HYDROLOGY OF PRAIRIE DOG CREEK VALLEY,

NORTON DAM TO STATE LINE, NORTH-CENTRAL KANSAS

By Lloyd E. Stullken

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 84-4162

Prepared in cooperation with the

KANSAS GEOLOGICAL SURVEY

Garden City, Kansas

1984

UNITED STATES DEPARTMENT OF THE INTERIOR

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CONVERSION TABLE

The inch-pound units of measurement used in this report are listed with factors for conversion to International System of Units (SI) as follows:

Inch-pound unit	Multiply by	SI unit
inch	25.4	millimeter
foot	0.3048	meter
mile	1.609	kilometer
square foot (ft^2)	0.09290	square meter
acre	0.4047	square hectometer
square mile (mi^2)	2.590	square kilometer
acre-foot (acre-ft)	0.001233	cubic hectometer
foot per second (ft/s)	0.3048	meter per second
foot per day (ft/d)	0.3048	meter per day
cubic foot per second (ft^3/s)	0.02832	cubic meter per second

GLOSSARY

Aquifer -- A formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

Confined ground water -- Water that is under pressure significantly greater than atmospheric and that has as its upper limit the bottom of a bed of distinctly lower hydraulic conductivity than the material in which the confined water occurs. Also called artesian ground water.

Constant head -- Term used in modeling to describe a water surface that is not allowed to change and, therefore, represents a source or sink of unlimited storage.

Hydraulic conductivity --The volume of water at the existing kinematic viscosity that will move in a unit of time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

Hydrologic budget -- A quantitative analysis of the flow of water into and out of an area. Normally used to show the relative proportions of determined or undetermined flow rates to the total.

Leakance - A rate that reflects the potential for water movement through a confining layer between two aquifers or between an aquifer and a surface-water body. The rate is equivalent to the vertical hydraulic conductivity in the confining bed divided by the thickness of the bed.

Potentiometric surface -- A surface that represents the hydrostatic head. In a confined aquifer where the water is under a pressure significantly greater than atmospheric, the surface is above the top of the aquifer and defined by levels to which water stands in tightly cased wells. In an unconfined aquifer, the surface coincides with the water table.

Specific yield -- The ratio of (1) the volume of water that the rock or soil, after being saturated, will yield by gravity to (2) the volume of the rock or soil. The definition implies that gravity drainage is complete.

Steady state -- Term used in ground-water modeling to describe an aquifer model in which there is no change in hydraulic head and volume of water in storage with time.

Storage coefficient -- The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head.

Transient state -- Term used in ground-water modeling to describe an aquifer model that is stepped through time by allowing storage and hydraulic head in the aquifer to respond to the flow rates provided.

Transmissivity -- The rate at which water at the prevailing kinematic viscosity is transmitted through a unit width of the aquifer under a unit hydraulic gradient. It is equal to an integration of the hydraulic conductivities across the saturated part of the aquifer perpendicular to the flow paths. Transmissivity is equal to the hydraulic conductivity of an aquifer multiplied by its saturated thickness.

Unconfined ground water -- Water in an aquifer that has a water table.

Water table -- That surface of an unconfined ground-water body at which the water pressure is atmospheric. It is defined by the levels at which water stands in wells that penetrate the water body enough to hold standing water. The water table is a particular potentiometric surface.

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ABSTRACT

The water resources of Prairie Dog Creek valley between Norton Dam and the Kansas-Nebraska State line have been developed for an irrigation-based agriculture. Keith Sebelius Lake released an average of 6,900 acre-feet of water per year to the Almena Irrigation District during 1967-76. Development of irrigation from ground water increased from 4 wells during 1948 to 147 wells during 1978.

The aquifer in Prairie Dog Creek valley consists principally of alluvial deposits. The effects of irrigation development on the aquifer are evaluated by comparison of water-level changes. Using 1945-47 water-level data, saturated thicknesses from well and test-hole data, and an estimated specific yield of 0.15, the water in storage was determined to be 130,000 acre-feet. Using similar data based on 1979 water levels, the storage was determined to be 136,000 acre-feet, indicating that recharge to the aquifer from surface-water irrigation exceeded the pumpage by wells.

A steady-state digital model was calibrated to evaluate flow conditions in the aquifer prior to irrigation development during 1947. The simulation indicated that recharge was largely from precipitation (88 percent) and that discharge was largely to streams (54 percent) and by evapotranspiration (26 percent). The model was calibrated using a hydraulic conductivity for the aquifer of 125 feet per day.

A steady-state model simulates the aquifer condition before the natural recharge-discharge balance was affected by irrigation. A transient model for estimating the effects of surface-water diversions, precipitation, and irrigation-well withdrawals would require additional calculations from limited historic data.

Although this study indicates an increase in aquifer storage, other studies in western Kansas have indicated decreasing supplies. Because there is a potential for future water shortages, alternative management plans need to be investigated. A transient model, based on data from the steady-state model and data calculated from historic records, could be used as a predictive tool in management of the water resources.

INTRODUCTION

This investigation was a part of a hydrologic study of nine counties in north-central Kansas made by the U.S. Geological Survey, in cooperation with the Kansas Geological Survey. The purpose was to report on 1979 water-resources development and to quantitatively define the hydrologic system, including the relationship between surface water and ground water in the Prairie Dog Creek valley between Norton Dam and the Kansas-Nebraska State line.

Water-resources development is reported in terms of a well inventory for the nine counties (Ellis, Graham, Norton, Osborne, Phillips, Rooks, Russell, Smith, and Trego Counties) that was published in a hydrogeologic data report (Stullken, 1980). The data report also contains driller's logs of test holes drilled or augered throughout the project area and some previously unpublished logs of test holes in Prairie Dog Creek valley.

The hydrologic system, including the relationship between surface water and ground water, has been investigated with ground-water modeling techniques in the Prairie Dog Creek valley (this report), the South Fork Solomon River valley (Burnett and Reed, 1984), and the North Fork Solomon River valley (Jorgensen and Stullken, 1981).

Development of the water resources of Prairie Dog Creek valley has been a major factor in the economic vitality of agriculture in this area. Utilization of the available surface- and ground-water supplies has changed dramatically over the last 30 years as more ground and surface waters are used for irrigation. This report documents a numerical simulation of the predevelopment (1945-47) ground-water flow system in Prairie Dog Creek valley with a computerized model. Leakage to and from the stream is an integral part of the flow system.

The study area consists of 113 mi^2 in the Prairie Dog Creek valley between Norton Dam and the Kansas-Nebraska State line in north-central Kansas, as shown in figure 1. The cities of Norton, Almena, and Long Island are within the study area.

Major sources of data for this report are the hydrogeologic data report (Stullken, 1980), water-level measurements collected during February 1979, and a previous study by Frye and Leonard (1949). Additional data were obtained from the files of the U.S. Bureau of Reclamation; the Kansas State Board of Agriculture, Division of Water Resources; and the Almena Irrigation District.

DESCRIPTION OF STUDY AREA

This study includes the investigation of Prairie Dog Creek, the valley fill underlying the flood plain, and the adjacent terraces. Prairie Dog Creek generally is an intermittent tributary of the Republican River. In the study area, the creek meanders across the valley in a narrow channel that is incised 15 to 20 feet below the flood plain. A generalized geohydrologic section of the valley is shown in figure 2. The valley is 28.4 miles long and 3,000 to 9,000 feet wide. The valley sides generally are defined by rolling slopes and a few bedrock outcrops.

The valley-fill aquifer is comprised of unconsolidated alluvial deposits of Quaternary age. The valley floor and sides are underlain by the relatively impermeable Niobrara Chalk of Cretaceous age. The Ogallala Formation of late Tertiary age overlies the Cretaceous formations in the uplands but has been eroded from the valley area. Although the Ogallala Formation is an important aquifer in the uplands, it has no direct hydraulic contact with the alluvium of the valley. For a more complete discussion of the geology, the reader is referred to Frye and Leonard (1949, p. 23-54).

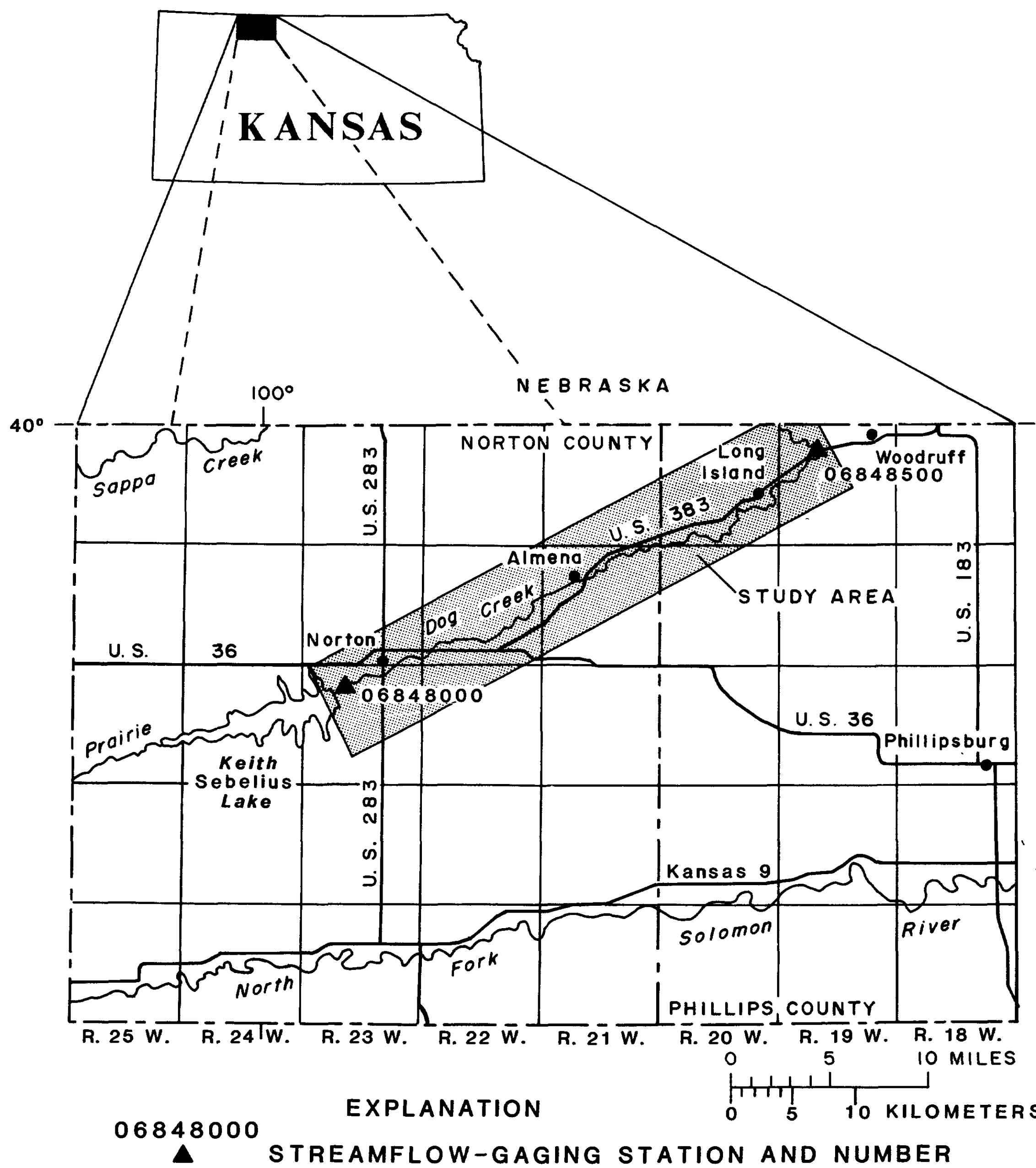

Figure 1.--Location of study area.

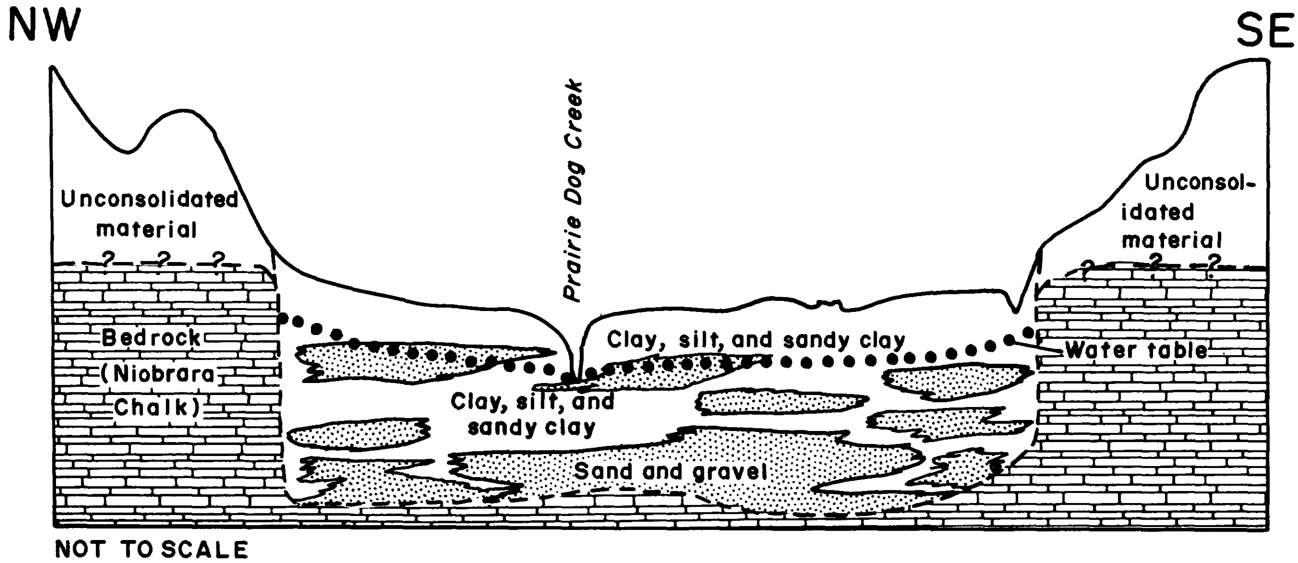

Figure 2.--Generalized geohydrologic section of Prairie Dog Creek valley.

SURFACE WATER

Surface water has been the most apparent and available water resource for development. Two gaging stations record the streamflow in Prairie Dog Creek. One streamflow-gaging station, Prairie Dog Creek at Norton, Kans. (06848000), is located on the west line of sec. 9, T.3 S., R.23 W., 3 miles southwest of Norton at the upstream end of the study reach and 0.5 mile downstream from Norton Dam. A second streamflow-gaging station, Prairie Dog Creek near Woodruff, Kans. (06848500), is located in the NW1/4 sec. 9, T.1 S., R.19 W., 1 mile south of the Kansas-Nebraska State line at the downstream end of the study reach. The drainage areas are approximately 683 mi^2 at the upstream gage and 980 mi^2 at the downstream gage. Streamflow has been recorded continuously at the Norton gage since October 1943, and at the Woodruff gage since October 1944. The average annual discharge of Prairie Dog Creek at the Norton gage is 27.2 ft^3/s, and at the Woodruff gage it is 38.9 ft^3/s.

Regulation by Norton Dam

Norton Dam has regulated the flow in Prairie Dog Creek since 1964. Keith Sebelius Lake has the capacity to impound 193,000 acre-ft of water for flood control, 33,000 acre-ft of which are considered conservation-pool storage and are used for irrigation, recreation, and municipal supply.

Almena Irrigation District began operation in April 1967. The District receives water from Keith Sebelius Lake through streamflow releases that are diverted to the district canal system at the Almena diversion dam, 2 miles southwest of Almena. The average annual diversion for the first 10 years of operation (1967-76) was 6,900 acre-ft. Decreasing inflow to the lake during the last few years has caused concern about the future availability of surface water for irrigation.

Precipitation and Runoff Relation

According to records of the National Weather Service, the 30-year average annual precipitation at Long Island is 23.17 inches. The average annual precipitation for the study area is estimated to be 23 inches.

The quantity of surface-water runoff per unit of precipitation is variable from year to year. The cumulative precipitation and cumulative runoff (U.S. Department of Commerce, 1952-77) for the area upstream from Norton Dam since 1952 are shown in figure 3. No significant change is shown in the trend of annual precipitation or cumulative runoff, although a decrease in runoff per unit of precipitation may be indicated during 1965-76. Even a small decrease in runoff, however, confirms the need for an investigation of the relationship between ground water and surface water in the basin--particularly downstream from the lake where conjunctive use of the available water may cause complex changes in the hydrologic system.

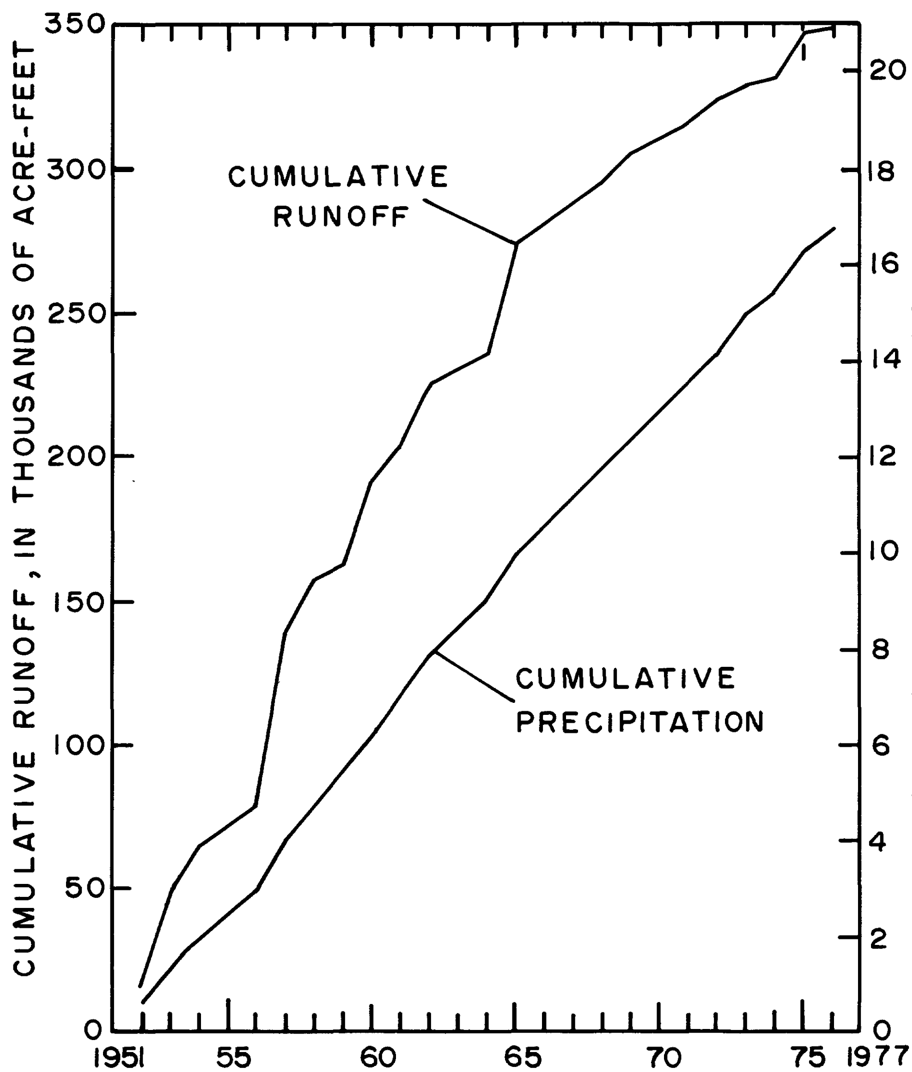

Figure 3.--Precipitation-runoff relation.

Surface- and Ground-Water Relation

Surface- and ground-water flow patterns greatly affect each other in the valley of Prairie Dog Creek. Natural losses of streamflow to the aquifer commonly result from the water table being lower than the stream surface. Likewise, gains in streamflow are the result of the water table in the aquifer being above the stream surface. Streamflow measurements and water-level measurements in nearby wells are used to show this interaction.

Seepage investigations have been made on seven different dates to document the gains and losses of streamflow throughout the study reach. These investigations consist of measured streamflow discharges at many sites along Prairie Dog Creek and were made during periods of low flow and no direct surface runoff. The earlier of these investigations were made on October 18, 1962, and on October 24, 1963, prior to closure of Norton Dam. The closure of the dam in 1964 and the release of water for downstream irrigation diversions beginning in 1967 changed the surface- and ground-water relation in the reach. Therefore, the seepage investigations made after 1963 were not considered viable indicators of predevelopment conditions.

Table 1 is an abbreviated listing of the streamflow gains below the upstream end of the study reach as computed from streamflow measurements. While both gains and losses are shown in the data, there was generally a total gain throughout the reach for the periods prior to dam closure (1964) and after releases began (1967). Closure of the dam depleted natural seepage of ground water to surface water as indicated by the overall losses in the 1964-66 seepage investigations.

Table 1.--Results of seepage investigations

Date of seepage investigation	Flow at river mile 87.2[1] (cubic feet per second)	Computed gains, in cubic feet per second, at river mile						
		83.4	70.5	62.0	55.8	52.9	43.0	33.0[2]
10-18-62[3]	3.29	-0.76	-0.09	0.51	1.21	0.99	0.81	1.66
10-23-63	3.62	-.20	.07	-.52	-.70	-.28	-.24	1.20
05-13-64	3.76	.22	-.90	-2.56	-.69	-1.07	-.19	-2.91
10-14-65[4]	0	.07	-.51	.07	-.03	.16	-.47	-.62
10-13-66	.38	-.29	-.57	-.14	.44	.27	.35	-.10
10-19-67	.92	.04	.33	2.05	3.11	3.14	2.65	1.89
11-11-75[5]	.09	-.09	.27	.69	1.42	1.61	1.45	1.66

[1] Gaging station 06848000, shown in figure 1.
[2] Gaging station 06848500, shown in figure 1.
[3] Published by U.S. Geological Survey, 1969.
[4] Published by U.S. Geological Survey, 1972.
[5] Unpublished data in the files of the U.S. Geological Survey, Lawrence, Kansas.

GROUND WATER

Aquifer Description

The alluvial valley fill is the principal aquifer in the Prairie Dog Creek valley. The fill consists of unconsolidated, lenticular beds of clays and silts interspersed with lenticular beds of sands and gravels. Frye and Leonard (1949, p. 86) described the valley as a "trough which Prairie Dog Creek has cut into the Cretaceous bedrock." The bedrock in their reference is the Niobrara Chalk of Cretaceous age, which is a relatively impermeable unit consisting of chalk, chalky limestone, and chalky shale. Ground water in the alluvial valley fill, therefore, is trapped within the valley with little possibility of lateral or downward leakage.

The grain size (clays to gravels) in the various lenticular beds corresponds to the relative proximity and activity of the stream at the time of deposition of that bed. Clay lenses, probably deposited in ponds and slackwater areas formed by old cutoff meanders, may be sufficiently extensive to cause confinement of ground water over small areas. In general, however, the matrix of the aquifer has sufficient vertical permeability to be considered unconfined (water-table condition).

The altitude of the base of the alluvial aquifer is shown on plate 1. The altitudes were determined using data from test holes described in Frye and Leonard (1949, p. 108-139), test holes drilled or augered during 1956 and 1976 by the Kansas and U.S. Geological Surveys, test holes augered or jetted by the U.S. Bureau of Reclamation for placement of observation wells, available logs of existing irrigation wells, valley-wall topography, and outcrop altitudes. Well depths were used as available to supplement the data from logs. The base of the alluvial aquifer is not considered a "bedrock" map because clay beds often occur at the bottom of the aquifer and are indistinguishable from the underlying bedrock.

Gradients on the base-of-aquifer surface are well defined. The surface was interpreted primarily as a tool for determining "BOTTOM" altitudes for simulation of ground-water flow. Low, sometimes branching, channels, broad flats, and higher "islands" are shown throughout the valley. This interpretation is only one of many that may be drawn through existing data points and, because of the sinuous nature of small stream development, it should be considered somewhat speculative where no data points are shown.

Irrigation Development

Conditions in the study area prior to 1948 are reported by Frye and Leonard (1949). At that time, farmers depended largely on precipitation to water their crops. The files of the Division of Water Resources, Kansas State Board of Agriculture, show only 22 permits to appropriate water in the study area at the end of 1948. Seventeen of those permits were issued for irrigation (13 diversions from streamflow and 4 from ground water), appropriating a total of about 1,600 acre-ft per year (or 0.80 inch per year applied over the study area). The other five permits were issued for municipal and industrial diversions of ground water.

Ground-water use has increased considerably since 1949, as shown by a graph of the cumulative number of applications to appropriate ground water from 1945-77 (fig. 4). The number of applications increased to 10 per year during the dry period of 1955-56, decreased to less than 3 per year from 1957-70, and increased to 9 per year from 1971-77. The growth in number of large-capacity wells is closely related to cumulative numbers of applications, though not necessarily on a one-to-one basis. During 1978, 147 irrigation wells and 15 public-supply wells were located during an inventory of the study area (plate 3).

Surface water diverted to crops on the flood plain prior to 1967 consisted primarily of water pumped from Prairie Dog Creek. Since 1964, flow in Prairie Dog Creek has been regulated by Norton Dam. In 1967, Keith Sebelius Lake began supplying water for the Almena Irrigation District. The district, in the downstream one-half of the study area, services 5,350 acres or 8.4 mi^2. The Almena Irrigation District diverted about 6,900 acre-ft of water annually from Prairie Dog Creek via releases from Keith Sebelius Lake during 1967-76.

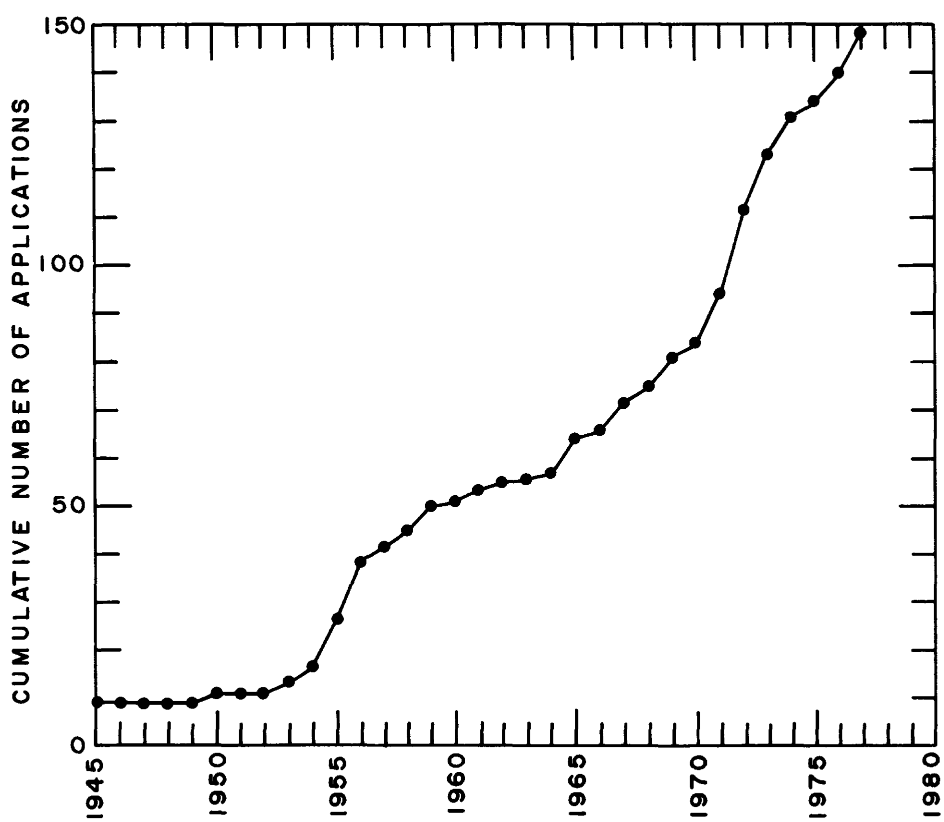

Figure 4.--Cumulative number of applications to appropriate ground water.

Water Levels

Measurements of water levels in wells and hydraulically connected streams are used to define the potentiometric surface of a ground-water reservoir and to determine the quantity of ground water in storage. The altitude and configuration of the 1945-47 water table, modified from Frye and Leonard (1949), is shown on plate 2. The altitude and configuration of the February 1979 water table is shown on plate 3.

In an unconfined aquifer, water-level changes are indicative of corresponding changes in the amount of ground water stored. Increased recharge rates (or decreased discharge rates) and the resulting increased ground-water storage are defined by rising water levels, whereas declining water levels are evidence of discharge rates greater than those of recharge. Constant water levels indicate a state of equilibrium (also called steady-state condition) in which discharge and recharge rates are nearly equal.

Frye and Leonard (1949, p. 87) reported the alluvial aquifer to be in a state of equilibrium during 1945-47. The recorded water levels changed very little during that period. During 1967-68, the spreading of surface water by the Almena Irrigation District provided additional recharge that resulted in increasing storage and rising water levels. Because there was little water-level change during 1969-74, it is indicated that the hydrologic system probably reestablished equilibrium with an increased volume in storage. These trends are reflected by the hydrographs for three observation wells (fig. 5). Seasonal fluctuations shown on the hydrographs indicate momentarily high recharge or discharge. They tend to mask the trends that indicate the long-term state of the hydrologic system. The U.S. Bureau of Reclamation and the Almena Irrigation District continue to maintain a network of observation wells throughout the irrigated area in which water levels are measured several times each year.

Ground Water in Storage

The amount of ground water in storage in an unconfined aquifer is determined by its specific yield and the thickness of saturated deposits between the base of the aquifer and the water table. The difference between altitudes on the base of the aquifer surface and those of the 1945-47 water table yields a saturated volume of 869,000 acre-ft. Assuming a specific yield of 0.15, there were about 130,000 acre-ft of ground water stored in the study area during 1947.

The saturated thickness for February 1979 is shown by pattern on plate 3 as greater than or less than 50 feet. Using the 1979 saturated thickness and a specific yield of 0.15, there were about 136,000 acre-ft of ground water stored in the aquifer at the beginning of 1979. The hydrographs (fig. 5) show that an increase in water levels has occurred largely during the first 3 to 5 years of the Almena Irrigation District activity. It appears that the movement and redistribution of water by the district have increased the total amount of ground water stored by about 5 percent, most of which occurs under the Irrigation District.

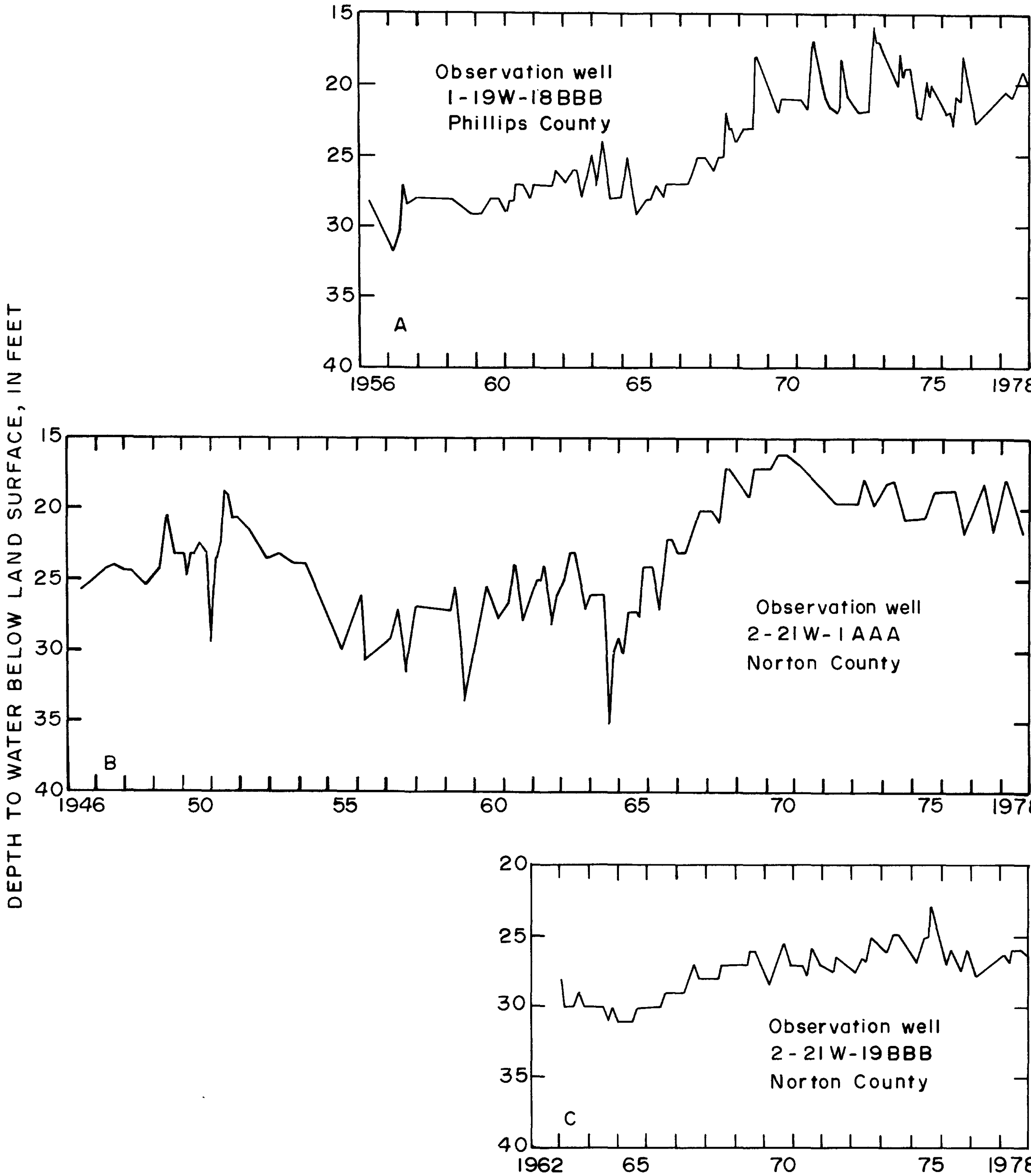

Figure 5--Hydrographs of selected wells.

AQUIFER MODEL

The successful simulation of an aquifer flow system by digital-modeling techniques requires that all input parameters be evaluated simultaneously in the calibration process. In so doing, the sources and locations of inflow and discharge rates are defined. The model includes many generalizations and has definite limitations. Some of the more important simplifying assumptions made are:

1. The aquifer is homogeneous and isotropic.
2. Ground-water movement within the aquifer is strictly horizontal.
3. The aquifer is bounded by an impermeable boundary at the valley walls.
4. All flow rates and hydraulic heads adjust instantaneously to affect an equilibrium condition without a change in ground-water storage.
5. River heads represent points of infinite storage capacity.
6. Unless otherwise defined by data, parameters are extrapolated throughout the study area as a uniform value.
7. The system is represented adequately by discrete data points at the center of uniform-size tracts.

The steady-state model presented in this report is a numerical representation of the hydraulic conditions in the alluvial aquifer from December 1945 to October 1947. During that time, the valley aquifer functioned in response to natural recharge and discharge conditions without significant manmade stresses. Streamflow and precipitation records indicated that the aquifer adjusted rapidly and continuously to natural recharge rates, with discharge rates such that the long-term change in storage of ground water was approximately zero. Very small changes in the total volume of storage were required to affect the transfer of water from recharge to streamflow.

Two parameters, hydraulic conductivity of the aquifer and streambed leakance, were tested for sensitivity in the model. Other parameters, such as recharge, were tested and adjusted on a trial-and-error basis by evaluation of changes in the water budget and resulting water table. Thus, test values, which were bound by rational limits, were used in the steady-state model.

The long-term hydrographs in figure 5 show that the aquifer was capable of attaining a near-equilibrium condition with respect to total storage (no appreciable change in water levels) and that the condition occurred from 1945 to 1947. Therefore, the water-table map based on measurements made from December 1945 to October 1947 (plate 2) is judged adequate for calibrating the steady-state model. Although a time period during which recharge and base flow were constant would be preferable for steady-state modeling, no such period was definable from daily streamflow hydrographs. During 1945-47, the relation of recharge to base flow was represented by many cycles of low and high flows. Therefore, it was necessary to use time-averaged data for the model. Monthly mean base-flow gains in Prairie Dog Creek (Busby and Armentrout, 1965, p. 37-39) ranged from -3.2 to 15 ft^3/s and averaged 2.9 ft^3/s during the period defined for the water-table map. Annual precipitation during the same period averaged 25.3 inches at Long Island or 2.8 inches greater than normal for that station. Short-term recharge rates indicated by the monthly mean base-flow gains ranged from zero to 5 inches per month. An average annual recharge rate of 1.9 inches was found to be consistent with average stream base-flow gains during the calibration period.

Model Grid

Finite-difference equations are used in the digital model to approximate the differential equations that define ground-water flow in the aquifer system. The numerical procedure requires that the modeled area be subdivided into a rectangular grid system, as shown in figure 6. The grid in this model consists of 21 rows and 60 columns with each block extending 1,000 feet toward the southeast and 2,500 feet toward the northeast. Model blocks may be identified individually by row number and column number, such as block (14,51) that represents an area in the city of Long Island, as indicated in figure 6. The outside corner of block (1,1) is located at latitude 39°49'18", longitude 99°57'09".

There are 416 "active" blocks (and corresponding node points) in the model simulation. Each node point, located at the center of the block, is assigned hydraulic values representative of the block as a whole.

Water Budget

The items in the hydrologic budget, as tested in the model, are shown in table 2. It should be emphasized that this solution is not unique. However, the values do represent tested estimates that are within physical and rational limits. The resulting simulated water-table distribution (shown on plate 2) is comparable to the corresponding historic 1945-47 water table (also shown on plate 2) and is considered reasonable for the application of this model.

Table 2.--Hydrologic budget from model simulation, 1945-47

Hydrologic item	Rate, in cubic feet per second	Percentage of total
Recharge		
Subsurface inflow		
Main stem	0.23	4
Tributaries	0.45	8
Precipitation[1]	5.12	88
Total recharge	5.80	100
Discharge		
Net leakage to stream[2]	3.14	54
Subsurface outflow (main stem)	0.41	7
Pumpage	0.75	13
Evapotranspiration	1.50	26
Total discharge	5.80	100

[1] Applied at a uniform rate of 1.9 inches per year.

[2] Leakage to the stream between the Norton and Woodruff streamflow gages in the simulation is 2.92 cubic feet per second.

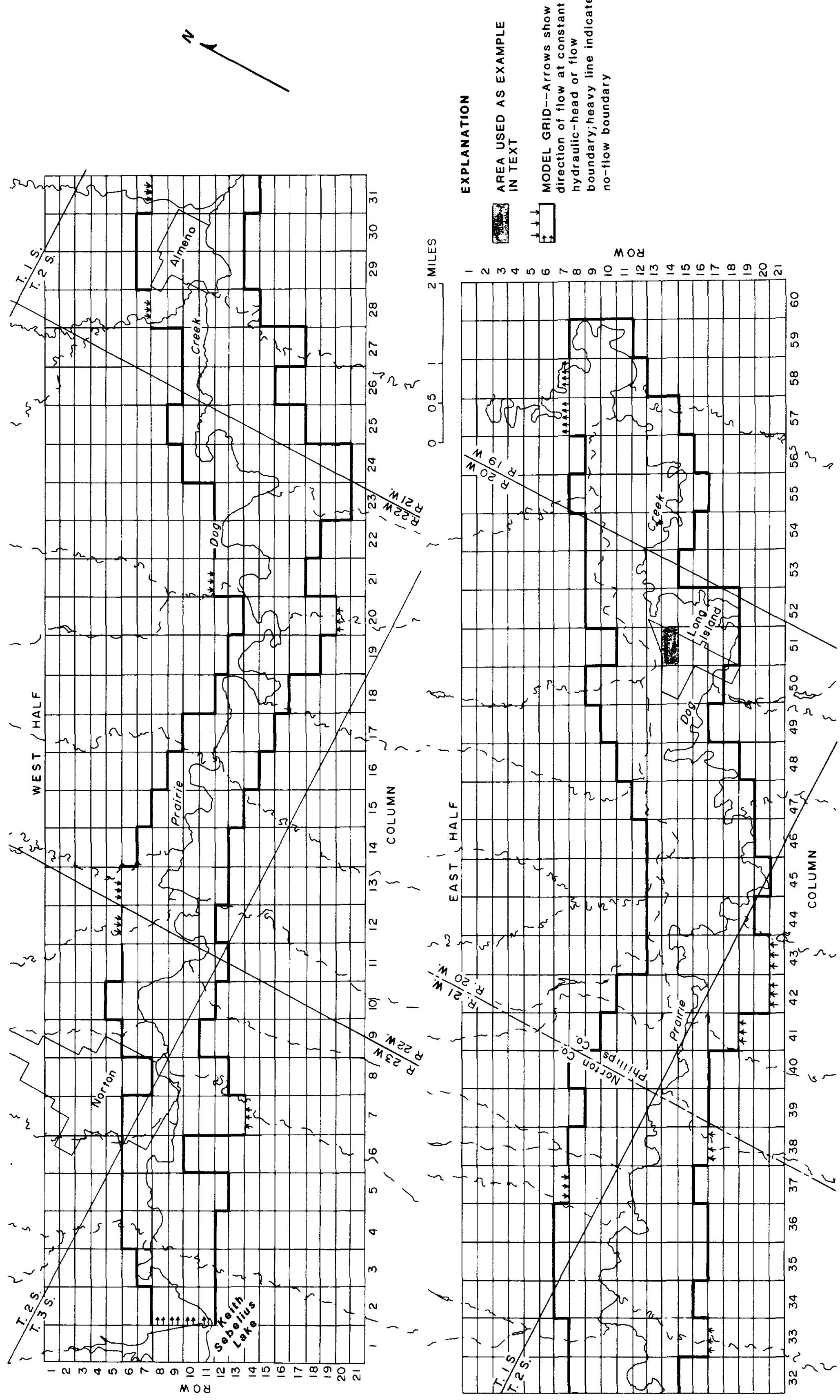

Figure 6.--Model grid used for simulation.

Recharge to Aquifer

Infiltration

When the land surface is covered with water as the direct result of precipitation, flooding from overland runoff, or applied irrigation, a part of that water will infiltrate the soil. As soil-moisture storage reaches a maximum, water will begin to drain or percolate downward, adding to the ground water stored in the valley aquifer. Overland runoff (flooding) and irrigation were relatively insignificant sources of recharge to the aquifer during 1945-47.

Estimates of recharge from precipitation in the High Plains area range from about 0.2 to 3 inches per year. Studies in the upland areas of the High Plains have estimated annual recharge as ranging from 0.2 inch (Boettcher, 1966; Pearl and others, 1972) to 0.9 inch (Cardwell and Jenkins, 1963). Recharge in upland areas also has been estimated (Gutentag and Stullken, 1976) to be 1 percent of the precipitation on nonirrigated land and 10 percent of the precipitation on irrigated land during the growing season. In studies of shallow alluvial aquifers in Kansas, estimates of annual recharge have ranged from 0.6 inch (Fader, 1968) to 2.3 inches (Jorgensen and Stullken, 1981).

Simulations using different recharge rates show that, with all other parameters held constant, increased rates of recharge result in similarly increased rates of seepage to streamflow and only minor changes in aquifer water levels. The mean of estimated annual recharge rates needed to balance the water budget in the Prairie Dog Creek valley during 1947-67 was 3.6 inches. Thus, the 20-year (1947-67) average annual recharge may be between 3 to 4 inches.

Short-term simulation (1945-47, the period used in the model) used an annual recharge rate of 1.9 inches based on the leakage rate to the stream of 2.9 ft^3/s. Recharge resulting from precipitation was applied as a uniform annual rate of 1.9 inches to all blocks of the model. Therefore, recharge from precipitation accounts for 88 percent of the recharge in this simulation.

Subsurface Inflow

Recharge into the modeled area by subsurface flow through saturated deposits occurs at the upstream end of the valley alluvium and at the mouth of the tributaries. Subsurface inflow at the upstream end is controlled in the model by specifying constant-head boundaries in four blocks, as shown in figure 6. Gradient from these constant heads to adjacent computed heads is the variable factor for computing inflow. Simulated subsurface flow at the upstream boundary is calculated to be 0.23 ft^3/s.

Surface tributaries to Prairie Dog Creek also act as collection systems for subsurface inflow. Small quantities of ground water from upland areas drain to the alluvium of the tributaries and move to the alluvium of Prairie Dog Creek valley. An initial simulation with the constant head at each block representing tributary inflow, as shown in figure 6, provided a value at that point consistent with the computed potentiometric surface in the valley. In the final simulation, those values inconsistent with the physical dimensions of the tributary alluvium were decreased to rational values and then applied as a recharging well in the block representing the mouth of the tributary. Blocks with tributary subsurface inflow are noted in figure 6. The total subsurface inflow from tributary sources was calculated to be 0.45 ft^3/s.

Because inflow along the remaining parts of the valley sides is insignificant in the water budget, the blocks have been specified as no-flow boundaries, as shown in figure 6. Terrace deposits along the valley are of limited extent and would provide only small amounts of water to the aquifer. Numerous bedrock exposures along the valley walls, as shown by Frye and Leonard (1949, plate 1), indicate that hydraulic connection between the valley alluvium and the upland Ogallala Formation probably is restricted to a few small buried channels.

Discharge from Aquifer

Ground-Water Withdrawals

The aquifer was virtually undeveloped during 1945-47, except for the municipal wells that account for a ground-water withdrawal rate of 0.75 ft^3/s (572 acre-ft per year) in this simulation. Because the withdrawals during this period were relatively small and at a constant rate, little change would be observed in the potentiometric head from year to year. The quantity of water pumped by the city of Norton was reported by Frye and Leonard (1949, p. 72). Pumpage for the Norton State Hospital and the cities of Almena and Long Island was derived using population (Frye and Leonard, 1949, p. 16) with estimates of water use per capita and consideration of the quantities of water requested in water-right applications. Water-right records indicate four irrigation wells in the study area during 1945-47. No pumpage is reported for them, and they are not considered as a part of this simulation.

Evapotranspiration

Hydrographs of streamflow at the gage on Prairie Dog Creek near Woodruff show that low flow commonly increases from the fall to the winter months. This increase in flow during winter months results from cessation of water use by plants (transpiration) and a decrease in evaporation of water from the aquifer along the stream where the water table is shallow. Busby and Armentrout (1965) reported an increase in mean base flow (1930-62) at the Woodruff streamflow gage from 7.4 ft^3/s in October to 10.5 ft^3/s in February. This 3-ft^3/s increase in base flow also was noted by inspection of the hydrographs. Considering 3 ft^3/s to be the rate of evapotranspiration in the study area for one-half of the year, an average annual evapotranspiration rate of approximately one-half or 1.5 ft^3/s was used in the model. Evapotranspiration from the aquifer was probably most significant in areas near the stream (riparian transpiration). In other areas, the water table lies far enough below land surface that evapotranspiration is an insignificant factor in water loss from the aquifer. Each grid block containing a segment of river was assigned a portion of the total evapotranspiration proportionate to the length of the river in that block. The total outflow for riparian transpiration in the final simulation was 1.5 ft^3/s, which is 26 percent of the total discharge (table 2).

Seepage to Stream

The interaction of ground water with the stream is discussed as a discharge from the aquifer because Prairie Dog Creek generally gains in flow. Within the reach between Norton and Woodruff the stream receives water from and returns water to the aquifer.

The model computes the amount and direction of this interaction by considering the water level in the stream, the water level in the aquifer, the streambed (confining bed) thickness, and the vertical hydraulic conductivity of the streambed. Actual measurements of thicknesses and vertical hydraulic conductivities of the streambed are not available. Their combined value (leakance) was estimated and adjusted by trial and error until the simulated gain in streamflow closely approximated that of the calibration period. Because streambed area varies from block to block with stream length, it was convenient in the simulation to establish an initial thickness and conductivity value for each block, proportioned by stream length in that block, and to use a multiplier as a variable for trial-and-error testing.

Leakage through the streambed, which allows water to transfer between the stream and the aquifer, was simulated using the equation:

$$Q = L \Delta h A, \tag{1}$$

where Q = flow or discharge between aquifer and stream;
L = leakance of streambed;
Δh = difference in hydraulic head between water level in the aquifer and water level in the stream; and
A = area of node.

Leakance of the streambed was simulated using the equation:

$$L = \frac{k'}{m'/Ps}, \tag{2}$$

where L = leakance of streambed;
k' = vertical hydraulic conductivity of streambed;
m' = thickness of streambed; and
Ps = portion of node covered by streambed.

The ratio of m'/Ps is used as the confining-bed thickness to properly proportion leakance to the various stream nodes. Therefore, an initial streambed thickness of 1 foot becomes a data value of 1,000 in the confining-bed thickness matrix for a node that has a streambed area of 2,500 ft^2.

Data matrix values of streambed hydraulic conductivity and thickness are created as computational tools to compute leakance. Neither the individual thickness nor conductivity values should be considered as actual physical measurements in the calibration. The calibrated leakance may, however, be separated to yield a streambed hydraulic conductivity of 0.01 ft/d if a streambed 2,500-feet long, 30-feet wide, and 1-foot thick is assumed within a node. Values in the "Model Input Data" section (at the end of this report) for confining-bed hydraulic conductivity and confining-bed thickness are individually and virtually meaningless until they are combined in the leakance term in the model.

A seepage investigation on Prairie Dog Creek was made during October 1962, prior to all channel disturbances caused by the construction of Norton Dam. Other data from seepage investigations were not used because they reflected channel disturbances by construction. Because the base flow measured during October 1962 was nearly equal to long-term base flow determined by Busby and Armentrout (1965), the data were used as the standard for comparing the results of the steady-state simulation.

The cumulative computed leakages and the corresponding gain in flow during the October 1962 seepage investigations are shown in figure 7. The summation is made by grid columns rather than by river mile to eliminate the variable disturbance of stream meanders. The distribution of the simulated leakage approximates that of the October 1962 seepage investigation. Both graphs lines are supported by the base-flow study of Busby and Armentrout (1965, p. 37-39), which reports a 2.5 ft^3/s gain in average base flow of Prairie Dog Creek from the streamflow-gaging station at Norton to the station near Woodruff during 1929-32 and 1937-62. Recorded base-flow gain between streamflow-gaging stations averaged 2.9 ft^3/s during the simulation period (December 1945 to October 1947). Simulated leakage to the river for the same reach was 2.9 ft^3/s. Total simulated leakage to the river was determined to be 3.14 ft^3/s or 54 percent of the total discharge from the aquifer.

Subsurface Outflow

Subsurface discharge from the modeled area through the valley alluvium occurs only at the downstream end of the model. This discharge is controlled in the model by using constant heads (representing the altitude of the water table) in two blocks, as shown in figure 6. When the constant heads at the boundary are specified, the outflow is a function of gradient from the computed heads in adjacent blocks. Simulated subsurface outflow from the study area at the downstream boundary is 0.41 ft^3/s.

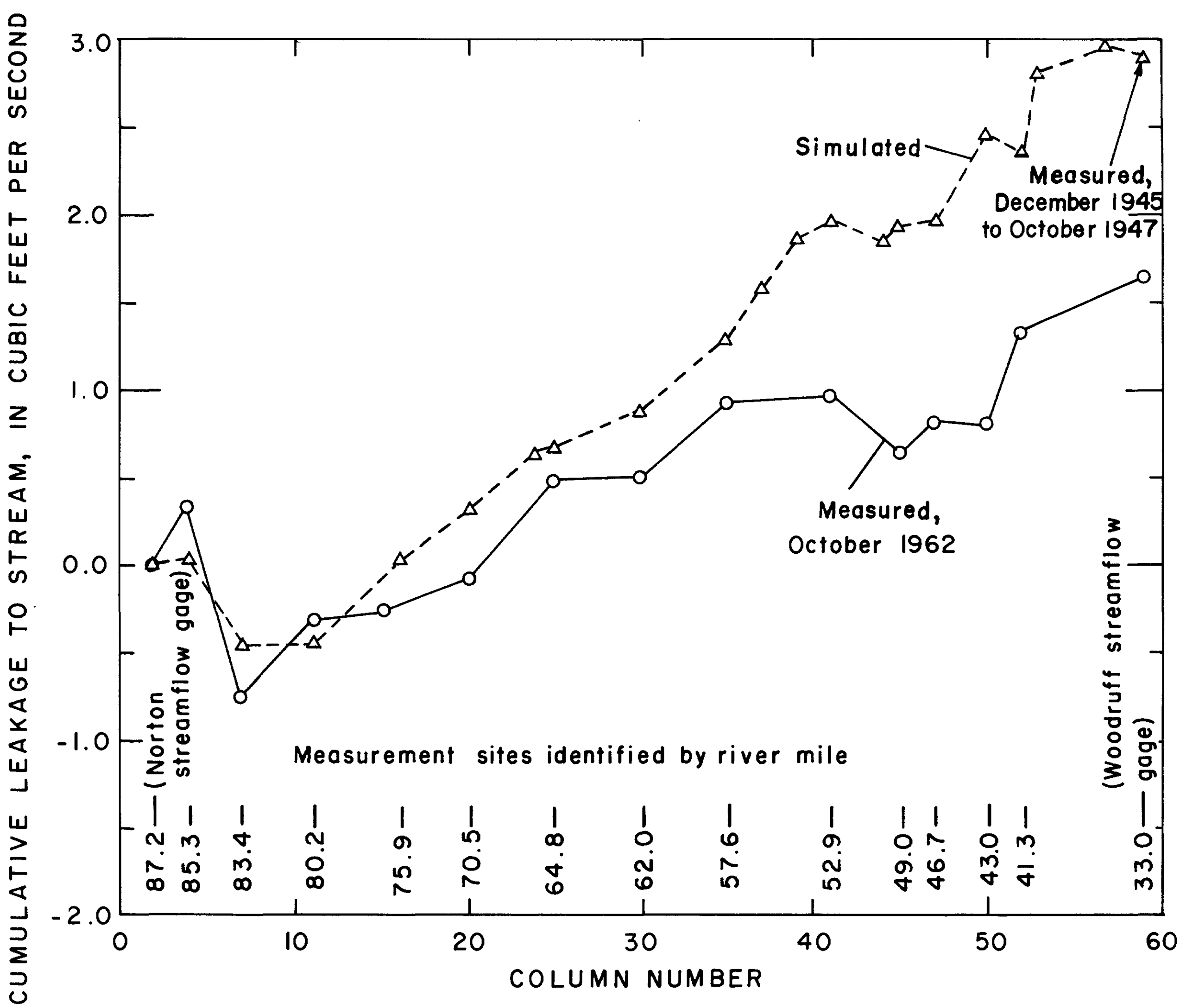

Figure 7.--Cumulative streamflow gain.

Other Model Parameters

The braided nature of stream-laid deposits results in large variations of aquifer lithology and hydraulic conductivity. Aquifer tests made by C. R. Johnson of the U.S. Geological Survey (written commun., 1956) for 10 different irrigation wells in the valley indicate hydraulic-conductivity values ranging from 30 to 515 ft/d. Analyses of test-hole logs indicate similar values of hydraulic conductivity ranging from about 50 to 300 ft/d. Because data were not available to define the areal variations, it was assumed that an average value could be used to represent the entire area. Simulations of alluvial aquifers in neighboring valleys have used hydraulic conductivities of 100 to 150 ft/d; therefore, the average value of 125 ft/d was assigned to each block in the model area.

Transmissivity, the product of hydraulic conductivity and saturated thickness, is computed for each block and each iteration within the model.

An approximation of the transmissivity, in feet squared per day, may be obtained for any area within the model boundary by multiplying the saturated-thickness value from plate 2 by 125 ft/d.

Storage coefficient and specific yield are treated as zero in this simulation because, by definition, no changes in stress or storage occur in a steady-state approximation. If this model is extended to simulate transient-state conditions (calculation of water-level changes with respect to time), typical values for these parameters would range from 10 to 20 percent.

ACCURACY OF MODEL SIMULATION

Comparison with Measured Water Levels

In this study, the model calibration process uses two "known" sets of data, the predevelopment (1945-47) water table and aquifer seepage to streamflow, to evaluate results. Many factors may account for differences between measured and simulated hydraulic heads. Most of these factors originate from an incomplete knowledge of the system parameters. The use of oversimplified generalizations for average conditions in a large area may cause erroneous conditions in a small area. Other factors could relate to inaccurate data or improper interpretation of the data.

The agreement of model simulations with natural conditions is indicated by the accuracy of match between measured and simulated hydraulic heads. Two ways to analyze the accuracy of match are by (1) contours based on measured and simulated hydraulic-heads and (2) numerical differences from measured hydraulic-head values.

Contours based on measured hydraulic heads (1945-47) and on simulated hydraulic heads are illustrated on plate 2. Considerable "character" shown in the contours of the measured data is not depicted in the contours of the simulated data primarily because of the lesser density of control points in the model as opposed to the density of actual data points.

The largest disparities between measured and simulated hydraulic heads probably result from the heterogeneity of aquifer characteristics that were applied as areally constant values in the model. As an example, limited accuracy of simulation was obtained in the area near Long Island. The simulated water table may be higher than the measured water table because the transmissivity or evapotranspiration in that area may be much larger than the average values used. In addition, the measured water table in that area may not be representative of the calibration period because most measurements were made during October 1947.

Another evaluation of simulated hydraulic heads may be made by considering the numerical difference between measured and simulated hydraulic heads at each node. A difference of less than 2 feet is attained at most nodes, and the average difference (using absolute values) per node value is 1.6 feet. The average-difference value is increased considerably by the poor match between measured and simulated water levels near Long Island and locally along the valley wall.

Sensitivity of Simulation

Model-derived leakage to the stream and total deviation of simulated heads from observed heads were used as indicators to test the relative sensitivity of the model to changes in parameter values. Two parameters, hydraulic conductivity of the aquifer and streambed leakance, were tested while all other variables remained unchanged.

Hydraulic conductivity of the aquifer was varied in stages from 50 to 300 ft/d. Leakage to the stream has a near-linear relation to hydraulic conductivity of the aquifer, as shown in figure 8. Increasing aquifer conductivity resulted in decreasing leakage to the stream. Total deviation, however, showed a variable sensitivity to aquifer hydraulic conductivity. Comparatively minor changes in total deviation occurred when the conductivities used were in the range of 50 to 150 ft/d. Total deviation of simulated heads increased noticeably when conductivity exceeded 150 ft/d.

Streambed leakance between the aquifer and the stream was tested using multipliers of the leakance, as described in the section "Seepage to the Stream." In this simulation, leakance has a near-linear relation to leakage to the stream. As shown in figure 8, increased values of leakance resulted in decreased leakage to the stream. To illustrate the effect of leakance, envision water from a reservoir (ground water) flowing through a gate (leakance) into a lower reservoir (surface water). The lower reservoir is infinitely large and, therefore, never fills or empties (constant head). Opening the leakance gate allows the ground-water reservoir to drain freely into the surface-water reservoir. In the ultimate case of no restriction, ground-water altitudes would approach those of the surface water, and no flow would occur. The sensitivity graph in figure 8 is apparently showing this tendency.

Sensitivity of the simulation to changes in streambed leakance, relative to total difference, was variable. Total difference increased rapidly as the streambed-leakance multiplier was decreased from 2x to 1x, as shown in figure 8. Changes in the streambed-leakance multiplier from 2x to 5x produced only minor changes in total difference. A leakance multiplier of 3x was considered optimum for the final model simulation.

CONCLUSIONS

The water resources of Prairie Dog Creek valley between Norton Dam and the Kansas-Nebraska State line have been developed for an irrigation-based agriculture. Keith Sebelius Lake, which impounds as much as 33,000 acre-ft of water for municipal, irrigation, and recreation use, released an average of 6,900 acre-ft per year to the Almena Irrigation District during 1967-76. Development of irrigation from ground water increased from 4 wells during 1948 to 147 wells during 1978.

Ground water in the Prairie Dog Creek valley is derived principally from the aquifer in the underlying alluvial deposits. The effects of irrigation development on aquifer conditions are evaluated by comparison of water-level changes. Using data from a map of the water table during 1945-47, saturated thicknesses from well and test-hole data, and an estimated specific yield of 0.15, the water in storage was determined to be 130,000 acre-ft. Using similar data based on 1979 water levels, the storage was determined to be 136,000 acre-ft. This comparison indicates that recharge to the aquifer from surface-water irrigation during 1967-78 exceeded the pumpage by wells during 1947-78.

A steady-state digital model was calibrated to evaluate flow conditions in the aquifer prior to irrigation development (1947). Simulation of the flow system indicated that recharge was largely from precipitation (88 percent) and that discharge was largely by leakage to streamflow (54 percent) and by evapotranspiration (26 percent). The model was calibrated using a hydraulic conductivity for the aquifer of 125 ft/d.

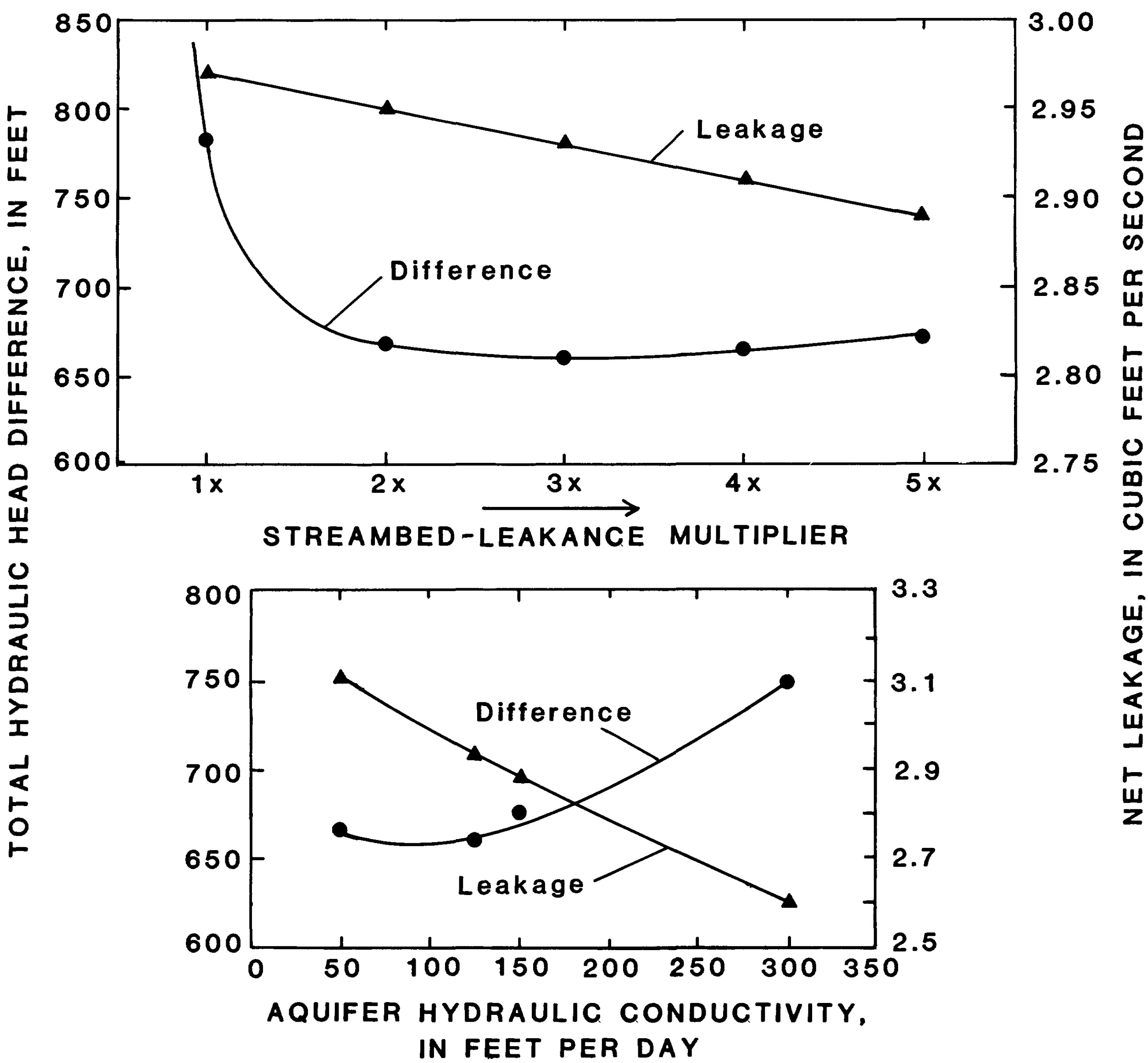

Figure 8.--Total hydraulic-head difference and net leakage to stream for various aquifer hydraulic conductivities and streambed-leakance multipliers.

The steady-state model simulates an equilibrium condition in the aquifer (represented by long-term averages) before the natural recharge-discharge balance was affected by irrigation. In order to simulate the changing conditions with time using a transient model, it would be necessary to obtain additional data for estimating the effects of historic surface-water diversions, precipitation, and irrigation-well withdrawals. Construction of a transient model for simulating historic changes and predicting future changes was beyond the scope of this study.

Although this study indicated that aquifer storage increased during 1947-78, other studies in western Kansas have indicated decreasing supplies of both surface water and ground water. Because there is a potential for future water shortages, alternative management plans need to be investigated. Thus, constructing a transient model calibrated to historic conditions, using data from the steady-state model and data calculated from limited historic records, would be useful as a predictive tool in management of the water resources.

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MODEL INPUT DATA

The program described in Trescott and others (1976) for finite-difference, two-dimensional modeling was used to evaluate the flow components in the stream-aquifer system. Minor code changes were made to tally and print stream-aquifer leakage rates and constant-head flow rates. A direct-ordering (D-4), computational subroutine was called by the LSOR option rather than the line-successive, over-relaxation subroutine as shown in Trescott and others (1976). The direct-ordering subroutine is documented in Larson (1979).

The listing that follows describes the input to the modeling program. Values shown for starting head and aquifer base are 1,500 feet below actual values (that is, from a datum at sea level + 1,500 feet). All measurements of length are in feet, and all time is in seconds unless noted otherwise.

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                                                     U. S. G. S.

                                              FINITE-DIFFERENCE MODEL
                                                        FOR
                                          SIMULATION OF GROUND-WATER FLOW

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

PRAIRIE DOG CREEK VALLEY AQUIFER MODEL--NORTON & PHILLIPS COUNTIES -- PRE-DEVELOPMENT STEADY-STATE CONDITIONS

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

SIMULATION OPTIONS:  WATE    LEAK                    RECH    LSOR    CHEC

                                                                NUMBER OF ROWS =   21
                                                             NUMBER OF COLUMNS =   60
        NUMBER OF WELLS FOR WHICH DRAWDOWN IS COMPUTED AT A SPECIFIED RADIUS =    0
                                        MAXIMUM PERMITTED NUMBER OF ITERATIONS =   10

                                                         WORDS OF Y VECTOR USED =  25924

                              ON ALPHAMERIC MAP:
                                       MULTIPLICATION FACTOR FOR X DIMENSION =   1000.000
                                       MULTIPLICATION FACTOR FOR Y DIMENSION =   1000.000
                                                      MAP SCALE IN UNITS OF     FT X1000
                                                  NUMBER OF FT X1000 PER INCH =   2.000000
                                          MULTIPLICATION FACTOR FOR DRAWDOWN =   1.000000
                                              MULTIPLICATION FACTOR FOR HEAD =   1.000000

                                                    NUMBER OF PUMPING PERIODS =    1
                                                 TIME STEPS BETWEEN PRINTOUTS =    1

                                                  ERROR CRITERION FOR CLOSURE =   .1000000
                                                 STEADY STATE ERROR CRITERION =   .1000000E-01

                                            SPECIFIC STORAGE OF CONFINING BED =   .0
                                                      EVAPOTRANSPIRATION RATE =   .0
                                                        EFFECTIVE DEPTH OF ET =   1.000000

                        MULTIPLICATION FACTOR FOR TRANSMISSIVITY IN X DIRECTION =   1.000000
                                                                 IN Y DIRECTION =   1.000000
```

STARTING HEAD MATRIX
(HEAD + 1500 = ALTITUDE ABOVE NVGD)

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	714.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	519.0	518.0	0.0	0.0
6	0.0	0.0	0.0	740.0	738.0	733.0	730.0	0.0	718.0	713.0
	712.0	709.0	701.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	519.0	518.0	0.0	0.0
7	0.0	0.0	743.0	738.0	736.0	733.0	729.0	0.0	718.0	712.0
	711.0	706.0	700.0	697.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	629.0	625.0
	0.0	0.0	0.0	609.0	606.0	604.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	520.0	518.0	0.0	0.0
8	0.0	748.0	741.0	738.0	735.0	732.0	728.0	721.0	717.0	712.0
	710.0	704.0	699.0	696.0	692.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	630.0	628.0	624.0
	623.0	618.0	610.0	608.0	605.0	603.0	601.0	599.0	0.0	591.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	531.0	0.0	519.0	519.0	519.0	0.0

9	0.0	745.0	742.0	739.0	735.0	730.0	726.0	721.0	716.0	710.0
	708.0	703.0	698.0	695.0	691.0	689.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	640.0	0.0	0.0	629.0	627.0	623.0
	622.0	618.0	610.0	608.0	605.0	602.0	600.0	597.0	593.0	590.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	540.0	536.0	532.0	530.0	527.0	522.0	520.0	519.0	0.0
10	0.0	745.0	742.0	739.0	736.0	0.0	726.0	722.0	718.0	709.0
	705.0	701.0	697.0	693.0	690.0	687.0	684.0	0.0	0.0	0.0
	0.0	0.0	0.0	641.0	639.0	635.0	632.0	629.0	626.0	623.0
	622.0	618.0	610.0	608.0	604.0	600.0	600.0	596.0	592.0	590.0
	587.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	550.0
	0.0	539.0	535.0	531.0	529.0	527.0	524.0	521.0	519.0	0.0
11	0.0	748.0	743.0	740.0	738.0	0.0	727.0	723.0	0.0	710.0
	706.0	702.0	697.0	691.0	689.0	686.0	683.0	0.0	0.0	0.0
	0.0	0.0	0.0	640.0	640.0	635.0	632.0	628.0	626.0	623.0
	621.0	617.0	611.0	608.0	603.0	599.0	598.0	594.0	591.0	589.0
	586.0	584.0	0.0	0.0	0.0	0.0	0.0	0.0	550.0	546.0
	541.0	539.0	535.0	532.0	530.0	528.0	525.0	522.0	519.0	0.0
12	0.0	0.0	0.0	0.0	738.0	0.0	728.0	724.0	0.0	0.0
	707.0	0.0	698.0	691.0	688.0	685.0	682.0	679.0	0.0	0.0
	662.0	660.0	652.0	646.0	641.0	637.0	633.0	630.0	628.0	623.0
	620.0	616.0	612.0	609.0	603.0	599.0	597.0	593.0	590.0	588.0
	585.0	583.0	0.0	0.0	0.0	0.0	556.0	552.0	548.0	544.0
	540.0	538.0	535.0	533.0	531.0	530.0	526.0	521.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	729.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	699.0	685.0	681.0	676.0	669.0	0.0
	662.0	658.0	652.0	646.0	642.0	638.0	634.0	631.0	629.0	624.0
	620.0	616.0	613.0	609.0	604.0	599.0	597.0	592.0	590.0	587.0
	584.0	582.0	580.0	571.0	563.0	559.0	556.0	552.0	549.0	543.0
	539.0	538.0	537.0	534.0	532.0	530.0	527.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	685.0	681.0	675.0	669.0	665.0
	661.0	657.0	651.0	646.0	642.0	638.0	635.0	632.0	0.0	0.0
	620.0	616.0	614.0	609.0	604.0	600.0	598.0	594.0	591.0	589.0
	584.0	581.0	579.0	570.0	562.0	559.0	557.0	554.0	550.0	544.0
	539.0	539.0	538.0	535.0	533.0	531.0	528.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	682.0	676.0	670.0	665.0
	661.0	657.0	651.0	647.0	643.0	639.0	635.0	0.0	0.0	0.0
	0.0	0.0	615.0	610.0	605.0	600.0	598.0	595.0	592.0	589.0
	585.0	581.0	578.0	571.0	564.0	560.0	558.0	555.0	552.0	548.0
	542.0	540.0	0.0	536.0	534.0	532.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	678.0	670.0	668.0
	662.0	658.0	652.0	649.0	645.0	0.0	636.0	0.0	0.0	0.0
	0.0	0.0	616.0	0.0	606.0	602.0	0.0	596.0	593.0	590.0
	586.0	582.0	579.0	572.0	567.0	561.0	560.0	558.0	555.0	551.0
	545.0	542.0	0.0	0.0	535.0	0.0	0.0	0.0	0.0	0.0

17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	671.0	668.0
	663.0	659.0	655.0	651.0	647.0	0.0	636.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	587.0	582.0	580.0	573.0	569.0	564.0	562.0	560.0	0.0	551.0
	547.0	545.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	672.0	669.0
	0.0	660.0	657.0	652.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	588.0	583.0	580.0	575.0	570.0	566.0	564.0	562.0	0.0	0.0
	547.0	545.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	C.0	0.0	0.0	670.0
	0.0	0.0	658.0	653.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	583.0	580.0	576.0	572.0	568.0	565.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	C.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	659.0	654.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	584.0	581.0	0.0	572.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STORAGE COEFFICIENT
MATRIX
(NEGATIVE VALUES SIGNAL CONSTANT-HEAD BLOCKS)

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	-0.10000E-19	-0.10000E-19	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0
6	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0
7	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19
	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0

8	0.0	-0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.10000E-19	0.0	-0.10000E-19	-0.10000E-19	0.10000E-19	0.0
9	0.0	-0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.10000E-19	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0
10	0.0	-0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19
	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0
11	0.0	-0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.0	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0
12	0.0	0.0	0.0	0.0	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.0	0.0
	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.1C000E-19	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.0	0.0	0.10000E-19	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.10000E-19
	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19	0.10000E-19
	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.1C000E-19	0.0	0.0
	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10000E-19
	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.10000E-19	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.10000E-19	0.10000E-19	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.10000E-19	0.10000E-19	0.0	0.10000E-19	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AQUIFER HYDRAULIC CONDUCTIVITY
MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02
	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

8	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.0
9	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.14500E-02	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0
10	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02
	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0
11	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.0	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0
12	0.0	0.0	0.0	0.0	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.0	0.0
	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.0	0.0	0.14500E-02	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.14500E-02
	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02	0.14500E-02
	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0
	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.14500E-02
	0.0	0.0	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.14500E-02	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.14500E-02	0.14500E-02	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.14500E-02	0.14500E-02	0.0	0.14500E-02	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AQUIFER BASE ELEVATION
MATRIX
(BASE + 1500 = ALTITUDE ABOVE NVGD)

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	695.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0
6	0.0	0.0	0.0	730.0	710.0	700.0	700.0	0.0	690.0	690.0
	670.0	660.0	660.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0
7	0.0	0.0	720.0	715.0	700.0	695.0	695.0	0.0	680.0	670.0
	650.0	645.0	640.0	655.0	0.0	0.0	0.0	0.0	0.C	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	610.0	600.0
	0.0	0.0	0.0	600.0	590.0	590.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	470.0	0.0	0.0

8	0.0	720.0	715.0	705.0	700.0	690.0	685.0	680.0	670.0	665.0
	655.0	660.0	660.0	635.0	655.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	610.0	600.0	590.0
	605.0	600.0	560.0	558.0	558.0	565.0	580.0	590.0	0.0	585.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	520.0	0.0	490.0	470.0	490.0	0.0
9	0.0	720.0	710.0	720.0	700.0	695.0	680.0	675.0	690.0	660.0
	670.0	675.0	670.0	665.0	630.0	655.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	635.0	0.0	0.0	600.0	590.0	580.0
	590.0	590.0	559.0	556.0	556.0	565.0	570.0	560.0	580.0	540.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	525.0	525.0	520.0	500.0	500.0	490.0	470.0	490.0	0.0
10	0.0	720.0	730.0	730.0	705.0	0.0	690.0	690.0	705.0	665.0
	675.0	675.0	670.0	665.0	645.0	640.0	680.0	0.0	0.0	0.0
	0.0	0.0	0.0	640.0	630.0	630.0	620.0	590.0	570.0	570.0
	570.0	560.0	558.0	554.0	554.0	565.0	555.0	550.0	545.0	540.0
	540.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	540.0
	0.0	490.0	485.0	485.0	475.0	475.0	475.0	470.0	490.0	0.0
11	0.0	730.0	735.0	730.0	705.0	0.0	695.0	690.0	0.0	670.0
	675.0	675.0	670.0	665.0	645.0	625.0	650.0	0.0	0.0	0.0
	0.0	0.0	0.0	630.0	630.0	610.0	580.0	575.0	570.0	565.0
	560.0	558.0	558.0	552.0	552.0	563.0	556.0	555.0	550.0	538.0
	540.0	560.0	0.0	0.0	0.0	0.0	0.0	0.0	520.0	520.0
	520.0	488.0	485.0	480.0	500.0	490.0	475.0	470.0	500.0	0.0
12	0.0	0.0	0.0	0.0	720.0	0.0	695.0	695.0	0.0	0.0
	675.0	0.0	670.0	690.0	650.0	635.0	630.0	640.0	0.0	0.0
	640.0	640.0	630.0	640.0	637.0	585.0	600.0	600.0	600.0	575.0
	560.0	560.0	560.0	559.0	550.0	558.0	557.0	560.0	565.0	537.0
	540.0	550.0	0.0	0.0	0.0	0.0	510.0	510.0	510.0	510.0
	500.0	490.0	490.0	480.0	490.0	475.0	500.0	500.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	715.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	660.0	645.0	620.0	630.0	650.0	0.0
	630.0	640.0	630.0	640.0	620.0	600.0	600.0	600.0	620.0	580.0
	560.0	558.0	560.0	565.0	553.0	553.0	560.0	565.0	565.0	540.0
	545.0	545.0	526.0	520.0	515.0	504.0	502.0	515.0	530.0	510.0
	510.0	492.0	510.0	480.0	475.0	500.0	520.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	660.0	630.0	615.0	620.0	630.0
	620.0	635.0	640.0	640.0	590.0	610.0	600.0	600.0	0.0	0.0
	570.0	560.0	560.0	600.0	555.0	550.0	565.0	565.0	565.0	545.0
	545.0	540.0	520.0	525.0	540.0	510.0	503.0	510.0	520.0	530.0
	525.0	495.0	520.0	485.0	480.0	520.0	525.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	660.0	630.0	613.0	610.0
	605.0	620.0	640.0	640.0	600.0	620.0	600.0	0.0	0.0	0.0
	0.0	0.0	560.0	605.0	560.0	547.0	590.0	560.0	560.0	550.0
	535.0	535.0	530.0	530.0	550.0	520.0	509.0	510.0	510.0	530.0
	525.0	498.0	0.0	510.0	500.0	530.0	0.0	0.0	0.0	0.0

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	650.0	630.0	630.0
	640.0	605.0	630.0	630.0	610.0	0.0	600.0	0.0	0.0	0.0
	0.0	0.0	560.0	0.0	580.0	560.0	0.0	570.0	570.0	560.0
	540.0	530.0	535.0	525.0	530.0	520.0	510.0	520.0	530.0	510.0
	510.0	500.0	0.0	0.0	530.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	640.0	640.0
	640.0	625.0	620.0	610.0	640.0	0.0	610.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	540.0	530.0	530.0	522.0	525.0	510.0	512.0	530.0	0.0	495.0
	490.0	520.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	650.0	650.0
	0.0	650.0	610.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	550.0	530.0	525.0	518.0	515.0	507.0	512.0	540.0	0.0	0.0
	530.0	530.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	660.0
	0.0	0.0	600.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	530.0	530.0	530.0	518.0	510.0	509.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	610.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	540.0	540.0	0.0	540.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIFIC YIELD = .0

CONFINING BED HYDRAULIC CONDUCTIVITY= .3000000E-04

RIVER HEAD
MATRIX
(HEAD + 1500 = ALTITUDE ABOVE NVGD)

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	504.0	503.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	505.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	506.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	508.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	509.0	510.0	0.0	0.0
7	0.0	0.0	741.0	739.0	737.0	735.0	0.0	0.0	715.0	713.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	509.0	512.0	0.0	0.0

8	0.0	745.0	741.0	738.0	737.0	732.0	0.0	720.0	716.0	711.0
	710.0	0.0	697.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	517.0	517.0	0.0
9	0.0	743.0	742.0	0.0	0.0	730.0	726.0	722.0	0.0	0.0
	708.0	702.0	697.0	694.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	607.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	517.0	518.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	706.0	702.0	698.0	692.0	690.0	687.0	0.0	0.0	0.0	0.0
	0.C	0.0	0.0	640.0	639.0	633.0	0.0	0.0	0.0	0.0
	0.0	0.0	608.0	605.0	600.0	599.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	524.0	522.0	519.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	705.0	703.0	0.0	0.0	688.0	686.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	641.0	640.0	633.0	631.0	628.0	0.0	624.0
	621.0	615.0	610.0	0.0	600.0	598.0	596.0	0.0	0.0	0.C
	0.C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	525.0	522.0	519.0	0.C
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	685.0	683.0	677.0	0.0	0.0
	0.0	655.0	654.0	0.0	642.0	0.0	0.0	627.0	626.0	0.0
	620.0	616.0	612.0	0.0	0.0	597.0	595.0	592.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	538.0	536.0	534.0	0.0	0.0	526.0	520.0	0.C	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.C	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	681.0	675.0	669.0	0.0
	663.0	655.0	654.0	646.0	643.0	0.0	0.0	0.0	627.0	0.0
	619.0	618.0	0.0	0.0	0.0	0.0	594.0	592.0	590.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	538.0	537.0	534.0	0.0	529.0	527.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	673.0	669.0	664.0
	662.0	657.0	652.0	646.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	589.0	588.C
	0.0	0.0	578.0	578.0	0.0	0.0	0.0	553.0	0.0	0.0
	0.C	538.0	0.0	532.0	531.0	531.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	672.0	668.0	665.0
	661.0	659.0	650.0	647.0	0.0	0.0	0.0	0.0	0.0	0.C
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	586.0
	585.0	582.0	580.0	576.0	0.0	0.0	0.0	555.0	555.0	0.0
	0.0	540.0	0.0	532.0	531.0	531.0	0.0	0.0	0.C	0.0

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	671.0	667.0	666.0
	0.0	0.0	649.0	648.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	583.0	0.0	576.0	0.0	0.0	0.0	557.0	554.0	553.0
	0.0	543.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	575.0	0.0	0.0	564.0	560.0	0.0	552.0
	0.0	545.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	574.0	0.0	567.0	566.0	562.0	0.0	0.0
	548.0	547.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	573.0	570.0	569.0	568.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	572.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONFINING BED THICKNESS
MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1669.99976	1000.00000	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	830.00000	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	770.00000	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	830.00000	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	830.00000	3330.00000	0.0	0.0
7	0.0	0.0	590.00000	3330.00000	830.00000	1999.99976	0.0	0.0	3330.00000	709.99976
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1999.99976	669.99951	0.0	0.0

8	0.0	1999.99976	1669.99976	1250.00000	5000.00000	1999.99976	0.0	1250.00000	770.00000	5000.00000
	3330.00000	0.0	1430.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2500.00000	830.00000	0.0
9	0.0	1430.00000	3330.00000	0.0	0.0	1250.00000	1000.00000	1999.99976	0.0	0.0
	1669.99976	1250.00000	1250.00000	3330.00000	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	5000.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1999.99976	830.00000	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2500.00000	1250.00000	1999.99976	1250.00000	1250.00000	1250.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	2500.00000	2500.00000	3330.00000	0.0	0.0	0.0	0.0
	0.0	0.0	2500.00000	1000.00000	1250.00000	3330.00000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1430.00000	3330.00000	1250.00000	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1430.00000	3330.00000	0.0	0.0	1000.00000	1999.99976	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	1250.00000	910.00000	1000.00000	1000.00000	830.00000	0.0	830.00000
	10000.0000	1999.99976	2500.00000	0.0	2500.00000	1999.99976	1999.99976	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1999.99976	1999.99976	1110.00000	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	1250.00000	1110.00000	1000.00000	0.0	0.0
	0.0	1250.00000	5000.00000	0.0	1669.99976	0.0	0.0	5000.00000	910.00000	0.0
	1250.00000	1250.00000	1000.00000	0.0	0.0	669.99951	1999.99976	3330.00000	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	3330.00000	830.00000	10000.0000	0.0	0.0	1999.99976	1430.00000	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	5000.00000	1999.99976	1669.99976	0.0
	1669.99976	2500.00000	1999.99976	1250.00000	3330.00000	0.0	0.0	0.0	3330.00000	0.0
	2500.00000	1669.99976	0.0	0.0	0.0	0.0	3330.00000	669.99951	1000.00000	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	630.00000	3330.00000	1999.99976	0.0	770.00000	1999.99976	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1430.00000	1110.00000	1430.00000
	1669.99976	1999.99976	1999.99976	2500.00000	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1669.99976	2500.00000
	0.0	0.0	1430.00000	1999.99976	0.0	0.0	0.0	1110.00000	0.0	0.0
	0.0	1999.99976	0.0	1000.00000	3330.00000	2500.00000	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1250.00000	1430.00000	1000.00000
	1250.00000	3330.00000	2500.00000	2500.00000	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	830.00000
	1000.00000	2500.00000	910.00000	5000.00000	0.0	0.0	0.0	1110.00000	5000.00000	0.0
	0.0	1999.99976	0.0	1669.99976	1250.00000	3330.00000	0.0	0.0	0.0	0.0

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2500.00000	1999.99976	1669.99976
	0.0	0.0	3330.00000	5000.00000	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	830.00000	0.0	1999.99976	0.0	0.0	0.0	1669.99976	830.00000	2500.00000
	0.0	1000.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	1110.00000	0.0	0.0	1000.00000	1250.00000	0.0	2500.00000
	0.0	1430.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	1110.00000	0.0	2500.00000	1430.00000	1250.00000	0.0	0.0
	830.00000	830.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	1999.99976	1669.99976	770.00000	2500.00000	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	910.00000	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AREAL RECHARGE RATE = .5000000E-08

DELX = 2500.000

DELY = 1000.000

179 WELLS

I	J	PUMPING RATE	ANNOTATION
6	12	.0400	TRIBUTARY SUBSURFACE INFLOW
6	13	.0400	TRIBUTARY SUBSURFACE INFLOW
7	3	-.0215	EVAPOTRANSPIRATION
7	4	-.0038	EVAPOTRANSPIRATION
7	5	-.0152	EVAPOTRANSPIRATION
7	6	-.2064	-.0064 ET AND -.2000 NORTON P.S.
7	9	-.0038	EVAPOTRANSPIRATION
7	10	-.0156	EVAPOTRANSPIRATION
8	2	-.0063	EVAPOTRANSPIRATION
8	3	-.0076	EVAPOTRANSPIRATION
8	4	-.0101	EVAPOTRANSPIRATION
8	5	-.0025	EVAPOTRANSPIRATION
8	6	-.4364	-.0064 ET AND -.4300 NORTON P.S.
8	8	-.0101	EVAPOTRANSPIRATION
8	9	-.0145	EVAPOTRANSPIRATION
8	10	-.0025	EVAPOTRANSPIRATION
8	11	-.0038	EVAPOTRANSPIRATION
8	13	-.0088	EVAPOTRANSPIRATION
8	28	.0500	TRIBUTARY SUBSURFACE INFLOW
8	31	.0400	TRIBUTARY SUBSURFACE INFLOW
8	37	.0400	TRIBUTARY SUBSURFACE INFLOW
8	58	-.0050	EVAPOTRANSPIRATION
8	59	-.0152	EVAPOTRANSPIRATION
9	2	-.0088	EVAPOTRANSPIRATION
9	3	-.0038	EVAPOTRANSPIRATION
9	6	-.0101	EVAPOTRANSPIRATION
9	7	-.0126	EVAPOTRANSPIRATION
9	8	-.0063	EVAPOTRANSPIRATION
9	11	-.0076	EVAPOTRANSPIRATION
9	12	-.0101	EVAPOTRANSPIRATION
9	13	-.0101	EVAPOTRANSPIRATION
9	14	-.0038	EVAPOTRANSPIRATION
9	33	-.0025	EVAPOTRANSPIRATION
9	58	-.0063	EVAPOTRANSPIRATION
9	59	-.0152	EVAPOTRANSPIRATION
10	11	-.0050	EVAPOTRANSPIRATION
10	12	-.0101	EVAPOTRANSPIRATION
10	13	-.0063	EVAPOTRANSPIRATION
10	14	-.0101	EVAPOTRANSPIRATION
10	15	-.0101	EVAPOTRANSPIRATION
10	16	-.0101	EVAPOTRANSPIRATION
10	24	-.0050	EVAPOTRANSPIRATION
10	25	-.0050	EVAPOTRANSPIRATION
10	26	-.0038	EVAPOTRANSPIRATION
10	29	-.0400	ALMENA PUBLIC SUPPLY
10	33	-.0050	EVAPOTRANSPIRATION
10	34	-.0126	EVAPOTRANSPIRATION
10	35	-.0101	EVAPOTRANSPIRATION
10	36	-.0038	EVAPOTRANSPIRATION

10	57	-.0088	EVAPOTRANSPIRATION
10	58	-.0038	EVAPOTRANSPIRATION
10	59	-.0101	EVAPOTRANSPIRATION
11	11	-.0088	EVAPOTRANSPIRATION
11	12	-.0038	EVAPOTRANSPIRATION
11	15	-.0226	-.0126 ET AND -.0100 NORTON ST.HOSP.
11	16	-.0063	EVAPOTRANSPIRATION
11	24	-.0101	EVAPOTRANSPIRATION
11	25	-.0139	EVAPOTRANSPIRATION
11	26	-.0126	EVAPOTRANSPIRATION
11	27	-.0126	EVAPOTRANSPIRATION
11	28	-.0152	EVAPOTRANSPIRATION
11	30	-.0552	-.0152 ET AND -.0400 ALMENA P.S.
11	31	-.0012	EVAPOTRANSPIRATION
11	32	-.0063	EVAPOTRANSPIRATION
11	33	-.0050	EVAPOTRANSPIRATION
11	35	-.0050	EVAPOTRANSPIRATION
11	36	-.0063	EVAPOTRANSPIRATION
11	37	-.0140	EVAPOTRANSPIRATION
11	57	-.0063	EVAPOTRANSPIRATION
11	58	-.0063	EVAPOTRANSPIRATION
11	59	-.0114	EVAPOTRANSPIRATION
12	16	-.0101	EVAPOTRANSPIRATION
12	17	-.0114	EVAPOTRANSPIRATION
12	18	-.0126	EVAPOTRANSPIRATION
12	21	.0300	TRIBUTARY SUBSURFACE INFLOW
12	22	-.0101	EVAPOTRANSPIRATION
12	23	-.0025	EVAPOTRANSPIRATION
12	25	-.0076	EVAPOTRANSPIRATION
12	28	-.0025	EVAPOTRANSPIRATION
12	29	-.0139	EVAPOTRANSPIRATION
12	31	-.0101	EVAPOTRANSPIRATION
12	32	-.0101	EVAPOTRANSPIRATION
12	33	-.0126	EVAPOTRANSPIRATION
12	36	-.0190	EVAPOTRANSPIRATION
12	37	-.0165	EVAPOTRANSPIRATION
12	38	-.0070	EVAPOTRANSPIRATION
12	52	-.0038	EVAPOTRANSPIRATION
12	53	-.0152	EVAPOTRANSPIRATION
12	54	-.0012	EVAPOTRANSPIRATION
12	57	-.0063	EVAPOTRANSPIRATION
12	58	-.0088	EVAPOTRANSPIRATION
13	7	.0400	TRIBUTARY SUBSURFACE INFLOW
13	17	-.0025	EVAPOTRANSPIRATION
13	18	-.0063	EVAPOTRANSPIRATION
13	19	-.0076	EVAPOTRANSPIRATION
13	21	-.0076	EVAPOTRANSPIRATION
13	22	-.0050	EVAPOTRANSPIRATION
13	23	-.0063	EVAPOTRANSPIRATION
13	24	-.0101	EVAPOTRANSPIRATION
13	25	-.0038	EVAPOTRANSPIRATION
13	29	-.0038	EVAPOTRANSPIRATION
13	31	-.0050	EVAPOTRANSPIRATION
13	32	-.0076	EVAPOTRANSPIRATION

13	37	-.0070	EVAPOTRANSPIRATION
13	38	-.0393	EVAPOTRANSPIRATION
13	39	-.0254	EVAPOTRANSPIRATION
13	52	-.0202	EVAPOTRANSPIRATION
13	53	-.0038	EVAPOTRANSPIRATION
13	54	-.0063	EVAPOTRANSPIRATION
13	56	-.0164	EVAPOTRANSPIRATION
13	57	-.0063	EVAPOTRANSPIRATION
14	18	-.0088	EVAPOTRANSPIRATION
14	19	-.0114	EVAPOTRANSPIRATION
14	20	-.0088	EVAPOTRANSPIRATION
14	21	-.0076	EVAPOTRANSPIRATION
14	22	-.0063	EVAPOTRANSPIRATION
14	23	-.0063	EVAPOTRANSPIRATION
14	24	-.0050	EVAPOTRANSPIRATION
14	39	-.0140	EVAPOTRANSPIRATION
14	40	-.0100	EVAPOTRANSPIRATION
14	43	-.0088	EVAPOTRANSPIRATION
14	44	-.0063	EVAPOTRANSPIRATION
14	48	-.0114	EVAPOTRANSPIRATION
14	50	-.0400	LONG ISLAND PUBLIC SUPPLY
14	52	-.0063	EVAPOTRANSPIRATION
14	54	-.0126	EVAPOTRANSPIRATION
14	55	-.0038	EVAPOTRANSPIRATION
14	56	-.0050	EVAPOTRANSPIRATION
15	18	-.0101	EVAPOTRANSPIRATION
15	19	-.0088	EVAPOTRANSPIRATION
15	20	-.0126	EVAPOTRANSPIRATION
15	21	-.0101	EVAPOTRANSPIRATION
15	22	-.0038	EVAPOTRANSPIRATION
15	23	-.0050	EVAPOTRANSPIRATION
15	24	-.0050	EVAPOTRANSPIRATION
15	40	-.0305	EVAPOTRANSPIRATION
15	41	-.0270	EVAPOTRANSPIRATION
15	42	-.0114	EVAPOTRANSPIRATION
15	43	-.0139	EVAPOTRANSPIRATION
15	44	-.0025	EVAPOTRANSPIRATION
15	48	-.0114	EVAPOTRANSPIRATION
15	49	-.0025	EVAPOTRANSPIRATION
15	52	-.0063	EVAPOTRANSPIRATION
15	54	-.0076	EVAPOTRANSPIRATION
15	55	-.0101	EVAPOTRANSPIRATION
15	56	-.0038	EVAPOTRANSPIRATION
16	18	-.0050	EVAPOTRANSPIRATION
16	19	-.0063	EVAPOTRANSPIRATION
16	20	-.0076	EVAPOTRANSPIRATION
16	23	-.0038	EVAPOTRANSPIRATION
16	24	-.0025	EVAPOTRANSPIRATION
16	33	.0600	TRIBUTARY SUBSURFACE INFLOW
16	38	.0300	TRIBUTARY SUBSURFACE INFLOW
16	42	-.0355	EVAPOTRANSPIRATION
16	44	-.0063	EVAPOTRANSPIRATION
16	48	-.0076	EVAPOTRANSPIRATION
16	49	-.0152	EVAPOTRANSPIRATION

16	50	-.0050	EVAPOTRANSPIRATION
16	52	-.0126	EVAPOTRANSPIRATION
17	44	-.0114	EVAPOTRANSPIRATION
17	47	-.0126	EVAPOTRANSPIRATION
17	48	-.0101	EVAPOTRANSPIRATION
17	50	-.0050	EVAPOTRANSPIRATION
17	52	-.0088	EVAPOTRANSPIRATION
18	41	.0200	TRIBUTARY SUBSURFACE INFLOW
18	44	-.0114	EVAPOTRANSPIRATION
18	46	-.0050	EVAPOTRANSPIRATION
18	47	-.0088	EVAPOTRANSPIRATION
18	48	-.0101	EVAPOTRANSPIRATION
18	51	-.0152	EVAPOTRANSPIRATION
18	52	-.0152	EVAPOTRANSPIRATION
19	20	.0300	TRIBUTARY SUBSURFACE INFLOW
19	44	-.0063	EVAPOTRANSPIRATION
19	45	-.0076	EVAPOTRANSPIRATION
19	46	-.0164	EVAPOTRANSPIRATION
19	47	-.0050	EVAPOTRANSPIRATION
20	42	.0100	TRIBUTARY SUBSURFACE INFLOW
20	43	.0200	TRIBUTARY SUBSURFACE INFLOW
20	45	-.0139	EVAPOTRANSPIRATION

FINAL SIMULATED HEADS

The listing that follows describes the digital heads output by the model. Values shown are 1,500 feet below actual values [that is, from a datum 1,500 above National Geodetic Vertical Datum of 1929 (sea level)]. These values have been plotted to scale and contoured to obtain the map of simulated heads shown on plate 2.

SIMULATED WATER TABLE HEADS
(HEAD + 1500 = ALTITUDE ABOVE NVGD)

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	518.0	518.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	712.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	519.0	518.0	0.0	0.0
6	0.0	0.0	0.0	738.2	735.1	730.1	727.7	0.0	714.9	712.0	707.8	704.3	700.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	519.0	518.0	0.0	0.0
7	0.0	0.0	741.1	738.4	735.5	729.7	727.2	0.0	715.2	712.0	707.9	704.0	700.1	696.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	625.7	624.0	0.0	0.0	0.0	606.8	603.8	601.6	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	520.0	518.0	0.0	0.0
8	0.0	748.0	741.7	738.4	735.3	728.7	726.3	721.4	715.8	711.6	707.9	703.7	699.1	695.5	691.4	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	628.7	625.8	623.6	620.6	615.2	610.2	606.9	603.6	601.2	598.8	595.8	0.0	590.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	531.7	0.0	519.0	519.0	517.8	0.0
9	0.0	745.0	742.1	738.8	735.5	729.4	725.9	722.0	716.2	711.3	707.6	703.0	698.4	694.6	690.7	687.6	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	640.0	0.0	0.0	628.4	625.7	623.3	620.0	615.3	610.3	606.8	603.3	600.7	597.9	595.0	592.0	589.9
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	539.2	537.0	534.3	531.5	527.9	521.8	519.6	518.4	0.0
10	0.0	745.0	742.7	739.2	736.2	0.0	725.7	722.8	716.4	710.9	707.1	702.7	698.3	693.7	689.9	686.9	683.6	0.0	0.0	0.0
	0.0	0.0	0.0	640.4	639.5	634.2	631.7	628.5	625.7	623.1	619.7	615.5	610.7	606.6	602.7	600.0	597.3	594.6	591.8	589.6
	587.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	550.3	0.0	539.3	536.9	534.2	531.5	528.1	523.5	520.6	518.9	0.0
11	0.0	748.0	743.3	739.4	736.6	0.0	725.7	723.6	0.0	710.4	706.6	702.8	698.3	693.7	688.9	686.1	682.5	0.0	0.0	0.0
	0.0	0.0	0.0	641.9	639.9	634.5	631.8	628.7	625.8	622.9	619.5	615.6	611.2	607.0	602.7	599.4	596.7	594.1	591.5	589.2
	587.3	584.9	0.0	0.0	0.0	0.0	0.0	0.0	553.7	550.1	545.0	539.6	536.8	534.2	531.6	528.4	524.3	521.2	519.2	0.0
12	0.0	0.0	0.0	0.0	736.8	0.0	726.0	724.0	0.0	0.0	706.7	0.0	698.3	693.9	688.3	685.3	681.7	676.5	0.0	0.0
	661.5	656.1	653.5	644.8	641.4	635.5	632.7	629.4	625.9	622.5	619.3	615.9	611.9	607.3	602.9	598.9	596.4	593.5	591.0	588.7
	586.8	584.4	0.0	0.0	0.0	0.0	562.2	558.1	554.0	550.0	545.1	539.8	536.6	534.0	531.7	528.9	525.2	521.1	0.0	0.0

13	0.0	0.0	0.0	0.0	0.0	0.0	726.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	687.9	684.7	680.7	675.4	669.8	0.0
	661.7	656.7	653.4	646.2	642.0	636.5	633.5	630.5	626.4	622.2	619.0	616.2	612.5	607.6	602.9	599.6	596.4	592.8	590.3	588.2
	586.2	583.4	579.3	576.1	571.9	567.4	562.7	558.0	554.3	550.1	545.3	539.8	536.8	533.6	531.8	529.3	526.6	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	684.1	679.9	674.2	669.3	665.1
	661.7	657.5	652.9	646.9	642.5	637.4	634.3	631.1	0.0	0.0	618.7	616.2	613.2	608.0	602.6	600.1	596.7	593.0	590.0	587.7
	585.5	582.8	579.2	576.3	571.9	567.4	563.1	557.3	554.5	550.2	545.8	540.7	536.9	533.1	531.8	530.2	527.9	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	679.1	673.1	668.8	665.3
	661.7	658.0	652.5	648.1	643.2	638.0	634.9	0.0	0.0	0.0	0.0	0.0	613.6	608.5	602.4	600.5	597.0	593.0	590.1	587.0
	584.9	582.4	579.3	576.0	571.9	567.5	563.4	557.7	554.6	550.7	546.5	542.1	0.0	532.7	531.7	531.1	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	672.3	668.4	665.7
	661.8	657.8	652.9	649.9	644.2	0.0	635.1	0.0	0.0	0.0	0.0	0.0	613.9	0.0	602.3	600.8	0.0	593.0	590.2	587.0
	584.4	582.1	579.1	575.7	571.8	567.9	564.1	558.8	554.4	550.8	547.2	543.4	0.0	0.0	532.5	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	668.3	666.2
	661.9	657.6	653.3	651.3	645.5	0.0	635.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	584.0	581.7	578.9	575.2	571.7	568.1	564.7	560.3	0.0	550.5	547.6	544.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	668.3	667.1
	0.0	657.2	653.2	652.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	583.8	581.4	578.9	574.9	571.6	568.3	565.6	561.5	0.0	0.0	547.7	546.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	668.2
	0.0	0.0	653.1	652.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	581.1	579.0	574.7	571.4	568.6	566.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	653.1	652.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	581.0	579.4	0.0	571.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0