area is greater than 10000 cfs, sites within 250 feet of the primary bank of the channelized reaches of the Valley should not be developed without bank stabilization or soil stability analysis prepared by a registered professional engineer, as per Article XII, Section A.1b of the Floodplain Management Ordinance. In addition, a 100 foot setback from the primary banks of Golder Wash should be enforced. Finally, the narrow canyon reaches are also not suitable for development due to the erosion hazard as well as the depth and velocity of flooding.

Floodplain permits may be issued, however, for sites within the AO-1 zone between the Sutherland and Golder Wash. Habitable structures and other applicable improvements should be elevated, at minimum, 2 feet above highest natural grade. Erosion hazard setbacks, of course, may also apply to sites

within this area. Areas within the A zone may also be permitted if they are elevated to the regulatory flood elevation. Homesites on the east side of the Sutherland Valley may also be permitted if covenants regarding the lack of all-weather access are signed. (See the Recommendations section below.)

Safety of Access.

As stated in Pima County Floodplain Management Ordinance 1988-FC1, safety of access (all-weather access) is defined in terms of an access route that is suitable for ordinary and emergency vehicles (Article VII, section D.8) during any type of weather. The Pima County Channel Design Standards Manual (p. VI-5) requires that for this classification of roadway, if it were publicly maintained, the 10-year discharge be contained under the roadway, the 25-year discharge be less than a foot in a depth over the road, and the 100-year discharge be contained within the dip section.

While the access route to the east side of the Sutherland Wash is not a publicly maintained roadway, safety of access should be addressed for all new development in this area. The depth, width, and duration of flood flow over the roadway is summarized in Table 2. Note that for as small a flood as the 2-year event, access is denied. Also, because the road is a privately maintained dirt road, flood scour and rutting could disrupt access for much longer periods than the actual duration of the flood.

Table 2. Depth and Duration of Flooding at Golder Residence Road

Recurrence Interval	Q-2	Q-10	P-1	Q-100 P-24	P-6
Depth (ft.)	2.19	3.26	4.50	5.06	4.80
Velocity (fps)	4.63	6.35	10.19	12.00	11.58
Width (ft.)	396	682	1143	1147	1125
Duration (hrs.)					
P-1	9.36	4.0+	4.8		
P-6	12.00+	6.0+			9.2
P-24	24.00+	24.0+		21.0	
Duration of flow over (hrs.) 1 ft. deep	3.26	2.32	2.44	6.03	12.72
General scour (ft.)	0	0	0.89	1.69	1.47

It is important to note that because there are no structures along the access route, there is no way for a motorist or pedestrian to tell what the depth of flow is during flooding. Also, because the east side of the Sutherland Wash is completely cut off by flooding there is no way to set up traffic barriers to prevent traffic from attempting to cross the floodplain. Further, since the roadway is constructed of silty soil, even during minor flooding, ordinary vehicles may become mired in the soft soil. Finally, the potential for scour during the regulatory flood further increases the flood hazard.

Case Study-Monument Wash.

This office has no data regarding specific instances of flooding on Sutherland Wash. However, case histories of a similar washes are available. Monument Wash drains a 11.63 square mile watershed on the far east side of Tucson. It is similar to the Sutherland Wash watershed in drainage area, slope soil type, elevation change, aspect, and time of concentration. The Sutherland Wash Watershed's slightly larger size cause it to generate slightly more severe flooding

conditions.

During the October, 1983 floods, Paul Williams, aged 24, tragically lost his life trying to ford Monument Wash at Speedway Boulevard. The dip crossing at Speedway is a paved dip 2.2 feet deep, 210 feet wide, with a 100-year discharge of 9495 cfs. Representatives of the Tanque Verde guest ranch stated that in 1983, Speedway Boulevard at Monument Wash was totally impassable: 9 days; passable by wading only: 16 days; passable by car, but through significant water: 47 days; roadway dry, but damaged by flooding: 150 days; for a total of 212 problem days during 1983.

By contrast, the access route through the Sutherland Valley is unpaved, with flows up to 4.5 feet deep, 1143 feet wide, with velocities up to 11.21 fps. (velocity at the surface = 14 fps., see figure 4). The duration of flooding over 100 cfs is up to 27 hours (4.6 hours for Q-2). The drainage crossing over Golder Wash, which is entirely separate from the Sutherland crossing, is paved with loose chip seal, has an unprotected scour hole developing on the downstream side, and experiences depths of up to 7.6 feet, widths up to 257 feet, and velocities up to 9.4 feet/second. If the roadway fails flow would be up to 11.5 feet/second and 8 feet deep. Thus, flood conditions are worse than that of Monument Wash, and represent an even more uncontrolled access hazard than that which claimed the life of Paul Williams.

RECOMMENDATIONS

This report recommends that the following floodplain management and permitting policies be enforced for the Sutherland Wash:

1. Figure 6, the map of the Sutherland Wash floodplain, be adopted for regulatory purposes.
2. Habitable structures not be permitted in the AO-3 zone as per Article IX, Section B.2g of Floodplain Management Ordinance 1988-FC1.
3. Fencing within the mapped floodplain be limited to 4-strand (maximum) barbed wire fence.
4. A 250 feet erosion hazard setback from the primary banks of Sutherland Wash be enforced as per Article XII, Section A.1b. of Floodplain Management Ordinance 1988-FC1.
5. A 100 feet erosion hazard setback from the primary banks of Golder Wash be enforced as per Article XII, Section A.1c of Floodplain Management Ordinance 1988-FC1.
6. Developers of parcels within or on the east side of the

Sutherland Valley be required to sign covenants which run with the land stating that the developer recognizes that a severe access hazard, due to flooding, erosion, and/or lack of road repair and maintenance, exists and that Pima County and the Pima County Flood Control District will be held harmless from any and all claims. Said covenants should be a condition of release of permits. Alternatively, all-weather access should be provided to all lots and homesites.

7. Sand and gravel mining in Golder Wash be prohibited without an engineering study documenting the potential for scour and bank instability adjacent to the mining operation.

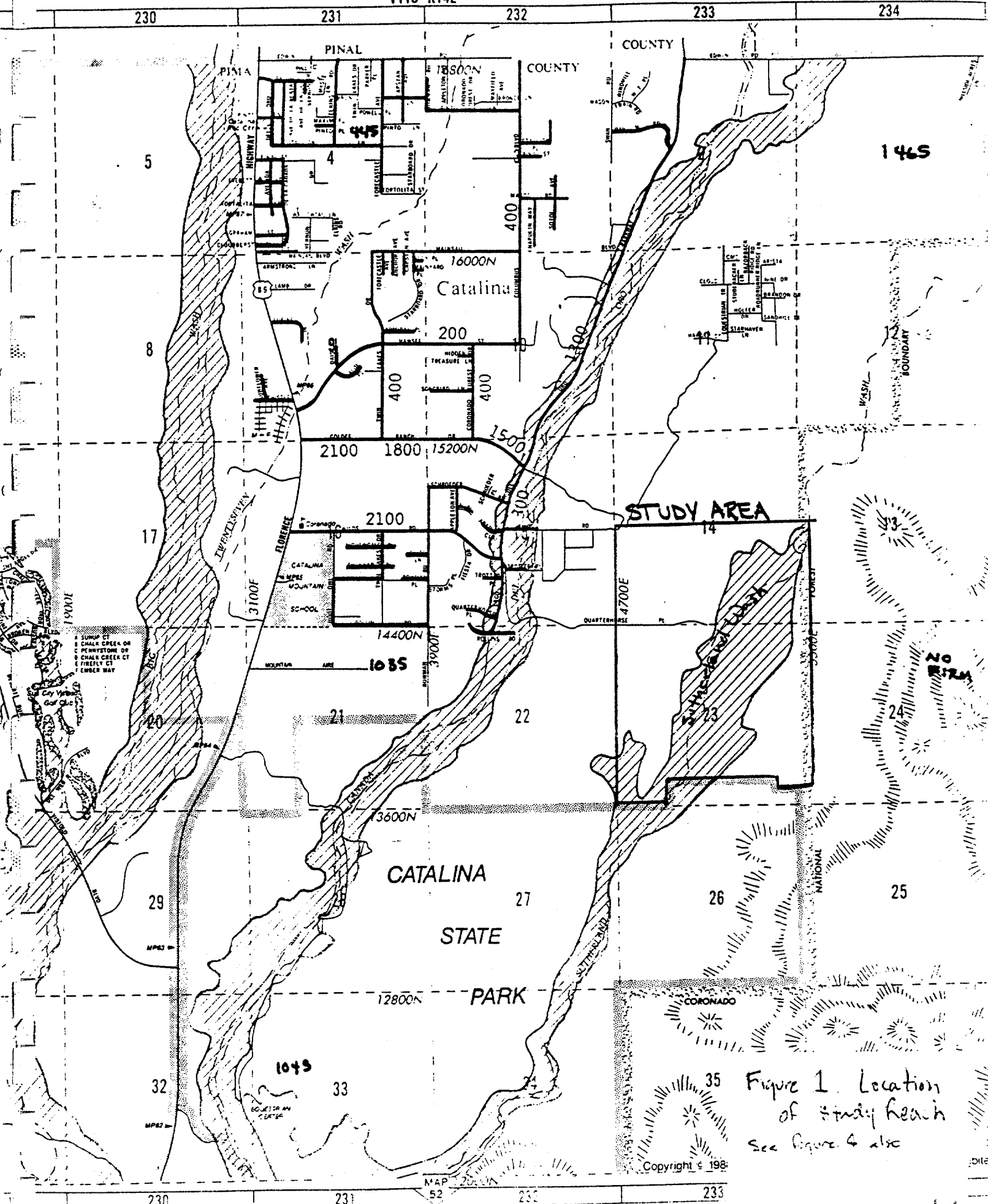
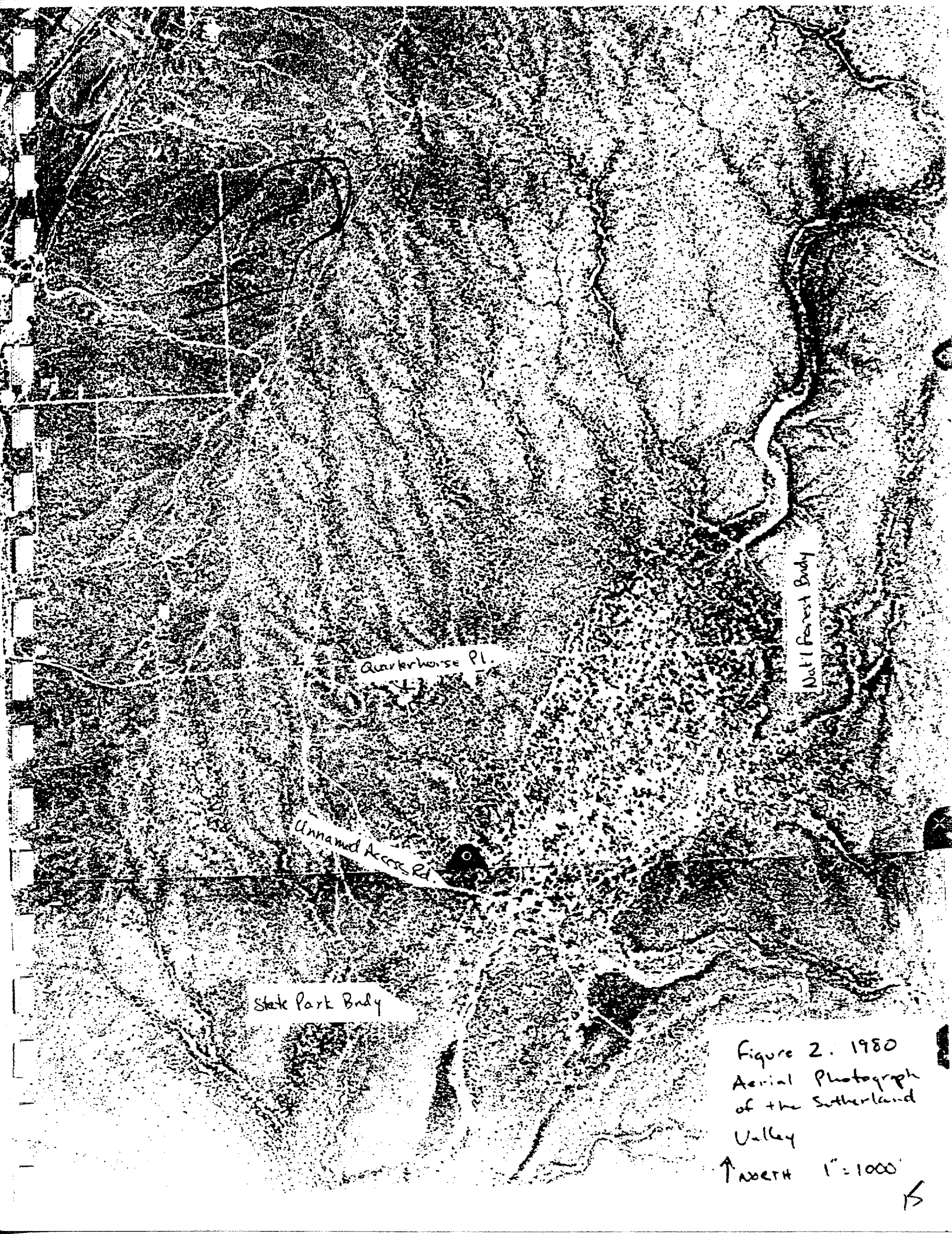


Figure 1. Location of study reach
See Figure 4 also



Quarterhorse Pl.

Unnamed Access Rd.

Stake Park Body

Natl Forest Body

Figure 2. 1980
Aerial Photograph
of the Sutherland
Valley
↑ NORTH 1" = 1000'

15

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

**PIMA COUNTY,
ARIZONA**
(UNINCORPORATED AREAS)

PANEL 1035 OF 4700
(SEE MAP INDEX FOR PANELS NOT PRINTED)

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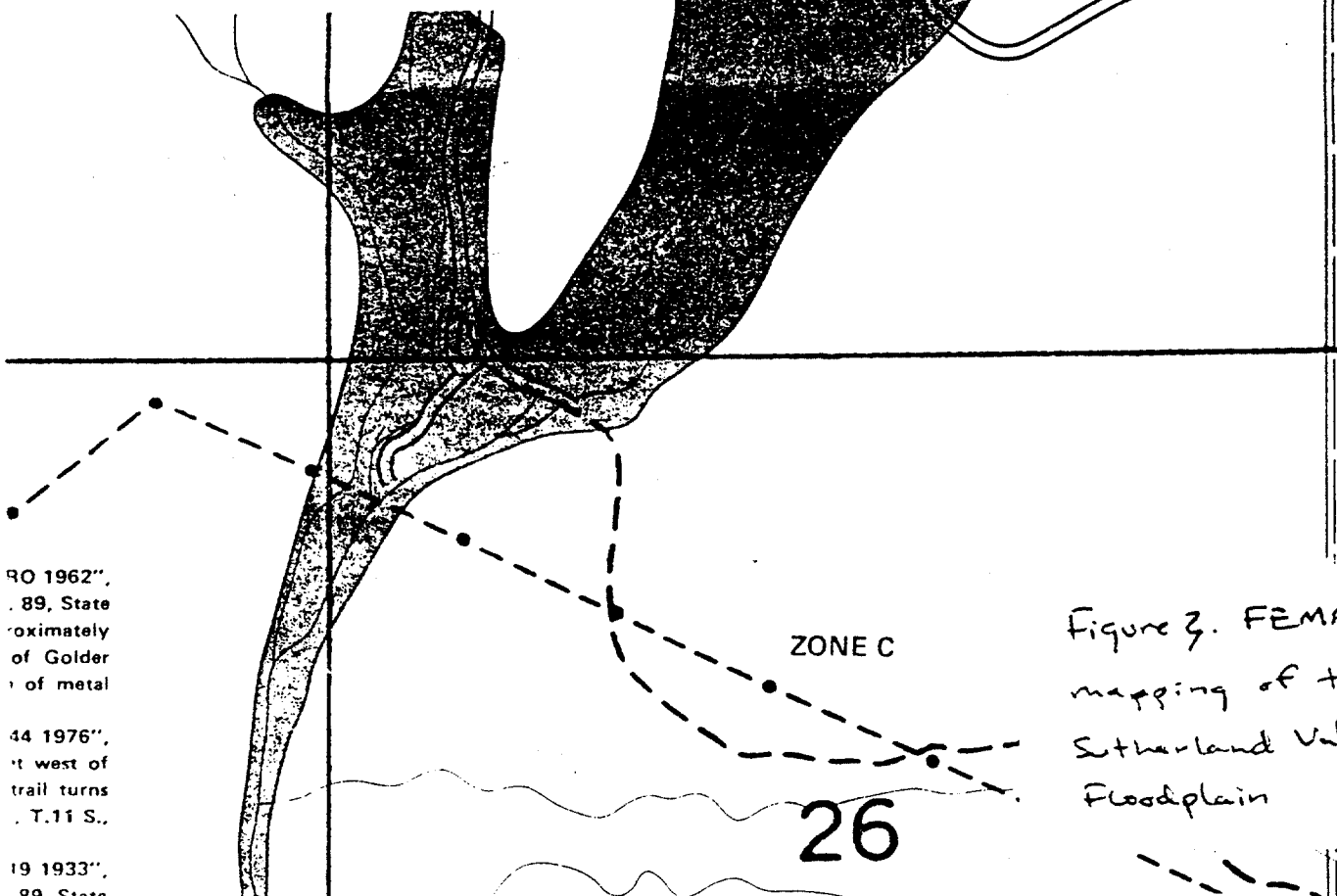
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Federal Emergency Management Agency

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JOINS PANEL 1075



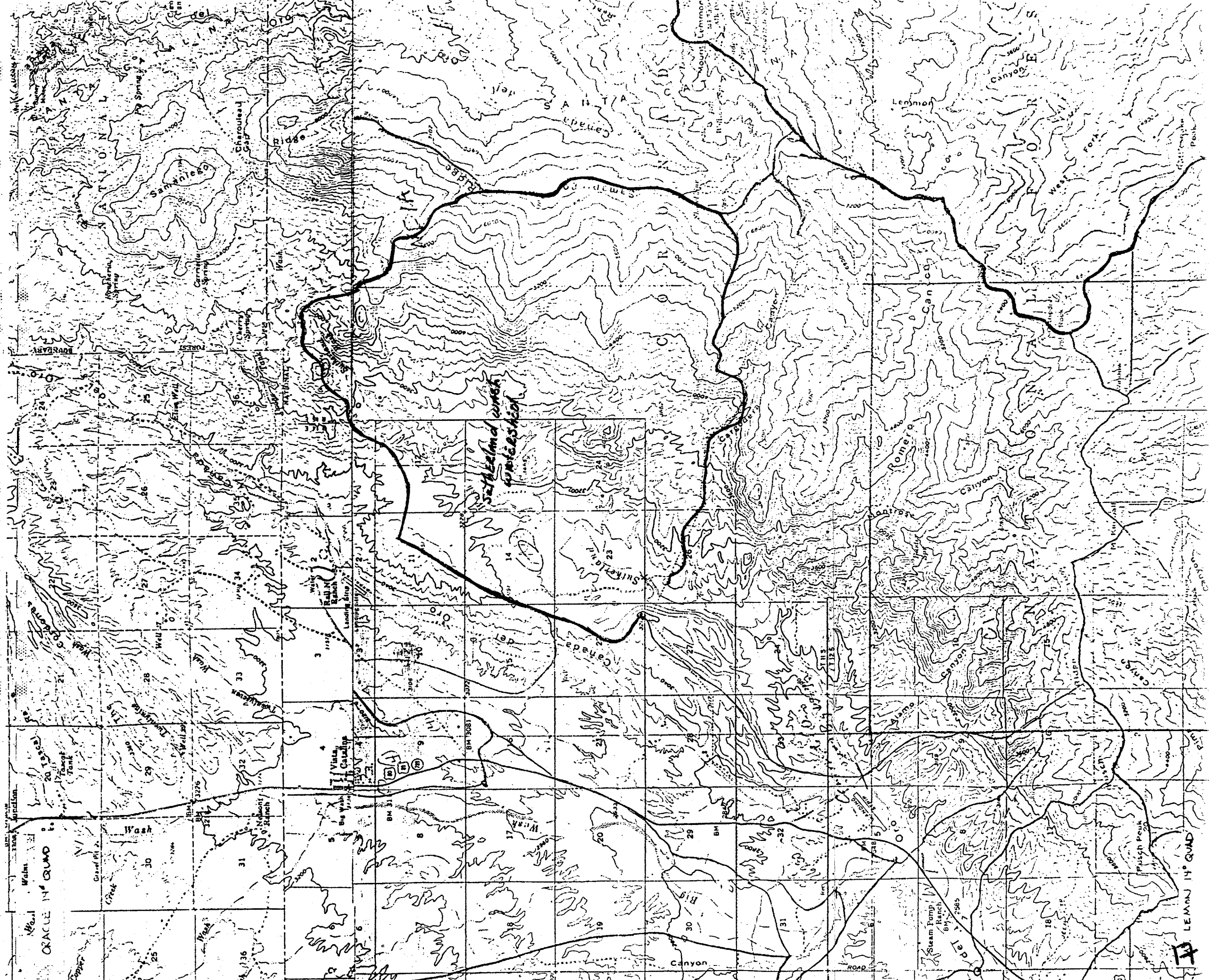
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Figure 3. FEMA
mapping of the
Sutherland Valley
Floodplain

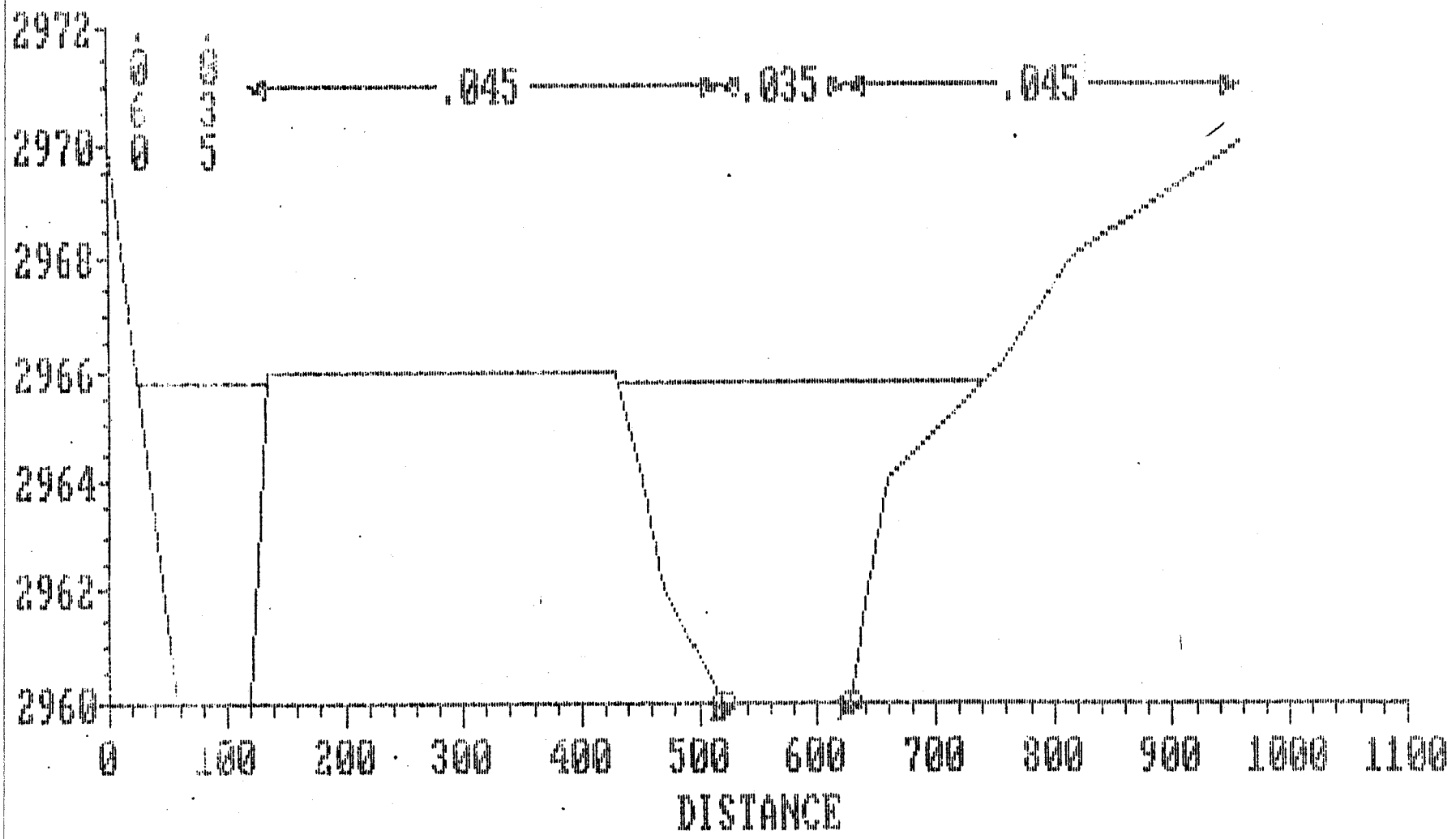
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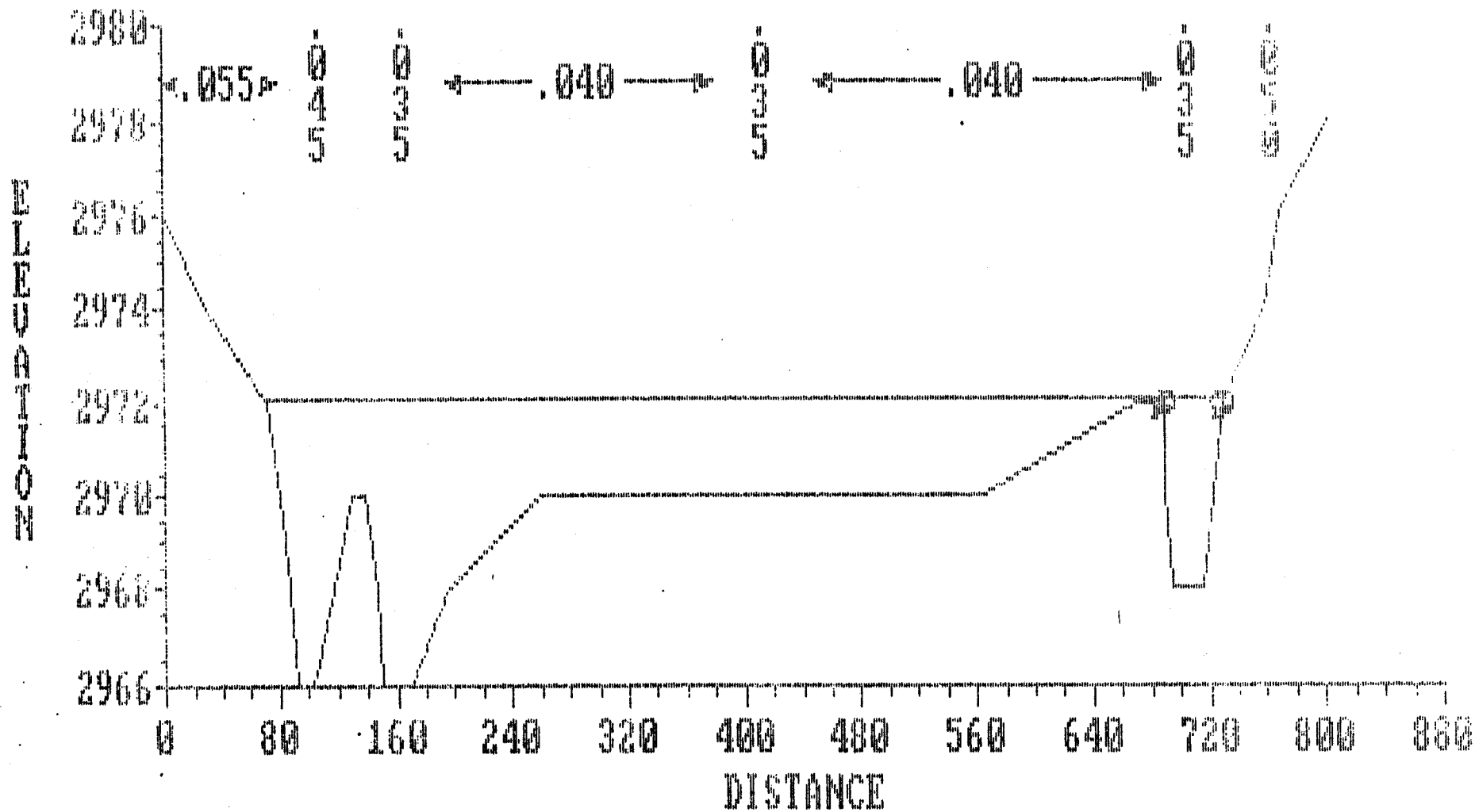
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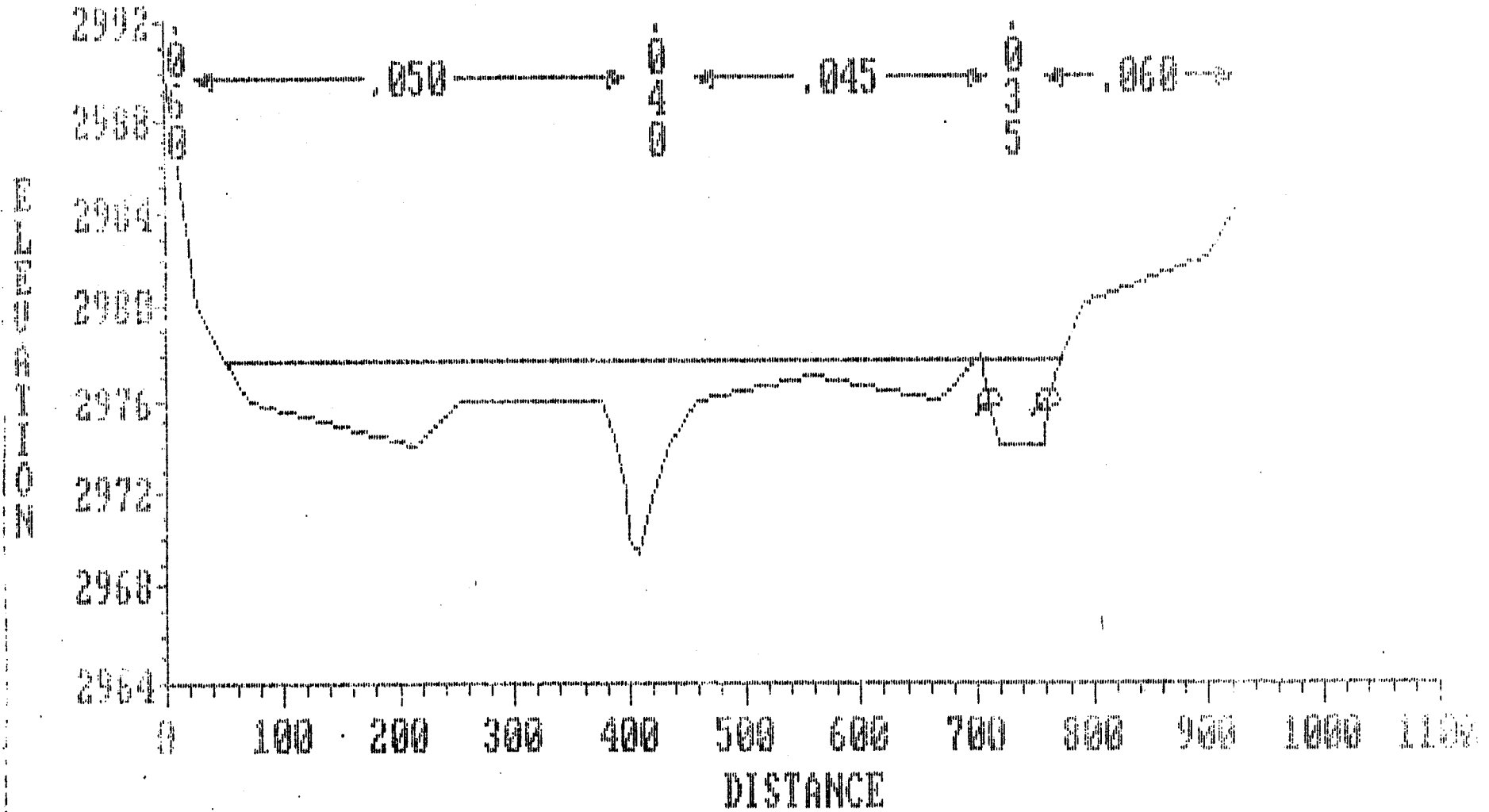
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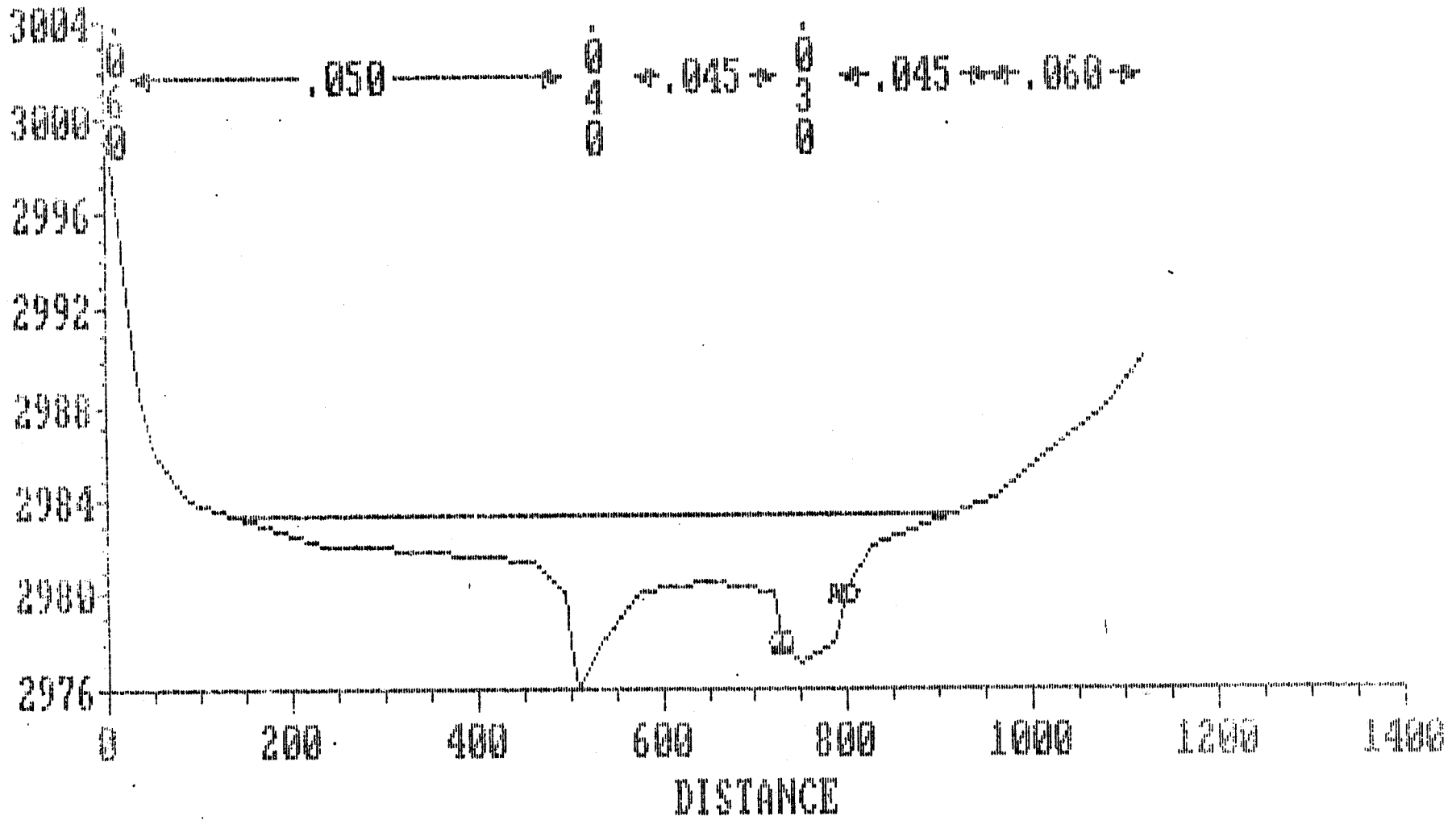
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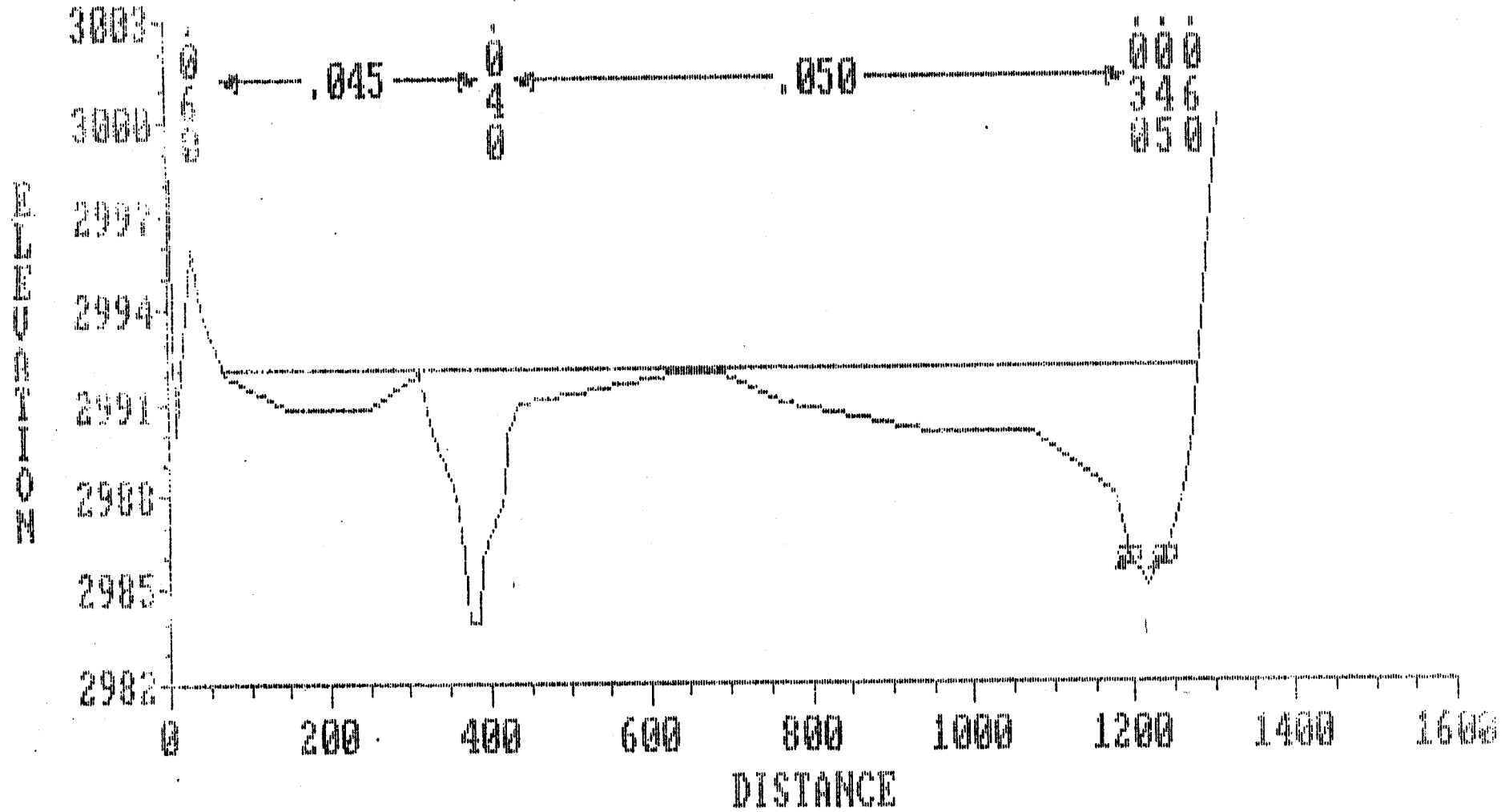
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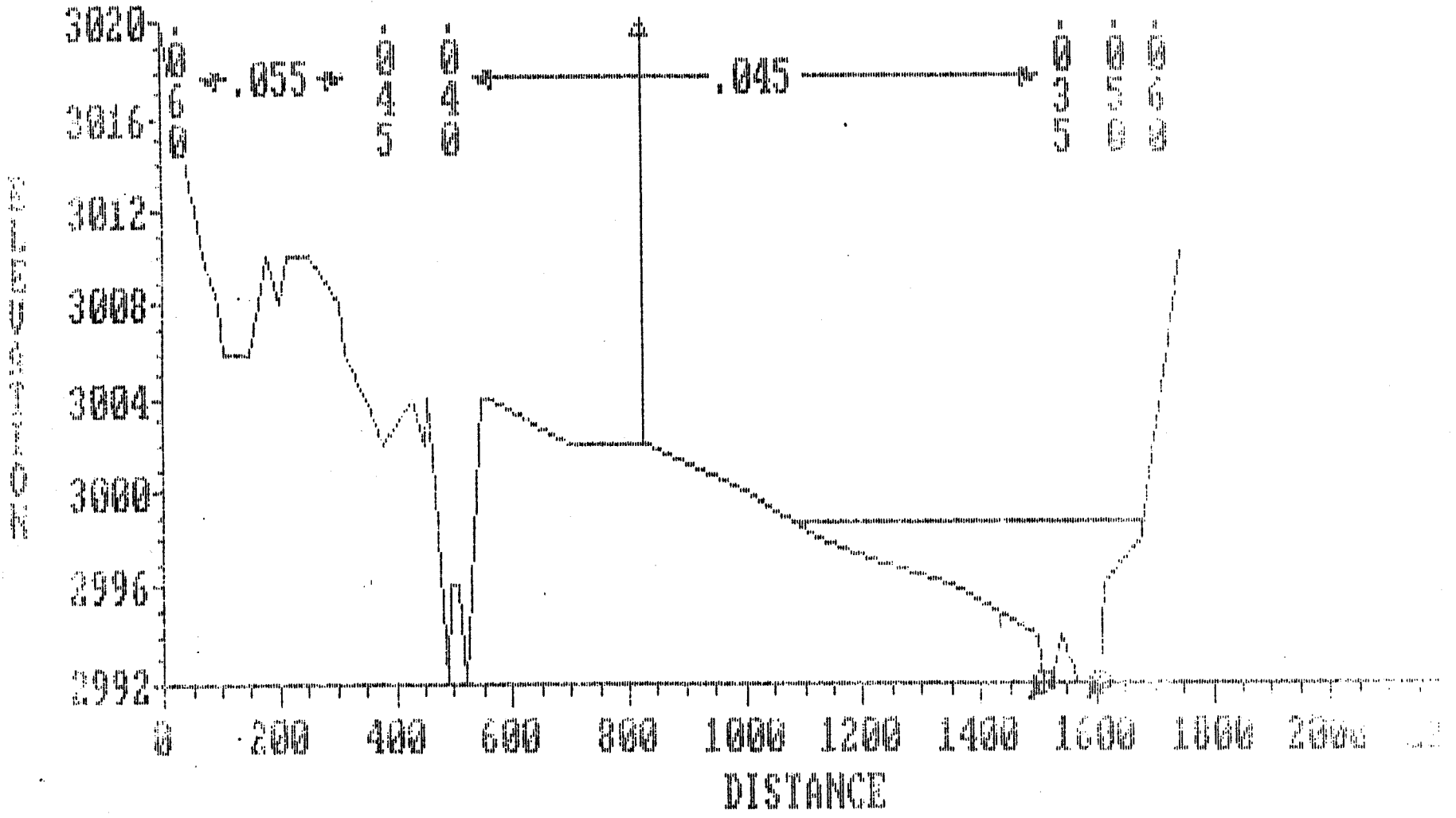
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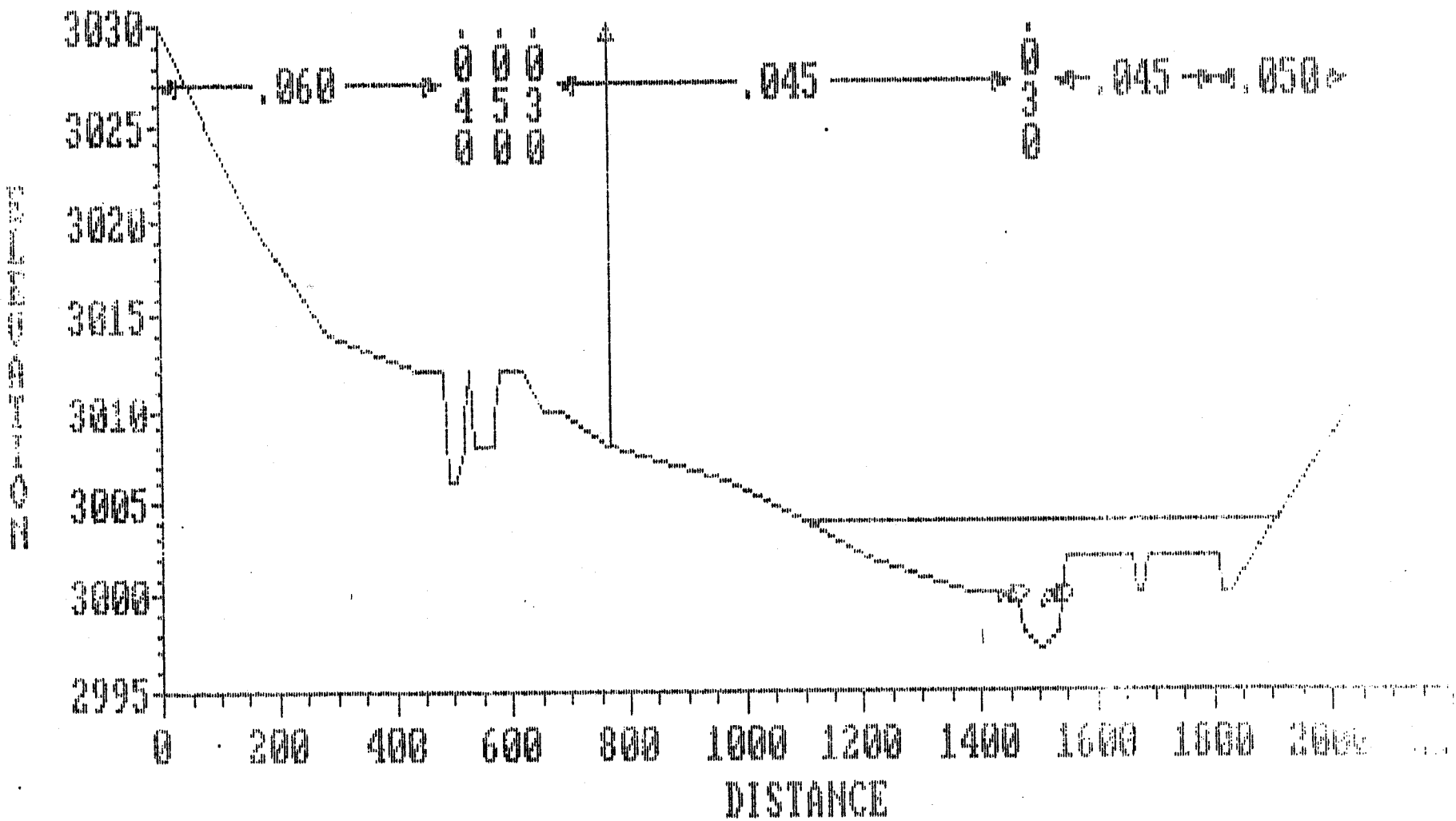
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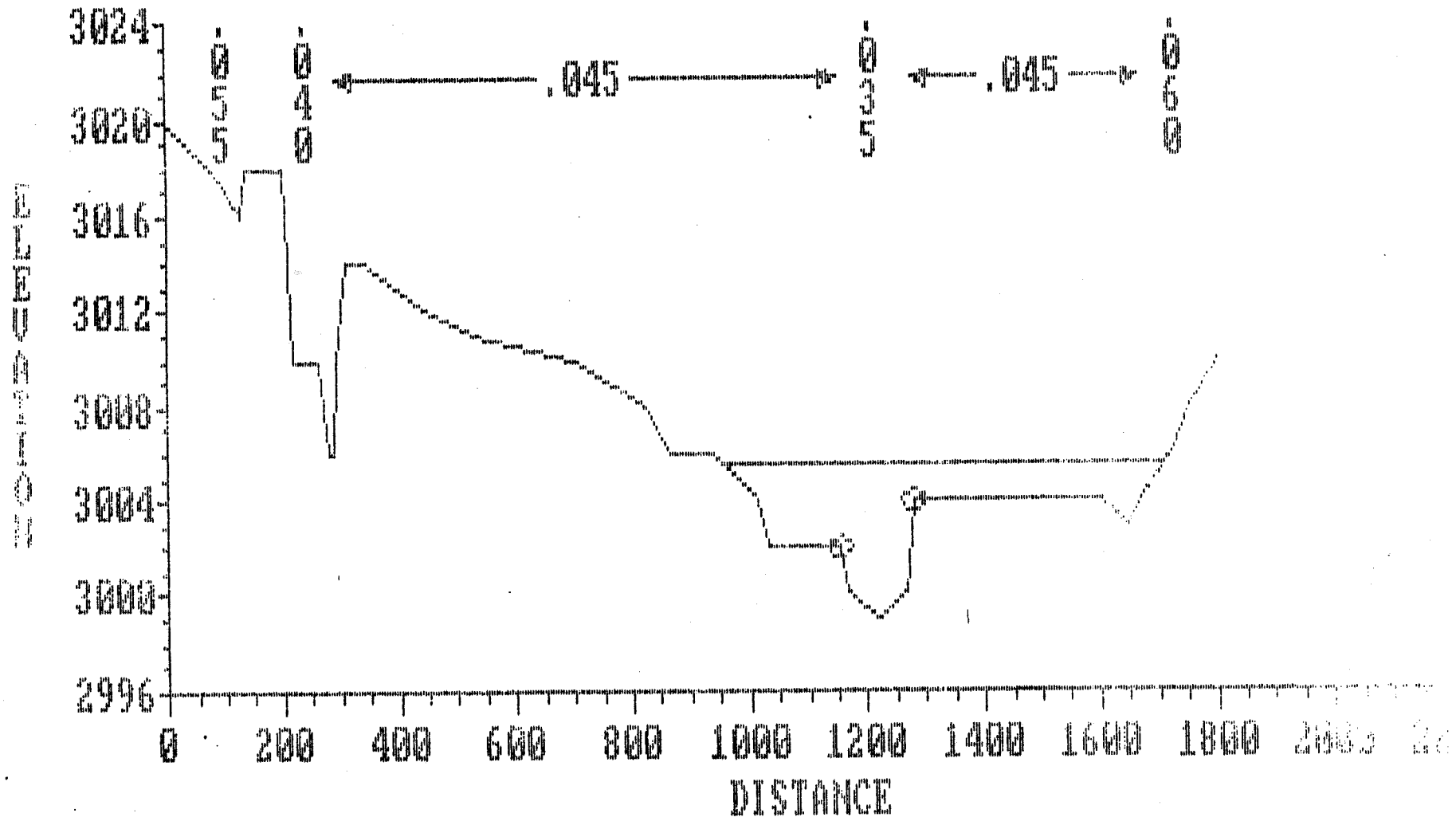
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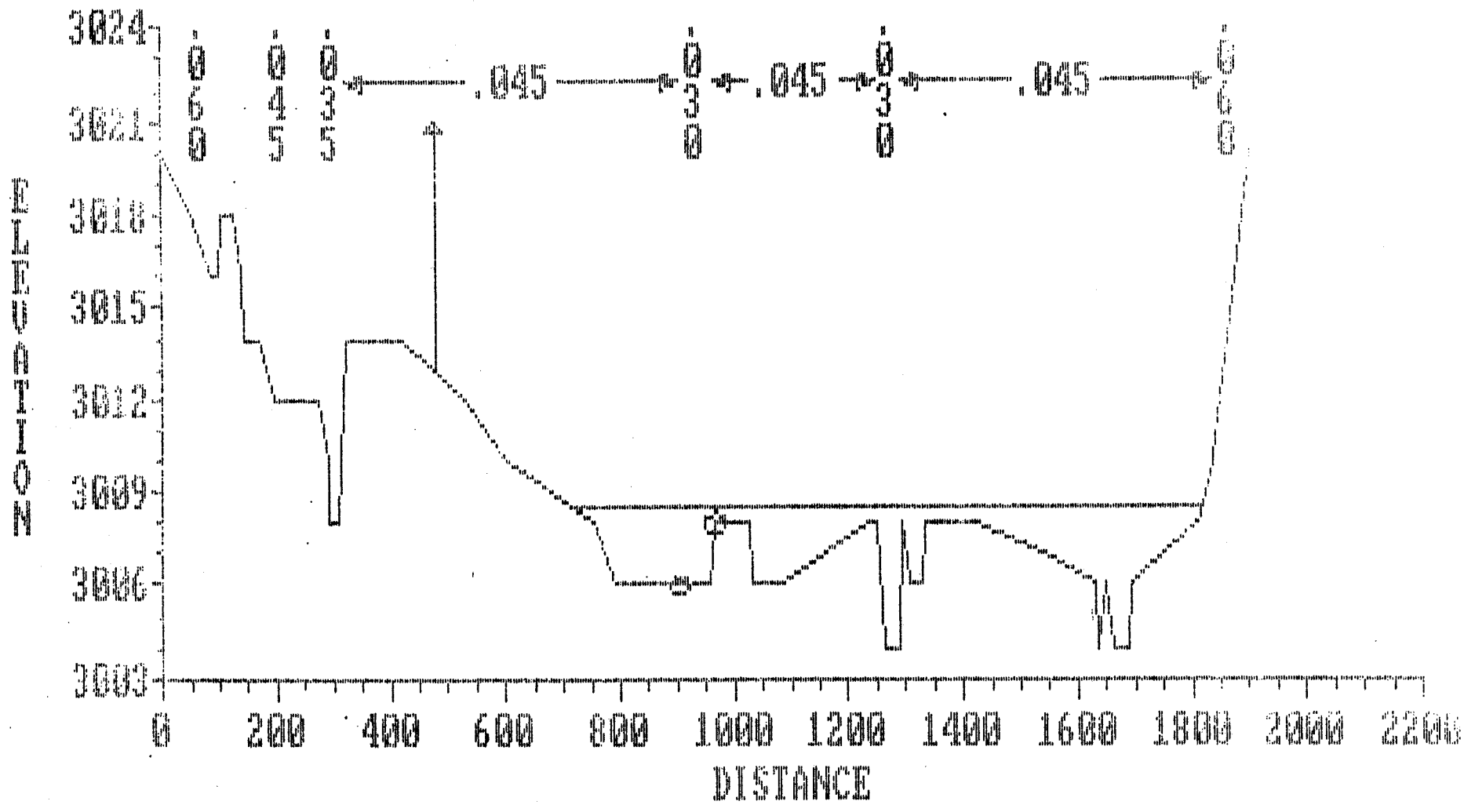
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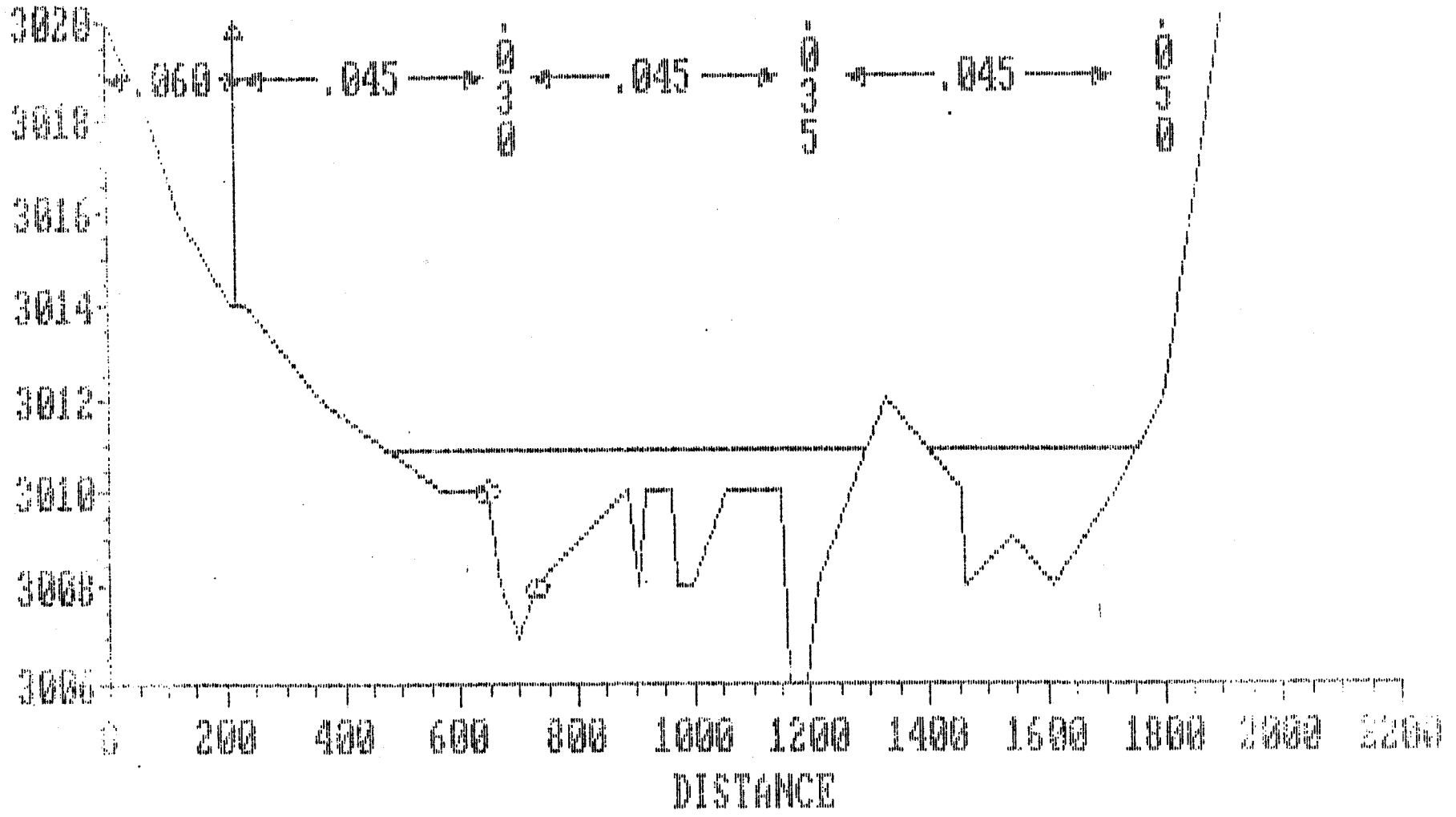
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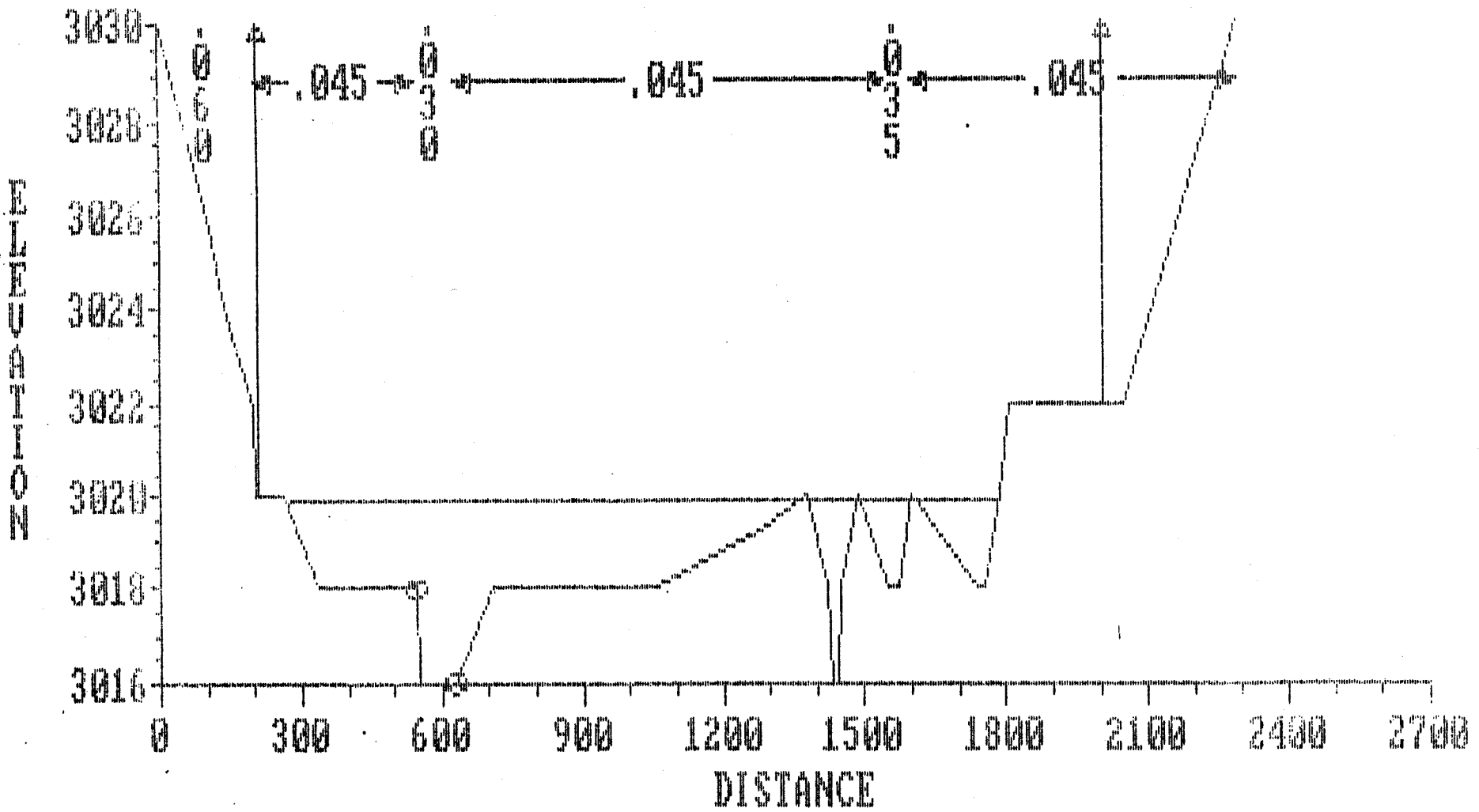
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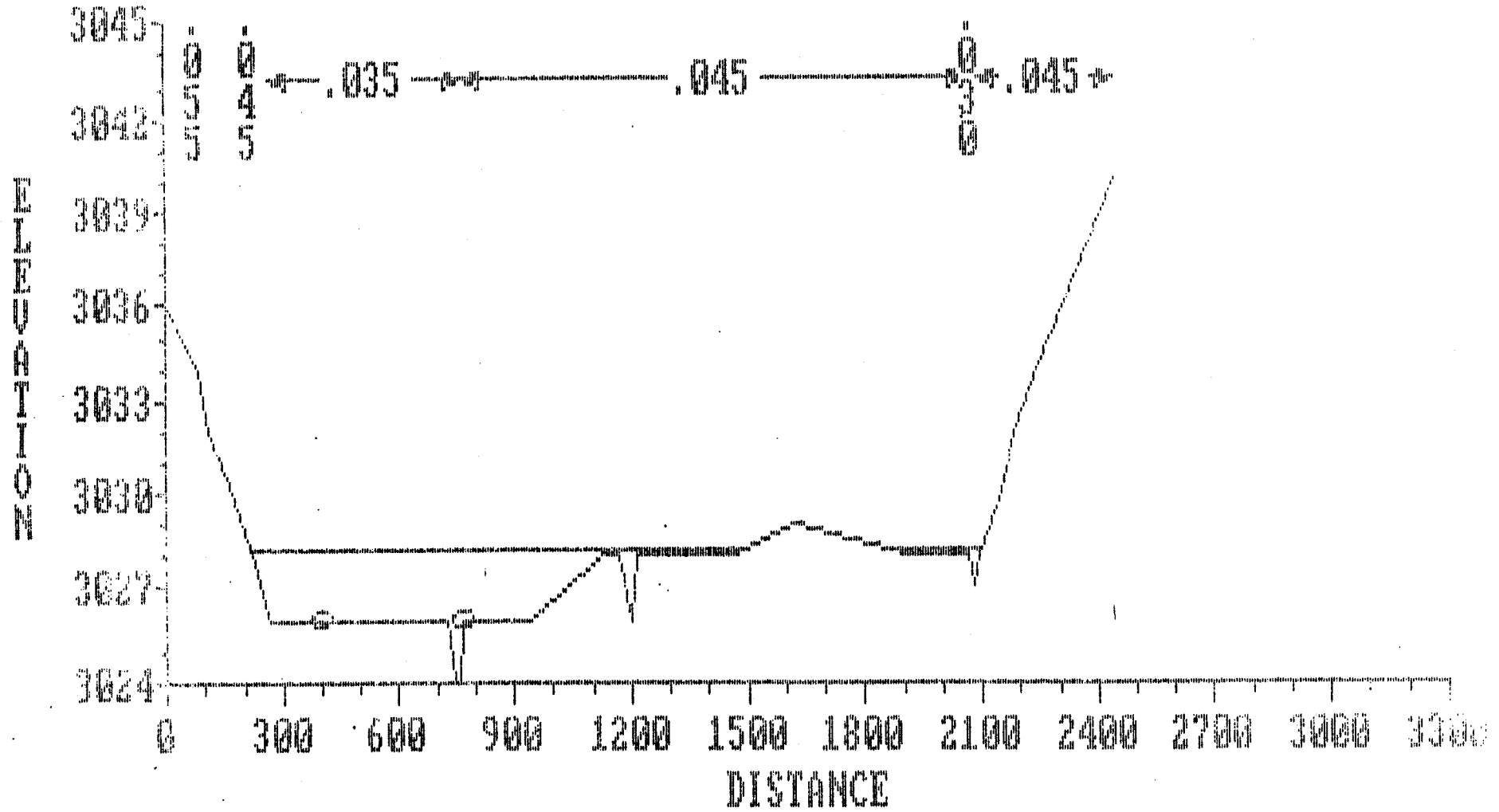
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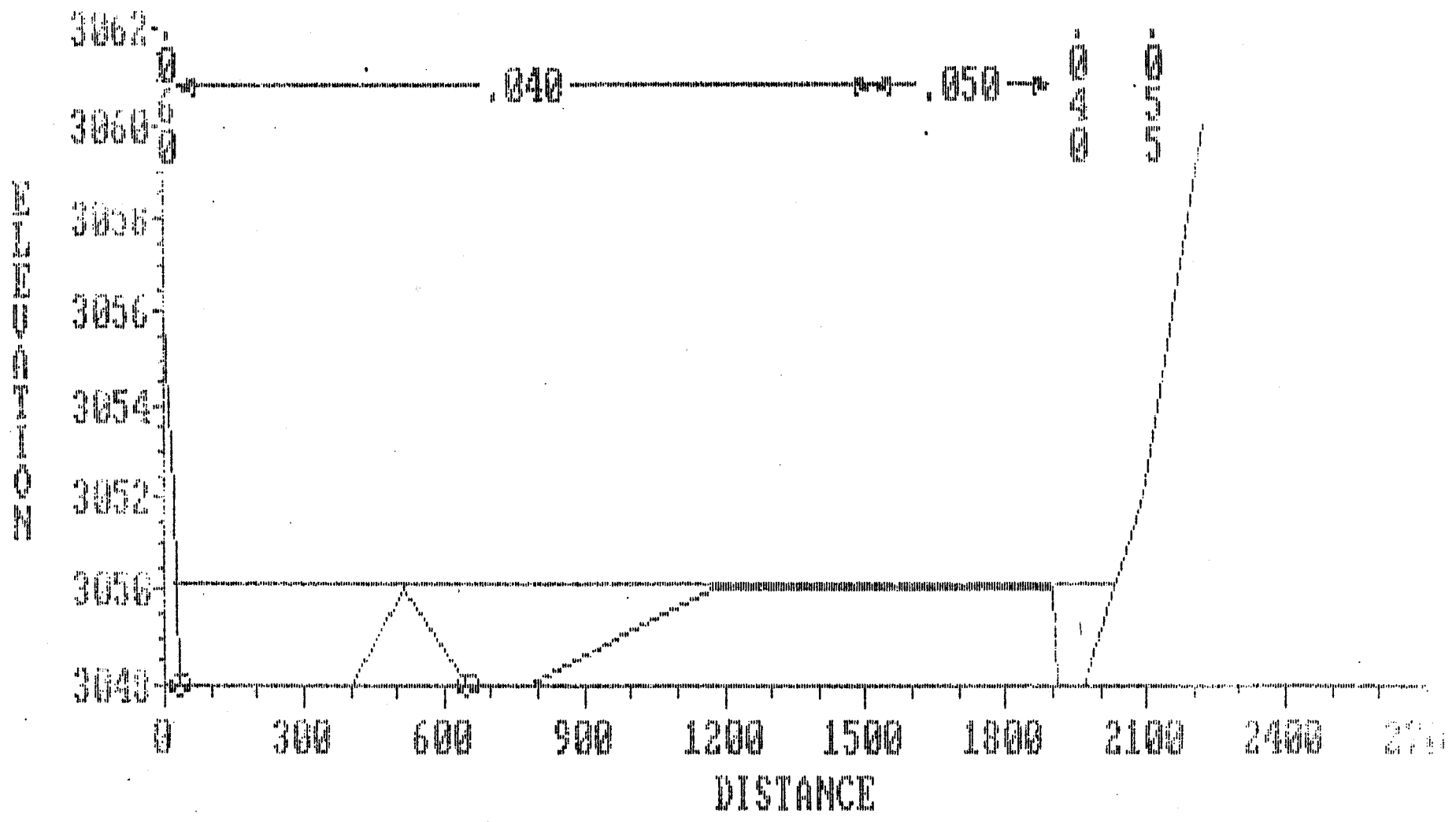
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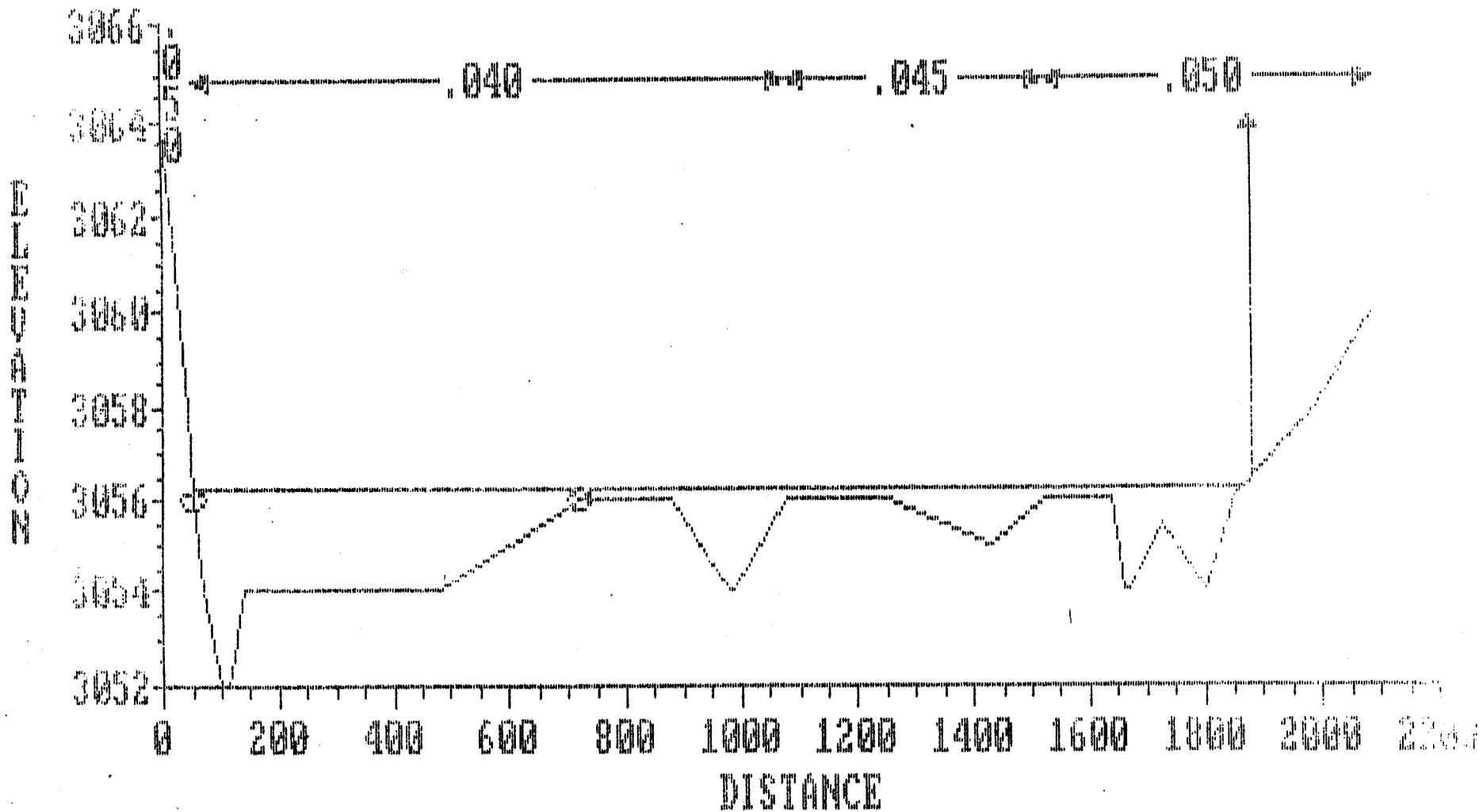
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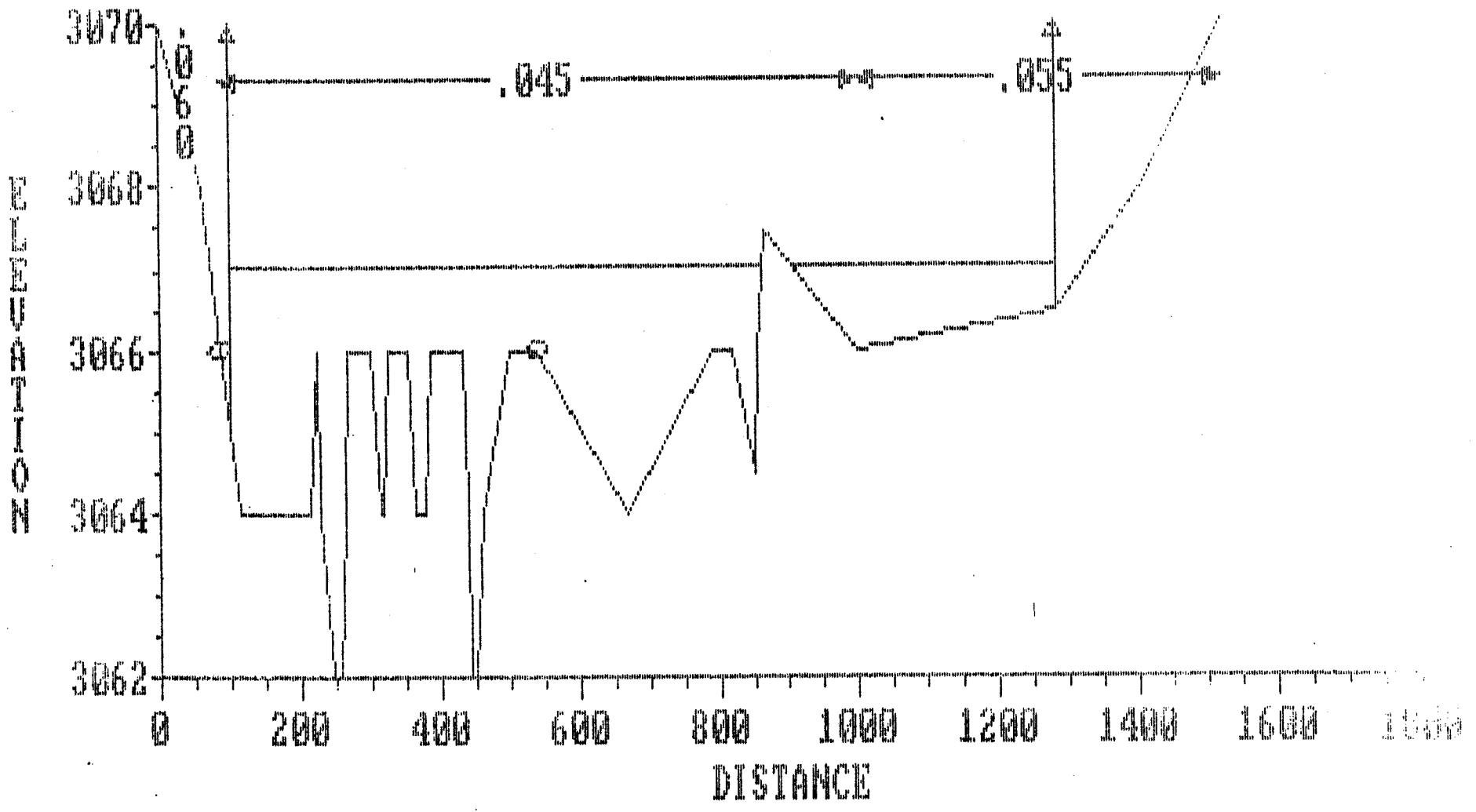
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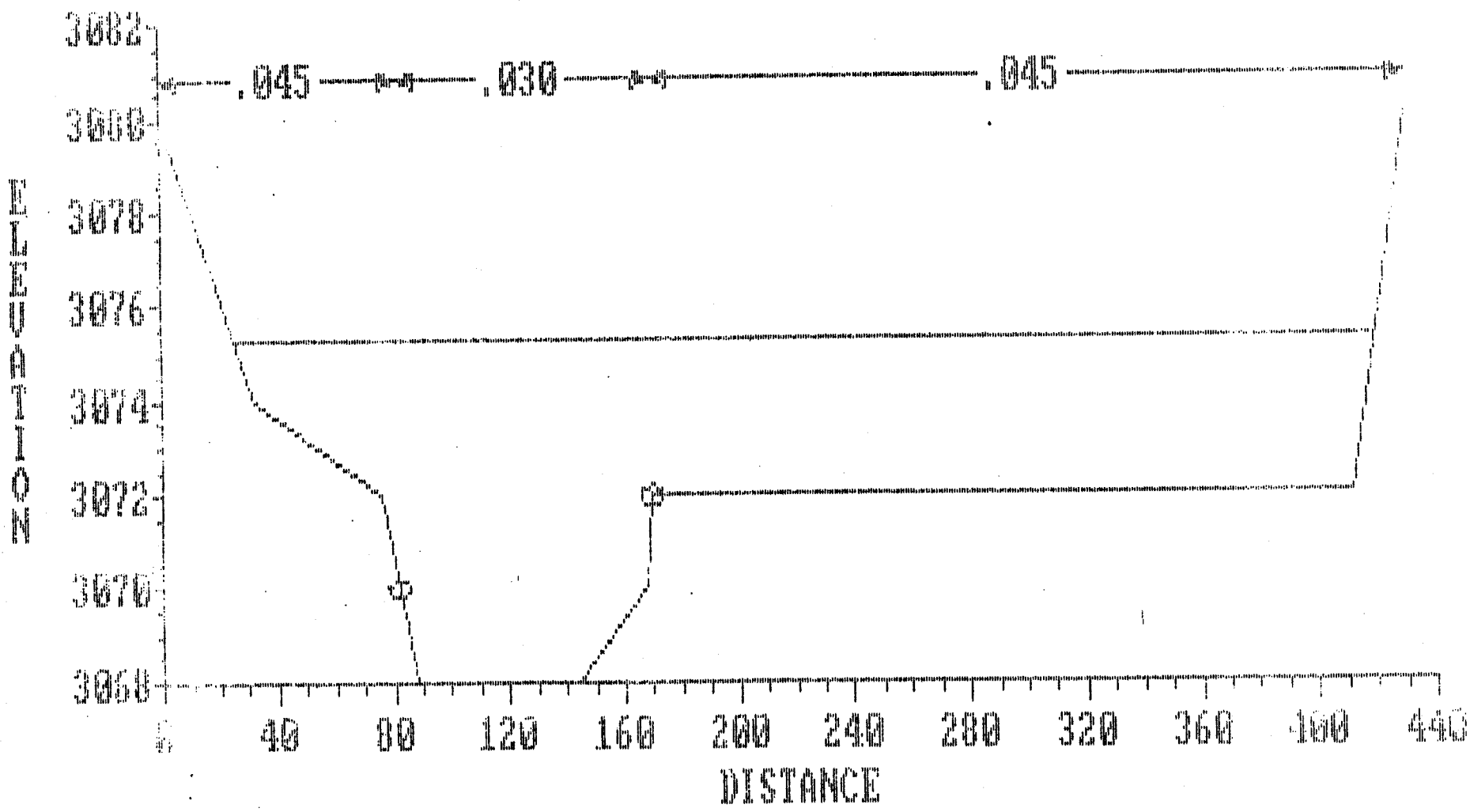
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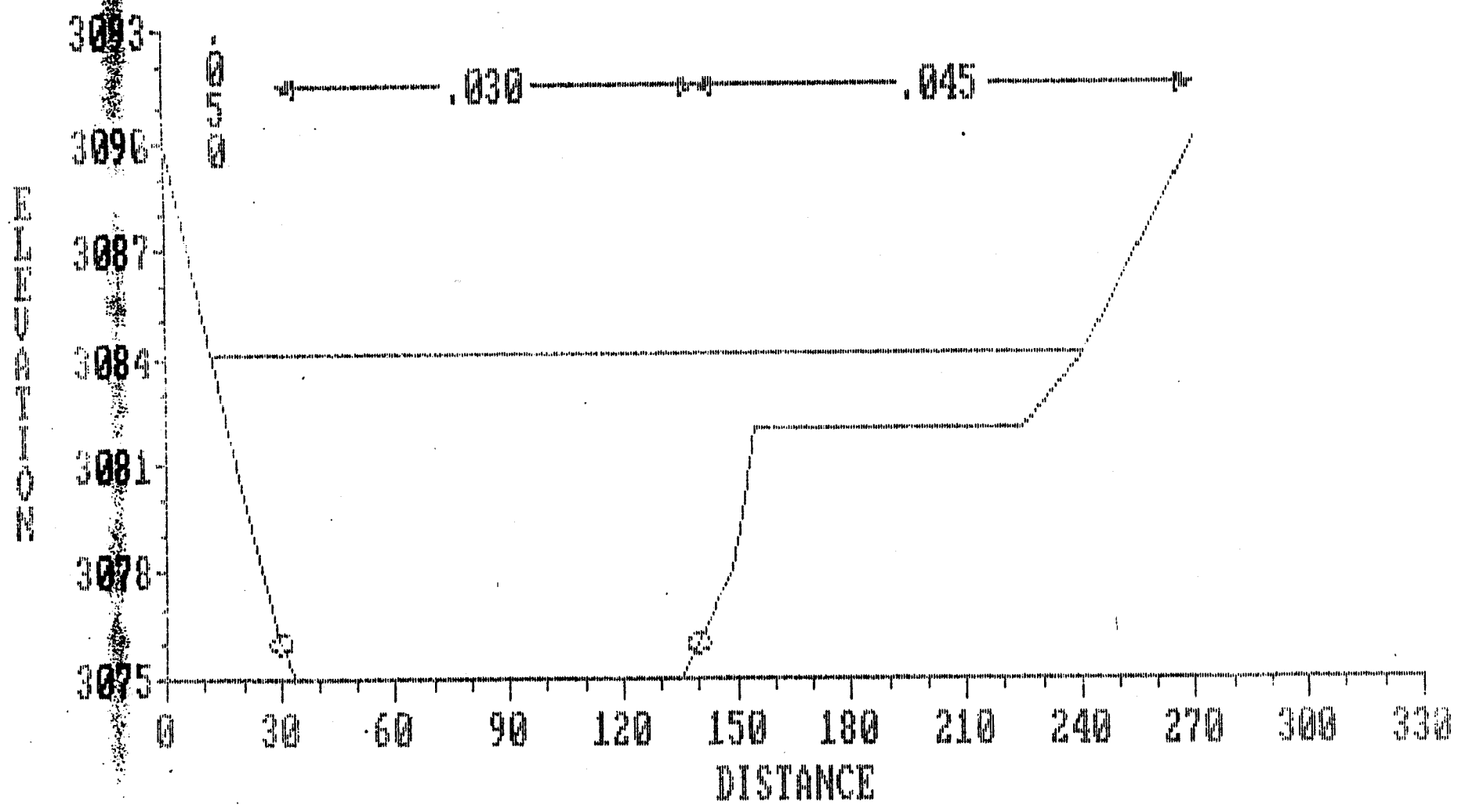
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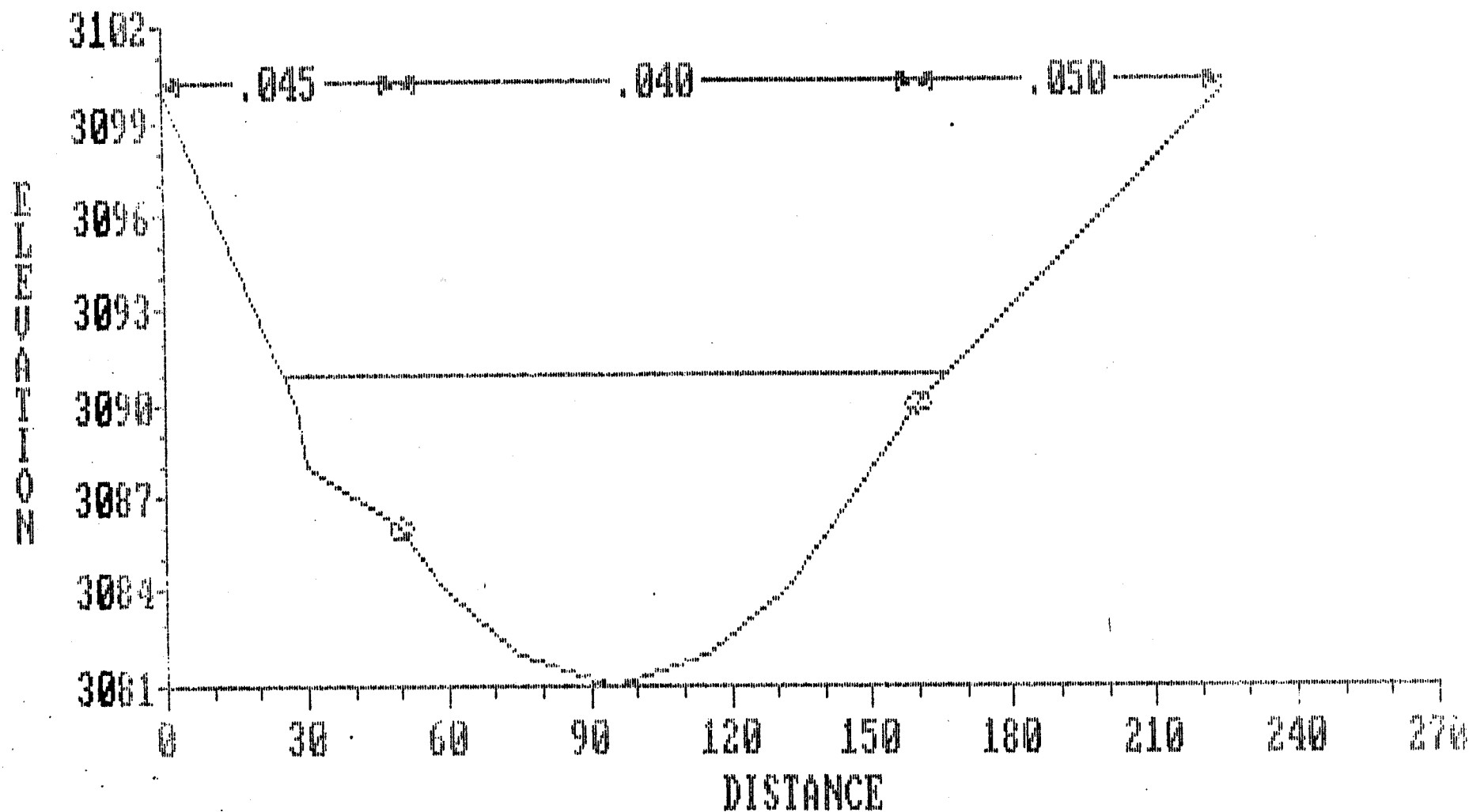
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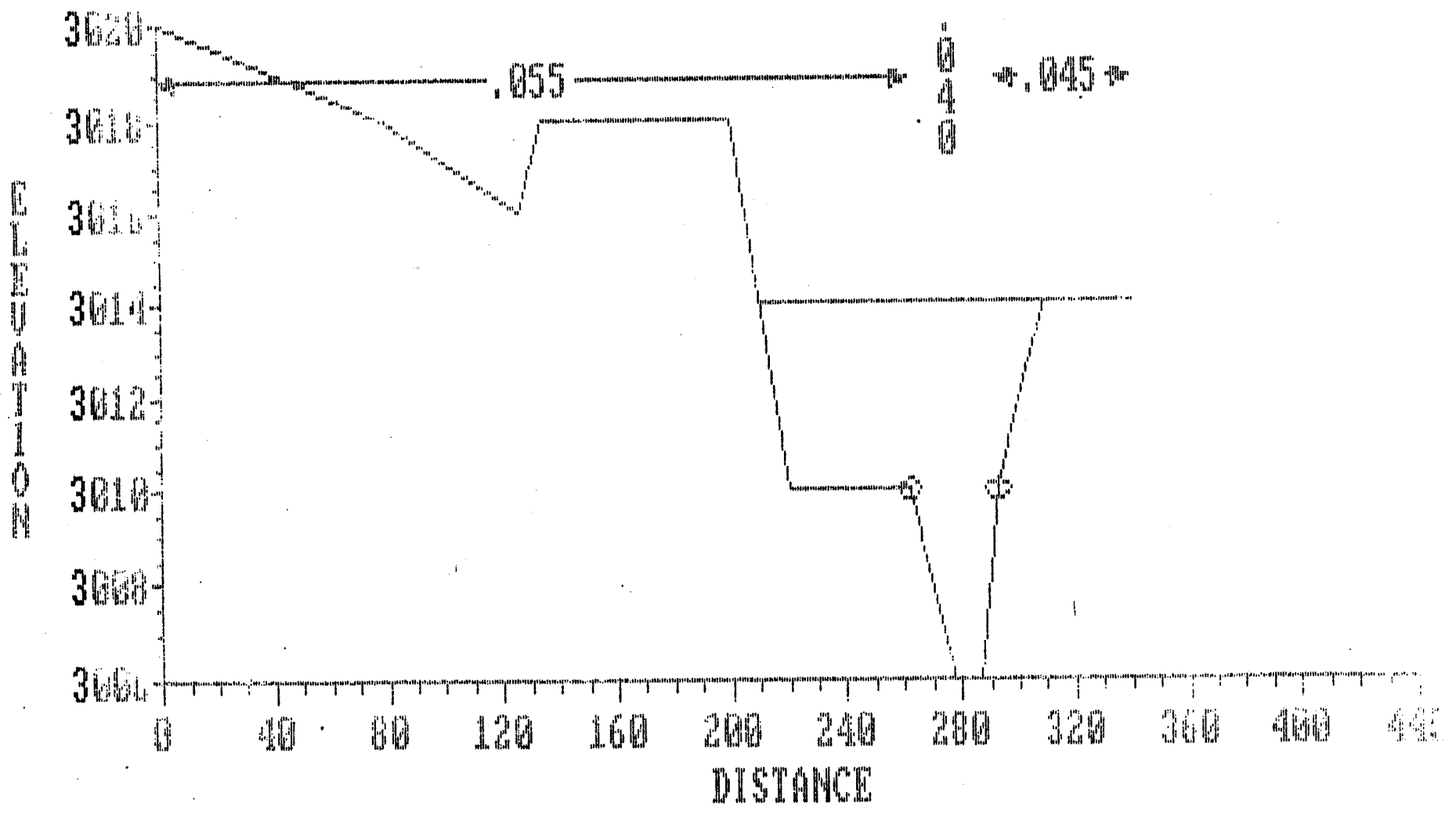
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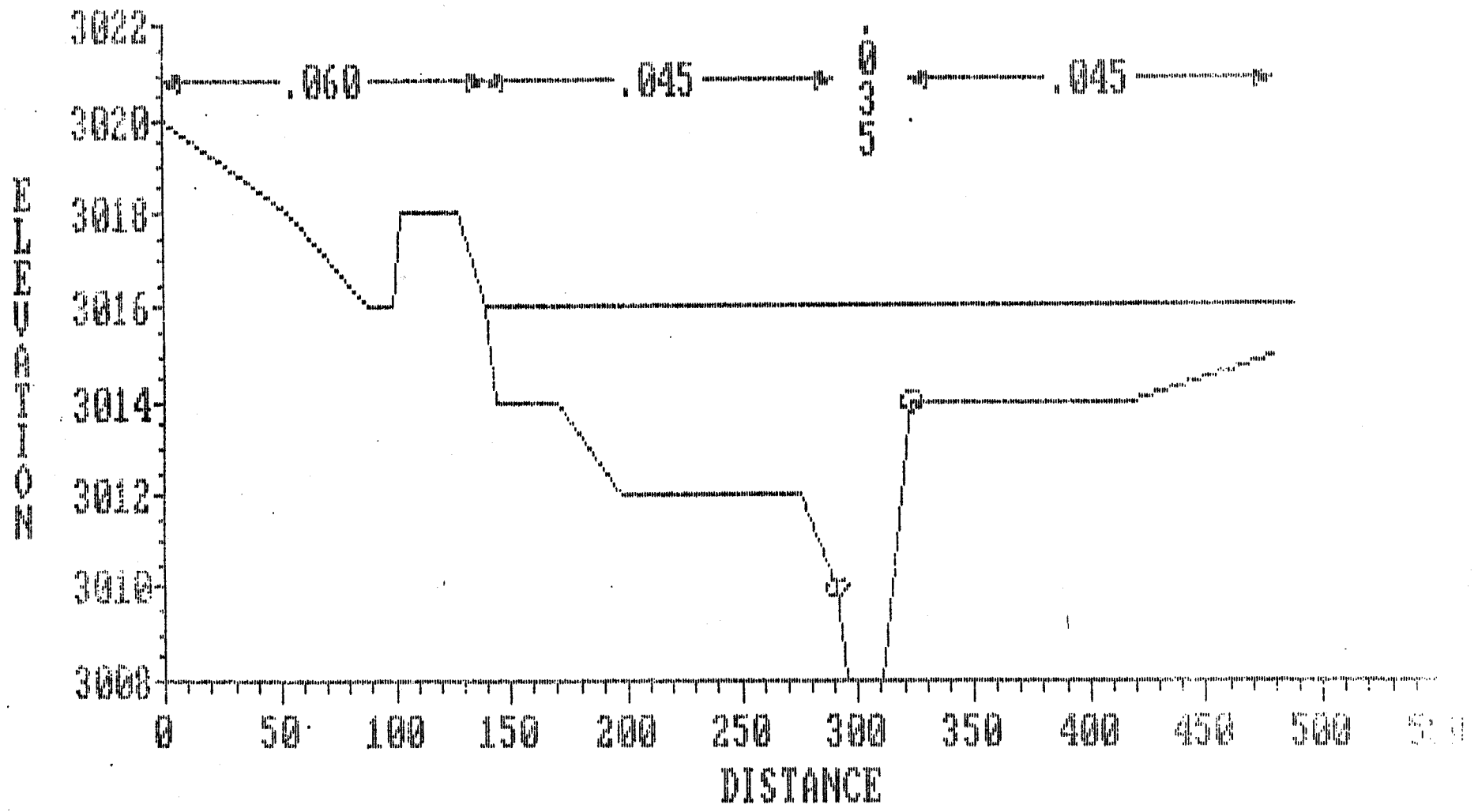
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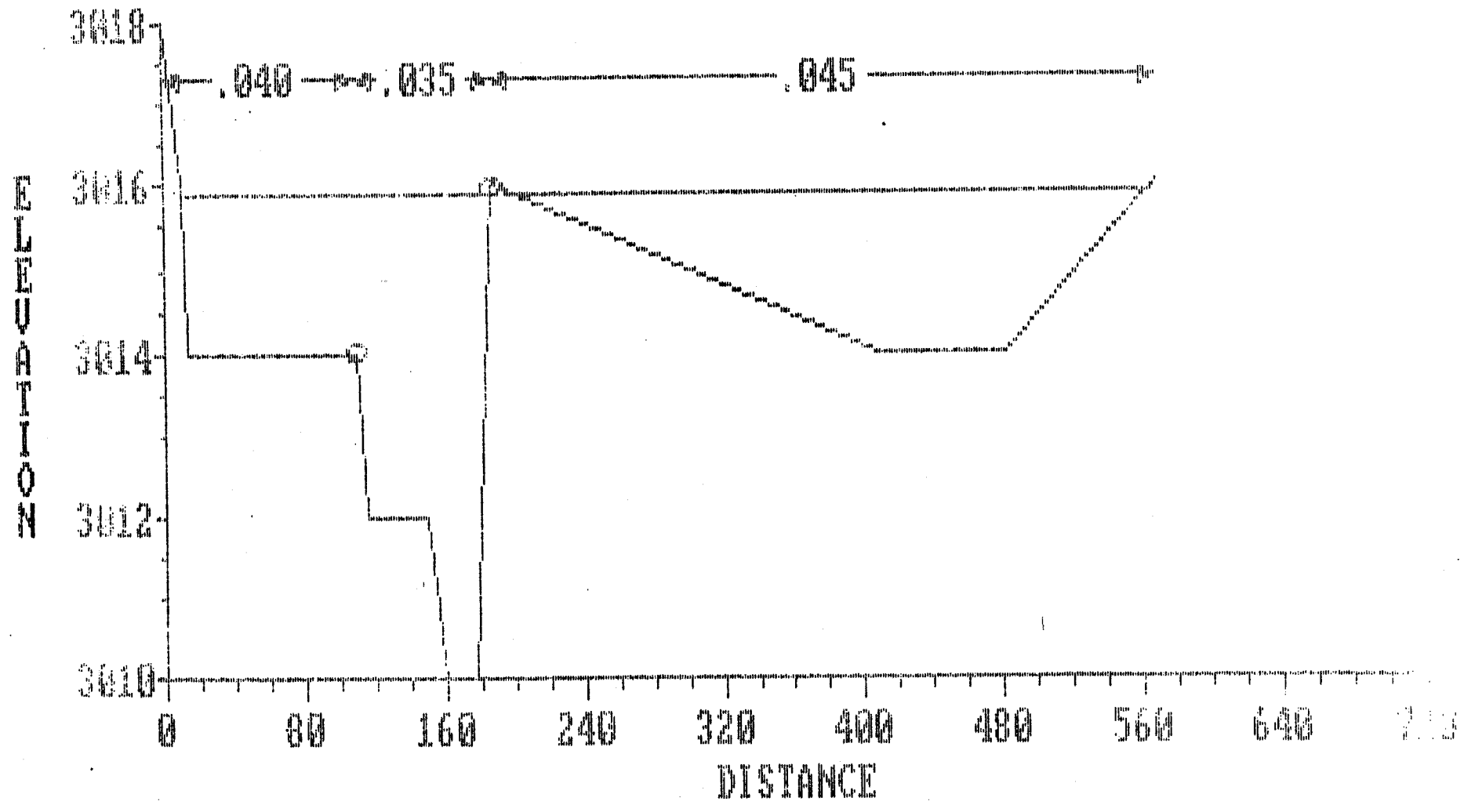
CROSS-SECTION NO. 200.000



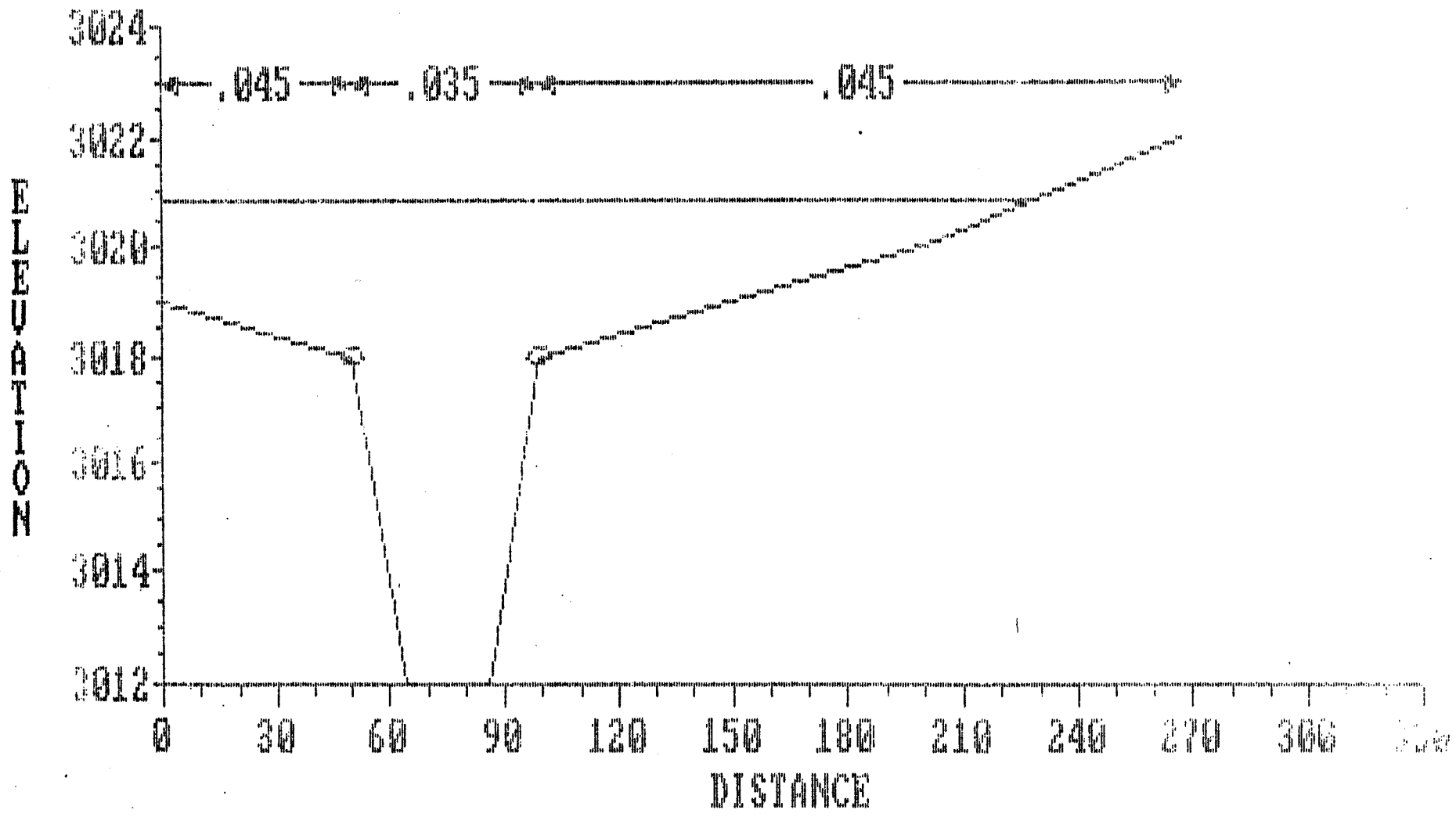
CROSS-SECTION NO. 210.000



CROSS-SECTION NO. 220.000



CROSS-SECTION NO. 240.000



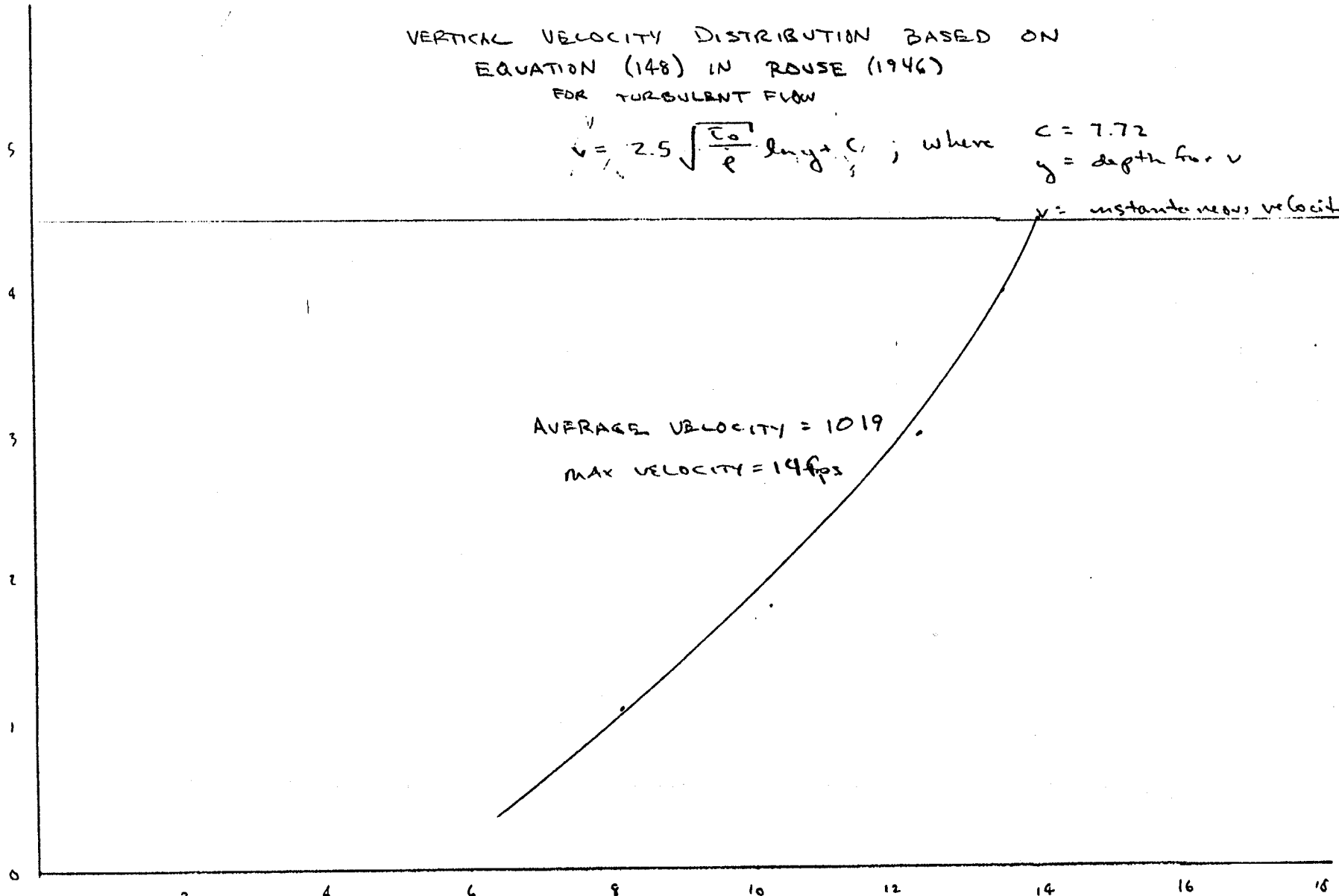
VERTICAL VELOCITY DISTRIBUTION BASED ON
EQUATION (148) IN ROUSE (1946)
FOR TURBULENT FLOW

$$v = 2.5 \sqrt{\frac{C_0}{\rho}} \ln y + C; \text{ where } C = 7.72$$

$y = \text{depth for } v$

$v = \text{instantaneous velocity}$

DEPTH (ft.)



VELOCITY (FT/SEC.)

oh

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: entire basin

Watershed Area = 10645.00 acres
Length of Watercourse (Lc): 35400 ft.
Length to Center of Gravity (Lca): 22800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)=10800	H(1)=140.0
L(2)=16400	H(2)=1300.0
L(3)= 5200	H(3)=1200.0
L(4)= 3000	H(4)=2090.0

Mean Slope (Sc): 0.0447 ft/ft

Basin Factor (Nbw): 0.048

FLOOD FREQUENCY: 100-Year

P24 = 4.40
P6 = 3.51
P1 = 2.60
P2 = 2.91
P3 = 3.12

Impervious Cover = 2.5 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN = 82.00
CN* = 86.65
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN = 83.00
CN* = 87.56
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN = 89.00
CN* = 92.09
Cover Density = 25.0 %

Time of Concentration (Tc) = 84.0 min
Intensity = 1.88 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.68
Runoff Supply Rate at Tc = 1.27

PEAK DISCHARGE: 13656.1 cfs

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: above watershed #5 confluence

Watershed Area = 7403.00 acres
Length of Watercourse (Lc): 31200 ft.
Length to Center of Gravity (Lca): 16500 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1) = 6000	H(1) = 90.0
L(2) = 3800	H(2) = 80.0
L(3) = 6400	H(3) = 360.0
L(4) = 6600	H(4) = 880.0
L(5) = 4800	H(5) = 1200.0
L(6) = 2800	H(6) = 1600.0
L(7) = 800	H(7) = 260.0

Mean Slope (Sc): 0.0535 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.66
P6 = 3.67
P1 = 2.67
P2 = 3.01
P3 = 3.24

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN = 82.00
CN* = 86.81
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN = 81.00
CN* = 86.10
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN = 89.00
CN* = 92.20
Cover Density = 25.0 %

Time of Concentration (Tc) = 64.2 min
Intensity = 2.53 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.67
Runoff Supply Rate at Tc = 1.71

PEAK DISCHARGE: 12751.9 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: national forest boundary (#4)

Watershed Area = 6013.00 acres
Length of Watercourse (Lc): 25200 ft.
Length to Center of Gravity (Lca): 11000 ft.

Incremental Change in Length (Li)-ft.

- L(1) = 3800
- L(2) = 6400
- L(3) = 6600
- L(4) = 4800
- L(5) = 2800
- L(6) = 800

Incremental Change in Elevation (Hi)-ft.

- H(1) = 80.0
- H(2) = 360.0
- H(3) = 880.0
- H(4) = 1200.0
- H(5) = 1600.0
- H(6) = 260.0

Mean Slope (Sc): 0.0859 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 100-Year

- P24 = 4.66
- P6 = 3.67
- P1 = 2.67
- P2 = 3.01
- P3 = 3.24

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN = 81.00
CN* = 86.10
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN = 89.00
CN* = 92.20
Cover Density = 25.0 %

Time of Concentration (Tc) = 48.6 min
Intensity = 3.08 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.67
Runoff Supply Rate at Tc = 2.07

PEAK DISCHARGE: 12556.4 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 3

Catchment Area = 407.00 acres
Length of Watercourse (Lc): 6400 ft.
Length to Center of Gravity (Lca): 3200 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1) = 6400 H(1) = 240.0

Average Slope (Sc): 0.0375 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN = 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN = 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 13.7 min
Intensity = 6.62 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.60
Runoff Supply Rate at Tc = 3.96

PEAK DISCHARGE: 1623.0 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 8

Watershed Area= 679.00 acres
Length of Watercourse (Lc): 5200 ft.
Length to Center of Gravity (Lca): 2600 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi) -ft.
L(1)= 3200 H(1)=360.0
L(2)= 2000 H(2)=682.0
Mean Slope (Sc): 0.1609 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 2.5 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 100.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 8.3 min
Intensity = 8.35 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.76
Runoff Supply Rate at Tc = 6.32

PEAK DISCHARGE: 4323.7 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 2

Watershed Area= 352.00 acres
Length of Watercourse (Lc): 6000 ft.
Length to Center of Gravity (Lca): 3000 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (H): ft.
L(1)= 6000 H(1)=210.0
Mean Slope (Sc): 0.0350 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 100-Year

p24 = 4.80
p6 = 3.82
p1 = 2.79
p2 = 3.14
p3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 12.2 min
Intensity = 7.03 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.74
Runoff Supply Rate at Tc = 5.23

PEAK DISCHARGE: 1856.5 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland 1
Drainage Concentration Point: cp 1

Watershed Area= 355.00 acres
Length of Watercourse (Lc): 7100 ft.
Length to Center of Gravity (Lca): 3550 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7100 H(1)=160.0
Mean Slope (Sc): 0.0225 ft/ft

Basin Factor (Nbw): 0.035 FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: C
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 88.00
CN* = 91.31
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 14.9 min
Intensity = 6.36 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.98
Runoff Supply Rate at Tc = 6.27

PEAK DISCHARGE: 2243.0 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: watershed #5

Watershed Area= 2344.00 acres
Length of Watercourse (Lc): 25400 ft.
Length to Center of Gravity (Lca): 12800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi) -ft.
L(1)= 5400	H(1)=120.0
L(2)=10200	H(2)=1080.0
L(3)= 4600	H(3)=800.0
L(4)= 2000	H(4)=600.0
L(5)= 3200	H(5)=1820.0

Mean Slope (Sc): 0.0862 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 86.36
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 92.38
Cover Density = 25.0 %

Time of Concentration (Tc) = 50.0 min
Intensity = 3.15 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.69
Runoff Supply Rate at Tc = 2.18

PEAK DISCHARGE: 5140.2 cfs

HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 6

Watershed Area= 406.00 acres
Length of Watercourse (Lc): 9600 ft.
Length to Center of Gravity (Lca): 4800 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 9600 H(1)=770.0
Mean Slope (Sc): 0.0802 ft/ft

Basin Factor (Nbw): 0.050 FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 30.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 93.43
Cover Density = 20.0 %

Time of Concentration (Tc) = 18.4 min
Intensity = 5.86 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.69
Runoff Supply Rate at Tc = 4.06

PEAK DISCHARGE: 1663.3 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 7

Watershed Area= 215.00 acres
Length of Watercourse (Lc): 7400 ft.
Length to Center of Gravity (Lca): 3700 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7400 H(1)=640.0
Mean Slope (Sc): 0.0865 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

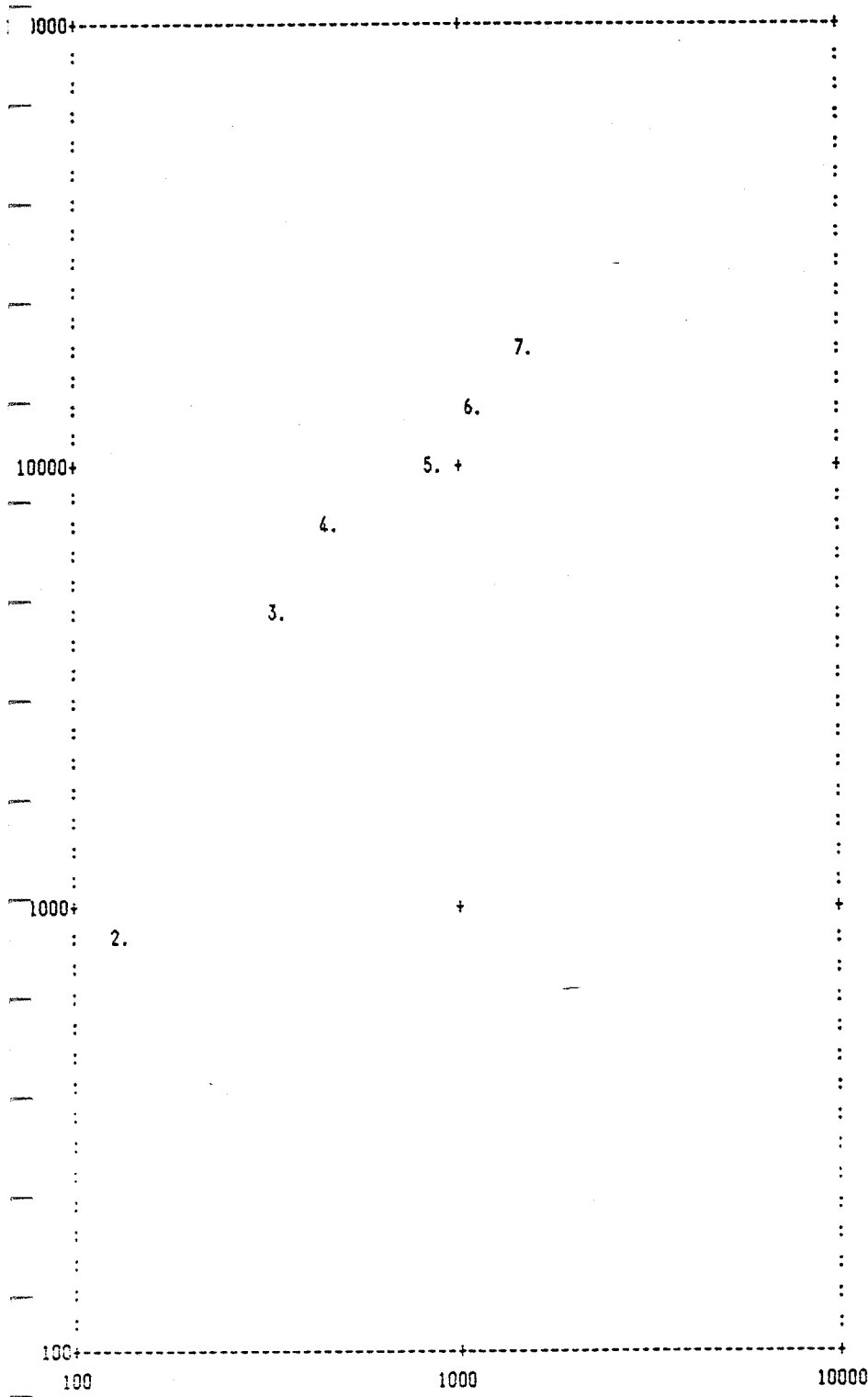
Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 85.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 91.00
CN* = 93.43
Cover Density = 20.0 %

Time of Concentration (Tc) = 15.8 min
Intensity = 6.20 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.59
Runoff Supply Rate at Tc = 3.65

PEAK DISCHARGE: 790.3 cfs



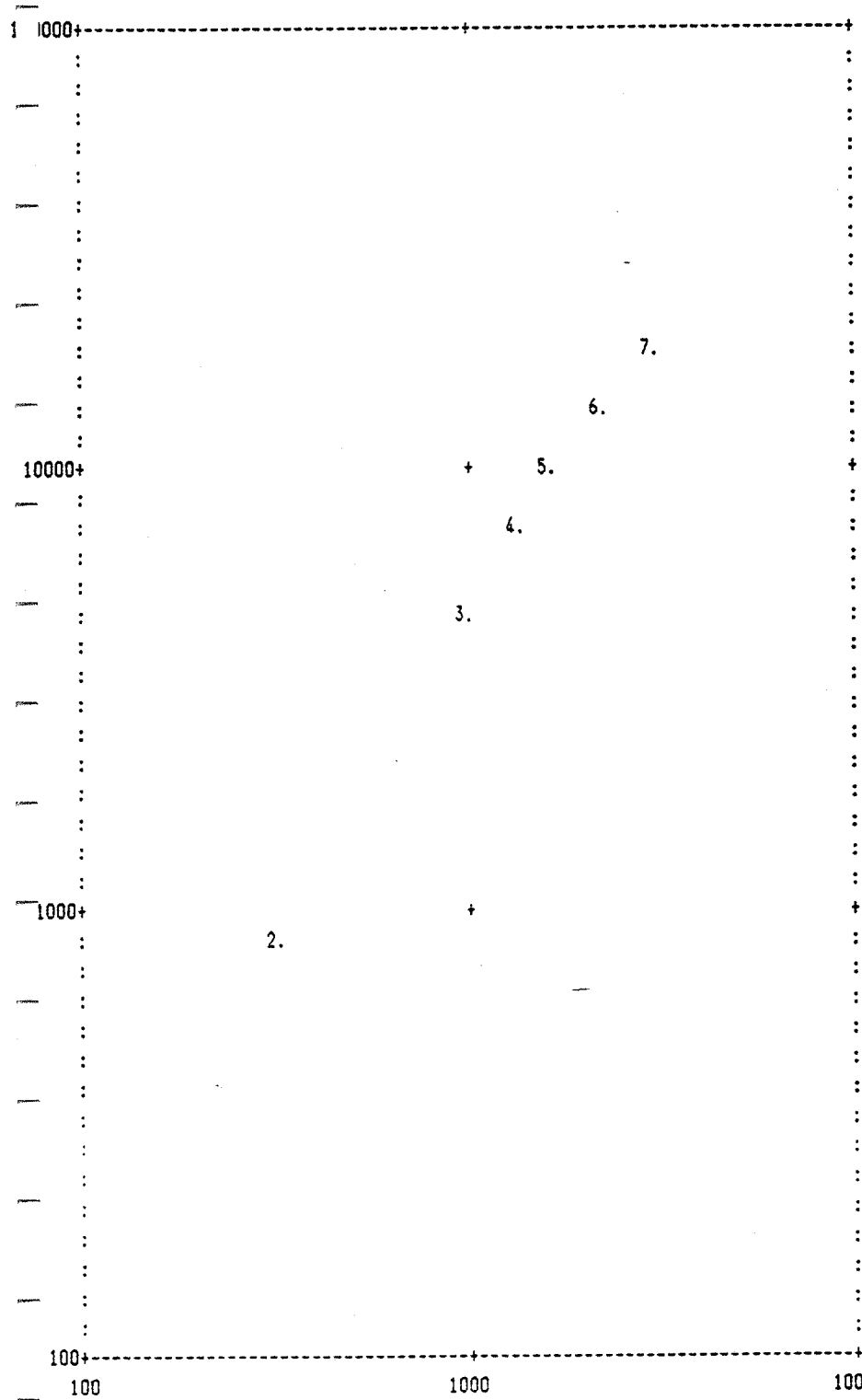
CROSS SECTION 2 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.79
2	880.00	139.00	1.79
3	4300.00	338.00	1.79
4	6900.00	469.00	1.66
5	9700.00	870.00	1.34
6	12800.00	1147.00	1.26
7	18500.00	1530.00	1.26

LEGEND

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

LOG CROSS SECTION END AREA IN SQ. FT.



CROSS SECTION 7 END AREA VS DISCHARGE

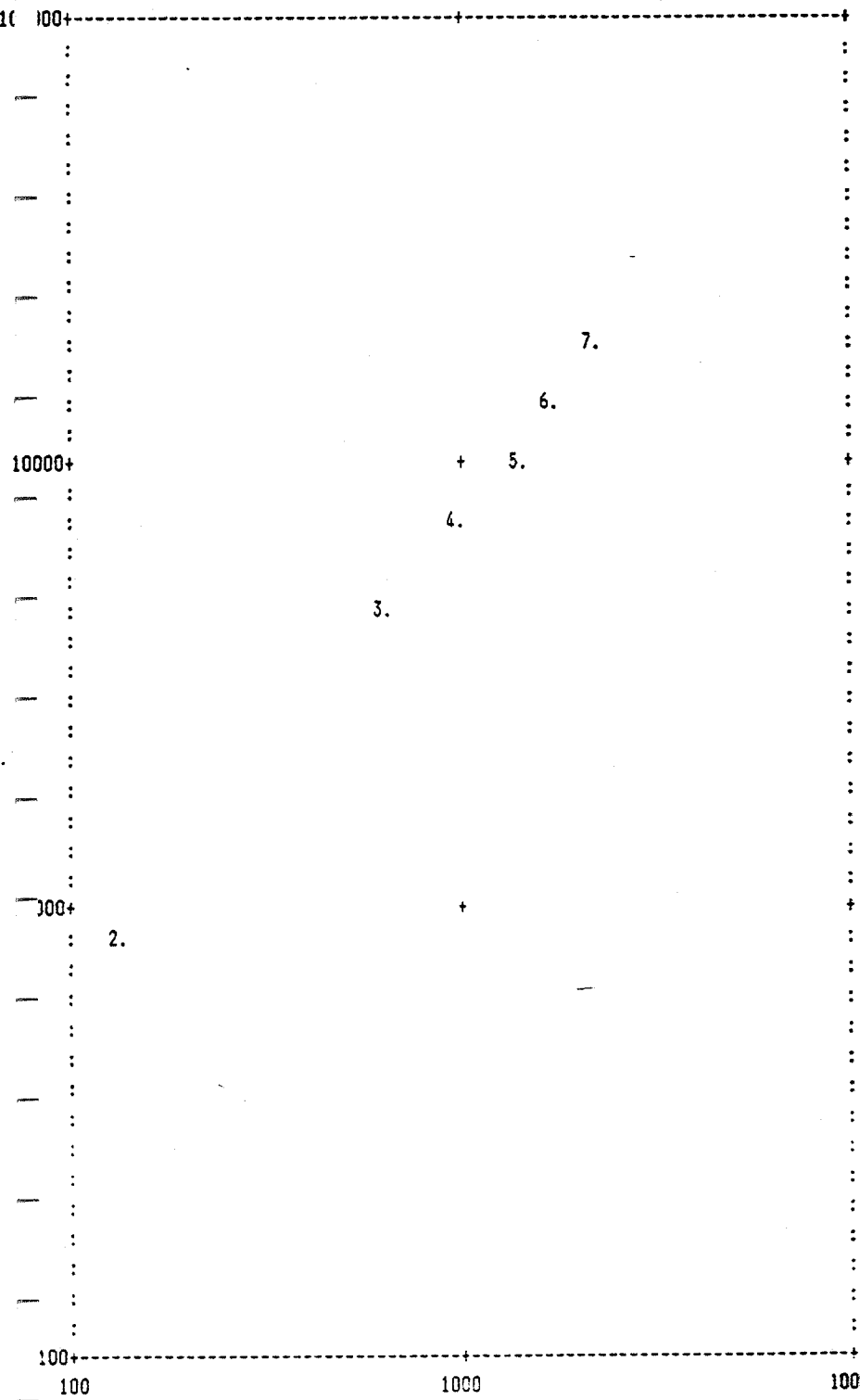
REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.41
2	880.00	321.00	1.41
3	4300.00	986.00	1.41
4	6900.00	1373.00	1.42
5	9700.00	1681.00	1.50
6	12800.00	2219.00	1.38
7	18500.00	2981.00	1.34

LEGEND

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

LOG CROSS SECTION END AREA IN SQ. FT.

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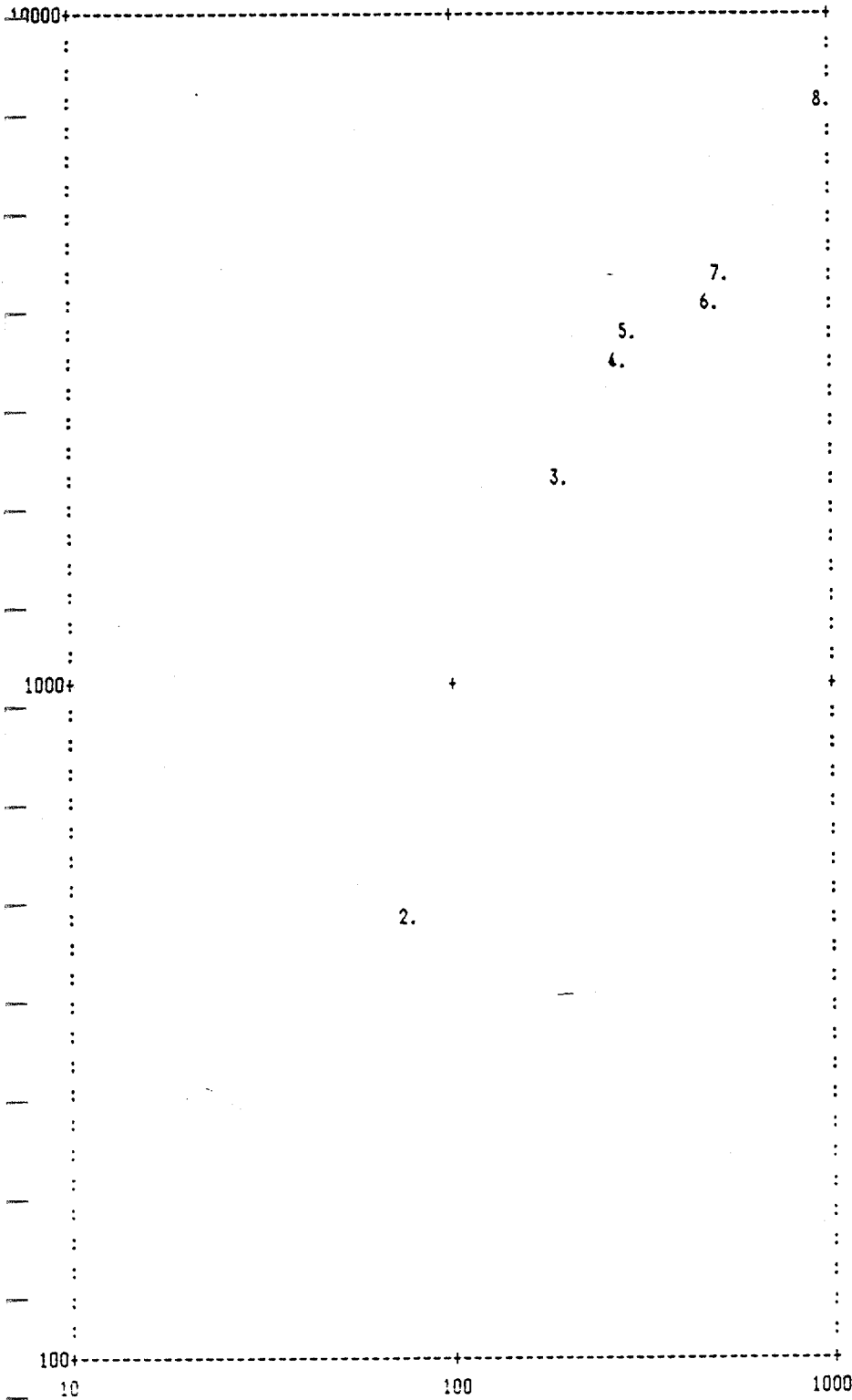
CROSS SECTION 10 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.05
2	900.00	139.00	1.05
3	4500.00	641.00	1.05
4	7300.00	1012.00	1.06
5	10400.00	1409.00	1.06
6	13700.00	1745.00	1.11
7	19550.00	2265.00	1.19

LEGEND

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

LOG CROSS SECTION END AREA IN SQ. FT.



CROSS SECTION 16 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.59
2	440.00	79.00	1.59
3	1950.00	201.00	1.59
4	3100.00	294.00	1.46
5	3482.00	316.00	1.47
6	3680.00	490.00	1.40
7	3869.00	526.00	1.37
8	7500.00	1000.00	1.20

LEGEND

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

LOG CROSS SECTION END AREA IN SQ. FT.

EXECUTIVE CONTROL OPERATION LIST

RECORD ID

LISTING OF CURRENT DATA

XSECTN NO.	DRAINAGE AREA	ELEVATION	DISCHARGE	END AREA
XSECTN 2	1.0000			
		3076.00	.00	.00
		3078.40	880.00	139.00
		3081.40	4300.00	338.00
		3083.30	6900.00	469.00
		3086.40	9700.00	870.00
		3087.70	12800.00	1147.00
		3089.40	18500.00	1530.00

9 E TBL

XSECTN NO.	DRAINAGE AREA	ELEVATION	DISCHARGE	END AREA
XSECTN 7	1.0000			
		3036.00	.00	.00
		3036.27	280.00	321.00
		3036.80	4300.00	986.00
		3037.00	6900.00	1373.00
		3037.30	9700.00	1681.00
		3037.60	12800.00	2219.00
		3038.00	18500.00	2981.00

9 E TBL

XSECTN NO.	DRAINAGE AREA	ELEVATION	DISCHARGE	END AREA
XSECTN 10	1.0000			
		2992.00	.00	.00
		2993.80	900.00	139.00
		2996.40	4500.00	641.00
		2997.30	7300.00	1012.00
		2998.10	10400.00	1409.00
		2998.70	13700.00	1745.00
		2999.50	19550.00	2265.00

ENDI8L

XSECTN NO.	DRAINAGE AREA	ELEVATION	DISCHARGE	END AREA
XS TN 16	1.0000	3001.00	.00	.00
		3003.70	440.00	79.00
		3006.30	1950.00	201.00
		3007.50	3100.00	294.00
		3007.70	3482.00	316.00
		3008.60	3680.00	490.00
		3008.70	3869.00	526.00
		3015.00	7500.00	1000.00

EI T8L

TIME INCREMENT					
D. 4Y0	.0200				
	.0000	.0300	.1000	.1900	.3100
	.4700	.6600	.8200	.9300	.9900
	1.0000	.9900	.9300	.8600	.7800
	.6800	.5600	.4600	.3900	.3300
	.2800	.2410	.2070	.1740	.1470
	.1260	.1070	.0910	.0770	.0660
	.0550	.0470	.0400	.0340	.0290
	.0250	.0210	.0180	.0150	.0130
	.0110	.0090	.0080	.0070	.0060
	.0050	.0040	.0030	.0020	.0010
	.0000	.0000	.0000	.0000	.0000

9 E T8L

COMPUTED PEAK RATE FACTOR = 484.00

TABLE NO.	TIME INCREMENT				
5 RAINFL 1	.0833				
	.0000	.0200	.0500	.3200	.4900
	.6200	.7200	.7900	.8500	.9000
	.9400	.9700	1.0000	1.0000	1.0000

9 E T8L

TABLE NO.	TIME INCREMENT				
RAINFL 2	.5000				
	.0000	.0030	.0090	.0100	.0140
	.0190	.0220	.0290	.0350	.0440
	.0600	.1000	.6600	.7480	.7800
	.8000	.8150	.8300	.8400	.8500
	.8600	.8690	.8780	.8850	.8900
	.8990	.9050	.9120	.9200	.9230
	.9300	.9330	.9400	.9430	.9500
	.9570	.9600	.9640	.9680	.9700
	.9740	.9800	.9810	.9830	.9880
	.9900	.9920	.9950	1.0000	1.0000

TABLE NO.	TIME INCREMENT				
RAINFL 3	.5000				
	.0000	.0100	.0220	.0360	.0510
	.0670	.0830	.0990	.1160	.1350
	.1560	.1790	.2040	.2330	.2680
	.3100	.4250	.4800	.5200	.5500
	.5770	.6010	.6230	.6440	.6640
	.6830	.7010	.7190	.7360	.7530
	.7690	.7850	.8000	.8150	.8300
	.8440	.8580	.8710	.8840	.8960
	.9080	.9200	.9320	.9440	.9560
	.9670	.9780	.9890	1.0000	1.0000

TABLE NO.	TIME INCREMENT				
R NFL 4	.5000				
	.0000	.0040	.0080	.0120	.0160
	.0200	.0250	.0300	.0350	.0400
	.0450	.0500	.0550	.0600	.0650
	.0700	.0750	.0810	.0870	.0930
	.0990	.1050	.1110	.1180	.1250
	.1320	.1400	.1480	.1560	.1650
	.1740	.1840	.1950	.2070	.2200
	.2360	.2550	.2770	.3030	.4090
	.5150	.5490	.5830	.6050	.6240
	.6400	.6550	.6690	.6820	.6940
	.7050	.7160	.7270	.7380	.7480
	.7580	.7670	.7760	.7840	.7920

57

	.8000	.8080	.8160	.8230	.8300
	.8370	.8440	.8510	.8580	.8640
	.8700	.8760	.8820	.8880	.8940
	.9000	.9060	.9110	.9160	.9210
	.9260	.9310	.9360	.9410	.9460
	.9510	.9560	.9610	.9660	.9710
	.9760	.9800	.9840	.9880	.9920
	.9960	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT				
5 R1 INFL 5	.5000				
	.0000	.0020	.0050	.0080	.0110
	.0140	.0170	.0200	.0230	.0260
	.0290	.0320	.0350	.0380	.0410
	.0440	.0470	.0510	.0550	.0590
	.0630	.0670	.0710	.0750	.0790
	.0840	.0890	.0940	.0990	.1040
	.1090	.1140	.1200	.1260	.1330
	.1400	.1470	.1540	.1620	.1710
	.1810	.1920	.2040	.2170	.2330
	.2520	.2770	.3180	.6380	.6980
	.7290	.7520	.7700	.7850	.7980
	.8090	.8190	.8290	.8380	.8460
	.8540	.8610	.8680	.8740	.8800
	.8860	.8920	.8970	.9020	.9070
	.9120	.9170	.9210	.9250	.9290
	.9330	.9370	.9410	.9450	.9490
	.9530	.9570	.9600	.9630	.9660
	.9690	.9720	.9750	.9780	.9810
	.9840	.9870	.9900	.9930	.9960
	.9980	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT				
5 R1 INFL 6	.2000				
	.0000	.0120	.0370	.0860	.3670
	.7340	.8070	.8310	.8430	.8620
	.8740	.8860	.8960	.9050	.9130
	.9240	.9290	.9360	.9410	.9490
	.9540	.9580	.9660	.9680	.9730
	.9780	.9820	.9880	.9940	1.0000

9 ENDTBL

STANDARD CONTROL INSTRUCTIONS

RU FF 1	1	6	9.4000	88.4000	.81000	0 0 0 0 1
REACH 3	2	6 7	1720.0000	.0000	.00000	0 0 0 0 1
RUNOFF 1	3	6	.6400	76.4000	.23000	0 0 0 0 1
AD YD 4	4	7 6 5			0 0 0 0 0 1	
RUNOFF 1	5	6	1.0600	89.0000	.14000	0 0 0 0 1
ADDHYD 4	6	5 6 7			0 0 0 0 0 1	
RE H 3	7	7 5	4500.0000	.0000	.00000	0 0 0 0 1
RU FF 1	8	6	.5300	87.6000	.20000	0 0 0 0 1
ADDHYD 4	9	5 6 7			0 0 0 0 0 1	
RE H 3	10	7 5	2700.0000	.0000	.00000	0 0 0 0 1
RU FF 1	11	6	.5500	78.8000	.25000	0 0 0 0 1
ADDHYD 4	12	5 6 7			1 1 0 0 0 1	
RUNOFF 1	13	5	3.6600	88.4000	.83000	0 0 0 0 1
DI RT 6	14	5 2 1	3200.0000	.8500	15.00000	0 0 0 0 1
RE H 3	16	2 6	3600.0000	.0000	.00000	0 0 0 0 1
RUNOFF 1	17	4	.6300	84.8000	.31000	0 0 0 0 1
RU FF 1	18	3	.3400	77.1000	.26000	0 0 0 0 1
AD YD 4	19	3 4 5			0 0 0 0 0 1	
ADDHYD 4	20	5 6 4			0 0 0 0 0 1	
ADDHYD 4	21	4 7 3			0 0 0 0 0 1	
AC HYD 4	22	3 1 7			1 1 0 0 0 1	

ENDATA

END LISTING

PER ION ADDHYD CROSS SECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
6.61	15296.10	(NULL)
13.07	494.65	(NULL)
14.12	490.21	(NULL)
16.38	348.85	(NULL)
17.69	429.94	(NULL)
20.73	298.87	(NULL)
22.52	231.56	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .08 HOURS	DRAINAGE AREA = 12.18 SQ.MI.								
6.20	DISCHG .00 .00 .00 .17	.78 2.76 9.36	21.36	38.45	61.38						
6.40	DISCHG 115.19 399.98 1217.94 2502.71	4071.40 5887.36 7855.47	9691.19	11136.79	12358.25						
6.60	DISCHG 13536.64 14549.21 15175.59 15263.08	14791.14 13870.13 12688.63	11395.06	10109.23	8899.17						
7.20	DISCHG 7788.03 6783.23 5894.90 5124.26	4465.23 3905.40 3428.91	3022.22	2678.33	2389.88						
8.00	DISCHG 2148.79 1947.29 1778.47 1636.63	1517.08 1416.30 1331.73	1260.86	1198.98	1142.23						
8.80	DISCHG 1090.25 1045.83 1007.26 971.78	937.46 903.70 870.87	839.78	811.29	786.17						
9.60	DISCHG 764.85 747.19 732.84 721.30	712.10 704.82 698.80	693.09	687.01	680.92						
10.40	DISCHG 675.25 669.89 664.49 658.88	653.09 647.27 641.66	636.47	631.78	626.57						
11.20	DISCHG 619.72 610.94 601.89 592.98	583.77 573.04 559.42	542.63	524.71	506.96						
12.00	DISCHG 489.64 473.76 461.96 456.14	454.41 454.65 457.18	462.70	469.65	476.11						
12.80	DISCHG 481.55 487.23 492.09 494.49	494.00 491.25 487.11	481.78	476.03	470.99						
13.60	DISCHG 467.85 467.46 469.90 474.01	478.99 484.55 489.21	489.52	483.11	472.54						
14.40	DISCHG 460.67 447.27 431.70 416.04	402.63 391.96 382.04	373.95	369.45	367.48						
15.20	DISCHG 365.62 362.43 359.94 357.68	353.81 348.37 343.84	341.96	340.75	339.81						
16.00	DISCHG 340.68 343.90 347.26 348.45	348.58 348.80 347.93	344.70	340.90	338.68						
16.80	DISCHG 338.44 338.01 338.32 341.25	347.95 358.36 371.56	386.26	401.22	415.14						
17.60	DISCHG 425.67 429.91 426.93 420.10	411.29 400.32 386.84	371.53	355.51	339.30						
18.40	DISCHG 323.44 308.99 297.03 287.97	281.68 277.69 275.42	274.33	273.81	272.39						
19.20	DISCHG 268.79 262.68 255.79 248.58	240.77 232.77 225.98	221.26	217.55	214.57						
20.00	DISCHG 213.00 214.14 219.49 229.56	242.60 256.68 271.12	285.11	295.22	298.83						
20.80	DISCHG 296.57 292.23 285.81 276.09	262.81 266.83 229.44	211.24	193.50	177.80						
21.60	DISCHG 166.39 161.47 163.54 169.64	177.93 188.13 199.55	210.00	217.64	223.34						
22.40	DISCHG 228.09 231.11 231.15 227.74	221.22 212.46 202.49	192.33	182.89	175.21						
23.20	DISCHG 170.01 167.32 166.10 165.97	166.98 169.96 176.14	185.81	197.00	208.57						

*** WARNING REACH 16 ATT-KIN COEFF.(C) GREATER THAN 0.667. CONSIDER REDUCING MAIN TIME INCREMENT ***

PER ION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
6.53	20641.77	(NULL)
13.00	682.49	(NULL)
14.09	678.80	(NULL)
16.23	484.44	(NULL)
17.64	595.57	(NULL)
20.68	416.29	(NULL)
22.46	320.15	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .08 HOURS				DRAINAGE AREA = 16.81 SQ.MI.				
	.00	.00	.00	.19	.99	3.64	12.11	28.49	53.91	92.84			
80 DISCHG													
60 DISCHG	232.03	824.47	2218.89	4266.26	6732.81	9577.25	13178.22	16011.33	17710.46	18924.12			
6.40 DISCHG	19891.78	20506.34	20602.85	20060.30	18936.96	17413.92	16080.56	14503.12	12849.82	11286.32			
7.20 DISCHG	9855.58	8572.26	7450.32	6485.98	5666.72	4971.40	4377.49	3871.62	3445.42	3088.57			
00 DISCHG	2790.17	2540.56	2331.17	2155.10	2006.66	1881.76	1777.43	1689.73	1610.04	1535.34			
0.80 DISCHG	1468.25	1411.12	1359.86	1311.29	1263.92	1217.77	1173.74	1133.03	1096.65	1065.35			
9.60 DISCHG	1039.22	1017.82	1000.52	986.68	975.70	967.00	959.51	951.59	943.06	934.77			
1 40 DISCHG	927.02	919.42	911.65	903.66	895.59	887.71	880.33	873.72	867.70	859.95			
1 20 DISCHG	849.05	836.22	823.44	810.55	796.84	780.25	758.94	734.27	709.15	684.65			
12.00 DISCHG	660.82	640.15	627.72	623.62	623.88	627.00	634.24	645.34	656.05	664.48			
1 80 DISCHG	671.55	678.12	682.07	681.86	678.37	672.93	666.23	658.62	651.43	646.01			
1 60 DISCHG	643.75	645.62	650.77	657.48	665.08	673.28	678.76	674.96	662.03	645.13			
14.40 DISCHG	626.42	604.56	580.04	558.46	541.94	528.89	517.54	510.41	508.88	508.41			
15.20 DISCHG	505.39	500.71	496.69	491.45	482.81	473.45	468.37	467.01	466.42	467.39			
1 00 DISCHG	472.27	479.65	483.96	484.44	483.82	482.47	478.01	470.31	464.68	462.96			
1 80 DISCHG	463.44	464.26	467.64	475.57	488.52	505.62	525.32	545.89	565.75	583.32			
17.60 DISCHG	594.34	594.61	586.21	574.05	559.21	541.02	519.82	497.43	475.08	453.15			
1 40 DISCHG	432.68	415.12	401.38	391.50	384.97	381.05	379.01	378.14	377.54	374.49			
1 20 DISCHG	367.57	357.93	347.68	336.77	324.85	313.58	305.41	300.12	296.04	293.49			
20.00 DISCHG	293.58	298.03	309.18	326.06	345.50	365.68	386.26	405.22	415.49	415.50			
2 80 DISCHG	409.18	400.40	387.65	369.79	348.06	324.25	299.59	275.01	252.41	233.70			
2 60 DISCHG	222.30	221.15	228.26	239.34	253.05	269.43	286.40	299.51	308.13	314.45			
22.40 DISCHG	318.95	319.99	316.54	308.74	297.53	284.24	270.25	256.77	244.87	236.07			
23.20 DISCHG	231.00	228.87	228.39	229.36	231.98	237.99	249.26	264.45	280.75	297.34			

EXECUTIVE CONTROL OPERATION ENDCMP

RECORD ID

COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO XSECTION 22

STARTING TIME = .00 RAIN DEPTH = 4.70 RAIN DURATION = 1.00 RAIN TABLE NO. = 2 ANT. MOIST. COND = 3
 ALTERNATE NO. = 3 STORM NO. = 1 MAIN TIME INCREMENT = .08 HOURS

*** WARNING - INFLOW EXCEEDED MAX. FLOW IN XSECTN TABLE 2 BY 349.3 CFS

*** WARNING REACH 2 ATT-KIN COEFF. (C) GREATER THAN 0.667, CONSIDER REDUCING MAIN TIME INCREMENT ***

* WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 7 BY 1398.8 CFS

*** WARNING REACH 10 ATT-KIN COEFF.(C) GREATER THAN 0.667, CONSIDER REDUCING MAIN TIME INCREMENT ***

PERATION ADDHYD CROSS SECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
6.56	19353.02	(NULL)
13.05	526.88	(NULL)
14.12	522.00	(NULL)
16.25	370.77	(NULL)
17.68	456.94	(NULL)
20.71	317.62	(NULL)
22.51	244.58	(NULL)

TIME(HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS							TIME INCREMENT = .08 HOURS			DRAINAGE AREA = 12.18 SQ.MI.		
		.00	.00	.00	.00	.00	.00	.02	.08	.19	.34			
0.00	DISCHG	.00	.00	.00	.00	.00	.00	.02	.08	.19	.34			
0.20	DISCHG	.61	1.40	2.74	4.58	6.96	9.96	13.56	17.58	22.08	27.05			
0.40	DISCHG	32.38	37.90	43.70	50.56	58.35	66.45	74.96	84.15	94.61	109.02			
0.60	DISCHG	128.25	149.53	172.33	197.38	228.15	274.42	344.30	424.89	512.10	614.78			
0.80	DISCHG	859.38	1610.66	3155.15	5123.73	7246.01	9540.11	11936.38	14096.82	15719.86	17000.53			
1.00	DISCHG	18148.25	19013.54	19352.96	19032.52	18079.37	16659.74	15010.76	13304.55	11671.01	10174.92			
1.20	DISCHG	8829.26	7632.05	6587.89	5692.65	4934.83	4296.55	3756.99	3299.04	2913.87	2592.50			
1.40	DISCHG	2325.26	2102.86	1917.12	1761.28	1629.90	1519.20	1426.62	1349.45	1282.19	1220.46			
1.60	DISCHG	1163.90	1115.91	1074.42	1036.29	999.39	963.13	927.96	894.81	864.61	838.15			
1.80	DISCHG	815.82	797.44	782.54	770.59	761.08	753.53	747.25	741.14	734.49	727.77			
2.00	DISCHG	721.53	715.64	709.72	703.57	697.25	690.94	684.88	679.31	674.27	668.60			
2.20	DISCHG	660.98	651.14	641.07	631.25	621.16	609.41	594.44	575.95	556.36	537.15			
2.40	DISCHG	518.56	501.71	489.61	484.36	483.61	484.77	488.23	494.76	502.53	509.33			
2.60	DISCHG	514.69	520.25	524.90	526.85	525.72	522.32	517.65	511.85	505.72	500.45			
2.80	DISCHG	497.33	497.26	500.28	505.01	510.53	516.57	521.46	521.26	513.35	500.87			
3.00	DISCHG	487.25	472.24	455.06	438.16	424.20	413.58	403.78	395.93	391.93	390.44			
3.20	DISCHG	388.62	384.88	381.78	378.94	374.33	368.13	363.28	361.75	361.07	360.63			
3.40	DISCHG	362.13	366.06	369.82	370.75	370.28	369.95	368.45	364.44	360.09	357.88			
3.60	DISCHG	358.18	358.26	359.10	362.78	370.49	382.07	396.46	412.24	428.10	442.65			
3.80	DISCHG	453.33	456.93	452.50	444.06	433.79	421.43	406.56	389.96	372.87	355.78			
4.00	DISCHG	339.20	324.24	312.02	302.93	296.75	292.96	290.86	289.95	289.52	287.99			
4.20	DISCHG	283.93	277.00	269.30	261.38	252.89	244.31	237.22	232.59	229.11	226.35			
4.40	DISCHG	225.08	226.73	232.98	244.35	258.80	274.12	289.62	304.45	314.75	317.60			
4.60	DISCHG	313.89	308.18	300.47	289.37	274.63	257.27	238.71	219.50	200.96	184.77			
4.80	DISCHG	173.34	169.07	172.44	179.96	189.52	200.89	213.32	224.38	232.03	237.41			
5.00	DISCHG	241.82	244.42	243.95	239.64	232.24	222.60	211.86	201.07	191.19	183.32			
5.20	DISCHG	178.20	175.81	174.93	175.12	176.45	179.89	186.83	197.60	209.90	222.41			

*** WARNING REACH 16 ATT-KIN COEFF.(C) GREATER THAN 0.667, CONSIDER REDUCING MAIN TIME INCREMENT ***

62

OPERATION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
6.47	26221.59	(NULL)
12.98	727.55	(NULL)
14.08	723.57	(NULL)
16.20	515.75	(NULL)
17.63	633.45	(NULL)
20.67	442.95	(NULL)
22.45	338.45	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .08 HOURS	DRAINAGE AREA = 16.81 SQ.MI.							
2.40	DISCHG .00 .00 .00 .00 .00 .00 .02 .08 .20 .39									
2.20	DISCHG .77 1.78 3.54 6.06 9.46 13.85 19.21 25.26 31.93 39.14									
2.00	DISCHG 46.68 54.47 62.79 72.48 83.37 94.93 107.34 121.02 137.28 158.93									
4.80	DISCHG 186.42 217.03 250.57 288.20 338.15 412.92 516.71 634.96 764.89 929.56									
4.60	DISCHG 1443.74 2897.27 5397.31 8372.75 11566.83 16034.77 19898.67 22566.47 24174.73 25235.04									
4.40	DISCHG 25960.83 26218.38 25832.46 24702.07 22939.78 20786.79 18536.29 16705.43 14783.82 12901.34									
7.20	DISCHG 11185.04 9661.94 8344.96 7224.32 6280.72 5485.87 4811.10 4239.35 3760.08 3360.83									
8.00	DISCHG 3028.63 2751.82 2520.16 2325.49 2161.22 2023.13 1908.30 1812.30 1725.14 1643.39									
8.80	DISCHG 1570.15 1508.28 1453.09 1400.88 1349.97 1300.43 1253.28 1209.83 1171.17 1138.07									
9.60	DISCHG 1110.57 1088.14 1070.06 1055.61 1044.14 1035.04 1027.10 1018.50 1009.09 999.92									
10.40	DISCHG 991.39 983.07 974.58 965.86 957.08 948.53 940.56 933.43 926.94 918.42									
11.20	DISCHG 906.26 891.92 877.79 863.68 848.78 830.70 807.36 780.33 753.01 726.60									
11.00	DISCHG 701.09 679.26 666.84 663.78 665.33 669.63 678.10 690.47 701.96 710.51									
12.80	DISCHG 717.35 723.73 727.33 726.49 722.23 716.06 708.76 700.56 692.91 687.23									
12.60	DISCHG 685.06 687.46 693.39 700.89 709.17 717.98 723.57 718.58 703.30 683.84									
12.40	DISCHG 662.87 638.86 612.27 589.41 572.55 559.70 548.51 541.73 540.84 540.70									
15.20	DISCHG 537.25 531.60 526.74 520.67 511.00 500.82 495.75 495.11 495.26 496.91									
16.00	DISCHG 502.64 510.86 515.27 515.07 513.57 511.46 506.13 497.45 491.44 490.14									
16.80	DISCHG 491.45 492.96 497.08 506.04 520.31 538.91 560.11 582.03 603.01 621.37									
17.60	DISCHG 632.39 631.44 620.96 606.72 590.03 570.04 547.06 523.10 499.44 476.40									
18.40	DISCHG 455.00 436.79 422.71 412.75 406.31 402.57 400.72 400.03 399.51 396.15									
19.20	DISCHG 388.40 377.61 366.32 354.48 341.66 329.71 321.36 316.30 312.50 310.24									
20.00	DISCHG 310.73 315.90 328.40 347.07 368.33 390.10 412.05 432.01 442.12 440.75									
20.80	DISCHG 432.44 421.92 407.50 387.84 364.28 338.81 312.71 286.84 263.24 243.91									
21.60	DISCHG 232.60 232.55 241.45 254.32 269.61 287.47 305.65 319.25 327.66 333.52									
22.40	DISCHG 337.59 338.08 333.83 325.02 312.69 298.32 283.36 269.10 256.66 247.65									
23.20	DISCHG 242.76 241.03 240.96 242.32 245.34 252.02 264.47 281.18 298.90 316.71									

EXECUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 3

RECORD ID

EXECUTIVE CONTROL OPERATION INCREM

MAIN TIME INCREMENT = .02 HOURS

RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO XSECTION 22

STARTING TIME = .00 RAIN DEPTH = 3.71 RAIN DURATION = 1.00 RAIN TABLE NO. = 6 ANT. MOIST. COND = 1
ALTERNATE NO. = 1 STORM NO. = 2 MAIN TIME INCREMENT = .02 HOURS

OPERATION ADDHYD CROSS SECTION 12

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)
1.77 7173.09 (NULL)
5.89 517.19 (NULL)

TIME (HRS)	FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .02 HOURS				DRAINAGE AREA = 12.18 SQ. MI.		
.00	DISCHG	.00	.00	.00	.00	.03	.28	1.36	4.52	11.82	
.80	DISCHG	26.01	50.24	88.01	142.79	218.25	318.17	445.48	601.63	786.68	999.62
1.60	DISCHG	1238.60	1498.24	1771.25	2049.07	2319.42	2568.42	2787.81	2975.05	3132.60	3266.31
2.40	DISCHG	3384.69	3496.17	3608.53	3727.89	3856.64	3994.07	4139.49	4292.82	4453.89	4622.71
3.20	DISCHG	4798.95	4981.67	5169.51	5360.71	5552.77	5742.74	5927.79	6105.54	6273.91	6431.16
4.00	DISCHG	6575.83	6706.63	6822.55	6922.73	7006.58	7073.67	7123.71	7156.47	7171.82	7169.76
4.80	DISCHG	7150.42	7114.00	7060.91	6991.67	6907.02	6807.94	6695.72	6571.86	6438.04	6296.04
5.60	DISCHG	6147.56	5994.24	5837.54	5678.79	5519.12	5359.50	5200.81	5043.80	4889.10	4737.26
6.40	DISCHG	4588.67	4443.65	4302.39	4165.02	4031.62	3902.19	3776.76	3655.35	3538.03	3424.80
7.20	DISCHG	3315.69	3210.69	3109.73	3012.75	2919.62	2830.17	2744.26	2661.77	2582.58	2506.58
8.00	DISCHG	2433.67	2363.74	2296.66	2232.33	2170.60	2111.33	2054.39	1999.71	1947.19	1896.77
8.80	DISCHG	1848.42	1802.09	1757.80	1715.54	1675.36	1637.33	1601.45	1567.65	1535.80	1505.74
9.60	DISCHG	1477.31	1450.26	1424.33	1399.24	1374.67	1350.31	1325.98	1301.64	1277.36	1253.28
10.40	DISCHG	1229.60	1206.54	1184.29	1163.06	1142.98	1124.11	1106.50	1090.10	1074.83	1060.58
11.20	DISCHG	1047.19	1034.50	1022.34	1010.52	998.87	987.23	975.48	963.59	951.56	939.40
12.00	DISCHG	927.19	915.01	902.99	891.25	879.95	869.25	859.22	849.91	841.25	833.19
12.80	DISCHG	825.60	818.36	811.30	804.29	797.17	789.80	782.12	774.14	765.92	757.56
13.60	DISCHG	749.20	740.96	732.93	725.18	717.71	710.49	703.50	696.74	690.20	683.89
14.40	DISCHG	677.83	672.06	666.65	661.69	657.32	653.67	650.83	648.78	647.43	646.54
15.20	DISCHG	646.23	645.99	645.65	644.96	643.60	641.27	637.81	633.23	627.68	621.32
16.00	DISCHG	614.41	607.22	600.04	593.13	586.70	580.94	575.94	571.71	568.21	565.33
16.80	DISCHG	562.94	560.89	559.05	557.30	555.56	553.78	551.93	549.98	547.92	545.74
17.60	DISCHG	543.45	541.04	538.50	535.84	533.04	530.05	526.88	523.54	520.08	516.53
18.40	DISCHG	512.95	509.41	505.99	502.79	499.91	497.45	495.49	494.03	493.05	492.50
19.20	DISCHG	492.29	492.36	492.53	493.04	493.55	494.15	494.82	495.55	496.34	497.18
20.00	DISCHG	498.07	499.01	500.02	501.10	502.25	503.49	504.82	506.26	507.80	509.45
20.80	DISCHG	511.19	512.95	514.62	516.05	516.98	517.14	516.36	514.62	512.02	508.71

OPERATION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
1.70	9895.65	(NULL)
4.41	878.67	(NULL)
5.89	719.14	(NULL)

TIME(HRS)	DISCHG	FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .02 HOURS			DRAINAGE AREA = 16.81 SQ.MI.		
		.00	.00	.00	.00	.05	.50	2.34	7.45	18.75
.60	DISCHG	.00	.00	.00	.00	.05	.50	2.34	7.45	18.75
.80	DISCHG	40.13	76.46	133.47	216.87	332.55	486.57	683.87	927.22	1217.10
1.00	DISCHG	1929.77	2339.94	2769.72	3205.14	3628.01	4017.95	4362.61	4660.08	4916.61
1.20	DISCHG	5350.17	5550.20	5752.07	5962.88	6184.46	6414.84	6652.23	6895.02	7140.70
1.40	DISCHG	7635.01	7880.65	8122.80	8359.36	8587.62	8804.14	9005.92	9190.75	9356.54
1.60	DISCHG	9624.75	9725.01	9801.99	9855.89	9886.95	9895.51	9881.92	9846.57	9789.80
1.80	DISCHG	9614.18	9497.06	9361.83	9209.93	9043.09	8863.09	8671.74	8471.10	8263.32
2.00	DISCHG	7833.92	7615.75	7397.31	7179.93	6964.75	6752.68	6544.51	6340.81	6141.93
2.20	DISCHG	5759.79	5576.86	5399.44	5227.58	5061.29	4900.50	4745.15	4595.19	4450.61
2.40	DISCHG	4177.35	4048.53	3924.78	3805.97	3691.92	3582.39	3477.18	3376.13	3279.10
2.60	DISCHG	3096.51	3010.69	2928.34	2849.35	2773.58	2700.83	2630.96	2563.84	2499.38
2.80	DISCHG	2378.17	2321.35	2267.09	2215.44	2166.49	2120.33	2076.96	2036.25	1998.01
3.00	DISCHG	1927.98	1895.57	1864.35	1833.93	1803.90	1773.82	1743.41	1712.73	1682.01
3.20	DISCHG	1621.57	1592.48	1564.56	1538.06	1513.14	1489.91	1468.36	1448.37	1429.73
3.40	DISCHG	1395.61	1379.65	1364.08	1348.69	1333.25	1317.59	1301.57	1285.21	1268.57
3.60	DISCHG	1234.88	1218.14	1201.74	1185.90	1170.84	1156.78	1143.84	1132.03	1121.21
3.80	DISCHG	1101.93	1093.06	1084.39	1075.70	1066.78	1057.46	1047.65	1037.40	1026.88
4.00	DISCHG	1005.74	995.45	985.49	975.92	966.72	957.81	949.16	940.73	932.50
4.20	DISCHG	916.66	909.18	902.17	895.79	890.25	885.78	882.50	880.35	879.15
4.40	DISCHG	878.61	878.64	878.33	877.30	875.13	871.40	865.91	858.77	850.29
4.60	DISCHG	830.75	820.51	810.51	801.11	792.61	785.22	779.06	774.06	770.03
4.80	DISCHG	763.96	761.49	759.14	756.76	754.26	751.61	748.77	745.77	742.62
5.00	DISCHG	736.00	732.53	728.95	725.24	721.37	717.28	712.97	708.46	703.81
5.20	DISCHG	694.37	689.80	685.50	681.62	678.30	675.68	673.87	672.82	672.46
5.40	DISCHG	673.32	674.29	675.48	676.78	678.16	679.58	681.04	682.54	684.08
5.60	DISCHG	687.37	689.14	691.02	693.01	695.13	697.38	699.77	702.29	704.96
5.80	DISCHG	710.67	713.51	716.05	718.03	719.08	718.81	716.98	713.63	708.98

EX CUTIVE CONTROL OPERATION ENDCMP

COMPUTATIONS COMPLETED FOR PASS 4

RECORD ID

EX CUTIVE CONTROL OPERATION COMPUT

FROM XSECTION 1
 TO XSECTION 22

RECORD ID

STARTING TIME = .00 RAIN DEPTH = 3.71 RAIN DURATION = 1.00 RAIN TABLE NO. = 6 ANT. MOIST. COND = 2
 ALTERNATE NO. = 2 STORM NO. = 2 MAIN TIME INCREMENT = .02 HOURS

OPERATION ADDHYD CROSS SECTION 12

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PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
1.70	13202.78	(NULL)
4.43	844.13	(NULL)
5.88	670.70	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .02 HOURS	DRAINAGE AREA = 12.18 SQ.MI.							
.60	DISCHG .03 .21 .97 3.87 12.22 31.43 68.43 130.46 223.54 351.32									
.80	DISCHG 515.00 714.06 967.25 1213.34 1512.38 1845.77 2213.81 2614.98 3046.63 3505.37									
1.00	DISCHG 3987.39 4482.66 4979.89 5466.29 5923.59 6332.00 6682.65 6976.36 7221.56 7431.05									
1.20	DISCHG 7620.99 7806.02 7998.84 8208.93 8438.87 8685.54 8946.25 9219.50 9503.75 9797.91									
1.40	DISCHG 10100.34 10408.38 10718.92 11028.30 11331.84 11624.20 11900.49 12156.67 12389.39 12595.93									
1.60	DISCHG 12774.22 12922.64 13040.08 13125.90 13179.88 13202.11 13192.91 13152.78 13082.35 12982.50									
1.80	DISCHG 12854.25 12698.80 12517.49 12311.86 12083.70 11835.12 11568.56 11286.82 10992.86 10689.66									
2.00	DISCHG 10380.12 10066.90 9752.36 9438.57 9127.28 8819.89 8517.64 8221.57 7932.54 7651.21									
2.20	DISCHG 7378.07 7113.42 6857.41 6610.10 6371.40 6141.20 5919.38 5705.85 5500.54 5303.39									
2.40	DISCHG 5114.31 4933.14 4759.72 4593.81 4435.14 4283.35 4138.13 3999.22 3866.39 3739.39									
2.60	DISCHG 3618.02 3502.04 3391.21 3285.28 3184.00 3087.09 2994.32 2905.52 2820.52 2739.20									
2.80	DISCHG 2661.46 2587.22 2516.46 2449.18 2385.42 2325.23 2268.60 2215.37 2165.31 2118.17									
3.00	DISCHG 2073.65 2031.35 1990.84 1951.68 1913.38 1875.44 1837.59 1799.82 1762.25 1725.11									
3.20	DISCHG 1688.71 1653.37 1619.39 1587.07 1556.59 1528.05 1501.47 1476.77 1453.81 1432.40									
3.40	DISCHG 1412.31 1393.27 1375.01 1357.27 1339.78 1322.32 1304.71 1286.93 1268.98 1250.92									
3.60	DISCHG 1232.85 1214.92 1197.33 1180.27 1163.97 1148.67 1134.48 1121.42 1109.40 1098.29									
3.80	DISCHG 1087.92 1078.05 1068.47 1058.91 1049.16 1039.00 1028.35 1017.21 1005.72 994.02									
4.00	DISCHG 982.32 970.79 959.58 948.78 938.40 928.37 918.67 909.30 900.24 891.53									
4.20	DISCHG 883.20 875.31 867.97 861.33 855.59 850.96 847.55 845.32 844.10 843.67									
4.40	DISCHG 843.76 844.03 844.07 843.48 841.81 838.60 833.64 827.00 818.91 809.65									
4.60	DISCHG 799.62 789.24 778.95 769.12 760.10 752.12 745.32 739.70 735.16 731.54									
4.80	DISCHG 728.63 726.22 724.09 722.07 720.04 717.94 715.73 713.36 710.82 708.10									
5.00	DISCHG 705.20 702.12 698.84 695.37 691.66 687.67 683.40 678.88 674.17 669.33									
5.20	DISCHG 664.46 659.65 655.03 650.74 646.94 643.77 641.33 639.62 638.58 638.13									
5.40	DISCHG 638.15 638.53 639.16 639.94 640.83 641.80 642.84 643.93 645.07 646.25									
5.60	DISCHG 647.46 648.73 650.06 651.46 652.94 654.52 656.20 658.01 659.94 662.01									
5.80	DISCHG 664.18 666.35 668.34 669.90 670.68 670.28 668.45 665.20 660.72 655.26									

OPERATION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
1.61	17922.59	(NULL)
4.43	1151.43	(NULL)
5.88	934.34	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .02 HOURS	DRAINAGE AREA = 16.81 SQ.MI.							
.60	DISCHG .05 .38 2.15 8.19 23.61 56.26 116.21 214.11 358.98 556.49									
.80	DISCHG 809.03 1117.17 1480.63 1898.58 2371.52 2901.56 3488.96 4130.58 4821.27 5555.41									
1.00	DISCHG 6326.13 7115.98 7904.32 8669.95 9386.09 10023.51 10568.82 11026.32 11412.90 11930.09									
1.20	DISCHG 12449.76 12899.51 13307.49 13695.10 14071.19 14435.06 14786.92 15128.31 15458.66 15777.26									
1.40	DISCHG 16084.98 16379.82 16658.52 16919.27 17157.82 17368.98 17550.19 17697.95 17809.69 17893.82									

1.60	DISCHG	17919.00	17916.64	17878.34	17804.28	17695.50	17553.20	17378.97	17174.36	16940.76	16680.20
1.7	DISCHG	16395.13	16087.53	15885.74	15645.93	15354.85	15024.05	14662.82	14279.10	13879.77	13470.40
2.1	DISCHG	13055.63	12639.43	12225.03	11815.11	11411.82	11016.80	10631.34	10256.36	9892.38	9539.85
2.20	DISCHG	9198.97	8869.81	8552.34	8246.43	7951.91	7668.52	7395.97	7134.09	6882.69	6641.59
2.40	DISCHG	6410.58	6189.41	5977.79	5775.41	5581.88	5396.72	5219.56	5050.05	4887.89	4732.80
2.5	DISCHG	4584.50	4442.71	4307.14	4177.54	4053.64	3935.08	3821.56	3712.86	3608.81	3509.24
2.60	DISCHG	3414.04	3323.17	3236.67	3154.59	3077.02	3004.06	2935.67	2871.63	2811.57	2755.13
3.00	DISCHG	2701.89	2651.23	2602.47	2555.00	2508.15	2461.23	2413.87	2366.19	2318.55	2271.39
3.1	DISCHG	2225.21	2180.46	2137.64	2097.10	2059.11	2023.78	1991.09	1960.84	1932.67	1906.25
3.1	DISCHG	1881.22	1857.20	1833.81	1810.71	1787.58	1764.16	1740.27	1715.95	1691.30	1666.50
3.60	DISCHG	1641.74	1617.30	1593.52	1570.73	1549.24	1529.39	1511.34	1495.05	1480.29	1466.83
3.7	DISCHG	1454.35	1442.51	1430.91	1419.22	1407.10	1394.30	1380.69	1366.36	1351.57	1336.62
4.1	DISCHG	1321.79	1307.27	1293.23	1279.77	1266.85	1254.35	1242.22	1230.41	1218.91	1207.72
4.20	DISCHG	1196.88	1186.57	1177.01	1168.45	1161.20	1155.60	1151.81	1149.71	1148.99	1149.29
4.40	DISCHG	1150.17	1151.08	1151.36	1150.44	1147.68	1142.49	1134.57	1124.16	1111.75	1097.90
4.5	DISCHG	1083.22	1068.35	1053.92	1040.49	1028.48	1018.24	1009.87	1003.27	998.13	994.10
4.60	DISCHG	990.85	988.04	985.40	982.70	979.81	976.68	973.28	969.61	965.72	961.63
5.00	DISCHG	957.38	952.95	948.32	943.48	938.36	932.89	927.07	920.93	914.57	908.10
5.1	DISCHG	901.65	895.40	889.56	884.34	879.96	876.62	874.44	873.37	873.27	873.95
5.2	DISCHG	875.22	876.90	878.82	880.87	882.95	885.04	887.14	889.23	891.35	893.52
5.60	DISCHG	895.75	898.07	900.50	903.04	905.73	908.57	911.56	914.72	918.05	921.55
5.7	DISCHG	925.15	928.61	931.58	933.66	934.31	932.94	929.26	923.37	915.63	906.49

EXECUTIVE CONTROL OPERATION ENDCMP

RECORD ID

COMPUTATIONS COMPLETED FOR PASS 5

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO XSECTION 22

STARTING TIME = .00 RAIN DEPTH = 3.71 RAIN DURATION = 1.00 RAIN TABLE NO. = 6 ANT. MOIST. COND = 3
ALTERNATE NO. = 3 STORM NO. = 2 MAIN TIME INCREMENT = .02 HOURS

* WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 7 BY 473.3 CFS

PER ION ADDHYD CROSS SECTION 12

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
1.67	17560.30	(NULL)
4.44	915.94	(NULL)
5.88	725.54	(NULL)

TIME (RS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .02 HOURS	DRAINAGE AREA = 12.18 SQ.MI.
.20	DISCHG .00 .00 .00 .00	.00 .00 .00	.00 .00 .02
.40	DISCHG .09 .30 .82 1.94	4.01 7.53 13.05	21.16 32.34 46.93
.60	DISCHG 65.34 89.33 122.41 169.87	239.96 343.63 491.36	689.99 941.63 1243.91
.80	DISCHG 1591.16 1976.07 2391.72 2832.98	3297.95 3788.22 4305.23	4848.48 5416.34 6006.31
1.00	DISCHG 6615.16 7231.35 7842.44 8435.48	8992.97 9496.08 9937.28	10317.42 10644.33 10929.83

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1.20	DISCHG	11190.87	11443.57	11702.93	11980.45	12279.30	12595.89	12927.08	13270.80	13624.63	13986.61
4.00	DISCHG	14354.06	14723.25	15090.18	15450.26	15797.82	16126.54	16430.48	16704.78	16945.32	17148.83
6.00	DISCHG	17312.94	17436.00	17517.21	17556.35	17553.59	17509.53	17425.16	17301.74	17140.80	16944.06
1.80	DISCHG	16713.41	16450.82	16158.33	15838.16	15492.82	15125.08	14738.04	14335.16	13920.06	13496.35
2.00	DISCHG	13067.60	12637.11	12207.81	11782.24	11362.45	10950.12	10546.64	10153.20	9770.74	9399.98
2.20	DISCHG	9041.42	8695.33	8361.76	8040.67	7731.83	7435.00	7149.91	6876.31	6614.01	6362.80
2.40	DISCHG	6122.45	5892.72	5673.31	5463.88	5264.03	5073.28	4891.21	4717.45	4551.64	4393.46
2.60	DISCHG	4242.58	4098.69	3961.44	3830.51	3705.54	3586.20	3472.18	3363.24	3259.15	3159.73
2.80	DISCHG	3064.83	2974.35	2888.23	2806.44	2728.97	2655.84	2586.99	2522.25	2461.38	2404.10
3.00	DISCHG	2350.08	2298.84	2249.87	2202.67	2156.68	2111.40	2066.52	2021.96	1977.79	1934.17
3.20	DISCHG	1891.40	1849.81	1809.77	1771.60	1735.53	1701.64	1669.97	1640.47	1613.00	1587.38
3.40	DISCHG	1563.38	1540.70	1519.02	1498.03	1477.46	1457.04	1436.61	1416.07	1395.43	1374.70
3.60	DISCHG	1353.98	1333.44	1313.30	1293.78	1275.12	1257.54	1241.18	1226.07	1212.16	1199.34
3.80	DISCHG	1187.43	1176.18	1165.32	1154.57	1143.66	1132.40	1120.66	1108.43	1095.81	1082.93
4.00	DISCHG	1069.99	1057.19	1044.67	1032.58	1020.93	1009.69	998.82	988.32	978.22	968.51
4.20	DISCHG	959.24	950.49	942.38	935.08	928.76	923.63	919.79	917.21	915.77	915.25
4.40	DISCHG	915.38	915.75	915.92	915.42	913.79	910.56	905.50	898.64	890.15	880.29
4.60	DISCHG	869.45	858.09	846.72	835.78	825.64	816.55	808.69	802.09	796.70	792.39
4.80	DISCHG	788.96	786.17	783.80	781.62	779.50	777.35	775.10	772.71	770.13	767.35
5.00	DISCHG	764.35	761.12	757.65	753.94	749.95	745.65	741.04	736.15	731.03	725.75
5.20	DISCHG	720.41	715.12	710.03	705.28	701.04	697.46	694.63	692.58	691.27	690.62
5.40	DISCHG	690.54	690.88	691.54	692.40	693.41	694.52	695.72	696.99	698.30	699.65
5.60	DISCHG	701.03	702.46	703.92	705.45	707.05	708.74	710.53	712.44	714.48	716.66
5.80	DISCHG	718.94	721.20	723.24	724.80	725.53	725.05	723.12	719.71	714.94	709.05

OPERATION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
1.57	23810.33	(NULL)
4.44	1251.12	(NULL)
5.87	1011.81	(NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .02 HOURS	DRAINAGE AREA = 16.81 SQ.MI.
.20	DISCHG .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .03		
.40	DISCHG .14 .46 1.28 3.03 6.25 11.67 20.13 32.47 49.41 71.48		
.60	DISCHG 99.34 137.24 193.22 276.43 400.07 581.13 835.28 1170.58 1587.33 2079.73		
.80	DISCHG 2638.20 3253.55 3917.09 4622.57 5368.23 6156.43 6988.37 7862.17 8774.66 9721.62		
1.00	DISCHG 10696.52 11678.91 12645.25 13572.46 14637.06 15667.33 16520.00 17217.34 17790.46 18270.82		
1.20	DISCHG 18690.29 19073.73 19440.88 19807.97 20178.67 20547.18 20909.29 21265.54 21610.92 21943.93		
1.40	DISCHG 22260.95 22561.09 22838.48 23090.27 23311.36 23495.07 23641.40 23743.36 23799.36 23807.60		
1.60	DISCHG 23766.58 23678.14 23544.39 23366.12 23145.01 22882.79 22582.01 22245.05 21874.20 21472.33		
1.80	DISCHG 21042.72 20587.99 20111.60 19617.06 19106.66 18582.25 18130.69 17700.46 17226.67 16723.51		
2.00	DISCHG 16202.10 15671.27 15137.88 14607.29 14083.57 13569.73 13068.09 12580.22 12107.17 11649.67		
2.20	DISCHG 11208.15 10782.75 10373.41 9979.94 9602.05 9239.35 8891.41 8557.92 8238.53 7932.91		
2.40	DISCHG 7640.72 7361.56 7095.01 6840.63 6597.87 6366.13 6144.36 5933.62 5731.96 5539.48		
2.60	DISCHG 5355.80 5180.50 5013.21 4853.57 4701.20 4555.65 4416.54 4283.57 4156.50 4035.10		
2.80	DISCHG 3919.20 3808.74 3703.74 3604.20 3510.19 3421.76 3338.85 3261.18 3188.37 3119.98		
3.00	DISCHG 3055.54 2994.33 2935.51 2878.39 2822.20 2766.20 2709.98 2653.51 2597.45 2541.89		

3.20	DISCHG	2487.47	2434.68	2384.10	2336.16	2291.13	2249.14	2210.19	2174.05	2140.38	2108.80
40	DISCHG	2078.96	2050.41	2022.73	1995.51	1968.43	1941.16	1913.52	1885.52	1857.26	1828.88
60	DISCHG	1800.60	1772.73	1745.66	1719.75	1695.34	1672.78	1652.24	1633.68	1616.88	1601.60
3.80	DISCHG	1587.53	1574.23	1561.27	1548.24	1534.79	1520.61	1505.57	1489.76	1473.43	1456.86
4.00	DISCHG	1440.35	1424.13	1408.39	1393.26	1378.71	1364.65	1351.01	1337.75	1324.87	1312.35
20	DISCHG	1300.26	1288.80	1278.23	1268.83	1260.90	1254.79	1250.66	1248.39	1247.68	1248.14
4.40	DISCHG	1249.31	1250.56	1251.11	1250.32	1247.50	1242.03	1233.59	1222.40	1208.97	1193.83
4.60	DISCHG	1177.66	1161.15	1145.05	1130.01	1116.49	1104.88	1095.30	1087.67	1081.70	1077.03
80	DISCHG	1073.32	1070.21	1067.38	1064.55	1061.57	1058.37	1054.90	1051.14	1047.14	1042.90
100	DISCHG	1038.47	1033.80	1028.88	1023.68	1018.15	1012.23	1005.89	999.20	992.25	985.15
5.20	DISCHG	978.05	971.15	964.70	958.92	954.05	950.31	947.82	946.53	946.31	946.97
40	DISCHG	948.31	950.14	952.27	954.54	956.88	959.24	961.61	963.97	966.36	968.78
60	DISCHG	971.26	973.80	976.44	979.20	982.08	985.11	988.29	991.64	995.16	998.85
5.80	DISCHG	1002.64	1006.26	1009.28	1011.28	1011.72	1009.99	1005.79	999.20	990.58	980.38

EXECUTIVE CONTROL OPERATION ENOCMP

RECORD ID

COMPUTATIONS COMPLETED FOR PASS 6

EXECUTIVE CONTROL OPERATION INCREM

RECORD ID

MAIN TIME INCREMENT = .01 HOURS

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO XSECTION 22

STARTING TIME = .00 RAIN DEPTH = 2.51 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 1
 ALTERNATE NO. = 1 STORM NO. = 3 MAIN TIME INCREMENT = .01 HOURS

OPERATION ADDHYD CROSS SECTION 12

PEAK TIME(HRS) 1.38 PEAK DISCHARGE(CFS) 4093.69 PEAK ELEVATION(FEET) (NULL)

TI(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .01 HOURS	DRAINAGE AREA = 12.18 SQ. MI.								
.20	DISCHG	.00	.00	.00	.00	.02	.10	.30	.73		
.30	DISCHG	1.52	2.87	5.02	8.26	12.88	19.19	27.49	38.03	51.06	66.74
40	DISCHG	85.20	106.50	130.62	157.53	187.13	219.30	253.89	290.71	329.56	370.18
.50	DISCHG	412.33	455.73	500.11	545.24	590.92	637.00	683.28	729.63	775.85	821.77
.60	DISCHG	867.26	912.26	956.75	1000.77	1044.39	1087.68	1130.76	1173.73	1216.68	1259.73
.70	DISCHG	1303.02	1346.66	1390.76	1435.43	1480.76	1526.82	1573.63	1621.25	1669.69	1718.98
.80	DISCHG	1769.11	1820.10	1871.95	1924.62	1978.05	2032.21	2087.05	2142.51	2198.58	2255.19
.90	DISCHG	2312.29	2369.81	2427.66	2485.77	2544.07	2602.53	2661.11	2719.78	2778.51	2837.30
1.00	DISCHG	2896.12	2954.88	3013.48	3071.78	3129.64	3186.90	3243.32	3298.67	3352.63	3404.92
1.10	DISCHG	3455.30	3503.60	3549.70	3593.57	3635.18	3674.56	3711.76	3746.83	3779.86	3810.93
.120	DISCHG	3840.16	3867.61	3893.36	3917.49	3940.06	3961.12	3980.72	3998.85	4015.50	4030.61
1.30	DISCHG	4044.15	4056.10	4066.44	4075.15	4082.21	4087.60	4091.30	4093.30	4093.60	4092.18
1.40	DISCHG	4089.05	4084.18	4077.59	4069.27	4059.24	4047.49	4034.05	4018.93	4002.15	3983.73
.50	DISCHG	3963.70	3942.09	3918.91	3894.22	3868.03	3840.40	3811.36	3780.96	3749.23	3716.23

69

1.60	DISCHG	3682.00	3646.60	3610.06	3572.45	3533.81	3494.20	3453.67	3412.28	3370.09	3327.14
1.70	DISCHG	3283.49	3239.20	3194.33	3148.93	3103.05	3056.75	3010.08	2963.09	2915.84	2868.36
1.80	DISCHG	2820.73	2772.96	2725.13	2677.27	2629.42	2581.62	2533.92	2486.35	2438.97	2391.80
1.90	DISCHG	2344.88	2298.25	2251.96	2206.01	2160.47	2115.34	2070.66	2026.45	1982.74	1939.56
2.00	DISCHG	1896.91	1854.82	1813.31	1772.38	1732.05	1692.33	1653.23	1614.76	1576.93	1539.73
2.10	DISCHG	1503.18	1467.27	1432.01	1397.40	1363.44	1330.13	1297.46	1265.43	1234.05	1203.29
2.20	DISCHG	1173.17	1143.67	1114.79	1086.52	1058.85	1031.79	1005.31	979.42	954.10	929.35
2.30	DISCHG	905.17	881.53	858.44	835.88	813.85	792.34	771.33	750.83	730.82	711.29
2.40	DISCHG	692.24	673.65	655.52	637.83	620.58	603.77	587.37	571.38	555.80	540.61
2.50	DISCHG	525.81	511.38	497.33	483.64	470.30	457.30	444.65	432.32	420.32	408.63
2.60	DISCHG	397.25	386.17	375.38	364.89	354.67	344.72	335.04	325.62	316.46	307.54
2.70	DISCHG	298.87	290.43	282.23	274.24	266.48	258.93	251.59	244.45	237.51	230.75
2.80	DISCHG	224.19	217.81	211.60	205.57	199.70	194.00	188.45	183.06	177.81	172.71
2.90	DISCHG	167.76	162.94	158.25	153.69	149.25	144.94	140.74	136.66	132.68	128.82

PERM. ION ADDHYD CROSS SECTION 22

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)		PEAK ELEVATION(FEET)								
1.29	5734.09		(NULL)								
TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .01 HOURS				DRAINAGE AREA = 16.81 SQ. MI.		
.00	DISCHG	.00	.00	.00	.00	.00	.04	.18	.50	1.17	
.10	DISCHG	2.39	4.44	7.67	12.45	19.18	28.28	40.12	55.11	73.60	95.92
.20	DISCHG	122.31	152.92	187.80	226.92	270.17	317.41	368.47	423.17	481.27	542.53
.30	DISCHG	606.63	673.18	741.79	812.11	883.85	956.79	1030.68	1105.34	1180.48	1255.82
.40	DISCHG	1331.10	1406.19	1480.99	1555.55	1629.92	1704.26	1778.71	1853.33	1928.22	2003.47
.50	DISCHG	2079.21	2155.53	2232.54	2310.35	2389.08	2468.74	2549.28	2630.67	2712.85	2795.77
.60	DISCHG	2879.41	2963.75	3048.75	3134.36	3220.40	3306.74	3393.26	3479.82	3566.36	3652.78
.70	DISCHG	3739.00	3824.92	3910.39	3995.29	4079.53	4163.04	4245.77	4327.71	4408.88	4489.28
.80	DISCHG	4568.88	4647.48	4724.94	4801.00	4875.47	4948.11	5018.62	5086.71	5151.95	5213.94
.90	DISCHG	5272.30	5326.83	5377.36	5423.92	5466.53	5505.34	5540.49	5572.13	5600.39	5625.46
1.00	DISCHG	5647.56	5666.81	5683.36	5697.36	5708.98	5718.32	5725.47	5730.47	5733.34	5734.06
1.10	DISCHG	5732.62	5729.06	5723.37	5715.58	5705.62	5693.48	5679.13	5662.57	5643.80	5622.84
1.20	DISCHG	5599.70	5574.39	5546.95	5517.39	5485.76	5452.07	5416.40	5378.78	5339.28	5297.93
1.30	DISCHG	5254.79	5209.90	5163.33	5115.14	5065.41	5014.20	4961.56	4907.56	4852.28	4795.77
1.40	DISCHG	4738.11	4679.37	4619.62	4558.93	4497.39	4435.07	4372.05	4308.40	4244.20	4179.52
1.50	DISCHG	4114.42	4048.98	3983.26	3917.33	3851.24	3785.06	3718.85	3652.66	3586.55	3520.58
1.60	DISCHG	3454.79	3389.24	3324.00	3259.09	3194.57	3130.49	3066.90	3003.85	2941.38	2879.53
1.70	DISCHG	2818.35	2757.85	2698.08	2639.06	2580.83	2523.40	2466.79	2411.02	2356.09	2302.01
1.80	DISCHG	2248.81	2196.48	2145.02	2094.46	2044.77	1995.98	1948.07	1901.05	1854.92	1809.68
1.90	DISCHG	1765.31	1721.83	1679.21	1637.46	1596.57	1556.52	1517.31	1478.93	1441.38	1404.63
2.00	DISCHG	1368.69	1333.53	1299.15	1265.53	1232.68	1200.56	1169.19	1138.54	1108.60	1079.37
2.10	DISCHG	1050.83	1022.97	995.78	969.25	943.36	918.10	893.45	869.42	845.97	823.11
2.20	DISCHG	800.82	779.09	757.90	737.24	717.12	697.50	678.38	659.76	641.61	623.94
2.30	DISCHG	606.72	589.95	573.61	557.70	542.22	527.13	512.45	498.16	484.24	470.70
2.40	DISCHG	457.52	444.68	432.20	420.05	408.23	396.73	385.55	374.67	364.10	353.81

2.70	DISCHG	343.80	334.08	324.62	315.42	306.47	297.78	289.32	281.10	273.11	265.34
30	DISCHG	257.79	250.44	243.30	236.35	229.60	223.04	216.65	210.44	204.40	198.52
90	DISCHG	192.81	187.25	181.83	176.57	171.45	166.46	161.60	156.87	152.27	147.79

EXECUTIVE CONTROL OPERATION ENDCMP

RECORD ID

COMPUTATIONS COMPLETED FOR PASS 7

EXECUTIVE CONTROL OPERATION COMPUT

RECORD ID

FROM XSECTION 1

TO XSECTION 22

STARTING TIME = .00 RAIN DEPTH = 2.51 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2
 ALTERNATE NO. = 2 STORM NO. = 3 MAIN TIME INCREMENT = .01 HOURS

OPERATION ADDHYD CROSS SECTION 12

PEAK TIME(HRS) 1.26
 PEAK DISCHARGE(CFS) 9033.23
 PEAK ELEVATION(FEET) (NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS	TIME INCREMENT = .01 HOURS	DRAINAGE AREA = 12.19 SQ.MI.								
20	DISCHG .01 .06 .28 .91 2.38 5.23 10.13 17.82 29.21 45.37										
30	DISCHG 67.52 96.89 134.56 181.31 237.50 303.17 378.08 461.80 553.76 653.17										
40	DISCHG 759.16 870.66 986.43 1105.24 1226.11 1348.17 1470.76 1593.22 1714.95 1835.46										
50	DISCHG 1954.30 2071.04 2185.53 2297.65 2407.35 2514.63 2619.54 2722.20 2822.70 2921.09										
60	DISCHG 3017.47 3112.05 3205.09 3296.90 3387.82 3478.22 3568.48 3658.92 3749.81 3841.49										
70	DISCHG 3934.24 4028.32 4123.97 4221.43 4320.88 4422.47 4526.25 4632.25 4740.44 4850.76										
80	DISCHG 4963.16 5077.56 5193.87 5311.95 5431.61 5552.62 5674.82 5798.02 5922.03 6046.65										
90	DISCHG 6171.67 6296.84 6421.92 6546.66 6670.85 6794.29 6916.81 7038.22 7158.40 7277.21										
00	DISCHG 7394.52 7510.05 7623.53 7734.66 7843.15 7948.70 8050.94 8149.51 8243.93 8333.75										
1.10	DISCHG 8418.57 8498.11 8572.14 8640.55 8703.21 8760.10 8811.25 8856.68 8896.46 8930.76										
1.20	DISCHG 8959.79 8983.69 9002.66 9016.89 9026.58 9031.94 9033.14 9030.30 9023.45 9012.63										
1.30	DISCHG 8997.86 8979.24 8956.85 8930.77 8901.05 8867.79 8831.05 8790.94 8747.54 8700.92										
1.40	DISCHG 8651.15 8598.32 8542.49 8483.76 8422.20 8357.88 8290.91 8221.35 8149.29 8074.82										
1.50	DISCHG 7998.03 7918.99 7837.81 7754.56 7669.33 7582.22 7493.32 7402.73 7310.53 7216.84										
1.60	DISCHG 7121.74 7025.34 6927.74 6829.04 6729.34 6628.73 6527.32 6425.20 6322.47 6219.23										
1.70	DISCHG 6115.57 6011.58 5907.37 5803.02 5698.63 5594.28 5490.07 5386.08 5282.38 5179.07										
1.80	DISCHG 5076.21 4973.89 4872.17 4771.11 4670.79 4571.26 4472.58 4374.89 4277.98 4182.17										
1.90	DISCHG 4087.42 3993.78 3901.30 3810.01 3719.96 3631.19 3543.73 3457.61 3372.87 3289.54										
2.00	DISCHG 3207.63 3127.16 3048.16 2970.63 2894.58 2820.03 2746.96 2675.39 2605.30 2536.70										
2.10	DISCHG 2469.58 2403.94 2339.75 2277.01 2215.71 2155.82 2097.34 2040.25 1984.53 1930.16										
2.20	DISCHG 1877.11 1825.37 1774.92 1725.73 1677.78 1631.04 1585.50 1541.12 1497.89 1455.78										
2.30	DISCHG 1414.77 1374.83 1335.95 1298.09 1261.25 1225.38 1190.48 1156.52 1123.48 1091.33										
2.40	DISCHG 1060.07 1029.66 1000.08 971.32 943.35 916.15 889.71 864.01 839.02 814.73										
2.50	DISCHG 791.12 768.17 745.87 724.19 703.13 682.66 662.77 643.45 624.67 606.43										
2.60	DISCHG 588.72 571.51 554.80 538.56 522.80 507.49 492.62 478.18 464.17 450.56										
2.70	DISCHG 437.34 424.52 412.06 399.97 388.23 376.84 365.78 355.04 344.61 334.69										
2.80	DISCHG 324.66 315.12 305.86 296.86 288.12 279.63 271.39 263.38 255.60 248.04										
2.90	DISCHG 240.69 233.54 226.60 219.84 213.27 206.88 200.67 194.61 188.72 182.99										

OPER ION ADDHYD CROSS SECTION 12

PEAK TIME(HRS) 1.21
 PEAK DISCHARGE(CFS) 12910.40
 PEAK ELEVATION(FEET) (NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .01 HOURS			DRAINAGE AREA = 12.18 SQ.MI.				
0	DISCHG	.00	.00	.00	.00	.00	.00	.08	.57		
0	DISCHG	2.12	5.65	12.31	23.49	40.87	66.42	102.22	150.45	213.19	292.24
.30	DISCHG	388.89	503.64	636.24	785.66	950.07	1127.44	1315.62	1512.45	1715.72	1923.08
0	DISCHG	2132.42	2341.68	2548.90	2752.25	2950.52	3142.79	3328.67	3507.97	3680.82	3847.54
0	DISCHG	4008.36	4163.44	4313.10	4457.69	4597.48	4732.83	4864.19	4992.05	5116.84	5238.91
.60	DISCHG	5358.67	5476.66	5593.44	5709.56	5825.62	5942.21	6059.91	6179.16	6300.34	6423.84
0	DISCHG	6550.03	6679.16	6811.46	6947.13	7086.34	7229.15	7375.50	7525.28	7678.33	7834.42
0	DISCHG	7993.32	8154.81	8318.64	8484.53	8652.06	8820.88	8990.63	9160.98	9331.59	9502.10
.90	DISCHG	9672.16	9841.36	10009.31	10175.63	10339.98	10502.06	10661.59	10818.31	10972.01	11122.52
1.00	DISCHG	11269.65	11413.00	11552.23	11686.92	11816.70	11941.21	12059.95	12172.46	12278.13	12376.41
0	DISCHG	12466.80	12549.00	12622.75	12687.99	12744.63	12792.70	12832.32	12863.58	12886.65	12901.80
0	DISCHG	12909.38	12909.66	12902.95	12889.58	12869.87	12844.16	12812.76	12775.88	12733.64	12686.14
1.30	DISCHG	12633.49	12575.87	12513.44	12446.40	12374.86	12298.98	12218.94	12134.91	12047.04	11955.50
0	DISCHG	11860.42	11761.93	11660.17	11555.29	11447.42	11336.70	11223.24	11107.17	10988.63	10867.72
0	DISCHG	10744.59	10619.33	10492.06	10362.90	10231.96	10099.37	9965.24	9829.69	9692.83	9554.78
1.60	DISCHG	9415.67	9275.60	9134.71	8993.10	8850.89	8708.19	8565.12	8421.79	8278.31	8134.77
1.70	DISCHG	7991.28	7847.95	7704.89	7562.18	7419.93	7278.24	7137.20	6996.90	6857.42	6718.85
0	DISCHG	6581.28	6444.77	6309.40	6175.24	6042.35	5910.79	5780.61	5651.88	5524.65	5398.97
0	DISCHG	5274.87	5152.42	5031.65	4912.61	4795.34	4679.86	4566.23	4454.45	4344.57	4236.61
2.00	DISCHG	4130.58	4026.51	3924.40	3824.26	3726.09	3629.90	3535.69	3443.44	3353.16	3264.82
0	DISCHG	3178.42	3093.95	3011.38	2930.69	2851.87	2774.90	2699.75	2626.40	2554.81	2484.97
0	DISCHG	2416.84	2350.40	2285.61	2222.45	2160.88	2100.88	2042.40	1985.43	1929.93	1875.86
2.30	DISCHG	1823.21	1771.93	1722.00	1673.39	1626.07	1580.00	1535.17	1491.55	1449.10	1407.80
2.40	DISCHG	1367.62	1328.53	1290.52	1253.54	1217.58	1182.62	1148.61	1115.55	1083.40	1052.15
0	DISCHG	1021.76	992.23	963.51	935.61	908.48	882.12	856.51	831.62	807.44	783.94
2.60	DISCHG	761.12	738.95	717.41	696.50	676.18	656.46	637.29	618.69	600.62	583.08
2.70	DISCHG	566.04	549.50	533.43	517.84	502.69	487.98	473.70	459.83	446.36	433.28
0	DISCHG	420.58	408.23	396.24	384.59	373.27	362.26	351.57	341.17	331.05	321.22
0	DISCHG	311.66	302.35	293.30	284.48	275.90	267.55	259.41	251.48	243.75	236.22

OPER ION ADDHYD CROSS SECTION 22

PEAK TIME(HRS) 1.12
 PEAK DISCHARGE(CFS) 17833.78
 PEAK ELEVATION(FEET) (NULL)

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .01 HOURS			DRAINAGE AREA = 16.81 SQ.MI.				
10	DISCHG	.00	.00	.00	.00	.00	.00	.05	.49	2.13	
20	DISCHG	6.38	15.07	30.31	54.43	90.23	140.69	208.78	297.59	410.04	543.72
30	DISCHG	715.43	910.68	1133.68	1382.32	1653.25	1942.74	2247.01	2562.47	2885.92	3214.21
40	DISCHG	3544.45	3873.89	4199.82	4519.71	4831.86	5135.04	5428.65	5712.39	5986.48	6251.55

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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.)

SEC ON/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 2													
XSECTION 1	RUNOFF	9.40	6	1	.02	.0	3.71	5.80	1.44	---	1.48	7750.50	824.5
XSECTION 2	REACH	9.40	6	1	.02	.0	3.71	5.80	1.44	3084.22	1.52	7733.28	822.7
XSECTION 3	RUNOFF	.64	6	1	.02	.0	3.71	5.80	.56	---	1.11	383.82	599.7
XSECTION 4	ADDHYD	10.04	6	1	.02	.0	3.71	5.80	1.38	---	1.51	7805.74	777.5
XSECTION 5	RUNOFF	1.06	6	1	.02	.0	3.71	5.80	1.54	---	1.03	2405.47	2269.3
XSECTION 6	ADDHYD	11.10	6	1	.02	.0	3.71	5.80	1.40	---	1.50	7963.08	717.4
XSECTION 7	REACH	11.10	6	1	.02	.0	3.71	5.80	1.39	3037.04	1.66	7280.67	655.9
XSECTION 8	RUNOFF	.53	6	1	.02	.0	3.71	5.80	1.39	---	1.06	966.20	1823.0
XSECTION 9	ADDHYD	11.63	6	1	.02	.0	3.71	5.80	1.39	---	1.66	7340.31	631.2
XSECTION 10	REACH	11.63	6	1	.02	.0	3.71	5.80	1.38	2997.24	1.77	7128.67	613.0
XSECTION 11	RUNOFF	.55	6	1	.02	.0	3.71	5.80	.69	---	1.11	407.13	740.2
XSECTION 12	ADDHYD	12.18	6	1	.02	.0	3.71	5.80	1.35	---	1.77	7173.09	588.9
XSECTION 13	RUNOFF	3.66	6	1	.02	.0	3.71	5.80	1.44	---	1.50	2959.19	808.5
XSECTION 14	DIVERT	3.11	6	1	.02	.0	3.71	5.80	1.70	---	1.50	2959.19	951.2
XSECTION 15	DIVERT	.55	6	1	.02	.0	3.71	5.80	.00	---	.00	.00	.0
XSECTION 16	REACH	3.11	6	1	.02	.0	3.71	5.80	1.69	3007.29	1.58	2899.48	932.0
XSECTION 17	RUNOFF	.63	6	1	.02	.0	3.71	5.80	1.12	---	1.14	727.32	1154.5
XSECTION 18	RUNOFF	.34	6	1	.02	.0	3.71	5.80	.60	---	1.12	205.81	605.3
XSECTION 19	ADDHYD	.97	6	1	.02	.0	3.71	5.80	.94	---	1.13	932.25	961.1
XSECTION 20	ADDHYD	4.08	6	1	.02	.0	3.71	5.80	1.51	---	1.54	3085.48	756.1
XSECTION 21	ADDHYD	16.26	6	1	.02	.0	3.71	5.80	1.39	---	1.70	9895.65	608.6
XSECTION 22	ADDHYD	16.81	6	1	.02	.0	3.71	5.80	1.34	---	1.70	9895.65	588.7
ALTERNATE 2 STORM 2													
XSECTION 1	RUNOFF	9.40	6	2	.02	.0	3.71	5.80	2.45	---	1.44	14108.94	1501.0
XSECTION 2	REACH	9.40	6	2	.02	.0	3.71	5.80	2.44	3088.07	1.48	14033.89	1493.0
XSECTION 3	RUNOFF	.64	6	2	.02	.0	3.71	5.80	1.54	---	1.07	1224.35	1913.0
XSECTION 4	ADDHYD	10.04	6	2	.02	.0	3.71	5.80	2.39	---	1.47	14214.86	1415.8
XSECTION 5	RUNOFF	1.06	6	2	.02	.0	3.71	5.80	2.55	---	1.01	3739.95	3528.3
XSECTION 6	ADDHYD	11.10	6	2	.02	.0	3.71	5.80	2.40	---	1.47	14467.86	1303.4
XSECTION 7	REACH	11.10	6	2	.02	.0	3.71	5.80	2.39	3037.64	1.61	13339.74	1201.8
XSECTION 8	RUNOFF	.53	6	2	.02	.0	3.71	5.80	2.42	---	1.04	1653.50	3119.8
XSECTION 9	ADDHYD	11.63	6	2	.02	.0	3.71	5.80	2.39	---	1.61	13428.50	1154.6

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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.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 1 STORM 2													
XSECTION 1	RUNOFF	9.40	6	1	.02	.0	3.71	5.80	1.44	---	1.48	7750.50	824.5
XSECTION 2	REACH	9.40	6	1	.02	.0	3.71	5.80	1.44	3084.22	1.52	7733.28	822.7
XSECTION 3	RUNOFF	.64	6	1	.02	.0	3.71	5.80	.56	---	1.11	383.82	599.7
XSECTION 4	ADDHYD	10.04	6	1	.02	.0	3.71	5.80	1.38	---	1.51	7805.74	777.5
XSECTION 5	RUNOFF	1.06	6	1	.02	.0	3.71	5.80	1.54	---	1.03	2405.47	2269.3
XSECTION 6	ADDHYD	11.10	6	1	.02	.0	3.71	5.80	1.40	---	1.50	7963.08	717.4
XSECTION 7	REACH	11.10	6	1	.02	.0	3.71	5.80	1.39	3037.04	1.66	7280.67	655.9
XSECTION 8	RUNOFF	.53	6	1	.02	.0	3.71	5.80	1.39	---	1.06	966.20	1823.0
XSECTION 9	ADDHYD	11.63	6	1	.02	.0	3.71	5.80	1.39	---	1.66	7340.31	631.2
XSECTION 10	REACH	11.63	6	1	.02	.0	3.71	5.80	1.38	2997.24	1.77	7128.67	613.0
XSECTION 11	RUNOFF	.55	6	1	.02	.0	3.71	5.80	.69	---	1.11	407.13	740.2
XSECTION 12	ADDHYD	12.18	6	1	.02	.0	3.71	5.80	1.35	---	1.77	7173.09	588.9
XSECTION 13	RUNOFF	3.66	6	1	.02	.0	3.71	5.80	1.44	---	1.50	2959.19	808.5
XSECTION 14	DIVERT	3.11	6	1	.02	.0	3.71	5.80	1.70	---	1.50	2959.19	951.2
XSECTION 15	DIVERT	.55	6	1	.02	.0	3.71	5.80	.00	---	.00	.00	.0
XSECTION 16	REACH	3.11	6	1	.02	.0	3.71	5.80	1.69	3007.29	1.58	2899.48	932.0
XSECTION 17	RUNOFF	.63	6	1	.02	.0	3.71	5.80	1.12	---	1.14	727.32	1154.5
XSECTION 18	RUNOFF	.34	6	1	.02	.0	3.71	5.80	.60	---	1.12	205.81	605.3
XSECTION 19	ADDHYD	.97	6	1	.02	.0	3.71	5.80	.94	---	1.13	932.25	961.1
XSECTION 20	ADDHYD	4.08	6	1	.02	.0	3.71	5.80	1.51	---	1.54	3085.48	756.1
XSECTION 21	ADDHYD	16.26	6	1	.02	.0	3.71	5.80	1.39	---	1.70	9895.65	608.6
XSECTION 22	ADDHYD	16.81	6	1	.02	.0	3.71	5.80	1.34	---	1.70	9895.65	588.7
ALTERNATE 2 STORM 2													
XSECTION 1	RUNOFF	9.40	6	2	.02	.0	3.71	5.80	2.45	---	1.44	14108.94	1501.0
XSECTION 2	REACH	9.40	6	2	.02	.0	3.71	5.80	2.44	3088.07	1.48	14033.89	1493.0
XSECTION 3	RUNOFF	.64	6	2	.02	.0	3.71	5.80	1.54	---	1.07	1224.35	1913.0
XSECTION 4	ADDHYD	10.04	6	2	.02	.0	3.71	5.80	2.39	---	1.47	14214.86	1415.8
XSECTION 5	RUNOFF	1.06	6	2	.02	.0	3.71	5.80	2.55	---	1.01	3739.95	3528.3
XSECTION 6	ADDHYD	11.10	6	2	.02	.0	3.71	5.80	2.40	---	1.47	14467.86	1303.4
XSECTION 7	REACH	11.10	6	2	.02	.0	3.71	5.80	2.39	3037.64	1.61	13339.74	1201.8
XSECTION 8	RUNOFF	.53	6	2	.02	.0	3.71	5.80	2.42	---	1.04	1653.50	3119.8
XSECTION 9	ADDHYD	11.63	6	2	.02	.0	3.71	5.80	2.39	---	1.61	13428.50	1154.6

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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.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 2 STORM 2													
XSECTION 10	REACH	11.63	6	2	.02	.0	3.71	5.80	2.38	2998.59	1.70	13122.90	1128.4
XSECTION 11	RUNOFF	.55	6	2	.02	.0	3.71	5.80	1.71	---	1.08	1132.42	2058.9
XSECTION 12	ADDHYD	12.18	6	2	.02	.0	3.71	5.80	2.35	---	1.70	13202.78	1084.0
XSECTION 13	RUNOFF	3.66	6	2	.02	.0	3.71	5.80	2.45	---	1.45	5389.05	1672.4
XSECTION 14	DIVERT	3.11	6	2	.02	.0	3.71	5.80	2.43	---	1.18*	3200.00*	1028.6
XSECTION 15	DIVERT	.55	6	2	.02	.0	3.71	5.80	2.54	---	1.45	2189.05	3987.3
XSECTION 16	REACH	3.11	6	2	.02	.0	3.71	5.80	2.42	3007.55	1.83	3204.20	1030.0
XSECTION 17	RUNOFF	.63	6	2	.02	.0	3.71	5.80	2.17	---	1.11	1501.33	2383.1
XSECTION 18	RUNOFF	.34	6	2	.02	.0	3.71	5.80	1.59	---	1.09	636.72	1872.7
XSECTION 19	ADDHYD	.97	6	2	.02	.0	3.71	5.80	1.97	---	1.10	2133.78	2199.8
XSECTION 20	ADDHYD	4.08	6	2	.02	.0	3.71	5.80	2.31	---	1.22	4407.36	1080.0
XSECTION 21	ADDHYD	16.26	6	2	.02	.0	3.71	5.80	2.34	---	1.70	16588.71	1020.2
XSECTION 22	ADDHYD	16.81	6	2	.02	.0	3.71	5.80	2.35	---	1.61	17922.59	1066.2
ALTERNATE 3 STORM 2													
XSECTION 1	RUNOFF	9.40	6	3	.02	.0	3.71	5.80	3.13	---	1.41	18457.17	1963.5
XSECTION 2	REACH	9.40	6	3	.02	.0	3.71	5.80	3.13	3089.36	1.45	18371.34	1954.4
XSECTION 3	RUNOFF	.64	6	3	.02	.0	3.71	5.80	2.53	---	1.06	1993.04	3114.1
XSECTION 4	ADDHYD	10.04	6	3	.02	.0	3.71	5.80	3.09	---	1.44	18659.16	1858.5
XSECTION 5	RUNOFF	1.06	6	3	.02	.0	3.71	5.80	3.20	---	1.00	4346.21	4100.2
XSECTION 6	ADDHYD	11.10	6	3	.02	.0	3.71	5.80	3.10	---	1.43	18976.64	1709.6
XSECTION 7	REACH	11.10	6	3	.02	.0	3.71	5.80	3.08	3037.94	1.59	17660.19	1591.0
XSECTION 8	RUNOFF	.53	6	3	.02	.0	3.71	5.80	3.14	---	1.03	2034.23	3838.2
XSECTION 9	ADDHYD	11.63	6	3	.02	.0	3.71	5.80	3.09	---	1.59	17766.84	1527.7
XSECTION 10	REACH	11.63	6	3	.02	.0	3.71	5.80	3.08	2999.21	1.67	17454.17	1500.8
XSECTION 11	RUNOFF	.55	6	3	.02	.0	3.71	5.80	2.67	---	1.06	1745.94	3174.4
XSECTION 12	ADDHYD	12.18	6	3	.02	.0	3.71	5.80	3.06	---	1.67	17560.30	1441.7
XSECTION 13	RUNOFF	3.66	6	3	.02	.0	3.71	5.80	3.13	---	1.42	7052.74	1927.0
XSECTION 14	DIVERT	3.11	6	3	.02	.0	3.71	5.80	2.72	---	1.08*	3200.00*	1028.6
XSECTION 15	DIVERT	.55	6	3	.02	.0	3.71	5.80	5.45	---	1.42	3852.74	7017.7
XSECTION 16	REACH	3.11	6	3	.02	.0	3.71	5.80	2.71	3007.55	1.91	3202.84	1029.5
XSECTION 17	RUNOFF	.63	6	3	.02	.0	3.71	5.80	3.02	---	1.09	2053.25	3259.1
XSECTION 18	RUNOFF	.34	6	3	.02	.0	3.71	5.80	2.57	---	1.07	1030.21	3030.0
XSECTION 19	ADDHYD	.97	6	3	.02	.0	3.71	5.80	2.86	---	1.08	3077.27	3172.4
XSECTION 20	ADDHYD	4.08	6	3	.02	.0	3.71	5.80	2.75	---	1.13	5744.12	1407.5

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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.)

SECTION	N/	STANDARD	DRAINAGE	RAIN	ANTEC	MAIN	PRECIPITATION			RUNOFF	PEAK DISCHARGE			
							TABLE	MOIST	TIME		BEGIN	AMOUNT	DURATION	AMOUNT
ID.		OPERATION	AREA	#	COND	INCREM	(HR)	(IN)	(HR)	(IN)	(FT)	(HR)	(CFS)	(CSM)
ALTERNATE 1 STORM 3														
SECTION	1	RUNOFF	9.40	1	1	.01	.0	2.51	1.00	.67	---	1.13	4401.83	468.3
SECTION	2	REACH	9.40	1	1	.01	.0	2.51	1.00	.67	3081.47	1.15	4394.54	467.5
SECTION	3	RUNOFF	.64	1	1	.01	.0	2.51	1.00	.15	---	.85	112.39	175.6
SECTION	4	ADDHYD	10.04	1	1	.01	.0	2.51	1.00	.64	---	1.14	4454.81	443.7
SECTION	5	RUNOFF	1.06	1	1	.01	.0	2.51	1.00	.72	---	.52	909.12	857.7
SECTION	6	ADDHYD	11.10	1	1	.01	.0	2.51	1.00	.65	---	1.07	4660.71	419.9
SECTION	7	REACH	11.10	1	1	.01	.0	2.51	1.00	.65	3036.78	1.29	4158.96	374.7
SECTION	8	RUNOFF	.53	1	1	.01	.0	2.51	1.00	.62	---	.59	364.88	688.4
SECTION	9	ADDHYD	11.63	1	1	.01	.0	2.51	1.00	.64	---	1.28	4177.16	359.2
SECTION	10	REACH	11.63	1	1	.01	.0	2.51	1.00	.64	2996.10	1.38	4085.82	351.3
SECTION	11	RUNOFF	.55	1	1	.01	.0	2.51	1.00	.21	---	.83	128.76	234.1
SECTION	12	ADDHYD	12.18	1	1	.01	.0	2.51	1.00	.62	---	1.38	4093.69	336.1
SECTION	13	RUNOFF	3.66	1	1	.01	.0	2.51	1.00	.67	---	1.14	1690.70	461.9
SECTION	14	DIVERT	3.11	1	1	.01	.0	2.51	1.00	.79	---	1.14	1690.70	543.5
SECTION	15	DIVERT	.55	1	1	.01	.0	2.51	1.00	.00	---	.00	.00	.0
SECTION	16	REACH	3.11	1	1	.01	.0	2.51	1.00	.79	3005.80	1.21	1661.70	534.1
SECTION	17	RUNOFF	.63	1	1	.01	.0	2.51	1.00	.45	---	.76	282.27	448.0
SECTION	18	RUNOFF	.34	1	1	.01	.0	2.51	1.00	.17	---	.86	64.21	188.9
SECTION	19	ADDHYD	.97	1	1	.01	.0	2.51	1.00	.35	---	.78	342.54	353.1
SECTION	20	ADDHYD	4.08	1	1	.01	.0	2.51	1.00	.69	---	1.14	1831.37	448.8
SECTION	21	ADDHYD	16.26	1	1	.01	.0	2.51	1.00	.64	---	1.29	5734.09	352.6
SECTION	22	ADDHYD	16.81	1	1	.01	.0	2.51	1.00	.62	---	1.29	5734.09	341.1
ALTERNATE 2 STORM 3														
SECTION	1	RUNOFF	9.40	1	2	.01	.0	2.51	1.00	1.42	---	1.03	9084.99	966.5
SECTION	2	REACH	9.40	1	2	.01	.0	2.51	1.00	1.42	3085.69	1.07	9055.79	963.4
SECTION	3	RUNOFF	.64	1	2	.01	.0	2.51	1.00	.72	---	.60	497.91	778.0
SECTION	4	ADDHYD	10.04	1	2	.01	.0	2.51	1.00	1.37	---	1.06	9300.65	926.4
SECTION	5	RUNOFF	1.06	1	2	.01	.0	2.51	1.00	1.46	---	.43	1977.69	1865.7
SECTION	6	ADDHYD	11.10	1	2	.01	.0	2.51	1.00	1.38	---	1.03	9816.34	884.4
SECTION	7	REACH	11.10	1	2	.01	.0	2.51	1.00	1.38	3037.24	1.18	9125.75	822.1
SECTION	8	RUNOFF	.53	1	2	.01	.0	2.51	1.00	1.36	---	.50	849.69	1603.2
SECTION	9	ADDHYD	11.63	1	2	.01	.0	2.51	1.00	1.38	---	1.16	9235.94	794.1

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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.)

SEC ON/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
TERMINATE 2 STORM 3													
XSECTION 10	REACH	11.63	1	2	.01	.0	2.51	1.00	1.38	2997.73	1.27	8977.60	771.9
XSECTION 11	RUNOFF	.55	1	2	.01	.0	2.51	1.00	.83	---	.60	490.01	890.9
XSECTION 12	ADDHYD	12.18	1	2	.01	.0	2.51	1.00	1.35	---	1.26	9033.23	741.6
XSECTION 13	RUNOFF	3.66	1	2	.01	.0	2.51	1.00	1.42	---	1.05	3488.69	953.2
XSECTION 14	DIVERT	3.11	1	2	.01	.0	2.51	1.00	1.64	---	.90*	3200.00*	1028.6
XSECTION 15	DIVERT	.55	1	2	.01	.0	2.51	1.00	.16	---	1.05	288.69	525.8
XSECTION 16	REACH	3.11	1	2	.01	.0	2.51	1.00	1.64	3007.55	1.21	3197.29	1027.7
XSECTION 17	RUNOFF	.63	1	2	.01	.0	2.51	1.00	1.17	---	.62	758.75	1204.4
XSECTION 18	RUNOFF	.34	1	2	.01	.0	2.51	1.00	.75	---	.62	268.23	788.9
XSECTION 19	ADDHYD	.97	1	2	.01	.0	2.51	1.00	1.03	---	.62	1026.89	1058.6
XSECTION 20	ADDHYD	4.08	1	2	.01	.0	2.51	1.00	1.49	---	.99	3722.85	912.2
XSECTION 21	ADDHYD	16.26	1	2	.01	.0	2.51	1.00	1.39	---	1.22	12444.76	765.3
XSECTION 22	ADDHYD	16.81	1	2	.01	.0	2.51	1.00	1.35	---	1.17	12497.99	743.5
TERMINATE 3 STORM 3													
XSECTION 1	RUNOFF	9.40	1	3	.01	.0	2.51	1.00	2.01	---	.97	12890.08	1371.3
XSECTION 2	REACH	9.40	1	3	.01	.0	2.51	1.00	2.01	3087.71	1.01	12834.26	1365.3
XSECTION 3	RUNOFF	.64	1	3	.01	.0	2.51	1.00	1.45	---	.52	1065.53	1664.9
XSECTION 4	ADDHYD	10.04	1	3	.01	.0	2.51	1.00	1.97	---	1.00	13243.98	1319.1
XSECTION 5	RUNOFF	1.06	1	3	.01	.0	2.51	1.00	2.03	---	.37	3038.94	2866.9
XSECTION 6	ADDHYD	11.10	1	3	.01	.0	2.51	1.00	1.98	---	.99	13887.99	1251.2
XSECTION 7	REACH	11.10	1	3	.01	.0	2.51	1.00	1.97	3037.61	1.15	12920.57	1164.0
XSECTION 8	RUNOFF	.53	1	3	.01	.0	2.51	1.00	1.98	---	.43	1327.44	2504.6
XSECTION 9	ADDHYD	11.63	1	3	.01	.0	2.51	1.00	1.97	---	1.13	13101.91	1126.6
XSECTION 10	REACH	11.63	1	3	.01	.0	2.51	1.00	1.97	2998.53	1.22	12782.78	1099.1
XSECTION 11	RUNOFF	.55	1	3	.01	.0	2.51	1.00	1.56	---	.53	971.87	1767.0
XSECTION 12	ADDHYD	12.18	1	3	.01	.0	2.51	1.00	1.95	---	1.21	12910.40	1060.0
XSECTION 13	RUNOFF	3.66	1	3	.01	.0	2.51	1.00	2.01	---	.99	4944.98	1351.1
XSECTION 14	DIVERT	3.11	1	3	.01	.0	2.51	1.00	1.97	---	.69*	3200.00*	1028.6
XSECTION 15	DIVERT	.55	1	3	.01	.0	2.51	1.00	2.18	---	.99	1744.98	3178.5
XSECTION 16	REACH	3.11	1	3	.01	.0	2.51	1.00	1.97	3007.55	1.39	3200.77	1028.9
XSECTION 17	RUNOFF	.63	1	3	.01	.0	2.51	1.00	1.87	---	.55	1277.03	2027.0
XSECTION 18	RUNOFF	.34	1	3	.01	.0	2.51	1.00	1.48	---	.54	560.01	1647.1
XSECTION 19	ADDHYD	.97	1	3	.01	.0	2.51	1.00	1.73	---	.55	1836.96	1893.8
XSECTION 20	ADDHYD	4.08	1	3	.01	.0	2.51	1.00	1.92	---	.78	4332.36	1061.6

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 REV PC 09/83(.2)

SUTHERLAND WASH - REGULATORY DISCHARGE - P-24, P-6, P-1

JOB 1 SUMMARY
 PAGE 33

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
 A QUESTION MARK(?) AFTER COEFF.(C) INDICATES PARAMETERS OUTSIDE ACCEPTABLE LIMITS, SEE PREVIOUS WARNINGS)

REACH	HYDROGRAPH INFORMATION								ROUTING PARAMETERS						PEAK				
	INFLOW	OUTFLOW		INTERV.AREA		BASE-	VOLUME	MAIN	ITER-	Q AND A	PEAK	S/O	ATT-	TRAVEL TIME					
LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	FLOW (CFS)	BASE (IN)	INCR (HR)	#	COEFF (X)	POWER (N)	FACTOR (K*)	O/I (Q*)	BPEAK (SEC)	KIN (C)	STOR- (HR)	KINE- (HR)	
ALTERNATE 1 STORM 1																			
2	1720	8838	6.4	8838	6.4		0	2.22	.08	0	.762	1.42	.006	1.000	101	1.00?	.00	.00	
7	4500	9394	6.4	8840	6.6		0	2.16	.08	1	.153	1.49	.050	.941	531	.43	.16	.15	
10	2700	9024	6.6	8787	6.7		0	2.16	.08	1	4.84	1.06	.068	.974	369	.58	.16	.10	
16	3600	3200	6.3	3195	6.6		0	2.60	.08	1	.776	1.46	.015	.998	231	.77?	.24	.06	
ALTERNATE 2 STORM 1																			
2	1720	15060	6.3	15060	6.3		0	3.40	.08	0	1.80	1.26	.012	1.000	118	1.00?	.00	.00	
7	4500	15953	6.3	15020	6.5		0	3.34	.08	1	.378	1.35	.069	.941	553	.41	.16	.15	
10	2700	15284	6.5	15080	6.6		0	3.34	.08	1	2.87	1.14	.038	.987	294	.66	.16	.08	
16	3600	3200	6.1	3200	6.9		0	3.38	.08	1	.776	1.46	.011	1.000	231	.77?	.80	.06	
ALTERNATE 3 STORM 1																			
2	1720	18849	6.3	18849	6.3		0	4.14	.08	0	1.75	1.26	.012	1.000	112	1.00?	.00	.00	
7	4500	19899	6.3	18939	6.5		0	4.10	.08	1	.447	1.33	.070	.952	538	.42	.16	.15	
10	2700	19227	6.5	19072	6.6		0	4.10	.08	1	2.05	1.19	.032	.992	265	.70?	.08	.07	

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1	3600	3200	6.0	3200	6.7	0	3.74	.08	1	.776	1.46	.009	1.000	231	.777	.72	.06
---	------	------	-----	------	-----	---	------	-----	---	------	------	------	-------	-----	------	-----	-----

ALTERNATE 1 STORM 2

2	1720	7750	1.5	7733	1.5	0	1.44	.02	1	.431	1.54	.005	.998	83	.60	.04	.02
---	------	------	-----	------	-----	---	------	-----	---	------	------	------	------	----	-----	-----	-----

7	4500	7963	1.5	7281	1.7	0	1.40	.02	1	.197	1.45	.087	.914	582	.12	.16	.16
---	------	------	-----	------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

10	2700	7340	1.7	7128	1.8	0	1.39	.02	1	4.91	1.06	.063	.971	354	.18	.10	.10
----	------	------	-----	------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

16	3600	2959	1.5	2899	1.6	0	1.70	.02	1	.743	1.47	.026	.980	234	.27	.08	.07
----	------	------	-----	------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

TERNATE 2 STORM 2

2	1720	14108	1.4	14034	1.5	0	2.45	.02	1	1.81	1.26	.017	.995	120	.46	.04	.03
---	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

7	4500	14465	1.5	13337	1.6	0	2.40	.02	1	.351	1.36	.095	.922	559	.12	.16	.16
---	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

10	2700	13424	1.6	13122	1.7	0	2.39	.02	1	3.43	1.11	.054	.977	311	.21	.08	.09
----	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

16	3600	3200	1.2	3200	1.8	0	2.43	.02	1	.776	1.46	.017	1.000	231	.27	.66	.06
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ALTERNATE 3 STORM 2

2	1720	18453	1.4	18365	1.4	0	3.13	.02	1	1.75	1.26	.016	.995	113	.48	.04	.03
---	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

7	4500	18973	1.4	17654	1.6	0	3.10	.02	1	.431	1.33	.095	.930	541	.12	.14	.15
---	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

10	2700	17764	1.6	17450	1.7	0	3.09	.02	1	2.31	1.17	.043	.982	275	.23	.10	.08
----	------	-------	-----	-------	-----	---	------	-----	---	------	------	------	------	-----	-----	-----	-----

16	3600	3200	1.1	3200	1.9	0	2.72	.02	1	.776	1.46	.014	1.000	231	.27	.84	.06
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TERNATE 1 STORM 3

2	1720	4401	1.1	4395	1.1	0	.67	.01	1	.136	1.78	.003	.998	75	.39	.02	.02
---	------	------	-----	------	-----	---	-----	-----	---	------	------	------	------	----	-----	-----	-----

7	4500	4660	1.1	4159	1.3	0	.65	.01	1	.250	1.41	.166	.892	712	.05	.22	.20
---	------	------	-----	------	-----	---	-----	-----	---	------	------	------	------	-----	-----	-----	-----

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
A QUESTION MARK(?) AFTER COEFF.(C) INDICATES PARAMETERS OUTSIDE ACCEPTABLE LIMITS, SEE PREVIOUS WARNINGS)

REACH	HYDROGRAPH INFORMATION								ROUTING PARAMETERS					PEAK				
	INFLOW		OUTFLOW		INTERV.AREA		BASE-	VOLUME	MAIN	ITER-	Q AND A	PEAK	S/O	ATT-	TRAVEL TIME			
LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	FLOW (CFS)	BASE (IN)	INCR (HR)	#	COEFF (X)	POWER (M)	FACTOR (K*)	O/I (Q*)	(K) (SEC)	COEFF (C)	AGE (HR)	MATIC (HR)
ALTERNATE 1 STORM 3																		
10	2700	4177	1.3	4086	1.4		0	.64	.01	1	4.99	1.05	.082	.978	367	.09	.10	.10
16	3600	1691	1.1	1662	1.2		0	.79	.01	1	.415	1.59	.032	.983	245	.14	.07	.07
ALTERNATE 2 STORM 3																		
2	1720	9085	1.0	9055	1.1		0	1.42	.01	1	.858	1.39	.012	.997	105	.29	.04	.03
7	4500	9816	1.0	9126	1.2		0	1.38	.01	1	.151	1.49	.101	.930	523	.07	.12	.15
10	2700	9236	1.2	8978	1.3		0	1.38	.01	1	4.83	1.06	.080	.972	348	.10	.11	.10
16	3600	3200	.9	3197	1.2		0	1.64	.01	1	.776	1.46	.030	.999	231	.14	.31	.06
ALTERNATE 3 STORM 3																		
2	1720	12889	1.0	12834	1.0		0	2.01	.01	1	1.83	1.26	.020	.996	122	.26	.04	.03
7	4500	13887	1.0	12920	1.1		0	1.98	.01	1	.340	1.37	.118	.930	562	.06	.13	.16
10	2700	13102	1.1	12783	1.2		0	1.97	.01	1	3.55	1.11	.066	.976	314	.11	.09	.09
16	3600	3200	.7	3200	1.4		0	1.97	.01	1	.776	1.46	.023	1.000	231	.14	.70	.06

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

XSECTION/ STRUCTURE	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....		
		1	2	3
XSECTION 1	9.40			
ALTERNATE 1		8837.86	7750.50	4401.83
ALTERNATE 2		15100.38	14108.94	9084.99
ALTERNATE 3		18851.30	18457.17	12890.08
XSECTION 2	9.40			
ALTERNATE 1		8837.86	7733.28	4394.54
ALTERNATE 2		15100.38	14033.89	9055.79
ALTERNATE 3		18851.30	18371.34	12834.26
XSECTION 3	.64			
ALTERNATE 1		472.03	383.82	112.39
ALTERNATE 2		1197.85	1224.35	497.91
ALTERNATE 3		1769.10	1993.04	1065.53
XSECTION 4	10.04			
ALTERNATE 1		8986.23	7805.74	4454.81
ALTERNATE 2		15426.44	14214.86	9300.65
ALTERNATE 3		19336.23	18659.16	13243.98
XSECTION 5	1.06			
ALTERNATE 1		2199.45	2405.47	909.12
ALTERNATE 2		3190.64	3739.95	1977.69
ALTERNATE 3		3603.41	4346.21	3038.94
XSECTION 6	11.10			
ALTERNATE 1		9395.23	7963.08	4660.71
ALTERNATE 2		15962.37	14467.86	9816.34
ALTERNATE 3		19939.91	18976.64	13887.99
XSECTION 7	11.10			
ALTERNATE 1		8841.06	7280.67	4158.96
ALTERNATE 2		15045.67	13339.74	9125.75
ALTERNATE 3		18961.51	17660.19	12920.57
XSECTION 8	.53			
ALTERNATE 1		931.03	966.20	364.88
ALTERNATE 2		1459.88	1653.50	849.69
ALTERNATE 3		1726.51	2034.23	1327.44

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

SECTION/ STRUCTURE	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....		
		1	2	3
SECTION 9	11.63			
ALTERNATE 1		9024.47	7340.31	4177.16
ALTERNATE 2		15304.10	13428.50	9235.94
ALTERNATE 3		19254.67	17766.84	13101.91
SECTION 10	11.63			
ALTERNATE 1		8808.17	7128.67	4085.82
ALTERNATE 2		15099.01	13122.90	8977.60
ALTERNATE 3		19074.20	17454.17	12782.78
SECTION 11	.55			
ALTERNATE 1		481.17	407.13	128.76
ALTERNATE 2		1106.41	1132.42	490.01
ALTERNATE 3		1558.96	1745.94	971.87
SECTION 12	12.18			
ALTERNATE 1		8896.46	7173.09	4093.69
ALTERNATE 2		15296.10	13202.78	9033.23
ALTERNATE 3		19353.02	17560.30	12910.40
SECTION 13	3.66			
ALTERNATE 1		3386.99	2959.19	1690.70
ALTERNATE 2		5793.81	5389.05	3488.69
ALTERNATE 3		7239.14	7052.74	4944.98
SECTION 14	3.11			
ALTERNATE 1		3200.00	2959.19	1690.70
ALTERNATE 2		3200.00	3200.00	3200.00
ALTERNATE 3		3200.00	3200.00	3200.00
SECTION 15	.55			
ALTERNATE 1		186.99	.00	.00
ALTERNATE 2		2593.81	2189.05	288.69
ALTERNATE 3		4039.14	3852.74	1744.98
SECTION 16	3.11			
ALTERNATE 1		3197.49	2899.48	1661.70
ALTERNATE 2		3233.23	3204.20	3197.29
ALTERNATE 3		3200.00	3202.84	3200.77

ALTERNATE	1	794.70	727.32	282.27
ALTERNATE	2	1459.34	1501.33	758.75

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

SECTION/ STRUCTURE	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....		
		1	2	3
<hr/>				
XSECTION 17	.63			
ALTERNATE 3		1857.88	2053.25	1277.03
<hr/>				
XSECTION 18	.34			
ALTERNATE 1		252.56	205.81	64.21
ALTERNATE 2		633.36	636.72	268.23
ALTERNATE 3		929.15	1030.21	560.01
<hr/>				
XSECTION 19	.97			
ALTERNATE 1		1047.19	932.25	342.54
ALTERNATE 2		2092.35	2133.78	1026.89
ALTERNATE 3		2786.12	3077.27	1836.96
<hr/>				
XSECTION 20	4.08			
ALTERNATE 1		3506.08	3085.48	1831.37
ALTERNATE 2		4794.38	4407.36	3722.85
ALTERNATE 3		5827.11	5744.12	4332.36
<hr/>				
XSECTION 21	16.26			
ALTERNATE 1		12228.69	9895.65	5734.09
ALTERNATE 2		18916.70	16588.71	12444.76
ALTERNATE 3		23107.57	21011.03	16499.57
<hr/>				
XSECTION 22	16.81			
ALTERNATE 1		12228.69	9895.65	5734.09
ALTERNATE 2		20641.77	17922.59	12497.99
ALTERNATE 3		26221.59	23810.33	17833.78

 WATER SURFACE PROFILES *
 VERSION OF NOVEMBER 1976 *
 DATED MAY 1984 *
 IBM-PC-XT VERSION AUGUST 1985 *
 RUN DATE 08-04-88 TIME 09:34:55 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * THE HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET, SUITE D *
 * DAVIS, CALIFORNIA 95616 *
 * (916) 440-2105 (FTS) 448-2105 *

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X   X   XXXXXXX   XXXX           YYYYY
X   X   X         X   X         X   X
X   X   X         X             X
XXXXXXXX   XXXX   X             XXXXX   XXXXX
X   X   X         X             X
X   X   X         X   X         X
X   X   XXXXXXX   XXXX           YYYYY
  
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SSUP100.HEC

Supercritical Profile -100 year event

THIS RUN EXECUTED 08-04-88

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 E1 DR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985

1 SUTHERLAND WASH - 100 YEAR
 FLOOD WATER SURFACE PROFILES - JON FULLER
 SUTHERLAND WASH

CHECK	INO	NINV	IDIR	STRT	METRIC	HVINS	0	WSEL	FO	
0.	2.	0.	1.	.010000	.00	.0	0.	3090.000	.000	
PROF	IPL0T	PRFVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE	
1.000	.000	-1.000	.000	.000	.000	.000	.000	.000	15.000	
VARIABLE CODES FOR SUMMARY PRINTOUT										
38.000	43.000	5.000	8.000	55.000	56.000	26.000	4.000	.000	.000	
INLEQ	ICOPY									
1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
NC	.045	.045	.045	.100	.300	.000	.000	.000	.000	.000
X1	1.000	12800.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	43.000	13.000	29.000	118.000	180.000	280.000	190.000	.000	.000	.000
SR	3100.000	.000	3090.000	29.000	3088.000	36.000	3086.000	45.000	3086.000	85.000
SR	3088.000	110.000	3090.000	118.000	3092.000	125.000	3094.000	129.000	3094.000	150.000
SR	3096.000	170.000	3098.000	208.000	3100.000	220.000	.000	.000	.000	.000
NC	.000	.000	.040	.000	.000	.000	.000	.000	.000	.000
X1	42.000	11.000	50.000	160.000	180.000	280.000	190.000	.000	.000	.000
GR	3100.000	.000	3090.000	28.000	3088.000	30.000	3086.000	50.000	3084.000	59.000
SR	3082.000	75.000	3081.000	95.000	3082.000	115.000	3084.000	132.000	3090.000	160.000
SR	3100.000	225.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.050	.038	.000	.000	.000	.000	.000	.000	.000
X1	41.000	11.000	170.000	264.000	210.000	320.000	260.000	.000	.000	.000
GR	3100.000	.000	3092.000	58.000	3090.000	103.000	3088.000	110.000	3084.000	123.000
GR	3084.000	170.000	3078.000	185.000	3078.000	230.000	3088.000	264.000	3090.000	282.000
GR	3096.000	300.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.045	.055	.035	.000	.000	.000	.000	.000	.000	.000
X1	40.000	10.000	172.000	240.000	190.000	260.000	220.000	.000	.000	.000
GR	3100.000	.000	3090.000	24.000	3088.000	30.000	3086.000	41.000	3084.000	172.000
GR	3076.000	175.000	3076.000	231.000	3080.000	240.000	3090.000	250.000	3100.000	280.000

	9.000	.060	81.000	.050	456.000	.040	525.000	.045	1485.000	.035
	1508.000	.045	1570.000	.030	1618.000	.045	1690.000	.060	1800.000	.000
	13.000	33.000	1485.000	1508.000	230.000	330.000	320.000	.000	.000	.000
X3	10.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
	3030.000	.000	3020.000	81.000	3012.000	235.000	3010.000	320.000	3608.000	435.000
	3006.000	456.000	3004.000	462.000	3002.000	470.000	3001.000	483.000	3002.000	492.000
GR	3004.000	501.000	3006.000	525.000	3008.000	531.000	3008.000	610.000	3008.000	658.000
GR	3006.000	725.000	3006.000	820.000	3004.000	926.000	3002.000	1070.000	3000.000	1195.000
	3000.000	1280.000	2998.000	1310.000	2998.000	1380.000	2996.000	1490.000	2994.000	1485.000
	2994.000	1508.000	2996.000	1514.000	2996.000	1518.000	2992.000	1570.000	2992.000	1618.000
GR	2998.000	1632.000	3000.000	1690.000	3010.000	1800.000	.000	.000	.000	.000
	8.000	.060	68.000	.055	315.000	.045	470.000	.040	540.000	.045
NH	1510.000	.035	1606.000	.050	1690.000	.060	1748.000	.000	.000	.000
	1.000	13146.000	.000	.000	.000	.000	.000	.000	.000	.000
	17.000	41.000	1510.000	1606.000	170.000	170.000	170.000	.000	.000	.000
X3	10.000	.000	.000	825.000	.000	.000	.000	.000	.000	.000
GR	3020.000	.000	3010.000	68.000	3008.000	95.000	3006.000	105.000	3006.000	150.000
	3008.000	168.000	3010.000	180.000	3008.000	200.000	3010.000	212.000	3010.000	255.000
	3008.000	304.000	3006.000	315.000	3004.000	350.000	3002.000	380.000	3004.000	428.000
GR	3002.000	450.000	3004.000	454.000	3000.000	470.000	2992.000	489.000	2996.000	496.000
	2996.000	508.000	2992.000	520.000	3000.000	540.000	3004.000	548.000	3004.000	565.000
	3002.000	700.000	3002.000	830.000	3000.000	1000.000	2998.000	1125.000	2997.000	1240.000
GR	2996.000	1350.000	2994.000	1500.000	2992.000	1510.000	2992.000	1523.000	2994.000	1540.000
GR	2992.000	1570.000	2992.000	1606.000	2996.000	1616.000	2998.000	1680.000	3000.000	1690.000
G	3010.000	1748.000	.000	.000	.000	.000	.000	.000	.000	.000
	6.000	.060	80.000	.050	312.000	.040	369.000	.045	1351.000	.035
NH	1464.000	.060	1490.000	.000	.000	.000	.000	.000	.000	.000
	16.000	37.000	1351.000	1464.000	260.000	350.000	250.000	.000	.000	.000
X3	10.000	.000	.000	760.000	.000	.000	.000	.000	.000	.000
GR	3010.000	.000	3000.000	54.000	2998.000	80.000	2996.000	125.000	2996.000	241.000
GR	2998.000	280.000	2998.000	312.000	2992.000	325.000	2990.000	336.000	2988.000	340.000
GR	2988.000	349.000	2990.000	351.000	2992.000	362.000	2996.000	369.000	2997.000	382.000
GR	2997.000	480.000	2996.000	500.000	2996.000	681.000	2994.000	690.000	2994.000	708.000
GR	2996.000	720.000	2996.800	845.000	2996.000	908.000	2994.000	940.000	2992.000	1198.000
GR	2990.000	1210.000	2992.000	1240.000	2992.000	1339.000	2990.000	1351.000	2988.000	1368.000
GR	2988.000	1405.000	2990.000	1430.000	2988.000	1440.000	2988.000	1460.000	2990.000	1464.000
GR	3000.000	1475.000	3010.000	1490.000	.000	.000	.000	.000	.000	.000
	7.000	.060	70.000	.045	391.000	.060	440.000	.050	1195.000	.030
NH	1240.000	.045	1262.000	.060	1311.000	.000	.000	.000	.000	.000
Q1	1.000	13700.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	15.000	29.000	1195.000	1240.000	270.000	310.000	330.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	3000.000	.000	2990.000	10.000	2996.000	30.000	2994.000	42.000	2992.000	70.000
GR	2990.800	150.000	2990.800	250.000	2992.000	315.000	2990.000	330.000	2988.000	359.000
GR	2986.000	370.000	2984.000	374.000	2984.000	387.000	2986.000	391.000	2988.000	420.000
GR	2990.000	423.000	2991.000	440.000	2992.000	638.000	2992.000	690.000	2991.000	770.000
GR	2990.000	950.000	2990.000	1075.000	2988.000	1178.000	2986.000	1195.000	2985.000	1220.000
GR	2986.000	1240.000	2988.000	1262.000	2990.000	1276.000	3000.000	1311.000	.000	.000

9.000	.060	81.000	.050	456.000	.040	525.000	.045	1485.000	.035
508.000	.045	1570.000	.030	1618.000	.045	1690.000	.060	1800.000	.000
18.000	33.000	1485.000	1508.000	230.000	330.000	320.000	.000	.000	.000
10.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
030.000	.000	3020.000	81.000	3012.000	235.000	3010.000	320.000	3008.000	435.000
006.000	456.000	3004.000	462.000	3002.000	470.000	3001.000	483.000	3002.000	492.000
3004.000	501.000	3005.000	525.000	3008.000	531.000	3008.000	610.000	3008.000	658.000
006.000	725.000	3005.000	820.000	3004.000	926.000	3002.000	1070.000	3000.000	1195.000
000.000	1280.000	2998.000	1310.000	2998.000	1390.000	2996.000	1480.000	2994.000	1485.000
2994.000	1508.000	2996.000	1514.000	2996.000	1518.000	2992.000	1570.000	2992.000	1618.000
2998.000	1632.000	3000.000	1690.000	3010.000	1800.000	.000	.000	.000	.000
8.000	.060	68.000	.055	315.000	.045	470.000	.040	540.000	.045
1510.000	.035	1606.000	.050	1690.000	.060	1748.000	.000	.000	.000
1.000	13146.000	.000	.000	.000	.000	.000	.000	.000	.000
17.000	41.000	1510.000	1606.000	170.000	170.000	170.000	.000	.000	.000
10.000	.000	.000	825.000	.000	.000	.000	.000	.000	.000
3020.000	.000	3010.000	68.000	3008.000	95.000	3006.000	105.000	3006.000	150.000
3008.000	168.000	3010.000	180.000	3008.000	200.000	3010.000	212.000	3010.000	255.000
3008.000	304.000	3006.000	315.000	3004.000	350.000	3002.000	380.000	3004.000	428.000
3002.000	450.000	3004.000	454.000	3000.000	470.000	2992.000	489.000	2996.000	496.000
2996.000	508.000	2992.000	520.000	3000.000	540.000	3004.000	548.000	3004.000	565.000
3002.000	700.000	3002.000	830.000	3000.000	1000.000	2998.000	1125.000	2997.000	1240.000
2996.000	1350.000	2994.000	1500.000	2992.000	1510.000	2992.000	1523.000	2994.000	1540.000
2992.000	1570.000	2992.000	1606.000	2996.000	1616.000	2998.000	1680.000	3000.000	1690.000
3010.000	1748.000	.000	.000	.000	.000	.000	.000	.000	.000
6.000	.060	80.000	.050	312.000	.040	369.000	.045	1351.000	.035
1464.000	.060	1490.000	.000	.000	.000	.000	.000	.000	.000
16.000	37.000	1351.000	1464.000	260.000	350.000	250.000	.000	.000	.000
10.000	.000	.000	760.000	.000	.000	.000	.000	.000	.000
3010.000	.000	3000.000	54.000	2998.000	80.000	2996.000	125.000	2996.000	241.000
2998.000	280.000	2998.000	312.000	2992.000	325.000	2990.000	336.000	2988.000	340.000
2988.000	349.000	2990.000	351.000	2992.000	362.000	2996.000	369.000	2997.000	382.000
2997.000	480.000	2996.000	500.000	2996.000	681.000	2994.000	690.000	2994.000	708.000
2996.000	720.000	2996.800	845.000	2996.000	908.000	2994.000	940.000	2992.000	1198.000
2990.000	1210.000	2992.000	1240.000	2992.000	1339.000	2990.000	1351.000	2988.000	1368.000
2988.000	1405.000	2990.000	1430.000	2988.000	1440.000	2988.000	1460.000	2990.000	1464.000
3000.000	1475.000	3010.000	1490.000	.000	.000	.000	.000	.000	.000
7.000	.060	70.000	.045	391.000	.040	440.000	.050	1195.000	.030
1240.000	.045	1262.000	.060	1311.000	.000	.000	.000	.000	.000
1.000	13700.000	.000	.000	.000	.000	.000	.000	.000	.000
15.000	29.000	1195.000	1240.000	270.000	310.000	330.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
3000.000	.000	2990.000	10.000	2996.000	30.000	2994.000	42.000	2992.000	70.000
2990.800	150.000	2990.800	250.000	2992.000	315.000	2990.000	330.000	2988.000	359.000
2986.000	370.000	2984.000	374.000	2984.000	387.000	2986.000	391.000	2988.000	420.000
2990.000	423.000	2991.000	440.000	2992.000	638.000	2992.000	690.000	2991.000	770.000
2990.000	950.000	2990.000	1075.000	2988.000	1178.000	2986.000	1195.000	2985.000	1220.000
2986.000	1240.000	2988.000	1262.000	2990.000	1276.000	3000.000	1311.000	.000	.000

7.000	.060	39.000	.050	419.000	.040	485.000	.045	865.000	.030
330.000	.045	990.000	.060	1200.000	.000	.000	.000	.000	.000
14.000	30.000	865.000	930.000	360.000	370.000	380.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
300.000	.000	2992.000	23.000	2990.000	39.000	2988.000	76.000	2986.500	120.000
286.000	204.000	2986.000	410.000	2984.000	415.000	2982.000	419.000	2980.000	422.000
2980.000	433.000	2982.000	445.000	2984.000	452.000	2982.000	470.000	2984.000	480.000
384.000	485.000	2936.000	545.000	2985.000	600.000	2984.000	730.000	2984.000	810.000
382.000	865.000	2980.000	870.000	2980.000	921.000	2982.000	930.000	2984.000	980.000
2986.000	990.000	2988.000	1020.000	2990.000	1100.000	2992.000	1160.000	2994.000	1200.000
7.000	.060	31.000	.050	496.000	.040	575.000	.045	728.000	.030
800.000	.045	960.000	.060	1122.000	.000	.000	.000	.000	.000
13.000	24.000	728.000	800.000	280.000	200.000	230.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
000.000	.000	2990.000	31.000	2988.000	38.000	2986.000	52.000	2984.000	89.000
2982.000	236.000	2982.000	280.000	2981.500	462.000	2980.000	496.000	2978.000	502.000
976.000	508.000	2978.000	535.000	2980.000	575.000	2980.600	650.000	2980.000	721.000
978.000	728.000	2977.000	750.000	2978.000	785.000	2980.000	800.000	2982.000	826.000
2984.000	960.000	2986.000	1020.000	2988.000	1082.000	2990.000	1122.000	.000	.000
5.000	.050	420.000	.035	506.000	.045	675.000	.035	767.000	.050
980.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
12.500	23.000	675.000	767.000	150.000	140.000	130.000	.000	.000	.000
10.000	.000	.000	586.000	.000	.000	.000	.000	.000	.000
990.000	.000	2984.000	19.000	2982.000	40.000	2980.000	210.000	2978.000	228.000
2978.000	248.000	2980.000	397.000	2980.000	415.000	2978.000	420.000	2972.000	430.000
972.000	441.000	2974.000	450.000	2976.000	491.000	2978.000	506.000	2979.000	586.000
978.000	675.000	2976.000	720.000	2978.000	767.000	2978.000	808.000	2980.000	826.000
2982.000	858.000	2984.000	925.000	2986.000	980.000	.000	.000	.000	.000
6.000	.060	26.000	.050	398.000	.040	460.000	.045	711.000	.035
762.000	.060	925.000	.000	.000	.000	.000	.000	.000	.000
12.000	27.000	711.000	762.000	110.000	180.000	120.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
990.000	.000	2980.000	26.000	2978.000	48.000	2976.000	72.000	2974.000	215.000
2976.000	255.000	2976.000	314.000	2976.000	375.000	2974.000	390.000	2972.000	398.000
2970.000	401.000	2969.500	408.000	2970.000	412.000	2972.000	422.000	2974.000	435.000
976.000	460.000	2977.000	560.000	2976.000	670.000	2978.000	705.000	2976.000	711.000
2974.000	720.000	2974.000	758.000	2976.000	762.000	2978.000	775.000	2980.000	795.000
2982.000	900.000	2984.000	925.000	.000	.000	.000	.000	.000	.000
7.000	.050	285.000	.040	323.000	.035	378.000	.045	705.000	.040
757.000	.030	806.000	.060	952.000	.000	.000	.000	.000	.000
11.000	27.000	705.000	806.000	200.000	135.000	152.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2980.000	.000	2978.000	2.000	2976.000	13.000	2974.000	20.000	2972.000	200.000
2972.000	285.000	2970.000	296.000	2968.000	302.000	2968.000	323.000	2970.000	331.000
2970.000	360.000	2972.000	378.000	2972.000	581.000	2974.000	589.000	2974.000	675.000
2976.000	694.000	2974.000	705.000	2972.000	712.000	2974.000	720.000	2975.000	740.000
2974.000	757.000	2972.300	770.000	2974.000	787.000	2974.000	806.000	2976.000	817.000
978.000	891.000	2980.000	952.000	.000	.000	.000	.000	.000	.000

	8.000	.055	81.000	.045	139.000	.035	195.000	.040	380.000	.035
	450.000	.040	689.000	.035	729.000	.050	803.000	.000	.000	.000
	10.500	28.000	689.000	729.000	230.000	230.000	230.000	.000	.000	.000
	10.000	.000	.000	290.000	.000	.000	.000	.000	.000	.000
	976.000	.000	2974.000	29.000	2972.000	72.000	2970.000	81.000	2968.000	88.000
	966.000	92.000	2966.000	103.000	2968.000	117.000	2970.000	129.000	2970.000	139.000
	2968.000	146.000	2966.000	151.000	2966.000	169.000	2968.000	195.000	2970.000	261.000
	970.000	380.000	2970.000	450.000	2970.000	565.000	2972.000	671.000	2972.000	689.000
	970.000	690.000	2968.000	694.000	2968.000	715.000	2970.000	722.000	2972.000	729.000
	2974.000	759.000	2976.000	770.000	2978.000	803.000	.000	.000	.000	.000
	6.000	.060	110.000	.035	261.000	.045	540.000	.030	630.000	.045
	894.000	.060	955.000	.000	.000	.000	.000	.000	.000	.000
	10.000	21.000	540.000	630.000	190.000	220.000	250.000	.000	.000	.000
	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	974.000	.000	2972.000	82.000	2970.000	100.000	2968.000	110.000	2966.000	118.000
	2964.000	130.000	2962.000	153.000	2964.000	169.000	2964.000	245.000	2968.000	252.000
	2968.000	261.000	2968.000	470.000	2966.000	491.000	2965.000	540.000	2965.000	630.000
	2966.000	639.000	2968.000	648.000	2970.000	667.000	2970.000	830.000	2972.000	894.000
	2974.000	955.000	.000	.000	.000	.000	.000	.000	.000	.000
	5.000	.060	60.000	.035	120.000	.045	520.000	.035	628.000	.045
	960.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	9.000	14.000	520.000	628.000	300.000	530.000	400.000	.000	.000	.000
	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	2970.000	.000	2960.000	60.000	2960.000	120.000	2966.000	135.000	2966.000	430.000
	2964.000	453.000	2962.000	470.000	2960.000	520.000	2960.000	628.000	2962.000	642.000
	2964.000	660.000	2966.000	752.000	2968.000	819.000	2970.000	960.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

SECNO	DEPTH	CWSEL	CRISW	WSELX	EG	HV	HL	OLOSS	BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRG 1

CHU = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF REACH TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

CH = .100 CEHV = .300
 SECNO 43.000
 3720 CRITICAL DEPTH ASSUMED

43.00	9.77	3095.77	3095.77	3090.00	3099.04	3.27	.00	.00	3090.00
2800.	331.	11832.	637.	48.	791.	97.	0.	0.	3090.00
.00	6.85	14.97	6.54	.045	.045	.045	.000	3086.00	12.26
11300	0.	0.	0.	0	17	6	.00	155.45	167.71

FLOW DISTRIBUTION FOR SECNO= 43.00 CWSEL= 3095.77

A=	12.	29.	118.	125.	129.	150.	168.
PER Q=	2.6	92.4	2.5	.6	1.5	.4	
REA=	48.3	790.6	33.4	11.1	37.2	15.7	
VEL=	6.9	15.0	9.7	6.4	5.1	3.2	

SECNO 42.000

31 HV CHANGED MORE THAN HVINS

12.00	8.23	3089.23	3090.98	.00	3095.32	6.09	3.44	.28	3086.00
2800.	425.	12375.	0.	45.	617.	0.	4.	1.	3090.00
.00	9.36	20.06	.00	.045	.040	.045	.000	3081.00	28.77
28367	180.	190.	280.	7	8	0	.00	127.65	156.42

FLOW DISTRIBUTION FOR SECNO= 42.00 CWSEL= 3089.23

S =	29.	30.	50.	160.
PER Q=	.0	3.3	96.7	
REA=	.8	44.6	616.9	
VEL=	3.2	9.5	20.1	

SECNO 41.000

30 1 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

11.00	10.07	3088.07	3088.14	.00	3091.26	3.19	3.19	.87	3084.00
12800.	1753.	11047.	0.	218.	732.	0.	7.	1.	3089.00
.01	8.03	15.10	.03	.045	.038	.050	.000	3076.00	109.75
11813	180.	190.	280.	2	11	0	.00	154.90	264.65

OK DISTRIBUTION FOR SECNO= 41.00 CWSEL= 3088.07

STA= 110. 123. 170. 264.
 PE Q= 1.1 12.6 86.3
 AEA= 26.9 191.4 731.8
 VEL= 5.2 8.4 15.1

SEC) 40.000
 35 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 20 CRITICAL DEPTH ASSUMED

11.00	11.70	3087.70	3087.70	.00	3090.53	2.84	1.31	2.01	3084.00
12800.	1640.	11048.	112.	361.	765.	30.	13.	2.	3080.00
.01	4.54	14.44	3.79	.045	.035	.055	.000	3076.00	31.68
11168	210.	260.	320.	20	8	0	.00	216.02	247.70

DISTRIBUTION FOR SECNO= 40.00 CWSEL= 3087.70

STA= 32. 41. 172. 240. 248.
 PE Q= .1 12.7 86.3 .9
 AEA= 7.9 353.1 765.3 29.6
 VEL= 2.1 4.6 14.4 3.8

SEC) 39.000
 307 HV CHANGED MORE THAN HVINS

11.00	5.16	3080.16	3082.61	.00	3087.37	7.20	2.73	.44	3076.00
12800.	177.	12324.	299.	22.	563.	32.	17.	3.	3076.00
.01	8.20	21.88	9.36	.050	.035	.055	.000	3075.00	19.68
11182	190.	220.	260.	7	14	0	.00	132.56	152.24

DISTRIBUTION FOR SECNO= 39.00 CWSEL= 3080.16

STA= 20. 30. 140. 149. 152.
 PE Q= 1.4 96.3 2.2 .1
 AEA= 21.6 563.2 28.4 3.5
 VEL= 8.2 21.9 9.9 4.6

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VR0B	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 38.000

30: V CHANGED MORE THAN HVINS

35 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 20 CRITICAL DEPTH ASSUMED

38.00	11.39	3082.39	3082.39	.00	3085.00	2.60	1.12	3.01	3074.00
12800.	612.	9099.	3089.	100.	606.	642.	22.	6.	3072.00
.02	6.09	15.02	4.81	.050	.035	.055	.000	3071.00	23.59
G-386	210.	210.	200.	20	17	0	.00	262.41	286.00

DISTRIBUTION FOR SECNO= 38.00 CWSEL= 3082.39

TA=	24.	31.	48.	105.	118.	275.	286.
Q=	.2	4.6	71.1	5.3	18.6	.2	
KEA=	8.9	91.6	605.8	96.1	532.3	13.1	
VEL=	2.4	6.4	15.0	7.1	6.5	2.2	

ECNO 37.000

35 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 20 CRITICAL DEPTH ASSUMED

37.00	9.98	3080.98	3080.98	.00	3083.52	2.54	1.59	.67	3072.00
12800.	463.	8649.	3688.	76.	573.	701.	30.	5.	3072.00
.03	6.12	15.11	5.26	.050	.035	.055	.000	3071.00	33.23
3998	310.	280.	220.	20	15	0	.00	251.72	284.95

DISTRIBUTION FOR SECNO= 37.00 CWSEL= 3080.98

TA=	33.	50.	108.	112.	279.	282.	285.
Q=	3.6	67.6	1.3	27.3	.1	.0	
KEA=	75.6	572.6	27.9	665.3	6.0	1.5	
VEL=	6.1	15.1	6.1	5.3	2.9	1.3	

ECNO 36.000

30: V CHANGED MORE THAN HVINS

36.00	7.55	3076.55	3077.96	.00	3081.30	4.75	2.00	.22	3070.00
12800.	535.	9082.	3183.	69.	448.	474.	35.	6.	3074.00
.03	7.79	20.29	6.71	.055	.035	.055	.000	3069.00	26.02
3155	220.	210.	140.	8	15	0	.00	278.81	304.83

SECNO	DEPTH	CWSEL	CRHS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TI	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

DISTRIBUTION FOR SECNO= 36.00 CWSEL= 3076.55

PER	26.	47.	113.	290.	304.	305.
PER 0=	4.2	71.0	24.0	.8	.0	
AREA=	68.7	447.6	452.2	21.8	.2	
VEL=	7.8	20.3	6.8	4.9	1.4	

SECNO 35.000

35.00	5.96	3073.96	3075.27	.00	3078.33	4.37	2.86	.11	3070.00
17.10	319.	9390.	3091.	60.	489.	480.	39.	8.	3072.00
.03	5.29	19.20	6.44	.045	.030	.045	.000	3068.00	32.76
015557	170.	170.	170.	8	11	0	.00	383.67	416.42

DISTRIBUTION FOR SECNO= 35.00 CWSEL= 3073.96

PER	33.	76.	82.	170.	412.	416.
PER 0=	1.4	1.1	73.4	24.0	.1	
AREA=	42.5	17.8	489.0	475.7	4.3	
VEL=	4.1	8.2	19.2	6.5	3.8	

1 NH CARD USED

SECNO 34.000

HV CHANGED MORE THAN HVINS

.00	6.81	3070.81	3071.24	.00	3072.56	1.75	4.98	.78	3070.00
.00.	32.	7475.	5293.	8.	713.	489.	43.	10.	3070.00
.04	3.95	10.49	10.83	.045	.045	.047	.000	3064.00	79.08
0 572	170.	180.	190.	5	11	0	.00	796.08	875.16

DISTRIBUTION FOR SECNO= 34.00 CWSEL= -3070.81

PER	79.	99.	500.	527.	542.	575.	865.	875.
PER 0=	.2	58.4	17.5	3.4	10.4	10.0	.1	
A A=	8.1	712.5	116.0	35.2	92.8	240.8	4.1	
L=	4.0	10.5	19.3	12.3	14.4	5.3	3.2	

490 NH CARD USED

SECNO 33.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
1 IE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

265 DIVIDED FLOW

301 HV CHANGED MORE THAN HVINS

68: 20 TRIALS ATTEMPTED WSEL,CWSEL
 69: PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS=	100.0	1280.0	TYPE=	1	TARGET=	1180.000
33.00	4.96	3066.96	3066.96	.00	3067.80	.84 6.08 4.20100000.00
12800.	0.	7789.	5011.	0.	968.	826. 53. 17. 3066.00
.05	.00	8.05	6.07	.045	.045	.046 .000 3062.00 100.00
.U21097	220.	280.	300.	20	13	0 .00 1128.24 1280.00

LOI DISTRIBUTION FOR SECNO= 33.00 CWSEL= 3066.96

STA	100.	540.	670.	791.	820.	850.	855.	861.	1000.	1280.
PI Q=	60.9	15.0	14.0	1.0	2.8	.4	.1	1.0	4.9	
AREA=	967.9	255.4	237.7	28.0	51.4	8.6	3.1	41.9	200.1	
VEL=	8.0	7.5	7.5	4.7	6.9	6.7	2.9	2.9	3.1	

496 NH CARD USED
 SECNO 32.000

326 DIVIDED FLOW

368: 20 TRIALS ATTEMPTED WSEL,CWSEL
 369: PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS=	140.0	1800.0	TYPE=	1	TARGET=	1660.000
2.00	3.53	3061.53	3061.53	.00	3062.15	.62 5.60 1.40100000.00
12800.	0.	6702.	6098.	0.	952.	1118. 66. 26. 3060.00
.06	.00	7.04	5.45	.045	.040	.046 .000 3058.00 140.00
.1 9873	230.	210.	375.	20	14	0 .00 1533.06 1770.63

FLOI DISTRIBUTION FOR SECNO= 32.00 CWSEL= 3061.53

STA	140.	780.	1050.	1115.	1300.	1531.	1740.	1771.
P Q=	52.4	8.9	4.4	15.7	5.3	12.7	.6	
EA=	951.8	237.9	81.1	286.8	169.0	320.0	23.4	
VEL=	7.0	4.8	7.0	7.0	4.0	5.1	3.2	

SECNO	DEPTH	CWSEL	CRHS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
1 IE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

91 NH CARD USED
 SECNO 31.000
 8 TRIALS ATTEMPTED WSEL.CWSEL
 11 WSEL ASSUMED BASED ON MIN DIFF
 93 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS=	.0	1879.0	TYPE=	1	TARGET=	1878.999
31.00	4.19	3056.19	3056.19	.00	3056.86	.67 4.93 .78 3056.00
800.	0.	9342.	3458.	0.	1288.	812. 81. 38. 3056.00
.07	.04	7.25	4.26	.050	.040	.045 .000 3052.00 51.34
.015889	290.	310.	310.	20	11	0 .00 1811.96 1863.30

LOW DISTRIBUTION FOR SECNO= 31.00 CWSEL= 3056.19

TA	51.	720.	980.	1079.	1432.	1669.	1730.	1800.	1863.
P_ Q=	73.0	5.2	5.7	3.5	3.6	3.3	3.8	2.0	
AREA=	1288.1	149.1	127.7	157.1	129.2	87.8	100.7	60.7	
EL=	7.3	4.5	5.7	2.9	3.5	4.8	4.8	4.1	

490 NH CARD USED
 SECNO 30.000

26 DIVIDED FLOW

0.00	1.95	3049.95	3050.14	.00	3050.77	.82	6.08	.02	3048.00
800.	31.	7126.	5643.	8.	946.	812.	95.	49.	3048.00
.09	3.61	7.54	6.95	.060	.040	.040	.000	3048.00	24.26
.2786	390.	330.	300.	3	11	0	.00	1263.79	2029.08

FLOW DISTRIBUTION FOR SECNO= 30.00 CWSEL= 3049.95

STA.	24.	33.	647.	780.	1166.	1910.	1965.	2029.
PER Q=	.2	55.7	17.6	16.1	.4	7.3	2.7	
AREA=	8.5	945.5	258.3	375.2	9.4	106.8	62.2	
EL=	3.6	7.5	8.7	5.5	5.4	8.7	5.5	

14 NH CARD USED
 *SI NO 29.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
P	QLOB	QCH	OROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
4E	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

265 DIVIDED FLOW

58: 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

9.00	3.02	3043.02	3043.02	.00	3043.66	.63	7.12	.16	3044.00
800.	0.	831.	11969.	0.	135.	1871.	109.	60.	3042.00
.10	.00	6.16	6.40	.060	.035	.043	.000	3040.00	103.69
2209	330.	300.	330.	20	14	0	.00	1683.24	2112.79

FLOW DISTRIBUTION FOR SECNO= 29.00 CWSEL= 3043.02

TA=	104.	570.	1100.	1789.	1919.	1951.	1970.	2039.	2051.	2076.	2100.	2113.
PER Q=	6.5	21.2	31.0	16.2	7.8	2.4	2.8	1.9	7.8	2.4	.1	
EA=	135.0	542.4	705.1	263.0	96.8	38.4	70.6	24.3	75.6	48.6	6.5	
EL=	6.2	5.0	5.6	7.9	10.3	7.8	5.0	10.0	13.2	6.4	2.6	

49 NH CARD USED
 SE 0 28.000

265 DIVIDED FLOW

1470 ENCROACHMENT STATIONS= 230.0 2500.0 TYPE= 1 TARGET= -230.000

8.00	1.47	3037.47	3037.49	.00	3038.14	.67	5.52	.00	3036.00
800.	647.	6136.	6017.	88.	820.	1119.	121.	70.	3036.00
.11	7.36	7.48	5.38	.035	.035	.044	.000	3036.00	230.00
8689	380.	340.	240.	2	8	0	.00	1663.04	2299.37

FLOW DISTRIBUTION FOR SECNO= 28.00 CWSEL= 3037.47

STA=	230.	290.	850.	1185.	1372.	1622.	1679.	2000.	2084.	2254.	2284.	2299.
PER Q=	5.1	47.9	22.3	12.5	8.3	.2	.2	.3	.3	2.6	.4	
EA=	87.8	819.9	490.5	273.8	241.0	13.2	17.0	19.4	8.6	43.9	11.3	
EL=	7.4	7.5	5.8	5.8	4.4	1.7	1.7	1.7	4.7	7.5	4.7	

149 NH CARD USED
 SE 10 27.000

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
IME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

36 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

34. ENCROACHMENT STATIONS=	140.0	2375.0	TYPE=	1	TARGET=	-140.000
27.00	4.91	3032.91	3032.91	.00	3033.55	.64 6.39 12.33 3031.00
2800.	575.	4927.	7297.	142.	665.	1257. 139. 84. 3030.00
.13	4.06	7.41	5.80	.055	.035	.044 .000 3028.00 143.95
.016741	450.	425.	340.	20	20	0 .00 1655.37 2256.55

FLOW DISTRIBUTION FOR SECNO= 27.00 CWSEL= 3032.91

ST	144.	275.	700.	780.	835.	855.	960.	1150.	1618.	2213.	2245.	2257.
R Q=	4.5	38.5	7.9	5.4	8.2	10.9	5.4	6.3	6.1	6.1	6.1	.7
AREA=	141.8	665.3	152.8	105.1	90.2	206.6	172.9	226.0	212.1	76.1	76.1	15.4
VEL=	4.1	7.4	6.6	6.6	11.7	6.7	4.0	3.6	3.7	10.3	10.3	5.9

1490 NH CARD USED
 *SECNO 26.000

3266 DIVIDED FLOW

36 20 TRIALS ATTEMPTED WSEL,CWSEL
 36 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

26.00	4.18	3028.18	3028.18	.00	3028.96	.78	3.82	.88	3026.00
2800.	2404.	6931.	3466.	340.	862.	749.	154.	96.	3026.00
.14	7.06	8.04	4.63	.036	.035	.045	.000	3024.00	217.24
.011602	390.	350.	290.	20	15	0	.00	1512.56	2097.30

FLOW DISTRIBUTION FOR SECNO= 26.00 CWSEL= 3028.18

ST	217.	298.	400.	770.	940.	1130.	2097.
PER Q=	5.4	13.4	54.1	17.3	7.0	2.8	
AREA=	118.1	222.3	862.5	370.5	224.1	154.1	
VEL=	5.9	7.7	8.0	6.0	4.0	2.3	

101

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV	
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
1	VL0B	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

49C NH CARD USED
SECNO 25.000

ENCR	STATIONS	90.0	2100.0	TYPE	1	TARGET	2010.000		
25.00	3.95	3023.95	3024.07	.00	3025.17	1.22	3.74	.04	3022.00
12800.	1506.	7692.	3602.	262.	734.	638.	169.	104.	3020.00
.15	5.74	10.48	5.64	.040	.030	.045	.000	3020.00	240.57
.608762	430.	390.	300.	2	8	.0	.00	631.80	872.37

FLO DISTRIBUTION FOR SECNO= 25.00 CWSEL= 3023.95

STA	241.	290.	318.	371.	587.	710.	797.	872.
PI 0=	4.0	3.4	4.4	60.1	18.0	6.4	3.8	
AREA=	90.8	68.5	103.1	734.3	362.3	169.3	106.9	
VEL=	5.7	6.3	5.4	10.5	6.4	4.8	4.5	

49C NH CARD USED
SECNO 24.000

326 DIVIDED FLOW

ENCR	STATIONS	210.0	2010.0	TYPE	1	TARGET	1800.000		
24.00	3.37	3019.37	3019.88	.00	3021.03	1.66	4.10	.04	3018.00
12800.	1778.	4323.	6700.	317.	275.	1119.	181.	111.	3016.00
.16	5.60	15.75	5.99	.045	.030	.045	.000	3016.00	288.02
.3627	300.	310.	300.	6	5	0	.00	1304.22	1779.89

FLO DISTRIBUTION FOR SECNO= 24.00 CWSEL= 3019.37

STA	288.	435.	501.	546.	629.	711.	898.	1055.	1280.	1445.	1575.	1758.	1780.
PI 0=	7.0	4.1	2.8	33.8	12.8	11.7	9.8	4.8	5.4	4.0	3.4	.4	
AREA=	165.5	90.3	61.6	274.5	194.2	255.8	214.8	161.5	84.4	91.9	101.8	15.0	
VEL=	5.4	5.8	5.8	15.7	8.4	5.8	5.8	3.8	8.2	5.6	4.3	3.7	

149 NH CARD USED
SECNO 23.000

330 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLUPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

593 ROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

170 ENCROACHMENT STATIONS= 150.0 1850.0 TYPE= 1 TARGET= -150.000
 23.00 5.16 3015.16 3015.16 .00 3016.07 .91 3.29 5.06 3012.00
 12800. 2438. 2767. 7594. 299. 242. 1392. 196. 121. 3012.00
 .18 8.16 11.45 5.45 .034 .030 .042 .000 3010.00 421.72
 .00/461 300. 310. 380. 20 14 0 .00 1017.12 1438.84

LOW DISTRIBUTION FOR SECNO= 23.00 CWSEL= 3015.16

STA	422.	478.	520.	545.	611.	765.	889.	1000.	1100.	1180.	1198.	1305.	1325.
PI Q=	8.3	4.4	6.4	21.6	5.4	4.0	10.1	9.1	10.3	4.8	4.1	4.0	
AREA=	129.0	90.8	79.1	241.8	186.1	144.2	240.1	216.3	185.0	74.9	136.5	54.3	
VEL=	8.2	6.2	10.4	11.4	3.7	3.6	5.4	5.4	7.1	8.3	3.9	9.5	
STA	1325.	1370.	1439.										
PER Q=	6.1	1.3											
AREA=	97.3	57.7											
EL=	8.1	2.9											

490 NH CARD USED
 SECNO 22.000

265 DIVIDED FLOW

471 ENCROACHMENT STATIONS= 220.0 1908.0 TYPE= 1 TARGET= -220.000
 22.00 4.48 3010.48 3010.84 .00 3011.73 1.25 4.31 .03 3010.00
 300. 122. 2813. 9866. 49. 220. 1295. 209. 128. 3008.00
 .19 2.50 12.79 7.62 .045 .030 .041 .000 3006.00 520.96
 .018493 320. 300. 335. 5 10 0 .00 1075.31 1739.52

LOW DISTRIBUTION FOR SECNO= 22.00 CWSEL= 3010.48

STA	521.	648.	732.	890.	998.	1058.	1163.	1195.	1211.	1270.	1543.	1608.	1720.
PI Q=	1.0	22.0	10.6	7.1	4.0	3.1	17.5	5.7	5.1	9.2	7.1	7.5	
AREA=	48.8	220.0	233.2	140.4	88.6	72.0	143.2	55.6	87.1	176.6	128.4	165.3	
VEL=	2.5	12.8	5.8	6.4	5.8	5.5	15.7	13.2	7.5	6.7	7.1	5.8	
STA	1720.	1740.											
PER Q=	.1												
AREA=	4.6												
EL=	1.6												

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

490 NH CARD USED
 SECNO 21.000
 685-20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 480.0 1904.0 TYPE= 1 TARGET= -480.000

.00	2.41	3008.41	3008.41	.00	3009.25	.83	3.73	2.88	3008.00
12800.	8.	4212.	8580.	6.	471.	1344.	221.	136.	3008.00
.20	1.24	8.94	6.39	.045	.030	.041	.000	3006.00	723.81
.00596	255.	300.	330.	20	6	0	.00	1090.56	1814.37

LOW DISTRIBUTION FOR SECNO= 21.00 CWSEL= 3008.41

STA	724.	755.	968.	1084.	1238.	1289.	1330.	1540.	1631.	1650.	1689.	1809.	1814.
P/Q=	.1	32.9	6.9	7.6	14.8	4.5	3.7	7.5	4.0	11.3	6.7	.0	
AREA=	6.4	471.0	156.9	217.6	149.1	88.9	152.2	174.1	64.8	159.1	179.6	1.1	
VEL=	1.2	8.9	5.6	4.5	12.7	6.5	3.1	5.5	7.9	9.1	4.8	1.2	

491 NH CARD USED
 SECNO 20.000

630 HV CHANGED MORE THAN HVINS

20.00	6.10	3005.10	3005.45	.00	3006.82	1.72	2.34	.09	3002.00
800.	2872.	8165.	1763.	441.	655.	486.	230.	141.	3004.00
.20	6.51	12.47	3.63	.045	.035	.045	.000	2999.00	973.62
.009564	260.	240.	190.	4	20	0	.00	726.42	1700.04

FLOW DISTRIBUTION FOR SECNO= 20.00 CWSEL= 3005.10

STA	974.	1015.	1031.	1155.	1280.	1599.	1650.	1673.	1700.
P/Q=	.4	1.4	20.7	63.8	9.5	2.8	1.3	.2	
AREA=	22.8	33.7	384.8	654.9	352.0	81.8	36.9	14.9	
VEL=	2.2	5.3	6.9	12.5	3.4	4.4	4.4	1.6	

1490 NH CARD USED
 SECNO 19.000

347 ENCROACHMENT STATIONS= 770.0 2035.0 TYPE= 1 TARGET= -770.000

19.00	6.42	3003.42	3003.74	.00	3004.99	1.57	1.78	.04	3000.00
800.	4130.	6004.	2665.	751.	439.	616.	238.	145.	3000.00
.21	5.50	13.67	4.33	.045	.030	.047	.000	2997.00	1130.57
.007699	210.	200.	230.	4	8	0	.00	768.67	1899.24

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	LOSS	BANK ELEV
Q	QLO8	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
IE	VLO8	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLO8L	XLCH	XLO8R	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

LOI DISTRIBUTION FOR SECNO= 19.00 CWSEL= 3003.42

STA	1131.	1382.	1461.	1539.	1660.	1688.	1809.	1831.	1870.	1899.
PI Q=	18.4	13.9	46.9	5.5	3.5	4.9	3.1	3.5		.3
AREA=	480.7	270.0	439.1	182.5	77.7	171.5	69.2	94.3		20.7
VEL=	4.9	6.6	13.7	3.9	5.8	3.7	5.7	4.7		2.1

49 NH CARD USED

SECNO 18.000

30 HV CHANGED MORE THAN HVINS

147 ENCROACHMENT STATIONS= 800.0 1800.0 TYPE= 1 TARGET= -800.000

18.00	6.25	2998.25	2999.69	.00	3002.59	4.34	2.12	.28	2994.00
12800.	859.	1522.	10419.	159.	98.	596.	243.	147.	2994.00
.21	5.39	15.57	17.49	.045	.035	.035	.000	2992.00	1306.25
.9545	170.	180.	170.	6	11	0	.00	332.99	1639.24

16 DISTRIBUTION FOR SECNO= 18.00 CWSEL= 2998.25

STA	1306.	1380.	1480.	1485.	1508.	1514.	1518.	1570.	1618.	1632.	1639.
PI Q=	.3	5.2	1.2	11.9	1.5	.6	20.9	55.1	3.4		.0
AREA=	18.0	125.0	16.2	97.7	19.5	9.0	221.0	300.0	45.5		.9
VEL=	1.8	5.4	9.6	15.6	9.8	7.9	12.1	23.5	9.6		1.2

14 NH CARD USED

SECNO 17.000

33 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 368 PROBABLE MINIMUM SPECIFIC ENERGY
 372 CRITICAL DEPTH ASSUMED

34 ENCROACHMENT STATIONS= 825.0 1748.0 TYPE= 1 TARGET= -825.000

17.00	6.58	2998.58	2998.58	.00	3000.01	1.43	2.19	4.52	2992.00
13146.	5455.	7037.	653.	958.	585.	148.	252.	149.	2992.00
.22	5.69	12.03	4.41	.045	.035	.050	.000	2992.00	1088.46
17225	230.	320.	330.	20	8	0	.00	594.47	1682.92

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	GCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

FLOW DISTRIBUTION FOR SECNO= 17.00 CWSEL= 2998.58

STA	1088.	1350.	1500.	1510.	1606.	1680.	1623.
PE Q=	10.9	26.9	3.7	53.5	5.0	.0	
AREA=	364.7	537.7	55.8	585.1	147.3	.9	
VEL=	3.9	6.6	8.7	12.0	4.4	1.1	

490 WH CARD USED

SECNO 16.000

301 V CHANGED MORE THAN HVINS

470	ENCROACHMENT STATIONS=	760.0	1490.0	TYPE=	1	TARGET=	-760.000		
16.00	5.53	2993.53	2994.82	.00	2997.64	4.11	2.10	.27	2990.00
13146.	2815.	10301.	30.	443.	570.	7.	257.	152.	2990.00
.23	6.36	18.07	4.31	.045	.035	.060	.000	2988.00	999.30
.151	170.	170.	170.	5	8	0	.00	468.59	1467.89

FLOW DISTRIBUTION FOR SECNO= 16.00 CWSEL= 2993.53

STA	999.	1198.	1240.	1339.	1351.	1464.	1468.
PE Q=	4.7	7.2	7.4	2.1	78.4	.2	
AREA=	153.0	106.7	152.5	30.5	570.1	6.9	
VEL=	4.0	8.9	6.4	8.9	18.1	4.3	

491 WH CARD USED

SECNO 15.000

326 DIVIDED FLOW

330 HV CHANGED MORE THAN HVINS

15.00	7.66	2991.66	2992.08	.00	2993.31	1.65	3.60	.74	2986.00
700.	8206.	4415.	1080.	1420.	277.	145.	265.	156.	2986.00
.23	5.78	15.93	7.47	.046	.030	.047	.000	2984.00	8.34
.009173	260.	250.	350.	4	14	0	.00	1028.21	1281.80

FLOW DISTRIBUTION FOR SECNO= 15.00 CWSEL= 2991.66

STA	8.	359.	370.	387.	420.	950.	1075.	1178.	1195.	1240.	1262.	1282.
P Q=	6.1	3.3	11.0	11.8	6.3	6.0	10.9	4.6	32.2	6.6	1.3	
AREA=	223.7	51.2	126.2	161.7	296.5	207.3	273.8	79.2	277.1	102.5	42.0	
VEL=	3.7	8.7	11.9	10.0	2.9	4.0	5.5	7.9	15.9	8.8	4.2	

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

190 H CARD USED

SECNO 14.000

265 DIVIDED FLOW

301 V CHANGED MORE THAN HVINS

14.00	5.63	2985.63	2987.01	.00	2989.34	3.71	3.77	.21	2982.00
100.	5534.	7049.	1117.	674.	352.	138.	275.	161.	2982.00
.24	8.21	20.02	8.08	.043	.030	.045	.000	2980.00	410.92
.017379	270.	330.	310.	7	10	0	.00	496.12	988.16

LOW DISTRIBUTION FOR SECNO= 14.00 CWSEL= 2985.63

TA:	411.	433.	445.	470.	730.	810.	865.	930.	980.	988.
PER Q=	8.8	5.5	4.4	7.1	5.8	8.8	51.5	8.0	.2	
AREA=	89.7	55.6	65.8	187.9	130.6	144.8	352.1	131.6	6.7	
EL=	13.5	13.5	9.2	5.2	6.0	8.3	20.0	8.3	3.8	

490 NH CARD USED

SECNO 13.000

301 HV CHANGED MORE THAN HVINS

368 20 TRIALS ATTEMPTED WSEL,CWSEL

369 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.00	7.28	2983.28	2983.28	.00	2984.61	1.33	2.65	4.44	2978.00
700.	8179.	5120.	401.	1350.	394.	114.	288.	166.	2980.00
.25	6.06	13.01	3.51	.044	.030	.045	.000	2976.00	141.88
.007178	360.	380.	370.	20	11	0	.00	769.91	911.79

FLOW DISTRIBUTION FOR SECNO= 13.00 CWSEL= 2983.28

STA	142.	462.	502.	535.	575.	650.	721.	728.	800.	912.
PER Q=	8.8	4.4	16.1	10.4	9.5	8.9	1.6	37.4	2.9	
AREA=	395.2	111.7	207.3	171.2	223.5	211.6	30.0	393.7	114.2	
EL=	3.1	5.4	10.6	8.3	5.8	5.8	7.2	13.0	3.5	

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENOST	

490 H CARD USED
SECNO 12.500

301 HV CHANGED MORE THAN HVINS

685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

670 ENCROACHMENT STATIONS=	586.0	980.0	TYPE=	1	TARGET=	-586.000					
1.50	6.91	2982.91	2982.91	.00	2985.10	2.19	2.56	1.37	2978.00		
13700.	3443.	7667.	2591.	392.	544.	347.	297.	169.	2978.00		
.26	8.77	14.10	7.48	.045	.035	.050	.000	2976.00	586.00		
1341	280.	230.	200.	20	11	0	.00	302.44	888.44		

LOI DISTRIBUTION FOR SECNO= 12.50 CWSEL= 2982.91

STA=	586.	675.	767.	808.	826.	858.	888.				
PF Q=	25.1	56.0	12.8	3.8	2.1	.2					
EA=	392.4	543.6	201.3	70.4	61.1	13.8					
VEL=	8.8	14.1	8.7	7.5	4.6	1.8					

491 VH CARD USED
SECNO 12.000

326 DIVIDED FLOW

330 HV CHANGED MORE THAN HVINS

12.00	2.61	2976.61	2977.72	.00	2981.00	4.39	3.88	.22	2976.00		
13700.	11276.	2420.	4.	704.	120.	1.	301.	171.	2976.00		
.26	16.01	20.11	3.02	.044	.035	.060	.000	2974.00	64.62		
2674	150.	130.	140.	6	11	0	.00	592.13	766.00		

FLO DISTRIBUTION FOR SECNO= 12.00 CWSEL= 2976.61

STA=	65.	215.	255.	375.	398.	401.	408.	412.	422.	435.	460.	711.	762.
P Q=	18.7	5.2	3.1	5.8	3.4	12.7	7.2	12.8	8.0	4.1	1.3	17.7	
EA=	233.2	64.6	73.8	53.1	16.8	48.1	27.5	56.1	47.0	40.4	43.6	120.4	
VEL=	11.0	11.0	5.8	15.1	28.0	36.1	36.0	31.2	23.4	13.8	4.1	20.1	
STA	762.	766.											
P Q=	.0												
AREA=	1.2												
VEL=	3.0												

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
UOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

49 NH CARD USED

SECNO 11.000

126 DIVIDED FLOW

130 HV CHANGED MORE THAN HVINS

11.00	2.27	2974.27	2974.60	.00	2975.80	1.53	4.35	.86	2974.00
700.	13372.	328.	0.	1336.	59.	0.	303.	173.	2974.00
.26	10.01	5.60	.92	.042	.033	.060	.000	2972.00	19.08
.021080	110.	120.	180.	4	14	0	.00	735.05	807.45

FLOW DISTRIBUTION FOR SECNO= 11.00 CWSEL= 2974.27

ST/	19.	200.	285.	296.	302.	323.	331.	360.	378.	581.	705.	806.	807.
F I Q=	8.4	10.4	3.1	3.6	17.6	5.6	14.6	5.8	27.7	.7	2.4	.0	
AREA=	227.5	192.4	35.9	31.6	131.5	42.1	123.6	58.7	459.4	33.3	58.6	.2	
VEL=	5.0	7.4	11.7	15.8	18.3	18.3	16.2	13.5	8.3	3.0	5.6	.9	

1490 NH CARD USED

*SECNO 10.500

364 20 TRIALS ATTEMPTED WSEL,CWSEL

366 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

34 ENCROACHMENT STATIONS=	290.0	803.0	TYPE=	1	TARGET=	-290.000			
10.50	5.41	2973.41	2973.41	.00	2974.95	1.54	2.54	3.62	2972.00
3700.	11340.	2320.	40.	1219.	181.	15.	310.	175.	2972.00
.27	9.30	12.78	2.68	.039	.035	.050	.000	2968.00	290.00
.U12991	200.	152.	135.	20	17	0	.00	460.17	750.17

FLOW DISTRIBUTION FOR SECNO= 10.50 CWSEL= 2973.41

ST/	290.	380.	450.	565.	671.	689.	729.	750.
F I Q=	21.0	19.1	27.5	14.2	1.0	16.9	.3	
AREA=	307.0	238.8	392.3	255.6	25.4	181.5	14.9	
VEL=	9.4	11.0	9.6	7.6	5.3	12.8	2.7	

1490 NH CARD USED

SECNO	DEPTH	CWSEL	CRIVS	WSELX	EG	HV	HL	OLOSS	BANK ELEV
D	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SE 0 10.000

326 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

.0.00	5.93	2967.93	2968.82	.00	2971.03	3.10	3.77	.16	2965.00
13700.	9633.	3842.	225.	685.	263.	30.	316.	177.	2965.00
.27	14.06	14.59	7.44	.036	.030	.045	.000	2962.00	110.29
.0708	230.	230.	230.	6	11	0	.00	318.49	647.67

PLC DISTRIBUTION FOR SECNO= 10.00 CWSEL= 2967.93

STA=	110.	118.	130.	153.	169.	245.	252.	491.	540.	630.	639.	648.
FLOW=	.3	3.2	14.6	10.1	33.1	.9	.7	7.4	28.0	1.4	.3	
AREA=	7.4	35.1	113.3	78.8	298.5	13.5	19.5	118.9	263.4	21.8	8.4	
VEL=	5.8	12.4	17.6	17.6	15.2	8.7	4.6	8.6	14.6	8.5	4.6	

149 NH CARD USED
*SECNO 9.000

328 DIVIDED FLOW

330 HV CHANGED MORE THAN HVINS

9.00	4.49	2964.49	2965.00	.00	2967.00	2.52	3.85	.17	2960.00
3700.	6132.	6960.	608.	555.	484.	81.	321.	179.	2960.00
.28	11.05	14.38	7.53	.039	.035	.045	.000	2960.00	33.11
.015521	190.	250.	220.	4	11	0	.00	332.81	682.17

FLC DISTRIBUTION FOR SECNO= 9.00 CWSEL= 2964.49

STA=	33.	60.	120.	131.	453.	470.	520.	628.	642.	660.	682.
FLOW=	2.3	28.2	1.2	.0	1.0	12.0	50.8	3.3	1.0	.1	
AREA=	60.3	268.9	25.1	1.3	25.2	174.1	484.0	48.7	26.7	5.3	
VEL=	5.2	14.4	6.7	1.6	5.3	9.4	14.4	9.4	5.3	1.6	

THIS RUN EXECUTED 08-04-88

HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
E FOR CORR - 01,02,03,04,05,06
M I FICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985

 WATER SURFACE PROFILES *
 VELOCITY OF NOVEMBER 1976 *
 UPDATED MAY 1984 *
 IBM-PC-XT VERSION AUGUST 1985 *
 RUN DATE 08-04-88 TIME 09:45:40 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * THE HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET, SUITE D *
 * DAVIS, CALIFORNIA 95616 *
 * (916) 440-2105 (FTS) 448-2105 *

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X   X  XXXXXXXX  XXXXX          XXXXX
X   X  X          X   X          X   X
X   X  X          X              X
XXXXXXXX XXXX   X          XXXXX  XXXXX
X   X  X          X              X
X   X  X          X   X          X
X   X  XXXXXXXX  XXXXX          XXXXXXXX
  
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SUTH100. HEC
 Subcritical Profile - 100 year event

THIS RUN EXECUTED 08-04-88

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 CORR - 01,02,03,04,05,06
 LOCATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985

SUTHERLAND WASH - 100 YEAR
 FLOOD WATER SURFACE PROFILES - JON FULLER
 SUTHERLAND WASH

STATION	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
0.	2.	0.	0.	.006000	.00	.0	0.	2962.000	.000
STATION	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
-1.000	.000	-1.000	.000	.000	.000	.000	.000	.000	15.000
VARIABLE CODES FOR SUMMARY PRINTOUT									
3.000	43.000	5.000	8.000	55.000	56.000	26.000	4.000	.000	.000
STATION	ICOPY								
1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
0.045	.045	.035	.100	.030	.000	.000	.000	.000	.000
5.000	.060	60.000	.035	120.000	.045	520.000	.035	628.000	.045
960.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1.000	13700.000	.000	.000	.000	.000	.000	.000	.000	.000
9.000	14.000	520.000	628.000	.000	.000	.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2970.000	.000	2960.000	60.000	2960.000	120.000	2966.000	135.000	2966.000	430.000
964.000	453.000	2962.000	470.000	2960.000	520.000	2960.000	628.000	2962.000	642.000
964.000	660.000	2966.000	752.000	2968.000	819.000	2970.000	960.000	.000	.000
6.000	.060	110.000	.035	261.000	.045	540.000	.030	630.000	.045
994.000	.060	955.000	.000	.000	.000	.000	.000	.000	.000
10.000	21.000	540.000	630.000	300.000	530.000	400.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
974.000	.000	2972.000	82.000	2970.000	100.000	2968.000	110.000	2966.000	118.000
2964.000	130.000	2962.000	153.000	2964.000	169.000	2964.000	245.000	2968.000	252.000
2968.000	261.000	2968.000	470.000	2966.000	491.000	2965.000	540.000	2965.000	630.000
966.000	639.000	2968.000	648.000	2970.000	667.000	2970.000	830.000	2972.000	894.000
974.000	955.000	.000	.000	.000	.000	.000	.000	.000	.000

8.000	.055	81.000	.045	139.000	.035	195.000	.040	380.000	.035
50.000	.040	689.000	.035	729.000	.050	803.000	.000	.000	.000
10.500	28.000	689.000	729.000	190.000	220.000	250.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
76.000	.000	2974.000	29.000	2972.000	72.000	2970.000	81.000	2968.000	88.000
66.000	92.000	2966.000	103.000	2968.000	117.000	2970.000	129.000	2970.000	139.000
2968.000	146.000	2966.000	151.000	2966.000	169.000	2968.000	195.000	2970.000	261.000
2970.000	380.000	2970.000	450.000	2970.000	565.000	2972.000	671.000	2972.000	689.000
70.000	690.000	2968.000	694.000	2968.000	715.000	2970.000	722.000	2972.000	729.000
2974.000	759.000	2976.000	770.000	2978.000	803.000	.000	.000	.000	.000
7.000	.050	285.000	.040	323.000	.035	378.000	.045	705.000	.040
57.000	.030	806.000	.060	952.000	.000	.000	.000	.000	.000
11.000	27.000	705.000	806.000	230.000	230.000	230.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
180.000	.000	2978.000	2.000	2976.000	13.000	2974.000	20.000	2972.000	200.000
2972.000	285.000	2970.000	296.000	2968.000	302.000	2968.000	323.000	2970.000	331.000
2970.000	360.000	2972.000	378.000	2972.000	581.000	2974.000	589.000	2974.000	675.000
176.000	694.000	2974.000	705.000	2972.000	712.000	2974.000	720.000	2975.000	740.000
2974.000	757.000	2972.300	770.000	2974.000	787.000	2974.000	806.000	2976.000	817.000
2978.000	891.000	2980.000	952.000	.000	.000	.000	.000	.000	.000
6.000	.060	26.000	.050	398.000	.040	460.000	.045	711.000	.035
762.000	.060	925.000	.000	.000	.000	.000	.000	.000	.000
12.000	27.000	711.000	762.000	200.000	135.000	152.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2990.000	.000	2980.000	26.000	2978.000	48.000	2976.000	72.000	2974.000	215.000
2976.000	255.000	2976.000	314.000	2976.000	375.000	2974.000	390.000	2972.000	398.000
370.000	401.000	2969.500	408.000	2970.000	412.000	2972.000	422.000	2974.000	435.000
376.000	460.000	2977.000	560.000	2976.000	670.000	2978.000	705.000	2976.000	711.000
2974.000	720.000	2974.000	758.000	2976.000	762.000	2978.000	775.000	2980.000	795.000
382.000	900.000	2984.000	925.000	.000	.000	.000	.000	.000	.000
5.000	.050	420.000	.035	506.000	.045	675.000	.035	767.000	.050
980.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
12.500	23.000	675.000	767.000	110.000	180.000	120.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2990.000	.000	2984.000	19.000	2982.000	40.000	2980.000	210.000	2978.000	228.000
978.000	248.000	2980.000	397.000	2980.000	415.000	2978.000	420.000	2972.000	430.000
972.000	441.000	2974.000	450.000	2976.000	491.000	2978.000	506.000	2979.000	586.000
2978.000	675.000	2976.000	720.000	2978.000	767.000	2978.000	808.000	2980.000	826.000
382.000	858.000	2984.000	925.000	2986.000	980.000	.000	.000	.000	.000
7.000	.060	31.000	.050	496.000	.040	575.000	.045	728.000	.030
800.000	.045	960.000	.060	1122.000	.000	.000	.000	.000	.000
13.000	24.000	728.000	800.000	150.000	140.000	130.000	.000	.000	.000
10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
3000.000	.000	2990.000	31.000	2988.000	38.000	2986.000	52.000	2984.000	89.000
982.000	236.000	2982.000	280.000	2981.500	462.000	2980.000	496.000	2978.000	502.000
976.000	508.000	2978.000	535.000	2980.000	575.000	2980.600	650.000	2980.000	721.000
2978.000	728.000	2977.000	750.000	2978.000	785.000	2980.000	800.000	2982.000	826.000
984.000	960.000	2986.000	1020.000	2988.000	1082.000	2990.000	1122.000	.000	.000

NH	7.000	.060	39.000	.050	419.000	.040	485.000	.045	865.000	.030
NH	930.000	.045	990.000	.060	1200.000	.000	.000	.000	.000	.000
X1	14.000	30.000	865.000	930.000	280.000	200.000	230.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	3000.000	.000	2992.000	23.000	2990.000	39.000	2988.000	76.000	2986.500	120.000
GR	2986.000	204.000	2986.000	410.000	2984.000	415.000	2982.000	419.000	2980.000	422.000
GR	2980.000	433.000	2982.000	445.000	2984.000	452.000	2982.000	470.000	2984.000	480.000
GR	2986.000	485.000	2986.000	545.000	2985.000	600.000	2984.000	730.000	2984.000	810.000
GR	2982.000	865.000	2980.000	870.000	2980.000	921.000	2982.000	930.000	2984.000	980.000
GR	2986.000	990.000	2988.000	1020.000	2990.000	1100.000	2992.000	1160.000	2994.000	1200.000

NH	7.000	.060	70.000	.045	391.000	.040	440.000	.050	1195.000	.030
NH	1240.000	.045	1262.000	.060	1311.000	.000	.000	.000	.000	.000
X1	15.000	29.000	1195.000	1240.000	360.000	370.000	380.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	3000.000	.000	2990.000	10.000	2996.000	30.000	2994.000	42.000	2992.000	70.000
GR	2990.800	150.000	2990.800	250.000	2992.000	315.000	2990.000	330.000	2988.000	359.000
GR	2986.000	370.000	2984.000	374.000	2984.000	387.000	2986.000	391.000	2988.000	420.000
GR	2990.000	423.000	2991.000	440.000	2992.000	638.000	2992.000	690.000	2991.000	770.000
GR	2990.000	950.000	2990.000	1075.000	2988.000	1178.000	2986.000	1195.000	2985.000	1220.000
GR	2986.000	1240.000	2988.000	1262.000	2990.000	1276.000	3000.000	1311.000	.000	.000

NH	6.000	.060	80.000	.050	312.000	.040	369.000	.045	1351.000	.035
NH	1464.000	.060	1490.000	.000	.000	.000	.000	.000	.000	.000
X1	16.000	37.000	1351.000	1464.000	270.000	310.000	330.000	.000	.000	.000
X3	10.000	.000	.000	760.000	.000	.000	.000	.000	.000	.000
GR	3010.000	.000	3000.000	54.000	2998.000	80.000	2996.000	125.000	2996.000	241.000
GR	2998.000	280.000	2998.000	312.000	2992.000	325.000	2990.000	336.000	2988.000	340.000
GR	2988.000	349.000	2990.000	351.000	2992.000	362.000	2996.000	369.000	2997.000	382.000
GR	2997.000	480.000	2996.000	500.000	2996.000	681.000	2994.000	690.000	2994.000	708.000
GR	2996.000	720.000	2996.800	845.000	2996.000	908.000	2994.000	940.000	2992.000	1198.000
GR	2990.000	1210.000	2992.000	1240.000	2992.000	1339.000	2990.000	1351.000	2988.000	1368.000
GR	2988.000	1405.000	2990.000	1430.000	2988.000	1440.000	2988.000	1460.000	2990.000	1464.000
GR	3000.000	1475.000	3010.000	1490.000	.000	.000	.000	.000	.000	.000

NH	8.000	.060	68.000	.055	315.000	.045	470.000	.040	540.000	.045
NH	1510.000	.035	1606.000	.050	1690.000	.060	1748.000	.000	.000	.000
X1	17.000	41.000	1510.000	1606.000	260.000	350.000	250.000	.000	.000	.000
X3	10.000	.000	.000	825.000	.000	.000	.000	.000	.000	.000
GR	3020.000	.000	3010.000	68.000	3008.000	95.000	3006.000	105.000	3006.000	150.000
GR	3008.000	168.000	3010.000	180.000	3008.000	200.000	3010.000	212.000	3010.000	255.000
GR	3008.000	304.000	3006.000	315.000	3004.000	350.000	3002.000	380.000	3004.000	428.000
GR	3002.000	450.000	3004.000	454.000	3000.000	470.000	2992.000	489.000	2996.000	496.000
GR	2996.000	508.000	2992.000	520.000	3000.000	540.000	3004.000	548.000	3004.000	565.000
GR	3002.000	700.000	3002.000	830.000	3000.000	1000.000	2998.000	1125.000	2997.000	1240.000
GR	2996.000	1350.000	2994.000	1500.000	2992.000	1510.000	2992.000	1523.000	2994.000	1540.000
GR	2992.000	1570.000	2992.000	1606.000	2996.000	1616.000	2998.000	1680.000	3000.000	1690.000
GR	3010.000	1748.000	.000	.000	.000	.000	.000	.000	.000	.000

NH	9.000	.060	81.000	.050	456.000	.040	525.000	.045	1485.000	.035
NH	1508.000	.045	1570.000	.030	1618.000	.045	1690.000	.060	1800.000	.000
X1	18.000	33.000	1485.000	1508.000	170.000	170.000	170.000	.000	.000	.000
X3	10.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
GR	3030.000	.000	3020.000	81.000	3012.000	235.000	3010.000	320.000	3008.000	435.000
GR	3006.000	456.000	3004.000	462.000	3002.000	470.000	3001.000	483.000	3002.000	492.000
GR	3004.000	501.000	3006.000	525.000	3008.000	531.000	3008.000	610.000	3008.000	658.000
GR	3006.000	725.000	3006.000	820.000	3004.000	926.000	3002.000	1070.000	3000.000	1195.000
GR	3000.000	1280.000	2998.000	1310.000	2998.000	1380.000	2996.000	1480.000	2994.000	1485.000
GR	2994.000	1508.000	2996.000	1514.000	2996.000	1518.000	2992.000	1570.000	2992.000	1618.000
GR	2998.000	1632.000	3000.000	1690.000	3010.000	1800.000	.000	.000	.000	.000
NH	8.000	.060	484.000	.040	571.000	.050	622.000	.030	685.000	.045
NH	1461.000	.030	1539.000	.045	1815.000	.050	2035.000	.000	.000	.000
X1	19.000	38.000	1461.000	1539.000	230.000	330.000	320.000	.000	.000	.000
X3	10.000	.000	.000	770.000	.000	.000	.000	.000	.000	.000
GR	3030.000	.000	3020.000	155.000	3014.000	290.000	3012.000	440.000	3012.000	484.000
GR	3006.000	495.000	3006.000	509.000	3008.000	519.000	3010.000	522.000	3012.000	530.000
GR	3010.000	535.000	3008.000	540.000	3008.000	571.000	3010.000	574.000	3012.000	581.000
GR	3012.000	622.000	3010.000	655.000	3010.000	685.000	3008.000	765.000	3006.000	972.000
GR	3004.000	1100.000	3002.000	1205.000	3000.000	1382.000	3000.000	1461.000	2998.000	1472.000
GR	2997.000	1504.000	2998.000	1535.000	3000.000	1539.000	3002.000	1550.000	3002.000	1660.000
GR	3000.000	1670.000	3000.000	1680.000	3002.000	1688.000	3002.000	1809.000	3000.000	1815.000
GR	3000.000	1831.000	3002.000	1870.000	3010.000	2035.000	.000	.000	.000	.000
NH	6.000	.055	200.000	.040	293.000	.045	1155.000	.035	1280.000	.045
NH	1673.000	.060	1800.000	.000	.000	.000	.000	.000	.000	.000
X1	20.000	33.000	1155.000	1280.000	170.000	170.000	180.000	.000	.000	.000
GR	3020.000	.000	3018.000	79.000	3016.000	126.000	3018.000	135.000	3018.000	200.000
GR	3010.000	220.000	3010.000	262.000	3008.000	269.000	3006.000	278.000	3006.000	287.000
GR	3010.000	293.000	3012.000	300.000	3014.000	310.000	3014.000	340.000	3012.000	447.000
GR	3011.000	530.000	3010.000	705.000	3008.000	826.000	3006.000	865.000	3006.000	940.000
GR	3004.000	1015.000	3002.000	1031.000	3002.000	1155.000	3000.000	1167.000	2999.000	1220.000
GR	3000.000	1269.000	3004.000	1280.000	3004.000	1599.000	3003.000	1650.000	3004.000	1673.000
GR	3006.000	1722.000	3008.000	1752.000	3010.000	1800.000	.000	.000	.000	.000
NH	9.000	.060	140.000	.045	276.000	.035	324.000	.045	905.000	.030
NH	968.000	.045	1249.000	.030	1296.000	.045	1835.000	.060	1904.000	.000
X1	21.000	45.000	905.000	968.000	210.000	230.000	200.000	.000	.000	.000
X3	.000	.000	.000	480.000	.000	.000	.000	.000	.000	.000
X4	1.000	3006.000	905.000	.000	.000	.000	.000	.000	.000	.000
GR	3020.000	.000	3018.000	54.000	3016.000	89.000	3016.000	99.000	3018.000	103.000
GR	3018.000	128.000	3016.000	140.000	3014.000	144.000	3014.000	170.000	3012.000	198.000
GR	3012.000	254.000	3012.000	276.000	3010.000	291.000	3008.000	295.000	3008.000	311.000
GR	3014.000	324.000	3014.000	418.000	3012.000	534.000	3010.000	604.000	3008.000	755.000
GR	3006.000	790.000	3006.000	960.000	3008.000	968.000	3008.000	1028.000	3006.000	1031.000
GR	3006.000	1084.000	3008.000	1238.000	3008.000	1249.000	3004.000	1265.000	3004.000	1289.000
GR	3008.000	1296.000	3006.000	1306.000	3006.000	1330.000	3008.000	1336.000	3008.000	1421.000
GR	3007.000	1540.000	3006.000	1631.000	3004.000	1635.000	3006.000	1650.000	3004.000	1663.000
GR	3004.000	1689.000	3006.000	1694.000	3008.000	1809.000	3010.000	1835.000	3020.000	1904.000

NH	7.000	.060	235.000	.045	648.000	.030	732.000	.045	1152.000	.035
NH	1270.000	.045	1720.000	.050	1908.000	.000	.000	.000	.000	.000
QT	1.000	12800.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	22.000	31.000	648.000	732.000	260.000	190.000	240.000	.000	.000	.000
X3	.000	.000	.000	220.000	.000	.000	.000	.000	.000	.000
GR	3020.000	.000	3018.000	76.000	3016.000	121.000	3014.000	209.000	3014.000	235.000
GR	3012.000	364.000	3010.000	570.000	3010.000	648.000	3008.000	668.000	3007.000	698.000
GR	3008.000	732.000	3010.000	890.000	3008.000	907.000	3010.000	918.000	3010.000	963.000
GR	3008.000	972.000	3008.000	998.000	3010.000	1058.000	3010.000	1152.000	3006.000	1163.000
GR	3006.000	1195.000	3008.000	1211.000	3010.000	1270.000	3012.000	1330.000	3010.000	1458.000
GR	3008.000	1462.000	3009.000	1543.000	3008.000	1608.000	3010.000	1720.000	3012.000	1802.000
GR	3020.000	1908.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	8.000	.060	52.000	.045	410.000	.035	500.000	.045	520.000	.030
NH	611.000	.045	1305.000	.030	1370.000	.045	1850.000	.000	.000	.000
X1	23.000	36.000	545.000	611.000	255.000	330.000	300.000	.000	.000	.000
X3	.000	.000	.000	150.000	.000	.000	.000	.000	.000	.000
GR	3024.000	.000	3020.000	52.000	3018.000	100.000	3016.000	152.000	3016.000	320.000
GR	3018.000	383.000	3016.000	410.000	3014.000	438.000	3012.000	445.000	3012.000	478.000
GR	3014.000	500.000	3012.000	520.000	3012.000	545.000	3011.000	584.000	3012.000	611.000
GR	3014.000	618.000	3014.000	765.000	3014.000	800.000	3014.000	843.000	3014.000	889.000
GR	3012.000	1000.000	3014.000	1100.000	3014.000	1153.000	3010.000	1161.000	3010.000	1180.000
GR	3012.000	1198.000	3014.000	1210.000	3014.000	1305.000	3012.000	1314.000	3012.000	1325.000
GR	3014.000	1370.000	3014.500	1430.000	3016.000	1450.000	3016.000	1655.000	3018.000	1770.000
GR	3020.000	1850.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	6.000	.060	204.000	.045	546.000	.030	629.000	.045	1551.000	.035
NH	1600.000	.045	2291.000	.000	.000	.000	.000	.000	.000	.000
X1	24.000	31.000	546.000	629.000	320.000	335.000	300.000	.000	.000	.000
X3	.000	.000	.000	210.000	.000	2010.000	.000	.000	.000	.000
GR	3030.000	.000	3026.000	100.000	3024.000	139.000	3022.000	200.000	3020.000	204.000
GR	3020.000	264.000	3018.000	340.000	3018.000	435.000	3018.000	501.000	3018.000	546.000
GR	3016.000	551.000	3016.000	629.000	3018.000	711.000	3018.000	898.000	3018.000	1055.000
GR	3019.300	1280.000	3020.000	1380.000	3018.000	1422.000	3016.000	1435.000	3016.000	1445.000
GR	3018.000	1450.000	3020.000	1485.000	3018.000	1551.000	3018.000	1575.000	3020.000	1600.000
GR	3018.000	1740.000	3018.000	1758.000	3020.000	1790.000	3022.000	1810.000	3022.000	2050.000
GR	3030.000	2291.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	7.000	.050	240.000	.040	371.000	.030	587.000	.045	1300.000	.050
NH	1875.000	.030	1894.000	.050	2110.000	.000	.000	.000	.000	.000
X1	25.000	30.000	371.000	587.000	300.000	380.000	310.000	.000	.000	.000
X3	.000	.000	.000	90.000	.000	2100.000	.000	.000	.000	.000
GR	3030.000	.000	3028.000	60.000	3026.000	190.000	3024.000	240.000	3022.000	261.000
GR	3021.000	290.000	3022.000	318.000	3022.000	371.000	3020.000	450.000	3020.000	517.000
GR	3022.000	535.000	3020.000	556.000	3020.000	587.000	3022.000	710.000	3022.000	797.000
GR	3020.000	807.000	3022.000	814.000	3024.000	874.000	3024.000	1070.000	3024.000	1170.000
GR	3026.000	1300.000	3026.000	1510.000	3024.000	1700.000	3026.000	1808.000	3024.000	1875.000
GR	3024.000	1891.000	3026.000	1894.000	3028.000	2000.000	3030.000	2034.000	3032.000	2110.000

H	6.000	.055	169.000	.045	270.000	.035	770.000	.045	2068.000	.030
H	392.000	.045	2450.000	.000	.000	.000	.000	.000	.000	.000
1	26.000	26.000	400.000	770.000	300.000	300.000	310.000	.000	.000	.000
4	1.000	3026.000	400.000	.000	.000	.000	.000	.000	.000	.000
R	036.000	.000	3034.000	84.000	3032.000	110.000	3030.000	169.000	3028.000	222.000
R	026.000	270.000	3026.000	298.000	3026.000	725.000	3024.000	750.000	3024.000	761.000
R	3026.000	770.000	3026.000	940.000	3028.000	1130.000	3028.000	1170.000	3026.000	1200.000
R	3028.000	1212.000	3028.000	1460.000	3029.000	1630.000	3028.000	1908.000	3028.000	2068.000
R	027.000	2080.000	3028.000	2092.000	3030.000	2151.000	3032.000	2185.000	3034.000	2242.000
R	040.000	2450.000	.000	.000	.000	.000	.000	.000	.000	.000
H	5.000	.055	275.000	.035	700.000	.045	2230.000	.030	2245.000	.045
H	375.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1	27.000	30.000	275.000	700.000	430.000	300.000	390.000	.000	.000	.000
3	.000	.000	.000	140.000	.000	.000	.000	.000	.000	.000
R	036.000	.000	3034.000	90.000	3032.000	189.000	3031.000	275.000	3032.000	610.000
R	030.000	679.000	3030.000	700.000	3032.000	780.000	3030.000	835.000	3028.000	843.000
R	3028.000	855.000	3030.000	858.000	3032.000	960.000	3032.000	1150.000	3033.800	1280.000
R	032.000	1444.000	3032.000	1618.000	3034.000	1652.000	3034.000	1720.000	3032.000	1735.000
R	034.000	1748.000	3034.000	1872.000	3032.000	2030.000	3032.000	2213.000	3030.000	2230.000
R	3030.000	2245.000	3032.000	2252.000	3034.000	2262.000	3036.000	2330.000	3040.000	2375.000
H	5.000	.050	160.000	.035	850.000	.045	2238.000	.035	2305.000	.050
H	2500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1	28.000	17.000	290.000	850.000	390.000	290.000	350.000	.000	.000	.000
3	.000	.000	.000	230.000	.000	.000	.000	.000	.000	.000
4	1.000	3036.000	290.000	.000	.000	.000	.000	.000	.000	.000
GR	3040.000	.000	3038.000	70.000	3036.000	160.000	3036.000	850.000	3036.000	1185.000
GR	036.000	1372.000	3037.000	1622.000	3038.000	1745.000	3038.000	1842.000	3037.000	2000.000
GR	038.000	2180.000	3038.000	2238.000	3036.000	2254.000	3036.000	2284.000	3038.000	2305.000
GR	3040.000	2360.000	3050.000	2500.000	.000	.000	.000	.000	.000	.000
H	7.000	.060	49.000	.035	570.000	.045	1100.000	.040	1789.000	.045
H	2039.000	.035	2076.000	.055	2200.000	.000	.000	.000	.000	.000
X1	29.000	18.000	49.000	570.000	450.000	340.000	425.000	.000	.000	.000
GR	050.000	.000	3048.000	30.000	3044.000	49.000	3043.000	105.000	3044.000	342.000
GR	044.000	433.000	3042.000	440.000	3042.000	570.000	3042.000	1100.000	3042.000	1789.000
GR	3040.000	1919.000	3040.000	1951.000	3042.000	1970.000	3042.000	2039.000	3040.000	2051.000
GR	3040.000	2076.000	3042.000	2100.000	3050.000	2200.000	.000	.000	.000	.000
H	5.000	.060	33.000	.040	1520.000	.050	1900.000	.040	2031.000	.055
H	2220.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	30.000	17.000	33.000	647.000	380.000	240.000	340.000	.000	.000	.000
GR	3056.000	.000	3054.000	9.000	3052.000	20.000	3050.000	24.000	3048.000	33.000
GR	3048.000	400.000	3050.000	515.000	3048.000	647.000	3048.000	780.000	3050.000	1178.000
GR	3050.000	1520.000	3050.000	1900.000	3048.000	1910.000	3048.000	1965.000	3050.000	2031.000
GR	3052.000	2092.000	3060.000	2220.000	.000	.000	.000	.000	.000	.000

NH	4.000	.050	52.000	.040	1079.000	.045	1525.000	.050	2090.000	.000
X1	31.000	24.000	52.000	720.000	330.000	330.000	300.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1879.000	.000	.000	.000	.000
GR	3064.000	.000	3058.000	45.000	3056.000	52.000	3054.000	70.000	3052.000	102.000
GR	3052.000	115.000	3054.000	141.000	3054.000	480.000	3056.000	720.000	3056.000	880.000
GR	3054.000	980.000	3054.000	990.000	3056.000	1079.000	3056.000	1251.000	3055.000	1432.000
GR	3056.000	1525.000	3056.000	1640.000	3054.000	1660.000	3054.000	1669.000	3055.500	1730.000
GR	3054.000	1800.000	3056.000	1850.000	3058.000	1991.000	3060.000	2090.000	.000	.000
NH	3.000	.060	120.000	.040	1300.000	.055	1926.000	.000	.000	.000
X1	32.000	32.000	120.000	780.000	390.000	300.000	330.000	.000	.000	.000
X3	.000	.000	.000	140.000	.000	1800.000	.000	.000	.000	.000
GR	3070.000	.000	3062.000	32.000	3060.000	120.000	3060.000	407.000	3058.000	415.000
GR	3060.000	425.000	3060.000	449.000	3062.000	452.000	3062.000	478.000	3060.000	504.000
GR	3058.000	509.000	3058.000	515.000	3060.000	519.000	3060.000	680.000	3060.000	780.000
GR	3061.300	870.000	3060.000	1050.000	3060.000	1071.000	3062.000	1090.000	3060.000	1099.000
GR	3059.000	1115.000	3060.000	1122.000	3060.000	1300.000	3062.000	1440.000	3062.000	1460.000
GR	3060.000	1483.000	3060.000	1531.000	3060.000	1740.000	3062.000	1780.000	3064.000	1843.000
GR	3066.000	1880.000	3070.000	1926.000	.000	.000	.000	.000	.000	.000
NH	3.000	.060	85.000	.045	1000.000	.055	1520.000	.000	.000	.000
X1	33.000	37.000	85.000	540.000	290.000	310.000	310.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	1280.000	.000	.000	.000	.000
GR	3070.000	.000	3068.000	60.000	3066.000	85.000	3064.000	115.000	3064.000	140.000
GR	3064.000	215.000	3066.000	225.000	3064.000	230.000	3062.000	248.000	3062.000	259.000
GR	3064.000	263.000	3066.000	269.000	3066.000	300.000	3064.000	313.000	3064.000	320.000
GR	3066.000	325.000	3066.000	354.000	3064.000	365.000	3064.000	380.000	3066.000	388.000
GR	3066.000	433.000	3064.000	441.000	3062.000	445.000	3062.000	449.000	3064.000	460.000
GR	3066.000	500.000	3066.000	540.000	3064.000	670.000	3066.000	791.000	3066.000	820.000
GR	3064.500	850.000	3066.000	855.000	3067.500	865.000	3066.000	1000.000	3066.500	1280.000
GR	3068.000	1408.000	3070.000	1520.000	.000	.000	.000	.000	.000	.000
NH	4.000	.050	50.000	.045	580.000	.055	890.000	.060	921.000	.000
X1	34.000	31.000	99.000	500.000	230.000	375.000	210.000	.000	.000	.000
GR	3080.000	.000	3072.000	50.000	3070.000	99.000	3068.000	108.000	3070.000	150.000
GR	3070.000	198.000	3068.000	202.000	3066.000	207.000	3066.000	211.000	3068.000	230.000
GR	3070.000	234.000	3070.000	264.000	3068.000	268.000	3066.000	270.000	3064.000	280.000
GR	3064.000	289.000	3066.000	292.000	3068.000	297.000	3069.000	304.000	3068.000	312.000
GR	3070.000	385.000	3070.000	500.000	3066.000	507.000	3066.000	527.000	3070.000	535.000
GR	3068.000	542.000	3068.000	575.000	3070.000	580.000	3070.000	865.000	3072.000	890.000
GR	3080.000	921.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.045	.045	.030	.000	.000	.000	.000	.000	.000	.000
X1	35.000	10.000	82.000	170.000	220.000	300.000	280.000	.000	.000	.000
GR	3080.000	.000	3074.000	32.000	3072.000	76.000	3070.000	82.000	3068.000	88.000
GR	3068.000	144.000	3070.000	168.000	3072.000	170.000	3072.000	412.000	3080.000	430.000
NC	.055	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	36.000	11.000	47.000	113.000	170.000	190.000	180.000	.000	.000	.000
GR	3090.000	.000	3080.000	15.000	3070.000	47.000	3069.000	80.000	3070.000	105.000
GR	3072.000	110.000	3074.000	113.000	3074.000	290.000	3076.000	304.000	3080.000	310.000
GR	3090.000	354.000	.000	.000	.000	.000	.000	.000	.000	.000

GR	37.000	11.000	50.000	108.000	170.000	170.000	170.000	.000	.000	.000
GR	100.000	.000	3090.000	17.000	3080.000	35.000	3072.000	50.000	3071.000	55.000
GR	071.000	100.000	3072.000	108.000	3076.000	112.000	3078.000	279.000	3080.000	282.000
GR	3090.000	312.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	38.000	9.000	48.000	105.000	220.000	140.000	210.000	.000	.000	.000
GR	3090.000	.000	3080.000	31.000	3074.000	48.000	3072.000	58.000	3071.000	80.000
GR	3072.000	105.000	3078.000	118.000	3080.000	275.000	3090.000	321.000	.000	.000
NC	.050	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	39.000	12.000	30.000	140.000	310.000	220.000	280.000	.000	.000	.000
GR	090.000	.000	3080.000	20.000	3076.000	30.000	3075.000	34.000	3075.000	135.000
GR	076.000	140.000	3078.000	149.000	3080.000	152.000	3082.000	155.000	3082.000	225.000
GR	3084.000	240.000	3090.000	270.000	.000	.000	.000	.000	.000	.000
NC	.045	.055	.035	.000	.000	.000	.000	.000	.000	.000
GR	40.000	10.000	172.000	240.000	210.000	200.000	210.000	.000	.000	.000
GR	3100.000	.000	3090.000	24.000	3088.000	30.000	3086.000	41.000	3084.000	172.000
GR	076.000	175.000	3076.000	231.000	3080.000	240.000	3090.000	250.000	3100.000	280.000
NC	.000	.050	.038	.000	.000	.000	.000	.000	.000	.000
GR	41.000	11.000	170.000	264.000	190.000	260.000	220.000	.000	.000	.000
GR	1100.000	.000	3092.000	58.000	3090.000	103.000	3088.000	110.000	3084.000	123.000
GR	3084.000	170.000	3078.000	185.000	3078.000	230.000	3088.000	264.000	3090.000	282.000
GR	3096.000	300.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.040	.000	.000	.000	.000	.000	.000	.000
GR	42.000	11.000	50.000	160.000	210.000	320.000	260.000	.000	.000	.000
GR	3100.000	.000	3090.000	28.000	3088.000	30.000	3086.000	50.000	3084.000	59.000
GR	3082.000	75.000	3081.000	95.000	3082.000	115.000	3084.000	132.000	3090.000	160.000
GR	3100.000	225.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
GR	43.000	13.000	29.000	118.000	150.000	280.000	190.000	.000	.000	.000
GR	3100.000	.000	3090.000	29.000	3088.000	36.000	3086.000	45.000	3086.000	85.000
GR	3088.000	110.000	3090.000	118.000	3092.000	125.000	3094.000	129.000	3094.000	150.000
GR	3096.000	170.000	3098.000	208.000	3100.000	220.000	.000	.000	.000	.000
NH	4.000	.060	80.000	.050	312.000	.040	369.000	.045	760.000	.000
OT	1.000	3663.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	-16.000	22.000	312.000	369.000	330.000	290.000	310.000	.000	.000	.000
GR	3010.000	.000	3000.000	54.000	2998.000	80.000	2996.000	125.000	2996.000	241.000
GR	2998.000	280.000	2998.000	312.000	2992.000	325.000	2990.000	336.000	2988.000	340.000
GR	2988.000	349.000	2990.000	351.000	2992.000	362.000	2996.000	369.000	2997.000	382.000
GR	2997.000	480.000	2996.000	500.000	2996.000	681.000	2994.000	690.000	2994.000	708.000
GR	2996.000	720.000	2997.000	760.000	.000	.000	.000	.000	.000	.000
NH	5.000	.060	68.000	.055	315.000	.045	470.000	.040	540.000	.045
NH	825.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	170.000	27.000	470.000	540.000	390.000	310.000	380.000	.000	.000	.000
GR	3020.000	.000	3010.000	68.000	3008.000	95.000	3006.000	105.000	3006.000	150.000
GR	3008.000	168.000	3010.000	180.000	3008.000	200.000	3010.000	212.000	3010.000	255.000
GR	3008.000	304.000	3006.000	315.000	3004.000	350.000	3002.000	380.000	3004.000	428.000
GR	3002.000	450.000	3004.000	454.000	3000.000	470.000	2992.000	489.000	2996.000	496.000
GR	2996.000	508.000	2992.000	520.000	3000.000	540.000	3004.000	548.000	3004.000	565.000
GR	3002.000	700.000	3003.000	825.000	.000	.000	.000	.000	.000	.000
NH	4.000	.060	81.000	.050	456.000	.040	525.000	.045	658.000	.000
QT	1.000	3680.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	180.000	15.000	456.000	525.000	310.000	240.000	280.000	.000	.000	.000
GR	3030.000	.000	3020.000	81.000	3012.000	235.000	3010.000	320.000	3008.000	435.000
GR	3006.000	456.000	3004.000	462.000	3002.000	470.000	3001.000	483.000	3002.000	492.000
GR	3004.000	501.000	3006.000	525.000	3008.000	531.000	3008.000	610.000	3008.000	658.000
NH	3.000	.060	484.000	.040	519.000	.050	622.000	.000	.000	.000
QT	1.000	4045.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	190.000	16.000	484.000	519.000	200.000	220.000	210.000	.000	.000	.000
GR	3030.000	.000	3020.000	155.000	3014.000	290.000	3012.000	440.000	3012.000	484.000
GR	3006.000	495.000	3006.000	509.000	3008.000	519.000	3010.000	522.000	3012.000	530.000
GR	3010.000	535.000	3008.000	540.000	3008.000	571.000	3010.000	574.000	3012.000	581.000
GR	3012.000	622.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.055	.045	.040	.000	.000	.000	.000	.000	.000	.000
QT	1.000	4139.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	200.000	14.000	262.000	293.000	110.000	140.000	120.000	.000	.000	.000
GR	3020.000	.000	3018.000	79.000	3016.000	126.000	3018.000	135.000	3018.000	200.000
GR	3010.000	220.000	3010.000	262.000	3008.000	269.000	3006.000	278.000	3006.000	287.000
GR	3010.000	293.000	3012.000	300.000	3014.000	310.000	3014.000	340.000	.000	.000
NH	4.000	.060	140.000	.045	291.000	.035	324.000	.045	480.000	.000
QT	1.000	4252.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	210.000	18.000	291.000	324.000	70.000	110.000	90.000	.000	.000	.000
GR	3020.000	.000	3018.000	54.000	3016.000	89.000	3016.000	99.000	3018.000	103.000
GR	3018.000	128.000	3016.000	140.000	3014.000	144.000	3014.000	170.000	3012.000	198.000
GR	3012.000	254.000	3012.000	276.000	3010.000	291.000	3008.000	295.000	3008.000	311.000
GR	3014.000	324.000	3014.000	418.000	3015.000	480.000	.000	.000	.000	.000
NC	.040	.045	.035	.000	.000	.000	.000	.000	.000	.000
QT	1.000	5200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	220.000	13.000	110.000	188.000	1.000	100.000	70.000	.000	.000	.000
GR	3018.000	.000	3016.000	10.000	3014.000	13.000	3014.000	110.000	3012.000	116.000
GR	3012.000	150.000	3010.000	160.000	3010.000	177.000	3012.000	181.000	3016.000	188.000
GR	3014.000	410.000	3014.000	482.000	3016.000	569.000	.000	.000	.000	.000
NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	230.000	10.000	80.000	141.000	30.000	150.000	100.000	.000	.000	.000
GR	3018.000	.000	3018.000	38.000	3016.000	47.000	3014.000	80.000	3012.000	92.000
GR	3010.000	101.000	3010.000	122.000	3018.000	141.000	3018.000	240.000	3020.000	385.000

X1	240.000	7.000	50.000	99.000	80.000	150.000	110.000	.000	.000	.000
GR	3019.000	.000	3018.000	50.000	3012.000	64.000	3012.000	86.000	3018.000	99.000
GR	3020.000	200.000	3022.000	268.000	.000	.000	.000	.000	.000	.000
X1	250.000	10.000	69.000	121.000	120.000	100.000	110.000	.000	.000	.000
GR	3024.000	.000	3022.000	60.000	3020.000	69.000	3016.000	79.000	3014.000	86.000
GR	3012.000	101.000	3012.000	109.000	3020.000	121.000	3022.000	237.000	3024.000	314.000
X1	260.000	16.000	30.000	131.000	120.000	100.000	110.000	.000	.000	.000
GR	3031.000	.000	3030.000	18.000	3026.000	30.000	3018.000	61.000	3016.000	70.000
GR	3016.000	118.000	3022.000	131.000	3024.000	192.000	3024.000	273.000	3022.000	280.000
GR	3024.000	293.000	3026.000	330.000	3026.000	355.000	3022.000	370.000	3026.000	415.000
GR	3030.000	430.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.055	.000	.039	.000	.000	.000	.000	.000	.000	.000
X1	270.000	11.000	62.000	124.000	180.000	150.000	170.000	.000	.000	.000
GR	3040.000	.000	3030.000	50.000	3028.000	62.000	3020.000	75.000	3022.000	100.000
GR	3026.000	124.000	3026.000	365.000	3024.000	380.000	3024.000	390.000	3026.000	399.000
GR	3030.000	423.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	280.000	21.000	22.000	130.000	180.000	100.000	150.000	.000	.000	.000
GR	3040.000	.000	3030.000	22.000	3026.000	33.000	3024.000	41.000	3023.000	56.000
GR	3024.000	75.000	3026.000	110.000	3028.000	122.000	3030.000	130.000	3032.000	145.000
GR	3030.000	159.000	3030.000	214.000	3032.000	265.000	3030.000	280.000	3026.000	290.000
GR	3026.000	305.000	3030.000	314.000	3032.000	322.000	3034.000	334.000	3034.000	364.000
GR	3036.000	380.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	290.000	14.000	114.000	175.000	200.000	170.000	190.000	.000	.000	.000
GR	3050.000	.000	3040.000	20.000	3038.000	35.000	3036.000	45.000	3036.000	96.000
GR	3030.000	114.000	3030.000	130.000	3034.000	150.000	3030.000	160.000	3030.000	175.000
GR	3037.000	235.000	3032.000	280.000	3040.000	325.000	3049.000	400.000	.000	.000
NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	300.000	13.000	55.000	135.000	200.000	250.000	220.000	.000	.000	.000
GR	3060.000	.000	3050.000	20.000	3040.000	55.000	3038.000	60.000	3040.000	71.000
GR	3043.000	90.000	3040.000	104.000	3038.000	125.000	3040.000	135.000	3045.000	180.000
GR	3040.000	230.000	3040.000	250.000	3050.000	272.000	.000	.000	.000	.000
NC	.050	.040	.055	.000	.000	.000	.000	.000	.000	.000
X1	310.000	16.000	50.000	140.000	150.000	195.000	160.000	.000	.000	.000
GR	3060.000	.000	3050.000	50.000	3048.000	70.000	3046.000	76.000	3044.000	81.000
GR	3046.000	86.000	3048.000	100.000	3044.000	121.000	3050.000	140.000	3052.000	174.000
GR	3054.000	200.000	3052.000	221.000	3052.000	241.000	3054.000	251.000	3056.000	261.000
GR	3060.000	276.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	320.000	17.000	213.000	281.000	250.000	300.000	300.000	.000	.000	.000
GR	3090.000	.000	3070.000	51.000	3068.000	60.000	3066.000	85.000	3064.000	93.000
GR	3064.000	104.000	3066.000	134.000	3068.000	142.000	3068.000	180.000	3066.000	209.000
GR	3064.000	213.000	3062.000	226.000	3060.000	238.000	3062.000	250.000	3064.000	281.000
GR	3070.000	313.000	3080.000	340.000	.000	.000	.000	.000	.000	.000

C	.055	.000	.000	.000	.000	.000	.000	.000	.000	.000
1	330.000	13.000	100.000	150.000	210.000	200.000	180.000	.000	.000	.000
R	090.000	.000	3080.000	26.000	3078.000	52.000	3076.000	75.000	3074.000	86.000
R	3072.000	95.000	3070.000	100.000	3066.000	120.000	3066.000	132.000	3068.000	140.000
R	070.000	150.000	3080.000	180.000	3086.000	190.000	.000	.000	.000	.000
1	340.000	12.000	36.000	80.000	245.000	235.000	240.000	.000	.000	.000
R	3100.000	.000	3090.000	15.000	3088.000	21.000	3080.000	36.000	3076.000	50.000
R	076.000	68.000	3078.000	80.000	3080.000	-95.000	3082.000	107.000	3084.000	141.000
R	3090.000	165.000	3099.000	195.000	.000	.000	.000	.000	.000	.000
J	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
S PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRC 1

HLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF
 PROF E TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR
 DETAILS.

CHV .100 CEHV= .030
 490 NH CARD USED
 SECNO 9.000

265 DIVIDED FLOW

9.00	5.76	2965.76	.00	2962.00	2967.05	1.30	.00	.00	2960.00
100.	6235.	6571.	895.	789.	622.	187.	0.	0.	2960.00
.00	7.90	10.56	4.77	.040	.035	.045	.000	2960.00	25.44
.005996	0.	0.	0.	0	0	6	.00	417.11	740.93

FLOW DISTRIBUTION FOR SECNO= 9.00 CWSEL= 2965.76

STA:	25.	60.	120.	134.	453.	470.	520.	628.	642.	660.	741.
PER Q=	2.8	26.6	1.5	.3	1.7	12.6	48.0	3.5	1.8	1.2	
AREA=	99.5	345.6	41.5	17.8	46.9	238.0	622.0	66.6	49.7	71.2	
EL=	3.8	10.6	4.9	2.3	5.0	7.2	10.6	7.2	5.0	2.3	

490 NH CARD USED
 SECNO 10.000

718: MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

10.00	6.93	2968.93	2968.93	.00	2970.28	1.35	2.77	-.37	2965.00
700.	9522.	3888.	291.	1101.	353.	52.	12.	4.	2965.00
.01	8.65	11.00	5.57	.037	.030	.045	.000	2962.00	105.37
.007969	300.	400.	530.	4	17	0	.00	551.42	656.79

FLOW DISTRIBUTION FOR SECNO= 10.00 CWSEL= 2968.93

STA:	105.	130.	153.	169.	245.	470.	540.	630.	657.
PER Q=	3.9	12.3	8.5	30.0	5.2	9.5	28.4	2.1	
AREA=	64.7	136.3	94.8	374.3	222.2	208.3	353.3	52.2	
EL=	8.2	12.4	12.3	11.0	3.2	6.3	11.0	5.6	

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SL.PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

490 4 CARD USED

SECNO 10.500

685 20 TRIALS ATTEMPTED WSEL,CWSEL

693 ROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

10.50	4.06	2972.06	2972.06	.00	2973.20	1.14	2.29	-.32	2972.00	
1 00.	12496.	1204.	0.	1476.	127.	0.	20.	7.	2972.00	
.02	8.46	9.45	.03	.039	.035	.050	.000	2968.00	70.66	
.011355	190.	250.	220.	20	22	0	.00	659.27	729.93	

LOW DISTRIBUTION FOR SECNO= 10.50 CWSEL= 2972.06

TA=	71.	103.	117.	146.	169.	195.	261.	380.	450.	565.	671.	689.	729.
PER Q=	8.5	5.3	4.3	14.3	12.8	12.3	11.5	7.7	11.1	3.4	.0	8.8	
AREA=	117.9	70.9	78.8	134.4	131.6	202.1	245.4	144.4	237.2	112.6	1.1	127.5	
L=	9.8	10.3	7.4	14.6	13.3	8.3	6.4	7.3	6.4	4.1	.6	9.4	

490 NH CARD USED

SECNO 11.000

265 DIVIDED FLOW

.00	6.85	2974.85	.00	.00	2975.73	.88	2.50	.03	2974.00	
1 00.	13137.	560.	3.	1725.	108.	2.	29.	10.	2974.00	
.03	7.61	5.18	1.41	.043	.032	.060	.000	2968.00	17.03	
.0453	230.	230.	230.	2	0	0	.00	770.74	810.66	

LOW DISTRIBUTION FOR SECNO= 11.00 CWSEL= 2974.85

TA=	17.	200.	285.	302.	323.	331.	360.	378.	581.	705.	806.	811.
PER Q=	11.1	10.8	5.9	14.4	4.7	12.8	5.4	28.6	2.2	4.1	.0	
AREA=	333.9	242.1	77.4	143.8	46.8	140.6	69.3	578.2	93.1	108.1	2.0	
L=	4.6	6.1	10.4	13.7	13.8	12.4	10.6	6.8	3.3	5.2	1.4	

490 NH CARD USED

SECNO 12.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRINS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
S-PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

.00	8.23	2977.73	2977.73	.00	2978.99	1.25	3.16	-.61	2976.00	
13700.	11490.	2183.	28.	1400.	177.	10.	36.	14.	2976.00	
.03	8.21	12.30	2.84	.045	.035	.060	.000	2969.50	51.20	
.0 217	200.	152.	135.	6	11	0	.00	716.61	773.27	

FLOW DISTRIBUTION FOR SECNO= 12.00 CWSEL= 2977.73

STA=	51.	215.	255.	314.	375.	398.	408.	412.	422.	435.	460.	560.	670.
PER Q=	21.6	5.9	4.1	4.2	5.1	9.9	4.4	8.2	5.9	4.6	4.4	4.8	4.8
AREA=	408.9	109.3	102.3	105.8	78.9	76.1	31.9	67.3	61.5	68.3	123.4	135.7	
VEL=	7.2	7.4	5.5	5.5	8.8	17.8	18.8	16.7	13.2	9.2	4.8	4.8	
STA=	670.	711.	762.	773.									
PER Q=	.9	15.9	.2										
AREA=	30.8	177.4	9.8										
VEL=	3.8	12.3	2.8										

1490 NH CARD USED

*SECNO 12.500

3685-20 TRIALS ATTEMPTED WSEL,CWSEL

369. PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

12.50	4.44	2980.44	2980.44	.00	2981.67	1.23	1.19	.26	2978.00	
700.	9911.	3135.	654.	1130.	317.	128.	41.	16.	2978.00	
.04	8.77	9.90	5.13	.039	.035	.050	.000	2976.00	172.50	
.010482	110.	120.	180.	20	11	0	.00	660.56	833.06	

FLOW DISTRIBUTION FOR SECNO= 12.50

CWSEL= 2980.44

STA	173.	397.	430.	441.	450.	491.	506.	586.	675.	767.	808.	833.
PER Q=	8.8	5.1	12.2	8.0	21.9	3.7	6.0	6.6	22.9	4.0	.7	
AREA=	297.8	69.6	92.9	67.0	223.1	51.6	155.3	172.8	316.6	100.1	27.5	
EL=	4.1	10.1	18.0	16.3	13.4	9.9	5.3	5.3	9.9	5.5	3.7	

1490 NH CARD USED

*SECNO 13.000

368 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.00	7.31	2983.31	2983.31	.00	2984.61	1.29	1.00	.20	2978.00	
13700.	8199.	5091.	410.	1370.	396.	118.	46.	18.	2980.00	
.04	5.98	12.85	3.47	.044	.030	.045	.000	2976.00	139.39	
.6952	150.	130.	140.	20	14	0	.00	774.68	914.07	

SELNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
TJ	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SL	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

LOW DISTRIBUTION FOR SECNO= 13.00 CWSEL= 2983.31

TA=	139.	462.	502.	535.	575.	650.	721.	728.	800.	914.
PER Q=	9.1	4.5	16.0	10.3	9.5	9.0	1.6	37.2	3.0	
AREA=	406.1	113.1	208.4	172.6	226.1	214.0	30.2	396.1	118.1	
VEL=	3.1	5.4	10.5	8.2	5.7	5.7	7.1	12.9	3.5	

490 I CARD USED

SECNO 14.000

685 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

	14.00	6.99	2986.99	2986.99	.00	2988.10	1.11	1.21	.25	2982.00
1 00.	7133.	5347.	1220.	1537.	441.	227.	59.	23.	2982.00	
.05	4.64	12.14	5.38	.044	.030	.045	.000	2980.00	105.56	
.004740	280.	230.	200.	20	10	0	.00	899.33	1004.89	

LOW DISTRIBUTION FOR SECNO= 14.00 CWSEL= 2986.99

TA=	106.	410.	433.	445.	470.	545.	730.	810.	865.	930.	980.	1005.
PER Q=	3.8	7.0	4.4	4.6	3.1	11.7	8.3	9.2	39.0	8.3	.6	
AREA=	270.4	120.8	71.9	99.8	109.4	406.1	239.4	219.6	440.5	199.6	27.3	
L=	1.9	8.0	8.4	6.4	3.9	3.9	4.7	5.7	12.1	5.7	2.9	

490 NH CARD USED

SECNO 15.000

265 DIVIDED FLOW

685 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

	.00	8.08	2992.08	2992.08	.00	2993.15	1.06	2.17	-.21	2986.00
1 00.	8719.	3958.	1024.	1857.	296.	162.	78.	32.	2986.00	
.06	4.69	13.36	6.30	.047	.030	.048	.000	2984.00	7.92	
.004909	360.	380.	370.	20	11	0	.00	1223.44	1283.28	

LOW DISTRIBUTION FOR SECNO= 15.00 CWSEL= 2992.08

S.L.NO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

STA=	8.	250.	359.	370.	387.	420.	770.	950.	1075.	1178.	1195.	1240.	1262.
PER Q=	3.7	4.4	3.0	9.6	10.9	3.0	6.4	7.1	11.2	4.2	28.9	6.1	
AREA=	192.0	149.8	55.9	133.4	175.7	201.9	284.6	260.1	317.3	86.4	296.1	111.8	
L=	2.6	4.1	7.4	9.9	8.5	2.0	3.1	3.7	4.8	6.7	13.4	7.5	

STA=	1262.	1283.
PER Q=	1.4	
A=	50.7	
L=	3.7	

490 NH CARD USED

SE() 16.000

685 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

721 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=	760.0	1490.0	TYPE=	1	TARGET=	-760.000
4.00	6.96	2994.96	2994.96	.00	2996.44	1.48 1.91 -.06 2990.00
100.	5102.	8558.	40.	1020.	730.	14. 91. 38. 2990.00
.07	5.00	11.72	2.97	.045	.035	.060 .000 2988.00 924.64
.006388	270.	330.	310.	20	12	0 .00 544.81 1469.46

FLOW DISTRIBUTION FOR SECNO= 16.00 CWSEL= 2994.96

STA=	925.	1198.	1240.	1339.	1351.	1464.	1469.
PER Q=	15.3	8.0	11.6	2.3	62.5	.3	
AREA=	513.0	166.3	293.0	47.5	730.4	13.5	
L=	4.1	6.6	5.4	6.5	11.7	3.0	

490 NH CARD USED

SE() 17.000

681 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

721 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=	825.0	1748.0	TYPE=	1	TARGET=	-825.000
17.00	6.67	2998.67	2998.67	.00	3000.13	1.45 1.86 -.11 2992.00
700.	5769.	7232.	699.	997.	594.	155. 101. 41. 2992.00
.08	5.79	12.18	4.51	.045	.035	.050 .000 2992.00 1082.82
.007265	260.	250.	350.	20	11	0 .00 600.55 1683.37

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
S PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

LOW ISTRIBUTION FOR SECNO= 17.00 CWSEL= 2998.67

TA=	1083.	1240.	1350.	1500.	1510.	1606.	1680.	1683.
PE Q=	3.2	8.3	27.0	3.7	52.8	5.1	.0	
A...A=	149.3	239.2	551.2	56.7	593.8	153.9	1.1	
VEL=	3.0	4.7	6.7	8.8	12.2	4.5	1.2	

490 H CARD USED

SECNO 18.000

685 20 TRIALS ATTEMPTED WSEL,CWSEL

693 ROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

470	ENCROACHMENT STATIONS=	800.0	1800.0	TYPE=	1	TARGET=	-800.000
.00	7.95	2999.95	2999.95	.00	3001.65	1.70	1.10 .07 2994.00
13700.	2434.	1535.	9731.	484.	137.	861.	108. 43. 2994.00
.08	5.02	11.22	11.31	.045	.035	.036	.000 2992.00 1280.77
.0 482	170.	170.	170.	20	11	0	.00 407.73 1688.51

LOW ISTRIBUTION FOR SECNO= 18.00 CWSEL= 2999.95

TA=	1281.	1310.	1380.	1480.	1485.	1508.	1514.	1518.	1570.	1618.	1632.	1689.
PE Q=	.5	4.1	11.8	1.3	11.2	1.6	.8	19.7	44.2	3.7	1.0	
A A=	28.5	136.4	294.8	24.7	136.8	29.7	15.8	309.3	381.5	69.3	55.1	
VEL=	2.6	4.1	5.5	7.3	11.2	7.5	6.6	8.7	15.9	7.3	2.6	

490 H CARD USED

SECNO 19.000

301 W CHANGED MORE THAN HVINS

685 20 TRIALS ATTEMPTED WSEL,CWSEL

693 ROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

470	ENCROACHMENT STATIONS=	770.0	2035.0	TYPE=	1	TARGET=	-770.000
.00	6.93	3003.93	3003.93	.00	3005.07	1.13	1.59 .22 3000.00
13700.	4636.	5747.	3317.	928.	479.	805.	120. 47. 3000.00
.10	4.99	11.99	4.12	.045	.030	.046	.000 2997.00 1103.46
.0 264	230.	320.	330.	20	10	0	.00 806.43 1909.89

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
S PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

FLOW DISTRIBUTION FOR SECNO= 19.00 CWSEL= 3003.93

STA=	1103.	1382.	1461.	1539.	1660.	1688.	1809.	1831.	1870.	1910.
PE Q=	20.3	13.5	41.9	6.9	3.6	6.4	3.1	3.7	.6	
AREA=	617.5	310.8	479.4	245.0	92.2	234.0	80.5	114.4	38.6	
VEL=	4.5	6.0	12.0	3.9	5.3	3.7	5.2	4.4	2.1	

496 NH CARD USED

SECNO 20.00

685-20 TRIALS ATTEMPTED WSEL,CWSEL

69: PROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

20.00	6.56	3005.56	3005.56	.00	3006.87	1.31	1.21	-.14	3002.00
100.	3144.	7985.	2570.	528.	712.	680.	128.	50.	3004.00
.10	5.95	11.21	3.78	.045	.035	.045	.000	2999.00	956.48
.006922	170.	180.	170.	20	11	0	.00	754.75	1711.23

FLOW DISTRIBUTION FOR SECNO= 20.00 CWSEL= 3005.56

STA=	956.	1015.	1031.	1155.	1280.	1599.	1650.	1673.	1711.
PL. Q=	.8	1.5	20.6	58.3	13.4	3.4	1.5	.4	
AREA=	45.7	41.0	441.5	712.1	497.8	105.1	47.4	29.8	
VEL=	2.3	5.1	6.4	11.2	3.7	4.4	4.4	1.7	

490 NH CARD USED

SECNO 21.00

718: MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

3471 ENCROACHMENT STATIONS=	480.0	1904.0	TYPE=	1	TARGET=	-480.000
1.00	4.50	3008.50	3008.50	.00	3009.34	.84 2.89 -.65 3006.00
13700.	2302.	1522.	9876.	349.	149.	1417. 138. 55. 3008.00
.11	6.59	10.18	6.97	.045	.030	.042 .000 3004.00 717.29
3420	210.	200.	230.	6	18	0 .00 1098.21 1815.49

FLOW DISTRIBUTION FOR SECNO= 21.00 CWSEL= 3008.50

STA=	717.	905.	968.	1084.	1238.	1265.	1289.	1330.	1540.	1631.	1650.	1689.	1809.
PE Q=	16.8	11.1	7.5	8.4	3.1	12.3	4.9	4.4	8.1	4.2	11.8	7.4	
AREA=	349.3	149.5	166.9	230.9	45.5	108.0	92.5	170.4	182.0	66.5	162.5	189.9	
VEL=	6.6	10.2	6.1	5.0	9.4	15.6	7.2	3.5	6.1	8.6	10.0	5.3	

STA 1809. 1815.

P Q= .0

AREA= 1.6

VEL= 1.5

STLNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA	
S PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

490 H CARD USED
SECNO 22.000

265 DIVIDED FLOW

ENCROACHMENT STATIONS=	220.0	1908.0	TYPE=	1	TARGET=	-220.000
.00	4.89	3010.89	.00	.00	3011.65	.76 2.30 .01 3010.00
12800.	282.	2592.	9925.	109.	254.	1659. 147. 60. 3008.00
.12	2.59	10.20	5.98	.045	.030	.042 .000 3006.00 478.97
.0 699	260.	240.	190.	2	0	0 .00 1172.34 1756.24

FLOW DISTRIBUTION FOR SECNO= 22.00 CWSEL= 3010.89

STA=	479.	648.	732.	890.	972.	998.	1058.	1163.	1195.	1211.	1270.	1543.	1608.
PER O=	2.2	20.3	11.5	3.6	3.9	4.4	4.0	14.7	5.0	5.5	9.6	7.0	
EA=	109.2	254.2	297.6	109.5	75.0	113.0	114.8	156.3	62.1	111.1	237.3	154.9	
VEL=	2.6	10.2	5.0	4.2	6.6	5.0	4.4	12.0	10.3	6.4	5.2	5.8	
STA=	1608.	1720.	1756.										
PER O=	8.2	.2											
EA=	211.0	16.0											
VEL=	5.0	1.7											

490 H CARD USED
SECNO 23.000

18 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS=	150.0	1850.0	TYPE=	1	TARGET=	-150.000
.00	5.12	3015.12	3015.12	.00	3016.08	.95 3.16 -.04 3012.00
1300.	2448.	2795.	7557.	294.	239.	1361. 161. 68. 3012.00
.13	8.32	11.68	5.55	.034	.030	.042 .000 3010.00 422.25
.0 999	255.	300.	330.	2	8	0 .00 1016.08 1438.33

FLOW DISTRIBUTION FOR SECNO= 23.00 CWSEL= 3015.12

STA=	422.	478.	520.	545.	611.	765.	889.	1000.	1100.	1180.	1198.	1305.	1325.
PER O=	8.3	4.4	6.5	21.8	5.2	3.9	10.1	9.1	10.4	4.9	4.1	4.0	
EA=	126.8	89.2	78.1	239.2	180.2	139.5	235.8	212.5	182.0	74.2	132.3	53.5	
VEL=	8.4	6.3	10.6	11.7	3.7	3.6	5.5	5.5	7.3	8.5	3.9	9.7	
STA=	1325.	1370.	1438.										
PER O=	6.1	1.3											
EA=	95.6	55.1											
VEL=	8.2	2.9											

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
IE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1491 NH CARD USED
*SECNO 24.000

326 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
372 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
24.00	3.90	3019.90	3019.90	.00	3020.62	.72	2.63	.30	3018.00
300.	1982.	3475.	7343.	460.	319.	1676.	178.	78.	3016.00
.16	4.31	10.90	4.38	.045	.030	.045	.000	3016.00	267.80
.008108	320.	300.	335.	8	16	0	.00	1490.88	1788.40

FLOW DISTRIBUTION FOR SECNO= 24.00 CWSEL= 3019.90

STA	268.	435.	501.	546.	629.	711.	898.	1055.	1280.	1445.	1575.	1740.	1788.
PER Q=	8.0	4.5	3.0	27.1	11.2	12.7	10.6	7.6	5.1	4.8	3.5	1.9	
AREA=	249.1	125.4	85.5	318.7	237.8	355.3	298.3	281.2	140.3	151.2	148.9	63.1	
VEL=	4.1	4.6	4.6	10.9	6.0	4.6	4.6	3.5	4.7	4.1	3.0	3.8	

1490 NH CARD USED
*SECNO 25.000

718 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
25.00	3.98	3023.98	3023.98	.00	3025.17	1.19	2.84	-.04	3022.00
12800.	1517.	7668.	3614.	267.	742.	649.	194.	86.	3020.00
.16	5.68	10.33	5.57	.040	.030	.045	.000	3020.00	240.18
.8400	300.	310.	380.	2	5	0	.00	633.30	873.48

FLOW DISTRIBUTION FOR SECNO= 25.00 CWSEL= 3023.98

STA	240.	290.	318.	371.	587.	710.	797.	873.
P Q=	4.1	3.4	4.4	59.9	18.0	6.4	3.8	
AREA=	92.6	69.5	105.1	742.3	366.9	172.5	109.7	
VEL=	5.6	6.2	5.4	10.3	6.3	4.8	4.5	

149 NH CARD USED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
1E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
1DPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SEI) 26.000

3265 DIVIDED FLOW

718L MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

5.00	4.18	3028.18	3028.18	.00	3028.96	.78	3.54	-.44	3026.00
300.	2403.	6929.	3468.	341.	863.	750.	207.	94.	3026.00
.17	7.05	8.03	4.62	.036	.035	.045	.000	3024.00	217.20
.011572	300.	310.	300.	4	8	0	.00	1513.30	2097.34

FLOW DISTRIBUTION FOR SECNO= 26.00 CWSEL= 3028.18

STA:	217.	298.	400.	770.	940.	1130.	2097.
PER Q=	5.4	13.4	54.1	17.3	7.0	2.8	
AREA=	118.2	222.5	863.0	370.8	224.4	154.9	
EL=	5.9	7.7	8.0	6.0	4.0	2.3	

1490 NH CARD USED

*SEI) 27.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 140.0 2375.0 TYPE= 1 TARGET= -140.000

27.00	4.98	3032.98	.00	.00	3033.55	.57	4.57	.02	3031.00
800.	584.	4911.	7304.	152.	698.	1342.	223.	106.	3030.00
.18	3.85	7.04	5.44	.055	.035	.044	.000	3028.00	140.16
.014182	430.	390.	300.	5	0	0	.00	1680.50	2256.93

FLOW DISTRIBUTION FOR SECNO= 27.00 CWSEL= 3032.98

STA	140.	275.	700.	780.	835.	855.	960.	1150.	1618.	2213.	2245.	2257.
PER Q=	4.6	38.4	7.7	5.3	7.8	10.7	5.7	6.8	6.5	5.9	.7	
AREA=	152.0	697.9	158.9	109.3	91.7	214.6	187.5	251.2	234.1	78.6	16.3	
EL=	3.8	7.0	6.2	6.2	10.9	6.4	3.9	3.4	3.6	9.6	5.5	

1490 NH CARD USED

*SEI) 28.000

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TI	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SL E	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

65 DIVIDED FLOW

70	CROACHMENT STATIONS=	230.0	2500.0	TYPE=	1	TARGET=	-230.000		
28.00	1.57	3037.57	.00	.00	3038.14	.57	4.59	.00	3036.00
12.00	640.	6080.	6080.	94.	881.	1235.	239.	118.	3036.00
20	6.78	6.90	4.92	.035	.035	.044	.000	3036.00	230.00
.014439	390.	350.	290.	4	0	0	.00	1715.37	2300.52

LOW DISTRIBUTION FOR SECNO= 28.00 CWSEL= 3037.57

TA=	230.	290.	850.	1185.	1372.	1622.	1693.	2000.	2103.	2254.	2284.	2301.
PER O=	5.0	47.5	22.1	12.3	8.7	.3	.3	.4	.3	2.5	.6	
AREA=	94.4	881.0	527.0	294.2	268.3	20.2	26.0	29.6	9.9	47.2	13.0	
VEL=	6.8	6.9	5.4	5.4	4.2	1.7	1.7	1.7	4.3	6.9	4.3	

90 NH CARD USED
SECNO 29.000

65 DIVIDED FLOW

00	3.17	3043.17	.00	.00	3043.67	.50	5.53	.01	3044.00
10.	0.	768.	12032.	0.	158.	2096.	258.	132.	3042.00
.22	.00	4.85	5.74	.035	.035	.043	.000	3040.00	95.55
.015861	450.	425.	340.	4	0	0	.00	1728.13	2114.61

LOW DISTRIBUTION FOR SECNO= 29.00 CWSEL= 3043.17

TA=	96.	570.	1100.	1789.	1919.	1951.	1970.	2039.	2051.	2076.	2100.	2115.
PER O=	6.0	22.3	32.7	15.3	7.1	2.2	2.9	1.8	7.1	2.3	.2	
AREA=	158.5	619.4	805.2	281.9	101.4	41.2	80.6	26.0	79.2	52.0	8.5	
VEL=	4.8	4.6	5.2	7.0	9.0	6.9	4.6	8.9	11.5	5.7	2.4	

90 NH CARD USED
SECNO 30.000

685 NO TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

.00	2.15	3050.15	3050.15	.00	3050.72	.56	3.88	.19	3048.00
12800.	33.	6956.	5810.	10.	1075.	1063.	272.	144.	3048.00
.23	3.21	6.47	5.47	.060	.040	.040	.000	3048.00	23.69
.0366	380.	340.	240.	20	18	0	.00	2011.99	2035.68

SL NO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SI PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

LOW DISTRIBUTION FOR SECNO= 30.00 CWSEL= 3050.15

STA=	24.	33.	647.	780.	1178.	1965.	2036.
PER Q=	.3	54.3	16.6	17.6	8.3	2.9	
A A=	10.4	1075.3	286.4	459.1	240.9	76.5	
VEL=	3.2	6.5	7.4	4.9	4.4	4.9	

490 H CARD USED

SECNO 31.000

185 MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=	.0	1879.0	TYPE=	1	TARGET=	1878.999
.00	4.22	3056.22	3056.22	.00	3056.86	.64 4.58 -.06 3056.00
1 00.	0.	9268.	3532.	0.	1311.	852. 287. 158. 3056.00
.24	.04	7.07	4.15	.050	.040	.045 .000 3052.00 51.22
.014734	330.	300.	330.	3	20	0 .00 1814.53 1865.75

LOW DISTRIBUTION FOR SECNO= 31.00 CWSEL= 3056.22

STA=	51.	720.	980.	1079.	1432.	1669.	1730.	1800.	1866.
PER Q=	72.4	5.4	5.7	3.7	3.7	3.3	3.8	2.0	
A A=	1311.2	158.1	131.1	169.4	137.4	89.9	103.1	62.9	
L=	7.1	4.4	5.6	2.8	3.5	4.7	4.7	4.0	

490 WH CARD USED

SEC 32.000

265 DIVIDED FLOW

470 ENCROACHMENT STATIONS=	140.0	1800.0	TYPE=	1	TARGET=	1660.000
.00	3.57	3061.57	.00	.00	3062.16	.60 5.30 .00100000.00
1 00.	0.	6680.	6120.	0.	971.	1147. 303. 170. 3060.00
.26	.00	6.88	5.34	.050	.040	.046 .000 3058.00 140.00
.018515	390.	330.	300.	5	0	0 .00 1537.09 1771.25

LOW DISTRIBUTION FOR SECNO= 32.00 CWSEL= 3061.57

STA=	140.	780.	870.	1050.	1115.	1300.	1531.	1740.	1771.
PER Q=	52.2	3.0	6.1	4.4	15.7	5.3	12.6	.6	
A A=	970.6	82.1	164.2	82.9	292.5	174.4	326.5	24.4	
L=	6.9	4.8	4.8	6.8	6.9	3.9	4.9	3.1	

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
V	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
X	XLOB	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

1491 NH CARD USED

*SECNO 33.000

326: DIVIDED FLOW

347	ENCROACHMENT STATIONS=	100.0	1280.0	TYPE=	1	TARGET=	1180.000
	3.00	5.05	3067.05	.00	.00	3067.80	.74 5.63 .00100000.00
	12800.	0.	7687.	5113.	0.	1010.	892. 317. 179. 3066.00
	.27	.00	7.61	5.73	.050	.045	.046 .000 3062.00 100.00
	7839	290.	310.	310.	4	0	0 .00 1137.47 1280.00

FLO DISTRIBUTION FOR SECNO= 33.00 CWSEL= 3067.05

STA=	100.	540.	670.	791.	820.	850.	855.	862.	1000.	1280.
P	Q=	60.1	14.9	13.9	1.1	2.8	.5	.1	1.1	5.5
	EA=	1009.9	267.8	249.3	30.7	54.3	9.1	3.7	50.6	226.8
	VEL=	7.6	7.1	7.1	4.6	6.5	6.4	2.9	2.9	3.1

149 NH CARD USED

*SECNO 34.000

34.00	7.54	3071.54	.00	.00	3072.34	.80	4.54	.00	3070.00
800.	100.	7497.	5203.	29.	1005.	766.	329.	186.	3070.00
.28	3.42	7.46	6.79	.045	.045	.049	.000	3064.00	61.19
.015186	230.	210.	375.	3	0	0	.00	823.11	884.29

FLOW DISTRIBUTION FOR SECNO= 34.00 CWSEL= 3071.54

STA	61.	99.	500.	527.	575.	865.	884.
P	Q=	.8	58.6	12.7	11.6	16.0	.3
	AREA=	29.2	1005.4	135.7	163.1	452.6	14.9
	VEL=	3.4	7.5	12.0	9.1	4.5	2.8

*SECNO 35.000

330 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

369 PROBABLE MINIMUM SPECIFIC ENERGY

372 CRITICAL DEPTH ASSUMED

35.00	7.33	3075.33	3075.33	.00	3077.08	1.76	1.50	.76	3070.00
2800.	598.	7865.	4336.	133.	609.	818.	340.	190.	3072.00
.29	4.50	12.92	5.30	.045	.030	.045	.000	3068.00	24.92
.005257	220.	280.	300.	20	8	0	.00	394.57	419.49

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	LOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
POPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENOST	

LC DISTRIBUTION FOR SECNO= 35.00 CWSEL= 3075.33

STA=	25.	32.	76.	82.	170.	412.	419.
P Q=	.1	3.4	1.2	61.4	33.6	.3	
EA=	4.7	102.4	26.0	608.8	805.2	12.5	
VEL=	1.8	4.2	6.1	12.9	5.3	3.2	

SE 0 36.000

301 HV CHANGED MORE THAN HVINS

680 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

72 CRITICAL DEPTH ASSUMED

6.00	8.93	3077.93	3077.93	.00	3080.19	2.26	.99	.00	3070.00
12800.	487.	7886.	4427.	101.	538.	739.	346.	191.	3074.00
.29	4.84	14.65	5.99	.055	.030	.045	.000	3069.00	21.62
5435	170.	180.	190.	20	11	0	.00	285.27	306.90

LO DISTRIBUTION FOR SECNO= 36.00 CWSEL= 3077.93

STA=	22.	47.	113.	290.	304.	307.
P Q=	3.8	61.6	33.0	1.6	.0	
EA=	100.6	538.4	695.6	41.0	2.8	
VEL=	4.8	14.6	6.1	5.0	2.1	

SE 0 37.000

680 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

72 CRITICAL DEPTH ASSUMED

7.00	10.02	3081.02	3081.02	.00	3083.49	2.47	.73	.09	3072.00
12800.	360.	8579.	3862.	76.	574.	706.	352.	192.	3072.00
.30	4.72	14.93	5.47	.055	.030	.045	.000	3071.00	33.17
4289	170.	170.	170.	20	8	0	.00	251.88	285.05

LO DISTRIBUTION FOR SECNO= 37.00 CWSEL= 3081.02

STA=	33.	50.	108.	112.	279.	282.	285.
P Q=	2.8	67.0	1.4	28.6	.1	.0	
EA=	76.2	574.4	28.1	670.7	6.0	1.5	
VEL=	4.7	14.9	6.3	5.5	3.1	1.3	

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
DPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 38.000
 685 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

3.00	11.47	3082.47	3082.47	.00	3084.98	2.51	.73	.04	3074.00
12800.	480.	9033.	3286.	102.	610.	656.	357.	193.	3072.00
.30	4.69	14.80	5.01	.055	.030	.045	.000	3071.00	23.34
3802	220.	210.	140.	20	8	0	.00	263.03	286.37

DISTRIBUTION FOR SECNO= 38.00 CWSEL= 3082.47

TA=	23.	31.	48.	105.	118.	275.	286.
PE Q=	.1	3.6	70.6	5.5	19.9	.3	
EA=	9.5	93.0	610.4	97.1	545.1	14.1	
VEL=	1.9	5.0	14.8	7.3	4.7	2.3	

SECNO 39.000

301 HV CHANGED MORE THAN HVINS

3.00	9.03	3084.03	.00	.00	3085.95	1.92	.90	.06	3076.00
12800.	346.	11506.	948.	76.	988.	245.	365.	195.	3076.00
.31	4.53	11.64	3.87	.050	.030	.045	.000	3075.00	11.95
2963	310.	280.	220.	3	0	0	.00	228.19	240.14

DISTRIBUTION FOR SECNO= 39.00 CWSEL= 3084.03

TA=	12.	20.	30.	140.	149.	152.	155.	225.	240.
PE Q=	.3	2.4	89.9	3.2	.5	.2	3.2	.2	
EA=	16.2	60.3	988.5	63.2	15.1	9.1	141.9	15.4	
VEL=	2.4	5.1	11.6	6.5	4.7	-3.3	2.9	1.8	

SECNO 40.000

301 HV CHANGED MORE THAN HVINS

685 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

1.00	11.66	3087.66	3087.66	.00	3090.53	2.88	1.10	-.21	3084.00
12800.	1614.	11075.	111.	356.	763.	29.	371.	196.	3080.00
.31	4.54	14.52	3.80	.045	.035	.055	.000	3076.00	31.89
252	210.	210.	200.	20	14	0	.00	215.77	247.66

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
OPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

LO DISTRIBUTION FOR SECNO= 40.00 CWSEL= 3087.66

TA=	32.	41.	172.	240.	248.
P Q=	.1	12.5	86.5	.9	
EA=	7.6	348.1	762.7	29.3	
VEL=	2.1	4.6	14.5	3.8	

SE 0 41.000

301-HV CHANGED MORE THAN HVINS

41.00	11.80	3089.80	.00	.00	3091.70	1.90	1.07	.10	3084.00
12800.	2254.	10518.	27.	327.	893.	14.	377.	197.	3088.00
.32	6.89	11.77	1.88	.045	.038	.050	.000	3078.00	103.73
4669	190.	220.	260.	3	0	0	.00	176.39	280.12

LO DISTRIBUTION FOR SECNO= 41.00 CWSEL= 3089.80

TA=	104.	110.	123.	170.	264.	280.
P Q=	.1	2.0	15.5	82.2	.2	
EA=	5.6	49.3	272.2	893.4	14.4	
VEL=	2.0	5.3	7.3	11.8	1.9	

SE 0 42.000

302-HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

2.00	9.97	3090.97	3090.97	.00	3094.31	3.34	2.94	-.83	3086.00
300.	724.	12070.	6.	85.	807.	3.	383.	198.	3090.00
.32	8.55	14.96	1.96	.045	.040	-.050	.000	3081.00	25.29
1544	210.	260.	320.	2	15	0	.00	141.02	166.30

LOW-DISTRIBUTION FOR SECNO= 42.00 CWSEL= 3090.97

TA=	25.	28.	30.	50.	160.	166.
PER Q=	.0	.1	5.5	94.3	.0	
EA=	1.3	3.9	79.4	806.6	3.1	
EL=	2.1	4.4	8.9	15.0	2.0	

CNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK	ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

SE 10 43.000

663 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

72 CRITICAL DEPTH ASSUMED

3.00	9.75	3095.75	3095.75	.00	3099.08	3.33	2.19	.00	3090.00
12800.	331.	11898.	571.	48.	789.	96.	387.	198.	3090.00
.33	6.90	15.08	5.92	.045	.045	.050	.000	3086.00	12.32
.1517	150.	190.	280.	20	8	0	.00	155.18	167.50

LC DISTRIBUTION FOR SECNO= 43.00 CWSEL= 3095.75

STA=	12.	29.	118.	125.	129.	150.	168.
Q=	2.6	93.0	2.3	.5	1.3	.3	
EA=	47.9	788.8	33.3	11.0	36.8	15.3	
VEL=	6.9	15.1	8.8	5.8	4.6	2.9	

49 NH CARD USED

SECNO -16.000

START TRIB COMP

16.000 16.000 2994.960

265 DIVIDED FLOW

301 HV CHANGED MORE THAN HVINS

72 CRITICAL DEPTH ASSUMED

-16.00	8.99	2996.99	2996.99	.00	2997.72	.73	1.59	-1.59	2998.00
3663.	272.	2494.	897.	136.	309.	311.	393.	201.	2996.00
.34	2.00	8.08	2.89	.050	.040	.045	.000	2988.00	102.69
.5167	330.	310.	290.	0	9	0	.00	504.83	759.66

FLO DISTRIBUTION FOR SECNO= -16.00 CWSEL= 2996.99

STA=	103.	241.	260.	369.	681.	708.	760.
Q=	7.1	.3	68.1	12.2	9.1	3.2	
EA=	126.1	9.6	308.6	195.7	71.8	43.6	
VEL=	2.1	1.3	8.1	2.3	4.6	2.7	

1491 NH CARD USED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	LOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

USE TO 170.000

301 HV CHANGED MORE THAN HVINS

12 MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

0.00	7.80	2999.80	2999.80	.00	3002.05	2.26	5.93	-2.51	3000.00
1663.	0.	3663.	0.	0.	304.	0.	397.	203.	3000.00
.35	.00	12.06	.00	.045	.040	.045	.000	2992.00	470.48
.015957	390.	380.	310.	2	15	0	.00	69.01	539.49

FLOW DISTRIBUTION FOR SECNO= 170.00 CWSEL= 2999.80

STA 470. 540.

PER O= 100.0

AREA= 303.8

VEL= 12.1

490 NH CARD USED

USE O 180.000

28 CROSS SECTION 180.00 EXTENDED .60 FEET

30 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY

72 CRITICAL DEPTH ASSUMED

180.00	7.60	3008.60	3008.60	.00	3009.85	1.26	2.01	.86	3006.00
3680.	127.	3367.	186.	44.	359.	86.	400.	204.	3006.00
.36	2.89	9.37	2.17	.050	.040	.045	.000	3001.00	400.58
.7181	310.	280.	240.	10	8	0	.00	257.42	658.00

FLOW DISTRIBUTION FOR SECNO= 180.00 CWSEL= 3008.60

STA= 401. 456. 525. 610. 658.

P O= 3.4 91.5 3.5 1.5

AREA= 43.9 359.3 56.9 28.7

VEL= 2.9 9.4 2.3 2.0

149 NH CARD USED

CNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 190.000
 286 CROSS SECTION 190.00 EXTENDED .82 FEET

68 20 TRIALS ATTEMPTED WSEL,CWSEL
 69 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

190.00	6.82	3012.82	3012.82	.00	3014.16	1.34	2.05	-.26	3012.00
.045	110.	2178.	1757.	61.	196.	261.	402.	205.	3008.00
.36	1.80	11.14	6.73	.060	.040	.050	.000	3006.00	378.70
.009660	200.	210.	220.	20	12	0	.00	243.30	622.00

FLOW DISTRIBUTION FOR SECNO= 190.00 CWSEL= 3012.82

STA	379.	484.	519.	530.	540.	571.	581.	622.
PER Q=	2.7	53.9	3.3	4.1	30.8	3.1	2.1	
AREA=	61.0	195.6	26.0	28.2	149.3	24.2	33.5	
VEL=	1.8	11.1	5.2	5.9	8.3	5.2	2.5	

SECNO 200.000
 328 CROSS SECTION 200.00 EXTENDED .04 FEET

330 HV CHANGED MORE THAN HVINS

685 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 72 CRITICAL DEPTH ASSUMED

200.00	8.04	3014.04	3014.04	.00	3015.97	1.92	1.28	-.03	3010.00
4139.	1271.	2685.	183.	190.	207.	33.	404.	206.	3010.00
.37	6.68	12.95	5.53	.055	.040	.045	.000	3006.00	209.89
.0359	110.	120.	140.	20	11	0	.00	130.11	340.00

FLOW DISTRIBUTION FOR SECNO= 200.00 CWSEL= 3014.04

STA=	210.	220.	262.	293.	300.	310.	340.
P Q=	2.1	28.6	64.9	3.5	.9	.0	
AREA=	20.4	169.8	207.3	21.3	10.4	1.3	
VEL=	4.2	7.0	13.0	6.9	3.4	.4	

149 NH CARD USED

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SI 40 210.000

265 DIVIDED FLOW

221 CROSS SECTION 210.00 EXTENDED 1.04 FEET

330 HV CHANGED MORE THAN HVINS

210.00	8.04	3016.04	.00	.00	3016.43	.39	.31	.15	3010.00
.252.	2023.	1547.	682.	533.	222.	287.	405.	206.	3014.00
.37	3.80	6.96	2.38	.045	.035	.045	.000	3008.00	88.34
.002267	70.	90.	110.	4	0	0	.00	350.97	480.00

FLOW DISTRIBUTION FOR SECNO= 210.00 CWSEL= 3016.04

STA	88.	170.	198.	254.	276.	291.	324.	418.	480.
PER Q=	3.3	6.6	21.2	8.3	8.2	36.4	11.4	4.6	
AREA=	57.5	85.1	226.1	88.8	75.6	222.2	191.6	95.3	
DEL=	2.4	3.3	4.0	4.0	4.6	7.0	2.5	2.1	

SECNO 220.000

326 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

369 PROBABLE MINIMUM SPECIFIC ENERGY

372 CRITICAL DEPTH ASSUMED

220.00	5.93	3015.93	3015.93	.00	3016.74	.81	.36	-.10	3014.00
200.	881.	2993.	1327.	190.	334.	426.	406.	207.	3016.00
.38	4.64	8.95	3.12	.040	.035	.045	.000	3010.00	10.11
.006591	1.	70.	100.	20	13	0	.00	547.56	565.85

FLOW DISTRIBUTION FOR SECNO= 220.00 CWSEL= 3015.93

STA	10.	13.	110.	188.	410.	432.	566.
PER Q=	.1	16.8	57.5	10.4	11.1	4.1	
AREA=	2.8	187.0	334.3	206.2	138.8	80.8	
DEL=	2.6	4.7	9.0	2.6	4.2	2.6	

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 230.000
 3260 CROSS SECTION 230.00 EXTENDED .53 FEET

33 HV CHANGED MORE THAN HVINS

3645 20 TRIALS ATTEMPTED WSEL,CWSEL
 3646 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

230.00	8.53	3018.53	3018.53	.00	3020.14	1.61	.54	.07	3014.00
5200.	745.	4360.	95.	150.	399.	62.	408.	208.	3018.00
.38	4.96	10.92	1.52	.045	.035	.045	.000	3010.00	.00
.005642	30.	100.	150.	20	14	0	.00	278.29	278.29

FLOW DISTRIBUTION FOR SECNO= 230.00 CWSEL= 3018.53

ST :	0.	38.	47.	80.	141.	240.	278.
PER Q=	.6	.9	12.9	83.8	1.6	.2	
AREA=	20.1	13.8	116.4	399.2	52.3	10.1	
VEL=	1.6	3.2	5.7	10.9	1.6	1.0	

*SECNO 240.000
 3270 CROSS SECTION 240.00 EXTENDED 1.86 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3710 CRITICAL DEPTH ASSUMED

240.00	8.86	3020.86	3020.86	.00	3022.44	1.58	.60	.01	3018.00
5200.	497.	3994.	709.	118.	353.	200.	410.	209.	3018.00
.38	4.22	11.31	3.54	.045	.035	.045	.000	3012.00	.00
.05459	80.	110.	150.	20	8	0	.00	229.16	229.16

FL DISTRIBUTION FOR SECNO= 240.00 CWSEL= 3020.86

STA=	0.	50.	99.	200.	229.
R Q=	9.6	76.8	13.3	.3	
AREA=	117.9	353.0	187.6	12.5	
VEL=	4.2	11.3	3.7	1.4	

*S NO 250.000
 3685 20 TRIALS ATTEMPTED WSEL,CWSEL

NO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
PE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

93 PROBABLE MINIMUM SPECIFIC ENERGY

20 CRITICAL DEPTH ASSUMED

250.00	10.55	3022.55	3022.55	.00	3024.32	1.77	.55	.03	3020.00
200.	48.	4581.	571.	19.	405.	186.	411.	209.	3020.00
.38	2.58	11.32	3.07	.045	.035	.045	.000	3012.00	43.48
.005042	120.	110.	100.	20	8	0	.00	214.73	258.21

LOW DISTRIBUTION FOR SECNO= 250.00 CWSEL= 3022.55

TA=	43.	60.	69.	121.	237.	258.
PE Q=	.1	.8	88.1	10.9	.1	
AREA=	4.6	14.0	404.6	179.9	5.8	
WCL=	1.0	3.1	11.3	3.1	1.0	

SECNO 260.000

65 DIVIDED FLOW

260.00	7.57	3023.57	.00	.00	3024.90	1.32	.53	.04	3026.00
200.	0.	5069.	131.	0.	542.	68.	413.	210.	3022.00
.39	.00	9.35	1.91	.045	.035	.045	.000	3016.00	39.41
.004679	120.	110.	100.	3	0	0	.00	178.77	387.67

LOW DISTRIBUTION FOR SECNO= 260.00 CWSEL= 3023.57

TA=	39.	131.	179.	280.	290.	370.	388.
PE Q=	97.5	1.4	.2	.3	.2	.5	
AREA=	542.1	37.6	4.3	8.0	4.6	13.9	
WCL=	9.4	1.9	1.9	1.9	1.9	1.9	

SECNO 270.000

85 TRIALS ATTEMPTED WSEL,CWSEL

93 PROBABLE MINIMUM SPECIFIC ENERGY

20 CRITICAL DEPTH ASSUMED

270.00	7.58	3027.58	3027.58	.00	3028.60	1.02	1.46	-.31	3028.00
200.	0.	2962.	2238.	0.	297.	486.	415.	211.	3026.00
.39	.00	9.97	4.61	.055	.039	.045	.000	3020.00	62.68
.008823	180.	170.	150.	20	5	0	.00	345.79	408.47

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TYPE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SHAPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

LOW DISTRIBUTION FOR SECNO= 290.00 CWSEL= 3035.58

TA=	97.	114.	175.	223.	280.	300.
PE Q=	6.5	64.3	19.2	6.2	3.8	
A.A=	46.7	280.5	133.5	57.7	36.1	
VEL=	7.2	11.9	7.5	5.6	5.5	

SEC 300.000

65 DIVIDED FLOW

85 20 TRIALS ATTEMPTED WSEL,CWSEL

93 PROBABLE MINIMUM SPECIFIC ENERGY

20 CRITICAL DEPTH ASSUMED

1.00	5.80	3043.80	3043.80	.00	3045.34	1.53	3.40	-.19	3040.00
5200.	153.	3361.	1686.	25.	302.	229.	423.	213.	3040.00
.41	6.03	11.14	7.35	.045	.039	.045	.000	3038.00	41.69
.907	200.	220.	250.	20	8	0	.00	193.92	258.37

LOW DISTRIBUTION FOR SECNO= 300.00 CWSEL= 3043.80

TA=	42.	55.	135.	169.	230.	250.	258.
PE Q=	2.9	64.6	7.7	8.6	14.4	1.8	
A.A=	25.3	301.7	65.1	72.3	76.0	15.9	
VEL=	6.0	11.1	6.2	6.2	9.8	5.8	

SEC 310.000

85 20 TRIALS ATTEMPTED WSEL,CWSEL

93 PROBABLE MINIMUM SPECIFIC ENERGY

20 CRITICAL DEPTH ASSUMED

1.00	7.95	3051.95	3051.95	.00	3053.83	1.87	3.48	-.49	3050.00
5200.	40.	4988.	172.	10.	447.	32.	425.	214.	3050.00
.41	4.18	11.16	5.29	.050	.055	.040	.000	3044.00	40.23
.939	150.	160.	195.	20	11	0	.00	133.00	173.22

LOW DISTRIBUTION FOR SECNO= 310.00 CWSEL= 3051.95

TA=	40.	50.	140.	173.
PE Q=	.8	95.9	3.3	
A.A=	9.5	446.9	32.5	
VEL=	4.2	11.2	5.3	

CNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	QLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
OPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

SECNO 320.000

265 DIVIDED FLOW

18 MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

220.00	7.45	3067.45	3067.45	.00	3068.97	1.52	5.33	.42	3064.00
200.	1190.	3785.	225.	173.	350.	32.	428.	215.	3064.00
.42	6.87	10.80	7.11	.050	.055	.040	.000	3060.00	66.90
.018138	250.	300.	300.	18	8	0	.00	184.28	299.39

FLOW DISTRIBUTION FOR SECNO= 320.00 CWSEL= 3067.45

STA	67.	85.	93.	104.	134.	140.	209.	213.	281.	299.
PER Q=	.8	2.7	6.7	10.3	.3	.9	1.3	72.8	4.3	
AREA=	13.1	19.6	37.9	73.4	4.2	15.2	9.8	350.5	31.7	
EL=	3.2	7.1	9.1	7.3	3.2	3.2	6.7	10.8	7.1	

SECNO 330.000

330 HV CHANGED MORE THAN HVINS

368-20 TRIALS ATTEMPTED WSEL,CWSEL

369 PROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

330.00	8.55	3074.55	3074.55	.00	3077.20	2.65	3.52	-.05	3070.00
200.	217.	4716.	267.	33.	350.	31.	430.	215.	3070.00
.43	6.66	13.49	8.57	.055	.055	.040	.000	3066.00	82.95
.019047	210.	180.	200.	20	8	0	.00	80.71	163.66

FLOW DISTRIBUTION FOR SECNO= 330.00 CWSEL= 3074.55

STA	83.	86.	95.	100.	150.	164.
FLK Q=	.0	1.3	2.8	90.7	5.1	
AREA=	.8	14.0	17.8	349.7	31.1	
EL=	1.6	4.9	8.3	13.5	8.6	

SECNO 340.000

330 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TI	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SL E	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

85 TRIALS ATTEMPTED WSEL,CWSEL
 93 PROBABLE MINIMUM SPECIFIC ENERGY
 20 CRITICAL DEPTH ASSUMED

34.00	7.83	3083.83	3083.83	.00	3085.96	2.13	3.81	.39	3080.00
5.00	66.	3729.	1405.	14.	304.	135.	432.	216.	3078.00
.43	4.84	12.25	10.43	.055	.055	.040	.000	3076.00	28.82
.0137	245.	240.	235.	20	11	0	.00	109.24	138.06

LOW DISTRIBUTION FOR SECNO= 340.00 CWSEL= 3083.83

A=	29.	36.	80.	95.	107.	138.
PER Q=	1.3	71.7	18.5	6.1	2.4	
AF =	13.7	304.4	72.4	33.9	28.4	
V =	4.8	12.3	13.3	9.3	4.4	

THIS RUN EXECUTED 08-04-88

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985

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

SUTHERLAND WASH

SUMMARY PRINTOUT

SECNO	Q	10K*5	DEPTH	VL08	VR08	VCH	TOPWID
9.000	13700.00	59.96	5.76	7.90	4.77	10.56	417.11
* 10.000	13700.00	79.69	6.93	8.65	5.57	11.00	551.42
* 10.500	13700.00	113.55	4.06	8.46	.03	9.45	659.27
11.000	13700.00	104.53	6.85	7.61	1.41	5.18	770.74
* 12.000	13700.00	162.17	8.23	8.21	2.84	12.30	716.61
* 12.500	13700.00	104.82	4.44	8.77	5.13	9.90	660.56
* 13.000	13700.00	69.52	7.31	5.98	3.47	12.85	774.68
* 14.000	13700.00	47.40	6.99	4.64	5.38	12.14	899.33
* 15.000	13700.00	59.09	8.08	4.69	6.30	13.36	1223.44
* 16.000	13700.00	63.88	6.96	5.00	2.97	11.72	544.81
* 17.000	13700.00	72.65	6.67	5.79	4.51	12.18	600.55
* 18.000	13700.00	64.92	7.95	5.02	11.31	11.22	407.73
* 19.000	13700.00	52.64	6.93	4.99	4.12	11.99	806.43
* 20.000	13700.00	69.22	6.56	5.95	3.78	11.21	754.75
* 21.000	13700.00	134.20	4.50	6.59	6.97	10.18	1098.21
22.000	12800.00	96.99	4.89	2.59	5.98	10.20	1172.34
* 23.000	12800.00	99.99	5.12	8.32	5.55	11.68	1016.08

SECNO	Q	10K*S	DEPTH	VLOB	VR08	VCH	TOPWID
24.000	12800.00	81.08	3.90	4.31	4.38	10.90	1490.88
25.000	12800.00	84.00	3.98	5.68	5.57	10.33	633.30
26.000	12800.00	115.72	4.18	7.05	4.62	8.03	1513.30
27.000	12800.00	141.82	4.98	3.85	5.44	7.04	1680.50
28.000	12800.00	144.39	1.57	6.78	4.92	6.90	1715.37
29.000	12800.00	158.61	3.17	.00	5.74	4.85	1728.13
30.000	12800.00	143.66	2.15	3.21	5.47	6.47	2011.99
31.000	12800.00	147.34	4.22	.04	4.15	7.07	1814.53
32.000	12800.00	185.15	3.57	.00	5.34	6.88	1537.09
33.000	12800.00	178.39	5.05	.00	5.73	7.61	1137.47
34.000	12800.00	151.86	7.54	3.42	6.79	7.46	823.11
35.000	12800.00	52.57	7.33	4.50	5.30	12.92	394.57
36.000	12800.00	54.35	8.93	4.84	5.99	14.65	285.27
37.000	12800.00	42.89	10.02	4.72	5.47	14.93	251.88
38.000	12800.00	38.02	11.47	4.69	5.01	14.80	263.03
39.000	12800.00	29.63	9.03	4.53	3.87	11.64	228.19
40.000	12800.00	52.52	11.66	4.54	3.80	14.52	215.77
41.000	12800.00	46.69	11.80	6.89	1.88	11.77	176.39
42.000	12800.00	115.44	9.97	8.55	1.96	14.96	141.02
43.000	12800.00	115.17	9.75	6.90	5.92	15.08	155.18
16.000	3663.00	51.67	8.99	2.00	2.89	8.08	504.83
170.000	3663.00	159.57	7.80	.00	.00	12.06	69.01
80.000	3680.00	71.81	7.60	2.89	2.17	9.37	257.42
190.000	4045.00	96.60	6.82	1.80	6.73	11.14	243.30
200.000	4139.00	103.59	8.04	6.68	5.53	12.95	130.11
210.000	4252.00	22.67	8.04	3.80	2.38	6.96	350.97

SECNO	Q	10K*S	DEPTH	VLOB	VR08	VCH	TOPWID
20.000	5200.00	65.91	5.93	4.64	3.12	8.95	547.56
230.000	5200.00	56.42	8.53	4.96	1.52	10.92	278.29
40.000	5200.00	54.59	8.86	4.22	3.54	11.31	229.16
250.000	5200.00	50.42	10.55	2.58	3.07	11.32	214.73
60.000	5200.00	46.79	7.57	.00	1.91	9.35	178.77
70.000	5200.00	88.23	7.58	.00	4.61	9.97	345.79
280.000	5200.00	138.54	6.17	.00	7.25	11.30	132.42
90.000	5200.00	131.37	5.58	7.24	6.68	11.92	177.96
300.000	5200.00	149.07	5.80	6.03	7.35	11.14	193.92
110.000	5200.00	209.39	7.95	4.18	5.29	11.16	133.00
120.000	5200.00	181.38	7.45	6.87	7.11	10.80	184.28
330.000	5200.00	190.47	8.55	6.66	8.57	13.49	80.71
140.000	5200.00	159.37	7.83	4.84	10.43	12.25	109.24

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION	SECNO=	10.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	10.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	10.500	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	10.500	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
AUT	SECNO=	10.500	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	12.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	12.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	12.500	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	12.500	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
AUT	SECNO=	12.500	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	13.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	13.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	13.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	14.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	14.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	14.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	15.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	15.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	15.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	16.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	16.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
AUT	SECNO=	16.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	17.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	17.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
AUT	SECNO=	17.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	18.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	18.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	18.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	19.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
AUT	SECNO=	19.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	19.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	20.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	20.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	20.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	21.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	21.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	23.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	23.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY

CAUTION	SECNO=	24.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	24.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	25.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	25.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	26.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	26.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	30.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	30.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	30.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	31.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	31.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	35.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	35.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	35.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	36.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	36.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	36.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	37.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	37.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	37.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	38.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	38.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	38.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	40.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	40.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	40.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	42.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	42.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	43.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	43.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	43.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	-16.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	170.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	170.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	180.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	180.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	190.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	190.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 190.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 200.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 200.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 220.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 220.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 230.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 230.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 230.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 240.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 240.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 250.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 250.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 250.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 270.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 270.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 270.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 280.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 280.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 280.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 290.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 290.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 300.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 300.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 310.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 310.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 310.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 320.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 320.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 330.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 330.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 340.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

THIS RUN EXECUTED 08-04-88

HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985

 WATER SURFACE PROFILES *
 VISION OF NOVEMBER 1976 *
 UPDATED MAY 1984 *
 IBM-PC-XT VERSION AUGUST 1985 *
 RAN DATE 08-04-88 TIME 10:36:42 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * THE HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET, SUITE D *
 * DAVIS, CALIFORNIA 95616 *
 * (916) 440-2105 (FTS) 448-2105 *

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X   X XXXXXXX XXXXX          XXXXX
X   X X      X   X          X   X
X   X X      X              X
XXXXXXXX XXXX X              XXXXX
X   X X      X              X
X   X X      X   X          X
X   X XXXXXXX XXXXX          XXXXXXX
  
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STRIB100.HEC

Subcritical Tributary Profile (Golder Wash)
 100 year event
 Split Flow Run

THIS RUN EXECUTED 08-04-88

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*****
HI  RELEASE DATED NOV 76 UPDATED MAY 1984
EI  DR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
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SPLIT FLOW BEING PERFORMED

SPLIT FLOW CARDS FOR BREAKOUT FROM TRIBUTARY TO MAIN CHANNEL

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TN  NORMAL DEPTH APPROXIMATION METHOD UTILIZED CROSS-SECTION 170 TO 180
NS  2   170   180   -1   .045   .008
NG  0   3003   280   3008

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TN  NORMAL DEPTH METHOD FOR CROSS-SECTION 180 TO 190
NS  2   180   190   -1   .045   .008
NG  0   3008   220   3012

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TN  NORMAL DEPTH METHOD FOR CROSS-SECTION 190 TO 200
NS  2   190   200   -1   .045   .008
NG  0   3012   130   3014

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TN  NORMAL DEPTH METHOD FOR CROSS-SECTION 200 TO 210
NS  2   200   210   -1   .045   .008
NG  0   3014   100   3015

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TN  NORMAL DEPTH METHOD FOR CROSS-SECTION 210 TO 220
NS  2   210   220   -1   .045   .008
NG  0   3015   450  3015.5

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T1 MAIN TRIBUTARY FLOW PROFILES - 0-100
 T2 JON FULLER PERMITS AND COMPLIANCE SECTION, PCDOT+PCD
 T3 IN TRIBUTARY TO SUTHERLAND

J1	CHECK	INO	NINV	IDIR	STRT	METRIC	HVINS	0	WSEL	FO
	0.	2.	0.	0.	.010000	.00	.0	2992.	.000	.000
J2	PROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000
J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	50.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.040	.100	.300	.000	.000	.000	.000	.000
NH	4.000	.060	80.000	.050	312.000	.040	369.000	.045	760.000	.000
QT	1.000	5200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	160.000	22.000	312.000	369.000	.000	.000	.000	.000	.000	.000
GR	3010.000	.000	3000.000	54.000	2998.000	80.000	2996.000	125.000	2996.000	241.000
GR	2998.000	280.000	2998.000	312.000	2992.000	325.000	2990.000	336.000	2988.000	340.000
GR	2988.000	349.000	2990.000	351.000	2992.000	362.000	2996.000	369.000	2997.000	382.000
GR	2997.000	480.000	2996.000	500.000	2996.000	681.000	2994.000	690.000	2994.000	708.000
GR	2996.000	720.000	2997.000	760.000	.000	.000	.000	.000	.000	.000
NH	5.000	.060	68.000	.055	315.000	.045	470.000	.040	540.000	.045
NH	825.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	170.000	27.000	470.000	540.000	390.000	310.000	380.000	.000	.000	.000
GR	3020.000	.000	3010.000	68.000	3008.000	95.000	3006.000	105.000	3006.000	150.000
GR	3008.000	168.000	3010.000	180.000	3008.000	200.000	3010.000	212.000	3010.000	255.000
GR	3008.000	304.000	3006.000	315.000	3004.000	350.000	3002.000	380.000	3004.000	428.000
GR	3002.000	450.000	3004.000	454.000	3000.000	470.000	2992.000	489.000	2996.000	496.000
GR	2996.000	508.000	2992.000	520.000	3000.000	540.000	3004.000	548.000	3004.000	565.000
GR	3002.000	700.000	3003.000	825.000	.000	.000	.000	.000	.000	.000
NH	4.000	.060	81.000	.050	456.000	.040	525.000	.045	658.000	.000
X1	180.000	15.000	456.000	525.000	310.000	240.000	280.000	.000	.000	.000
GR	3030.000	.000	3020.000	81.000	3012.000	235.000	3010.000	320.000	3008.000	435.000
GR	3006.000	456.000	3004.000	462.000	3002.000	470.000	3001.000	483.000	3002.000	492.000
GR	3004.000	501.000	3006.000	525.000	3008.000	531.000	3008.000	610.000	3008.000	658.000
NH	3.000	.060	484.000	.040	519.000	.050	622.000	.000	.000	.000
X1	190.000	16.000	484.000	519.000	200.000	220.000	210.000	.000	.000	.000
GR	3030.000	.000	3020.000	155.000	3014.000	290.000	3012.000	440.000	3012.000	484.000
GR	3006.000	495.000	3006.000	509.000	3008.000	519.000	3010.000	522.000	3012.000	530.000
GR	3010.000	535.000	3008.000	540.000	3008.000	571.000	3010.000	574.000	3012.000	581.000
GR	3012.000	622.000	.000	.000	.000	.000	.000	.000	.000	.000

NC	.055	.045	.040	.000	.000	.000	.000	.000	.000	.000
X1	200.000	14.000	262.000	293.000	110.000	140.000	120.000	.000	.000	.000
GR	3020.000	.000	3018.000	79.000	3016.000	126.000	3018.000	135.000	3018.000	200.000
GR	3010.000	220.000	3010.000	262.000	3008.000	269.000	3006.000	278.000	3006.000	287.000
GR	3010.000	293.000	3012.000	300.000	3014.000	310.000	3014.000	340.000	.000	.000
NH	4.000	.060	140.000	.045	291.000	.035	324.000	.045	480.000	.000
X1	210.000	18.000	291.000	324.000	70.000	110.000	90.000	.000	.000	.000
GR	3020.000	.000	3018.000	54.000	3016.000	89.000	3016.000	99.000	3018.000	103.000
GR	3018.000	128.000	3016.000	140.000	3014.000	144.000	3014.000	170.000	3012.000	198.000
GR	3012.000	254.000	3012.000	276.000	3010.000	291.000	3008.000	295.000	3008.000	311.000
GR	3014.000	324.000	3014.000	418.000	3015.000	480.000	.000	.000	.000	.000
NC	.040	.045	.035	.000	.000	.000	.000	.000	.000	.000
X1	220.000	13.000	110.000	188.000	1.000	100.000	70.000	.000	.000	.000
GR	3018.000	.000	3016.000	10.000	3014.000	13.000	3014.000	110.000	3012.000	116.000
GR	3012.000	150.000	3010.000	160.000	3010.000	177.000	3012.000	181.000	3016.000	188.000
GR	3014.000	410.000	3014.000	482.000	3016.000	569.000	.000	.000	.000	.000
NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	230.000	10.000	80.000	141.000	30.000	150.000	100.000	.000	.000	.000
GR	3018.000	.000	3018.000	38.000	3016.000	47.000	3014.000	80.000	3012.000	92.000
GR	3010.000	101.000	3010.000	122.000	3018.000	141.000	3018.000	240.000	3020.000	385.000
X1	240.000	7.000	50.000	99.000	80.000	150.000	110.000	.000	.000	.000
GR	3019.000	.000	3018.000	50.000	3012.000	64.000	3012.000	86.000	3018.000	99.000
GR	3020.000	200.000	3022.000	268.000	.000	.000	.000	.000	.000	.000
X1	250.000	10.000	69.000	121.000	120.000	100.000	110.000	.000	.000	.000
GR	3024.000	.000	3022.000	60.000	3020.000	69.000	3016.000	79.000	3014.000	86.000
GR	3012.000	101.000	3012.000	109.000	3020.000	121.000	3022.000	237.000	3024.000	314.000
X1	260.000	16.000	30.000	131.000	120.000	100.000	110.000	.000	.000	.000
GR	3031.000	.000	3030.000	18.000	3026.000	30.000	3018.000	61.000	3016.000	70.000
GR	3016.000	118.000	3022.000	131.000	3024.000	192.000	3024.000	273.000	3022.000	280.000
GR	3024.000	293.000	3026.000	330.000	3026.000	355.000	3022.000	370.000	3026.000	415.000
GR	3030.000	430.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.055	.000	.039	.000	.000	.000	.000	.000	.000	.000
X1	270.000	11.000	62.000	124.000	180.000	150.000	170.000	.000	.000	.000
GR	3040.000	.000	3030.000	50.000	3028.000	62.000	3020.000	75.000	3022.000	100.000
GR	3026.000	124.000	3026.000	365.000	3024.000	380.000	3024.000	390.000	3026.000	399.000
GR	3030.000	423.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	280.000	21.000	22.000	130.000	180.000	100.000	150.000	.000	.000	.000
GR	3040.000	.000	3030.000	22.000	3026.000	33.000	3024.000	41.000	3023.000	56.000
GR	3024.000	75.000	3026.000	110.000	3028.000	122.000	3030.000	130.000	3032.000	145.000
GR	3030.000	159.000	3030.000	214.000	3032.000	265.000	3030.000	280.000	3026.000	290.000
GR	3026.000	305.000	3030.000	314.000	3032.000	322.000	3034.000	334.000	3034.000	364.000
GR	3036.000	380.000	.000	.000	.000	.000	.000	.000	.000	.000

NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	290.000	14.000	114.000	175.000	200.000	170.000	190.000	.000	.000	.000
GR	3050.000	.000	3040.000	20.000	3038.000	35.000	3036.000	45.000	3036.000	96.000
GR	3030.000	114.000	3030.000	130.000	3034.000	150.000	3030.000	160.000	3030.000	175.000
GR	3037.000	235.000	3032.000	280.000	3040.000	325.000	3049.000	400.000	.000	.000

NC	.045	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	300.000	13.000	55.000	135.000	200.000	250.000	220.000	.000	.000	.000
GR	3060.000	.000	3050.000	20.000	3040.000	55.000	3038.000	60.000	3040.000	71.000
GR	3043.000	90.000	3040.000	104.000	3038.000	125.000	3040.000	135.000	3045.000	180.000
GR	3040.000	230.000	3040.000	250.000	3050.000	272.000	.000	.000	.000	.000

NC	.050	.040	.055	.000	.000	.000	.000	.000	.000	.000
X1	310.000	16.000	50.000	140.000	150.000	195.000	160.000	.000	.000	.000
GR	3060.000	.000	3050.000	50.000	3048.000	70.000	3046.000	76.000	3044.000	81.000
GR	3046.000	86.000	3048.000	100.000	3044.000	121.000	3050.000	140.000	3052.000	174.000
GR	3054.000	200.000	3052.000	221.000	3052.000	241.000	3054.000	251.000	3056.000	261.000
GR	3060.000	276.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	320.000	17.000	213.000	281.000	250.000	300.000	300.000	.000	.000	.000
GR	3090.000	.000	3070.000	51.000	3068.000	60.000	3066.000	85.000	3064.000	93.000
GR	3064.000	104.000	3066.000	134.000	3068.000	142.000	3068.000	180.000	3066.000	209.000
GR	3064.000	213.000	3062.000	226.000	3060.000	238.000	3062.000	250.000	3064.000	281.000
GR	3070.000	313.000	3080.000	340.000	.000	.000	.000	.000	.000	.000

NC	.055	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	330.000	13.000	100.000	150.000	210.000	200.000	180.000	.000	.000	.000
GR	3090.000	.000	3080.000	26.000	3078.000	52.000	3076.000	75.000	3074.000	86.000
GR	3072.000	95.000	3070.000	100.000	3066.000	120.000	3066.000	132.000	3068.000	140.000
GR	3070.000	150.000	3080.000	180.000	3086.000	190.000	.000	.000	.000	.000

X1	340.000	12.000	36.000	80.000	245.000	235.000	240.000	.000	.000	.000
GR	3100.000	.000	3090.000	15.000	3088.000	21.000	3080.000	36.000	3076.000	50.000
GR	3076.000	68.000	3078.000	80.000	3080.000	95.000	3082.000	107.000	3084.000	141.000
GR	3090.000	165.000	3099.000	195.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PROF 1

CHV .100 CEHV= .300

490 H CARD USED

SECNO 160.000

096 SEL NOT GIVEN,AVG OF MAX,MIN USED

265 DIVIDED FLOW

720 CRITICAL DEPTH ASSUMED

1.00	8.97	2996.97	2996.97	.00	2997.72	.75	.00	.00	2998.00
3663.	265.	2514.	885.	132.	307.	304.	0.	0.	2996.00
.00	2.00	8.18	2.91	.050	.040	.045	.000	2988.00	103.20
.0315	0.	0.	0.	0	21	0	.00	502.20	758.76

490 H CARD USED

SECNO 170.000

301 V CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

1.00	7.80	2999.80	2999.80	.00	3002.05	2.26	3.18	.45	3000.00
3663.	0.	3663.	0.	0.	304.	0.	4.	2.	3000.00
.01	.00	12.06	.00	.045	.040	.045	.000	2992.00	470.49
.0965	390.	380.	310.	4	15	0	.00	69.00	539.49

490 H CARD USED

SECNO 180.000

280 CROSS SECTION 180.00 EXTENDED .60 FEET

301 HV CHANGED MORE THAN HVINS

368 NO TRIALS ATTEMPTED WSEL,CWSEL

369 PROBABLE MINIMUM SPECIFIC ENERGY

720 CRITICAL DEPTH ASSUMED

1.00	7.60	3008.60	3008.60	.00	3009.85	1.26	2.88	.10	3006.00
381.	127.	3368.	186.	44.	359.	86.	7.	3.	3006.00
.02	2.89	9.38	2.17	.050	.040	.045	.000	3001.00	400.62
.07189	310.	280.	240.	20	8	0	.00	257.38	658.00

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	GLOB	QCH	GROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TI	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

190 ... CARD USED

SECNO 190.000

190 CROSS SECTION 190.00 EXTENDED .82 FEET

185 20 TRIALS ATTEMPTED WSEL,CWSEL

193 PROBABLE MINIMUM SPECIFIC ENERGY

190 CRITICAL DEPTH ASSUMED

190.00	6.82	3012.82	3012.82	.00	3014.16	1.34-	1.77	.03	3012.00
4045.	110.	2178.	1757.	61.	196.	261.	9.	4.	3008.00
.02	1.81	11.13	6.72	.060	.040	.050	.000	3006.00	378.62
.00 52	200.	210.	220.	20	12	0	.00	243.38	622.00

SECNO 200.000

200 CROSS SECTION 200.00 EXTENDED .05 FEET

201 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY

200 CRITICAL DEPTH ASSUMED

200.00	8.05	3014.05	3014.05	.00	3015.97	1.92	1.23	.17	3010.00
39.	1271.	2685.	183.	190.	207.	33.	11.	5.	3010.00
.03	6.68	12.95	5.52	.055	.040	.045	.000	3006.00	209.89
.010349	110.	120.	140.	6	11	0	.00	130.11	340.00

210 ... CARD USED

SECNO 210.000

265 DIVIDED FLOW

210 CROSS SECTION 210.00 EXTENDED 1.08 FEET

301 HV CHANGED MORE THAN HVINS

2 .00	8.08	3016.08	.00	.00	3016.46	.38	.34	.15	3010.00
4253.	2024.	1534.	695.	540.	224.	294.	12.	6.	3014.00
.03	3.75	6.86	2.37	.045	.035	.045	.000	3008.00	87.56
.0 181	70.	90.	110.	2	0	0	.00	352.09	480.00

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
T E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SEC 220.000
 3280 CROSS SECTION 220.00 EXTENDED .06 FEET

2	1.00	6.05	3016.05	.00	.00	3016.74	.69	.19	.09	3014.00
	5200.	900.	2880.	1420.	203.	344.	474.	13.	6.	3016.00
	.03	4.44	8.36	2.99	.040	.035	.045	.000	3010.00	9.72
	.0567	1.	70.	100.	4	0	0	.00	559.28	569.00

*SEC 230.000
 3280 CROSS SECTION 230.00 EXTENDED .53 FEET

330: IV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 369: PROBABLE MINIMUM SPECIFIC ENERGY
 372L CRITICAL DEPTH ASSUMED

230.00	8.53	3018.53	3018.53	.00	3020.14	1.61	.54	.27	3014.00
200.	745.	4359.	95.	150.	399.	62.	15.	7.	3018.00
.04	4.96	10.92	1.52	.045	.035	.045	.000	3010.00	.00
.005639	30.	100.	150.	20	14	0	.00	278.34	278.34

*SEC 240.000
 3280 CROSS SECTION 240.00 EXTENDED 1.86 FEET

368 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 372 CRITICAL DEPTH ASSUMED

0.00	8.86	3020.86	3020.86	.00	3022.44	1.58	.61	.00	3018.00
5200.	497.	3994.	709.	118.	353.	200.	17.	8.	3018.00
.04	4.22	11.31	3.54	.045	.035	.045	.000	3012.00	.00
.5458	80.	110.	150.	20	8	0	.00	229.17	229.17

*SEC 250.000
 368 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 372 CRITICAL DEPTH ASSUMED

0.00	10.55	3022.55	3022.55	.00	3024.32	1.77	.57	.06	3020.00
5200.	48.	4581.	571.	19.	405.	186.	19.	9.	3020.00
.04	2.57	11.32	3.07	.045	.035	.045	.000	3012.00	43.45
.5039	120.	110.	100.	20	8	0	.00	214.80	258.24

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
1E	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
1JPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SE 260.000

3265 DIVIDED FLOW

200.00	7.58	3023.58	.00	.00	3024.90	1.32	.53	.05	3026.00
5200.	0.	5067.	133.	0.	543.	69.	20.	9.	3022.00
.05	.00	9.33	1.92	.045	.035	.045	.000	3016.00	39.38
4655	120.	110.	100.	4	0	0	.00	179.29	387.77

*SE 270.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY

372 CRITICAL DEPTH ASSUMED

200.00	7.58	3027.58	3027.58	.00	3028.60	1.03	1.04	.03	3028.00
5200.	0.	2965.	2235.	0.	297.	485.	23.	10.	3026.00
.05	.00	9.99	4.61	.055	.039	.045	.000	3020.00	62.69
8858	180.	170.	150.	20	5	0	.00	345.76	408.45

*SE 280.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

368 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

0.00	6.17	3029.17	3029.17	.00	3031.03	1.87	1.50	.25	3030.00
5200.	0.	4683.	517.	0.	414.	71.	25.	11.	3030.00
.06	.00	11.30	7.26	.055	.039	.045	.000	3023.00	24.29
3870	180.	150.	100.	20	19	0	.00	132.40	312.12

*SE 290.000

3265 DIVIDED FLOW

368 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

164

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

90.00	5.57	3035.57	3035.57	.00	3037.26	1.69	2.53	.02	3030.00
5200.	338.	3347.	1514.	46.	280.	226.	27.	11.	3030.00
.06	7.28	11.97	6.70	.045	.039	.045	.000	3030.00	97.30
13296	200.	190.	170.	20	8	0	.00	177.60	300.07

*SECNO 300.000

3265 DIVIDED FLOW

36 20 TRIALS ATTEMPTED WSEL,CWSEL
 36 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

00.00	5.80	3043.80	3043.80	.00	3045.34	1.53	3.21	.02	3040.00
5200.	153.	3361.	1686.	25.	302.	229.	30.	12.	3040.00
.07	6.03	11.14	7.35	.045	.039	.045	.000	3038.00	41.69
14907	200.	220.	250.	20	8	0	.00	193.92	258.37

*SECNO 310.000

36 20 TRIALS ATTEMPTED WSEL,CWSEL
 36 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

10.00	7.95	3051.95	3051.95	.00	3053.83	1.87	2.91	.10	3050.00
5200.	40.	4988.	172.	10.	447.	32.	32.	13.	3050.00
.07	4.18	11.16	5.29	.050	.055	.040	.000	3044.00	40.23
20939	150.	160.	195.	20	11	0	.00	133.00	173.22

*SECNO 320.000

32 DIVIDED FLOW

36 20 TRIALS ATTEMPTED WSEL,CWSEL
 36 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

320.00	7.45	3067.45	3067.45	.00	3068.97	1.52	5.72	.04	3064.00
5200.	1190.	3785.	225.	173.	350.	32.	35.	14.	3064.00
.08	6.87	10.80	7.11	.050	.055	.040	.000	3060.00	66.90
018138	250.	300.	300.	20	8	0	.00	184.28	299.39

SECNO	DEPTH	CWSEL	CRINS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
IME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SE 10 330.000

301 HV CHANGED MORE THAN HVINS

68 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 72 CRITICAL DEPTH ASSUMED

0.00	8.55	3074.55	3074.55	.00	3077.20	2.65	3.44	.34	3070.00
5200.	217.	4716.	267.	33.	350.	31.	37.	15.	3070.00
.08	6.66	13.49	8.57	.055	.055	.040	.000	3066.00	82.95
9047	210.	180.	200.	20	8	0	.00	80.71	163.66

SE 10 340.000

301 HV CHANGED MORE THAN HVINS

68 20 TRIALS ATTEMPTED WSEL,CWSEL
 693 PROBABLE MINIMUM SPECIFIC ENERGY
 720 CRITICAL DEPTH ASSUMED

0.00	7.83	3083.83	3083.83	.00	3085.96	2.13	4.16	.05	3080.00
200.	66.	3729.	1405.	14.	304.	135.	40.	15.	3078.00
.09	4.84	12.25	10.43	.055	.055	.040	.000	3076.00	28.82
5937	245.	240.	235.	20	11	0	.00	109.24	138.06

TN NORMAL DEPTH APPROXIMATION METHOD UTILIZED CROSS-SECTION 170 TO 180

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
13.2	1.32	.60	.30	280.0	44.0

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
17.38	17.38	.01	17.38	17.38	.01	9	2999.796	3008.598	170.000	180.000

TN NORMAL DEPTH METHOD FOR CROSS-SECTION 180 TO 190

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
155.8	2.35	.82	.71	220.0	220.0

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
364.18	365.52	.37	381.56	382.90	.35	9	3008.598	3012.818	180.000	190.000

TN NORMAL DEPTH METHOD FOR CROSS-SECTION 190 TO 200

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
56.1	1.69	.82	.43	130.0	130.0

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
94.36	94.70	.36	475.92	477.60	.35	9	3012.818	3014.045	190.000	200.000

TN NORMAL DEPTH METHOD FOR CROSS-SECTION 200 TO 210

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH
56.4	2.02	1.08	.56	100.0	100.0

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
113.67	113.58	.09	589.59	591.17	.27	9	3014.045	3016.082	200.000	210.000

TN NORMAL DEPTH METHOD FOR CROSS-SECTION 210 TO 220

TOTAL AREA	AVG VELOCITY	MAX DEPTH	AVG DEPTH	TOF WIDTH	TOP WIDTH						
367.4	2.58	1.08	.82	450.0	450.0						
ASO	QCOMP	ERRAC	TASO	TCO	TABER	NITER	DSWS	USWS	DSSNO	USSNO	
947.08	947.85	.08	1536.67	1539.03	.15	9	3016.082	3016.051	210.000	220.000	

THIS RUN EXECUTED 08-04-88

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 DIFICATION - 50,51,52,53,54,55,56
 M-PC-XI VERSION AUGUST 1985

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

TRIBUTARY TO SUTHERLAND

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRINS	EG	10K*S	VCH	AREA	.01K
* 160.000	.00	.00	.00	2988.00	3663.33	2996.97	2996.97	2997.72	53.15	8.18	743.96	502.50
* 170.000	380.00	.00	.00	2992.00	3663.33	2999.80	2999.80	3002.05	159.65	12.06	303.80	289.92
* 180.000	280.00	.00	.00	3001.00	3680.71	3008.60	3008.60	3009.85	71.89	9.38	488.61	434.12
* 190.000	210.00	.00	.00	3006.00	4044.89	3012.82	3012.82	3014.16	96.52	11.13	518.06	411.73
* 200.000	120.00	.00	.00	3006.00	4139.25	3014.05	3014.05	3015.97	103.49	12.95	430.87	406.89
210.000	90.00	.00	.00	3008.00	4252.92	3016.08	.00	3016.46	21.81	6.86	1057.80	910.68
220.000	70.00	.00	.00	3010.00	5200.00	3016.05	.00	3016.74	55.47	8.36	1021.12	698.21
* 230.000	100.00	.00	.00	3010.00	5200.00	3018.53	3018.53	3020.14	56.39	10.92	612.05	692.49
* 240.000	110.00	.00	.00	3012.00	5200.00	3020.86	3020.86	3022.44	54.58	11.31	671.09	703.88
* 250.000	110.00	.00	.00	3012.00	5200.00	3022.55	3022.55	3024.32	50.39	11.32	609.09	732.53
260.000	110.00	.00	.00	3016.00	5200.00	3023.58	.00	3024.90	46.55	9.33	612.13	762.15
* 270.000	170.00	.00	.00	3020.00	5200.00	3027.58	3027.58	3028.60	88.58	9.99	781.60	552.50
* 280.000	150.00	.00	.00	3023.00	5200.00	3029.17	3029.17	3031.03	138.70	11.30	485.51	441.54
* 290.000	190.00	.00	.00	3030.00	5200.00	3035.57	3035.57	3037.26	132.96	11.97	552.00	450.97
* 300.000	220.00	.00	.00	3038.00	5200.00	3043.80	3043.80	3045.34	149.07	11.14	556.32	425.91
* 310.000	160.00	.00	.00	3044.00	5200.00	3051.95	3051.95	3053.83	209.39	11.16	488.91	359.36
* 320.000	300.00	.00	.00	3060.00	5200.00	3067.45	3067.45	3068.97	181.38	10.80	555.41	386.11

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*S	VCH	AREA	.01K
330.000	180.00	.00	.00	3066.00	5200.00	3074.55	3074.55	3077.20	190.47	13.49	413.40	376.78
340.000	240.00	.00	.00	3076.00	5200.00	3083.83	3083.83	3085.96	159.37	12.25	452.84	411.91

R UTARY TO SUTHERLAND

UARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
160.000	3663.33	2996.97	.00	.00	.00	502.20	.00
170.000	3663.33	2999.80	.00	2.83	.00	69.00	380.00
180.000	3680.71	3008.60	.00	8.80	.00	257.38	280.00
190.000	4044.89	3012.82	.00	4.22	.00	243.38	210.00
200.000	4139.25	3014.05	.00	1.23	.00	130.11	120.00
210.000	4252.92	3016.08	.00	2.04	.00	352.09	90.00
220.000	5200.00	3016.05	.00	-.03	.00	559.28	70.00
230.000	5200.00	3018.53	.00	2.48	.00	278.34	100.00
240.000	5200.00	3020.86	.00	2.33	.00	229.17	110.00
250.000	5200.00	3022.55	.00	1.69	.00	214.80	110.00
260.000	5200.00	3023.58	.00	1.02	.00	179.29	110.00
270.000	5200.00	3027.58	.00	4.00	.00	345.76	170.00
280.000	5200.00	3029.17	.00	1.59	.00	132.40	150.00
290.000	5200.00	3035.57	.00	6.40	.00	177.60	190.00
300.000	5200.00	3043.80	.00	8.24	.00	193.92	220.00
310.000	5200.00	3051.95	.00	8.15	.00	133.00	160.00
320.000	5200.00	3067.45	.00	15.49	.00	184.28	300.00
330.000	5200.00	3074.55	.00	7.11	.00	80.71	180.00
340.000	5200.00	3083.83	.00	9.27	.00	109.24	240.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION	SECNO=	160.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	170.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	170.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	180.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	180.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	180.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	190.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	190.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	190.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	200.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	200.000	PROFILE= 1	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	230.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	230.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	230.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	240.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	240.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	240.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	250.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	250.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	250.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	270.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	270.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	270.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	280.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	280.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	280.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	290.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	290.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	290.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	300.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	300.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	300.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	310.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	310.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	310.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	320.000	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	320.000	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	320.000	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL

AUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 330.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
AUTION SECNO= 330.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

AUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 340.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
AUTION SECNO= 340.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

THIS RUN EXECUTED 08-04-88

 HLL2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 HLL2-PC-XT VERSION AUGUST 1985

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Hydrologic and Hydraulic Report for Sutherland Wash North of the
Catalina State Park Boundary, Pima County, Arizona

INTRODUCTION:

This report summarizes the hydrologic and hydraulic conditions for a portion of Sutherland Wash between the western boundary line of the Coronado National Forest and the northern boundary of Catalina State Park. The project area is located in portions of sections 14 and 23 of Township 11 South, Range 14 East. The Sutherland Valley, as the study reach is called, is a broad, geologically-controlled floodplain which fans out between the narrow canyon reaches of the National Forest and the State Park. See figure 2.

At the present time, the Sutherland Valley is sparsely developed. Several homes have been built on the east side of the valley. Two homes exist in the valley itself. The floodplain of the Sutherland supports a dense mesquite bosque and grassland which has historically been used to graze cattle. The valley is traversed by two privately maintained dirt roads, Quarterhorse Place to the north, and an unnamed road to the south.

The Federal Insurance Rate Maps show the entire Sutherland Valley in Zone A (flood prone; flood depth unknown). See figure 3. This study attempts to quantify the depth and extent of flooding within the FIRM A Zone so that floodplain permits can be issued for development which meets local and federal restrictions.

METHODOLOGY:

Hydrology

Pima County has not, to date, officially adopted a regulatory discharge for Sutherland Wash. Therefore, a 100-year (1%) discharge of 13656 cfs, at the northern boundary of Catalina State Park, was determined using the procedures outlined in the Pima County Hydrology Manual. See Appendix 1 for data sheet. Because the watershed area of the Sutherland exceeds 10 square miles, the USDA Soil Conservation Service computer hydrologic routing model TR-20 was used to verify the discharges obtained using the Pima County method. The discharges obtained by both methods are summarized in Table 1 below.

Table 1. Peak Discharges for Sutherland Wash
METHOD

Recurrence Interval	Pima County		TR-20	
	1 hr. storm	1 hr. storm	24 hr. storm	6 hr. storm
1 HOUR STORM	At State Park Boundary - all values in cfs			
Q-2	904	1509	2170	1962
Q-10	4507	1752	3174	2552
Q-25	7315	-	-	-
Q-50	10349	-	-	-
Q-100	13656	12497	20642	17923
Q-500*	19550	-	-	-

* obtained by logarithmic extrapolation of lower recurrence interval peaks

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The TR-20 model generally predicts lower peak discharges than the Pima County method due to its channel routing capability and its ability to treat subwatersheds individually. However, it is important to note that TR-20 predicts much higher discharges when wet antecedent moisture conditions are specified. Values shown in Table 1 represent average antecedent moisture conditions. Because the time of concentration was significantly larger than one hour, TR-20 was used to simulate basin response to the 24 hour and the 6 hour storms. The dimensionless SCS Type IIA rainfall was used for the 6 and 24 hour durations. Due to the large size of the Sutherland Wash watershed, the 24- and the 6-hour storms may be more likely to cause floods than a 1-hour storm, particularly for low recurrence interval rainfall depths.

TR-20 has the capability to generate hydrographs at specified points within the watershed. This feature was used to determine the duration of flooding at the principal access route through the Sutherland Valley. The output from the TR-20 model can be found in Appendix 2.

Hydraulics-

Once peak discharges were established, flood water surface profiles for the 2, 10, 25, 50, 100, 500, 100(P=24 hr.), 100(P=6 hr.) year floods were determined using the Corps of Engineers computer model HEC-2. Profiles were determined for both subcritical and supercritical flow regimes. A split flow analysis was used to determine the amount of break-over flow from the major tributary (Golder Wash) into Sutherland Wash proper.

The HEC-2 results indicate that the Sutherland, within the study reach, flows close to critical depth. Flow can be considered to be transitional. Froude numbers are close enough to 1 that the formation of hydraulic jumps are unlikely. In keeping with FEMA standards, subcritical flow depths were used as regulatory flood depths. Copies of the HEC-2 output can be found in Appendix 3.

No regulatory floodway was mapped for the Sutherland Wash. In the broad floodplain area above Golder Residence Road, the wash behaves more like an active alluvial fan. Because of the main flow channel's tendency to migrate across the fan, a single defined floodway would not be meaningful. That is, after any given flow event, the main channel could have migrated entirely outside the floodway as defined at the time of mapping. A floodway encroachment was preformed for the defined reaches below Golder Residence Rd. but is not included as part of this report. The allowable encroachment was insignificant on the west overbank. As per FEMA requirements, if the width of the floodway fringe is not significant it is generally not mapped. The allowable encroachment on the east bank is complicated by breakout flow from Golder Wash, and thus does not strictly meet the criteria for the floodway fringe. Therefore, rather than map a floodway, depth and velocity of flow (depth x velocity squared), and the erosion hazard setback, should be used to establish areas within the floodplain acceptable for development.

RESULTS:

Floodplain delineation-

The floodplain of the Sutherland Wash is shown on figure 4. At the upstream end of the project reach at the mouth of the narrow canyon, flood flow rapidly changes from a deep, high velocity profile to that of wide, less deep, generally undefined flow. This pattern can be seen on the aerial photograph as the sandy (light-colored) wash in the confined reach disappears into a downwardly dendritic pattern with no significant continuous flow path. A quick field investigation further substantiates the calculated flow pattern, as the sediment sizes change from sand with cobbles and boulders in the confined reach to sandy silt in the broad floodplain.

The existing defined flow paths within the upstreammost part of the fan area would not be likely to be preserved in the event of a large flood. High velocity erosive flows coming out of the canyon would scour a new channel parallel to the exit flow direction, rather than make the 90 degree turn of the present channel configuration. Because of the potential to create a new channel during flooding, the unconfined reach downstream is mapped as an alluvial fan as per the FEMA Method. For this reason, finished floor elevations should be based on flood depths (depth in the migrating channel), rather than on the calculated water surface elevation as in the defined reaches downstream.

Further downstream, just below the unnamed dirt road, the Sutherland becomes better defined, although significant overbank flooding still occurs. However, the area above the regulatory water surface elevation of Sutherland Wash main channel is impacted by break-over flow from the Golder Wash tributary (figure 4), and thus the area is not entirely flood free. However, the depth of this break-over flow is less than 6 inches except in minor depressions where the flow depths may be up to 1 foot. Flood water from the main channel of the Sutherland does not break into Golder Wash.

Finally, just above Catalina State Park, flow from Golder Wash and Sutherland Wash join and enter the canyon reach within the state park. Flooding in this subreach is characterized by fast flowing channel flow and shallow overbank flow. Due to increased channel capacity and high velocity the potential for lateral bank erosion is high.

Geomorphology-

As a whole, Sutherland Wash is neither aggrading nor degrading. The wide reach is locally depositional due to the rapid expansion. As a result, local steepening or flattening occur as the low flow channel migrates across the fan apex. However, no long term slope adjustments are evident or likely. Bedrock acts as a grade control at both the upstream and downstream ends of the study reach, limiting the amount of degradation possible.

Golder Wash, the main tributary, has experienced some significant headcutting due to an unpermitted sand and gravel mining operation at the "elbow" where the tributary enters the Sutherland Valley. A 2 - 3 feet deep scour hole has developed downstream of the Golder Residence Road. The road crossing is threatened by the scour hole. A special erosion hazard setback should be enforced downstream of the gravel pit due to the potential for bank collapse from undercutting.

Analysis of aerial photographs dating back to the 1970's indicates that prior to the degradation of Golder Wash tributary, floods originating in the tributary watershed spread out over the Sutherland Valley in an alluvial fan pattern. The HEC-2 profile of the tributary (cross sections 200 - 340) show that a secondary channel could develop in the right overbank. This secondary channel would discharge directly west into the Sutherland valley at cross section 22 (see figure 4). Historic aerial photographs indicate that, at one time, this overflow path may have been a primary channel. Future development should account for the possibility of re-establishing the overflow channel during a large flood. Such a scenario would result in a third hazardous dip crossing for the homes on the north side of Golder Wash.

SAFETY OF ACCESS:

As stated in Pima County Floodplain Management Ordinance 1988-FC1, safety of access (all-weather access) is defined in terms of an access route that is suitable for ordinary and emergency vehicles (Article VII, section D.8). The Pima County Channel Design Standards Manual (p. VI-5) requires that for this classification of roadway, if public, the 10-year discharge be contained under the roadway, the 25-year discharge be less than a foot in a depth over the road, and the 100-year discharge be contained within the dip section.

While the access route to the east side of the Sutherland Wash is not a public maintained roadway, safety of access should be addressed for all new development in this area. The depth, width, and duration of flood flow over the roadway is summarized in Table 2. Note that for as small a flood as the 2-year event, access is denied. Also, because the road is a privately maintained dirt road, flood scour and rutting could disrupt access for much longer periods than the actual duration of the flood.

Table 2. Flow Characteristics at Golder Residence Road (cross section 21)

	Q-2	Q-10	Q-100	P-24	P-6
depth (ft.)	2.19	3.26	4.50	5.06	4.80
velocity (fps)	4.63	6.35	10.19	12.00	11.58
width (ft.)	396	682	1143	1147	1125
duration (hrs.)					
P-1	9.36	4.0+	4.8		
P-6	12.0+	6.0+			9.2
P-24	24.0+	24.0+		21.0	
duration of flow over (hrs.) 1 ft. deep	3.26	2.32	2.44	6.03	12.72
general scour (ft.)	0	0	0.89	1.69	1.47

It is important to note that because there are no structures along the access route, there is no way to tell what the depth of flow is during flooding. Also, because the east side of the Sutherland Wash is completely cut off by flooding there is no way to set up traffic barriers to prevent traffic from attempting to cross the floodplain. Further, since the roadway is constructed of silty soil, even during minor flooding, ordinary vehicles may become mired in the soft soil. Finally, the potential for scour during the regulatory flood further increases the flood hazard.

CASE STUDY--MONUMENT WASH:

This office has no data regarding specific instances of flooding on Sutherland Wash. However, case histories of a similar washes are available. Monument Wash drains a 11.63 square mile watershed on the far east side of Tucson. It is similar to the Sutherland Wash watershed in drainage area, slope soil type, elevation change, aspect, and time of concentration, except that the Sutherland watershed conditions generate slightly more severe conditions.

During the October, 1983 floods, Paul Williams, aged 24, tragically lost his life trying to ford Monument Wash at Speedway Boulevard. The dip crossing at Speedway is a paved dip 2.2 feet deep, 210 feet wide, with a 100-year discharge of 9495 cfs. Representatives of the Tanque Verde guest ranch stated that in 1983 Speedway Blvd. at Monument Wash was totally impassable: 9 days; passable by wading only: 16 days; passable by car, but through significant water: 47 days; roadway dry, but damaged by flooding: 150 days; for a total of 212 problem days during 1983.

By contrast, the access route through the Sutherland Valley is unpaved, with flows up to 4.5 feet deep, 1143 feet wide, with velocities up to 11.21 fps. The duration of flooding over 100 cfs is up to 27 hours (4.6 hours for Q-2). The drainage crossing over Golder Wash, which is entirely separate from the Sutherland crossing, is paved with loose chip seal, has an unprotected scour hole developing on the downstream side, and experiences depths of up to 7.6 feet, widths up to 257 feet, and velocities up to 9.4 feet/second. If the roadway fails flow would be up to 11.5 feet/second and 8 feet deep. Thus, flood conditions are worse than that of Monument Wash, and represent an even more uncontrolled access hazard than that which claimed the life of Paul Williams.

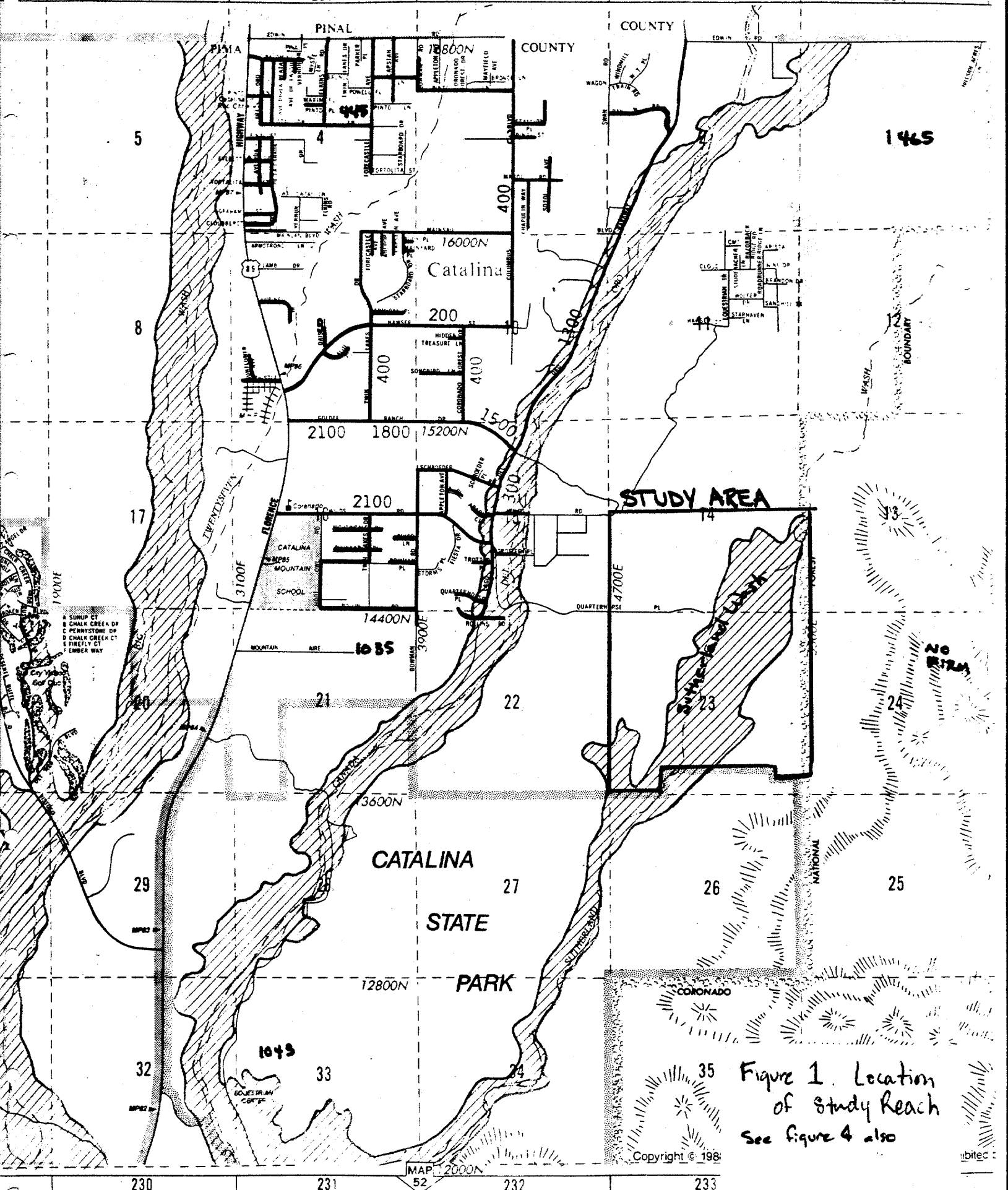
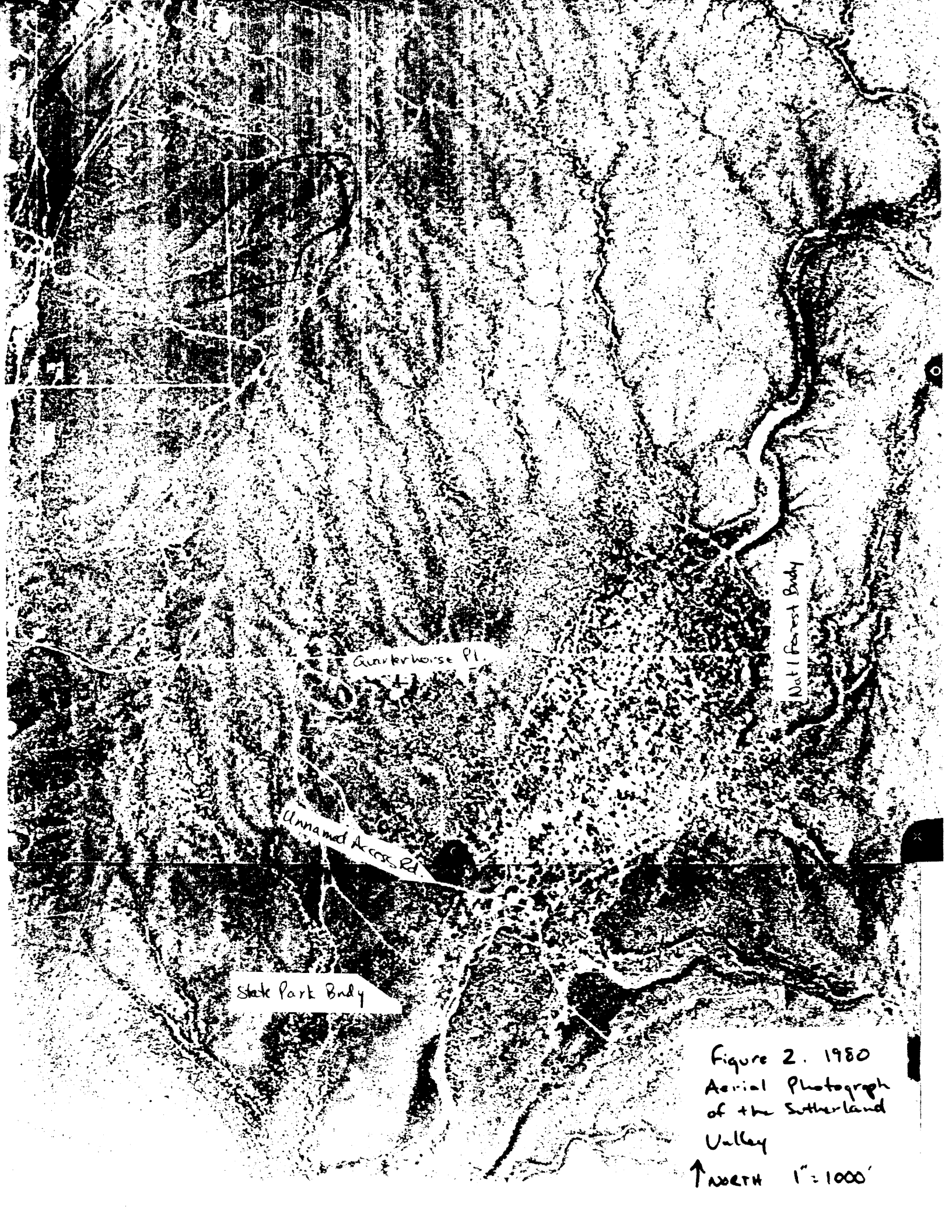


Figure 1. Location of study reach
See figure 4 also



Quarterhorse Pt.

Unnamed Access Rd.

State Park Body

Nat'l Forest Body

Figure 2. 1980
Aerial Photograph
of the Sutherland
Valley
↑ NORTH 1" = 1000'

FIRM
FLOOD INSURANCE RATE MAP

**PIMA COUNTY,
ARIZONA**
(UNINCORPORATED AREAS)

PANEL 1035 OF 4700
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
040073 1035 B

EFFECTIVE DATE:
FEBRUARY 15, 1983



Federal Emergency Management Agency



JOINS PANEL 1075

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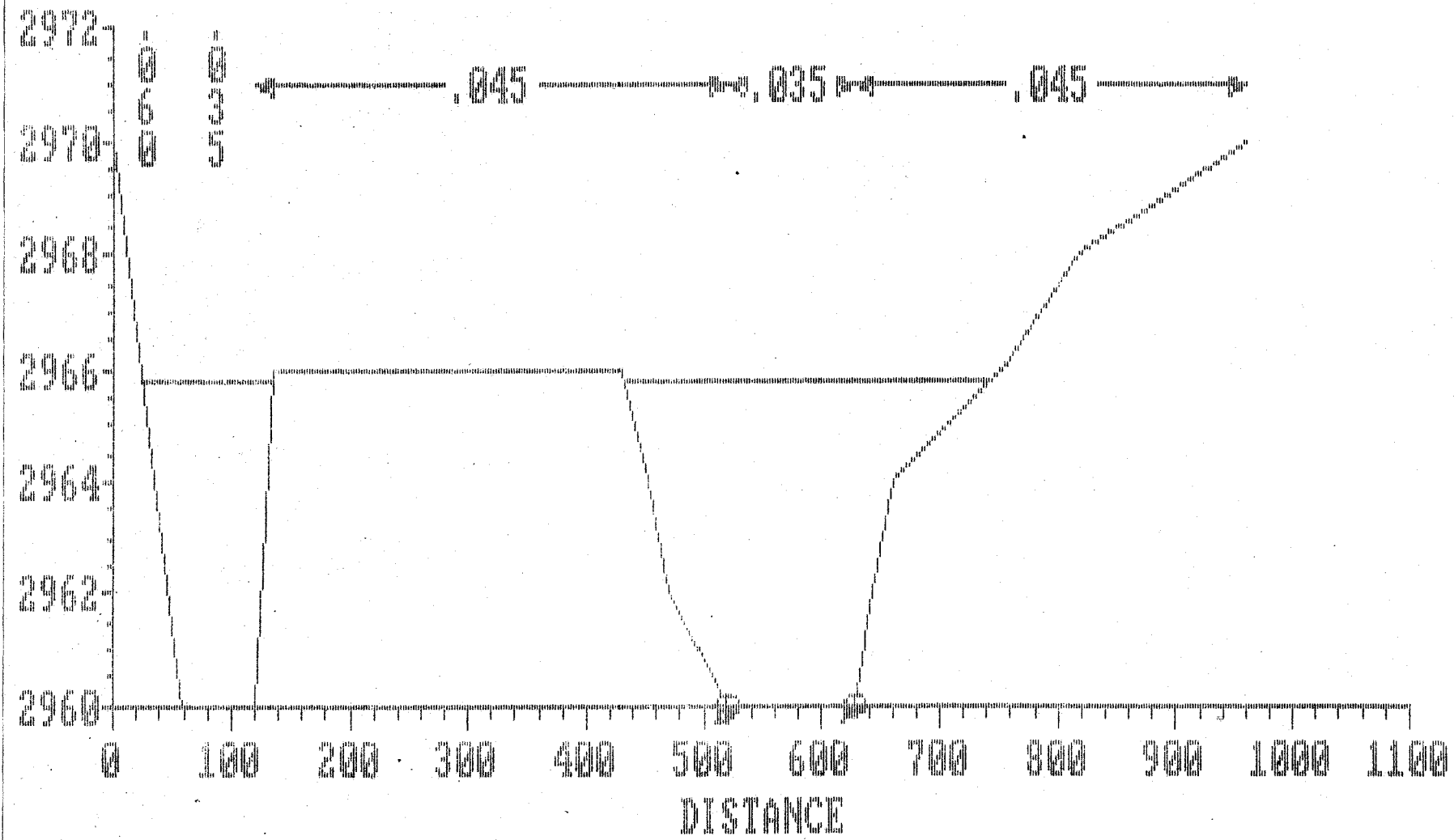
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Figure 3. FEMA
mapping of the
Sutherland Valley
Floodplain

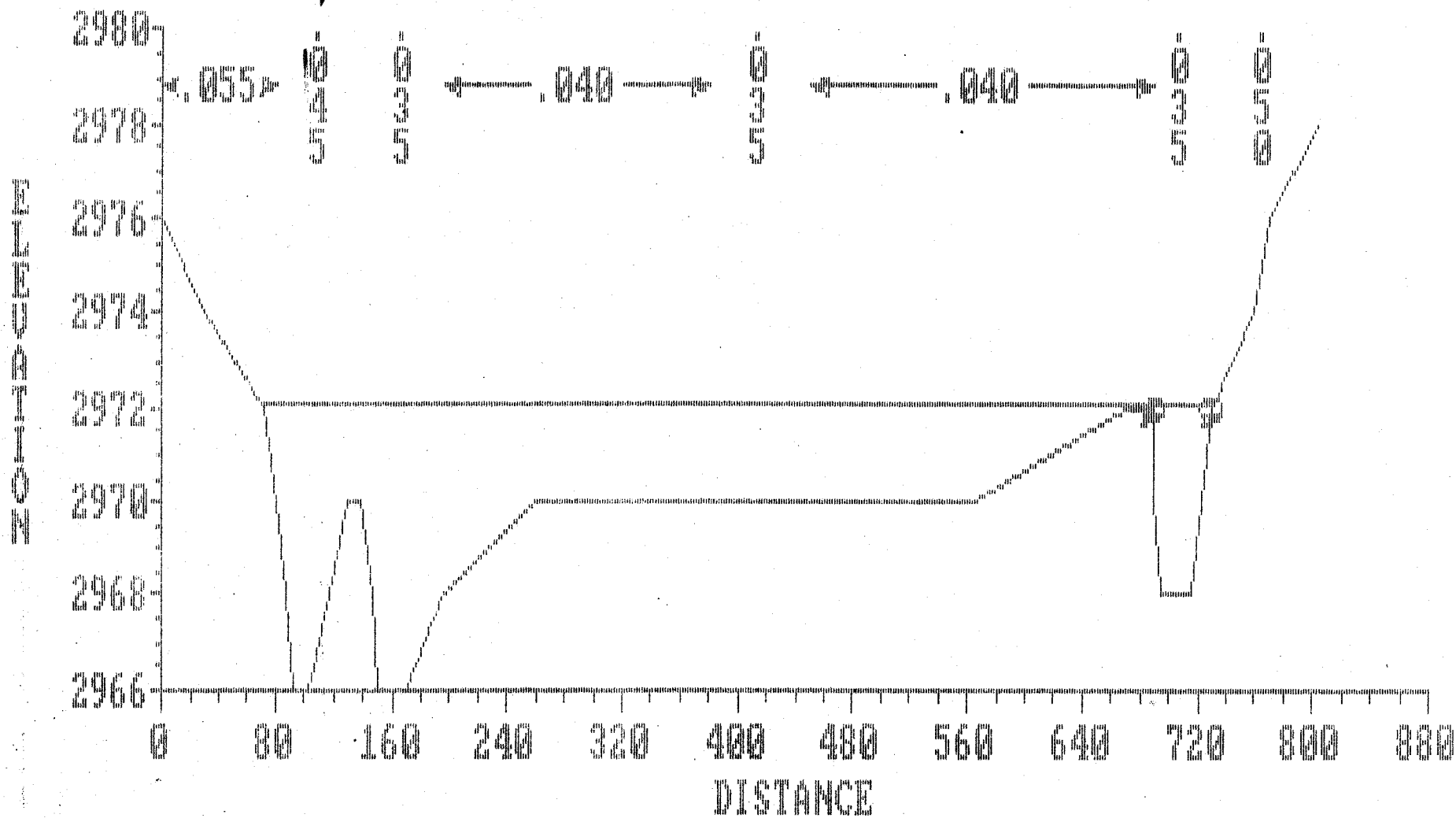
26

182

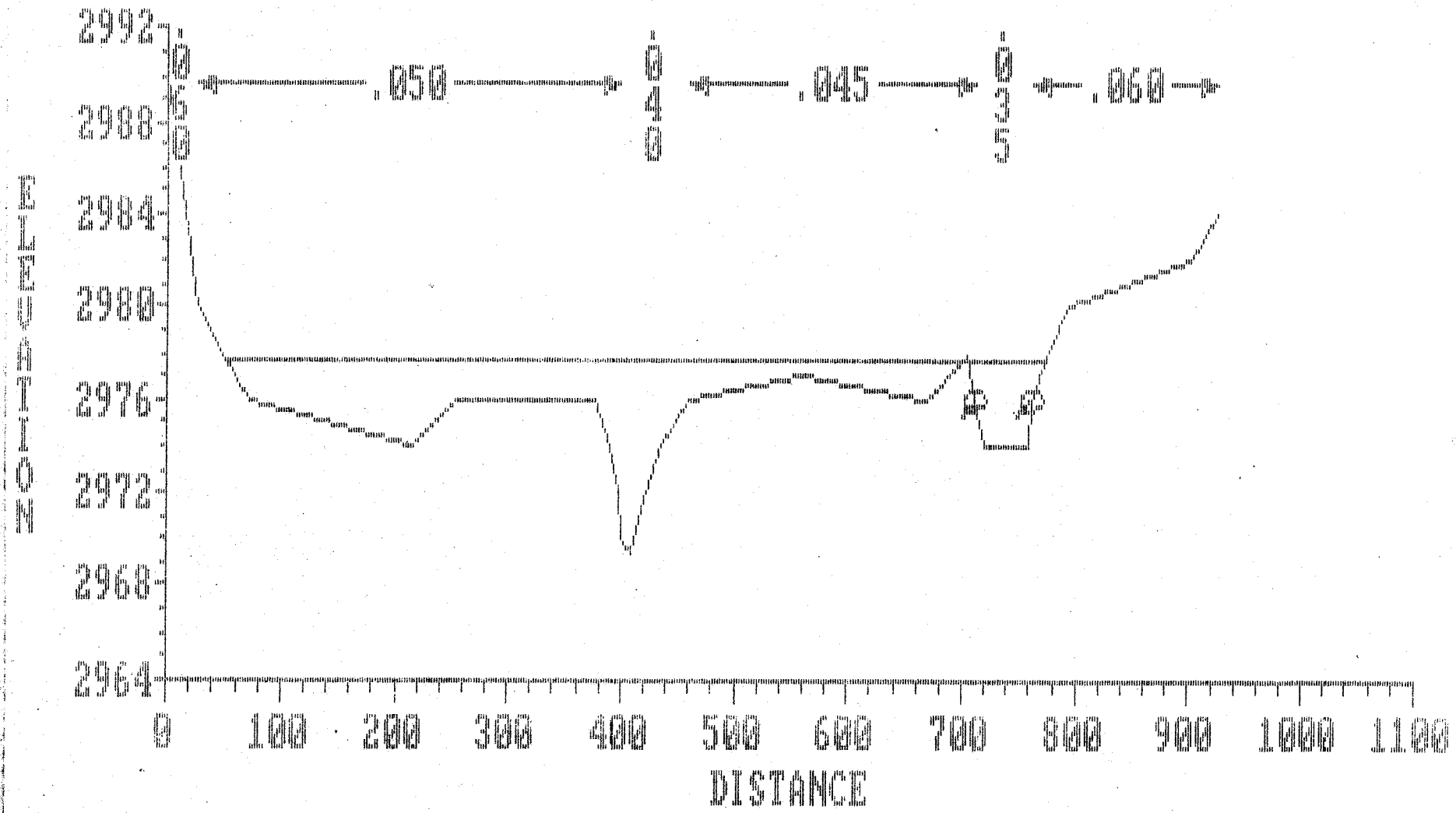
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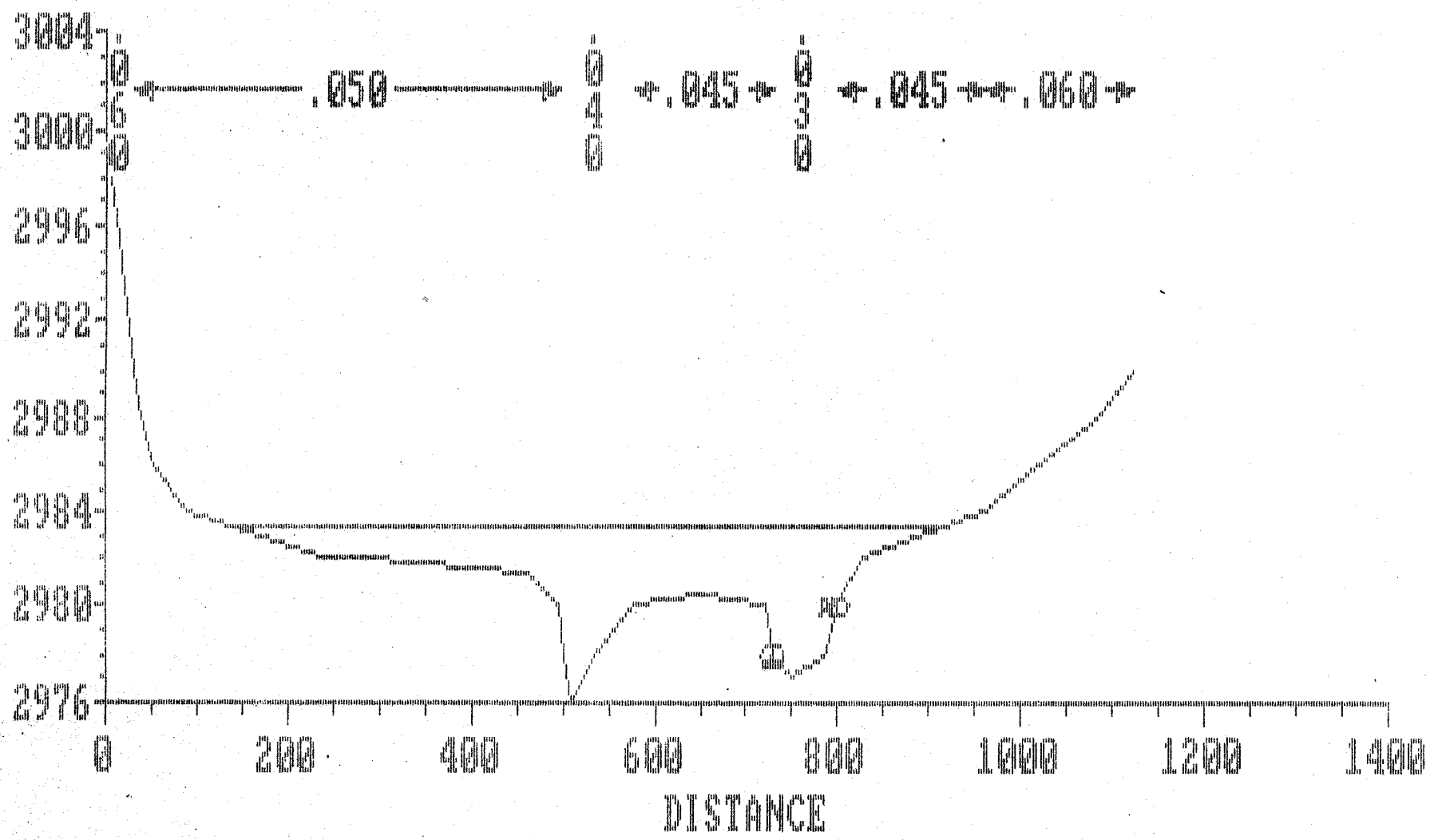
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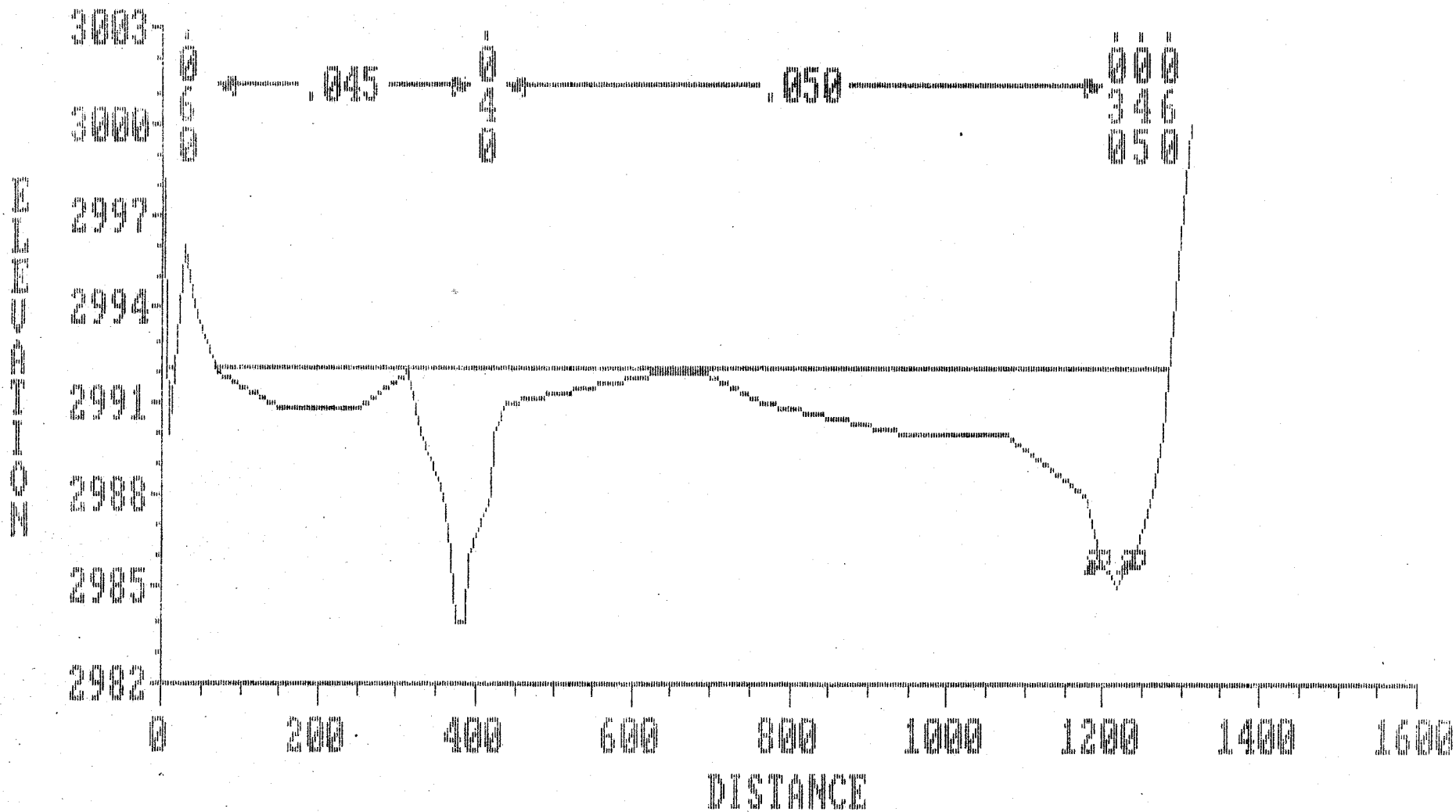
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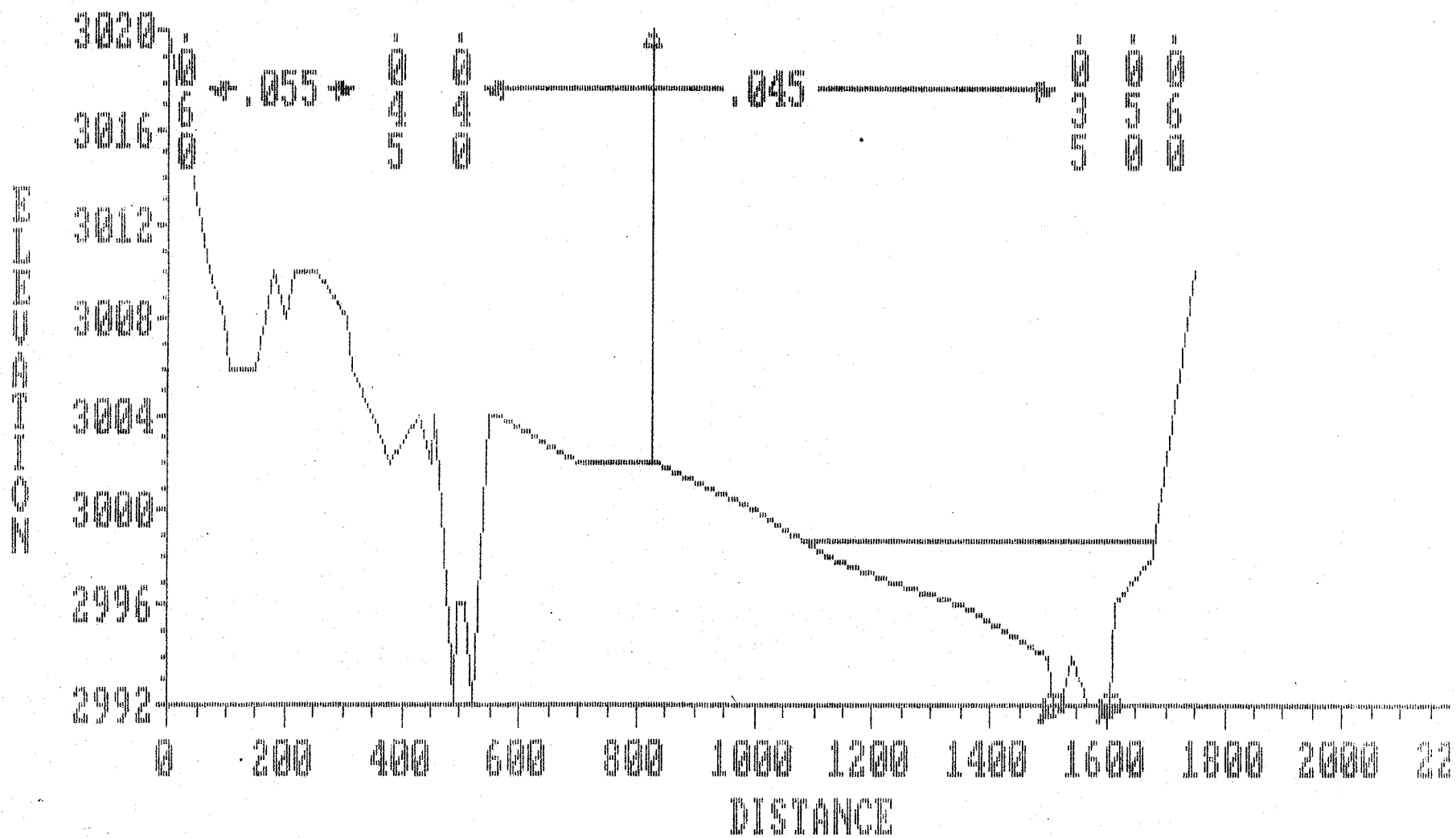
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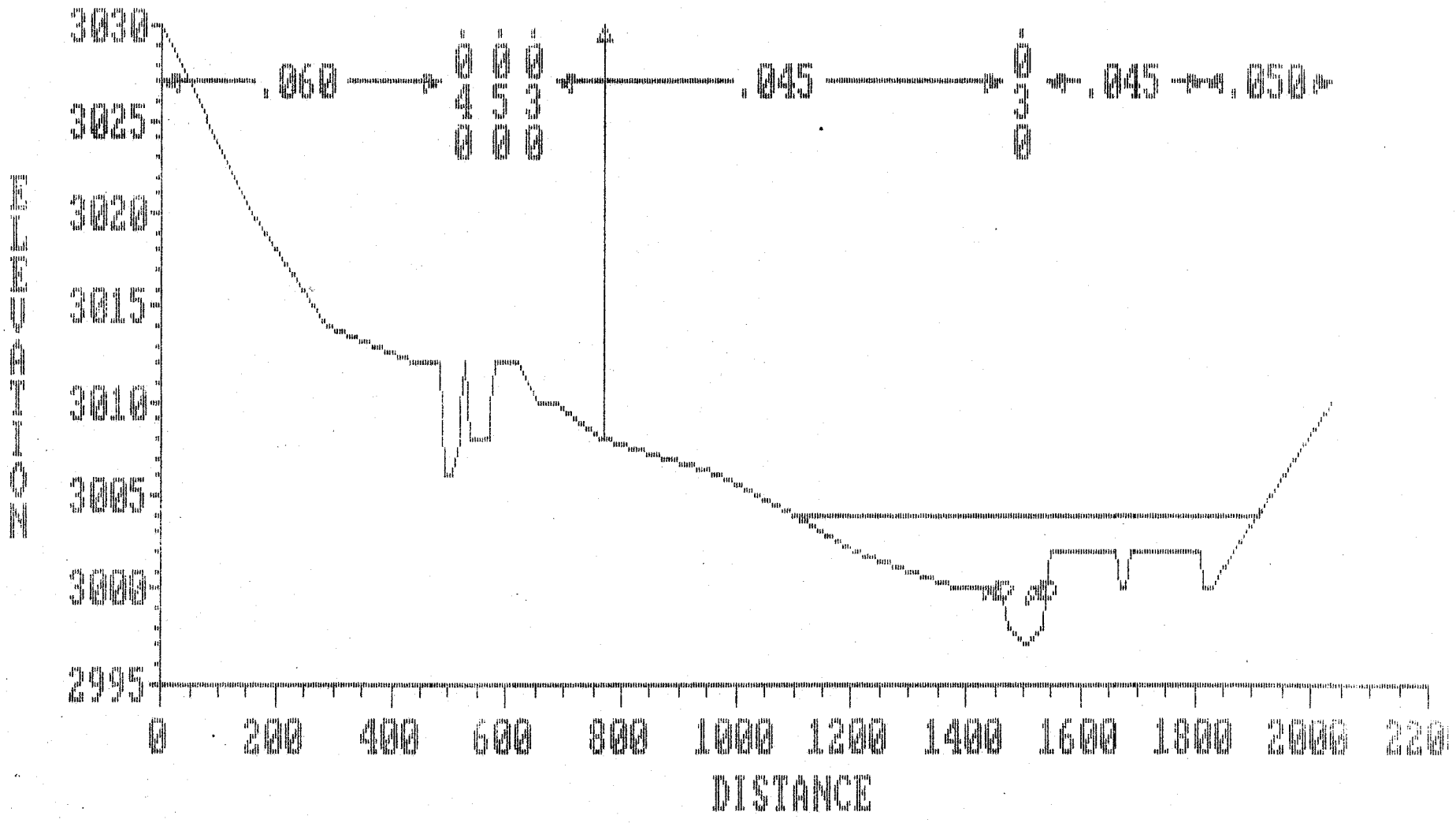
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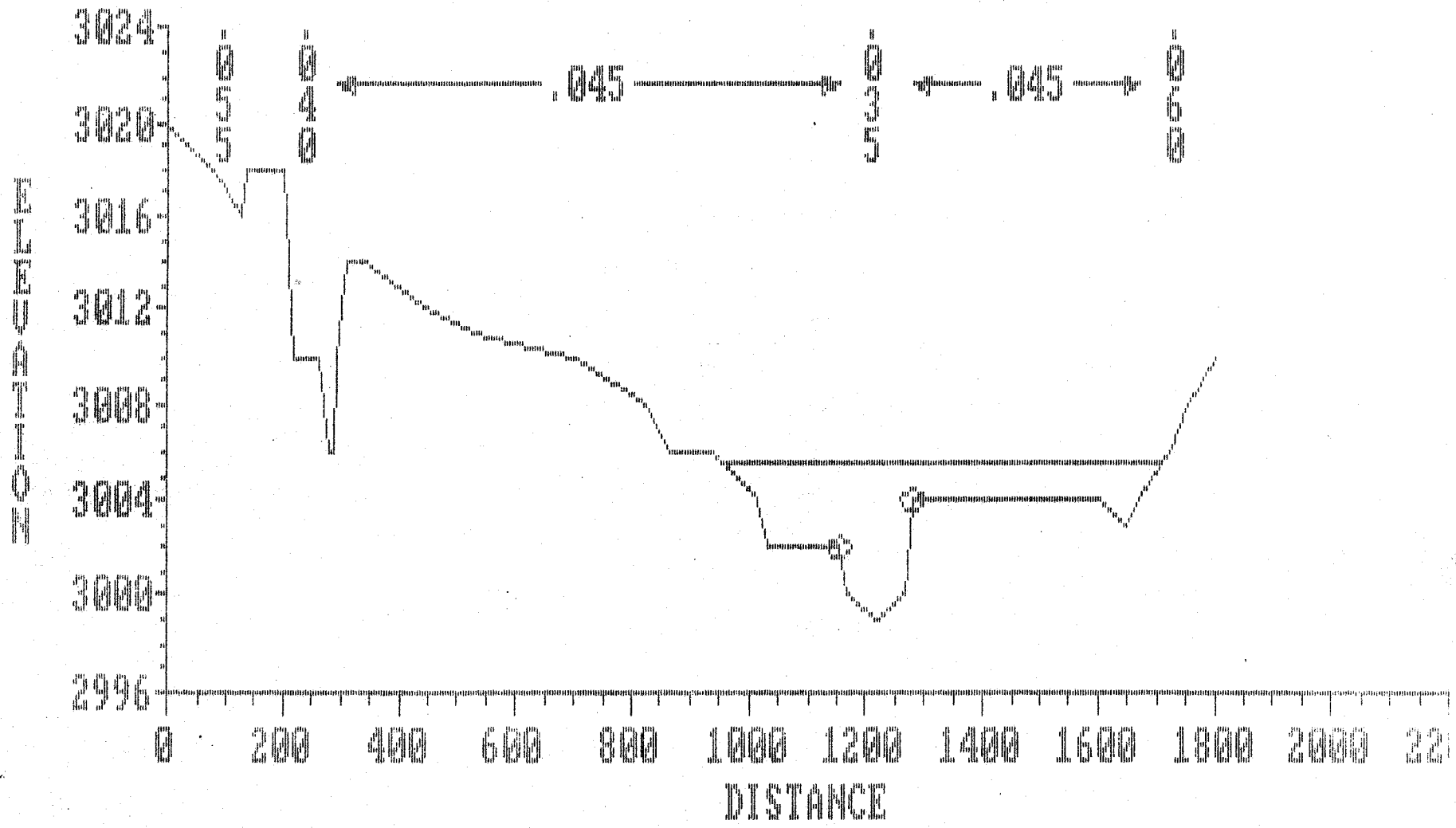
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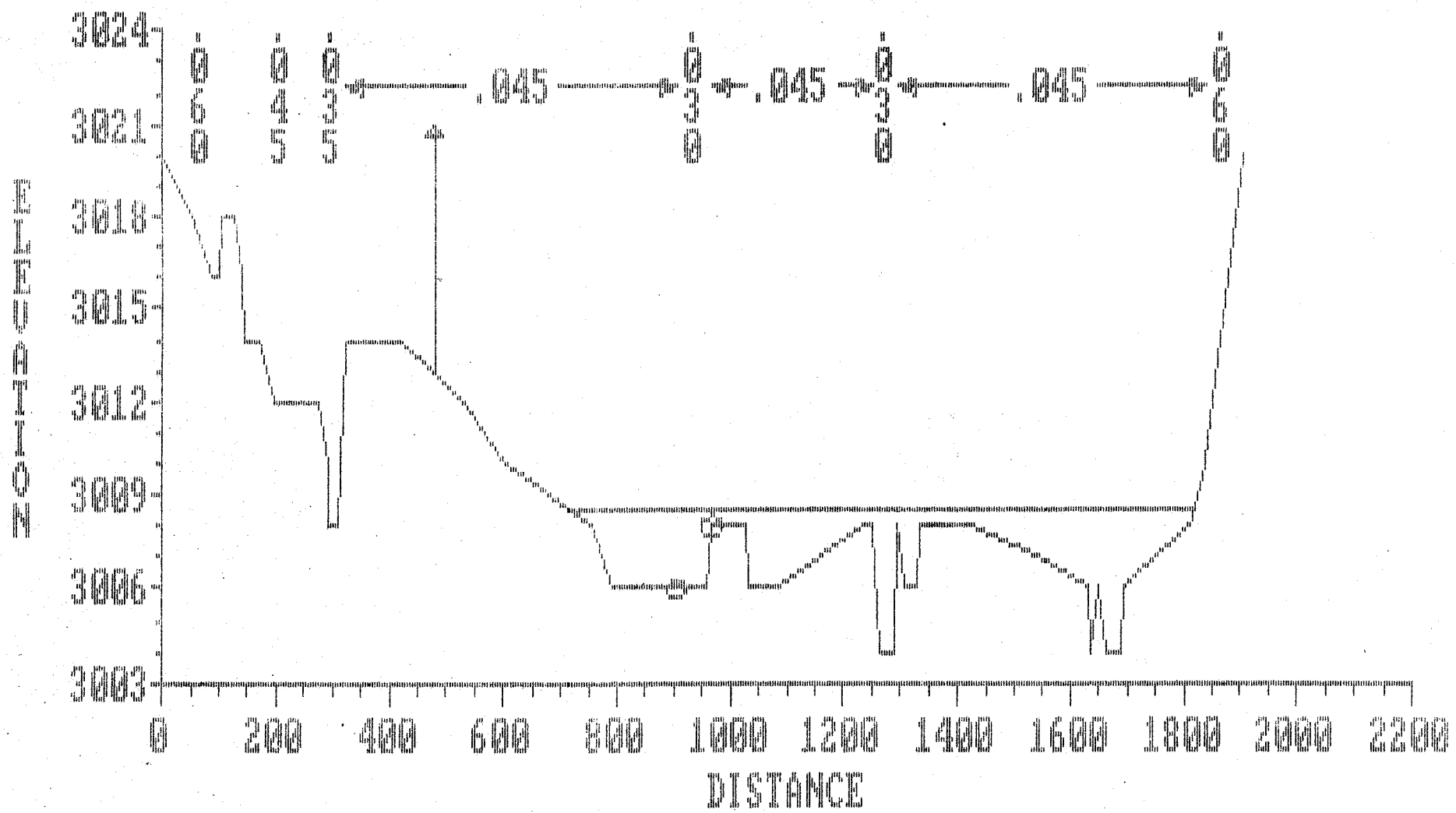
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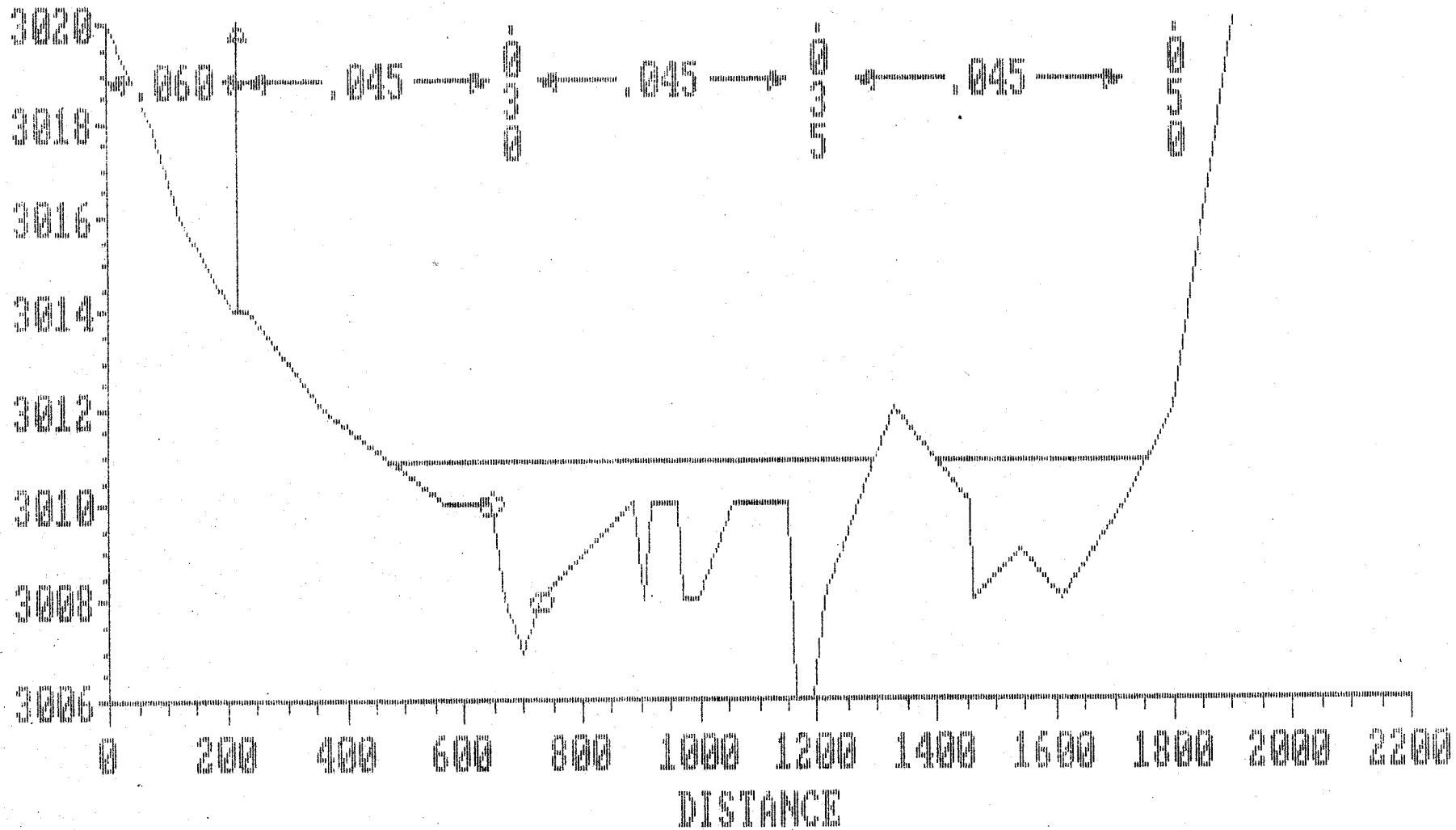
CROSS-SECTION NO. 20.000



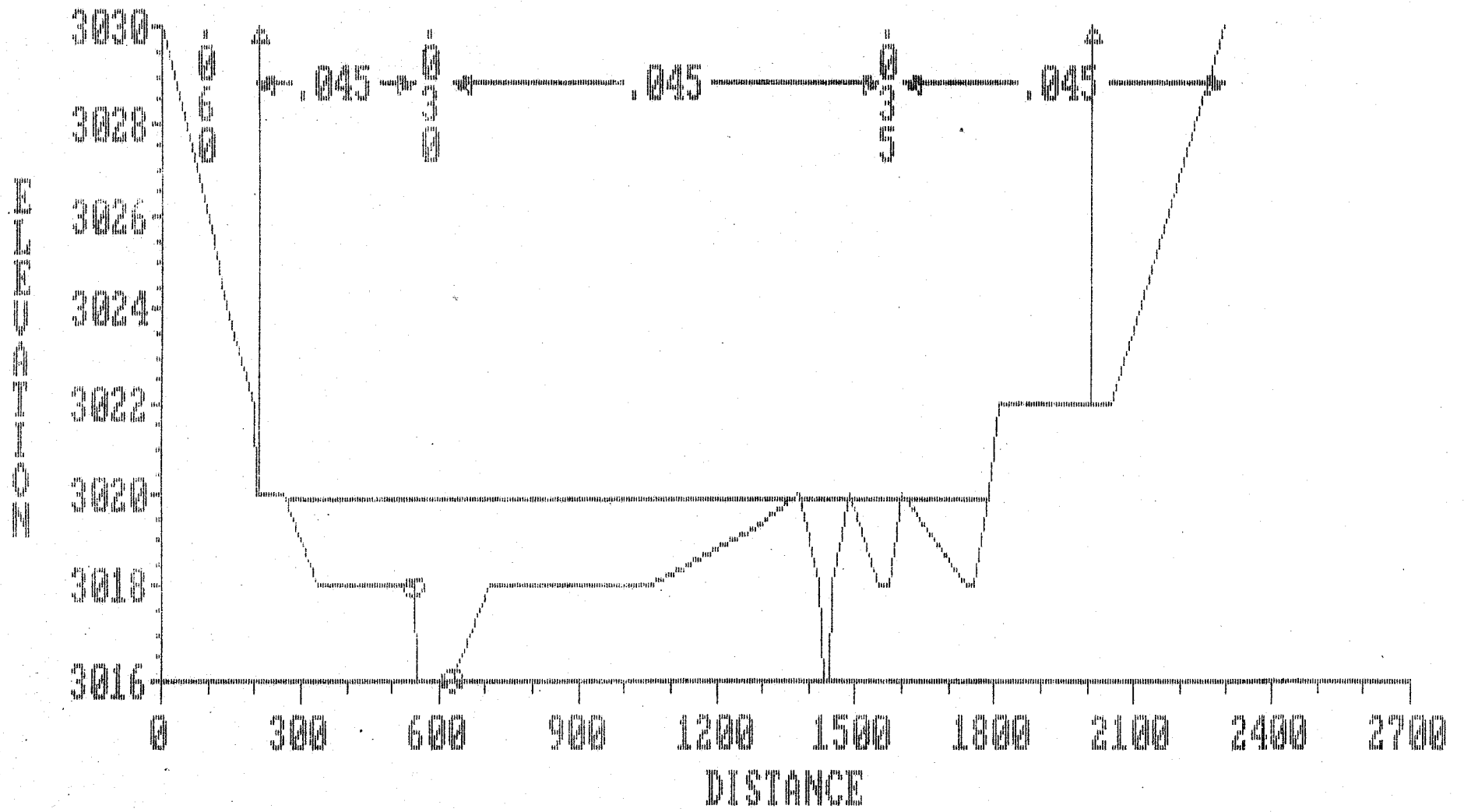
CROSS-SECTION NO. 21.000



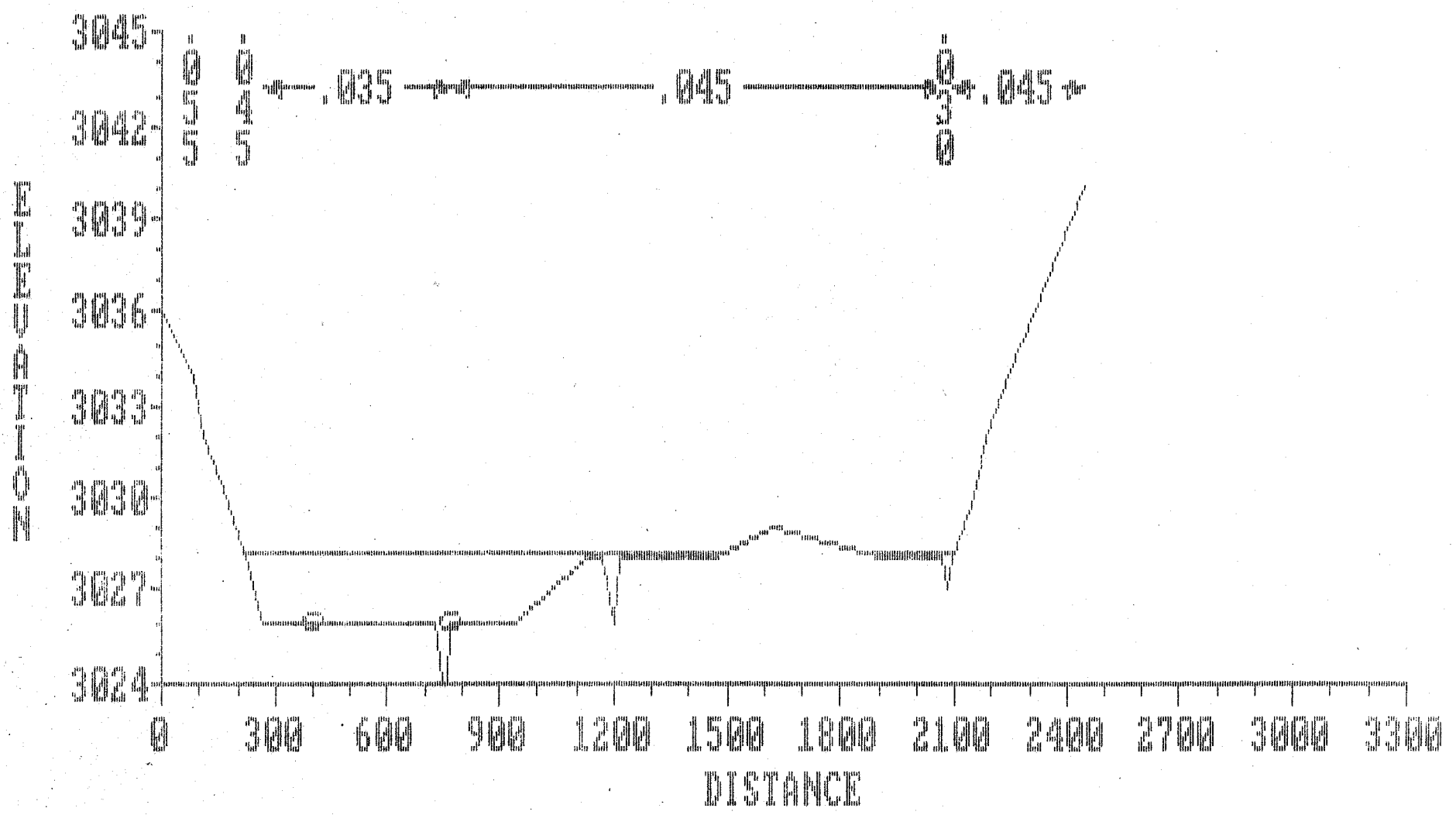
CROSS-SECTION NO. 22.000



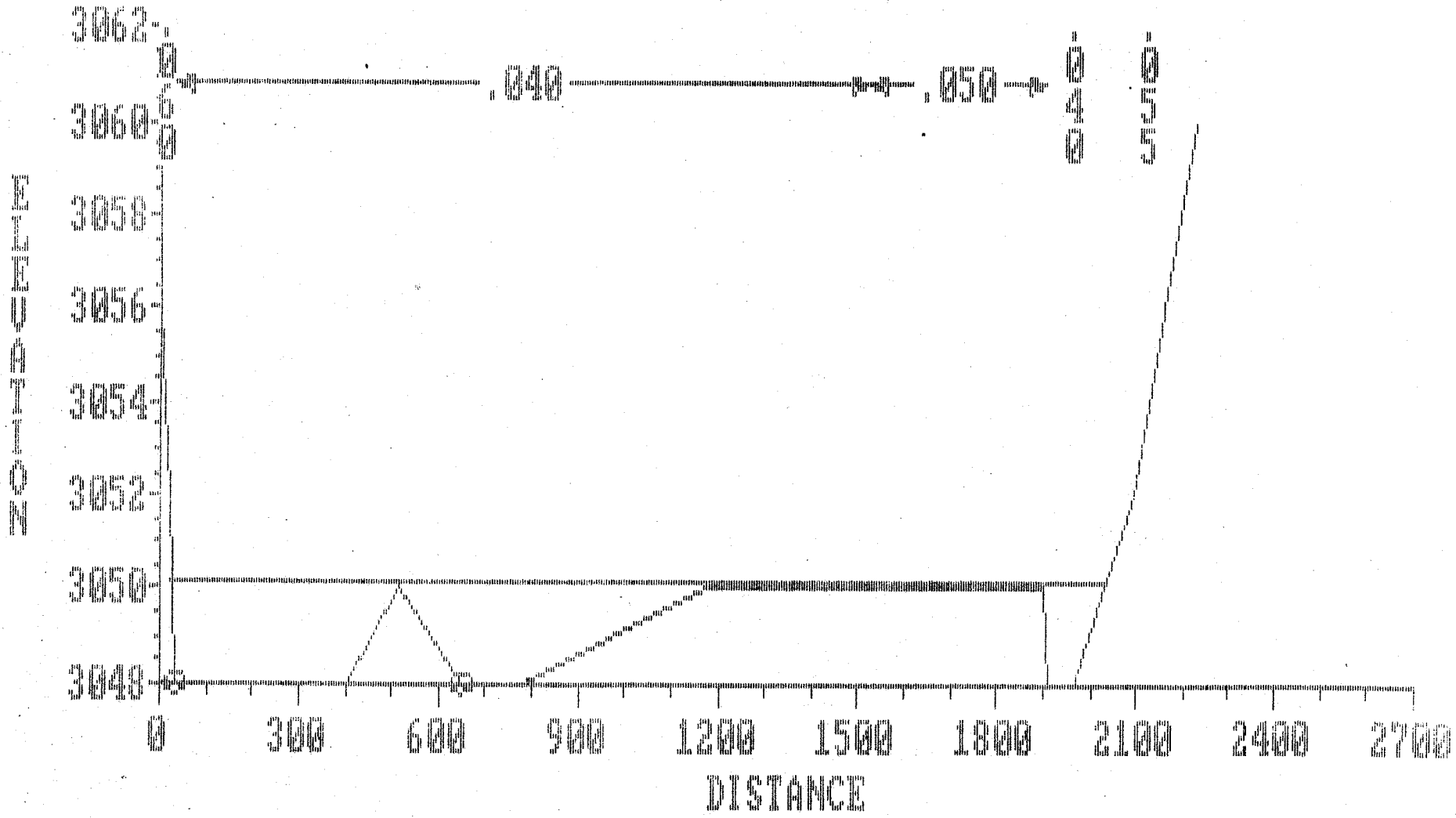
CROSS-SECTION NO. 24.000



CROSS-SECTION NO. 26.000

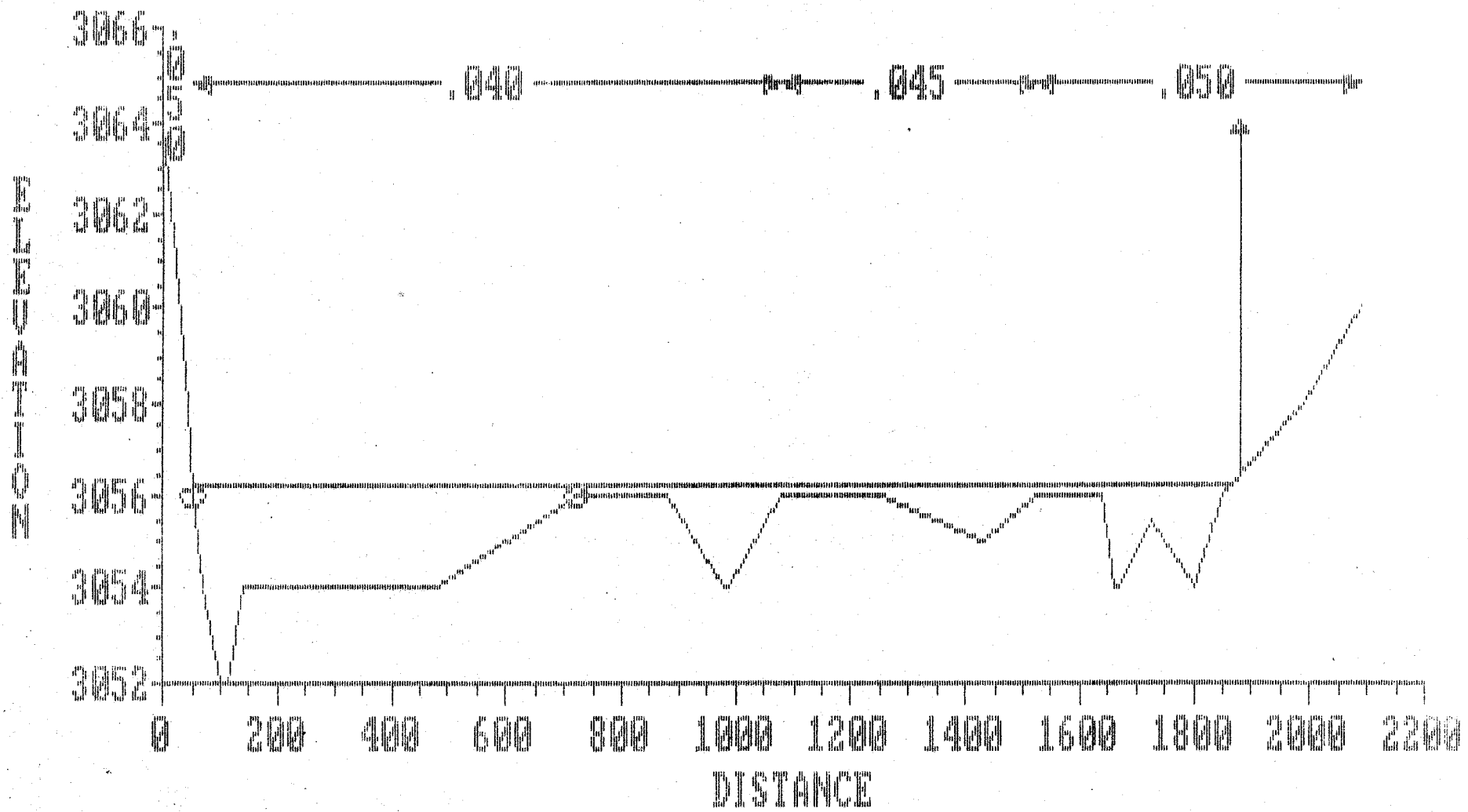


CROSS-SECTION NO. 30.000

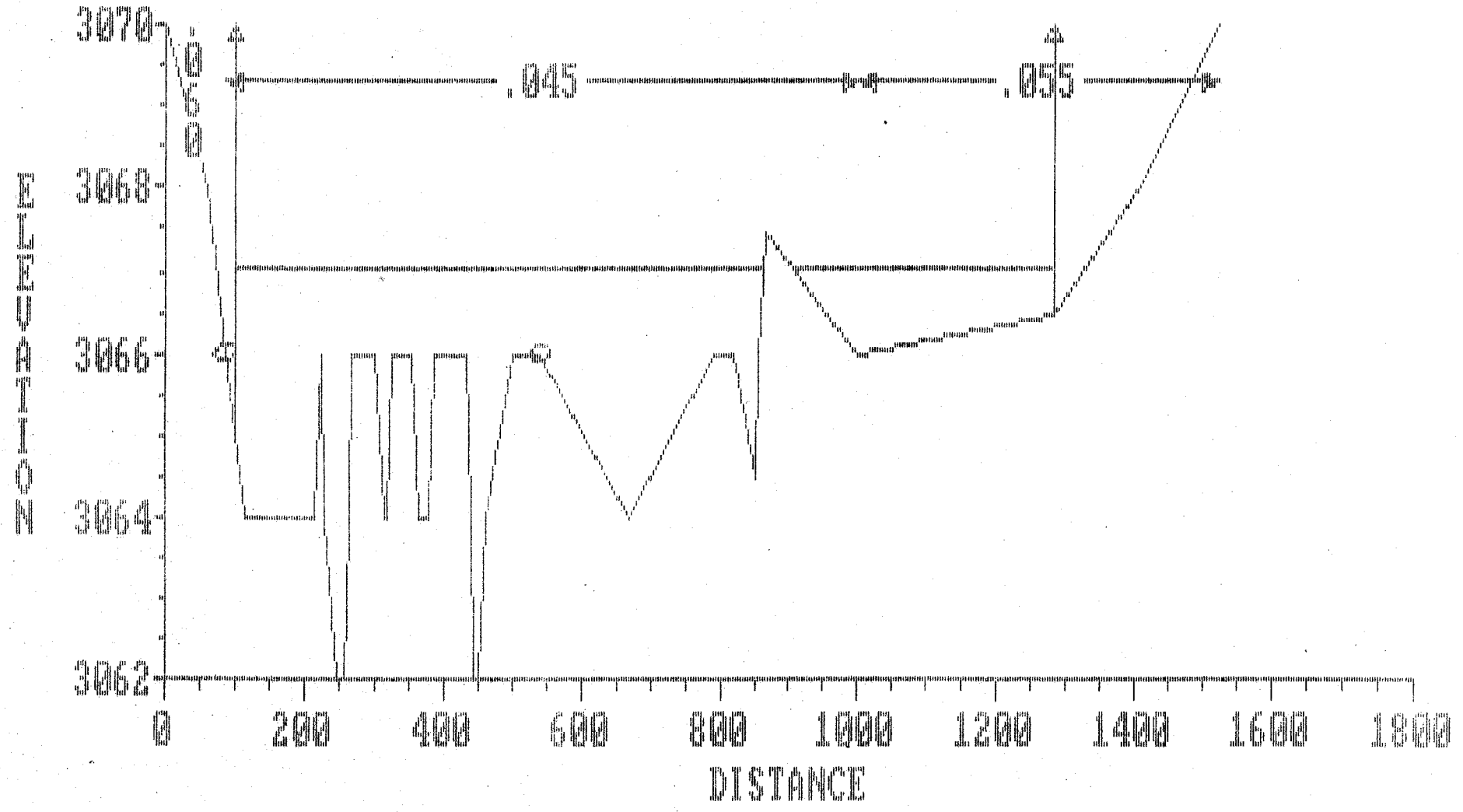


pic

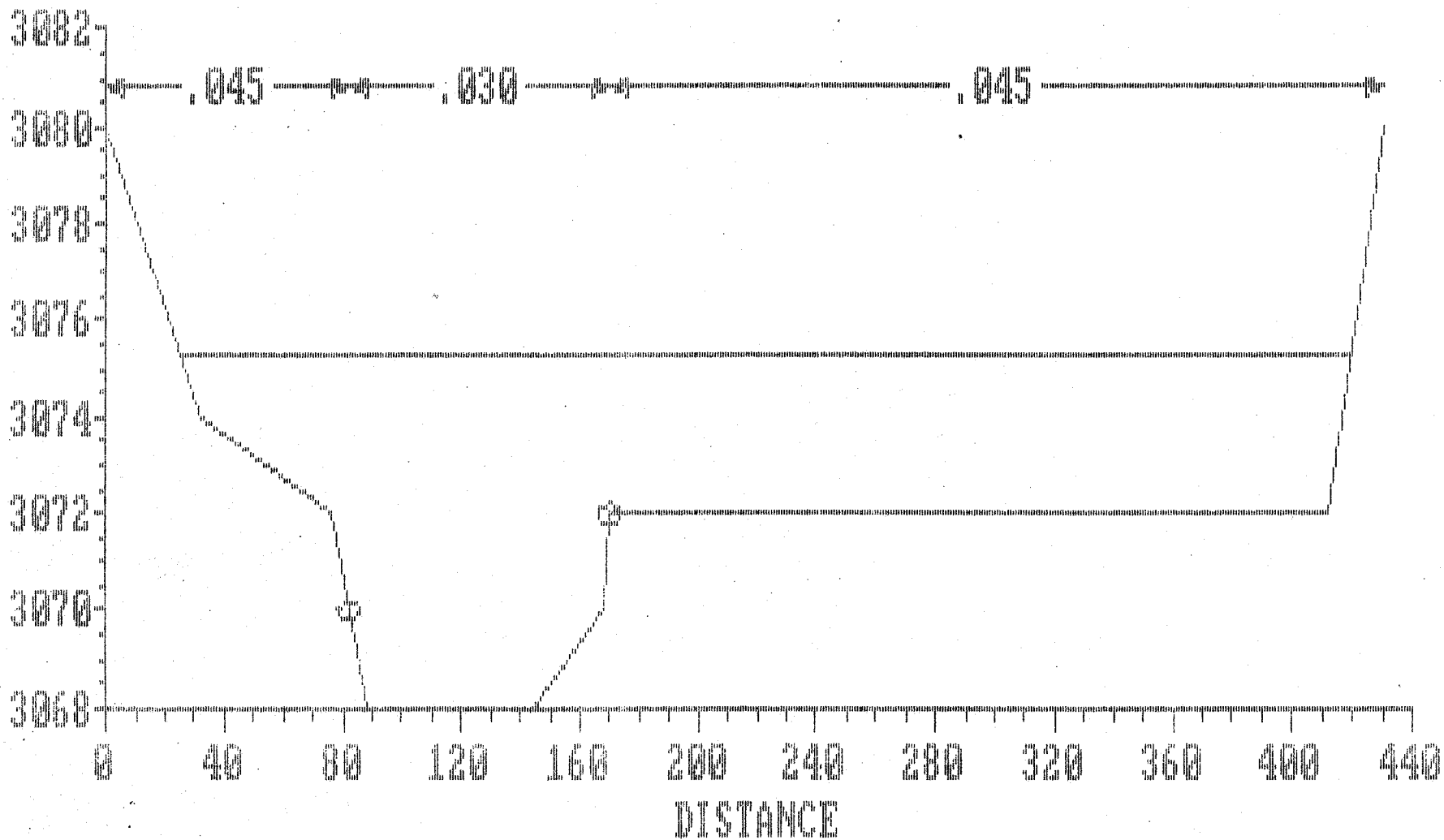
CROSS-SECTION NO. 31.000



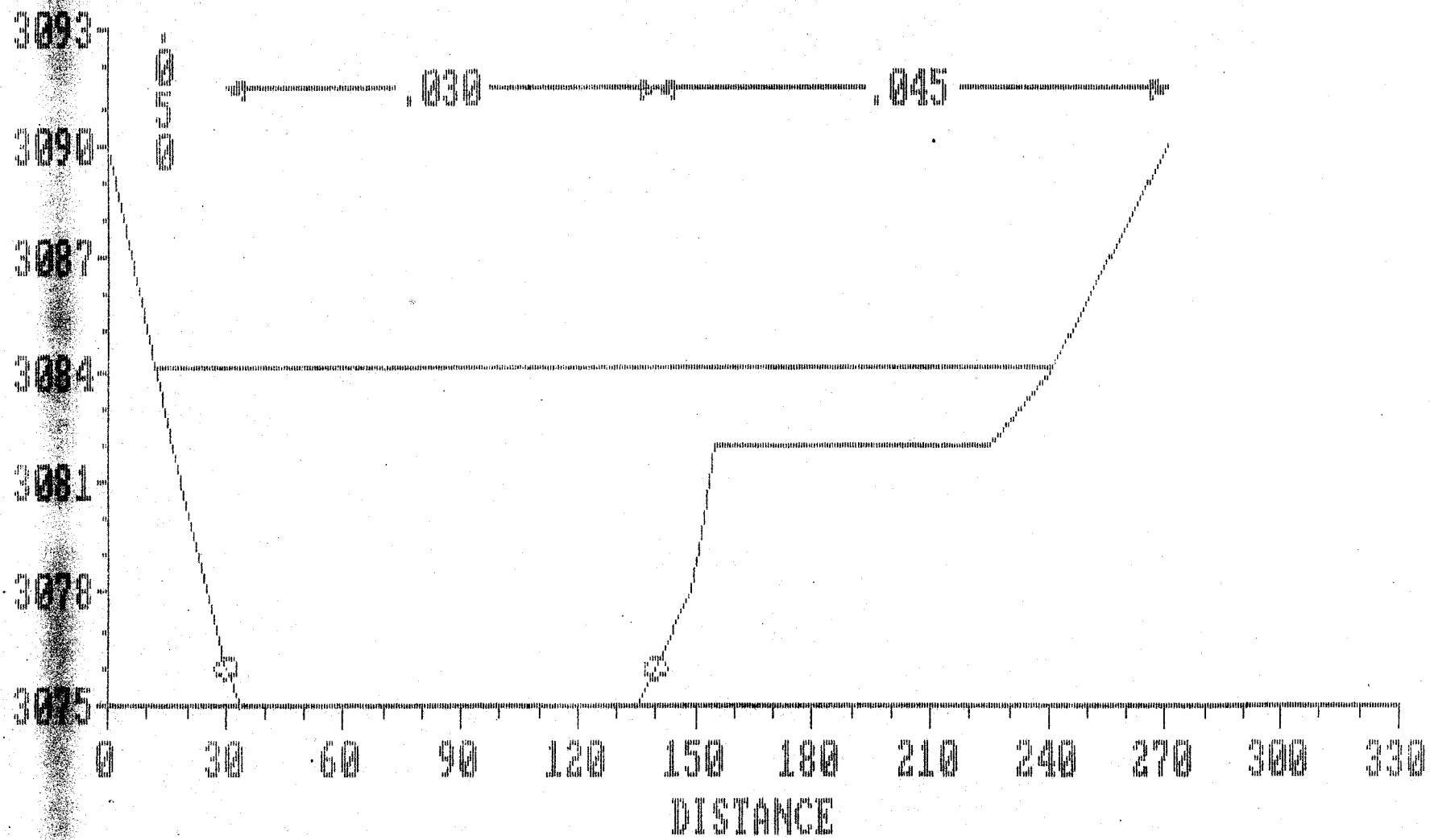
CROSS-SECTION NO. 33.000



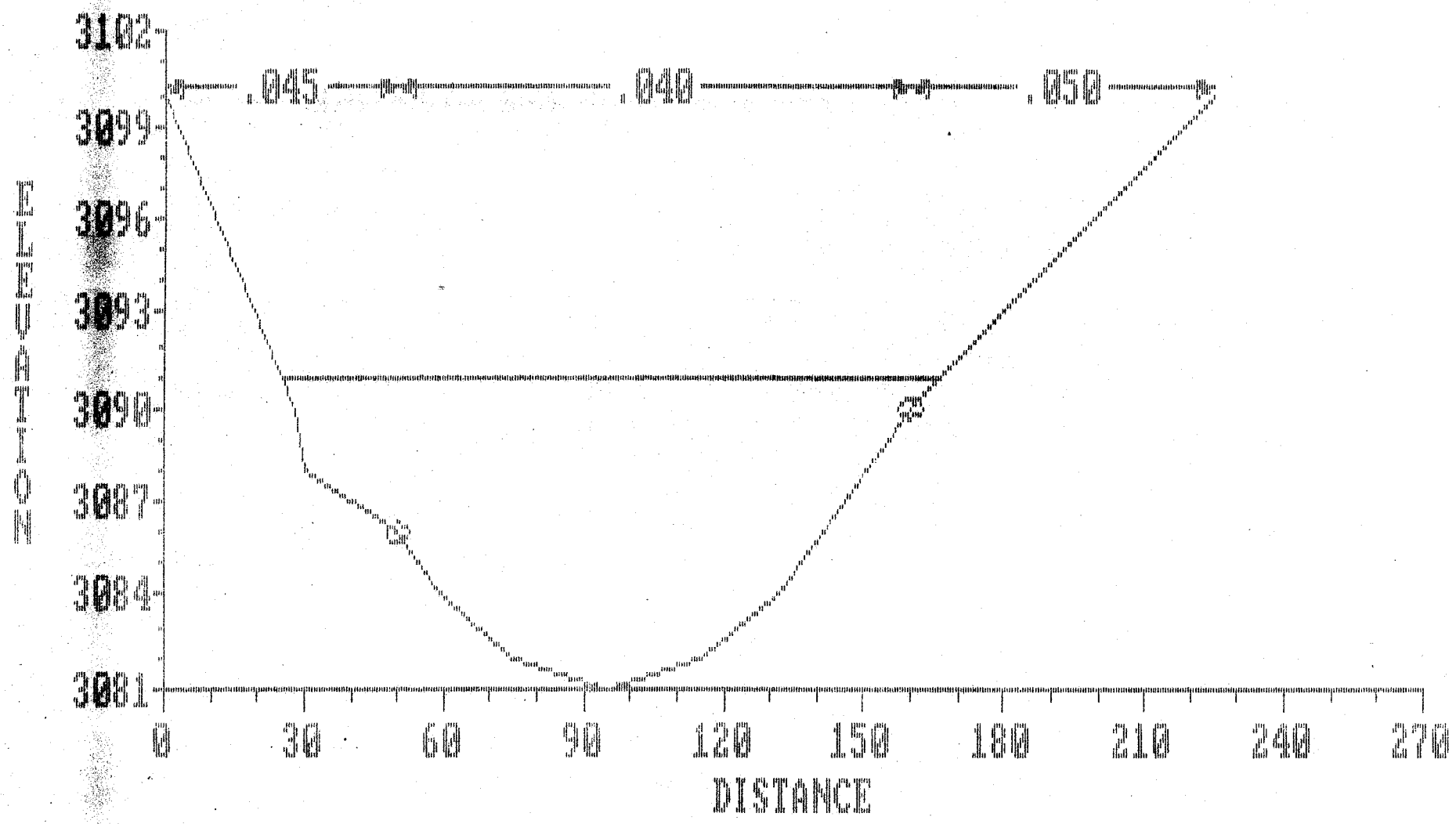
CROSS-SECTION NO. 35.000



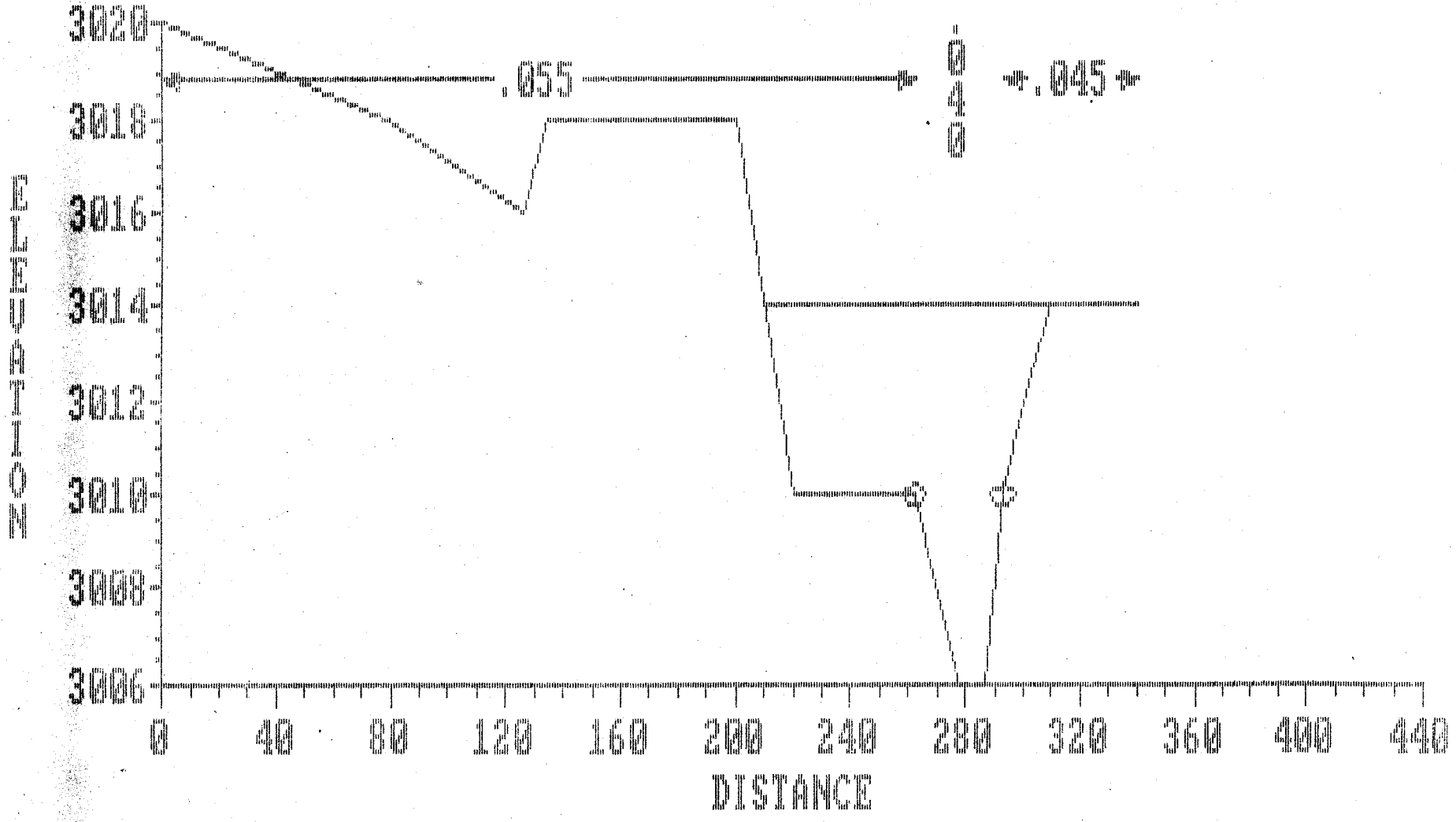
CROSS-SECTION NO. 39.000



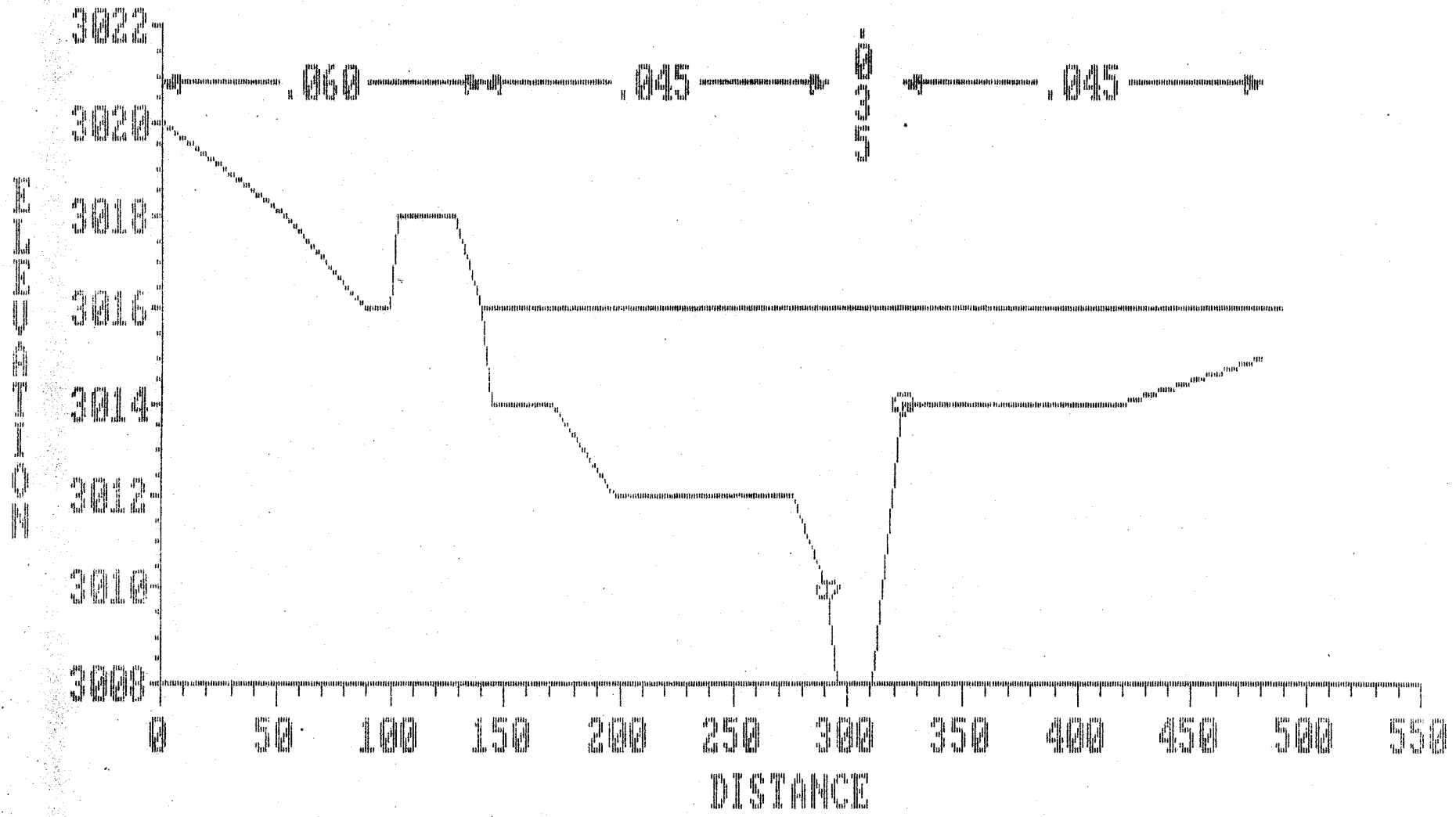
CROSS-SECTION NO. 42.000



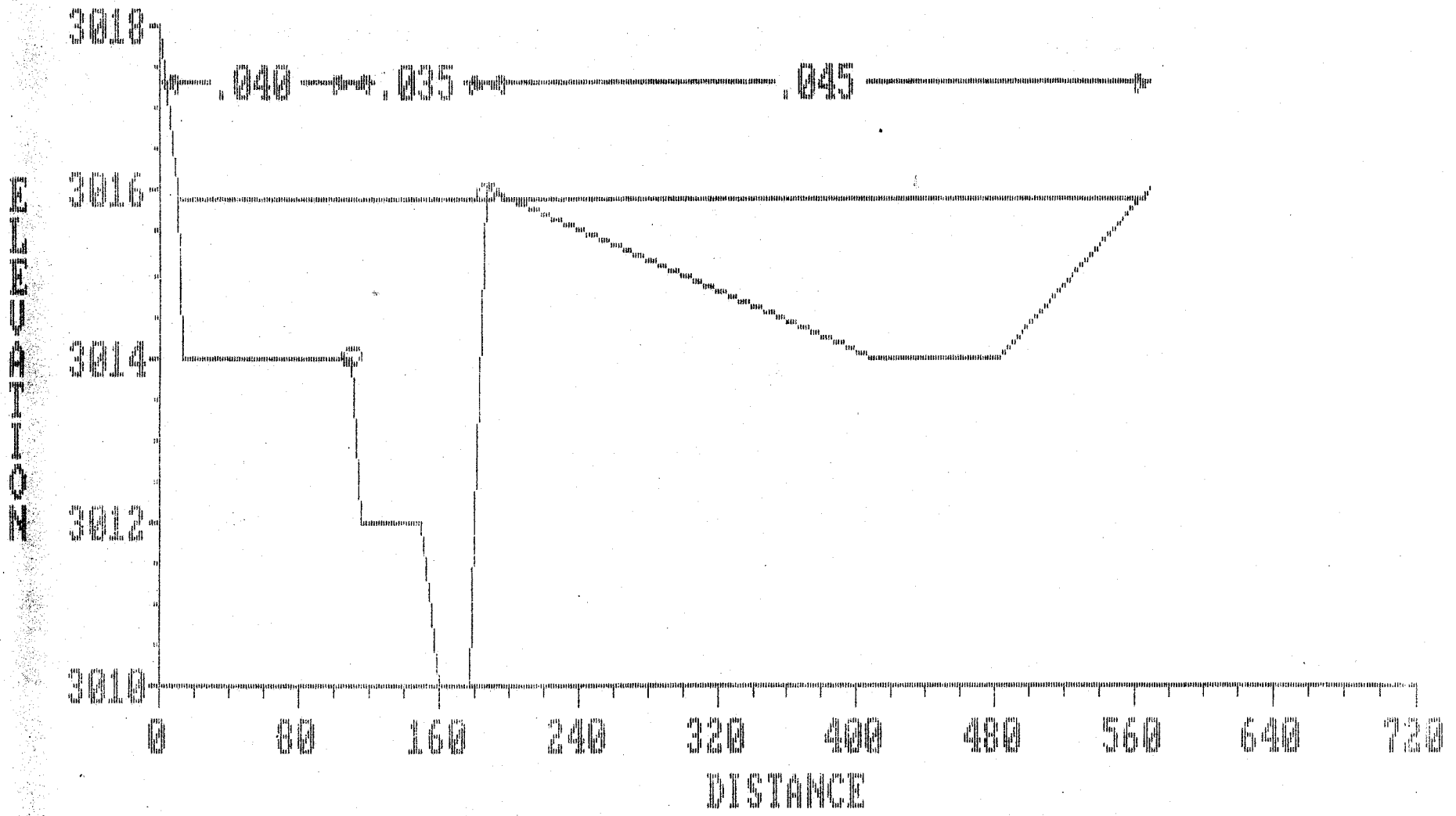
CROSS-SECTION NO. 200.000



CROSS-SECTION NO. 210.000

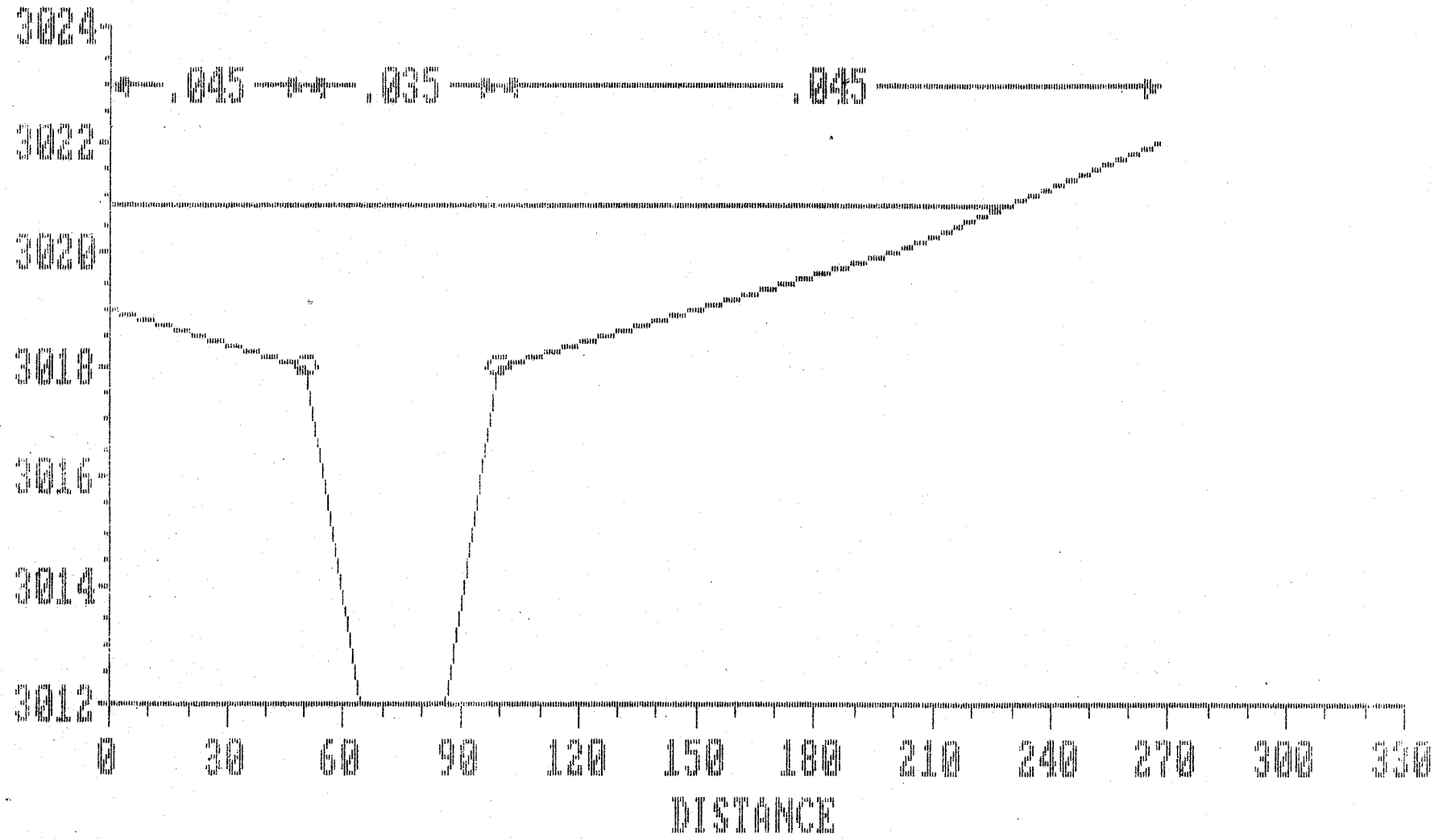


CROSS-SECTION NO. 220.000



CROSS-SECTION NO. 240.000

TOPOGRAPHY



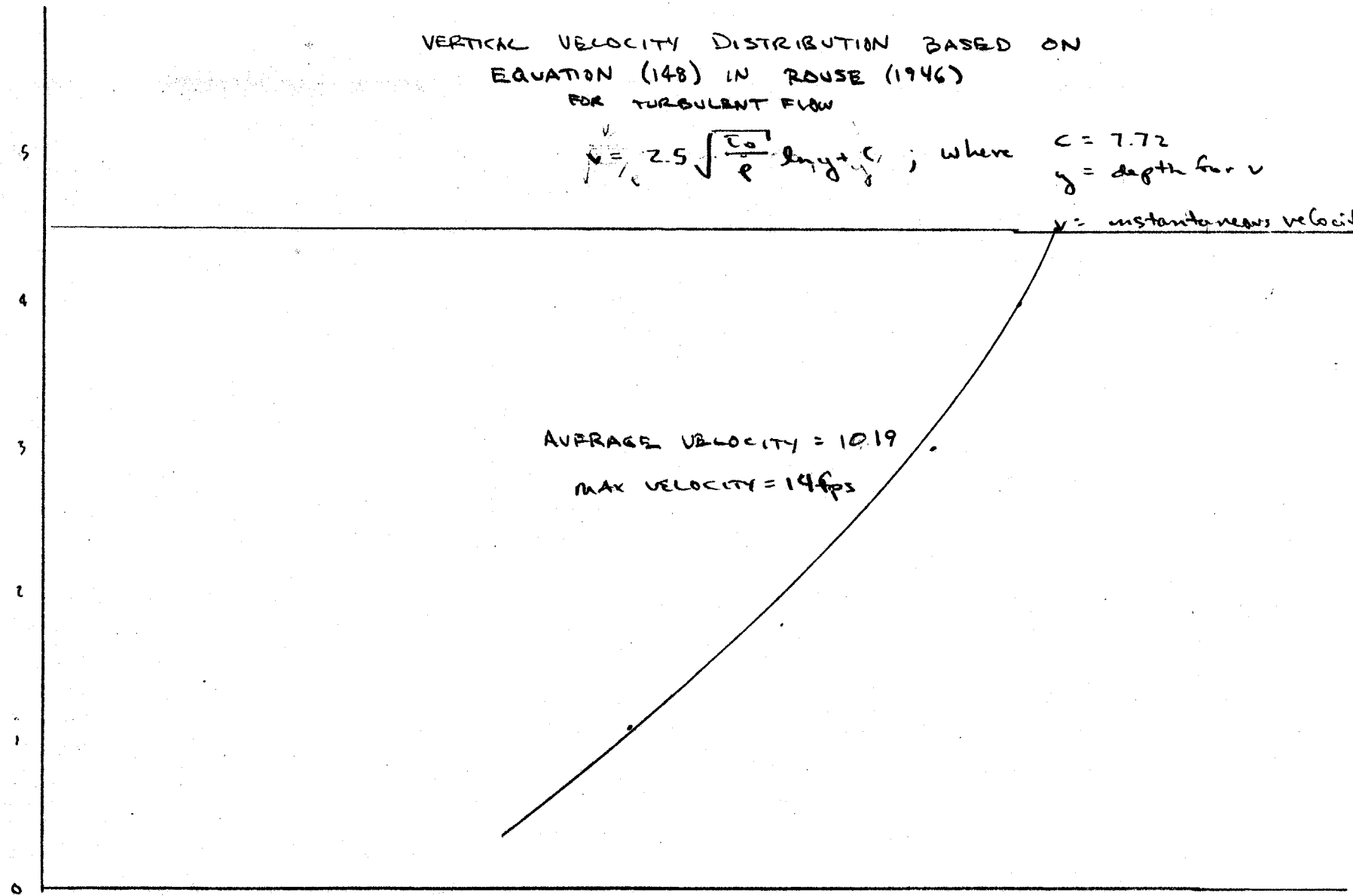
VERTICAL VELOCITY DISTRIBUTION BASED ON
EQUATION (148) IN ROUSE (1946)
FOR TURBULENT FLOW

$$v = 2.5 \sqrt{\frac{C_0}{\rho}} \ln y + C; \text{ where } C = 7.72$$

$y = \text{depth for } v$

$v = \text{instantaneous velocity}$

DEPTH (ft.)



AVERAGE VELOCITY = 10.19
MAX VELOCITY = 14 fps

VELOCITY (FT/SEC.)

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate

ERROR: Tc > 180 minutes.
The regression formula used in this program is invalid.
The Tc value is inaccurate

HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: entire basin

Watershed Area= 10645.00 acres
Length of Watercourse (Lc): 35400 ft.
Length to Center of Gravity (Lca): 22800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)=10800	H(1)=140.0
L(2)=16400	H(2)=1300.0
L(3)= 5200	H(3)=1200.0
L(4)= 3000	H(4)=2090.0
Mean Slope (Sc): 0.0447 ft/ft	

Basin Factor (Nbw): 0.048

FLOOD FREQUENCY: 2-Year

- P24 = 1.81
- P6 = 1.52
- P1 = 1.19
- P2 = 1.30
- P3 = 1.38

Impervious Cover = 2.5 %

Soil Group: B
 Cover Type = Desert Brush
 % of Pervious Area = 5.0
 CN= 82.00
 CN* = 79.37
 Cover Density = 20.0 %

Soil Group: C
 Cover Type = Mountain Brush
 % of Pervious Area = 10.0
 CN= 83.00
 CN* = 80.61
 Cover Density = 20.0 %

Soil Group: D
 Cover Type = Mountain Brush
 % of Pervious Area = 85.0
 CN= 89.00
 CN* = 86.99
 Cover Density = 25.0 %

Time of Concentration (Tc) = 233.7 min
 Intensity = 0.31 in./hr.
 Weighted Runoff to Rainfall Ratio (Cw) = 0.27
 Runoff Supply Rate at Tc = 0.08

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: entire basin

Watershed Area= 10645.00 acres
Length of Watercourse (Lc): 35400 ft.
Length to Center of Gravity (Lca): 22800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)=10800	H(1)=140.0
L(2)=16400	H(2)=1300.0
L(3)= 5200	H(3)=1200.0
L(4)= 3000	H(4)=2090.0

Mean Slope (Sc): 0.0447 ft/ft

Basin Factor (Nbw): 0.048

FLOOD FREQUENCY: 10-Year

P24 = 2.87
P6 = 2.33
P1 = 1.77
P2 = 1.96
P3 = 2.09

Impervious Cover = 2.5 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN= 82.00
CN* = 83.76
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN= 83.00
CN* = 84.80
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 90.07
Cover Density = 25.0 %

Time of Concentration (Tc) = 127.2 min
Intensity = 0.85 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.50
Runoff Supply Rate at Tc = 0.42

PEAK DISCHARGE: 4507.0 cfs

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: entire basin

Watershed Area= 10645.00 acres
Length of Watercourse (Lc): 35400 ft.
Length to Center of Gravity (Lca): 22800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)=10800	H(1)=140.0
L(2)=16400	H(2)=1300.0
L(3)= 5200	H(3)=1200.0
L(4)= 3000	H(4)=2090.0

Mean Slope (Sc): 0.0447 ft/ft

Basin Factor (Nbw): 0.048

FLOOD FREQUENCY: 100-Year

P24 = 4.40
P6 = 3.51
P1 = 2.60
P2 = 2.91
P3 = 3.12

Impervious Cover = 2.5 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN= 82.00
CN* = 86.65
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN= 83.00
CN* = 87.56
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 92.09
Cover Density = 25.0 %

Time of Concentration (Tc) = 84.0 min
Intensity = 1.88 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.68
Runoff Supply Rate at Tc = 1.27

PEAK DISCHARGE: 13656.1 cfs

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: above watershed #5 confluence

Watershed Area= 7403.00 acres
Length of Watercourse (Lc): 31200 ft.
Length to Center of Gravity (Lca): 16500 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 6000	H(1)= 90.0
L(2)= 3800	H(2)= 80.0
L(3)= 6400	H(3)=360.0
L(4)= 6600	H(4)=880.0
L(5)= 4800	H(5)=1200.0
L(6)= 2800	H(6)=1600.0
L(7)= 800	H(7)=260.0

Mean Slope (Sc): 0.0535 ft/ft

Basin Factor (Nbw): 0.050 FLOOD FREQUENCY: 2-Year

P24 = 1.91
P6 = 1.59
P1 = 1.23
P2 = 1.35
P3 = 1.43

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN= 82.00
CN* = 79.85
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN= 81.00
CN* = 78.90
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 87.33
Cover Density = 25.0 %

Time of Concentration (Tc) = 174.4 min
Intensity = 0.43 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.27
Runoff Supply Rate at Tc = 0.12

PEAK DISCHARGE: 878.2 cfs

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: above watershed #5 confluence

Watershed Area = 7403.00 acres
Length of Watercourse (Lc): 31200 ft.
Length to Center of Gravity (Lca): 16500 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1) = 6000	H(1) = 90.0
L(2) = 3800	H(2) = 80.0
L(3) = 6400	H(3) = 360.0
L(4) = 6600	H(4) = 880.0
L(5) = 4800	H(5) = 1200.0
L(6) = 2800	H(6) = 1600.0
L(7) = 800	H(7) = 260.0

Mean Slope (Sc): 0.0535 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 10-Year

P24 = 3.04
P6 = 2.44
P1 = 1.82
P2 = 2.03
P3 = 2.17

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN = 82.00
CN* = 84.03
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN = 81.00
CN* = 83.23
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN = 89.00
CN* = 90.26
Cover Density = 25.0 %

Time of Concentration (Tc) = 96.2 min
Intensity = 1.15 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.50
Runoff Supply Rate at Tc = 0.57

PEAK DISCHARGE: 4278.7 cfs

WARNING: Area > 10 sq. mi. Use Areal Reduction
The Tc given may not be accurate
HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: above watershed #5 confluence

Watershed Area = 7403.00 acres
Length of Watercourse (Lc): 31200 ft.
Length to Center of Gravity (Lca): 16500 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1) = 6000	H(1) = 90.0
L(2) = 3800	H(2) = 80.0
L(3) = 6400	H(3) = 360.0
L(4) = 6600	H(4) = 880.0
L(5) = 4800	H(5) = 1200.0
L(6) = 2800	H(6) = 1600.0
L(7) = 800	H(7) = 260.0

Mean Slope (Sc): 0.0535 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.66
P6 = 3.67
P1 = 2.67
P2 = 3.01
P3 = 3.24

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 5.0
CN = 82.00
CN* = 86.81
Cover Density = 20.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 10.0
CN = 81.00
CN* = 86.10
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN = 89.00
CN* = 92.20
Cover Density = 25.0 %

Time of Concentration (Tc) = 64.2 min
Intensity = 2.53 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.67
Runoff Supply Rate at Tc = 1.71

PEAK DISCHARGE: 12751.9 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: national forest boundary

Watershed Area= 6013.00 acres
Length of Watercourse (Lc): 25200 ft.
Length to Center of Gravity (Lca): 11000 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3800	H(1)= 80.0
L(2)= 6400	H(2)=360.0
L(3)= 6600	H(3)=880.0
L(4)= 4800	H(4)=1200.0
L(5)= 2800	H(5)=1600.0
L(6)= 800	H(6)=260.0

Mean Slope (Sc): 0.0859 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 2-Year

P24 = 1.91
P6 = 1.59
P1 = 1.23
P2 = 1.35
P3 = 1.43

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 78.90
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 87.33
Cover Density = 25.0 %

Time of Concentration (Tc) = 130.3 min
Intensity = 0.57 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.27
Runoff Supply Rate at Tc = 0.16

PEAK DISCHARGE: 951.6 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: national forest boundary

Watershed Area= 6013.00 acres
Length of Watercourse (Lc): 25200 ft.
Length to Center of Gravity (Lca): 11000 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3800	H(1)= 80.0
L(2)= 6400	H(2)=360.0
L(3)= 6600	H(3)=880.0
L(4)= 4800	H(4)=1200.0
L(5)= 2800	H(5)=1600.0
L(6)= 800	H(6)=260.0

Mean Slope (Sc): 0.0859 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 10-Year

P24 = 3.04
P6 = 2.44
P1 = 1.82
P2 = 2.03
P3 = 2.17

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 83.23
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 90.26
Cover Density = 25.0 %

Time of Concentration (Tc) = 72.4 min
Intensity = 1.53 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.50
Runoff Supply Rate at Tc = 0.76

PEAK DISCHARGE: 4604.4 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: national forest boundary (#4)

Watershed Area= 6013.00 acres
Length of Watercourse (Lc): 25200 ft.
Length to Center of Gravity (Lca): 11000 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3800	H(1)= 80.0
L(2)= 6400	H(2)=360.0
L(3)= 6600	H(3)=880.0
L(4)= 4800	H(4)=1200.0
L(5)= 2800	H(5)=1600.0
L(6)= 800	H(6)=260.0

Mean Slope (Sc): 0.0859 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 100-Year

P24 = 4.66
P6 = 3.67
P1 = 2.67
P2 = 3.01
P3 = 3.24

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 86.10
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 92.20
Cover Density = 25.0 %

Time of Concentration (Tc) = 48.6 min
Intensity = 3.08 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.67
Runoff Supply Rate at Tc = 2.07

PEAK DISCHARGE: 12556.4 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 3

Watershed Area= 407.00 acres
Length of Watercourse (Lc): 6400 ft.
Length to Center of Gravity (Lca): 3200 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6400 H(1)=240.0
Mean Slope (Sc): 0.0375 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 82.00
CN* = 80.46
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 91.00
CN* = 89.30
Cover Density = 20.0 %

Time of Concentration (Tc) = 34.7 min
Intensity = 1.85 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.22
Runoff Supply Rate at Tc = 0.40

PEAK DISCHARGE: 163.3 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 3

Watershed Area= 407.00 acres
Length of Watercourse (Lc): 6400 ft.
Length to Center of Gravity (Lca): 3200 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6400 H(1)=240.0
Mean Slope (Sc): 0.0375 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 82.00
CN* = 84.42
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 91.00
CN* = 91.80
Cover Density = 20.0 %

Time of Concentration (Tc) = 19.8 min
Intensity = 3.79 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.42
Runoff Supply Rate at Tc = 1.58

PEAK DISCHARGE: 649.3 cfs

HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 3

Watershed Area= 407.00 acres
Length of Watercourse (Lc): 6400 ft.
Length to Center of Gravity (Lca): 3200 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6400 H(1)=240.0
Mean Slope (Sc): 0.0375 ft/ft

Basin Factor (Nbw): 0.035 FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 13.7 min
Intensity = 6.62 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.60
Runoff Supply Rate at Tc = 3.96

PEAK DISCHARGE: 1623.0 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 8

Watershed Area= 679.00 acres
Length of Watercourse (Lc): 5200 ft.
Length to Center of Gravity (Lca): 2600 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3200	H(1)=360.0
L(2)= 2000	H(2)=682.0
Mean Slope (Sc): 0.1609 ft/ft	

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P5 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 2.5 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 100.0
CN= 91.00
CN* = 89.30
Cover Density = 20.0 %

Time of Concentration (Tc) = 15.9 min
Intensity = 2.87 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.39
Runoff Supply Rate at Tc = 1.13

PEAK DISCHARGE: 775.8 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 8

Watershed Area= 679.00 acres
Length of Watercourse (Lc): 5200 ft.
Length to Center of Gravity (Lca): 2600 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3200	H(1)=360.0
L(2)= 2000	H(2)=682.0
Mean Slope (Sc): 0.1609 ft/ft	

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 2.5 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 100.0
CN= 91.00
CN* = 91.80
Cover Density = 20.0 %

Time of Concentration (Tc) = 10.8 min
Intensity = 4.98 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.61
Runoff Supply Rate at Tc = 3.02

PEAK DISCHARGE: 2064.4 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 8

Watershed Area= 679.00 acres
Length of Watercourse (Lc): 5200 ft.
Length to Center of Gravity (Lca): 2600 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 3200	H(1)=360.0
L(2)= 2000	H(2)=682.0
Mean Slope (Sc): 0.1609 ft/ft	

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 2.5 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 100.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 8.3 min
Intensity = 8.35 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.76
Runoff Supply Rate at Tc = 6.32

PEAK DISCHARGE: 4323.7 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 2

Watershed Area= 352.00 acres
Length of Watercourse (Lc): 6000 ft.
Length to Center of Gravity (Lca): 3000 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6000 H(1)=210.0
Mean Slope (Sc): 0.0350 ft/ft

Basin Factor (Nbw): 0.035 FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 82.00
CN* = 80.46
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 91.00
CN* = 89.30
Cover Density = 20.0 %

Time of Concentration (Tc) = 24.9 min
Intensity = 2.26 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.39
Runoff Supply Rate at Tc = 0.88

PEAK DISCHARGE: 310.5 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 2

Watershed Area= 352.00 acres
Length of Watercourse (Lc): 6000 ft.
Length to Center of Gravity (Lca): 3000 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6000 H(1)=210.0
Mean Slope (Sc): 0.0350 ft/ft

Basin Factor (Nbw): 0.035 FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 82.00
CN* = 84.42
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 91.00
CN* = 91.80
Cover Density = 20.0 %

Time of Concentration (Tc) = 16.4 min
Intensity = 4.23 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.59
Runoff Supply Rate at Tc = 2.51

PEAK DISCHARGE: 890.2 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 2

Watershed Area= 352.00 acres
Length of Watercourse (Lc): 6000 ft.
Length to Center of Gravity (Lca): 3000 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 6000 H(1)=210.0
Mean Slope (Sc): 0.0350 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 90.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 12.2 min
Intensity = 7.03 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.74
Runoff Supply Rate at Tc = 5.23

PEAK DISCHARGE: 1856.5 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland 1
Drainage Concentration Point: cp 1

Watershed Area= 355.00 acres
Length of Watercourse (Lc): 7100 ft.
Length to Center of Gravity (Lca): 3550 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7100 H(1)=160.0
Mean Slope (Sc): 0.0225 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 82.00
CN* = 80.46
Cover Density = 20.0 %

Soil Group: C
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 88.00
CN* = 86.25
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 89.30
Cover Density = 20.0 %

Time of Concentration (Tc) = 34.1 min
Intensity = 1.89 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.43
Runoff Supply Rate at Tc = 0.81

PEAK DISCHARGE: 290.7 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland 1
Drainage Concentration Point: cp 1

Watershed Area= 355.00 acres
Length of Watercourse (Lc): 7100 ft.
Length to Center of Gravity (Lca): 3550 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7100 H(1)=160.0
Mean Slope (Sc): 0.0225 ft/ft

Basin Factor (Nbw): 0.035 FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 82.00
CN* = 84.42
Cover Density = 20.0 %

Soil Group: C
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 88.00
CN* = 89.28
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 91.80
Cover Density = 20.0 %

Time of Concentration (Tc) = 20.8 min
Intensity = 3.68 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.74
Runoff Supply Rate at Tc = 2.71

PEAK DISCHARGE: 969.7 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland 1
Drainage Concentration Point: cp 1

Watershed Area= 355.00 acres
Length of Watercourse (Lc): 7100 ft.
Length to Center of Gravity (Lca): 3550 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7100 H(1)=160.0
Mean Slope (Sc): 0.0225 ft/ft

Basin Factor (Nbw): 0.035

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 5.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 70.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: C
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 88.00
CN* = 91.31
Cover Density = 20.0 %

Soil Group: D
Cover Type = Desert Brush
% of Pervious Area = 10.0
CN= 91.00
CN* = 93.47
Cover Density = 20.0 %

Time of Concentration (Tc) = 14.9 min
Intensity = 6.36 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.98
Runoff Supply Rate at Tc = 6.27

PEAK DISCHARGE: 2243.0 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: watershed #5

Watershed Area= 2344.00 acres
Length of Watercourse (Lc): 25400 ft.
Length to Center of Gravity (Lca): 12800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 5400	H(1)=120.0
L(2)=10200	H(2)=1080.0
L(3)= 4600	H(3)=800.0
L(4)= 2000	H(4)=600.0
L(5)= 3200	H(5)=1820.0

Mean Slope (Sc): 0.0862 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 79.53
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 87.76
Cover Density = 25.0 %

Time of Concentration (Tc) = 127.9 min
Intensity = 0.61 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.30
Runoff Supply Rate at Tc = 0.19

PEAK DISCHARGE: 437.6 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: watershed #5

Watershed Area= 2344.00 acres
Length of Watercourse (Lc): 25400 ft.
Length to Center of Gravity (Lca): 12800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 5400	H(1)=120.0
L(2)=10200	H(2)=1080.0
L(3)= 4600	H(3)=800.0
L(4)= 2000	H(4)=600.0
L(5)= 3200	H(5)=1820.0

Mean Slope (Sc): 0.0862 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 83.62
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 90.53
Cover Density = 25.0 %

Time of Concentration (Tc) = 73.4 min
Intensity = 1.58 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.52
Runoff Supply Rate at Tc = 0.82

PEAK DISCHARGE: 1938.0 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland wash
Drainage Concentration Point: watershed #5

Watershed Area= 2344.00 acres
Length of Watercourse (Lc): 25400 ft.
Length to Center of Gravity (Lca): 12800 ft.

Incremental Change in Length (Li)-ft.	Incremental Change in Elevation (Hi)-ft.
L(1)= 5400	H(1)=120.0
L(2)=10200	H(2)=1080.0
L(3)= 4600	H(3)=800.0
L(4)= 2000	H(4)=600.0
L(5)= 3200	H(5)=1820.0

Mean Slope (Sc): 0.0862 ft/ft

Basin Factor (Nbw): 0.060

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 0.0 %

Soil Group: C
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 81.00
CN* = 86.36
Cover Density = 25.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 85.0
CN= 89.00
CN* = 92.38
Cover Density = 25.0 %

Time of Concentration (Tc) = 50.0 min
Intensity = 3.15 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.69
Runoff Supply Rate at Tc = 2.18

PEAK DISCHARGE: 5140.2 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 6

Watershed Area= 406.00 acres
Length of Watercourse (Lc): 9600 ft.
Length to Center of Gravity (Lca): 4800 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 9600 H(1)=770.0
Mean Slope (Sc): 0.0802 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 30.0
CN= 82.00
CN* = 80.46
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 89.25
Cover Density = 20.0 %

Time of Concentration (Tc) = 42.5 min
Intensity = 1.62 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.31
Runoff Supply Rate at Tc = 0.51

PEAK DISCHARGE: 206.8 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 6

Watershed Area= 406.00 acres
Length of Watercourse (Lc): 9600 ft.
Length to Center of Gravity (Lca): 4800 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 9600 H(1)=770.0
Mean Slope (Sc): 0.0802 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 30.0
CN= 82.00
CN* = 84.42
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 91.76
Cover Density = 20.0 %

Time of Concentration (Tc) = 25.8 min
Intensity = 3.26 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.53
Runoff Supply Rate at Tc = 1.72

PEAK DISCHARGE: 703.4 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 6

Watershed Area= 406.00 acres
Length of Watercourse (Lc): 9600 ft.
Length to Center of Gravity (Lca): 4800 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 9600 H(1)=770.0
Mean Slope (Sc): 0.0802 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 30.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 70.0
CN= 91.00
CN* = 93.43
Cover Density = 20.0 %

Time of Concentration (Tc) = 18.4 min
Intensity = 5.86 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.69
Runoff Supply Rate at Tc = 4.06

PEAK DISCHARGE: 1663.3 cfs

HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 7

Watershed Area= 215.00 acres
Length of Watercourse (Lc): 7400 ft.
Length to Center of Gravity (Lca): 3700 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7400 H(1)=640.0
Mean Slope (Sc): 0.0865 ft/ft

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 2-Year

P24 = 1.97
P6 = 1.65
P1 = 1.29
P2 = 1.42
P3 = 1.50

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 85.0
CN= 82.00
CN* = 80.46
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 91.00
CN* = 89.25
Cover Density = 20.0 %

Time of Concentration (Tc) = 43.3 min
Intensity = 1.62 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.19
Runoff Supply Rate at Tc = 0.31

PEAK DISCHARGE: 66.4 cfs

HYDROLOGIC DATA SHEET
PCP.PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 7

Watershed Area= 215.00 acres
Length of Watercourse (Lc): 7400 ft.
Length to Center of Gravity (Lca): 3700 ft.

Incremental Change in Length (Li)-ft.
L(1)= 7400
Mean Slope (Sc): 0.0865 ft/ft

Incremental Change in Elevation (Hi)-ft.
H(1)=640.0

Basin Factor (Nbw): 0.050

FLOOD FREQUENCY: 10-Year

P24 = 3.13
P6 = 2.54
P1 = 1.91
P2 = 2.12
P3 = 2.27

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 85.0
CN= 82.00
CN* = 84.42
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 91.00
CN* = 91.76
Cover Density = 20.0 %

Time of Concentration (Tc) = 23.3 min
Intensity = 3.51 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.40
Runoff Supply Rate at Tc = 1.41

PEAK DISCHARGE: 304.8 cfs

HYDROLOGIC DATA SHEET
PCP. PAS

Project Name and Location: sutherland
Drainage Concentration Point: cp 7

Watershed Area= 215.00 acres
Length of Watercourse (Lc): 7400 ft.
Length to Center of Gravity (Lca): 3700 ft.

Incremental Change in Length (Li)-ft. Incremental Change in Elevation (Hi)-ft.
L(1)= 7400 H(1)=640.0
Mean Slope (Sc): 0.0865 ft/ft

Basin Factor (Nbw): 0.050 FLOOD FREQUENCY: 100-Year

P24 = 4.80
P6 = 3.82
P1 = 2.79
P2 = 3.14
P3 = 3.38

Impervious Cover = 0.0 %

Soil Group: B
Cover Type = Desert Brush
% of Pervious Area = 85.0
CN= 82.00
CN* = 87.06
Cover Density = 20.0 %

Soil Group: D
Cover Type = Mountain Brush
% of Pervious Area = 15.0
CN= 91.00
CN* = 93.43
Cover Density = 20.0 %

Time of Concentration (Tc) = 15.8 min
Intensity = 6.20 in./hr.
Weighted Runoff to Rainfall Ratio (Cw) = 0.59
Runoff Supply Rate at Tc = 3.65

PEAK DISCHARGE: 790.3 cfs

