REPORT ON DEVELOPMENT OF HYDROLOGIC MODEL

Central and Southern Florida Flood Control District
September, 1968

Submitted to: W. V. Storch

By: L. E. Lindahl

INTRODUCTION

The purpose of this report is to document the results of our first stage efforts in developing an operational water management model. As stated in the memorandum of November 7, 1967, on the subject of management of the District's water system, the first phase of development is a model that will reproduce or predict the reaction of a basin system to a given set of initial and input conditions. The steps taken to accomplish this goal can be described in the following manner:

1. Conceptual development and problem definition.
2. Establishment of what parameters are necessary to support the adopted concept.
3. Are these parameters economically feasible to obtain and evaluate.
4. Creation of a computer program that simulates and processes the adopted concept.
5. Evaluate the parameters in a form that is acceptable for input to the program.
6. Evaluate the results.
7. Acquire a "feel" for the response of the system to various changes.

Taylor Creek basin, extending north from the north shore of Lake Okeechobee, was chosen as the test area used in the development of a model. For a detailed description of Taylor Creek's physiographic features, reference is made to the progress report entitled "HYDROLOGY OF THREE EXPERIMENTAL WATERSHEDS IN SOUTH FLORIDA" by Speir, Mills and Stephens.

CONCEPT

Academically, the treatment used in describing runoff and hydrograph synthesis can be termed a time-invariant linear approach. The treatment describing relationships between rainfall and rainfall excess can be termed as an infiltration approach and threshold concept. An analysis of the concepts and functional relationships

utilized for infiltration, and hydrograph synthesis are discussed and developed in the writers memorandum report of December 21, 1967, on the subject of Techniques Pertaining to Basin Models. These techniques have been incorporated into the system described herein and, therefore, will not be restated in this report. In the memorandum report there was a discussion on methods of hydrograph analysis wherein parameters describing the behavior of each reservoir can be determined. The writer's evaluation of this particular method has changed somewhat and this has resulted in several points of departure from the procedures originally presented. It should be pointed out that the word "reservoir" refers to any water storage unit such as a zone of soil, open channel, lake, etc.

The storage coefficient, K(hrs.), for a reservoir can be determined by reverse integrating a hydrograph through the region where the reservoir flow characteristics are predominate. This parameter, when used in the evaluation of either the equal or unequal impulse function derived by Nash or Singh respectively, produces a very useful and accurate mechanism for routing the reservoir releases through time. In the model by Jamieson and Onstad, and also, the one by Holtan, it is assumed that this K value of a reservoir times the peak discharge of that reservoir yields the total available free water storage. Based on this assumption, it was possible to also use the same K value as a "generator" in determining how much water would be released from a reservoir during each finite time period. No appreciable error appeared in their results for two apparent reasons:

1. The basins used as test plots had K values in the order of .5 hrs. to 1.5 hrs. This indicates a flashy stream with a short time of concentration and rapid recessions.
2. The basins areas were in the order of 2 to 4 square miles.

Because of these factors, there was little loss of storage to evaporation and transpiration during the period when free water was being released from the various reservoirs. These conditions, however, do not exist in Taylor Creek or generally speaking, in the central and south Florida area. Taylor Creek has a basin area of 100 square miles, a time of concentration of about 32 hours and its free water storage is very definitely affected by evapo-transpiration during its recession. Consequently, it cannot be assumed that the storage coefficient for routing reservoir releases is the same as the generator that determines what is released during any period of time. It is further noted that because evapo-transpiration is variable depending on water table conditions, growing conditions, and time of year, the release of or yield from a given reservoir will not be equal under all conditions. Add to this the fact that an infiltration function is incorporated into the model and it becomes possible to conclude that, although academics classify the general approach as time-invariant and linear, the result of our present effort is an approximation of a time-variant, non-linear system. I am certain that this point can be debated, however for the present, it remains to be the writer's opinion.

INPUT PARAMETERS

As in all quantitative problems, there must be some initial information or conditions accompanying its solution. For the model, this necessary input information is listed and defined as follows:

S = Total available storage in the contributing soil zone.

G = Total free water storage in the contributing soil zone.

GD = Total amount of free water that is extracted during the period of reservoir releases.

VDM = Maximum volume of water stored in surface depressions.

FC = Constant rate of free water seepage out of the contributing soil zone.

AWC = Total volume of capillary water in the contributing soil zone that is available for plant consumption.

D = Depth of contributing soil zone.

H2OTA = Depth at which free water evaporation from the soil surface ceases.

PPAN = Ratio of maximum evapo-transpiration to maximum pan evaporation.

A = Expression of maximum root density as related to soil pore connections.

SUBM = Relationship between storage and discharge for various reservoirs.

EP = Pan evaporation.

GI_n = Growth indexes for several types of vegetation.

PR = Rainfall.

ECONOMICS

The economics of obtaining and evaluating the previously listed parameters is largely a question of what accuracies are demanded from the model results. Preliminary observations of the model results indicate that accuracies of a simulation are extremely sensitive to the given rainfall and soils data. As was suspected, rainfall and soils data are the most costly input requirement and there has been no determination made as to what is an economically feasible expenditure to acquire these data. Continual inquiry is being made into this question and initial steps have been taken in expanding the existing data network. The final configuration, however, will have to be compatible with the requirements and desired intelligence of an operational system.

THE COMPUTER PROGRAM

The computer program consists of a mainline, four subroutines, and five supporting programs. The name and function of each program is as follows:

Mainline Program for Watershed Model:

This program is primarily a series of decision making statements. It continually examines existing conditions of the soil, distribution of free and capillary water in the soil, occurrence of a rainfall event, evapo-transpiration processes, day and time, and when to call the required subroutines. It also sorts and totals all the output items and contains the formats, transfer of control statements, and file organization necessary to handle the data that is processed during a simulation.

ETFC:

This subroutine performs all the calculations and bookkeeping functions associated with determining evaporation and transpiration.

RECOV:

This subroutine is responsible for generating lateral releases of free water storage. These releases are subsequently sorted into their respective reservoirs and stored on disk for future routing.

INITL:

This subroutine initializes certain variables when the mainline recognizes that a rainfall event has arrived.

INFIL:

This subroutine calculates infiltration of water into the soil reservoirs, determines how much water was refused due to infiltration rate being less than precipitation intensity, determines the condition of surface storage depressions and depletes water in the surface storage depressions subsequent to terminating a rainfall event.

GI & EP:

This program takes in pan evaporation and vegetation data, calculates the GI values, then stores this information on disk for future use by ETFC.

PRECIP:

This program takes in precipitation data, as compiled by H & H and stores it on disk for future use in the above mainline and four subroutines. It has the capability of compiling more than one station's rainfall record and combining it with others.

ROUTE:

This program contains the two routing functions of the model. For input it uses reservoir data stored on disk; the output also goes on disk in the form of a routed hydrograph. This program executes the most time consuming calculations in the entire model.

OUTPUT:

This program reads and sums the routed results that are stored on disk and prints them out in four hour increments.

EDIT:

This program examines rainfall data for possible errors in time and quantity due to either keypunching or extraction from the original charts.

A listing and flowchart of all programs is attached to this report. In executing the model, instructions concerning available options and required information are printed out on the console typewriter.

EVALUATION OF PARAMETERS

The source and manner by which the input parameters were evaluated is discussed in the following paragraphs.

Total available storage (S):

Several recessions during the period when ground water tables were recorded were used to determine depth of the contributing soil zone. By using available soils maps, a determination was made of type and distribution of the soils present in Taylor Creek Basin. This information was then combined with information on moisture characteristics of soils in Florida to evaluate total soil storage capacity of the basin. As shown in the ARS Taylor Creek report, the contributing soil zone is not uniform over the basin. The Upper basin or Penhaloway Terrace and its fall to the lower basin or Talbot Terrace has a shallower contributing soil zone. This had to be taken into account when establishing a single value to represent the entire basin.

Total free water storage (G):

The amount of free water storage was calculated using percent water released at tensions of 60 and 100 cm. of water. The desorption of a soil under the influence of a water table condition is not unfiform. A capillary fringe zone rising from the water table distorts any lumped numerical evaluation of available free water. To acquire a precise measurement of the water released under the influence of gravity, a soil sample can be run through an absorption and desorption test in a laboratory. The correct answer can then be acquired by integrating the resulting desorption curve to the desired profile depth. After analyzing results of some laboratory tests on fine sands, it became apparent that the volume of free water released at 60 cm. tension closely approximated the more accurate laboratory results. Therefore, this approximation was used in the analysis of Taylor Creek's soil moisture characteristics.

Surface storage depressions (VD):

An aerial photo of Taylor Creek Basin, supplied by SCS, was used as the source for this determination. Compared to other input requirements, this had a minimum of

detailed analysis and was actually a rather crude evaluation. The analysis employed was a simple count of an average size storage depression with an estimated six inch depth of water as a threshold value. The result was the equivalent of 0.1 inches over the entire basin or approximately 1000 acres of ponds, six inches deep.

Rate of constant infiltration (FC):

Values for this parameter are discussed and listed in the 1955 Agricultural Yearbook on water. The work was done by G. W. Musgrave in his study of the major soils of the United States. For Taylor Creek, this value was determined as zero because of water table conditions existing over the entire basin.

Depth of contributing soil zone (D):

This value was established by observing ground water tables during periods of a long recession. Its determination is linked with the analysis of total soil storage.

Maximum depth of free water evaporation H2OTA):

This value was determined from the results of lysimeter tests conducted at Plantation Field Station and reported in the yearly ARS publication containing Taylor Creek data.

Pan evaporation (EP):

These values were determined from pan evaporation records compiled for the Taylor Creek Basin and reported in the ARS yearly publications. They are stored and used by the model in the form of weekly values. Therefore, for any given week, the same value is used for each day of that week. It was felt that for the present, weekly values are the smallest practical increment that could be utilized. Daily values experience severe scatter when plotted; however, weekly values do demonstrate a cyclical trend.

Ratio of ET/E_p (PPAN):

Determined from data compiled at Plantation Field Station.

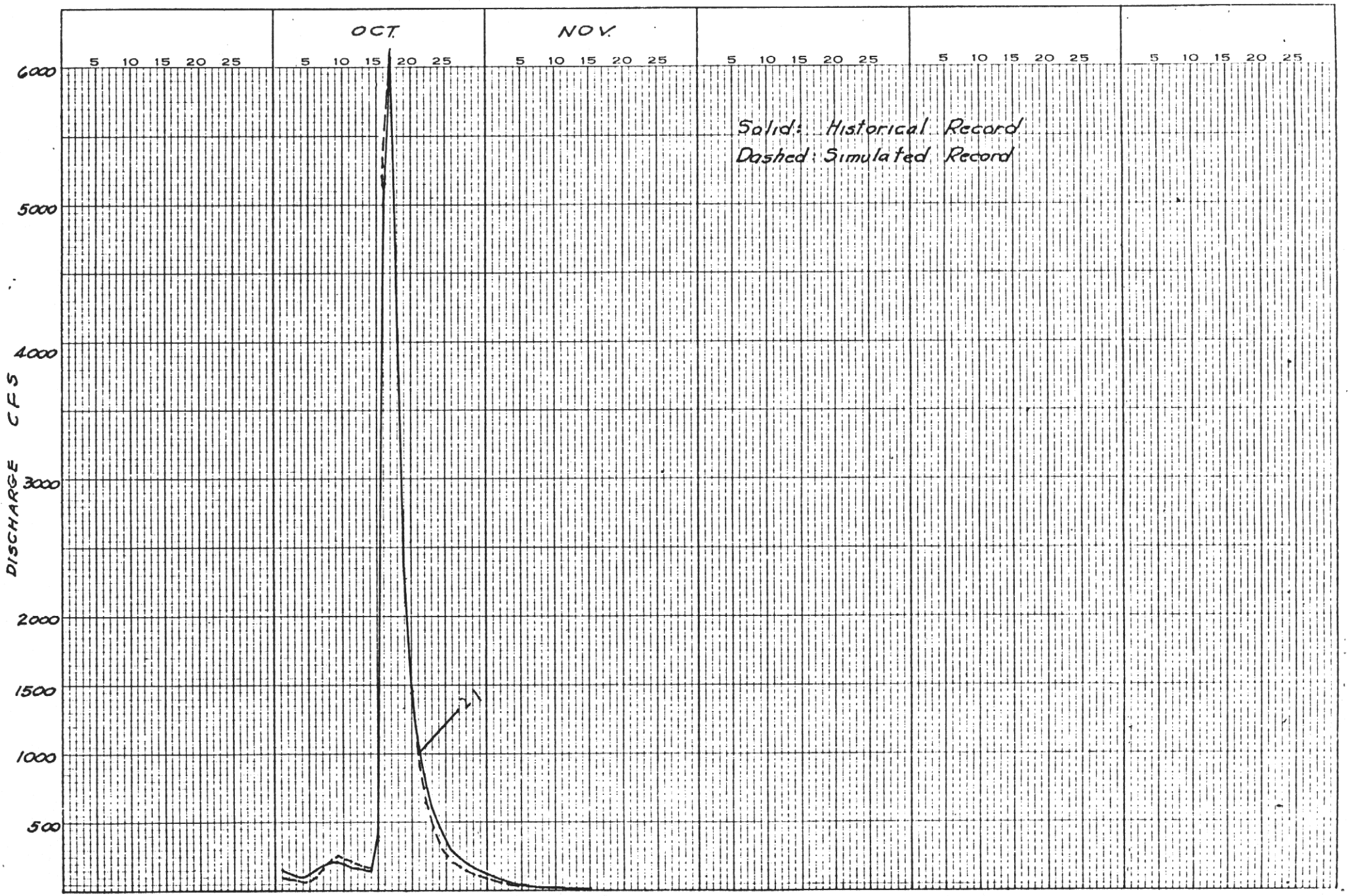
Root Density (A):

Determined from ARS reports entitled INFLUENCE OF SOILS, VEGETATION AND GEOMORPHOLOGY

NO. 340-T9 DIETZGEN GRAPH PAPER
6 MONTHS BY DAYS

EUGENE DIETZGEN CO.
MADE IN U.S.A.

TAYLOR CREEK
1956



NO. 340-T9 DIETZGEN GRAPH PAPER
6 MONTHS BY DAYS

EUGENE DIETZGEN CO.
MADE IN U. S. A.

TAYLOR CREEK - 1959

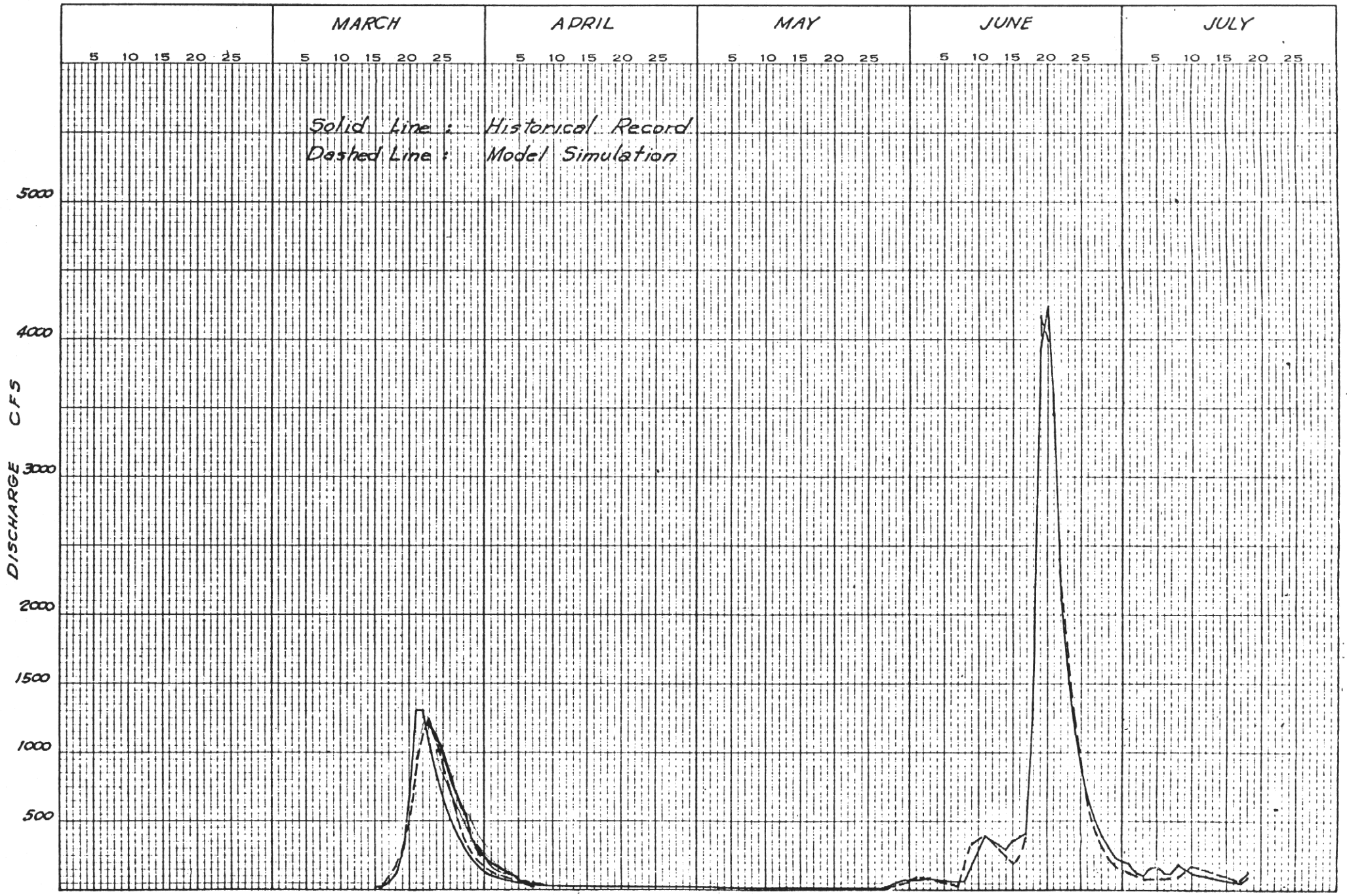


FIG. II

ON ELEMENTS OF THE FLOOD HYDROGRAPH, FIELD & LABORATORY STUDIES OF THE HYDROLOGIC CAPACITIES OF SELECTED SOILS and PLOT SAMPLES OF WATERSHED HYDROLOGY.

Growth Indexes (GI):

Determined from lysimeter tests conducted at Plantation Field Station with various types of vegetative cover. The distribution of pasture grass, virgin land, etc., is expressed as a percent of basin area and the GI values are calculated and stored on disk by weeks. The handling and arrangement of this file is very similar to that of Pan Evaporation.

Precipitation (PR):

Precipitation for periods of constant intensity, as extracted from rainfall records, is pre-processed into time increments of 15 minutes and stored on disk in that form. Therefore, each daily rainfall record contained 96 pieces of data.

Capillary water (AWC):

Determined from information on free water storage (G), and total storage (S), where AWC=S-G.

$SUBM_n$ & GD:

The relationship between storage, discharge, and free water extracted during reservoir releases should be discussed under the same heading. These values are determined from hydrograph analysis performed in the following suggested manner:

The recession of a hydrograph through any particular segment is a composite of X number of reservoirs acting together. The flow characteristics of the particular region appears to represent only one reservoir even though there are several participating units. The apparent reason for this is that in QRF, the $\Delta DRF \cong 0$ while PE is rapidly approaching zero, and in DRF, the QRF becomes small compared to DRF. Therefore, through a particular region of flow, the predominant functioning reservoir will determine the slope of the storage discharge curve for that region when the hydrograph is integrated. The slope ($\Delta S/\Delta Q$), is

the routing factor for that reservoir. The problem then arises concerning the maximum flow being released by each soil zone or reservoir. Each volume of water from a reservoir is routed through time and therefore has attenuated when it appears as the dominant reservoir on the recession. However, its first appearance as an influencing factor in the shape of a hydrograph is noted at the beginning signs of an inflection point. It is in this region that emphasis is shifting from one reservoir to another and would therefore indicate a possible maximum release of water for all reservoirs acting at that particular time. By taking the difference between these inflection points, the potential discharge at various storage levels can be determined.

So far, determination of the K value for routing, and maximum releases from each soil zone or reservoir have been discussed. The next questions are how is the storage distributed among reservoirs and what is the total free water storage involved in desorption of the soil zones.

Itcan be assumed that a specific region of a recession represents the action of a single reservoir. As already explained, a recession is the composite action of several reservoirs; however, for determining volumetric releases, this assumption appears reasonably valid. Therefore, the routing coefficient, KR_1, times the maximum release rate of a reservoir would give that portion of the total free water storage that is discharged. To this value, the plant and soil evapo-transpiration for an equal period of time must be added. Plant evapo-transpiration is determined from the schedule of weekly values and soil evaporation is determined as a function of depth to water table. It should be recognized that the recession analysis for a hydrograph occurring say, in June, will not match an analysis of a November hydrograph except in total free water (GD) released from the contributing soil zone.

RESULTS

As was previously stated, the output of the model should reproduce the reaction of a basin system to a set of initial and input conditions. To test the model response, historical record for the periods of October 1st to November 15th, 1956, and March 15th to July 4th, 1959, were used. These periods represent 46 and 127 days respectively.

The October 1st - November 15th, 1956 period of record includes a storm of approximately 1 in 100 year frequency followed by a 137 day recession. The major portion of the storm occurred between October 13-16 with 9.98 inches falling on the 15th. This provides an excellent check on the model's capability to simulate hydrologic response to extreme conditions of rainfall with an almost uninterrupted recession. A graphical comparison of historical and simulated record is shown in Figure I. A listing of the computed output prior to basin routing is attached as Exhibit I. The following is a breakdown of recorded and simulated results:

ITEM	RECORDED	SIMULATED
Evapo-transpiration	2.33 inches	2.34 inches
Yield	9.98 inches	9.97 inches
Time of Peak Flow	Midnight-Oct. 16	Midnight-Oct. 16
Peak Flow	6930 cfs.	6700 cfs.
Rainfall	12.31 (6 gages)	12.38 (2 gages)

The relationship between soil storage and discharge is:

RESERVOIR	STORAGE (Inches)	CUMULATIVE STORAGE (Inches)	DISCHARGE (in./hr.)	CUMULATIVE DISCHARGE (in./hr.)
Base	3.40	3.40	.00021	.00021
DRF	1.00	4.40	.00479	.00500
QRF	2.20	6.60	.02750	.03250
PE	∞	-	-	-

PE was routed through linear equal reservoirs with a storage coefficient, K, of 16 hrs. and lagged by three (3) cascades. QRF was also routed through linear equal reservoirs with a storage coefficient of 16 hrs., and lagged by five (5) cascades. The DRF was routed through linear unequal reservoirs with storage coefficient of 120 and 16 hrs. for groundwater and channel flow respectively.

The March 15th - July 4th, 1959 period of record includes a cycle of hydrologic conditions. The cycle begins with a mild storm period from March 16th to March 23rd with a maximum rainfall of 1.92 inches occurring on March 19th; then a 49 day recession of minimum rainfall; then a 33 day period of varying threshold rainfall; then a medium storm period from June 15th to June 22nd with a maximum rainfall of 3.71 inches occurring on June 18th. A graphic comparison of historical and simulated records for this period is shown in Figure II and a listing of the computed output prior to routing is attached as Exhibit II. The following is a breakdown of recorded and simulated results.

ITEM	RECORDED	SIMULATED
Evapo-transpiration	14.65 inches	14.73 inches
Yield	13.70 inches	14.70 inches
Peak Flows	1300 cfs. (1st storm) 4450 cfs. (2nd storm)	1230 cfs. 4350 cfs.
Rainfall	29.11 (6 gages)	30.18 (2 gages)

The storage-discharge relationships of QRF, DRF, and base flow were identical to those used in the 1956 simulation; likewise, the routing procedure was identical.

To demonstrate how each reservoir of the system responds, a separated hydrograph, Figure III, was plotted for the 1956 period of record. The total hydrograph is computed by adding values of the separated hydrographs at a particular point in time.

SYSTEM RESPONSE

A period of about 8 weeks was used by the writer to examine the response of the model to changes in input parameters and routing procedures. It was felt that this was a necessary and profitable expenditure of time because it gave the writer a "feel" for recognizing erroneous input data by examining characteristic indicators of output. Where the model must be applied to areas that lack sufficient data to adequately define input parameters, the ability to recognize certain output indicators that are linked with input information will be an outstanding advantage that will result in a considerable savings of guess work and time.

The process of converging on accurate input information has been generally called the "tuning process". Accordingly, there are several "tuning knobs" that are available in the form of input parameters that can be adjusted to compensate for errors in simulated results. The following is a discussion of the major tuning mechanisms:

A. ET & E: An incorrect schedule of ET & E values and/or functions will be the major consideration in balancing the water budget of a basin. Very simply, if there is a deficient or surplus amount of water attributed to the yield of a basin with the complementary error attributed to evapo-transpiration, then the schedule of ET values should be examined. The information required to make these determinations is printed as shown in Exhibits I and II. In fitting the model to a basin, the balance of ET and water yields should be realized before any effort is spent on the routing problem.

B. FC: This variable also has a volumetric impact on the water budget of a basin and may be difficult to recognize unless an error in its determination results in an unreasonable adjustment to the ET schedule. If there is any continuous record available, the effects of this variable can more easily be recognized by examining the rainfall-yield relationships of the basin. If no record is available,

the best value to use is Musgrave's determination in his analysis of the major soils as reported in 1955 Agriculture Yearbook. A simulation for an extended period of time would help expose any major errors in the assignment of this value.

Examples of A and B:

When the model was first run with correct rainfall for the period in 1956, a schedule of ET values that had been quickly developed was used. When model results were compared to historical record a deficiency in yield and a surplus of ET was apparent. The same held true for the first runs of the 1959 period. The following is an example of the magnitude of error:

	1956 (46 days)	1959 (90 days)
Recorded ET	2.33 inches	10.31 inches
Simulated ET	4.87 inches	14.12 inches
Recorded Yield	9.98 inches	9.78 inches
Simulated Yield	7.22 inches	8.32 inches

When extended periods of record are simulated, such as in 1959, the effects of small incremental errors in ET become magnified and can induce significant errors: i.e., a .02 inch error in ET will result in ±2 inches of storage error at the threshold of a rainfall event 100 days later. The actual effects of one half inch (0.5) surplus in soil storage at the beginning of a major rainfall event is shown in Figure IV.

C. A-Value: This particular parameter does not show itself until a period of medium to high intensity rainfall occurs. It affects the amount of PE that is generated by placing limitations on the maximum rate of infiltration that can exist. If, during a storm period, the historical record shows a rapid response with a short peak duration and the simulated record appears to be more groundwater oriented with an attenuated rise and translated peak, then suspicions concerning the A value should be investigated. There is another parameter that has the same effect but

it has other indicators to distinguish it from the A-Value. The effect of this A-Value is not of great magnitude and it should be varied only in the very fine stages of basin analysis and model fitting. An example of its application as a tuning device is demonstrated by the 75th day of 1959 as shown in Exhibit II. Originally there was no PE generated due to the 1.32 inches of rainfall. The historical record indicated that a small amount of PE did exist due to the hysteresis effect in the rising limb of the hydrograph. After adjusting the A-Value, PE in the amount of 0.09 inches was generated which fit very well. The adjustment also resulted in a better fit for other periods where PE existed.

D. Amount and Distribution of GD: In the absence of adequate historical record, establishing the amount of free water available to drain (GD) and its distribution among the assigned reservoirs will be a difficult task. There are, however, certain indicators that can be used in the fixation of both the amount and distribution of free water stored in the contributing soil zone. As an example, if, when plotted, the simulated DRF reservoir consistently falls to the right of recorded events when reasonable adjustments have been made to the routing factors, then the possibility exists of allocating too much water to DRF. A deficit will not necessarily be noticeable in QRF because of the large difference between contributing flows of QRD and DRF. In other words, the deletion of storage allocated to DRF with an equivalent amount added to QRD will make a signifcant change in the simulated response of DRF with only a slight change occurring in QRF. Another example is the effect of total storage on the generation of PE. If the given total storage is greater than what actually exists, it is possible to get the correct yield from a simulation but never match recorded peak flows. This results from the lack of PE, which is the major cause of rapid rising, high peak flows.

Routing Coefficients: A considerable amount of effort was spent on determining

the sensitivity of the routing function to changes in the "K" coefficients. For Taylor Creek, in the region of PE and QRF, the output of a simulation is extremely sensitive to changes in the routing coefficients. Because of this, gross errors will develop in the model output when an incorrect K value is used. However, because the function is so sensitive, it also offers an excellent tuning device when compensating for innumerable indeterminate variables that cause unexplained departures of simulated record from historical record. Care must be exercised, however, in determining whether the errors are due to incorrect routing coefficients or incorrect storage distributions of groundwater. It is in separating these differences that a long, continuous historical record becomes very useful. For demonstration purposes, the 1956 storm was routed using a K of 12 hrs. with 2 cascades for PE, a K of 12 hrs. with 3 cascades for QRF, and DRF was held constant. A comparison of the incorrect simulation and historical record is shown in Figure V.

Precipitation: Rainfall, because it is an input determined from recorded values, might be questioned as to its utility in tuning the model output. This is not to imply that rainfall data should be altered as an input variable. What is meant is that the output accuracies of the present and future numerical schemes used in a watershed model are limited by the availability of accurate and representative rainfall data. Evaluation of model results generated from erroneous rainfall data have demonstrated to the writer that hydrograph shape, peak, and temporal characteristics are critically altered when errors of approximately one-half inch are experienced. The one-half inch error does not have to occur at a single point in time but can be accumulative through time and produce similar incorrect results. It is felt that emphasis needs to be placed on developing a reliable and accurate precipitation data acquisition facility and to develop a scheme for reducing, evaluating and storing these data in machine readable form.

CONCLUSIONS & RECOMMENDATIONS

The concepts, numerical scheme, and methods of data analysis as described in the previous paragraphs and related memoranda have been compiled into the form of a computer program portfolio that is operative and simulates, within reasonable accuracies, the response of a watershed to a given set of initial and input conditions. The simulations have been checked against historical record for continuous periods of 46 and 127 days and demonstrates the capability of computing acceptable results for peak flows, extended recessions, hydrograph shape and overall accounting of a water budget.

The present structure of the computer programs is inefficient, with the primary considerations being oriented toward developmental utilization. During the time when an operational model is being organized, the programs will be continually changing and, to some degree, there will be changes in fundamental concepts. However, these changes are not sufficient cause to pursue further development work on the Taylor Creek basin.

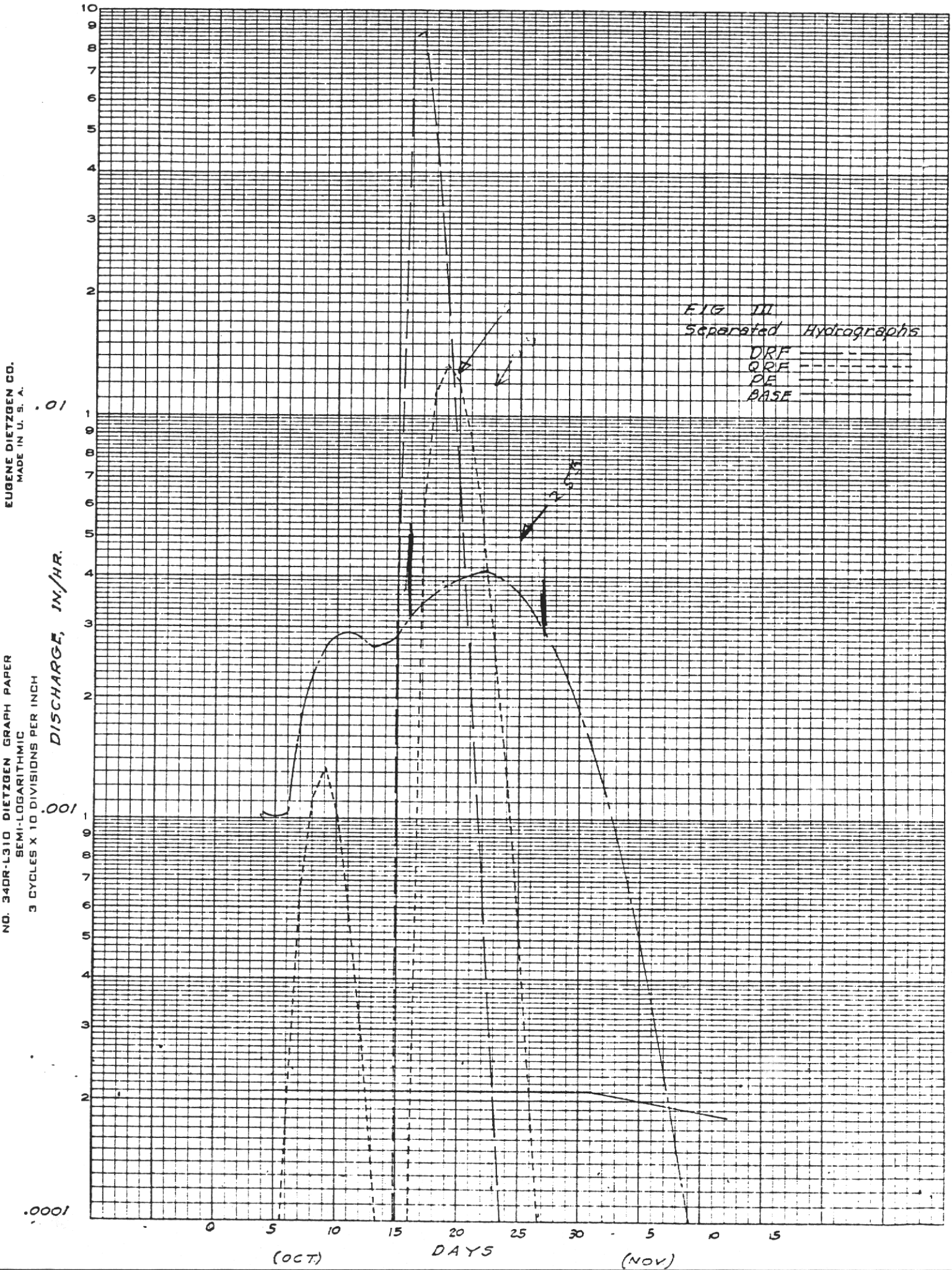
It is the writer's opinion that the verification of this mathematical model has satisfied the criteria and objectives necessary to justify the continuation of our program as outlined in the November 1967 report. It is therefore recommended that we terminate development efforts on Taylor Creek basin, begin a "grass roots" analysis of hydrologic parameters for the many Kissimmee sub-basins and apply the numerical scheme and concepts as described herein to continue working towards the major objectives of an operational model that will assist management in the decision making processes.

Respectfully submitted,

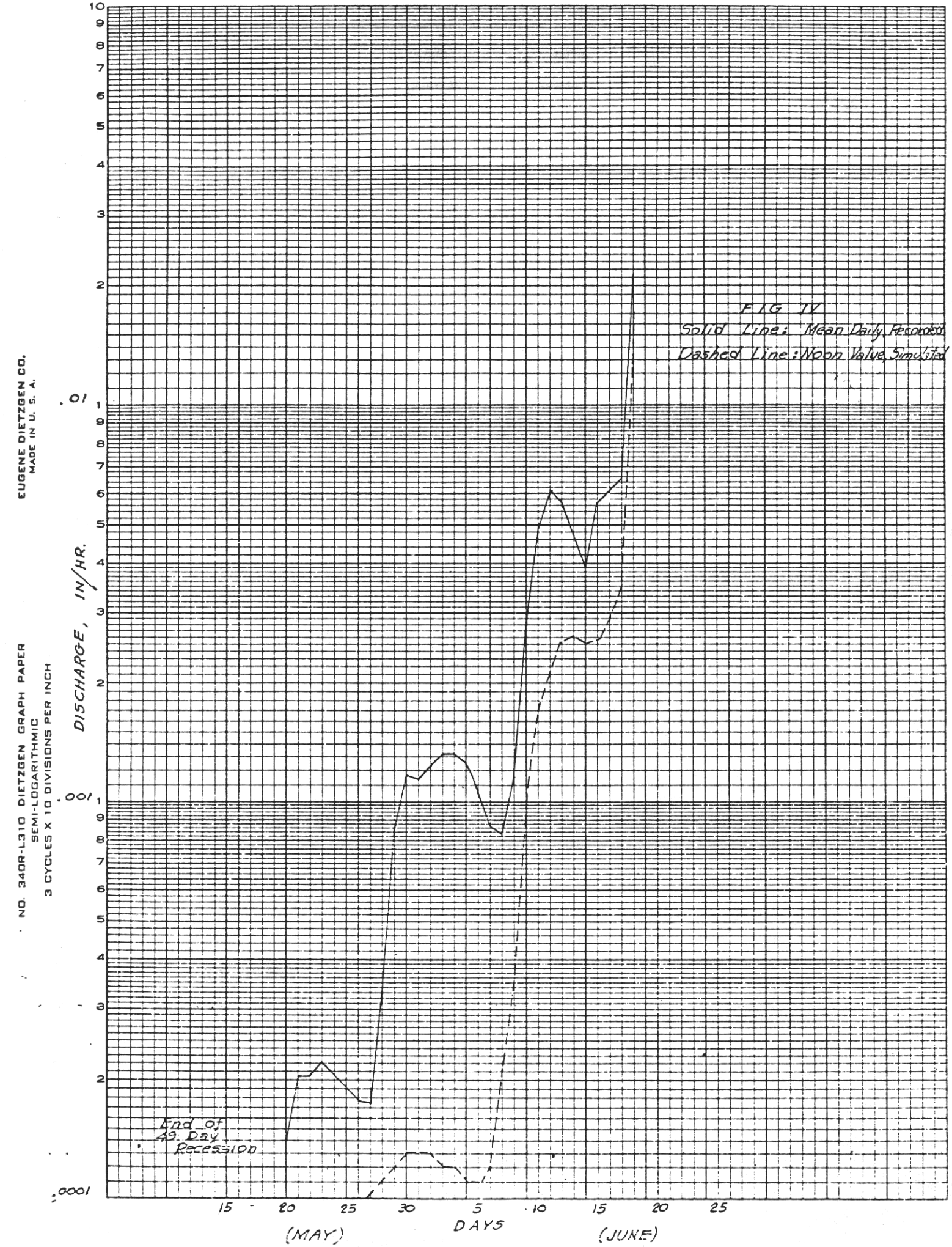
L. E. Lindahl
Systems Engineer

LEL:og

TAYLOR CREEK
1956



TAYLOR CREEK
1959



1956

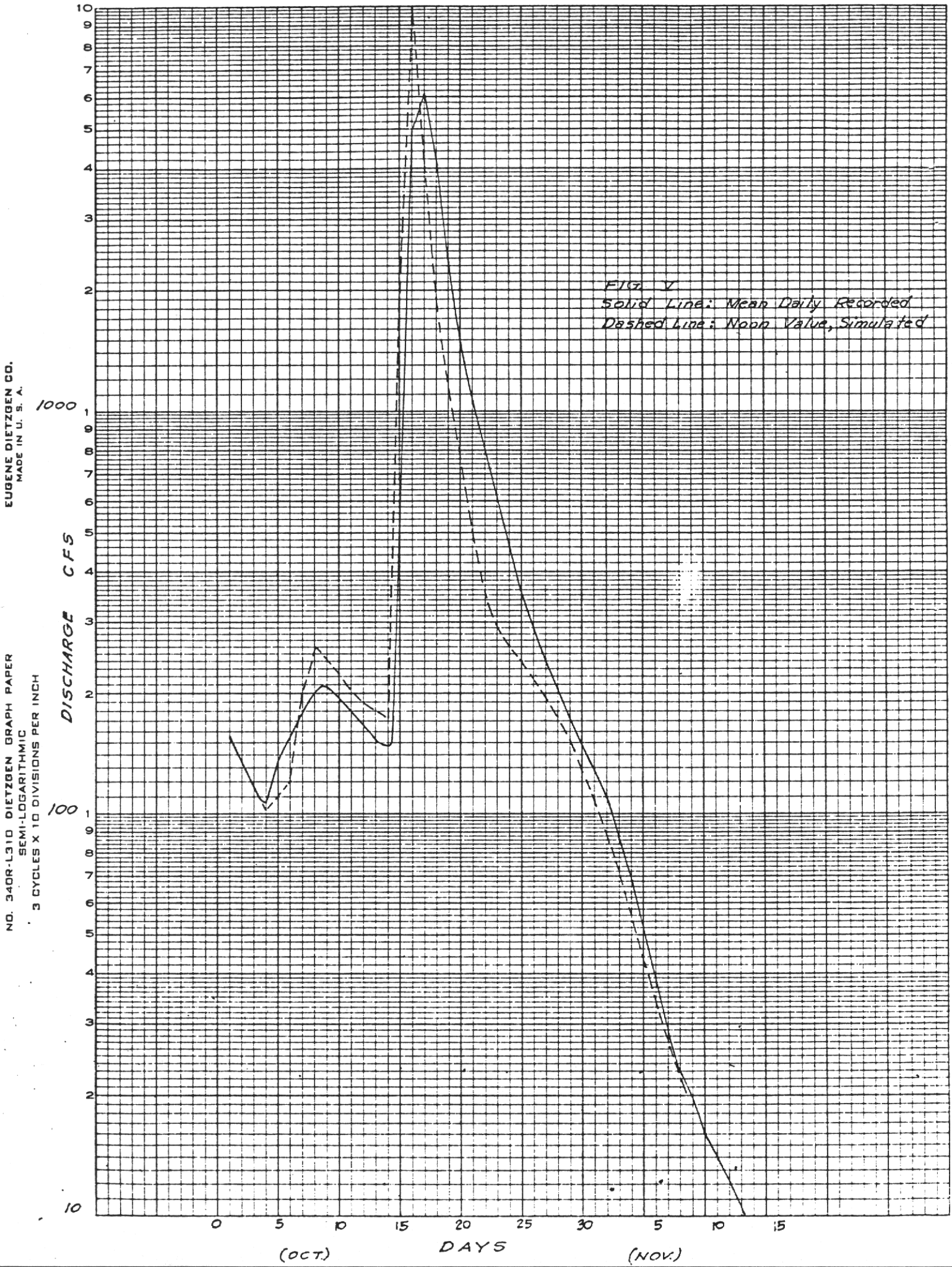


FIG. V
Solid Line: Mean Daily Recorded
Dashed Line: Noon Value, Simulated
DISCHARGE CFS
1000
100
10
0
5
10
15
20
25
30
5
10
15
(OCT.)
DAYS
(NOV.)
EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 340R-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

E X H I B I T

I

DIAGRAMMING SYMBOLS USED

I	Vertical connector line between blocks and for DO's
1-9	Vertical connectors for branch flowlines
.	Horizontal connector line between blocks
0	Change of direction or junction of flowlines
A	Direction of flow (upward), at junctions only
V	Direction of flow (downward), at junctions only
(	Direction of entry into a connector line
Z	Branching on zero in an IF *
+	Branching on plus in an IF *
-	Branching on negative in an IF *

* These symbols are followed by the statement number being branched to unless the number is that of the next statement.

"FORFLO" analyzes each card which is read in to determine statement type. Each type is enclosed in a block which is outlined with a characteristic symbol. Sequential cards of the same type are grouped in the same block. Comment cards are blocked with the preceeding statement type.

BLOCK CHARACTERISTIC	STATEMENT TYPES
********	Branches and DO's
=-=-=-=-	Control cards (FORTRAN)
////////	Specifications and CALLs which are not exits
--------	I/O Statements
========	Exits
++++++++	Arithmetics and any others undefined

LISTING

&

FLOWCHART

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VQ
200										
4.0		5.025	2.17		3.256	11.354	0.00529	9.9993		
8.0		4.979	2.22		3.266	11.370	0.00488	10.0195		
12.0		4.935	2.26		3.275	11.386	0.00464	10.0386		
14.2	0.02	4.934	2.26	1.51	3.280	11.395	0.00464	10.0489	0.00	0.000
16.0		4.917	2.28		3.283	11.402	0.00455	10.0569		
20.0		4.878	2.32		3.292	11.419	0.00432	10.0747		
24.0		4.839	2.36		3.300	11.435	0.00411	10.0915		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBO	TQ	PE	VD
193										
4.0		4.383	2.81		3.080	10.701	0.00171	9.6264		
8.0		4.357	2.84		3.085	10.716	0.00157	9.6390		
12.0		4.332	2.86		3.089	10.731	0.00144	9.6390		
16.0		4.307	2.89		3.093	10.746	0.00131	9.6445		
20.0		4.284	2.91		3.096	10.761	0.00118	9.6495		
24.0		4.261	2.94		3.100	10.776	0.00107	9.6540		
194										
4.0		4.238	2.96		3.103	10.791	0.00094	9.6580		
8.0		4.217	2.98		3.107	10.806	0.00082	9.6616		
12.0		4.196	3.00		3.110	10.821	0.00071	9.6647		
13.7	0.08	4.269	2.93	1.94	3.111	10.827	0.00110	9.6659	0.00	0.000
16.0		4.258	2.94		3.113	10.836	0.00105	9.6683		
20.0		4.236	2.96		3.116	10.851	0.00093	9.6722		
24.0		4.214	2.98		3.119	10.865	0.00081	9.6757		
195										
4.0		4.193	3.00		3.122	10.880	0.00070	9.6787		
8.0		4.173	3.02		3.125	10.895	0.00060	9.6813		
12.0		4.153	3.04		3.128	10.910	0.00049	9.6835		
16.0		4.134	3.06		3.130	10.925	0.00039	9.6852		
20.0		4.115	3.08		3.133	10.940	0.00029	9.6866		
24.0		4.097	3.10		3.135	10.955	0.00020	9.6876		
196										
4.0		4.079	3.12		3.137	10.970	0.00020	9.6884		
8.0		4.061	3.13		3.139	10.985	0.00020	9.6892		
12.0		4.044	3.15		3.140	11.000	0.00020	9.6900		
16.0		4.026	3.17		3.142	11.015	0.00020	9.6908		
20.0		4.009	3.19		3.143	11.030	0.00020	9.6916		
24.0		3.992	3.20		3.145	11.045	0.00020	9.6924		
197										
4.0		3.974	3.22		3.146	11.061	0.00020	9.6932		
8.0		3.956	3.24		3.147	11.077	0.00020	9.6940		
12.0		3.938	3.26		3.148	11.093	0.00020	9.6948		
16.0		3.920	3.28		3.149	11.110	0.00019	9.6956		
20.0		3.902	3.29		3.149	11.126	0.00019	9.6964		
24.0		3.885	3.31		3.150	11.142	0.00019	9.6972		
198										
4.0		3.868	3.33		3.150	11.158	0.00019	9.6979		
8.0		3.850	3.35		3.150	11.175	0.00019	9.6987		
12.0		3.833	3.36		3.150	11.191	0.00019	9.6994		
13.0	0.75	4.580	2.61	1.85	3.150	11.195	0.00276	9.6997	0.00	0.000
14.2	0.03	4.609	2.59	1.82	3.152	11.200	0.00291	9.7029	0.00	0.000
16.0		4.596	2.60		3.155	11.207	0.00284	9.7080		
17.7	0.96	5.535	1.66	0.98	3.158	11.214	0.01166	9.7156	0.00	0.000
19.0	0.00	5.520	1.67	0.99	3.163	11.219	0.01147	9.7300	0.00	0.000
20.0		5.505	1.69		3.166	11.223	0.01128	9.7414		
24.0		5.433	1.77		3.179	11.240	0.01037	9.7847		
199										
4.0		5.364	1.83		3.192	11.256	0.00951	9.8245		
8.0		5.299	1.90		3.203	11.272	0.00870	9.8609		
12.0		5.237	1.96		3.215	11.289	0.00795	9.8942		
16.0		5.180	2.02		3.226	11.305	0.00722	9.9245		
20.0		5.128	2.07		3.237	11.321	0.00655	9.9520		
24.0		5.074	2.12		3.247	11.337	0.00591	9.9769		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
186										
4.0	0.01	4.525	2.66	1.50	2.814	10.119	0.00247	9.1057	0.00	0.000
4.2	0.02	4.549	2.65	1.49	2.814	10.120	0.00260	9.1063	0.00	0.000
8.0		4.524	2.67		2.819	10.132	0.00246	9.1158		
12.0		4.496	2.70		2.825	10.145	0.00231	9.1254		
16.0		4.468	2.73		2.830	10.158	0.00217	9.1343		
20.0		4.442	2.75		2.835	10.171	0.00202	9.1427		
24.0		4.416	2.78		2.840	10.184	0.00189	9.1505		
187										
4.0		4.391	2.80		2.844	10.197	0.00176	9.1578		
8.0		4.367	2.83		2.849	10.210	0.00163	9.1646		
12.0		4.344	2.85		2.853	10.223	0.00151	9.1709		
16.0		4.321	2.87		2.857	10.236	0.00138	9.1766		
20.0		4.299	2.90		2.861	10.249	0.00126	9.1819		
24.0		4.277	2.92		2.864	10.262	0.00115	9.1868		
188										
4.0		4.256	2.94		2.868	10.275	0.00104	9.1911		
8.0		4.236	2.96		2.871	10.288	0.00093	9.1951		
12.0	0.01	4.216	2.97	1.74	2.874	10.301	0.00082	9.1986	0.00	0.000
13.2	1.09	5.798	1.90	0.93	2.876	10.305	0.00870	9.2029	0.00	0.000
16.0		5.262	1.94		2.885	10.314	0.00824	9.2262		
20.0		5.206	1.99		2.896	10.327	0.00755	9.2578		
24.0		5.153	2.05		2.907	10.340	0.00687	9.2867		
189										
4.0		5.103	2.09		2.917	10.353	0.00626	9.3130		
8.0		5.056	2.14		2.927	10.366	0.00569	9.3369		
12.0		5.011	2.19		2.937	10.379	0.00513	9.3585		
16.0		4.969	2.23		2.946	10.392	0.00483	9.3783		
20.0		4.928	2.27		2.955	10.405	0.00460	9.3972		
24.0		4.888	2.31		2.964	10.418	0.00440	9.4152		
190										
4.0		4.848	2.35		2.972	10.433	0.00418	9.4323		
8.0		4.808	2.39		2.980	10.448	0.00397	9.4486		
12.0		4.770	2.43		2.988	10.463	0.00377	9.4641		
16.0		4.733	2.46		2.996	10.477	0.00357	9.4788		
20.0		4.697	2.50		3.003	10.492	0.00338	9.4927		
24.0		4.662	2.54		3.010	10.507	0.00320	9.5058		
191										
4.0		4.628	2.57		3.016	10.522	0.00301	9.5183		
8.0		4.595	2.60		3.023	10.537	0.00283	9.5300		
12.0		4.562	2.63		3.029	10.552	0.00267	9.5410		
16.0		4.531	2.67		3.035	10.567	0.00250	9.5513		
18.2	0.03	4.543	2.65	1.69	3.038	10.575	0.00256	9.5568	0.00	0.000
20.0		4.532	2.66		3.040	10.582	0.00251	9.5612		
24.0		4.501	2.69		3.046	10.597	0.00234	9.5709		
192										
4.0		4.472	2.72		3.051	10.612	0.00219	9.5800		
8.0		4.444	2.75		3.056	10.627	0.00204	9.5884		
12.0		4.416	2.78		3.061	10.642	0.00189	9.5963		
16.0		4.389	2.81		3.066	10.657	0.00174	9.6035		
16.5	0.07	4.460	2.73	1.76	3.066	10.658	0.00212	9.6044	0.00	0.000
20.0		4.437	2.76		3.071	10.671	0.00200	9.6116		
24.0		4.410	2.79		3.076	10.686	0.00185	9.6193		

TIME	PRECIP	FREE*	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
179										
4.0		4.293	2.90		2.709	9.556	0.00123	8.9690		
8.0		4.271	2.92		2.713	9.570	0.00112	8.9737		
12.0		4.250	2.95		2.716	9.583	0.00101	8.9780		
16.0		4.229	2.97		2.719	9.597	0.00090	8.9818		
20.0		4.209	2.99		2.722	9.611	0.00079	8.9851		
24.0		4.189	3.01		2.725	9.625	0.00068	8.9881		
180										
4.0		4.170	3.03		2.728	9.639	0.00058	8.9906		
8.0		4.151	3.04		2.730	9.652	0.00049	8.9927		
12.0		4.133	3.06		2.733	9.666	0.00038	8.9945		
16.0		4.116	3.08		2.735	9.680	0.00029	8.9958		
20.0		4.099	3.10		2.737	9.694	0.00020	8.9968		
24.0		4.082	3.11		2.739	9.707	0.00020	8.9976		
181										
4.0		4.066	3.13		2.741	9.721	0.00020	8.9984		
8.0		4.049	3.15		2.743	9.735	0.00020	8.9993		
12.0		4.033	3.16		2.745	9.749	0.00020	9.0001		
16.0	0.02	4.038	3.15	2.04	2.746	9.763	0.00020	9.0009	0.00	0.000
16.0	0.02	4.044	3.15	2.04	2.746	9.763	0.00020	9.0009	0.00	0.000
20.0		4.029	3.17		2.748	9.776	0.00020	9.0017		
24.0		4.013	3.18		2.749	9.790	0.00020	9.0025		
182										
4.0		3.997	3.20		2.750	9.804	0.00020	9.0033		
8.0		3.981	3.21		2.752	9.818	0.00020	9.0041		
12.0		3.965	3.23		2.753	9.832	0.00020	9.0049		
16.0		3.950	3.25		2.754	9.845	0.00020	9.0057		
20.0		3.934	3.26		2.754	9.859	0.00020	9.0065		
24.0		3.919	3.28		2.755	9.873	0.00019	9.0073		
183										
4.0		3.904	3.29		2.756	9.886	0.00019	9.0081		
8.0		3.890	3.31		2.756	9.899	0.00019	9.0088		
12.0		3.876	3.32		2.756	9.912	0.00019	9.0096		
16.0		3.862	3.33		2.757	9.925	0.00019	9.0103		
20.0		3.848	3.35		2.757	9.938	0.00019	9.0111		
24.0		3.834	3.36		2.757	9.951	0.00019	9.0119		
184										
4.0	0.12	3.940	3.25	1.98	2.757	9.964	0.00020	9.0126	0.00	0.000
8.0	0.25	4.053	3.13	1.88	2.759	9.977	0.00020	9.0134	0.00	0.000
12.0	0.38	4.165	3.02	1.79	2.761	9.990	0.00055	9.0147	0.00	0.000
16.0	0.51	4.274	2.91	1.70	2.764	10.003	0.00113	9.0181	0.00	0.000
20.0	0.63	4.379	2.81	1.62	2.768	10.016	0.00169	9.0237	0.00	0.000
24.0	0.76	4.482	2.71	1.53	2.773	10.029	0.00224	9.0316	0.00	0.000
185										
0.0	0.76	4.488	2.71	1.53	2.773	10.029	0.00226	9.0316	0.00	0.000
4.0		4.463	2.73		2.778	10.042	0.00213	9.0404		
6.2	0.17	4.623	2.57	1.43	2.781	10.049	0.00298	9.0453	0.00	0.000
8.0		4.611	2.59		2.783	10.055	0.00292	9.0504		
12.0	0.05	4.619	2.56	1.42	2.790	10.068	0.00297	9.0619	0.00	0.000
12.0	0.05	4.631	2.56	1.42	2.790	10.068	0.00303	9.0619	0.00	0.000
16.0		4.601	2.60		2.796	10.081	0.00287	9.0737		
20.0		4.571	2.63		2.802	10.094	0.00271	9.0848		
21.7	0.01	4.568	2.63	1.47	2.805	10.099	0.00269	9.0896	0.00	0.000
24.0		4.553	2.64		2.808	10.106	0.00262	9.0955		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBO	TQ	PE	VD
172										
4.0		6.219	0.98		2.291	8.952	0.02017	7.7335		
8.0		6.107	1.09		2.309	8.967	0.01877	7.8114		
12.0		6.002	1.20		2.327	8.982	0.01746	7.8839		
16.0	0.14	6.037	1.15	0.53	2.345	8.996	0.01791	7.9530	0.00	0.000
17.0	0.27	6.144	1.05	0.47	2.349	9.000	0.01923	7.9712	0.00	0.000
18.2	0.40	6.112	1.08	0.49	2.355	9.005	0.01885	7.9951	0.00	0.000
20.0		6.071	1.13		2.363	9.011	0.01834	8.0277		
24.0		5.968	1.23		2.381	9.026	0.01705	8.0984		
173										
4.0		5.870	1.33		2.398	9.041	0.01582	8.1641		
8.0		5.778	1.42		2.414	9.056	0.01466	8.2251		
12.0		5.690	1.51		2.429	9.071	0.01359	8.2816		
16.0	0.04	5.652	1.54	0.80	2.444	9.086	0.01311	8.3349	0.00	0.000
17.0	0.05	5.642	1.55	0.81	2.448	9.089	0.01297	8.3480	0.00	0.000
20.0		5.587	1.61		2.459	9.100	0.01230	8.3860		
24.0		5.510	1.69		2.472	9.115	0.01133	8.4333		
174										
4.0		5.438	1.76		2.486	9.130	0.01045	8.4768		
8.0		5.370	1.83		2.498	9.145	0.00961	8.5169		
12.0		5.306	1.89		2.511	9.160	0.00881	8.5537		
16.0		5.246	1.95		2.522	9.175	0.00806	8.5874		
20.0		5.189	2.01		2.533	9.190	0.00733	8.6182		
24.0		5.135	2.06		2.544	9.205	0.00666	8.6462		
175										
4.0		5.084	2.11		2.554	9.219	0.00604	8.6716		
8.0		5.036	2.16		2.564	9.234	0.00542	8.6945		
12.0		4.991	2.21		2.574	9.249	0.00494	8.7151		
16.0		4.948	2.25		2.583	9.264	0.00471	8.7345		
20.0		4.905	2.29		2.592	9.279	0.00449	8.7529		
24.0		4.864	2.33		2.600	9.294	0.00427	8.7704		
176										
4.0		4.826	2.37		2.608	9.307	0.00406	8.7871		
8.0		4.788	2.41		2.616	9.321	0.00386	8.8029		
12.0		4.752	2.44		2.624	9.335	0.00367	8.8180		
16.0		4.716	2.48		2.631	9.349	0.00348	8.8325		
20.0		4.682	2.51		2.638	9.363	0.00330	8.8459		
24.0		4.649	2.55		2.644	9.376	0.00312	8.8588		
177										
4.0		4.616	2.58		2.651	9.390	0.00296	8.8709		
8.0		4.585	2.61		2.657	9.404	0.00279	8.8824		
12.0		4.554	2.64		2.663	9.418	0.00262	8.8932		
16.0		4.525	2.67		2.668	9.432	0.00247	8.9034		
20.0		4.496	2.70		2.674	9.445	0.00231	8.9129		
24.0		4.468	2.73		2.679	9.459	0.00216	8.9219		
178										
4.0		4.441	2.76		2.684	9.473	0.00202	8.9302		
8.0		4.414	2.78		2.688	9.487	0.00188	8.9380		
12.0		4.389	2.81		2.693	9.501	0.00174	8.9453		
16.0		4.364	2.83		2.697	9.514	0.00161	8.9520		
20.0		4.340	2.86		2.701	9.528	0.00148	8.9582		
24.0		4.316	2.88		2.705	9.542	0.00136	8.9638		

20.0	6.464	0.74	2.250	8.922	0.02323	7.5601
24.0	6.338	0.86	2.271	8.937	0.02185	7.6498

TIME	PRECIP	FREE	SA	RATE	TE	TET	SURQ	TQ	PE	VD
165										
4.0		4.276	2.92		1.575	8.301	0.00114	4.8847		
8.0		4.252	2.94		1.579	8.317	0.00101	4.8891		
12.0		4.229	2.97		1.582	8.333	0.00090	4.8929		
16.0		4.206	2.99		1.585	8.349	0.00077	4.8962		
17.0	0.06	4.253	2.94	2.10	1.586	8.353	0.00103	4.8970	0.00	0.000
20.0	1.42	5.642	1.55	0.85	1.592	8.365	0.01300	4.9131	0.00	0.000
22.2	1.62	5.798	1.40	0.74	1.601	8.374	0.01493	4.9440	0.00	0.000
24.0		5.764	1.44		1.608	8.381	0.01450	4.9698		
166										
4.0		5.676	1.52		1.624	8.397	0.01343	5.0256		
8.0		5.594	1.61		1.638	8.413	0.01238	5.0772		
12.0		5.516	1.68		1.652	8.429	0.01141	5.1248		
16.0		5.442	1.76		1.666	8.445	0.01050	5.1686		
19.0	0.13	5.518	1.68	0.95	1.676	8.457	0.01144	5.2022	0.00	0.000
20.0		5.504	1.70		1.680	8.461	0.01125	5.2135		
24.0		5.431	1.77		1.693	8.477	0.01037	5.2568		
167										
4.0		5.362	1.84		1.706	8.493	0.00951	5.2964		
8.0		5.297	1.90		1.718	8.509	0.00867	5.3328		
12.0		5.236	1.96		1.730	8.525	0.00792	5.3660		
16.0		5.178	2.02		1.741	8.541	0.00720	5.3962		
20.0		5.123	2.07		1.752	8.557	0.00653	5.4237		
24.0		5.072	2.13		1.762	8.573	0.00588	5.4485		
168										
4.0		5.024	2.17		1.772	8.589	0.00526	5.4708		
8.0	0.89	5.836	1.35	0.70	1.784	8.605	0.01541	5.5059	0.00	0.000
8.0	0.89	5.848	1.35	0.70	1.784	8.605	0.01555	5.5059	0.00	0.000
12.0		5.761	1.44		1.801	8.621	0.01447	5.5661		
16.0		5.674	1.53		1.816	8.637	0.01337	5.6218		
20.0	0.88	6.407	0.74	0.30	1.834	8.653	0.02253	5.6917	0.00	0.000
24.0	1.58	6.888	0.29	0.08	1.858	8.669	0.02852	5.7962	0.10	0.100
169										
4.0	3.42	6.986	0.21	0.05	1.883	8.684	0.02973	5.9133	1.59	0.100
8.0	5.15	7.007	0.19	0.04	1.909	8.699	0.03000	6.0329	3.15	0.100
12.0	5.39	7.011	0.18	0.04	1.934	8.714	0.03005	6.1530	3.27	0.059
13.5	5.39	7.010	0.18	0.04	1.944	8.720	0.03002	6.1981	3.27	0.000
16.0		6.921	0.28		1.960	8.729	0.02892	6.2720		
20.0		6.769	0.43		1.984	8.744	0.02704	6.3839		
24.0		6.626	0.58		2.008	8.759	0.02524	6.4884		
170										
4.0		6.491	0.71		2.030	8.774	0.02358	6.5860		
8.0	1.06	6.774	0.40	0.12	2.052	8.788	0.02710	6.6851	0.51	0.100
9.0	1.06	6.859	0.34	0.09	2.058	8.792	0.02814	6.7127	0.51	0.000
12.0	0.05	6.804	0.39	0.11	2.076	8.803	0.02747	6.7958	0.00	0.000
13.0	0.08	6.793	0.40	0.12	2.082	8.807	0.02734	6.8233	0.00	0.000
16.0		6.693	0.51		2.100	8.818	0.02608	6.9035		
20.0		6.554	0.65		2.122	8.833	0.02436	7.0043		
24.0		6.423	0.78		2.144	8.848	0.02272	7.0985		
171										
4.0		6.299	0.90		2.164	8.863	0.02119	7.1862		
8.0		6.183	1.02		2.184	8.878	0.01971	7.2680		
8.7	0.22	6.359	0.84	0.34	2.188	8.880	0.02191	7.2834	0.01	0.000
11.2	0.94	6.739	0.46	0.14	2.204	8.891	0.02664	7.3541	0.46	0.000
12.0		6.739	0.46		2.205	8.892	0.02664	7.3608		
16.0		6.597	0.61		2.228	8.907	0.02489	7.4639		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
158										
4.0		3.654	3.54		1.225	7.600	0.00018	4.0089		
8.0		3.636	3.56		1.225	7.618	0.00018	4.0097		
12.0		3.618	3.58		1.225	7.635	0.00018	4.0104		
16.0		3.600	3.60		1.225	7.652	0.00018	4.0111		
17.2	2.08	5.462	1.73	1.06	1.227	7.657	0.01074	4.0146	0.21	0.000
20.0		5.417	1.78		1.236	7.669	0.01018	4.0433		
24.0		5.347	1.85		1.249	7.686	0.00932	4.0823		
159										
4.0		5.282	1.92		1.261	7.704	0.00849	4.1179		
8.0		5.220	1.98		1.273	7.721	0.00773	4.1504		
12.0		5.162	2.04		1.284	7.738	0.00701	4.1798		
16.0	0.33	5.128	1.76	1.09	1.295	7.755	0.00658	4.2066	0.00	0.009
18.0	0.67	5.737	1.46	0.83	1.303	7.764	0.01418	4.2331	0.00	0.000
20.0		5.698	1.50		1.310	7.773	0.01367	4.2610		
24.0		5.612	1.59		1.326	7.790	0.01262	4.3136		
160										
4.0		5.532	1.67		1.340	7.807	0.01160	4.3620		
8.0		5.456	1.74		1.354	7.824	0.01066	4.4066		
12.0		5.385	1.81		1.367	7.842	0.00978	4.4475		
16.0		5.317	1.88		1.380	7.859	0.00894	4.4849		
20.0		5.253	1.95		1.392	7.876	0.00814	4.5190		
24.0		5.193	2.00		1.403	7.893	0.00739	4.5501		
161										
4.0		5.137	2.06		1.414	7.910	0.00669	4.5783		
8.0		5.083	2.11		1.425	7.928	0.00602	4.6037		
12.0		5.033	2.16		1.435	7.945	0.00540	4.6265		
16.0		4.985	2.21		1.445	7.962	0.00491	4.6470		
20.0		4.939	2.26		1.454	7.979	0.00467	4.6661		
24.0		4.895	2.30		1.463	7.997	0.00443	4.6843		
162										
4.0		4.853	2.34		1.472	8.013	0.00421	4.7016		
8.0		4.812	2.39		1.480	8.029	0.00399	4.7180		
12.0		4.772	2.42		1.488	8.045	0.00378	4.7336		
16.0		4.734	2.46		1.495	8.061	0.00357	4.7483		
20.0		4.697	2.50		1.502	8.077	0.00339	4.7623		
24.0		4.661	2.54		1.509	8.093	0.00319	4.7754		
163										
4.0		4.626	2.57		1.516	8.109	0.00300	4.7878		
8.0		4.591	2.61		1.522	8.125	0.00282	4.7994		
12.0		4.558	2.64		1.528	8.141	0.00264	4.8104		
16.0		4.526	2.67		1.534	8.157	0.00247	4.8206		
20.0		4.495	2.70		1.540	8.173	0.00230	4.8302		
24.0		4.465	2.73		1.545	8.189	0.00215	4.8391		
164										
4.0		4.435	2.76		1.550	8.205	0.00199	4.8474		
8.0		4.407	2.79		1.555	8.221	0.00183	4.8550		
12.0		4.379	2.82		1.559	8.237	0.00169	4.8621		
16.0		4.352	2.84		1.564	8.253	0.00155	4.8686		
20.0		4.326	2.87		1.568	8.269	0.00140	4.8745		
24.0		4.301	2.90		1.572	8.285	0.00127	4.8799		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
151										
4.0		4.509	2.69		1.154	6.847	0.00238	3.9151		
8.0		4.475	2.72		1.159	6.865	0.00221	3.9249		
12.0		4.443	2.75		1.164	6.884	0.00203	3.9328		
16.0		4.412	2.78		1.169	6.902	0.00187	3.9406		
20.0		4.381	2.82		1.174	6.921	0.00170	3.9477		
24.0		4.352	2.84		1.179	6.939	0.00154	3.9542		
152										
4.0		4.323	2.87		1.183	6.958	0.00139	3.9601		
8.0		4.295	2.90		1.187	6.976	0.00124	3.9654		
12.0		4.268	2.93		1.190	6.995	0.00110	3.9701		
16.0		4.242	2.95		1.194	7.013	0.00096	3.9742		
20.0		4.216	2.98		1.197	7.032	0.00082	3.9778		
24.0		4.191	3.00		1.200	7.051	0.00069	3.9809		
153										
4.0		4.167	3.03		1.203	7.069	0.00056	3.9835		
8.0		4.144	3.05		1.206	7.088	0.00045	3.9857		
12.0		4.122	3.07		1.208	7.106	0.00032	3.9870		
16.0		4.100	3.10		1.211	7.125	0.00021	3.9881		
20.0		4.078	3.12		1.213	7.143	0.00020	3.9889		
24.0		4.057	3.14		1.215	7.162	0.00020	3.9897		
154										
4.0		4.036	3.16		1.217	7.180	0.00020	3.9906		
8.0		4.015	3.18		1.218	7.199	0.00020	3.9914		
12.0		3.994	3.20		1.220	7.217	0.00020	3.9922		
16.0		3.973	3.22		1.221	7.236	0.00020	3.9930		
20.0		3.953	3.24		1.222	7.254	0.00020	3.9938		
24.0		3.933	3.26		1.223	7.273	0.00019	3.9946		
155										
4.0		3.914	3.28		1.223	7.290	0.00019	3.9954		
8.0		3.895	3.30		1.224	7.307	0.00019	3.9962		
12.0		3.877	3.32		1.224	7.325	0.00019	3.9970		
16.0		3.859	3.34		1.225	7.342	0.00019	3.9977		
20.0		3.840	3.36		1.225	7.359	0.00019	3.9985		
24.0		3.822	3.37		1.225	7.376	0.00019	3.9993		
156										
4.0		3.804	3.39		1.225	7.394	0.00019	4.0001		
8.0		3.786	3.41		1.225	7.411	0.00019	4.0008		
12.0		3.768	3.43		1.225	7.428	0.00019	4.0016		
16.0		3.750	3.45		1.225	7.445	0.00018	4.0023		
20.0		3.732	3.46		1.225	7.463	0.00018	4.0031		
24.0		3.714	3.48		1.225	7.480	0.00018	4.0038		
157										
4.0		3.697	3.50		1.225	7.497	0.00018	4.0045		
8.0		3.679	3.52		1.225	7.514	0.00018	4.0053		
12.0		3.661	3.54		1.225	7.531	0.00018	4.0060		
16.0		3.643	3.55		1.225	7.549	0.00018	4.0067		
19.7	0.06	3.690	3.50	2.84	1.225	7.565	0.00018	4.0074	0.00	0.000
20.0		3.690	3.51		1.225	7.566	0.00018	4.0076		
24.0		3.672	3.52		1.225	7.583	0.00018	4.0082		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBG	TO	PE	VD
144										
4.0		3.388	3.81		1.033	6.039	0.00016	3.6701		
8.0		3.368	3.83		1.033	6.059	0.00016	3.6708		
12.0		3.347	3.85		1.033	6.079	0.00016	3.6714		
16.0		3.327	3.87		1.033	6.099	0.00016	3.6721		
20.0		3.306	3.89		1.033	6.118	0.00016	3.6727		
24.0		3.286	3.91		1.033	6.138	0.00016	3.6734		
145										
4.0		3.266	3.93		1.033	6.158	0.00015	3.6740		
8.0		3.245	3.95		1.033	6.178	0.00015	3.6747		
12.0		3.225	3.97		1.033	6.197	0.00015	3.6753		
16.0		3.204	3.99		1.033	6.217	0.00015	3.6759		
20.0		3.184	4.01		1.033	6.237	0.00015	3.6766		
24.0		3.163	4.03		1.033	6.257	0.00015	3.6771		
146										
4.0		3.143	4.05		1.033	6.277	0.00015	3.6777		
8.0		3.123	4.07		1.033	6.296	0.00015	3.6784		
12.0		3.102	4.09		1.033	6.316	0.00015	3.6790		
16.0		3.082	4.11		1.033	6.336	0.00014	3.6795		
20.0		3.061	4.13		1.033	6.356	0.00014	3.6801		
24.0		3.041	4.15		1.033	6.376	0.00014	3.6807		
147										
4.0		3.021	4.18		1.033	6.395	0.00014	3.6813		
8.0		3.000	4.20		1.033	6.415	0.00014	3.6819		
12.0		2.980	4.22		1.033	6.435	0.00014	3.6824		
16.0		2.960	4.24		1.033	6.455	0.00014	3.6830		
20.0		2.939	4.26		1.033	6.475	0.00014	3.6836		
24.0		2.919	4.28		1.033	6.494	0.00013	3.6841		
148										
4.0		2.900	4.30		1.033	6.513	0.00013	3.6847		
8.0		2.881	4.32		1.033	6.531	0.00013	3.6852		
12.0	0.40	3.268	3.92	3.52	1.033	6.550	0.00016	3.6858	0.00	0.000
16.0	1.81	4.625	2.54	1.91	1.035	6.569	0.00299	3.6882	0.00	0.000
20.0	2.16	4.945	2.23	1.60	1.043	6.587	0.00470	3.7041	0.00	0.000
20.0	2.16	4.960	2.23	1.60	1.043	6.587	0.00478	3.7041	0.00	0.000
24.0		4.916	2.28		1.052	6.606	0.00455	3.7128		
149										
1.0	0.07	4.982	2.21	1.58	1.055	6.610	0.00489	3.7275	0.00	0.000
3.7	0.04	4.993	2.20	1.57	1.061	6.623	0.00496	3.7409	0.00	0.000
4.0		4.993	2.20		1.062	6.624	0.00496	3.7421		
7.0	0.00	4.958	2.24	1.60	1.069	6.638	0.00477	3.7567	0.00	0.000
8.0		4.949	2.25		1.071	6.643	0.00472	3.7615		
12.0		4.903	2.29		1.081	6.661	0.00447	3.7799		
16.0		4.858	2.34		1.090	6.680	0.00424	3.7973		
20.0		4.815	2.38		1.098	6.698	0.00400	3.8138		
24.0		4.772	2.42		1.106	6.717	0.00378	3.8294		
150										
4.0		4.731	2.47		1.114	6.735	0.00356	3.8441		
8.0		4.691	2.51		1.121	6.754	0.00335	3.8580		
12.0		4.653	2.54		1.128	6.772	0.00314	3.8710		
16.0		4.615	2.58		1.135	6.791	0.00295	3.8832		
20.0		4.579	2.62		1.142	6.810	0.00275	3.8946		
24.0		4.543	2.66		1.148	6.828	0.00256	3.9052		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBO	TQ	PE	VD
137										
4.0		2.213	4.98		1.033	5.148	0.00009	3.6477		
8.0		2.190	5.01		1.033	5.170	0.00009	3.6480		
12.0		2.167	5.03		1.033	5.192	0.00009	3.6484		
16.0		2.144	5.05		1.033	5.215	0.00009	3.6488		
20.0		2.122	5.07		1.033	5.237	0.00009	3.6492		
24.0		2.099	5.10		1.033	5.260	0.00008	3.6495		
138										
4.0		2.076	5.12		1.033	5.282	0.00008	3.6499		
8.0		2.053	5.14		1.033	5.305	0.00008	3.6502		
12.0		2.030	5.17		1.033	5.327	0.00008	3.6506		
16.0		2.008	5.19		1.033	5.349	0.00008	3.6509		
19.0	0.03	2.025	5.17	5.99	1.033	5.366	0.00008	3.6511	0.00	0.000
20.0		2.021	5.18		1.033	5.372	0.00008	3.6512		
24.0		1.998	5.20		1.033	5.394	0.00008	3.6516		
139										
4.0		1.975	5.22		1.033	5.417	0.00008	3.6519		
8.0		1.953	5.24		1.033	5.439	0.00008	3.6522		
12.0		1.930	5.27		1.033	5.461	0.00007	3.6525		
16.0	1.32	3.230	3.96	4.13	1.033	5.484	0.00015	3.6531	0.00	0.000
17.7	1.52	3.416	3.78	3.86	1.033	5.494	0.00016	3.6534	0.00	0.000
20.0		3.405	3.79		1.033	5.506	0.00016	3.6538		
24.0		3.382	3.81		1.033	5.529	0.00016	3.6544		
140										
4.0		3.359	3.84		1.033	5.551	0.00016	3.6551		
8.0		3.336	3.86		1.033	5.573	0.00016	3.6557		
12.0		3.313	3.88		1.033	5.596	0.00016	3.6564		
16.0		3.289	3.91		1.033	5.618	0.00016	3.6570		
18.0	0.01	3.288	3.91	4.04	1.033	5.630	0.00016	3.6574	0.00	0.000
20.0		3.278	3.92		1.033	5.641	0.00016	3.6577		
24.0		3.255	3.94		1.033	5.663	0.00015	3.6583		
141										
4.0		3.235	3.96		1.033	5.683	0.00015	3.6589		
8.0		3.214	3.98		1.033	5.703	0.00015	3.6596		
12.0	0.00	3.197	4.00	3.80	1.033	5.723	0.00015	3.6602	0.00	0.000
13.7	0.02	3.211	3.98	3.79	1.033	5.731	0.00015	3.6605	0.00	0.000
16.0		3.200	4.00		1.033	5.742	0.00015	3.6608		
20.0		3.180	4.02		1.033	5.762	0.00015	3.6614		
24.0		3.160	4.04		1.033	5.782	0.00015	3.6620		
142										
4.0		3.139	4.06		1.033	5.802	0.00015	3.6626		
8.0		3.119	4.08		1.033	5.821	0.00015	3.6633		
12.0	0.07	3.164	4.02	3.84	1.033	5.841	0.00015	3.6639	0.00	0.000
13.0	0.10	3.198	4.00	3.80	1.033	5.846	0.00015	3.6640	0.00	0.000
16.0		3.184	4.01		1.033	5.861	0.00015	3.6645		
20.0		3.164	4.03		1.033	5.881	0.00015	3.6651		
24.0		3.143	4.05		1.033	5.901	0.00015	3.6657		
143										
4.0		3.123	4.07		1.033	5.920	0.00015	3.6663		
8.0		3.102	4.09		1.033	5.940	0.00015	3.6669		
12.0		3.082	4.11		1.033	5.960	0.00014	3.6675		
16.0	0.30	3.227	3.83	3.58	1.033	5.980	0.00015	3.6681	0.00	0.000
16.7	0.38	3.445	3.75	3.48	1.033	5.984	0.00017	3.6682	0.00	0.000
20.0		3.429	3.77		1.033	6.000	0.00016	3.6688		
24.0		3.409	3.79		1.033	6.019	0.00016	3.6694		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
130										
4.0		2.478	4.72		1.033	4.266	0.00011	3.6308		
8.0		2.458	4.74		1.033	4.286	0.00011	3.6312		
12.0		2.438	4.76		1.033	4.305	0.00011	3.6317		
16.0		2.418	4.78		1.033	4.325	0.00010	3.6321		
20.0		2.397	4.80		1.033	4.345	0.00010	3.6325		
24.0		2.377	4.82		1.033	4.365	0.00010	3.6330		
131										
4.0		2.357	4.84		1.033	4.385	0.00010	3.6334		
8.0		2.337	4.86		1.033	4.405	0.00010	3.6338		
12.0		2.316	4.88		1.033	4.424	0.00010	3.6342		
16.0		2.296	4.90		1.033	4.444	0.00010	3.6346		
20.0		2.276	4.92		1.033	4.464	0.00010	3.6350		
24.0		2.256	4.94		1.033	4.484	0.00009	3.6354		
132										
4.0		2.235	4.96		1.033	4.504	0.00009	3.6358		
8.0		2.215	4.98		1.033	4.524	0.00009	3.6362		
12.0		2.195	5.00		1.033	4.543	0.00009	3.6366		
16.0		2.175	5.02		1.033	4.563	0.00009	3.6370		
20.0		2.155	5.04		1.033	4.583	0.00009	3.6373		
24.0		2.134	5.06		1.033	4.603	0.00009	3.6377		
133										
4.0		2.114	5.08		1.033	4.623	0.00009	3.6381		
8.0		2.094	5.10		1.033	4.642	0.00008	3.6384		
12.0		2.074	5.12		1.033	4.662	0.00008	3.6388		
16.0		2.054	5.14		1.033	4.682	0.00008	3.6391		
20.0	0.35	2.351	4.81	4.93	1.033	4.702	0.00010	3.6395	0.00	0.000
21.0	0.36	2.388	4.81	4.93	1.033	4.707	0.00010	3.6396	0.00	0.000
24.0		2.374	4.82		1.033	4.722	0.00010	3.6399		
134										
4.0		2.352	4.84		1.033	4.744	0.00010	3.6403		
8.0		2.329	4.87		1.033	4.767	0.00010	3.6407		
12.0		2.306	4.89		1.033	4.789	0.00010	3.6412		
13.7	0.17	2.465	4.73	5.29	1.033	4.799	0.00011	3.6413	0.00	0.000
16.0		2.453	4.74		1.033	4.811	0.00011	3.6416		
20.0		2.430	4.77		1.033	4.834	0.00010	3.6420		
24.0		2.407	4.79		1.033	4.856	0.00010	3.6425		
135										
4.0		2.385	4.81		1.033	4.879	0.00010	3.6429		
8.0		2.362	4.83		1.033	4.901	0.00010	3.6433		
12.0		2.339	4.86		1.033	4.923	0.00010	3.6437		
16.0		2.316	4.88		1.033	4.946	0.00010	3.6441		
20.0		2.293	4.90		1.033	4.968	0.00010	3.6445		
24.0		2.270	4.93		1.033	4.991	0.00010	3.6449		
136										
4.0		2.248	4.95		1.033	5.013	0.00009	3.6453		
8.0		2.225	4.97		1.033	5.036	0.00009	3.6457		
12.0		2.202	4.99		1.033	5.058	0.00009	3.6461		
14.2	0.10	2.290	4.90	5.56	1.033	5.071	0.00010	3.6463	0.00	0.000
16.0		2.281	4.91		1.033	5.080	0.00010	3.6465		
20.0		2.258	4.94		1.033	5.103	0.00009	3.6469		
24.0		2.236	4.96		1.033	5.125	0.00009	3.6473		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
123										
4.0		3.283	3.91		1.033	3.484	0.00016	3.6079		
8.0		3.265	3.93		1.033	3.502	0.00015	3.6085		
12.0		3.247	3.95		1.033	3.519	0.00015	3.6091		
16.0		3.228	3.97		1.033	3.537	0.00015	3.6098		
20.0		3.210	3.99		1.033	3.554	0.00015	3.6104		
24.0		3.192	4.00		1.033	3.572	0.00015	3.6110		
124										
4.0		3.174	4.02		1.033	3.590	0.00015	3.6116		
8.0		3.155	4.04		1.033	3.607	0.00015	3.6122		
12.0		3.137	4.06		1.033	3.625	0.00015	3.6128		
16.0		3.119	4.08		1.033	3.643	0.00015	3.6134		
20.0		3.101	4.09		1.033	3.660	0.00015	3.6140		
24.0		3.082	4.11		1.033	3.678	0.00014	3.6146		
125										
4.0		3.064	4.13		1.033	3.695	0.00014	3.6152		
8.0		3.046	4.15		1.033	3.713	0.00014	3.6158		
12.0		3.028	4.17		1.033	3.731	0.00014	3.6164		
16.0		3.010	4.19		1.033	3.748	0.00014	3.6170		
20.0		2.991	4.20		1.033	3.766	0.00014	3.6175		
24.0		2.973	4.22		1.033	3.783	0.00014	3.6181		
126										
4.0		2.955	4.24		1.033	3.801	0.00014	3.6187		
8.0		2.937	4.26		1.033	3.819	0.00014	3.6192		
12.0		2.919	4.28		1.033	3.836	0.00013	3.6198		
16.0		2.901	4.30		1.033	3.854	0.00013	3.6203		
20.0		2.882	4.31		1.033	3.872	0.00013	3.6209		
24.0		2.864	4.33		1.033	3.889	0.00013	3.6214		
127										
4.0		2.844	4.35		1.033	3.909	0.00013	3.6220		
8.0		2.824	4.37		1.033	3.929	0.00013	3.6225		
12.0		2.803	4.39		1.033	3.949	0.00013	3.6230		
16.0		2.783	4.41		1.033	3.968	0.00013	3.6235		
20.0		2.763	4.43		1.033	3.988	0.00012	3.6241		
24.0		2.742	4.45		1.033	4.008	0.00012	3.6246		
128										
4.0		2.722	4.47		1.033	4.028	0.00012	3.6251		
8.0		2.702	4.49		1.033	4.048	0.00012	3.6256		
12.0		2.681	4.51		1.033	4.068	0.00012	3.6261		
16.0		2.661	4.53		1.033	4.087	0.00012	3.6266		
20.0		2.641	4.56		1.033	4.107	0.00012	3.6271		
24.0		2.620	4.58		1.033	4.127	0.00012	3.6275		
129										
4.0		2.600	4.60		1.033	4.147	0.00011	3.6280		
8.0		2.580	4.62		1.033	4.167	0.00011	3.6285		
12.0		2.560	4.64		1.033	4.187	0.00011	3.6290		
16.0		2.539	4.66		1.033	4.206	0.00011	3.6294		
20.0		2.519	4.68		1.033	4.226	0.00011	3.6299		
24.0		2.499	4.70		1.033	4.246	0.00011	3.6303		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
116										
4.0		4.011	3.18		1.026	2.794	0.00020	3.5772		
8.0		3.993	3.20		1.027	2.809	0.00020	3.5780		
12.0		3.974	3.22		1.028	2.825	0.00020	3.5788		
16.0		3.959	3.24		1.030	2.840	0.00020	3.5796		
20.0		3.941	3.25		1.030	2.856	0.00020	3.5804		
24.0		3.924	3.27		1.031	2.871	0.00019	3.5812		
117										
4.0		3.907	3.29		1.032	2.887	0.00019	3.5820		
8.0		3.891	3.30		1.032	2.902	0.00019	3.5828		
12.0		3.874	3.32		1.033	2.917	0.00019	3.5836		
16.0		3.858	3.34		1.033	2.933	0.00019	3.5844		
20.0		3.841	3.35		1.033	2.948	0.00019	3.5852		
24.0		3.825	3.37		1.033	2.964	0.00019	3.5859		
118										
4.0		3.809	3.39		1.033	2.979	0.00019	3.5867		
8.0		3.793	3.40		1.033	2.995	0.00019	3.5875		
12.0		3.776	3.42		1.033	3.010	0.00019	3.5882		
16.0		3.760	3.44		1.033	3.026	0.00018	3.5890		
20.0		3.744	3.45		1.033	3.041	0.00018	3.5897		
24.0		3.728	3.47		1.033	3.057	0.00018	3.5905		
119										
4.0		3.712	3.48		1.033	3.072	0.00018	3.5912		
8.0		3.695	3.50		1.033	3.087	0.00018	3.5920		
12.0		3.679	3.52		1.033	3.103	0.00018	3.5927		
16.0		3.663	3.53		1.033	3.118	0.00018	3.5934		
20.0		3.647	3.55		1.033	3.134	0.00018	3.5942		
24.0		3.631	3.56		1.033	3.149	0.00018	3.5949		
120										
4.0		3.612	3.58		1.033	3.167	0.00018	3.5956		
8.0		3.594	3.60		1.033	3.185	0.00017	3.5963		
12.0		3.576	3.62		1.033	3.202	0.00017	3.5970		
16.0		3.557	3.64		1.033	3.220	0.00017	3.5978		
20.0		3.539	3.66		1.033	3.237	0.00017	3.5985		
24.0		3.521	3.67		1.033	3.255	0.00017	3.5992		
121										
4.0		3.502	3.69		1.033	3.273	0.00017	3.5999		
8.0		3.484	3.71		1.033	3.290	0.00017	3.6005		
12.0		3.466	3.73		1.033	3.308	0.00017	3.6012		
16.0		3.448	3.75		1.033	3.325	0.00017	3.6019		
20.0		3.429	3.77		1.033	3.343	0.00016	3.6026		
24.0		3.411	3.78		1.033	3.361	0.00016	3.6033		
122										
4.0		3.393	3.80		1.033	3.378	0.00016	3.6039		
8.0		3.374	3.82		1.033	3.396	0.00016	3.6046		
12.0		3.356	3.84		1.033	3.414	0.00016	3.6053		
16.0		3.338	3.86		1.033	3.431	0.00016	3.6059		
20.0		3.320	3.88		1.033	3.449	0.00016	3.6066		
24.0		3.301	3.89		1.033	3.466	0.00016	3.6072		

TIME	PRECIP	FRCE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
109										
4.0		3.368	3.83		1.007	2.193	0.00016	3.5450		
8.0		3.354	3.84		1.007	2.206	0.00016	3.5456		
12.0		3.340	3.86		1.007	2.220	0.00016	3.5463		
16.0	0.17	3.325	3.89	2.39	1.007	2.233	0.00016	3.5469	0.00	0.000
16.0	0.17	3.504	3.69	2.39	1.007	2.233	0.00017	3.5469	0.00	0.000
20.0		3.490	3.70		1.007	2.246	0.00017	3.5476		
24.0		3.476	3.72		1.007	2.260	0.00017	3.5483		
110										
4.0		3.462	3.73		1.007	2.273	0.00017	3.5490		
8.0		3.448	3.75		1.007	2.286	0.00017	3.5497		
12.0		3.434	3.76		1.007	2.300	0.00017	3.5504		
16.0		3.420	3.78		1.007	2.313	0.00016	3.5510		
20.0		3.406	3.79		1.007	2.327	0.00016	3.5517		
24.0		3.392	3.80		1.007	2.340	0.00016	3.5524		
111										
4.0		3.378	3.82		1.007	2.353	0.00016	3.5531		
8.0		3.364	3.83		1.007	2.367	0.00016	3.5537		
12.0		3.350	3.85		1.007	2.380	0.00016	3.5544		
16.0	0.43	3.678	3.42	2.15	1.007	2.393	0.00018	3.5550	0.00	0.000
16.2	0.49	3.826	3.37	2.10	1.007	2.394	0.00019	3.5551	0.00	0.000
19.0	0.06	3.857	3.34	2.08	1.007	2.403	0.00019	3.5556	0.00	0.000
20.0		3.854	3.34		1.007	2.407	0.00019	3.5558		
24.0		3.840	3.36		1.007	2.420	0.00019	3.5566		
112										
1.0	0.00	3.843	3.35	2.09	1.007	2.423	0.00019	3.5568	0.00	0.000
4.0		3.834	3.36		1.007	2.433	0.00019	3.5574		
8.0		3.820	3.38		1.007	2.447	0.00019	3.5581		
12.0		3.805	3.39		1.007	2.460	0.00019	3.5589		
16.0		3.791	3.40		1.007	2.473	0.00019	3.5597		
20.0		3.777	3.42		1.007	2.487	0.00019	3.5604		
24.0		3.763	3.43		1.007	2.500	0.00018	3.5612		
113										
4.0		3.747	3.45		1.007	2.516	0.00018	3.5619		
8.0		3.731	3.46		1.007	2.531	0.00018	3.5627		
12.0		3.715	3.48		1.007	2.546	0.00018	3.5634		
16.0		3.698	3.50		1.007	2.562	0.00018	3.5642		
20.0		3.682	3.51		1.007	2.577	0.00018	3.5649		
24.0		3.666	3.53		1.007	2.593	0.00018	3.5656		
114										
4.0	0.09	3.740	3.45	2.48	1.007	2.608	0.00018	3.5664	0.00	0.000
8.0	0.19	3.820	3.37	2.40	1.007	2.624	0.00019	3.5671	0.00	0.000
12.0	0.28	3.899	3.29	2.32	1.008	2.639	0.00019	3.5679	0.00	0.000
16.0	0.38	3.978	3.21	2.25	1.008	2.655	0.00020	3.5687	0.00	0.000
20.0	0.47	4.056	3.13	2.17	1.010	2.670	0.00020	3.5695	0.00	0.000
24.0	0.57	4.134	3.06	2.09	1.012	2.686	0.00039	3.5705	0.00	0.000
115										
0.0	0.57	4.139	3.06	2.09	1.012	2.686	0.00041	3.5705	0.00	0.000
4.0		4.120	3.08		1.015	2.701	0.00032	3.5720		
8.0		4.102	3.09		1.017	2.716	0.00021	3.5731		
12.0		4.083	3.11		1.019	2.732	0.00020	3.5739		
16.0		4.065	3.13		1.021	2.747	0.00020	3.5748		
20.0		4.047	3.15		1.023	2.763	0.00020	3.5756		
24.0		4.029	3.17		1.024	2.778	0.00020	3.5764		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
102										
4.0		3.650	3.55		1.007	1.663	0.00018	3.5146		
8.0		3.637	3.56		1.007	1.675	0.00018	3.5153		
12.0		3.624	3.57		1.007	1.687	0.00018	3.5161		
16.0		3.612	3.58		1.007	1.699	0.00018	3.5168		
19.2	0.24	3.851	3.34	1.93	1.007	1.709	0.00019	3.5174	0.00	0.000
20.0		3.849	3.35		1.007	1.711	0.00019	3.5175		
24.0		3.836	3.36		1.007	1.723	0.00019	3.5183		
103										
4.0		3.823	3.37		1.007	1.735	0.00019	3.5191		
6.2	0.02	3.843	3.35	1.94	1.007	1.742	0.00019	3.5195	0.00	0.000
8.0		3.839	3.36		1.007	1.747	0.00019	3.5198		
12.0		3.826	3.37		1.007	1.759	0.00019	3.5206		
16.0		3.813	3.38		1.007	1.771	0.00019	3.5214		
20.0		3.800	3.40		1.007	1.783	0.00019	3.5221		
24.0		3.787	3.41		1.007	1.795	0.00019	3.5229		
104										
4.0		3.775	3.42		1.007	1.807	0.00019	3.5237		
8.0		3.762	3.43		1.007	1.819	0.00018	3.5244		
12.0		3.749	3.45		1.007	1.831	0.00018	3.5252		
16.0		3.736	3.46		1.007	1.843	0.00018	3.5259		
20.0		3.724	3.47		1.007	1.855	0.00018	3.5267		
24.0		3.711	3.48		1.007	1.867	0.00018	3.5274		
105										
4.0		3.698	3.50		1.007	1.879	0.00018	3.5282		
8.0		3.685	3.51		1.007	1.891	0.00018	3.5289		
12.0		3.673	3.52		1.007	1.903	0.00018	3.5296		
16.0		3.660	3.54		1.007	1.915	0.00018	3.5304		
20.0		3.647	3.55		1.007	1.927	0.00018	3.5311		
24.0		3.634	3.56		1.007	1.939	0.00018	3.5318		
106										
4.0		3.620	3.58		1.007	1.953	0.00018	3.5326		
8.0		3.606	3.59		1.007	1.966	0.00018	3.5333		
12.0		3.592	3.60		1.007	1.979	0.00017	3.5340		
16.0		3.578	3.62		1.007	1.993	0.00017	3.5347		
20.0		3.564	3.63		1.007	2.006	0.00017	3.5354		
24.0		3.550	3.65		1.007	2.019	0.00017	3.5361		
107										
4.0		3.536	3.66		1.007	2.033	0.00017	3.5368		
8.0		3.522	3.67		1.007	2.046	0.00017	3.5375		
12.0		3.508	3.69		1.007	2.059	0.00017	3.5382		
16.0		3.494	3.70		1.007	2.073	0.00017	3.5389		
20.0		3.480	3.72		1.007	2.086	0.00017	3.5396		
24.0		3.466	3.73		1.007	2.100	0.00017	3.5403		
108										
4.0		3.452	3.74		1.007	2.113	0.00017	3.5410		
8.0		3.438	3.76		1.007	2.126	0.00017	3.5416		
12.0		3.424	3.77		1.007	2.140	0.00016	3.5423		
16.0		3.410	3.79		1.007	2.153	0.00016	3.5430		
20.0		3.396	3.80		1.007	2.166	0.00016	3.5437		
24.0		3.382	3.81		1.007	2.180	0.00016	3.5443		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
95										
4.0		4.199	3.00		0.971	1.190	0.00073	3.4745		
8.0		4.183	3.01		0.974	1.201	0.00065	3.4773		
12.0		4.167	3.03		0.976	1.212	0.00056	3.4798		
16.0		4.152	3.04		0.979	1.222	0.00049	3.4819		
20.0		4.137	3.06		0.981	1.233	0.00041	3.4837		
24.0		4.123	3.07		0.984	1.243	0.00034	3.4852		
96										
4.0		4.109	3.09		0.986	1.254	0.00026	3.4863		
8.0		4.095	3.10		0.988	1.265	0.00020	3.4873		
12.0		4.082	3.11		0.990	1.275	0.00020	3.4881		
16.0		4.069	3.13		0.991	1.286	0.00020	3.4889		
20.0		4.056	3.14		0.993	1.297	0.00020	3.4897		
24.0		4.042	3.15		0.995	1.307	0.00020	3.4906		
97										
4.0		4.030	3.17		0.996	1.318	0.00020	3.4914		
8.0		4.017	3.18		0.998	1.328	0.00020	3.4922		
12.0		4.004	3.19		0.999	1.339	0.00020	3.4930		
16.0		3.991	3.20		1.000	1.350	0.00020	3.4938		
20.0		3.979	3.22		1.001	1.360	0.00020	3.4946		
24.0		3.966	3.23		1.002	1.371	0.00020	3.4955		
98										
4.0		3.954	3.24		1.003	1.382	0.00020	3.4963		
8.0		3.942	3.25		1.004	1.392	0.00020	3.4971		
12.0		3.929	3.27		1.005	1.403	0.00019	3.4979		
16.0		3.917	3.28		1.005	1.414	0.00019	3.4986		
20.0		3.905	3.29		1.006	1.424	0.00019	3.4994		
24.0		3.893	3.30		1.006	1.435	0.00019	3.5002		
99										
4.0		3.880	3.31		1.007	1.447	0.00019	3.5010		
8.0		3.867	3.33		1.007	1.459	0.00019	3.5018		
12.0		3.854	3.34		1.007	1.471	0.00019	3.5026		
16.0		3.841	3.35		1.007	1.483	0.00019	3.5033		
20.0		3.829	3.37		1.007	1.495	0.00019	3.5041		
24.0		3.816	3.38		1.007	1.507	0.00019	3.5049		
100										
4.0		3.803	3.39		1.007	1.519	0.00019	3.5057		
8.0		3.790	3.41		1.007	1.531	0.00019	3.5064		
12.0		3.778	3.42		1.007	1.543	0.00019	3.5072		
16.0		3.765	3.43		1.007	1.555	0.00018	3.5079		
20.0		3.752	3.44		1.007	1.567	0.00018	3.5087		
24.0		3.739	3.46		1.007	1.579	0.00018	3.5094		
101										
4.0		3.726	3.47		1.007	1.591	0.00018	3.5102		
8.0		3.714	3.48		1.007	1.603	0.00018	3.5109		
12.0		3.701	3.49		1.007	1.615	0.00018	3.5117		
16.0		3.688	3.51		1.007	1.627	0.00018	3.5124		
20.0		3.675	3.52		1.007	1.639	0.00018	3.5132		
24.0		3.663	3.53		1.007	1.651	0.00018	3.5139		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VO
88										
4.0		4.329	2.87		0.842	0.763	0.00142	3.3091		
8.0		4.310	2.89		0.846	0.773	0.00133	3.3086		
12.0		4.292	2.90		0.849	0.782	0.00123	3.3137		
16.0		4.274	2.92		0.853	0.792	0.00113	3.3185		
20.0		4.257	2.94		0.856	0.802	0.00105	3.3228		
24.0		4.240	2.96		0.859	0.812	0.00095	3.3268		
89										
4.0		4.224	2.97		0.862	0.822	0.00086	3.3305		
8.0		4.208	2.99		0.864	0.831	0.00079	3.3338		
12.0		4.192	3.00		0.867	0.841	0.00069	3.3368		
16.0		4.177	3.02		0.870	0.851	0.00062	3.3394		
20.0		4.163	3.03		0.872	0.861	0.00054	3.3417		
24.0		4.148	3.05		0.874	0.871	0.00047	3.3438		
90										
4.0		4.135	3.06		0.877	0.880	0.00039	3.3455		
8.0		4.121	3.07		0.879	0.890	0.00032	3.3469		
12.0		4.108	3.09		0.881	0.900	0.00025	3.3481		
16.0		4.095	3.10		0.883	0.910	0.00020	3.3490		
20.0		4.083	3.11		0.885	0.920	0.00020	3.3498		
24.0		4.071	3.12		0.886	0.929	0.00020	3.3506		
91										
4.0		4.058	3.14		0.888	0.939	0.00020	3.3515		
8.0		4.046	3.15		0.890	0.949	0.00020	3.3523		
12.0		4.034	3.16		0.891	0.959	0.00020	3.3531		
16.0		4.022	3.17		0.892	0.969	0.00020	3.3539		
18.7	0.31	4.328	2.87	1.38	0.894	0.975	0.00142	3.3549	0.00	0.000
20.0		4.323	2.87		0.895	0.978	0.00139	3.3567		
24.0		4.305	2.89		0.898	0.988	0.00129	3.3621		
92										
4.0		4.286	2.91		0.902	0.999	0.00120	3.3671		
5.0	0.01	4.300	2.89	1.45	0.903	1.002	0.00127	3.3683	0.00	0.000
8.0		4.287	2.91		0.905	1.010	0.00120	3.3720		
12.0		4.268	2.93		0.909	1.020	0.00110	3.3766		
14.0	0.26	4.518	2.68	1.30	0.911	1.025	0.00243	3.3798	0.00	0.000
16.0		4.507	2.69		0.913	1.031	0.00238	3.3846		
20.0		4.482	2.71		0.918	1.041	0.00224	3.3939		
24.0		4.458	2.74		0.923	1.052	0.00211	3.4026		
93										
4.0		4.434	2.76		0.928	1.063	0.00198	3.4108		
8.0		4.411	2.78		0.932	1.073	0.00186	3.4185		
12.0		4.389	2.81		0.937	1.084	0.00174	3.4257		
16.0		4.368	2.83		0.941	1.095	0.00163	3.4325		
20.0		4.347	2.85		0.945	1.105	0.00151	3.4388		
24.0		4.326	2.87		0.949	1.116	0.00141	3.4447		
94										
4.0		4.307	2.89		0.952	1.126	0.00131	3.4501		
8.0		4.287	2.91		0.956	1.137	0.00120	3.4552		
12.0		4.269	2.93		0.959	1.148	0.00110	3.4598		
16.0		4.251	2.95		0.962	1.158	0.00101	3.4641		
20.0		4.233	2.96		0.965	1.169	0.00092	3.4679		
24.0		4.216	2.98		0.968	1.180	0.00082	3.4714		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBO	TQ	PE	VD
81										
4.0		5.911	1.29		0.505	0.369	0.01633	2.2827		
8.0		5.824	1.38		0.519	0.378	0.01525	2.3458		
12.0		5.742	1.46		0.533	0.387	0.01423	2.4048		
16.0		5.664	1.53		0.546	0.396	0.01327	2.4598		
17.0	0.11	5.751	1.44	0.50	0.549	0.398	0.01434	2.4729	0.00	0.000
18.5	0.03	5.756	1.44	0.50	0.554	0.402	0.01442	2.4942	0.00	0.000
20.0		5.731	1.47		0.559	0.405	0.01410	2.5156		
24.0		5.655	1.54		0.572	0.414	0.01313	2.5701		
82										
4.0		5.582	1.62		0.585	0.423	0.01225	2.6209		
8.0		5.513	1.69		0.597	0.432	0.01139	2.6681		
10.5	0.02	5.498	1.70	0.63	0.604	0.438	0.01120	2.6963	0.00	0.000
12.0		5.478	1.72		0.609	0.441	0.01093	2.7130		
16.0		5.415	1.78		0.620	0.450	0.01015	2.7552		
20.0		5.356	1.84		0.631	0.459	0.00943	2.7943		
24.0		5.299	1.90		0.641	0.468	0.00873	2.8306		
83										
4.0		5.247	1.95		0.652	0.477	0.00806	2.8641		
8.0		5.197	2.00		0.661	0.486	0.00744	2.8951		
12.0		5.149	2.05		0.671	0.495	0.00685	2.9237		
16.0		5.105	2.09		0.680	0.504	0.00628	2.9500		
20.0		5.063	2.13		0.689	0.513	0.00577	2.9741		
24.0		5.023	2.17		0.697	0.522	0.00526	2.9962		
84										
4.0		4.985	2.21		0.705	0.531	0.00491	3.0165		
8.0		4.949	2.25		0.713	0.540	0.00471	3.0357		
12.0		4.914	2.28		0.721	0.549	0.00453	3.0543		
16.0		4.879	2.32		0.729	0.558	0.00435	3.0720		
20.0		4.846	2.35		0.736	0.567	0.00417	3.0891		
24.0		4.814	2.38		0.743	0.576	0.00400	3.1055		
85										
4.0		4.781	2.42		0.750	0.586	0.00383	3.1211		
8.0		4.749	2.45		0.757	0.596	0.00366	3.1361		
12.0		4.719	2.48		0.763	0.606	0.00350	3.1504		
16.0		4.689	2.51		0.770	0.616	0.00333	3.1641		
20.0		4.660	2.54		0.776	0.625	0.00318	3.1772		
24.0		4.631	2.56		0.782	0.635	0.00303	3.1896		
86										
4.0		4.604	2.59		0.788	0.645	0.00288	3.2015		
8.0		4.577	2.62		0.793	0.655	0.00275	3.2127		
12.0		4.551	2.64		0.798	0.665	0.00260	3.2234		
16.0		4.526	2.67		0.804	0.674	0.00247	3.2336		
20.0		4.502	2.69		0.809	0.684	0.00234	3.2433		
24.0		4.478	2.72		0.813	0.694	0.00222	3.2524		
87										
4.0		4.455	2.74		0.818	0.704	0.00209	3.2610		
8.0		4.432	2.76		0.822	0.714	0.00197	3.2692		
12.0		4.410	2.79		0.827	0.723	0.00185	3.2769		
16.0		4.389	2.81		0.831	0.733	0.00174	3.2841		
20.0		4.369	2.83		0.835	0.743	0.00164	3.2908		
24.0		4.349	2.85		0.839	0.753	0.00153	3.2972		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
74										
4.0		4.069	3.13		0.001	0.008	0.00020	0.0008		
8.0		4.059	3.14		0.003	0.016	0.00020	0.0016		
12.0		4.048	3.15		0.004	0.024	0.00020	0.0024		
16.0		4.038	3.16		0.005	0.033	0.00020	0.0033		
20.0		4.027	3.17		0.007	0.041	0.00020	0.0041		
24.0		4.017	3.18		0.008	0.049	0.00020	0.0049		
75										
4.0		4.007	3.19		0.009	0.057	0.00020	0.0057		
8.0		3.997	3.20		0.010	0.066	0.00020	0.0066		
12.0		3.987	3.21		0.011	0.074	0.00020	0.0074		
16.0		3.977	3.22		0.012	0.082	0.00020	0.0082		
19.7	1.32	5.181	2.01	0.77	0.017	0.090	0.00725	0.0197	0.09	0.000
20.0		5.181	2.02		0.018	0.090	0.00725	0.0215		
24.0		5.136	2.06		0.026	0.099	0.00669	0.0493		
76										
2.0	0.13	5.243	1.95	0.74	0.031	0.103	0.00803	0.0626	0.00	0.000
4.0	0.16	5.300	1.81	0.66	0.036	0.107	0.00873	0.0786	0.00	0.000
4.0	0.16	5.383	1.81	0.66	0.036	0.107	0.00978	0.0786	0.00	0.000
8.0		5.331	1.87		0.046	0.115	0.00910	0.1163		
12.0		5.277	1.92		0.056	0.123	0.00843	0.1514		
16.0		5.227	1.97		0.065	0.132	0.00781	0.1839		
20.0		5.179	2.02		0.075	0.140	0.00722	0.2140		
24.0		5.134	2.06		0.084	0.148	0.00666	0.2417		
77										
4.0	0.39	5.452	1.71	0.61	0.093	0.156	0.01063	0.2727	0.00	0.000
8.0	0.96	5.937	1.22	0.38	0.106	0.165	0.01665	0.3271	0.00	0.000
12.0	1.04	5.962	1.23	0.39	0.120	0.173	0.01697	0.3952	0.00	0.000
15.0	1.08	5.930	1.26	0.40	0.131	0.179	0.01657	0.4458	0.00	0.000
16.0		5.913	1.29		0.134	0.181	0.01638	0.4623		
20.0		5.828	1.37		0.148	0.189	0.01531	0.5256		
24.0		5.747	1.45		0.161	0.198	0.01429	0.5848		
78										
4.0	0.15	5.799	1.38	0.47	0.175	0.207	0.01493	0.6414	0.00	0.000
8.0	0.51	6.070	1.10	0.34	0.189	0.216	0.01832	0.7075	0.00	0.000
12.0	0.89	6.351	0.83	0.23	0.206	0.225	0.02183	0.7885	0.00	0.000
16.0	1.25	6.583	0.60	0.14	0.225	0.234	0.02471	0.8816	0.00	0.000
20.0	1.57	6.773	0.41	0.08	0.245	0.243	0.02707	0.9851	0.00	0.000
24.0	1.92	6.900	0.29	0.05	0.266	0.252	0.02865	1.0972	0.00	0.092
79										
4.0	2.14	6.939	0.25	0.04	0.288	0.261	0.02916	1.2130	0.06	0.065
8.0	2.23	6.948	0.25	0.04	0.310	0.270	0.02927	1.3300	0.06	0.000
12.0	2.25	6.821	0.38	0.08	0.332	0.279	0.02766	1.4439	0.06	0.000
14.0	2.25	6.751	0.44	0.09	0.342	0.283	0.02680	1.4985	0.06	0.000
16.0		6.692	0.51		0.352	0.288	0.02608	1.5515		
20.0		6.562	0.64		0.372	0.297	0.02444	1.6575		
24.0		6.439	0.76		0.391	0.306	0.02291	1.7472		
80										
4.0		6.323	0.86		0.409	0.315	0.02146	1.8359		
8.0		6.213	0.99		0.426	0.324	0.02009	1.9191		
12.0		6.109	1.09		0.442	0.333	0.01880	1.9969		
16.0		6.011	1.19		0.458	0.342	0.01759	2.0696		
19.0	0.18	6.119	1.08	0.33	0.470	0.349	0.01893	2.1239	0.00	0.000
20.0		6.100	1.10		0.474	0.351	0.01869	2.1427		
24.0		6.003	1.20		0.490	0.360	0.01748	2.2151		

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JOB
XEQ MODEL
LOCAL,ETFC,RECOV,INFIL,INITL
(19,DELP1),(10,DELP2),(11,BINDX),(12,EPAN),
(101,DRF),(102,DRF),(103,PEX),(104,BASE)

     TEST RUN ON TAYLOR CREEK          1959 RAINFALL
THE RECIPROCAL K VALUES ARE

  0.00080   0.00470   0.01250

THE INITIAL STATE CONDITION IS
          SA1=     3.1700
          VDM=     0.1000
          FC=      0.0000
          G=       7.2000
          AWC=     12.3000
          GD=      6.6000
          D=       60.0000
          H2OTA=     26.0000
          PPAN=      0.7800
          A=       0.8000
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E X H I B I T

I I

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
317										
4.0		3.660	3.54		0.774	1.475	0.00018	3.9614		
8.0		3.654	3.54		0.774	1.480	0.00018	3.9622		
12.0		3.649	3.55		0.774	1.484	0.00018	3.9629		
16.0		3.644	3.55		0.774	1.489	0.00018	3.9637		
20.0		3.638	3.56		0.774	1.493	0.00018	3.9644		
24.0		3.633	3.56		0.774	1.498	0.00018	3.9652		
318										
4.0		3.628	3.57		0.774	1.502	0.00018	3.9659		
8.0		3.623	3.57		0.774	1.507	0.00018	3.9667		
12.0		3.617	3.58		0.774	1.512	0.00018	3.9674		
16.0		3.612	3.58		0.774	1.516	0.00018	3.9682		
20.0		3.607	3.59		0.774	1.521	0.00018	3.9689		
24.0		3.601	3.59		0.774	1.525	0.00018	3.9696		
319										
4.0		3.596	3.60		0.774	1.530	0.00018	3.9704		
8.0		3.591	3.60		0.774	1.534	0.00018	3.9711		
12.0		3.586	3.61		0.774	1.539	0.00018	3.9718		
16.0		3.580	3.61		0.774	1.543	0.00018	3.9726		
20.0		3.575	3.62		0.774	1.548	0.00018	3.9733		
24.0		3.570	3.63		0.774	1.553	0.00018	3.9740		
320										
4.0		3.564	3.63		0.774	1.557	0.00018	3.9748		
8.0		3.559	3.64		0.774	1.562	0.00018	3.9755		
12.0		3.554	3.64		0.774	1.566	0.00018	3.9762		
16.0		3.549	3.65		0.774	1.571	0.00018	3.9769		
20.0		3.543	3.65		0.774	1.575	0.00018	3.9777		
24.0		3.538	3.66		0.774	1.580	0.00018	3.9784		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBO	TQ	PE	VD
310										
4.0		3.896	3.30		0.774	1.272	0.00020	3.9286		
8.0		3.891	3.30		0.774	1.276	0.00020	3.9294		
12.0		3.885	3.31		0.774	1.281	0.00020	3.9302		
16.0		3.879	3.32		0.774	1.286	0.00020	3.9311		
20.0		3.873	3.32		0.774	1.291	0.00020	3.9319		
24.0		3.868	3.33		0.774	1.296	0.00020	3.9327		
311										
4.0		3.862	3.33		0.774	1.301	0.00020	3.9335		
8.0		3.856	3.34		0.774	1.306	0.00020	3.9343		
12.0		3.851	3.34		0.774	1.311	0.00020	3.9351		
16.0		3.845	3.35		0.774	1.316	0.00020	3.9359		
20.0		3.839	3.36		0.774	1.321	0.00020	3.9367		
24.0		3.833	3.36		0.774	1.326	0.00019	3.9375		
312										
4.0		3.828	3.37		0.774	1.330	0.00019	3.9383		
8.0		3.822	3.37		0.774	1.335	0.00019	3.9390		
12.0		3.816	3.38		0.774	1.340	0.00019	3.9398		
16.0		3.811	3.38		0.774	1.345	0.00019	3.9406		
20.0		3.805	3.39		0.774	1.350	0.00019	3.9414		
24.0		3.799	3.40		0.774	1.355	0.00019	3.9422		
313										
4.0		3.794	3.40		0.774	1.360	0.00019	3.9430		
8.0		3.788	3.41		0.774	1.365	0.00019	3.9438		
12.0		3.782	3.41		0.774	1.370	0.00019	3.9446		
16.0		3.776	3.42		0.774	1.375	0.00019	3.9453		
20.0		3.771	3.42		0.774	1.379	0.00019	3.9461		
24.0		3.765	3.43		0.774	1.384	0.00019	3.9469		
314										
4.0		3.759	3.44		0.774	1.389	0.00019	3.9477		
8.0		3.754	3.44		0.774	1.394	0.00019	3.9485		
12.0		3.748	3.45		0.774	1.399	0.00019	3.9492		
16.0		3.742	3.45		0.774	1.404	0.00019	3.9500		
20.0		3.737	3.46		0.774	1.409	0.00019	3.9508		
24.0		3.731	3.46		0.774	1.414	0.00019	3.9515		
315										
4.0		3.725	3.47		0.774	1.419	0.00019	3.9523		
8.0		3.720	3.48		0.774	1.424	0.00019	3.9531		
12.0		3.714	3.48		0.774	1.429	0.00019	3.9539		
16.0		3.708	3.49		0.774	1.433	0.00019	3.9546		
20.0		3.703	3.49		0.774	1.438	0.00019	3.9554		
24.0		3.697	3.50		0.774	1.443	0.00019	3.9561		
316										
4.0		3.692	3.50		0.774	1.448	0.00019	3.9569		
8.0		3.686	3.51		0.774	1.452	0.00019	3.9577		
12.0		3.681	3.51		0.774	1.457	0.00019	3.9584		
16.0		3.676	3.52		0.774	1.461	0.00019	3.9592		
20.0		3.670	3.52		0.774	1.466	0.00018	3.9599		
24.0		3.665	3.53		0.774	1.471	0.00018	3.9607		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
303										
4.0		4.157	3.04		0.772	1.053	0.00095	3.8649		
8.0		4.148	3.05		0.772	1.058	0.00092	3.8687		
12.0		4.138	3.06		0.773	1.063	0.00087	3.8723		
16.0		4.129	3.07		0.773	1.068	0.00082	3.8757		
20.0		4.121	3.07		0.773	1.074	0.00079	3.8789		
24.0		4.112	3.08		0.774	1.079	0.00075	3.8820		
304										
4.0		4.104	3.09		0.774	1.084	0.00070	3.8849		
8.0		4.096	3.10		0.774	1.090	0.00066	3.8876		
12.0		4.088	3.11		0.774	1.095	0.00063	3.8902		
16.0		4.080	3.12		0.774	1.100	0.00059	3.8927		
20.0		4.072	3.12		0.774	1.105	0.00055	3.8950		
24.0		4.065	3.13		0.774	1.111	0.00052	3.8971		
305										
4.0		4.057	3.14		0.774	1.116	0.00049	3.8992		
8.0		4.050	3.14		0.774	1.121	0.00045	3.9010		
12.0		4.043	3.15		0.774	1.126	0.00041	3.9028		
16.0		4.036	3.16		0.774	1.132	0.00038	3.9044		
20.0		4.030	3.17		0.774	1.137	0.00035	3.9059		
24.0		4.023	3.17		0.774	1.142	0.00032	3.9072		
306										
4.0		4.017	3.18		0.774	1.148	0.00029	3.9084		
8.0		4.010	3.18		0.774	1.153	0.00026	3.9095		
12.0		4.004	3.19		0.774	1.158	0.00022	3.9105		
16.0		3.998	3.20		0.774	1.163	0.00020	3.9114		
20.0		3.992	3.20		0.774	1.169	0.00020	3.9122		
24.0		3.986	3.21		0.774	1.174	0.00020	3.9130		
307										
4.0		3.979	3.22		0.774	1.179	0.00020	3.9139		
8.0		3.973	3.22		0.774	1.184	0.00020	3.9147		
12.0		3.967	3.23		0.774	1.190	0.00020	3.9155		
16.0		3.961	3.23		0.774	1.195	0.00020	3.9164		
20.0		3.955	3.24		0.774	1.200	0.00020	3.9172		
24.0		3.949	3.25		0.774	1.206	0.00020	3.9180		
308										
4.0		3.943	3.25		0.774	1.211	0.00020	3.9188		
8.0		3.937	3.26		0.774	1.216	0.00020	3.9197		
12.0		3.931	3.26		0.774	1.221	0.00020	3.9205		
16.0		3.925	3.27		0.774	1.227	0.00020	3.9213		
20.0		3.918	3.28		0.774	1.232	0.00020	3.9221		
24.0		3.912	3.28		0.774	1.237	0.00020	3.9229		
309										
2.0	0.02	3.933	3.26	1.28	0.774	1.240	0.00020	3.9233	0.00	0.000
4.0		3.931	3.26		0.774	1.242	0.00020	3.9237		
8.0		3.925	3.27		0.774	1.247	0.00020	3.9246		
12.0		3.919	3.28		0.774	1.252	0.00020	3.9254		
16.0		3.913	3.28		0.774	1.257	0.00020	3.9262		
20.0		3.908	3.29		0.774	1.262	0.00020	3.9270		
24.0		3.902	3.29		0.774	1.267	0.00020	3.9278		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
296										
4.0		4.849	2.35		0.683	0.818	0.00427	3.4620		
6.0	0.03	4.870	2.32	0.84	0.685	0.821	0.00437	3.4704	0.00	0.000
8.0		4.858	2.34		0.688	0.824	0.00431	3.4791		
12.0		4.831	2.37		0.692	0.829	0.00418	3.4961		
16.0		4.804	2.39		0.696	0.835	0.00406	3.5126		
20.0		4.779	2.42		0.700	0.841	0.00393	3.5286		
24.0		4.753	2.44		0.704	0.846	0.00382	3.5441		
297										
4.0		4.729	2.47		0.708	0.852	0.00369	3.5591		
8.0		4.705	2.49		0.711	0.858	0.00358	3.5737		
12.0		4.682	2.51		0.715	0.863	0.00347	3.5878		
16.0		4.659	2.54		0.718	0.869	0.00337	3.6015		
20.0		4.637	2.56		0.721	0.875	0.00325	3.6147		
24.0		4.616	2.58		0.724	0.880	0.00315	3.6276		
298										
4.0		4.594	2.60		0.727	0.886	0.00305	3.6400		
8.0		4.574	2.62		0.730	0.891	0.00296	3.6520		
12.0		4.554	2.64		0.733	0.897	0.00286	3.6636		
16.0		4.534	2.66		0.735	0.903	0.00277	3.6749		
20.0		4.515	2.68		0.738	0.908	0.00267	3.6858		
24.0		4.497	2.70		0.740	0.914	0.00258	3.6963		
299										
4.0		4.479	2.72		0.742	0.920	0.00250	3.7065		
8.0		4.461	2.73		0.745	0.925	0.00241	3.7163		
12.0		4.444	2.75		0.747	0.931	0.00233	3.7258		
16.0		4.427	2.77		0.749	0.937	0.00224	3.7350		
20.0		4.410	2.79		0.751	0.942	0.00217	3.7438		
24.0		4.394	2.80		0.752	0.948	0.00209	3.7524		
300										
4.0		4.379	2.82		0.754	0.954	0.00202	3.7606		
8.0		4.363	2.83		0.756	0.959	0.00195	3.7686		
12.0		4.348	2.85		0.757	0.965	0.00187	3.7762		
16.0		4.334	2.86		0.759	0.971	0.00180	3.7836		
20.0		4.320	2.88		0.760	0.976	0.00174	3.7907		
24.0		4.306	2.89		0.762	0.982	0.00167	3.7975		
301										
4.0		4.293	2.90		0.763	0.988	0.00161	3.8041		
8.0		4.279	2.92		0.764	0.993	0.00154	3.8104		
12.0		4.267	2.93		0.765	0.999	0.00148	3.8165		
16.0		4.254	2.94		0.766	1.004	0.00142	3.8223		
20.0		4.242	2.95		0.767	1.010	0.00137	3.8279		
24.0		4.230	2.97		0.768	1.016	0.00131	3.8333		
302										
4.0		4.219	2.98		0.769	1.021	0.00125	3.8384		
8.0		4.208	2.99		0.769	1.026	0.00120	3.8433		
12.0		4.197	3.00		0.770	1.032	0.00115	3.8480		
16.0		4.187	3.01		0.771	1.037	0.00110	3.8525		
20.0		4.177	3.02		0.771	1.042	0.00105	3.8569		
24.0		4.167	3.03		0.772	1.047	0.00101	3.8610		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
289										
2.5	0.48	5.282	1.91	0.65	0.281	0.565	0.00851	1.1215	0.00	0.000
4.0	0.74	5.503	1.56	0.49	0.284	0.567	0.01125	1.1352	0.27	0.100
8.0	2.68	6.546	0.62	0.13	0.296	0.573	0.02425	1.2128	1.18	0.100
12.0	3.24	6.810	0.38	0.06	0.312	0.579	0.02755	1.3177	1.36	0.100
16.0	5.89	6.895	0.30	0.04	0.328	0.585	0.02860	1.4303	3.80	0.100
20.0	7.32	6.925	0.27	0.04	0.345	0.591	0.02898	1.5456	5.07	0.100
24.0	8.46	6.937	0.26	0.04	0.362	0.597	0.02911	1.6619	6.05	0.100
290										
2.7	8.46	6.942	0.25	0.03	0.373	0.601	0.02916	1.7420	6.05	0.000
4.0		6.907	0.30		0.378	0.603	0.02874	1.7783		
8.0		6.773	0.43		0.395	0.609	0.02707	1.8899		
10.0	0.02	6.724	0.47	0.09	0.402	0.612	0.02648	1.9433	0.00	0.000
12.0		6.669	0.53		0.410	0.615	0.02578	1.9957		
16.0		6.547	0.65		0.425	0.621	0.02428	2.0958		
20.0		6.433	0.77		0.439	0.628	0.02283	2.1900		
24.0		6.324	0.88		0.452	0.634	0.02148	2.2786		
291										
4.0		6.221	0.98		0.465	0.640	0.02020	2.3620		
8.0		6.124	1.08		0.478	0.646	0.01899	2.4404		
12.0		6.033	1.17		0.489	0.652	0.01786	2.5141		
16.0		5.946	1.25		0.501	0.658	0.01676	2.5833		
20.0		5.864	1.34		0.511	0.664	0.01574	2.6484		
24.0		5.786	1.41		0.521	0.670	0.01477	2.7094		
292										
4.0		5.713	1.49		0.531	0.676	0.01386	2.7667		
8.0		5.643	1.56		0.541	0.682	0.01300	2.8205		
12.0		5.578	1.62		0.550	0.688	0.01219	2.8708		
16.0		5.516	1.68		0.558	0.694	0.01141	2.9180		
20.0		5.457	1.74		0.567	0.700	0.01069	2.9622		
24.0		5.402	1.80		0.574	0.706	0.00999	3.0036		
293										
4.0		5.349	1.85		0.582	0.712	0.00935	3.0422		
8.0		5.299	1.90		0.589	0.718	0.00873	3.0783		
12.0		5.252	1.94		0.596	0.724	0.00814	3.1120		
16.0		5.208	1.99		0.603	0.730	0.00757	3.1435		
20.0		5.166	2.03		0.610	0.736	0.00706	3.1727		
24.0		5.126	2.07		0.616	0.742	0.00655	3.2000		
294										
4.0		5.089	2.11		0.622	0.748	0.00610	3.2253		
8.0		5.053	2.14		0.628	0.754	0.00564	3.2488		
12.0		5.020	2.18		0.633	0.760	0.00524	3.2706		
16.0		4.988	2.21		0.639	0.766	0.00494	3.2908		
20.0		4.957	2.24		0.644	0.772	0.00479	3.3103		
21.0	0.06	5.012	2.18	0.78	0.645	0.774	0.00513	3.3151	0.00	0.000
24.0		4.990	2.21		0.649	0.778	0.00494	3.3302		
295										
4.0	0.03	4.989	2.20	0.78	0.654	0.784	0.00494	3.3500	0.00	0.000
8.0	0.06	4.991	2.20	0.78	0.660	0.790	0.00495	3.3698	0.00	0.000
8.0	0.06	4.991	2.20	0.78	0.660	0.790	0.00495	3.3698	0.00	0.000
12.0		4.963	2.23		0.665	0.795	0.00481	3.3893		
16.0		4.933	2.26		0.670	0.801	0.00468	3.4083		
20.0		4.904	2.29		0.674	0.807	0.00453	3.4267		
24.0		4.876	2.32		0.679	0.812	0.00440	3.4446		

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
282										
4.0		4.999	2.20		0.136	0.295	0.00499	0.5661		
8.0		4.967	2.23		0.142	0.302	0.00484	0.5858		
12.0		4.936	2.26		0.147	0.308	0.00469	0.6049		
16.0		4.906	2.29		0.152	0.315	0.00455	0.6233		
20.0		4.876	2.32		0.157	0.321	0.00440	0.6412		
24.0		4.848	2.35		0.162	0.328	0.00427	0.6586		
283										
4.0		4.820	2.38		0.167	0.335	0.00413	0.6754		
8.0		4.792	2.40		0.171	0.341	0.00400	0.6917		
12.0		4.766	2.43		0.175	0.348	0.00387	0.7074		
16.0		4.740	2.46		0.180	0.354	0.00374	0.7227		
20.0		4.714	2.48		0.183	0.361	0.00363	0.7374		
24.0		4.690	2.51		0.187	0.367	0.00351	0.7517		
284										
4.0		4.666	2.53		0.191	0.374	0.00340	0.7655		
8.0		4.642	2.55		0.194	0.380	0.00328	0.7789		
12.0		4.619	2.58		0.198	0.387	0.00317	0.7918		
16.0		4.597	2.60		0.201	0.394	0.00307	0.8043		
20.0		4.575	2.62		0.204	0.400	0.00296	0.8164		
24.0		4.554	2.64		0.207	0.407	0.00286	0.8280		
285										
4.0		4.533	2.66		0.210	0.413	0.00276	0.8393		
8.0		4.513	2.68		0.213	0.420	0.00267	0.8501		
12.0		4.494	2.70		0.215	0.426	0.00256	0.8606		
16.0		4.474	2.72		0.218	0.433	0.00248	0.8707		
20.0		4.456	2.74		0.220	0.440	0.00238	0.8805		
24.0		4.437	2.76		0.222	0.446	0.00230	0.8899		
286										
4.0		4.420	2.78		0.225	0.453	0.00222	0.8989		
8.0		4.402	2.79		0.227	0.459	0.00213	0.9076		
12.0		4.385	2.81		0.228	0.466	0.00205	0.9160		
16.0		4.369	2.83		0.230	0.472	0.00197	0.9241		
20.0		4.353	2.84		0.232	0.479	0.00190	0.9318		
24.0		4.337	2.86		0.234	0.485	0.00182	0.9393		
287										
4.0		4.322	2.87		0.235	0.492	0.00175	0.9464		
4.2	0.17	4.490	2.70	1.10	0.235	0.492	0.00255	0.9469	0.00	0.000
8.0		4.473	2.72		0.238	0.499	0.00247	0.9562		
11.5	0.36	4.819	2.38	0.92	0.240	0.504	0.00412	0.9652	0.00	0.000
12.0		4.818	2.38		0.240	0.505	0.00412	0.9672		
14.0	0.04	4.844	2.35	0.91	0.243	0.508	0.00425	0.9754	0.00	0.000
16.0		4.832	2.36		0.245	0.512	0.00419	0.9839		
20.0		4.804	2.39		0.249	0.518	0.00406	1.0004		
24.0		4.777	2.42		0.254	0.525	0.00393	1.0163		
288										
4.0		4.752	2.44		0.258	0.531	0.00380	1.0318		
8.0		4.727	2.47		0.262	0.537	0.00369	1.0468		
12.0		4.702	2.49		0.265	0.543	0.00357	1.0613		
16.0	0.05	4.726	2.46	0.93	0.269	0.549	0.00368	1.0756	0.00	0.000
20.0	0.18	4.836	2.35	0.87	0.273	0.555	0.00421	1.0912	0.00	0.000
20.0	0.18	4.841	2.35	0.87	0.273	0.555	0.00423	1.0912	0.00	0.000
24.0	0.20	4.884	2.18	0.78	0.278	0.561	0.00443	1.1080	0.00	0.000

TIME	PRECIP	FREE	SA	RATE	TE	TET	SUBQ	TQ	PE	VD
275										
4.0		3.992	3.20		0.000	0.006	0.00020	0.0008		
8.0		3.984	3.21		0.000	0.013	0.00020	0.0016		
12.0		3.977	3.22		0.000	0.020	0.00020	0.0025		
16.0		3.969	3.23		0.000	0.027	0.00020	0.0033		
20.0		3.961	3.23		0.000	0.034	0.00020	0.0041		
24.0		3.953	3.24		0.000	0.041	0.00020	0.0050		
276										
4.0		3.946	3.25		0.000	0.048	0.00020	0.0058		
8.0		3.938	3.26		0.000	0.055	0.00020	0.0066		
12.0		3.930	3.26		0.000	0.062	0.00020	0.0074		
16.0		3.922	3.27		0.000	0.069	0.00020	0.0083		
20.0		3.915	3.28		0.000	0.076	0.00020	0.0091		
24.0		3.907	3.29		0.000	0.083	0.00020	0.0099		
277										
4.0		3.899	3.30		0.000	0.090	0.00020	0.0107		
8.0		3.891	3.30		0.000	0.097	0.00020	0.0115		
12.0		3.884	3.31		0.000	0.104	0.00020	0.0123		
16.0		3.876	3.32		0.000	0.110	0.00020	0.0131		
20.0		3.868	3.33		0.000	0.117	0.00020	0.0140		
24.0		3.860	3.33		0.000	0.124	0.00020	0.0148		
278										
4.0		3.853	3.34		0.000	0.131	0.00020	0.0156		
8.0		3.845	3.35		0.000	0.138	0.00020	0.0164		
12.0		3.837	3.36		0.000	0.145	0.00019	0.0172		
16.0	0.59	4.382	2.77	1.17	0.000	0.152	0.00204	0.0189	0.00	0.000
18.5	1.40	5.214	1.98	0.73	0.002	0.156	0.00765	0.0279	0.00	0.000
20.0		5.200	2.00		0.005	0.159	0.00747	0.0392		
24.0		5.157	2.04		0.012	0.166	0.00693	0.0680		
279										
4.0		5.117	2.08		0.019	0.173	0.00645	0.0948		
8.0		5.078	2.12		0.025	0.180	0.00596	0.1196		
12.0		5.042	2.15		0.031	0.187	0.00551	0.1425		
16.0	0.07	5.068	2.12	0.80	0.037	0.194	0.00583	0.1644	0.00	0.000
17.5	0.13	5.127	2.07	0.77	0.040	0.196	0.00655	0.1737	0.00	0.000
19.7	0.17	5.275	1.92	0.70	0.044	0.200	0.00841	0.1882	0.00	0.000
20.0		5.275	1.92		0.044	0.201	0.00841	0.1901		
24.0		5.228	1.97		0.051	0.208	0.00781	0.2225		
280										
4.0		5.183	2.01		0.059	0.215	0.00728	0.2528		
8.0		5.141	2.06		0.065	0.221	0.00674	0.2808		
12.0		5.102	2.10		0.072	0.228	0.00626	0.3068		
16.0		5.064	2.13		0.078	0.235	0.00580	0.3309		
20.0		5.029	2.17		0.084	0.242	0.00534	0.3532		
22.0	0.28	5.297	1.90	0.69	0.088	0.246	0.00867	0.3647	0.00	0.000
24.0		5.275	1.92		0.091	0.249	0.00841	0.3817		
281										
4.0		5.229	1.97		0.099	0.256	0.00784	0.4142		
8.0		5.185	2.01		0.105	0.262	0.00730	0.4445		
12.0		5.144	2.05		0.112	0.269	0.00677	0.4726		
16.0		5.104	2.09		0.118	0.275	0.00628	0.4987		
20.0		5.067	2.13		0.125	0.282	0.00583	0.5229		
24.0		5.032	2.16		0.131	0.289	0.00540	0.5454		

```
// JOB
// XEQ MODEL    3
*LOCAL,ETFC,RECOV,INFIL,INITL
*FILES(9,DELR1),(10,DELP2),(11,GINDX),(12,EPAN),
*FILES(101,DRF),(102,ORF),(103,PEX),(104,PASE)

      TEST RUN ON TAYLOR CREEK          1956 RAINFALL
THE RECIPROCAL K VALUES ARE

   0.00006    0.00479    0.01250

THE INITIAL STATE CONDITION IS
        SA1=      3.2000
        VDM=      0.1000
        FC=       0.0000
        G=        7.2000
        AWC=     12.3000
        GD=       6.6000
        D=       60.0000
        H2DTA=   26.0000
        PPAN=     0.7800
        A=        0.8000
```

units

What is S ?

```
                                   (ENTRANCE)
                                       |
=========================================================================CONTROL CARDS ==========
=  *IOCS(CARD,TYPEWRITER,KEYBOARD,1132 PRINTER,DISK)                                            =
=  *ONE WORD INTEGERS                                                                           =
=  *LIST ALL                                                                                    =
=================================================================================================
                                       |
//////////////////////////////////////////////////////////////////////////////SPECIFICATIONS//////
/        DIMENSION  FLOW(30),IBAS(50)                                                           /
/        DEFINE FILE 121(366,12,U,IT1),122(366,12,U,IT2),123(366,12,U,IT3)                      /
/      1,104(366,48,U,I04)                                                                      /
/        DEFINE FILE 103(366,48,U,I03),102(366,48,U,I02),101(366,48,U,I01)                      /
//////////////////////////////////////////////////////////////////////////////////////////////////
                                       |
                                       0(.......................................................0
                                       |                                                       :
=================================================================FORMATTED I/O===                :
=   30 READ(6,1) IDAT,IEND,NF                                                                   =
=    1 FORMAT(5X,3I5)                                                                           =
=================================================================================               :
                                       |                                                       :
                                       0(.....................................0                 :
                                       |                                     :                 :
*****************************************************************************                  :
*   15 IF(NF-113) 40,40,20                                                  *-Z..40.....0       :
*****************************************************************************       :         :
                                       |                                     :       :         :
=================================================================FILE I/O=====     :         :
=   20 READ(NF'IDAT) (FLOW(I),I=1,6)                                            =   :         :
=================================================================================   :         :
                                       |                                     :       :         :
=================================================================FORMATTED I/O===  :         :
=      WRITE(3,2) IDAT,(FLOW(I),I=1,6)                                          =  :         :
=    2 FORMAT(I5/6F10.6/)                                                       =  :         :
=================================================================================  :         :
                                       |                                     :      :         :
*****************************************************************************      :         :
*      IF(IDAT-IEND) 42,42,30                                                 *-Z..42.....0    :
*****************************************************************************      :         :
                                       0(.....................................0    :         :
                                       |                                     :      :         :
=================================================================FILE I/O=====     :         :
=   40 READ(NF'IDAT) (IBAS(I),I=1,48)                                           =   :         :
=================================================================================   :         :
                                       |                                     :       :         :
=================================================================FORMATTED I/O===  :         :
=      WRITE(3,4) IDAT,(IBAS(I),I=1,48)                                         =  :         :
=  4   FORMAT(I5/(6I10))                                                        =  :         :
=================================================================================  :         :
                                       |                                     :      :         :
*****************************************************************************      :         :
*      IF(IDAT-IEND) 42,42,30                                                 *-30.....0        :
*****************************************************************************      :         :
                                       |                                     :      :         :
                                       0(.....................................0    :         :
                                       |                                     :      :         :
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+   42 IDAT=IDAT+1                                                                            +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+   40 IDAT=IDAT+1                                                    +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*****************************************************************
*      GO TO 30                                                 *....30.....
*****************************************************************

-----------------------------------------------FORMATTED I/O--
-    1 FORMAT(' TYPE IN BEGINNING AND ENDING DATE'/5X'  00-
-     10  000'/)                                              -
-    3 FORMAT(5X,2I5)                                         -
-    2 FORMAT(I5/6F10.6/)                                     -
-----------------------------------------------------------------
                                                                 0(.....
=================================================================
=   99 CALL EXIT                                                =
=================================================================

=================================================================
=      END                                                      =
=================================================================
```

(ENTRANCE)

CONTROL CARDS

```
*IOCS(CARD,TYPEWRITER,KEYBOARD,1132 PRINTER,DISK)
*ONE WORD INTEGERS
*LIST ALL
```

SPECIFICATIONS

```
      DIMENSION ORF(50),DRF(50),PE(50),BASE(50),HY(10),IBAS(50)
      DEFINE FILE 121(344,12,U,IT1),122(344,12,U,IT2),123(344,12,U,IT3)
     1,104(344,48,U,104)
```

FORMATTED I/O

```
      WRITE(1,1)
      READ(4,3) IDAT,IEND
```

FILE I/O

```
   30 READ(121'IDAT) (DRF(I),I=1,6)
      READ(122'IDAT) (ORF(I),I=1,6)
      READ(123'IDAT) (PE(I),I=1,6)
      READ(104'IDAT) (IBAS(I),I=1,48)
```

```
      J=1
      DO 20 I=8,48,8
      BASE(J)=IBAS(I)/100000.
      HY(J)=0.
   20 J=J+1
      DO 100 I=1,6
  100 HY(I)= DRF(I)+ORF(I)+PE(I)+BASE(I)
```

FORMATTED I/O

```
      WRITE(3,2) IDAT,(HY(I),I=1,6)
```

(ENTRANCE)

CONTROL CARDS

```
*IOCS(CARD,TYPEWRITER,KEYBOARD,1132PRINTER,DISK)
*ONE WORD INTEGERS
*ARITHMETIC TRACE
*TRANSFER TRACE
*LIST ALL
```

SPECIFICATIONS

```
C     MAINLINE PROGRAM FOR WATERSHED MODEL
      DIMENSION AQ(96),IQRF(50),IDRF(50),IBAS(50),IPE(50),IPX(96)
      DIMENSION G(35),EP(35),IPR(100)
      DIMENSION PA(100),INFO(80),Q(20),SUBG(20),SUBM(20)
      COMMON NW,FC,S,E,FREE,SA1,DELP,G,K,AWC,PR,PT,D,M20TA,ET,
     1Q,SUBG,SUBM,SUBQ1,DG,GD,DFC,RECO,SUBQ2,PPAN,VD,PE,FREED,FR2,NF2,
     2NF1,NK,SA2,A,AF,VDM,FR1,G1,EP,TPR,DPE
      DEFINE FILE 9(183,96,U,LFAL1),10(183,96,U,LFAL2)
      DEFINE FILE 11(1,106,U,NFAL3),12(1,106,U,NFAL4)
      DEFINE FILE 101(366,48,U,IQ1),102(366,48,U,IQ2),103(366,48,U,IQ3),
     1104(366,48,U,104)
```

```
      MIX=2
```

FORMATTED I/O

```
      READ(2,1) (INFO(J),J=1,80)
      READ(2,2) S,FC,AWC,G,M20TA,VDM,GD,D,PPAN,A
      WRITE(1,8)
    8 FORMAT(' TYPE IN THE FOLLOWING'/5X'WEEK NUMBER'/5X'
     1DAY OF WEEK'/5X'BEGINNING DATE'/5X'ENDING DATE'/5X'
     1AVAILABLE STORAGE'/5X'INITIAL DISCHARGE'/5X' 000
     1 000  000  000  00.000   0.0000')
```

FORMATTED I/O

```
 3001 READ(6,3) NW,IDAY,IDAT,IEND,SA1,SUBQ1
```

```
      IF(NW) 99,99,776
```

Z..99

FORMATTED I/O

```
 776  READ(2,4) NK,(Q(I),SUBG(I),I=1,NK)
```

```
      DO 777 I=2,NK
      K=I-1
 777  SUBM(K)=(Q(I)-Q(K))/(SUBG(I)-SUBG(K))
      I=NK-1
```

```
FREE=0.
SA1=5

31 DQ=0.
   SUBQI=0.

322 IF(VD) 99,32,677

677 IF(VDTES) 99,678,67

678 VDTES=PR(K-1)

    GO TO 67

32 IF(PR(K)) 99,200,23

23 IF(K-1) 99,26,25

25 IF(PR(K-1)) 99,24,67

26 IF(PRTES) 99,24,67
```

```
                                                  FORMATTED I/O
      WRITE(MIX,101) (INFO(K),K=1,80)
      WRITE(MIX,102) (SUBM(K),K=1,I)
      WRITE(MIX,103) SAI,VOM,FC,G,AWC,GD,D,H2OTA,PPAN,A
C     INITIALIZE VARIABLES

      TET=0.
      TE=0.
      TIME=0.
      VD=0.
      TFC=0.
      TQ=0.
      TFIL=0.
      TIME=0.
      IDCK=7
      NF=9
      NF1=11
      NF2=12
      DI=.25
      VDT=0. = 0.
      PRTES=0.
      KMD=1

                                                  FORMATTED I/O
      WRITE(MIX,105)
      WRITE(MIX,106)
      WRITE(MIX,104) IDAT

                                                  FILE I/O
      READ(NF1,1) (S1(K),K=1,52)
      READ(NF2,1) (EP(K),K=1,52)

 2000 IF(IDAY-IDCK) 20,20,21                      *-Z..20

   21 NW=NW+1
      IDAY=1

   20 IF(IDAT-183) 42,42,42                       *-Z..42
```

```
42 NF=10
   IDAR=IDAT-183

   GO TO 430

43 IDAR=IDAT

430 READ(NF'IDAR) (IPR(I),I=1,96)                    FILE I/O

   DO 531 I=1,96

531 PR(I)=IPR(I)/1000.

   DO 1000 K=1,96

   IF(S-SA1) 28,28,27

27 CALL ETFC                                         SUBROUTINE

   IF(FREED) 31,31,30

30 CALL RECOV                                        SUBROUTINE

   GO TO 322

28 ET=0.
   E=0.
```

```
                                                                  SUBROUTINE
   24 CALL INITL

                                                                  SUBROUTINE
   67 CALL  INFIL

        TFIL=TFIL+DELF
        TE=TE+E
        TET=TET+ET
        TQ=TQ+DQ
        TIME=TIME+DT
        TPR=TPR+PR(K)
        COMP=K/16.
        ICOMP=COMP

        IF(ICOMP-COMP)  35,55,35                                  35

                                                                  FORMATTED I/O
   55 WRITE(MIX,901) TIME,TPR,FREE,SA2,FR2,TE,TET,SUBQ2,T-
     1Q,PE,VD

        KHD=KHD+1

   35 SA1=SA2
      FR1=FR2

        GO TO 1001                                                1001

  200   CONTINUE

  201 IF(K-1) 99,226,225                                          99
                                                                  226

  225 IF(PR(K-1)) 99,626,227                                      99
                                                                  227
```

```
8 CONTINUE

33 IF(FREED) 205,205,4                                  4
205 IF(DFC) 206,206,207                                 207
206  RECO=ET+E

     GO TO 4                                            4
207  RECO=ET+E+DFC

  .4 RETURN

     END
```

Why?

```
200 SA=SA1+DFC
    E=EP(NW)*(1-SA*D/(H2OTA*G))*(DT/24.)*PPAN

IF(E) 10,11,11                                  Z+..11

10 E=0.

11 FREE=6-SA

IF(FREE) 115,115,112                            -Z..115

112 IF(FREE-E) 5,5,6                            +..6

5 E=FREE

115 FREE=0.

6 SA=SA+E
    ET=GI(NW)*EP(NW)*DT/24.*PPAN
    CAP=1-SA

IF(CAP-ET) 7,7,8                                +..8

7 FREE=0.
    ET=0.
```

```
                                    (ENTRANCE)
                                        |
-----------------------------------------------------------CONTROL CARDS -----
-  *ONE WORD INTEGERS                                                        -
-  *LIST ALL                                                                 -
-----------------------------------------------------------------------------
                                        |
//////////////////////////////////////////////////////////////SPECIFICATIONS//////
/        SUBROUTINE ETFC                                                      /
/        DIMENSION GI(55),EP(55)                                              /
/        DIMENSION PR(100),Q(20),SUBG(20),SUBM(20)                            /
/        COMMON NW,FC,S,E,FREE,SA1,DELF,G,K,AWC,PR,DT,D,H2OTA,ET,             /
/       1Q,SUBG,SUBM,SUBQ1,DQ,GD,DFC,RECO,SUBQ2,PPAN,VD,PE,FREED,FR2,NF2,     /
/       2NF1,NK,SA2,A,AF,VDM,FR1,GI,EP,TPR,DPE                                /
//////////////////////////////////////////////////////////////////////////////
                                        |
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+      FRED1=GD-SA1                                                         +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        |
*****************************************************************************
*      IF(FRED1)-201,201,202                                                *+...202.........................O
*****************************************************************************
                                        |
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+  201 DFC=0.                                                               +
+      FREED=0.                                                             +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        |
*****************************************************************************
*      GO TO 204                                                            *....204.........................O
*****************************************************************************
                                        O(.........................................................O
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+  202 DFC=FC*DT                                                            +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        |
*****************************************************************************
*      IF(FRED1-DFC)1,1,2                                                   *+...2.........................O
*****************************************************************************
                                        |
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+    1 DFC=FRED1                                                            +
+      FREED=0.                                                             +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        |
*****************************************************************************
*      GO TO 200                                                            *....200.........O
*****************************************************************************
                                        O(.........................................................O
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+    2 FREED=FRED1-DFC                                                      +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                                        O(.........................................................O
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+  204 CONTINUE                                                             +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
                    ****************************
                    |
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+      KHD=1                                                          +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    |
                    O(.......................................................O
                    |
-------------------------------------------------------FORMATTED I/O--
-  436 WRITE(MIX,104) IDAT                                            -
-------------------------------------------------------------------------
                    |
                    |
*************************************************************************
*      GO TO 2000                                                       *....2000.....O
*************************************************************************

-------------------------------------------------------FORMATTED I/O--
-  104 FORMAT(4X,I3)                                                   -
-  901 FORMAT(7X,F4.1,1X,F6.2,F7.3,2F6.2,2F7.3,F9.5,F8.4,F-
-     16.2,F6.3)                                                       -
-  902 FORMAT(7X,F4.1,7X,F7.3,F6.2,6X,2F7.3,F9.5,F8.4)                 -
-    1 FORMAT(80A1)                                                    -
-    2 FORMAT(10F5.2)                                                  -
-    3 FORMAT(5X,4I5,2F10.0)                                           -
-    4 FORMAT(I5/(2F10.0))                                             -
-  101 FORMAT(80A1)                                                    -
-  102 FORMAT(' THE RECIPROCAL K VALUES ARE'//(5F10.5))                -
-  103 FORMAT(1H0,1X,'THE INITIAL STATE CONDITION IS'/10X'-
-     1SA1=',F10.4/ 10X,'VDN=',F10.4/10X'FC=',F10.4/10X,-
-     1'G=',F10.4/10X'AWC=',F10.4/10X'GD=',F10.4/10X'D=',F-
-     110.4/10X'H2OTA=',F10.4/10X'PPAN=',F10.4/10X  'A=',F-
-     110.4////)                                                       -
-  105 FORMAT(1H1)                                                     -
-  106 FORMAT(7X'TIME PRECIP  FREE    SA   RATE   TE     T-
-     1ET     SUBQ      TQ      PE     VD'/)                          -
-------------------------------------------------------------------------
                    |
                    O(.......................................................O
                    |
=========================================================================
=   99 CALL EXIT                                                        =
=========================================================================

=========================================================================
=      END                                                              =
=========================================================================
```

```
      IF(ITEST) 602,602,601
  601 IDRF(J)=ITEST*100000.
      IBAS(J)=6(NK-2)*100000.
      GO TO 2011
  602 IBAS(J)=AQ(I)*100000.
 2011 J=J+1
                                                    FILE I/O
      WRITE(101'IDAT) (IDRF(I),I=1,48)
      WRITE(102'IDAT) (IQRF(I),I=1,48)
      WRITE(103'IDAT) (IPE(I),I=1,48)
      WRITE(104'IDAT) (IBAS(I),I=1,48)
      IF(IDAT-IEND) 438,3001,3001
  438 IDAY=IDAY+1
      ARTES=PR(96)
      IDAY=IDAY+1
      TIME=0.
      IF(KMD-42) 436,437,437
                                                    FORMATTED I/O
  437 WRITE(MIX,105)
      WRITE(MIX,106)
```

```
      KHD=KHD+1

 1001 AQ(K)=SUBQ2
      IPX(K)=DPE*10000.

 1000 CONTINUE

      DO 2010 I=1,48

      IBAS(I)=0
      IPE(I)=0
      IQRF(I)=0

 2010 IDRF(I)=0
      J=1

      DO 2011 I=2,96,2

      IPE(J)=IPX(I)+IPX(I-1)
      TEST=AQ(I)-Q(NK-1)

      IF(TEST) 600,600,601

  601 IDRF(J)=TEST*100000.
      IDRF(J)=Q(NK-1)*100000.
      IBAS(J)=Q(NK-2)*100000.

      GO TO 2011
```

```
  626 IF(VDTES) 99,202,227

  226 IF(PRTES) 99,202,227

                                                  FORMATTED I/O
  227 WRITE(MIX,901) TIME,TPR,FREE,SA2,FR2,TE,TET,SUBQ2,T-
      1Q,PE,VD

      VDTES=0.

  202 SA2=SA1+RECO
      SA1=SA2

      IF(SUBQ1) 99,95,94

   95 SUBQ2=0.

   94 TE=TE+E
      TET=TET+ET
      TQ=TQ+DQ
      TIME=TIME+DT
      COMP=K/16.
      ICOMP=COMP

      IF(ICOMP-COMP) 1001,45,1001

                                                  FORMATTED I/O
   45 WRITE(MIX,902)  TIME,FREE,SA2,TE,TET,SUBQ2,TQ
```

(ENTRANCE)

```
CONTROL CARDS
*ONE WORD INTEGERS
*LIST ALL
```

```
SPECIFICATIONS
      SUBROUTINE RECOV
      DIMENSION GI(55),EP(55)
      DIMENSION PR(100),Q(20),SUBG(20),SUBM(20)
      COMMON NW,FC,S,E,FREE,SA1,DELF,G,K,AWC,PR,DT,D,H2OTA,ET,
     1G,SUBG,SUBM,SUBD1,DQ,QD,QFC,RECO,SUBD2,PPAN,VD,PE,FREED,FR2,NF2,
     2NF1,NK,SA2,A,AF,VDM,FR1,GI,EP,TPR,DPE
```

```
      DQ1=SUBD1*DT
      C4=2.*FREED-DQ1
```

```
      DO 60 I =2,NK
```

```
      J=I
      C5=Q(I)*DT+2*SUBG(I)
      PREV1=SUBG(J-1)
      PREV2=SUBG(I)
      PREV3=PREV2
```

possibly with large time increment.

```
      IF(C5-C4) 60,50,70
```

```
   50 DQ2=Q(I)*DT
      FRE=SUBG(I)
```

```
      GO TO 8888
```

```
   60 CONTINUE
```

```
   70 J=J-1
      FRE=PREV1+(PREV2-PREV1)/2.
      PREV3=PREV2
      PREV2=FRE
```

```
      DIF=(C5-C4)/DT
      TEST=ABS(DIF)-.01

      IF(TEST) 8888,8888,80

   80 IF(DIF) 90,8888,110

   90 FRE=PREV2+(PREV3-PREV2)/2.
      PREV1=PREV2
      PREV2=FRE

      GO TO 9999

  110 FRE=PREV1+(PREV2-PREV1)/2.
      PREV3=PREV2
      PREV2=FRE

      GO TO 9999

 8888 IF(FREED-DQ2) 100,101,101

  100 DQ2=FREED

  101 DQ=(DQ1+DQ2)/2.
      SUBQ2=DQ2/DT
      RECO=DFC+ET+E+DQ
      SUBQ1=SUBQ2
```

```
RETURN

END
```

```
                                                                  FILE I/O
   70 WRITE(NF1'I) (KAR(K),K=1,96)

      DO 71 I=1,183

                                                                  FILE I/O
   71 WRITE(NF2'I) (KAR(K),K=1,96)

  174  I=1

                                                          FORMATTED I/O
  201 READ(2,1)  NB(I),IT1(I),IT2(I),PR(I)

      IF(I-1) 99,23,21                                      99
                                                            23

   21 IF(NB(I)-NB(I-1)) 99,23,20                            99
                                                            20

   23 I=I+1

      GO TO 201                                             201

   20 J=I-1
      NR=NB(J)
```

DNA 0380

(ENTRANCE)

CONTROL CARDS

```
*IOCS(CARD,TYPEWRITER,1132 PRINTER,DISK,KEYBOARD)
*ONE WORD INTEGERS
*LIST ALL
```

SPECIFICATIONS

```
      DIMENSION PR(110),IT1(110),IT2(110),KAR(110),IPR(110),NB(110),
     1JPR(110)
      DEFINE FILE 9(183,96,U,LFAL1),10(183,96,U,LFAL2)
```

FORMATTED I/O

```
      WRITE(1,33)
   33 FORMAT(' IF YOU WISH TO ZERO OUT THE DATA FILES,FLI-
     1P SWITCH 10 UP'/'IF YOU WISH TO COMBINE THE NEW DAT-
     1A WITH EXISTING DATA IN THE FILES,FLIP SWITCH 10 DO-
     1WN'//' PUSH PROGRAM START ON THE CONSOLE'//)
```

```
      PAUSE
```

FORMATTED I/O

```
      WRITE(1,30)
   30 FORMAT(' TYPE IN THE TWO FILES FOR THIS RAINFALL---
     1THE DISTRIBUTION FACTOR FOR EXISTING DATA---'/' THE
     1DISTRIBUTION FACTOR FOR THE NEW DATA---THE RAINFALL-
     1 FACTOR'//5X'  000  000 0.00 0.00 0.00')
      READ(6,31) NF1,NF2,PRF1,PRF2,FACT
   31 FORMAT(5X,2I5,3F5.2)
```

```
      NF=NF1
```

SUBROUTINE

```
      CALL DATSW(10,KCK)
```

```
      IF(KCK-1) 99,74,174
```

```
   74 DO 73 K=1,100
```

```
   73 KAR(K)=0.
```

```
      DO 70 I=1,183
```

99

174

(ENTRANCE)

```
-----------------------------------------------------------CONTROL CARDS -----
-  *ONE WORD INTEGERS                                                        -
-  *LIST ALL                                                                 -
-----------------------------------------------------------------------------

/////////////////////////////////////////////////////////////SPECIFICATIONS//////
/        SUBROUTINE INITL                                                     /
/        DIMENSION GI(55),EP(55)                                              /
/        DIMENSION PR(100),Q(20),SUBG(20),SUBM(20)                            /
/        COMMON NW,FC,S,E,FREE,SA1,DELF,G,K,AWC,PR,DT,D,H2OTA,ET,             /
/       1Q,SUBG,SUBM,SUBQ1,DQ,GD,DFC,RECO,SUBQ2,PPAN,VD,PE,FREED,FR2,NF2,     /
/       2NF1,NK,SA2,A,AF,VDM,FR1,GI,EP,TPR,DPE                                /
/////////////////////////////////////////////////////////////////////////////
```

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+      DELF=0.                                                              +
+      DVD=0.                                                               +
+      FAV=0.                                                               +
+      DPE=0.                                                               +
+      PE=0.                                                                +
+      TPR=0.                                                               +
+      AF=GI(NW)*A                                                          +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

= a

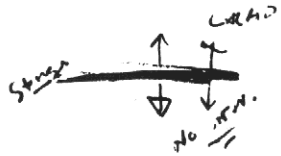
```
*****************************************************************************
*      IF(SA1-G) 1,2,2                                                      *Z+..2.........................O
*****************************************************************************
```

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+    1 FR1=AF*SA2**1.4+FC                                                   +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
*****************************************************************************
*      GO TO 3                                                              *....3.........................O
*****************************************************************************
```

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+    2 FR1=AF*SA2**1.4                                                      +
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
*****************************************************************************
*    3 RETURN                                                               *
*****************************************************************************

*****************************************************************************
*      END                                                                  *
*****************************************************************************
```



AWC = Threshold
= G

(ENTRANCE)

CONTROL CARDS

```
*ONE WORD INTEGERS
*LIST ALL
```

SPECIFICATIONS

```
      SUBROUTINE INFIL
      DIMENSION GI(55),EP(55)
      DIMENSION PR(100),Q(20),SUBG(20),SUBM(20)
      COMMON NW,FC,S,E,FREE,SA1,DELF,G,K,AWC,PR,DT,D,H2OTA,ET,
     1Q,SUBG,SUBM,SUBQ1,DQ,GD,DFC,RECO,SUBQ2,PPAN,VD,PE,FREED,FR2,NF2,
     2NF1,NK,SA2,A,AF,VDM,FR1,GI,EP,TPR,DPE
C     ESTIMATE FIRST GUESS FOR DELF
```

```
      IF(FR1*DT-(VD+PR(K))) 7,7,8
      7 DELF=FR1*DT
      GO TO 9
      8 DELF=VD+PR(K)
      9 SA2=SA1+RECO-DELF
      IF(SA2) 25,25,97
      25 SA2=0.
         FR2=SUBQ2+FC
         DELF=((FR1+FR2)/2.)*DT
      GO TO 78
      97 IF(FREE) 99,98,26
```

In apportion of excess, FREE must change ∴ FREE = G-SA, but the pgm does not [illegible]

```
      GO TO 95
C     CALCULATE VALUE OF INFILTRATION RATE

   26 FR2=AF*SA2**1.4+FC

   95 FAV=(FR1+FR2)/2.
C     CHECK GUESS

      IF(DELF/DT-FAV) 88,88,10

   10 DELF=DELF-.001

      GO TO 9
C     APPORTION EXCESS

   88 IF(PR(K)+VD-DELF) 79,79,78

   79 DELF= PR(K)+VD

   78 EX=PR(K)-DELF

      IF(EX) 12,13,14
```

See the [illegible] below 97.

```
12 DVD=EX
   VD=VD+EX

   IF(VD) 35,35,86

35 VD=0.

86 DPE=0.

   GO TO 99

13 DVD=0.
   DPE=0.

   GO TO 99

14 IF(VD+EX-VDM) 15,15,16

15 DPE=0.
   DVD=EX
   VD=VD+DVD

   GO TO 99

16 DVD=VDM-VD
   VD=VDM
   DPE=EX-DVD
   DPE=PE+DPE

99 RETURN
```

END

(ENTRANCE)

CONTROL CARDS

```
*IOCS(CARD,TYPEWRITER,KEYBOARD,1132 PRINTER,DISK)
*ONE WORD INTEGERS
*LIST ALL
```

SPECIFICATIONS

```
      DIMENSION GAMMA(650),HYDRO(2,650),RQ(50),IRQ(50)
      DIMENSION ROQ(50),ZERO(6)
      DEFINE FILE 101(366,48,U,IQ1),102(366,48,U,IQ2),103(366,48,U,IQ3),
     3121(366,12,U,IT1),122(366,12,U,IT2),123(366,12,U,IT3)
```

FORMATTED I/O

```
      WRITE(1,81)
   81 FORMAT('1 TO ZERO ALL FILES--FLIP SWITCH 2 UP------OT-
     1HERWISE LEAVE SWITCH 2 DOWN'/' PRESS PROGRAM START-
     1 ON CONSOLE'/)
```

PAUSE

SUBROUTINE

```
      CALL DATSW(2,ITEST)
```

```
      IF(ITEST-1) 82,82,27
```

27

```
   82 DO 102 I=1,6
  102 ZERO(I)=0.
      DO 101 I=1,366
```

FILE I/O

```
  101 WRITE(123'I)(ZERO(N),N=1,6)
      DO 103 I=1,366
```

FILE I/O

```
  103 WRITE(121'I)(ZERO(N),N=1,6)
```

```
      DO 104 I=1,366

  104 WRITE(122'I)(ZERO(N),N=1,6)                          FILE I/O

   27 DO 100 I=1,2

      DO 100 J = 1,650

  100 HYDRO(I,J)=0.00

                                                           FORMATTED I/O
      WRITE(1,2)
      READ(6,1) IDAT,IEND,IFIL,NF,NUM,SC1,SC2,QI,DT
      WRITE(1,71)

      PAUSE
      HYDRF=0.
      TGAM=0.0
      NUBT=(24./DT)+0.1
      IDT=DT+0.1
      NUM1=NUM+NUBT+2.0
      JBT=(DT/0.5)+0.1

                                                           SUBROUTINE
      CALL DATSW(10,ITES)

      IF(ITES-2) 61,62,99

   61 SC2=SC2-1.
      NFAC=SC2
```

Initial flow

If unequal linear reservoir

then SC1 = storage coeff. first reservoir

SC2 = " " far clearer

```
      GO TO(33,34,35,36),NFAC
   33 RFAC=1.
      GO TO 37
   34 RFAC=2.
      GO TO 37
   35 RFAC=6.
      GO TO 37
   36 RFAC=24.
   37 CONTINUE
      DO 8 I=1,NUM
      GAMMA(I)=(1/SC1)*(TGAM/SC1)**(SC2)  *(2.71828**(-TG
     1AM/SC1)/RFAC)
    8 TGAM=TGAM+DT
```

```
62 DO 7 I=1,NUM

   GAMMA(I)=(2.71828**(-TGAM/SC1)-2.71828**(-TGAM/SC2)
  1)/(SC1-SC2)

7 TGAM=TGAM+DT

63 DO 20 I=1,NUM

   HYDRO(1,I)= QI*GAMMA(I)
   HYDRF=HYDRF+HYDRO(1,I)
   HYDRO(1,I)= QI-HYDRF

   IF(HYDRO(1,I)) 51,41,20

51 HYDRO(1,I)=0.

   GO TO 41

20 CONTINUE

   GO TO 41
```

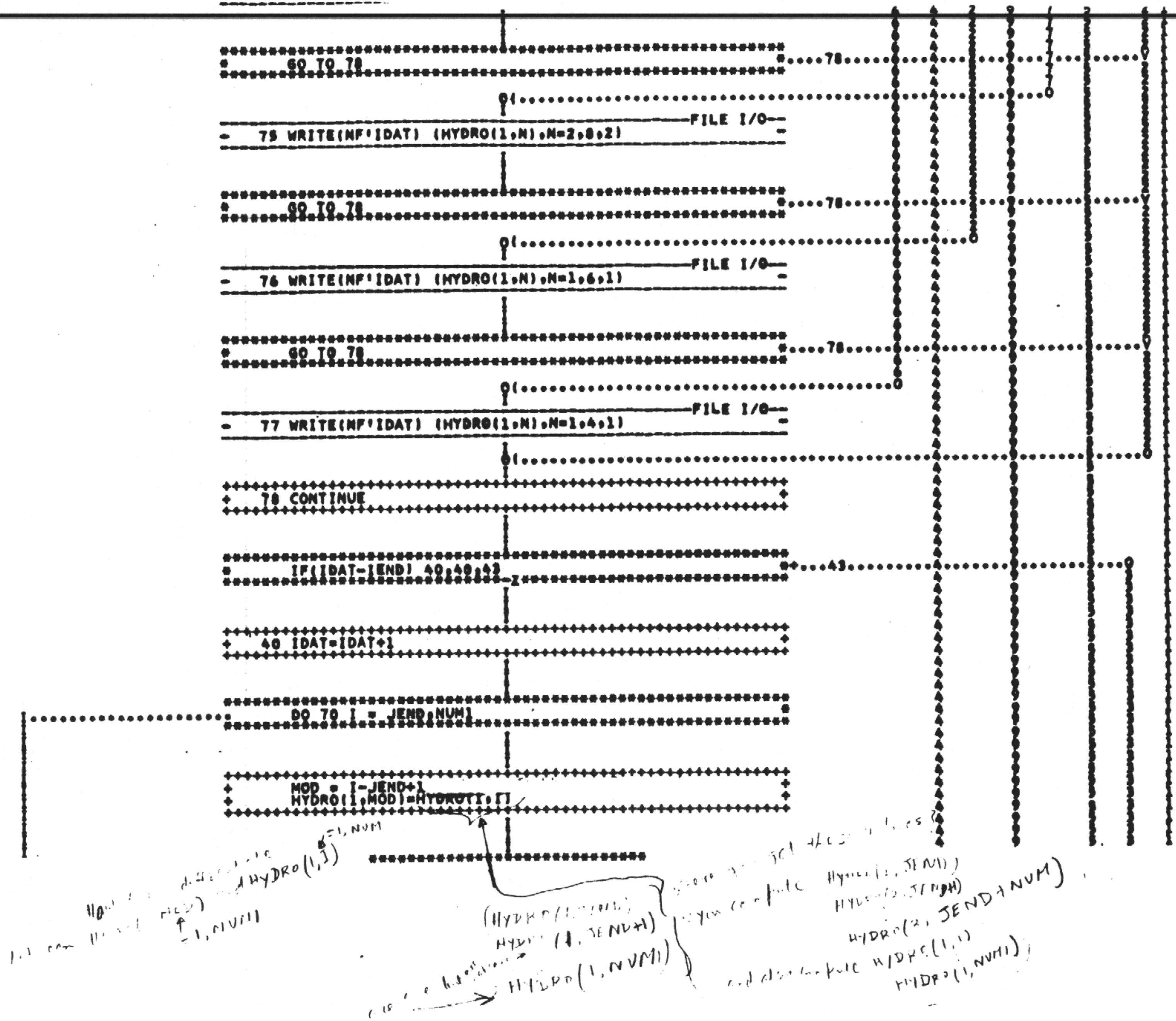
Always Cons to 63

will be +ve if GAMMA(I) < 1 & QI (1-GAMMA(I)) > HYDRF

HYDRO(1,I) < 0

Anytime you go to the [illegible] at 41 [illegible]

```
30 DO 11 I=2,JEND

      L=I

      DO 10 J=1,NUM

      HYDRO(2,L)=RQQ(I-1)*GAMMA(J)

   10 L=L+1

      DO 12 K=1,NUM1

      HYDRO(1,K)=HYDRO(1,K)+HYDRO(2,K)

   12 HYDRO(2,K)=0.

   11 CONTINUE

      GO TO (73,74,75,76,99,77),IDT

   73 WRITE(NF'IDAT) (HYDRO(1,N),N=6,24,6)          FILE I/O

      GO TO 78
```


GO TO 78
FILE I/O
75 WRITE(NF'IDAT) (HYDRO(1,N),N=2,8,2)
GO TO 78
FILE I/O
76 WRITE(NF'IDAT) (HYDRO(1,N),N=1,6,1)
GO TO 78
FILE I/O
77 WRITE(NF'IDAT) (HYDRO(1,N),N=1,4,1)
78 CONTINUE
IF(IDAT-IEND) 40,40,43
43
40 IDAT=IDAT+1
DO 70 I = JEND,NUM
MOD = I-JEND+1
HYDRO(1,MOD)=HYDRO(I,I)
HYDRO(1, NUM)
HYDRO(2, JEND+NUM)

```
70 HYDRO(1,I)=0.

41 READ(IFIL'IDAT) (IRQ(I),I=1,48)                    FILE I/O

DO 42 I=1,48

IF(IFIL-103) 31,32,31

32 RQ(I)=IRQ(I)/10000.

GO TO 42

31 RQ(I)=(IRQ(I)/100000.)*.5

42 CONTINUE
   JBEG=1
   JEND=JBEG+JBT-1

DO 55 JK=1,NUBT

RQQ(JK)=0.

DO 54 I= JBEG,JEND

54 RQQ(JK)=RQQ(JK)+RQ(I)
   JBEG=JEND+1
```

integer values [illegible]

31

42

NUBT is [illegible] integer [illegible]

24/DT ≡ 0.9

This could be any +ve number

DT/0.5 ≡ 0.9

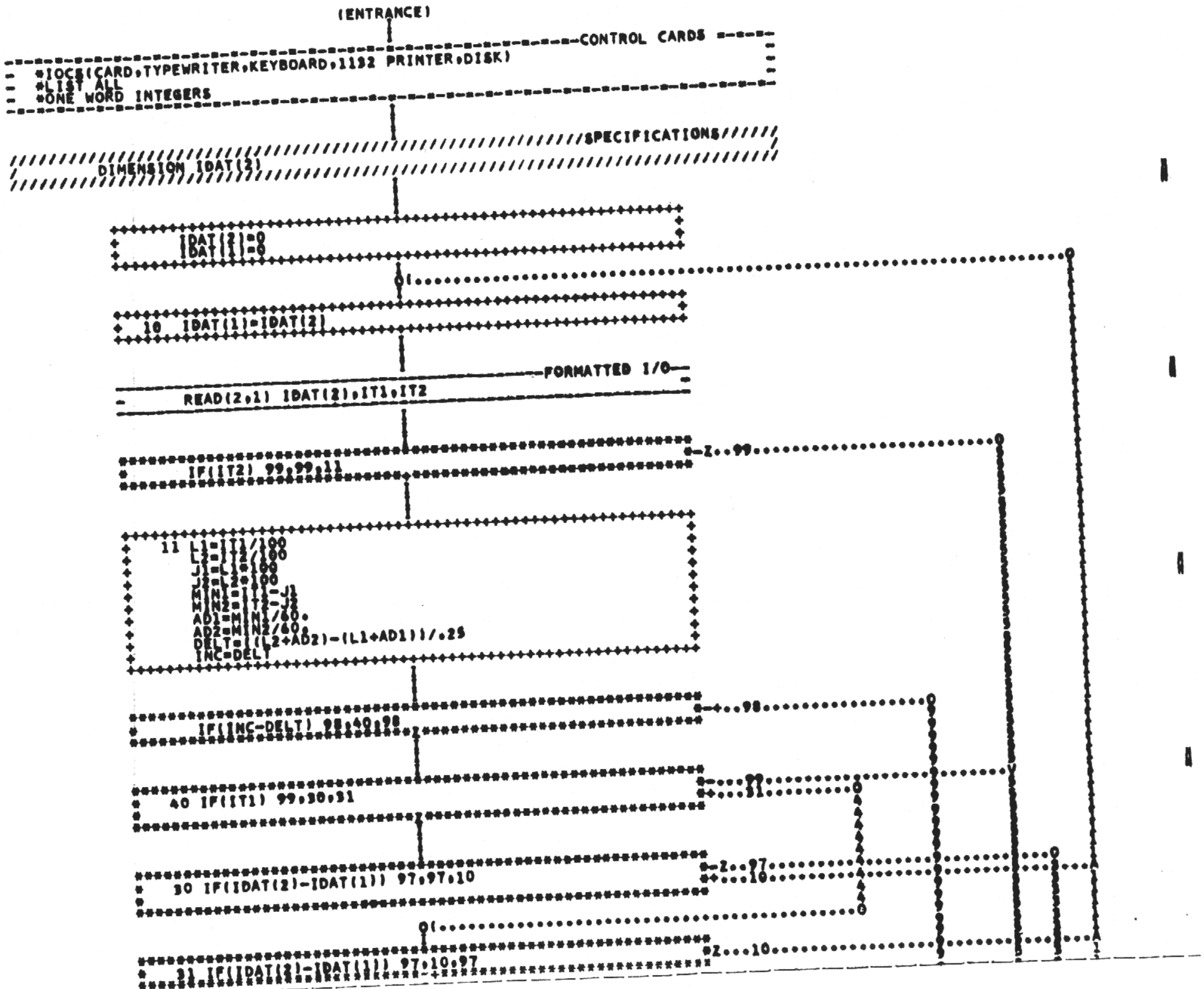
This [illegible] could be any +ve number.

```
      JEND=NUBT+1

      GO TO 30                                                  ....30.........0

   43 WRITE(1,3)                                   FORMATTED I/O

      PAUSE

      CALL DATSW(12,ITEST)                                      SUBROUTINE

      IF(ITEST-1) 27,27,99                                      -Z..27.........
                                                                +...99.........

    1 FORMAT(5X,5I5,3F10.2,F5.2)                                FORMATTED I/O
    2 FORMAT(' TYPE IN THE FOLLOWING INFORMATION'//' BEGI-
     1NNING DATE AND ENDING DATE'/' FILE CONTAINING INPUT-
     1 AND FILE FOR OUTPUT'/' NUMBER OF SUCCESSIVE IUH FU-
     1NCTIONS'/' STORAGE COEFFICIENT FOR GROUNDWATER AND -
     1CHANNEL OR STORAGE COEFFICIENT AND NUMBER OF RESERV-
     1OIRS'/' INITIAL FLOW'/' DELTA TIME'//5X' 000 000 -
     1 000  000  000  000.00    000.00    0.00000  0.00')-
    3 FORMAT(' IF YOU WISH TO CONTINUE---FLIP SWITCH 12 U-
     1P'/' IF NOT---FLIP SWITCH 12 DOWN'/' PRESS PROGRAM -
     1START'//)
   71 FORMAT(//' IF LINEAR EQUAL RESERVOIRS,FLIP SWITCH 1-
     10 UP----IF LINEAR UNEQUAL RESERVOIRS'/' FLIP SWITCH-
     1 10 DOWN'//' PRESS PROGRAM START ON CONSOLE'//)

   99 CALL EXIT

      END
```

```
      IF(NB(J)-183) 61,61,62
   62 NF=NF2
      NR=NB(J)-183
   61 IB=1
      DO 50 K=1,J
      L1=IT1(K)/100
      L2=IT2(K)/100
      J1=L1*100
      J2=L2*100
      M1N1=IT1(K)-J1
      M1N2=IT2(K)-J2
      AD1=M1N1/60.
      AD2=M1N2/60.
      DELT=((L2+AD2)-(L1+AD1))/.25
      INC=DELT + .1
      IE=IB+INC-1
      IF(INC-DELT) 98,40,98
   40 DO 41 L=IB,IE
   41 JPR(L)=(PR(K)/DELT)*1000.
      IB=IE+1
   50 CONTINUE
      CALL DATSW(10,ITES)
      IF(ITES-2) 81,72,99
```

```
FILE I/O
 72 READ(NF'NR) (IPR(L),L=1,96)

      DO 83 L=1,96

 83 JPR(L)=(IPR(L)*PRF1+JPR(L)*PRF2)*FACT

FILE I/O
 81 WRITE(NF'NR) (JPR(L),L=1,96)

      NB(I)=NB(I)
      IT1(I)=IT1(I)
      IT2(I)=IT2(I)
      PR(I)=PR(I)
      I=2

      GO TO 201                                   201

FORMATTED I/O
 98 WRITE(1,101)
101 FORMAT(' TIME INTERVAL IS NOT ON 15 MIN INCREMENT')
  1 FORMAT(16X,I3,1X,I4,1X,I4,1X,F8.2)

 99 CALL EXIT

      END
```

DNA 0380


(ENTRANCE)
CONTROL CARDS
*IOCS(CARD,TYPEWRITER,KEYBOARD,1132 PRINTER,DISK)
*LIST ALL
*ONE WORD INTEGERS
SPECIFICATIONS
DIMENSION IDAT(2)
IDAT(2)=0
IDAT(1)=0
10 IDAT(1)=IDAT(2)
FORMATTED I/O
READ(2,1) IDAT(2),IT1,IT2
IF(IT2) 99,99,11
11 L1=IT1/100
L2=IT2/100
J1=L1*100
J2=L2*100
MIN1=IT1-J1
MIN2=IT2-J2
AD1=MIN1/60.
AD2=MIN2/60.
DELT=((L2+AD2)-(L1+AD1))/.25
INC=DELT
IF(INC-DELT) 98,40,98
40 IF(IT1) 99,30,31
30 IF(IDAT(2)-IDAT(1)) 97,97,10
31 IF(IDAT(2)-IDAT(1)) 97,10,97
Z..99
..98
..99
..31
Z..97
..10
Z..10

```
97 WRITE(1,3)                                   FORMATTED I/O

      PAUSE

      GO TO 10                                  10

98 WRITE(1,4)                                   FORMATTED I/O

      PAUSE

      GO TO 10                                  10

                                                FORMATTED I/O
    1 FORMAT(16X,I2,2(1X,I4))
    3 FORMAT(' INCORRECT DAY-TIME CONTINUITY'//)
    4 FORMAT(' NOT IN 15 MIN INTERVALS'//)

99 CALL EXIT

      END
```

(ENTRANCE)

```
*IOCS(CARD,TYPEWRITER,KEYBOARD,1132 PRINTER,DISK)                    CONTROL CARDS
*LIST ALL

//////////////////////////////////////////////////////////////////////SPECIFICATIONS//////
/       DIMENSION GI(60),GIG(60),EP(60), GIF(60)                                        /
/       DEFINE FILE 1(1,106,U,NFAL3),2(1,106,U,NFAL4)                                   /
//////////////////////////////////////////////////////////////////////////////////////////

      NF1=11
      NF2=12

                                                                        FORMATTED I/O
      READ(2,2)  PERF,PERG
    2 FORMAT( 2F5.2)
      READ(2,1) (GIF(K),GIG(K),EP(K),K=1,53)
    1 FORMAT(3F10.2)

      DO 50 I=1,53

   50 GI(I)=PERF*GIF(I)+PERG*GIG(I)

                                                                        FILE I/O
      WRITE(NF1'I) (GI(I),I=1,53)
      WRITE(NF2'I) (EP(I),I=1,53)

      CALL EXIT

      END
```

```
99    CALL EXIT

      END
```