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The distribution of vertical groundwater flow in the saturated zone of the Yucca Mountain area: A cross-sectional finite element model

Sandra Jean Haws
University of Nevada, Las Vegas

Order Number 1340585

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Haws, Sandra Jean, M.S.

University of Nevada, Las Vegas, 1990

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

The Distribution of Vertical Groundwater Flow in the Saturated Zone of the Yucca Mountain Area: A Cross-sectional Finite Element Model

by

Sandra Jean Haws

A thesis submitted in partial fulfillment
of the requirements for the degree of

Master of Science
in
Geoscience

Department of Geoscience
University of Nevada, Las Vegas
May 1990

The thesis of Sandra J. Haws for the degree of Master of Science in Geoscience is approved.

Chairperson, Thomas H. Brikowski, Ph.D.

Examining Committee Member, Steve A. Mizell, Ph.D.

Examining Committee Member, David L. Weide, Ph.D.

Graduate Faculty Representative, Samaan G. Ladkany, Ph.D.

Graduate Dean, Ronald W. Smith, Ph.D.

University of Nevada, Las Vegas
May 1990

Abstract

This study uses cross-sectional modeling to explore the saturated groundwater flow at Yucca Mountain in a multi-layer system. Cross-sectional modeling allows the simulation of vertical leakage not included in areal models. The cross section of this study was constructed along an estimated streamline and is 84.3 kilometers long. The conceptual model includes an upper volcanic and lower carbonate aquifer separated by an aquitard. Down-gradient, in the Amargosa Desert, is an alluvial aquifer. Two scenarios of the model were calibrated to gain an understanding of the possible variations of ground-water flow. Results from this study indicate that some groundwater flows beneath the high-gradient (low conductivity) zone through the carbonate aquifer. The volcanic aquifer, south of the high gradient zone, must be supplied with additional groundwater as the low conductivity zone cannot transmit enough water to maintain the heads observed there. Upward leakage from the carbonate aquifer and recharge at Fortymile Wash provide the needed supply. Recharge alone is insufficient to maintain the observed heads, and upward leakage from the carbonates is also required. The model of this study was most sensitive to the vertical distribution of hydraulic conductivity north of the proposed repository site. This conductivity distribution determined the amount and location of groundwater entering the model which profoundly affects the distribution and amount of leakage occuring near the proposed repository.

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Acknowledgements

I would like to thank the State of Nevada Nuclear Waste Project Office and the Desert Research Institute for funding this thesis project. I would also like to thank the University of Nevada, Las Vegas for the Barrick Fellowship funding and the Geoscience Department for the teaching assistantship which helped finance my studies.

I appreciate my thesis committee, Dr. Tom Brikowski, Dr. Steve Mizell, Dr. Dave Weide, and Dr. Samaan Ladkany for their help and input to this thesis.

Special thanks goes to a few exceptional friends whose help and support were invaluable–David McKee, Lynn Oliver, Cheryl McDonnell-Canaan, and Steve Wild.

Disclaimer

This is a parametric study of saturated flow along an approximated streamline in the Yucca Mountain area. It is not intended to be used as a final or conclusive study of ground-water flow in the Yucca Mountain area nor is it intended to qualify or disqualify Yucca Mountain as the high-level nuclear waste repository. More data is needed to make this model a reliable representation of the real world.

1 Introduction

Yucca Mountain is currently being studied as a site for a high level nuclear waste repository. While the unsaturated zone is expected to be the primary barrier to radionuclide migration, an understanding of ground-water flow in the saturated zone is an important component for determining the containment of radionuclides. Numerical modeling is one technique being used to gain an understanding of the Yucca Mountain flow system. Previous numerical models of the area by Waddell (1982), Czarnecki and Waddell (1984), Czarnecki (1985), and Rice (1984) consider ground-water flow as purely horizontal in a single aquifer, neglecting vertical flow in a multi-layer system. Sinton (1987) constructed a quasi-three-dimensional model with a two layer system and a leakance between the layers. The present work examines ground-water flow in two dimensions, but in cross section rather than areally. In cross-sectional modeling, the hydraulic conductivity and pressure head determine leakage rather than the prescribed leakage of some quasi-three-dimensional models. Using cross-sectional modeling, this study explores the stratigraphic and possible structural controls on ground-water flow in the saturated zone.

1.1 Objectives

Areal numerical models of the Yucca Mountain flow system have provided information about horizontal directions and magnitude of ground-water flow. These models limit investigations to a one-aquifer system. Cross-sectional modeling provides another dimension in which to explore the flow system.

The objective of this study is to construct a multi-layer cross-sectional ground-water flow model consistent with available geologic and hydrologic data. This model

will help answer two main questions:

1. Does vertical flow occur between the volcanic and carbonate aquifers, and if so, in which direction and where is the leakage occurring?

2. What are the principal factors that control the distribution of this leakage?

2 Background

The Yucca Mountain area of southeastern Nevada (Figure 1), has been studied extensively as the proposed nuclear waste repository site. Existing geologic, hydrologic, and geophysical studies of the Nevada Test Site and Yucca Mountain provide the basis for the conceptual model presented in this study.

2.1 Geology

The Yucca Mountain area has a complex geologic history which includes periods of sedimentary deposition during the Paleozoic, deformation and erosion in the Paleozoic and Mesozoic, followed by deposition of Tertiary-age volcanic tuff from nearby calderas, and Cenozoic Basin and Range tectonism and continued erosion. Robinson (1985) discusses the structure of pre-Cenozoic rocks and their deformational history. Winograd and Thordarson (1975), U. S. Department of Energy (1988), and USGS (1984) give detailed overviews of the geologic history of the Yucca Mountain area. Geologic and geophysical interpretations of Robinson (1985), Snyder and Carr (1982), Healey and Miller (1971), Scott and Bonk (1984) and Waddell (1984), along with stratigraphic data from Yucca Mountain well reports, were used to define the stratigraphy of this model. Although faults are often found to be hydrologically important,

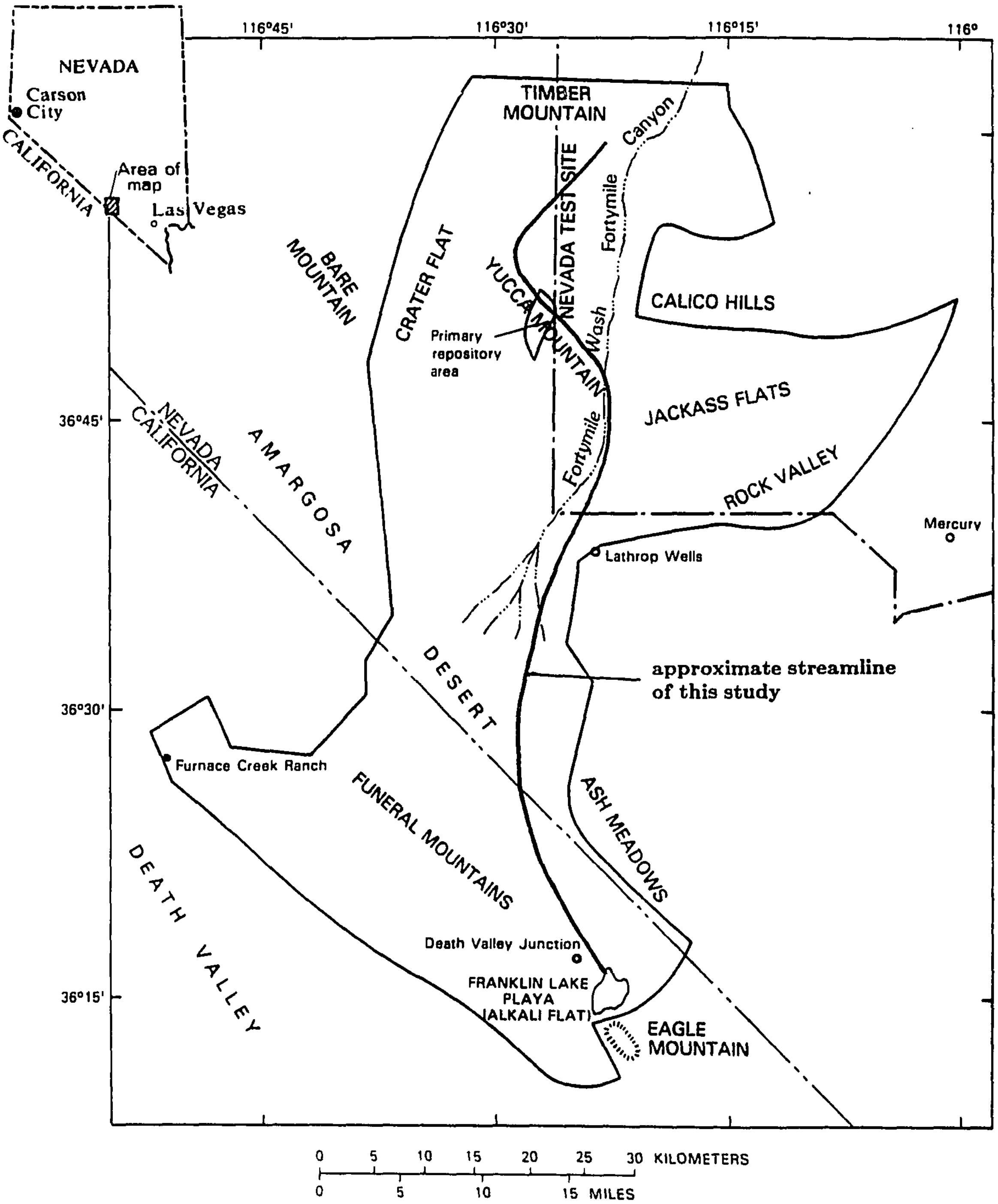


Figure 1: Location of Yucca Mountain and surrounding area with subregional model boundary (Czarnecki and Waddell, 1984) and location of this study's cross section. Modified from Czarnecki and Waddell, 1984.

lack of data did not allow the inclusion of their effects, except as a possible mechanism for concentrating leakage between aquifers.

2.2 Hydrogeology

A comprehensive analysis of the hydrogeology in the vicinity of Yucca Mountain and the Nevada Test Site is given by Winograd and Thordarson (1975). Another source of hydrogeological information is U. S. Department of Energy (1988). It is a compilation of work to date on the hydrology and geology of Yucca Mountain.

Winograd and Thordarson (1975) found that ground-water flow was strongly affected by the geology and defined several hydrostratigraphic units found at the Nevada Test Site. Robinson (1985) extended these units to the Yucca Mountain area along with an interpretation of their geometry in the subsurface based on geologic and geophysical data. In order of age (oldest to youngest) these units are 1) the lower carbonate aquifer, 2) the upper clastic aquitard, 3) the volcanic aquifer, and 4) the valley fill aquifer.

Data on the lower carbonate aquifer are sparse in the Yucca Mountain area. Well UE-25p#1 penetrated Silurian carbonates (Craig and Robison, 1984), which are part of the lower carbonate aquifer defined by Winograd and Thordarson (1975). It is the only well in the Yucca Mountain area that penetrates pre-Cenozoic rocks. The depth and extent of the lower carbonate aquifer is only inferred from geophysical data.

Previous numerical modeling studies have been done by Waddell (1982), Rice (1984), and Sinton (1987) on a regional scale, and Czarnecki and Waddell (1984) and Czarnecki (1985) on a sub-regional scale.

Hydrogeologic reports of data collected from Yucca Mountain wells are contained

in reports by Bentley and others (1983), Bentley (1984), Craig and others (1983), Craig and Robison (1984), Lahoud and others (1984), Rush and others (1984), Thordarson (1983), Thordarson and others (1985), and Whitfield and others (1984). These reports along with Winograd and Thordarson (1975) and Robinson (1985) provided the basis for the conceptual hydrostratigraphy of this study.

3 Model Design

3.1 Conceptual Model

In this study, the ground-water flow system in the Yucca Mountain area is visualized as a multi-layer system consisting of three aquifers and an aquitard, with each hydrologic unit considered internally homogeneous and isotropic. The general flow direction is north to south, with higher heads in the underlying carbonates.

Formulation of the conceptual model requires specification of the location of the cross section, the depth of flow, the geometry of hydrogeologic units/properties, and boundary conditions. The cross section was constructed to approximately follow a streamline from the sub-regional areal flow model of Czarnecki and Waddell (1984) and extends from Beatty Wash (just south of Timber Mountain) to the north end of Alkaii Flat (Franklin Lake Playa) near Death Valley Junction (Figure 2). These boundaries were chosen because of the uncertain nature of flow further north through Timber Mountain and because Alkali Flat is the known discharge point. A cross section that follows a streamline assumes that no water flows in or out of the section except at the boundaries. The depth of the section was chosen to include the important hydrostatigraphic units of the area and give a reasonable thickness of cir-

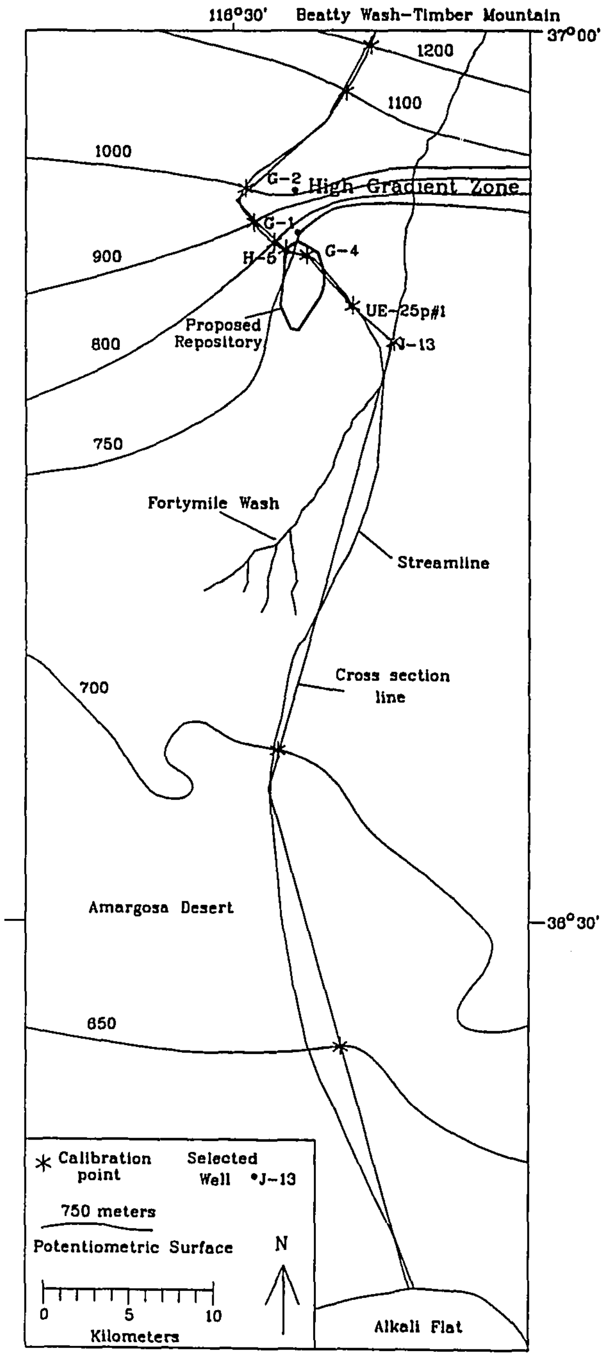


Figure 2: Location of the Yucca Mountain area showing streamline estimated from Czarnecki and Waddell (1984), cross section location, and contours of the potentiometric surface used in calibration of the model.

culation, two to three kilometers, based on interpretation of thermal data from the Nevada Test Site and Yucca Mountain (Sass and Lachenbruch, 1982).

Figure 3 is the visualization of the cross-sectional hydrostratigraphy of this study. The numerical model approximates this stratigraphy.

The lower unit of the model is considered to be a carbonate aquifer. Location and depth of the carbonate aquifer in most of the study area can only be inferred from geophysical and geochemical data. Robinson (1985) interpreted geophysical data to indicate that north and west of UE-25p#1 the carbonate surface plunges. North of the model area lies the Timber Mountain caldera. It is assumed that any carbonates once present at Timber Mountain were eradicated by volcanism (U.S. Dept. of Energy, 1988).

Above the carbonate aquifer lies an aquitard. Magnetic surveys of Bath and Jahren (1984) indicate that the Eleana formation, an aquitard, extends from Calico Hills (east of the model area) to the vicinity of Yucca Mountain wells G-1 and G-2. The Eleana probably extends as far west as the cross section of this model (Robinson, 1985). An aquitard is inferred beneath the volcanic aquifer based on head differences observed in UE-25p#1 between volcanic and carbonate units (Craig and Robison, 1984). Given these data, the aquitard is extended beneath all volcanic units in this model (Figure 3).

A volcanic aquifer lies above the carbonates at Yucca Mountain. Volcanic tuffs at Yucca Mountain are reported as aquifers and aquitards depending on their degree of welding; the densely welded tuff tends to be more fractured and is considered an aquifer while non-welded tuff is not highly fractured and is considered an aquitard (Waddell and others, 1984). Pumping tests at various Yucca Mountain wells identified

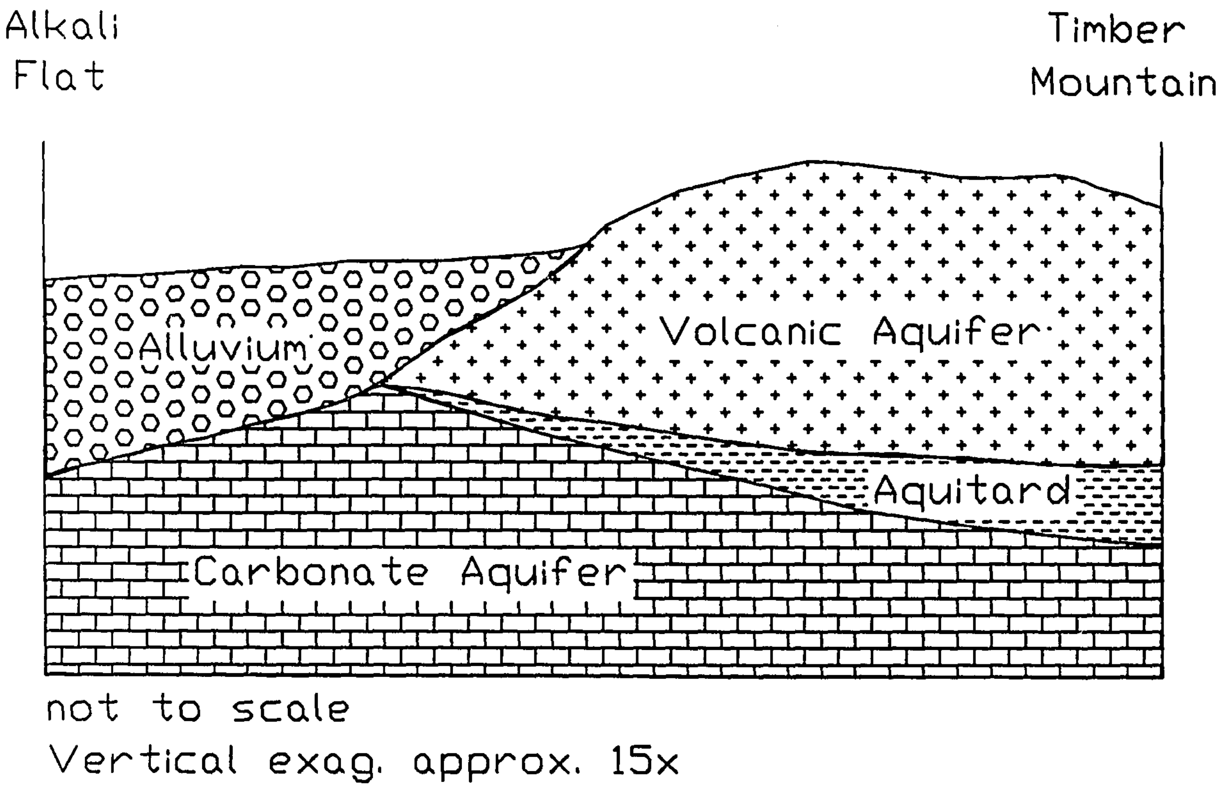


Figure 3: Conceptual model of stratigraphic relationships of hydrogeologic units.

different Tertiary-age tuff formations as the major water producing units. Due to the high variability in degree of fracturing as well as lack of data, this model considered all saturated volcanics to be a single homogeneous aquifer and did not separate the volcanics into various aquifers and aquitards. Gravity surveys by Healey and Miller (1971), and other geophysical reports surveyed by Robinson (1985) suggest that the volcanics pinch out a few kilometers north of Lathrop Wells under the alluvium.

In the southern portion of the study area lies an alluvial aquifer. Gravity data of Healey and Miller (1971) suggest the depth of alluvium as 1500 to 2000 meters in some parts of the Amargosa Desert. This is shown qualitatively in Figure 3.

3.2 Assumptions

Certain assumptions must be made when modeling because of incomplete data and the need for simplification to make the problem feasible. This study makes the following simplifying assumptions:

1. The cross section follows a streamtube of all hydrologic units (i.e. flow in the volcanics and alluvium is parallel to flow in the carbonates in plan view) and the streamtube is of constant thickness. No flow occurs across the plane of the cross section.

2. Steady-state conditions prevail; there is no change with time in any parameter in the model. The steady-state assumption may not be completely accurate, but errors associated with the steady-state assumption are small (Brikowski, 1989).

3. All hydrogeologic units are homogeneous and isotropic and exhibit Darcy flow on the scale of this model. Although tests show that most flow in the modeled units occurs through fractures, except in the alluvial aquifer, insufficient data are available to simulate fracture flow. The assumption is that the scale of the model is large enough so that fracture flow can be approximated by a porous media equivalent (Darcy flow).

4. Hydrogeologic units are divided in a manner that simulates the actual study area. Geology of the aquitard and lower carbonate aquifer are inferred by hydrogeologic and geophysical data.

5. Faults are not a major influence on the flow system. Data are not available to include the effects of faults in this model, however, faults could be the conduit for concentrated leakage which is explored in this model.

3.3 Computer Code

VAM2DH by HydroGeoLogic Inc. (Huyakorn and others, 1988) is the code used in this study. It was chosen because of its ability to model water table conditions (i.e. allowing fully saturated and variably saturated porous media) in cross section and the availability of the source code and documentation. Appendix A lists the governing equations used by the code.

Documentation of VAM2DH included code verification tests. Verification tests were also performed in this study to determine the code's ability to simulate water table conditions in cross section and to gain familiarization with the code. The model results were compared with analytic solutions, mainly those of Bear (1979),

or numerical results of other models when no analytic solution was available. These tests and the solutions are summarized in Appendix B.

3.4 Mesh Design

The cross section is 84.3 kilometers in length and follows a streamline derived from a vector plot of flow from Czarnecki and Waddell (1984). A mesh of elements was then chosen with element aspect ratios (length:width) of five to one or less. Denser grid spacing occurs in the high-gradient zone.

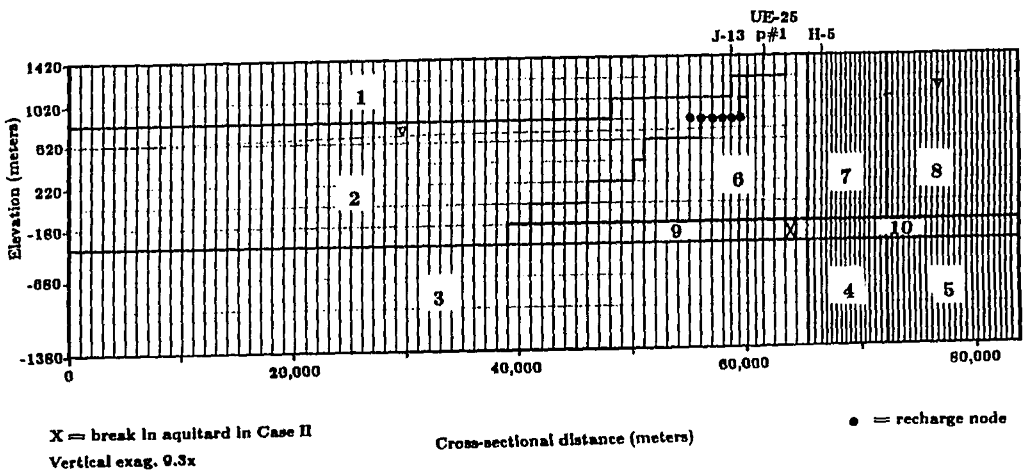
Using the conceptual model as a guide, groups of elements were defined as zones corresponding to hydrostratigraphic units in the conceptual model. A zone is an area assumed to be homogeneous with respect to hydraulic properties. The element grid and hydrogeologic zonation of the model are contained in Figure 4.

3.5 Boundary Conditions

Constant head boundary conditions were applied at both ends of the grid and all other boundaries were considered to be impermeable. On the north, up-gradient, end of the model the heads were set at 1220 meters in the volcanic aquifer and 1240 meters in the lower carbonate aquifer based on pressures measured at well UE-25p#1. The southern boundary heads were fixed as 620 meters in both the alluvial and carbonate aquifers.

3.6 Hydraulic Head for Calibration

Published reports and data collected by Peter Sinton (Sinton, 1987) were used to obtain hydraulic head estimates for the boundary conditions and calibration of the



Zone 1 = Air

Zone 2 = Alluvium

Zone 3,4,5 = Carbonate aquifer

Zone 6,8 = Volcanic aquifer

Zone 7 = High-gradeint volcanic aquifer

Zone 9,10 = Aquitard

Figure 4: Element grid and hydrogeologic zones–including well locations and "recharge" nodes.

model. Most data were composite heads and the model was calibrated to the potentiometric surface. The contours shown in Figure 2 of the potentiometric surface were then used to estimate heads along the cross section in areas where the section did not pass directly through a data point. Contours were used because there are very few data points in the northern part of the model area and some criteria was necessary for calibration. Eleven points along the cross section (see Figure 2) were chosen as calibration points and a sum of least square residuals between "observed" and simulated heads was used to find a best fit.

4 Model Procedure

After defining the grid, material geometries and boundary conditions, initial hydraulic conductivities were assigned to each zone of the model based on results of Czarnecki and Waddell (1984) and average conductivities observed for aquitards and carbonate aquifers (Freeze and Cherry, 1979). Unsaturated rock properties were estimated by an empirical formula given in Appendix A (derived from Brooks and Corey, 1966, and Mualem, 1976). Empirical parameters were assigned to correspond to representative unsaturated hydraulic conductivity values of fractured tuffs reported by Klavetter and Peters (1986) (Figure 5).

Through a series of VAM2DH runs, each zone's saturated hydraulic conductivity was adjusted to minimize residuals (i.e. the difference between the observed water table and the modeled water table). When residuals were minimized the model was considered calibrated.

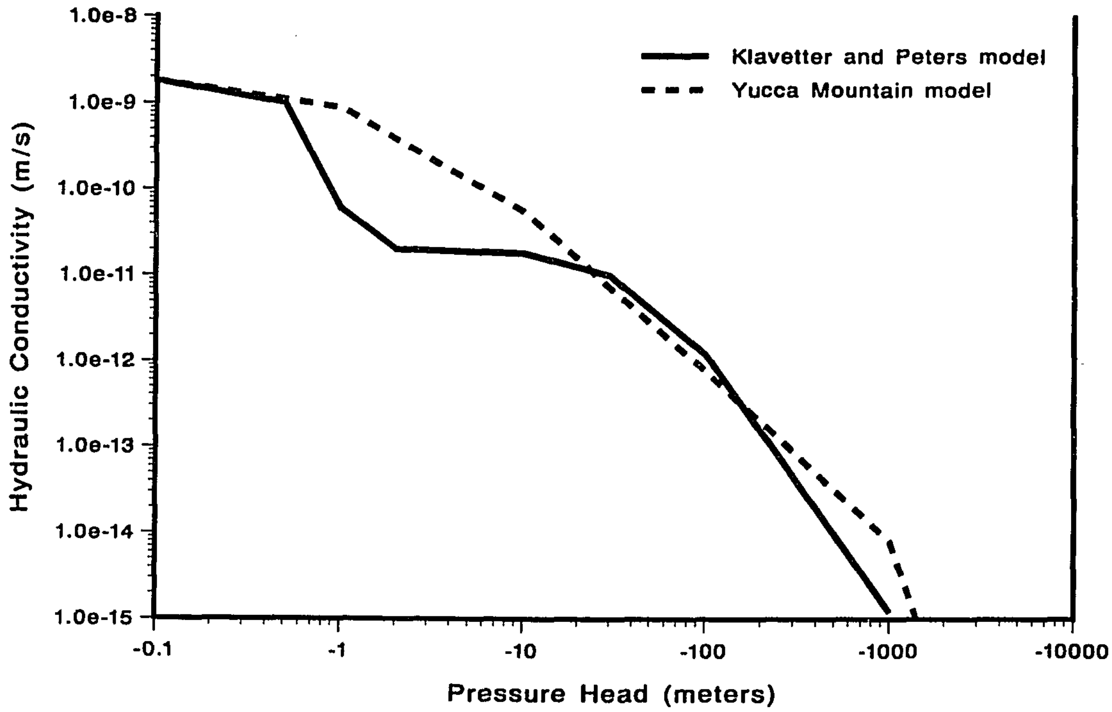


Figure 5: Hydraulic conductivity versus suction head of this model. (From Klavetter and Peters, 1986).

4.1 Case I and Case II

Hydraulic conductivity of the high-gradient zone can only be inferred by the steep gradients of the water table, no wells penetrate the area. To investigate the effects on the flow system of different hydraulic conductivities in the high-gradient zone (zone 7, Figure 4), two scenarios were calibrated. The first scenario, Case I, had a hydraulic conductivity in zone 7 similar to that for the same area of Czarnecki and Waddell (1984), which is about one order of magnitude smaller than the surrounding units (Figure 6).

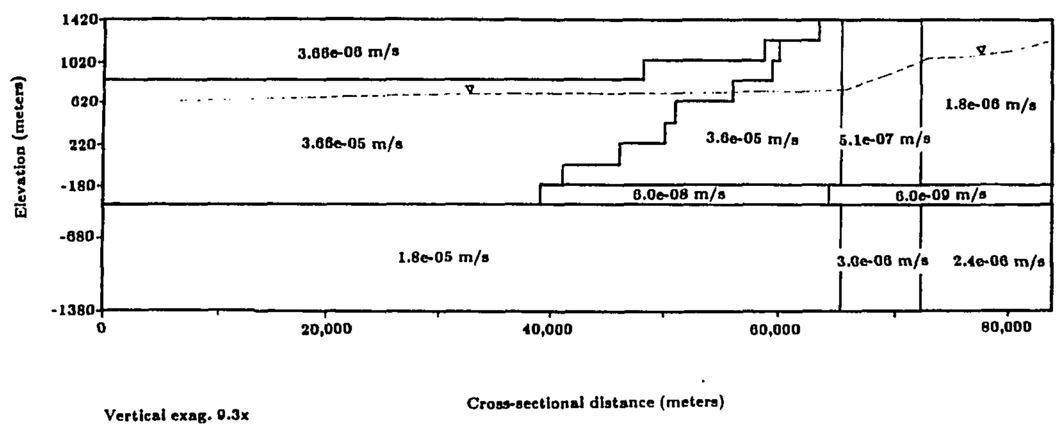
A second scenario, Case II, was calibrated by assigning initial conditions in zone 7 with a much lower hydraulic conductivity (three orders of magnitude less than surrounding units, Figure 6). The low conductivity of the high-gradient zone (zone 7) required a larger and more concentrated leakage to maintain heads in the proposed repository area. Concentrated leakage was achieved by assigning a higher hydraulic conductivity to one of the aquitard elements (see Figure 4).

5 Model Results

The simulated water table elevation ranged from 1220 meters at the north end of the cross section to 620 meters in the south at Alkali Flat (Figure 7). Model output was in the form of pressure head, but for convenience of interpretation all pressures were converted to total head (pressure head + elevation). Appendix C contains output information of pressure head and velocity calculated for each node and element respectively.

Residuals in the two scenarios discussed range from -17.5 to +42.5 meters in

Case I



Case II

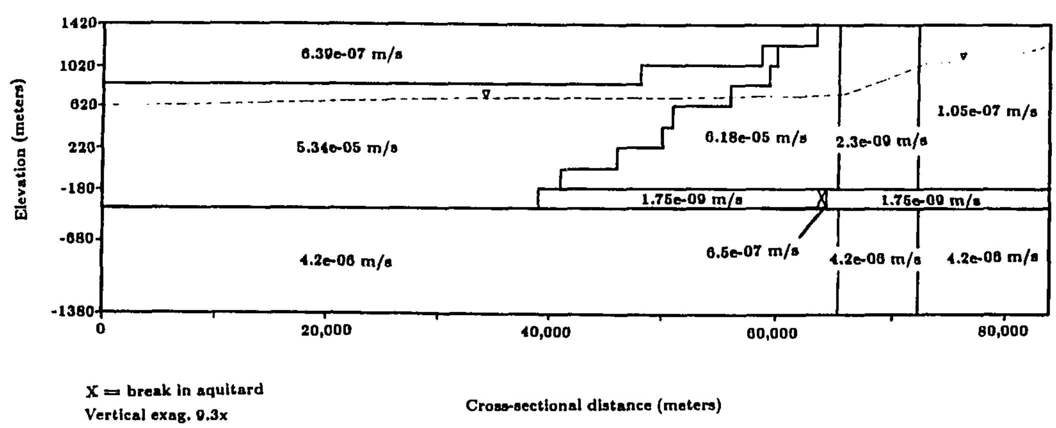


Figure 6: Hydraulic conductivities for best fit of water table as determined by this study for each of the model zones.

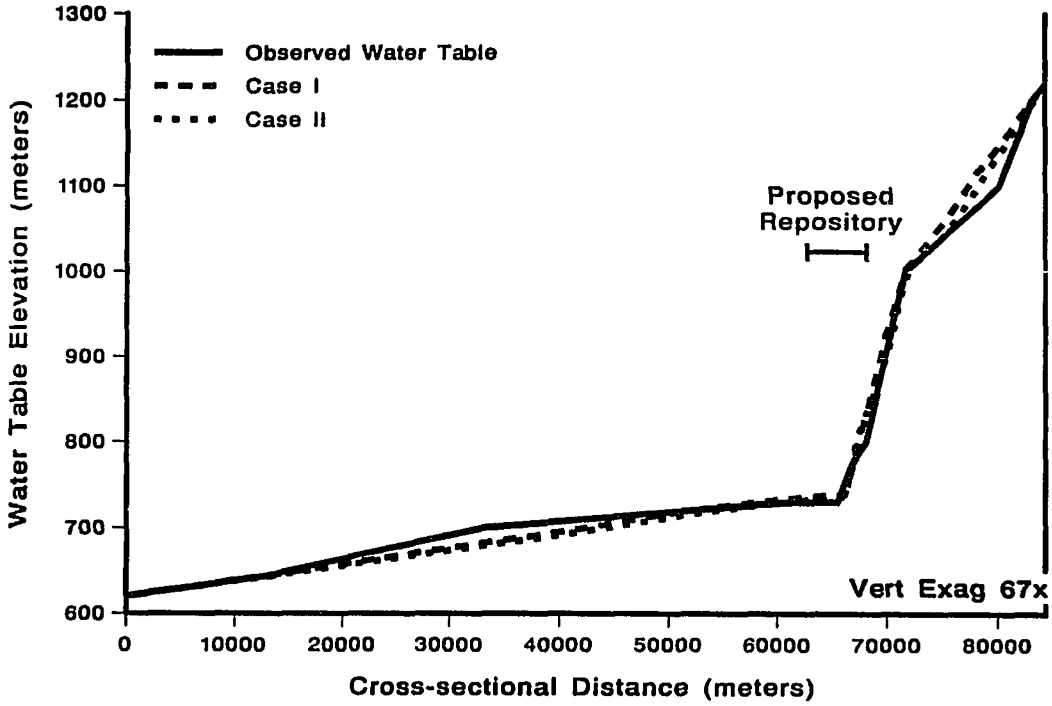


Figure 7: Model and observed water tables.

Case I and -20.0 to +37.2 meters in Case II (Figure 8). The largest residuals occur where hydraulic head is extrapolated from data points by contouring, and may be partially or wholly caused by misplaced contours. The north end of the model has few data points and the contours may differ from real heads by 50 meters or more. The maximum residual at data points (i.e. wells) is -4.9 to +10.2 meters in Case I and +0.8 to +8.3 meters in Case II.

Figure 6 gives the hydraulic conductivity distributions determined by the this study. Field values and model estimates of hydraulic conductivity are likely to differ. In both volcanic and carbonate rocks most ground-water flow is through fractures and solution cavities. Hydraulic conductivities can vary greatly within a short distance because of the complexity and discontinuity of fractures. The model determined the average hydraulic conductivity in the direction of flow for each hydrogeologic zone.

5.1 Case I versus Case II

The differences and similarities of results from Case I and II give insight to the Yucca Mountain flow system as viewed in cross section. Case I had input of smaller hydraulic conductivity contrast in the high-gradient zone (zone 7, Figure 4) with the result being a smaller and more distributed leakage (Figure 9). Case II results were a large conductivity contrast in zone 7 with a larger and more concentrated leakage.

6 Discussion

Upward leakage occurs in both scenarios of this study. This leakage must occur in order to maintain the water table at the observed elevation south of the high-gradient

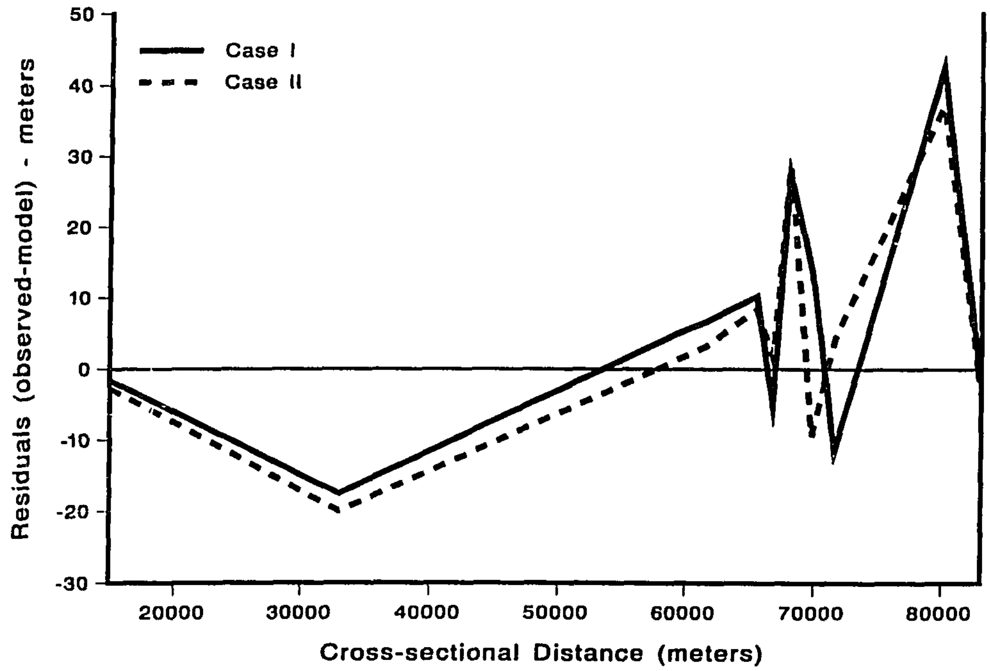


Figure 8: Model residuals from 11 calibration points along the cross section.

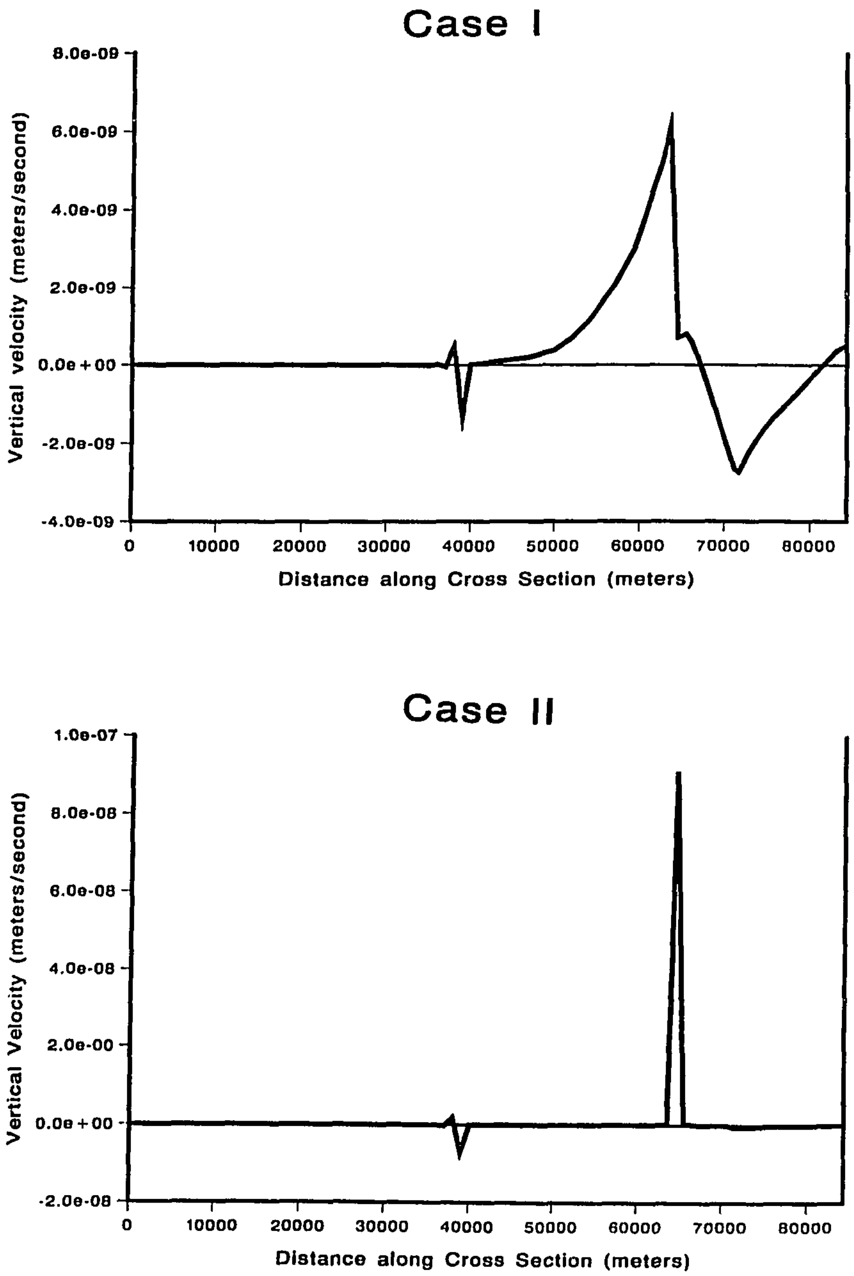


Figure 9: Vertical velocity at -280m elevation (near the aquitard). Downward velocity at 38,000 meters is produced by the ending of the aquitard.

Scenario	*Zone 7*	*Leakage*
Case I	conductivity 10^{-7}	smaller, distributed
Case II	conductivity 10^{-9}	larger, concentrated

Table 1: Hydraulic conductivity and leakage distribution of model results

zone. In both scenarios, net upward leakage occurs but zones of downward flow are present (Figure 9).

The key to understanding the necessity of upward leakage at Yucca Mountain lies in understanding the effect of the high-gradient zone. Areas of high-gradient in steady-state flow are caused by zones of low hydraulic conductivity which inhibit ground-water flow. The volcanic aquifer of the high-gradient zone in this study cannot transport enough groundwater laterally to maintain heads down-gradient; water must be supplied from another source. In this model, groundwater flows under the low conductivity zone through the carbonate aquifer then leaks upward to help maintain heads.

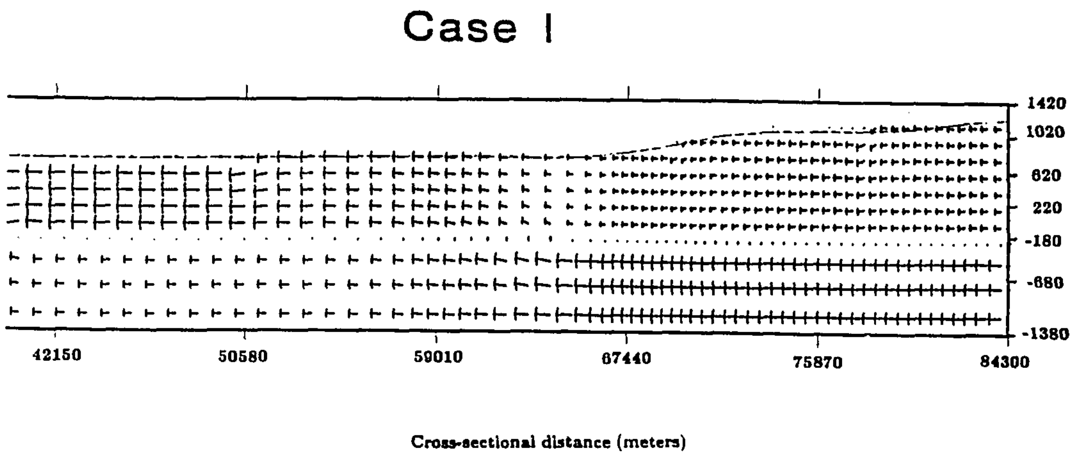
Results of geochemical modeling indicated that ground-water samples taken from the volcanic aquifer of well UE-25p#1 consist of 32% carbonate water and 68% water from the volcanic aquifer (Matuska, 1989). Immediately above the aquitard at well UE-25p#1, Case I would result in an apparent mix of 38% carbonate water in the volcanic aquifer and Case II about 97% carbonate water. Matuska's samples were taken at an elevation unknown by this author. The distance of the sample point above the aquitard could have a profound effect on the ratio of carbonate to volcanic water since horizontal flow is dominant in the system. If Matuska's modeling is a

good indicator, Case I is the better simulation of leakage in the Yucca Mountain area. The two scenarios are probably near the extremes of a two aquifer system with other scenarios lying between the two end members.

Case II (see Figure 10) indicates that a relatively large influx of water down-gradient of the high-gradient zone could produce the observed water table. The influx could come from various sources; in this study, those are upward leakage from a lower aquifer or recharge from Fortymile Wash. Out of section effects, such as lateral flow, are not likely to a significant degree and are not considered in this study.

This cross section parallels Fortymile Wash for approximately 5 kilometers. Recharge was simulated by a series of source terms applied at 6 nodes corresponding to that 5 kilometer stretch. The amount of recharge simulated corresponds to that of Sinton (1987). Although recharge was about 15% of groundwater that outflows at the southern model boundary, it did not significantly affect the distribution of leakage or the percent carbonate water contribution to volcanic water at well UE-25p#1. Recharge simulated in this model did not constitute enough flux to maintain observed heads. Upward leakage was still needed in order to produce the observed water table.

Czarnecki and Waddell (1984) modeled recharge from Fortymile Wash to be 22,140 m^3/day, while Sinton (1987) predicted recharge to be about 6,044 m^3/day and Feeney and others (1987) indicated 7,118 m^3/day. It appears that Czarnecki and Waddell (1984) needed more Fortymile Wash recharge in their model in order to have enough water down-gradient of the high-gradient zone to maintain heads since they had no upward leakage. In this study upward leakage from the carbonates alone or a combination of upward leakage and pseudo-recharge from Fortymile Wash provide the groundwater necessary to maintain heads in the area south of the high-gradient



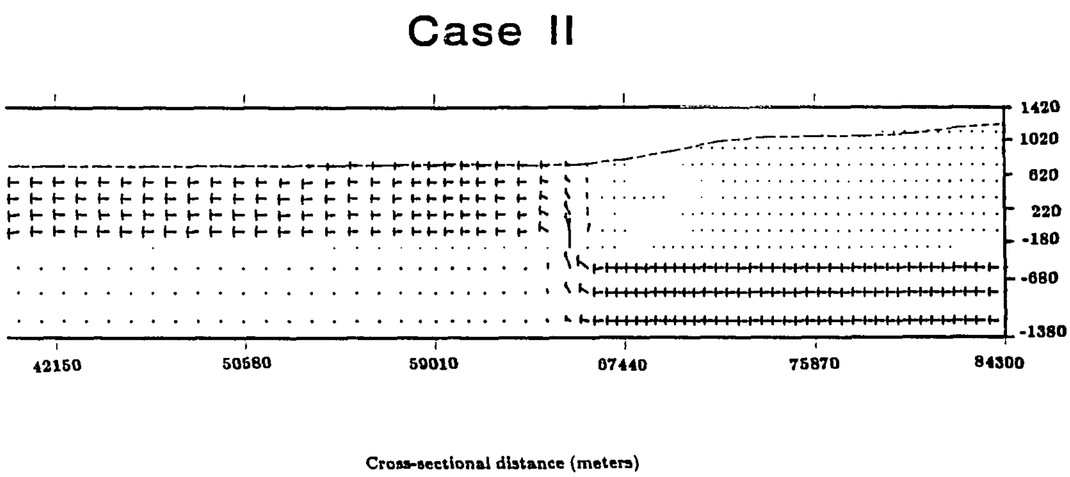


Figure 10: Velocity vector plots of ground-water flow from Beatty Wash to mid-Amargosa Desert. Size of vector is indicative of velocity. Density of vectors is dependent upon grid spacing, not velocity.

zone.

Groundwater flows around the low conductivity zone in plan view also (Czarnecki and Waddell, 1984, plate 2). The distortion of the flow field causes the velocities to increase and the streamtube to become narrower in width at the high-gradient zone. The streamtube widens again immediately south of the high-gradient zone which should have some effect on water table levels. Some of the difficulties associated with moving water through the high-gradient zone could be from a three-dimensional effect but it is doubtful that this effect is enough to maintain heads at observed levels without upward leakage.

A few observations about the model may give insight to future studies of the Yucca Mountain flow system. The vertical distribution of hydraulic conductivity in zones 4 and 5 versus zones 7 and 8 (Figure 4, page 12) determines the amount and location of water entering the up-gradient end of the section (compare Figure 6 and Figure 10). This choice appears to be the main cause of differences between Case I and II. The conductivities of the other model zones required to simulate observed heads are essentially determined by the amount and distribution of water entering the section. Amount and concentration of leakage down-gradient of the high-gradient zone depends on the amount of water that passes through zone 7, the volcanic aquifer of the high-gradient zone.

Field data are needed to distinguish between the scenarios. If the assumptions made in this study are valid, either the vertical distribution of hydraulic conductivity in the high-gradient zone or the amount and concentration of leakage must be determined to ascertain which of the two scenarios most accurately represents the Yucca Mountain flow system. Without field data, arbitrary choices for up-gradient

hydraulic conductivities must be made which profoundly influence model results.

7 Sensitivity

The sensitivity of model output to input parameters gives an idea about how well the model is able to predict model parameters. The more sensitive model output is to the change of a given input parameter, the more confidence that the parameter is predicted accurately. A parameter that does not have much effect on model output has less confidence in being accurately predicted by the model.

Plots of water table elevation changes versus hydraulic conductivity for each model zone are contained in Appendix D. These plots indicate that the modeled water table in the vicinity of the high-gradient zone is the most sensitive to conductivity changes and that conductivity changes in up-gradient aquifers (zones 4, 5, 7, and 8) have the greatest influence on the predicted water table throughout the model.

While the sensitivity plots of Appendix D indicate the accuracy of the hydraulic conductivity estimates, the effect of these estimates on the distribution and amount of leakage is not shown. A study of leakage versus hydraulic conductivity estimates would require a more detailed study involving the calibration of many different conductivity scenarios. This study will suffice with the two scenarios of Case I and Case II.

Model sensitivity to geometry is another important factor to consider. Robinson (1985) suggests that the entire Yucca Mountain area is underlain by the lower carbonate aquifer, but at a lower elevation than this study presents. He suggests that the volcanic sequence at Yucca Mountain is much thicker than shown in this study. Model results are similar when the transmissivity of each unit is held constant. If

units are actually thicker than shown in this model, but their relative positions with respect to one another are the same, this model gives a good indication of flow, but hydraulic conductivities in thicker units may be less than predicted by this study.

8 Conclusions

Cross-sectional modeling reproduced the observed water table within 10 meters at data points. Water table levels ranged from 1220 to 620 meters. The largest residuals occurred in areas of estimated water table levels. Some of this difference between modeled and observed heads could be from erroneous estimation of the actual water table rather than model errors.

In cross section, upward ground-water leakage from the carbonate to volcanic aquifer must occur in the vicinity of the proposed repository. The potentiometric surface cannot be simulated in a two layer system without upward leakage from the lower aquifer.

The low conductivity zone, which creates the high-gradient zone north of the proposed repository, acts as a barrier to flow in cross section as well as in the areal model (Czarnecki and Waddell, 1984). Groundwater is directed beneath the low conductivity volcanics through the carbonate aquifer. The volcanic aquifer, in the vicinity of the proposed repository, must be supplied with additional groundwater as the low conductivity zone cannot transmit enough water to maintain the heads observed there. Upward leakage from the carbonate aquifer and recharge at Fortymile Wash provide the needed supply.

The model of this study was most sensitive to the vertical distribution of hydraulic conductivity north of the repository where no wells are present. This con-

ductivity distribution determined the location and amount of groundwater entering the model which profoundly affects the modeled distribution and amount of leakage occuring near the proposed repository. Two scenarios were presented in this study. The scenario with a lower hydraulic conductivity in the high-gradient zone volcanics transmitted less groundwater and required a larger and more concentrated leakage than the scenario with the higher conductivity. Field data are needed to determine conductivity distributions or leakage amounts and distributions.

9 Future Work and Recommendations

The high-gradient zone and areas to the north are defined by very few wells. Results from the cross-sectional modeling indicate that this area, especially the high-gradient zone, has the greatest affect on model outputs. Therefore, an understanding of the flow system up-gradient of the proposed repository is essential for predicting the movement of saturated zone groundwater. Field studies should concentrate efforts on the high-gradient zone and areas immediately north. These studies should focus on the nature and hydraulic conductivity of the high-gradient zone.

The main difference between the two scenarios of this study was the hydraulic conductivity of the high-gradient zone. In order to determine which of the two scenarios best describes flow at Yucca Mountain, either the hydraulic conductivity of the high-gradient zone or the amount and distribution of leakage needs to be defined by field work. Neither parameter is easy to define but it should be realized that in order for a more definitive study of Yucca Mountain saturated flow to be done, this information must be obtained by field work.

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A Governing Equations

VAM2D uses pressure head as the dependent variable. The governing equation for describing variably saturated, ground-water flow is (Huyakorn and others, 1988):

$$\frac{\partial}{\partial x_i}\left[\rho_w K_{ij} k_{rw}(\frac{\partial \psi}{\partial x_j} + e_j)\right] = \frac{\partial}{\partial t}(\rho_w \phi S_w) - \rho_w q \tag{1}$$

where:

ρ_w	density of water
ψ	pressure head
K_{ij}	saturated hydraulic conductivity
k_{rw}	relative permeability with respect to the water phase
x_i	($i = 1, 2$) spatial coordinates
t	time
e_j	unit vector assumed vertically upward
S_w	water phase saturation
ϕ	effective porosity
q	volumetric flow rate via sources/sinks per unit volume of the porous medium

In this study the fluid was assumed to be a slightly compressible fluid, therefore, the fluid density can be eliminated and equation (1) can be rewritten as:

$$\frac{\partial}{\partial x_i}\left[K_{ij} k_{rw}(\frac{\partial \psi}{\partial x_j} + e_j)\right] = (S_w S_s + \phi\frac{dS_w}{d\psi})\frac{\partial \psi}{\partial t} - q \tag{2}$$

where S_s is specific storage.

Under steady state conditions there are no storage or source/sink terms in the flow equation. These terms are set equal to zero and the flow equation takes the form used in this study:

$$\frac{\partial}{\partial x_i}\left[\rho_w K_{ij} k_{rw}\left(\frac{\partial \psi}{\partial x_j} + e_j\right)\right] = 0 \qquad (3)$$

Variably saturated flow is an extremely non-linear problem because hydraulic conductivity ($K_{ij}k_{wr}$) depends on moisture content, which in turn depends on flow. k_{wr} is calculated by the code according to an empirical equation described by Brooks and Corey (1966) and Mualem (1976):

$$k_{rw} = \frac{(S_w - S_{wr})^n}{(1 - S_{wr})^n} \qquad (4)$$

and

$$\frac{S_w - S_{wr}}{1 - S_{wr}} = \begin{cases} \frac{1}{[1+(\alpha|\psi-\psi_a|)^\beta]^\gamma} & \text{for } \psi < \psi_a \\ 1 & \text{for } \psi \geq \psi_a \end{cases} \qquad (5)$$

where n, α, β, and γ are empirical parameters, ψ_a is air entry pressure and S_{wr} is the residual water phase saturation.

Galerkin finite element formulation is used to approximate flow equations 3, 4, and 5. The pressure head function ψ is approximated by a trial function which contains a basis function and the nodal value for ψ at time t. The basis function is piecewise continuous over each element and is in the form of a linear weighted average (Huyakorn and others, 1984). When saturation S_w is less than one (i.e. above the water table, fringe effects neglected) this set of non-linear equations is solved by either Picard or Newton-Raphson iterative techniques. Additional effects such as hysteresis of wetting and drying soils, seepage faces, evaporation and infiltration, and water uptake by plant roots were not modeled in this study, but can be treated by the code.

A more complete description of the solution techniques of the code are found in Huyakorn and others (1984) and Huyakorn and others (1988).

B VAM2DH Code Verification

VAM2DH is a finite element code supplied by HydroGeoLogic Inc. Documentation provided with VAM2DH (Huyakorn and others, 1988) has several examples of code verification. Further code verifications were done in this study by comparing model results to analytic solutions. An added benefit of the code verification is familiarization of the modeler with the code, the governing equations and basic assumptions made in the code derivation.

The verifications done in this study are summarized below along with brief explanations of important points tested by each trial of the code. All simulations were performed on the Sun 3/280 with operating system Unix 4.0.3.

B.1 Trial 1 - Linear Water Table

This test was used to verify the capabilities of the code in a saturated cross-sectional flow problem. Toth (1962) approximated a small drainage basin in Canada by an analytic solution. Simplifying assumptions are a homogeneous, isotropic aquifer whose water table slope is gentle enough to be approximated by a linear change in head along the top of a rectangular aquifer region (i.e. top boundaries were fixed heads). No-flow boundaries are assumed on both sides and the bottom (Figure 11). Figures 12 and 13 contain the input data for running VAM2DH and a velocity vector plot of flow in the linear water table conditions, respectively. VAM2DH duplicated the analytic solution to four significant digits in a steady-state, unconfined, fully saturated, cross-sectional model.

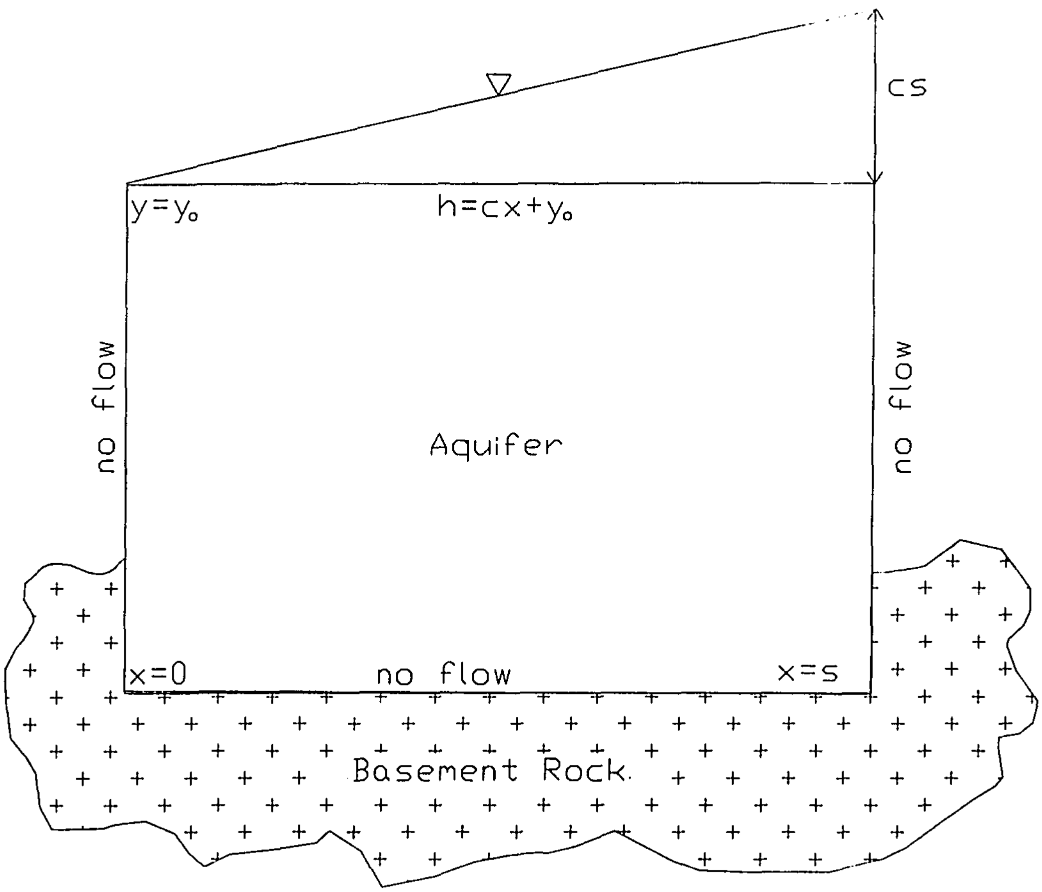

Figure 11: Schematic representation of the linear water table problem. After Wang and Anderson, 1982.

```
        1
Linear water table - unconfined flow, fully saturated, cross section
    1    0    0    1    0    0    0    1    1    1                       CARD 3
    0    1    1    1   66   50    0    0    1    0    0    0    0        CARD 4
    1    1    1    1    0      0.001                                    CARD 5
    0    0    0    0    0    1    1    1    1    0    0    1    0     0 CARD 6
  1.00e+02                                                             CARD 8a
  3.00e-04  3.00e-04  0.00e+00  0.00e+00  0.00e+00  0.00e+00    0     0 CARD 10
    6   11      20.00      20.00    0        0.0                       CARD 14
    20.000    20.000   200.000   100.000      1.00      1.00      0.00      0.00
   11    0    0    0                                                   CARD 19a
    6    1    0  1.00e+02                                              CARD 19b
   12    1    0  1.004e+2                                              CARD 19b
   18    1    0  1.008e+2                                              CARD 19b
   24    1    0  1.012e+2                                              CARD 19b
   30    1    0  1.016e+2                                              CARD 19b
   36    1    0  1.020e+2                                              CARD 19b
   42    1    0  1.024e+2                                              CARD 19b
   48    1    0  1.028e+2                                              CARD 19b
   54    1    0  1.032e+2                                              CARD 19b
   60    1    0  1.036e+2                                              CARD 19b
   66    1    0  1.040e+2                                              CARD 19b
```

Figure 12: Input data for the linear water table problem.

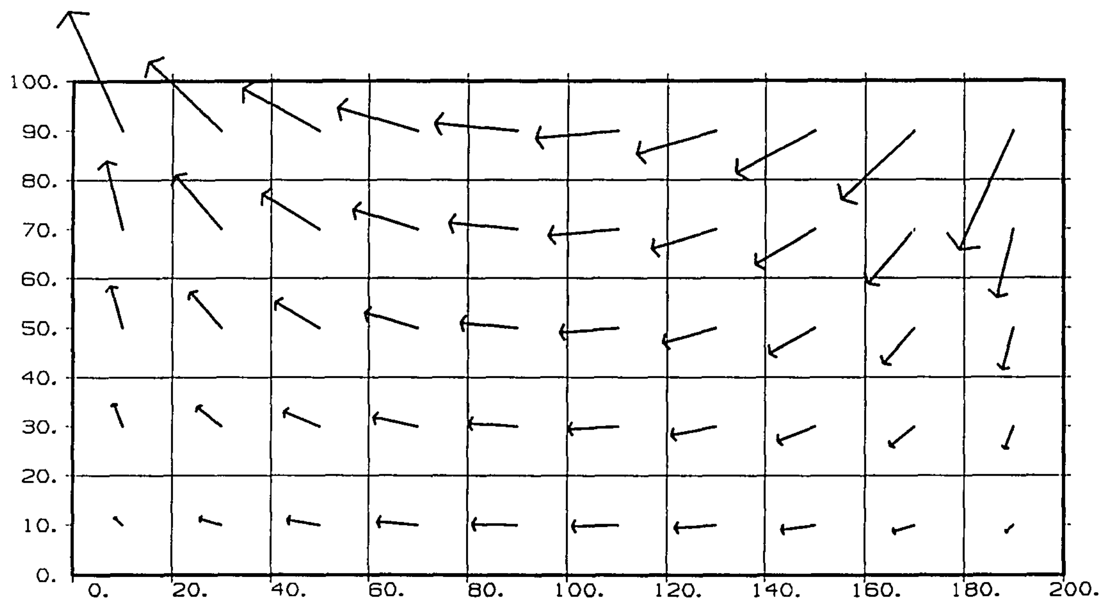

Figure 13: Velocity vector plot of linear water table flow problem.

B.2 Trial 2 - Fixed Heads, Areal Flow

This test simulates the flow between two side boundaries with fixed heads of 0.75 meters on one end and 0.25 meters on the other. Figure 14 is a cross-sectional visualization of the areal model. Top and bottom boundaries are impermeable. This simulation is important for testing the code's ability to emulate water table conditions and recharge. The form of the governing equations makes the unsaturated flow equation the one of choice as it updates the saturated thickness of the aquifer through a series of iterations giving a more accurate transmissivity than the saturated equation.

Bear (1979) developed an analytic solution for flow between two fixed head surfaces. The analytic solution has the form of $\frac{\partial^2 h^2}{\partial x^2}$ which requires the free surface to be one of the element boundaries. Cross-sectional models do not have the free surface as an element boundary, and therefore do not exactly match the analytic solution. Areal flow is the only configuration that allows calculations in the form of the analytic solution.

One trial was run without recharge and the second trial was run with recharge occuring over the top surface of the model area. Figures 15 and 16 contain input data for no recharge and recharge, respectively. VAM2DH duplicated the analytic solutions to three significant digits.

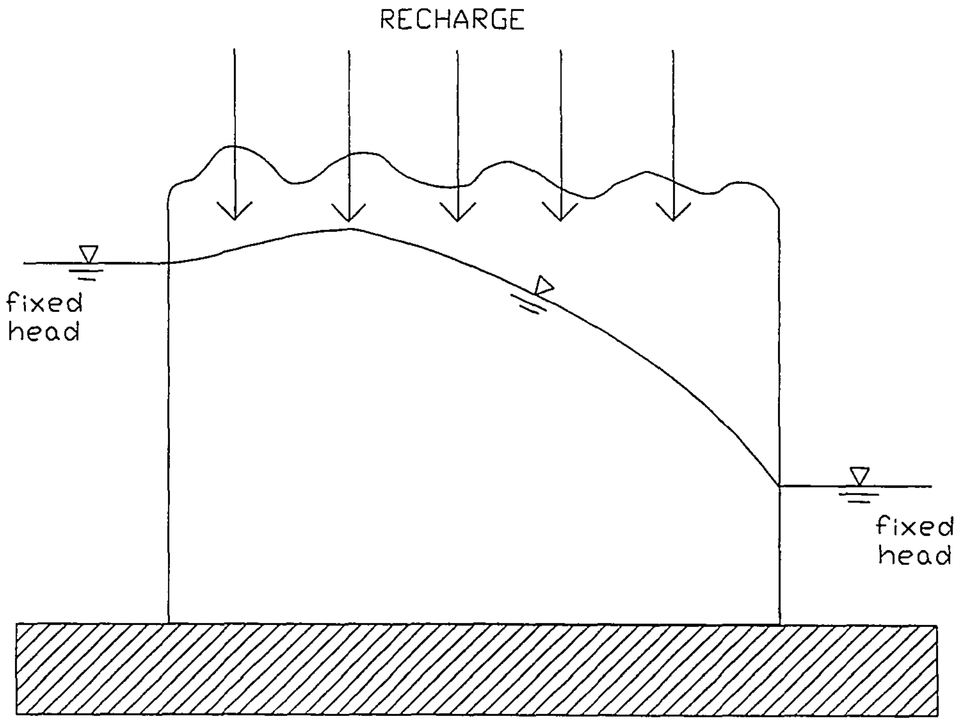

Figure 14: Cross-sectional schematic of areal fixed head problem.

```
        1
Fixed heads-areal unconfined flow no recharge, variably saturated
        1    0    1    0    0    0    0    1    0    1
        0    1    1    1   42   20    0    0    1    0    0    0    0         CARD 3
        1    1    9    9    0      0.001                                     CARD 4
        0    0    0    0    2    1    1    1    1    0    0    1    0    0   CARD 5
     0.500                                                                   CARD 6
  3.00e-02  3.00e-02       0.0       0.0       0.0       0.0    0    0     CARD 8a
  0.30e+00  4.00e+00  0.56e+00  4.00e+00  1.00e+00                           CARD 10
        2   21      1.00      1.00    0        0.0                           CARD 12a
     1.000     1.000    20.000     1.000      1.00      1.00      0.00       CARD 14
        4    0    0    0                                                        0.00
        1    1    0  0.750e+0                                                CARD 19a
        2    1    0  0.750e+0                                                CARD 19b
       41    1    0  0.250e+0                                                CARD 19b
       42    1    0  0.250e+0                                                CARD 19b
        1                                                                    CARD 19b
        1   42        0.00              1                                    CARD 29a
                                                                             CARD 29b
```

Figure 15: Input data for fixed heads, no recharge problem.

```
    1
Fixed heads-areal, unconfined flow, recharge, variably saturated
    1    0    1    0    0    0    0    1    0    1
    0    1    1    1   42   20    0    0    1    0    0    0    0        CARD 3
    1    1    9    9    0     0.001                                     CARD 4
    0    1    0    0    2    1    1    1    1    0    0    1    0    0  CARD 5
     0.500                                                             CARD 6
  3.00e-02  3.00e-02       0.0       0.0       0.0       0.0    0    0  CARD 8a
  0.30e+00  4.00e+00  0.56e+00  4.00e+00  1.00e+00                     CARD 10
    2   21      1.00      1.00  0          0.0                         CARD 12a
     1.000     1.000    20.000     1.000      1.00      1.00      0.00      0.00
    1                                                                  CARD 14
    1    1   42 7.505e-05     1                                        CARD 18a
    4    0    0    0                                                   CARD 18b
    1    1    0  0.750e+0                                              CARD 19a
    2    1    0  0.750e+0                                              CARD 19b
   41    1    0  0.250e+0                                              CARD 19b
   42    1    0  0.250e+0                                              CARD 19b
    1                                                                  CARD 19b
    1   42      0.00              1                                    CARD 29a
                                                                       CARD 29b
```

Figure 16: Input data for fixed heads with recharge problem.

B.3 Trial 3 - Seepage Face

This example was supplied in the user's manual (Huyakorn and others, 1988). It was used to test the code's ability to simulate water table and seepage face conditions in cross section in a variably saturated system. Huyakorn and others (1988) compared VAM2D results to those obtained using other widely accepted codes, namely, UNSAT2 and STFREE. The results obtained in this study duplicate those of listed in the user's manual, which are very similar to results of the other two codes (Huyakorn and others, 1988, p. 4-12–4-13). Figure 17 contains input data for the seepage problem.

The seepage face example turned out to be a challenge more in data presentation than actual theoretical results. The unsaturated flow equation uses pressure head as the dependent variable. In order to present head data graphically as contours, elevation head is added to the pressure head to obtain total head. With a water table line the contours of total head above the water table are ignored and the contours below the water table are used for interpretation (see Figures 18 and 19).

```
      1
Steady state flow through an embankment
      1     0     0     0     0     1     1     1     1     1                          Card 3
      0     1     1     1   121   100     0     0     1     0     1     0     0        CARD 4
      1     0    15    15     0  1.00e-02                                             CARD 5
      0     0     0     0     0     1     1     1     1     0     0     1     0     0 CARD 6
  1.00e+01                                                                            CARD 8a
  1.00e-02  1.00e-02  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
  2.00e-01  4.00e+00  5.62e-01  4.00e+00  1.00e+00                                    CARD 12a
     11    11      1.00      1.00     0       0.00                                    CARD 14
      1.00         1.00     10.00       10.00      1.00      1.00      0.00      0.00
     16     3     0     0                                                             CARD 19a
      1     1     0     10.00                                                         CARD 19b
      2     1     0      9.00
      3     1     0      8.00
      4     1     0      7.00
      5     1     0      6.00
      6     1     0      5.00
      7     1     0      4.00
      8     1     0      3.00
      9     1     0      2.00
     10     1     0      1.00
     11     1     0      0.00
    111     1     0      2.00
    112     1     0      1.00
    113     1     0      0.00
    114     1     0      0.00
    115     1     0      0.00
    119     1     0      0.00       0.00
    120     1     0      0.00       0.00
    121     1     0      0.00       0.00
     11     1                                                                         CARD 28a
      1    11    12    22    23    33    34    44    45    55    56    66    67    77    78    88
     89    99   100   110   111   121                                                 CARD 28b
      3     1                                                                         CARD 30a
    114   115   116                                                                   CARD 30b
```

Figure 17: Input data for seepage face problem.

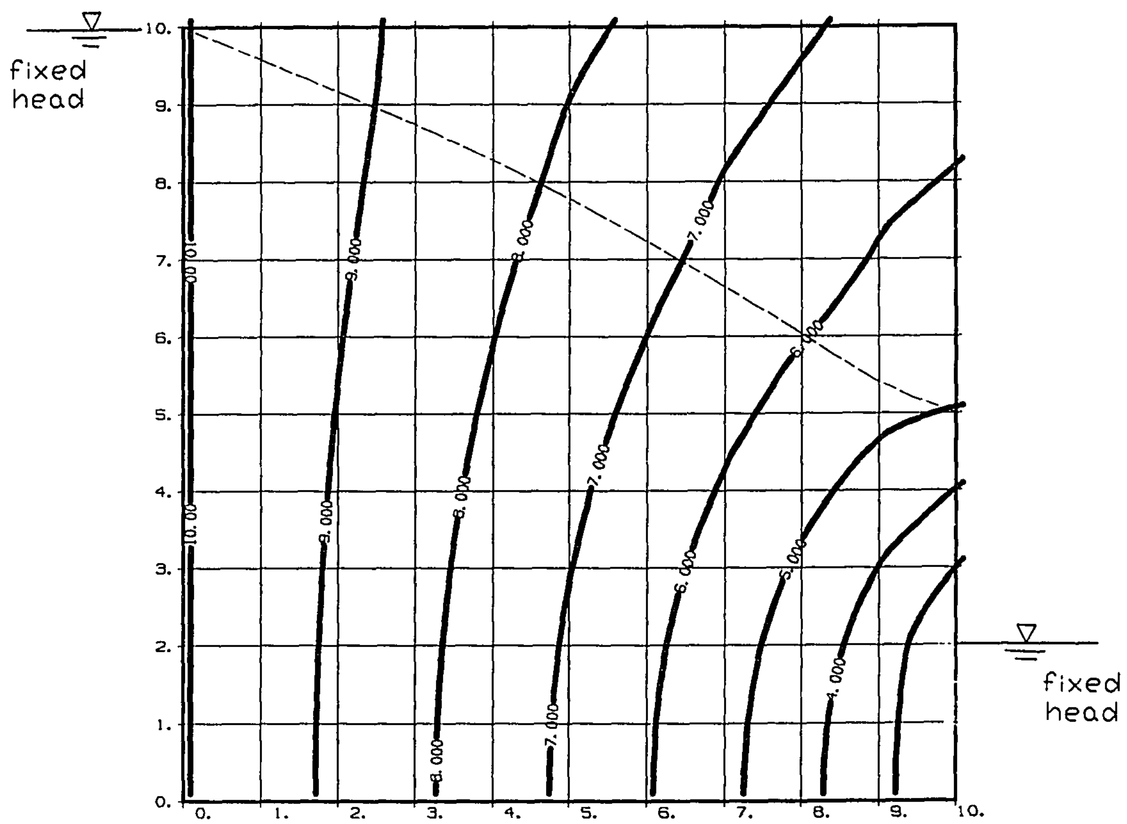

Figure 18: Contour plot of heads of the seepage face problem.

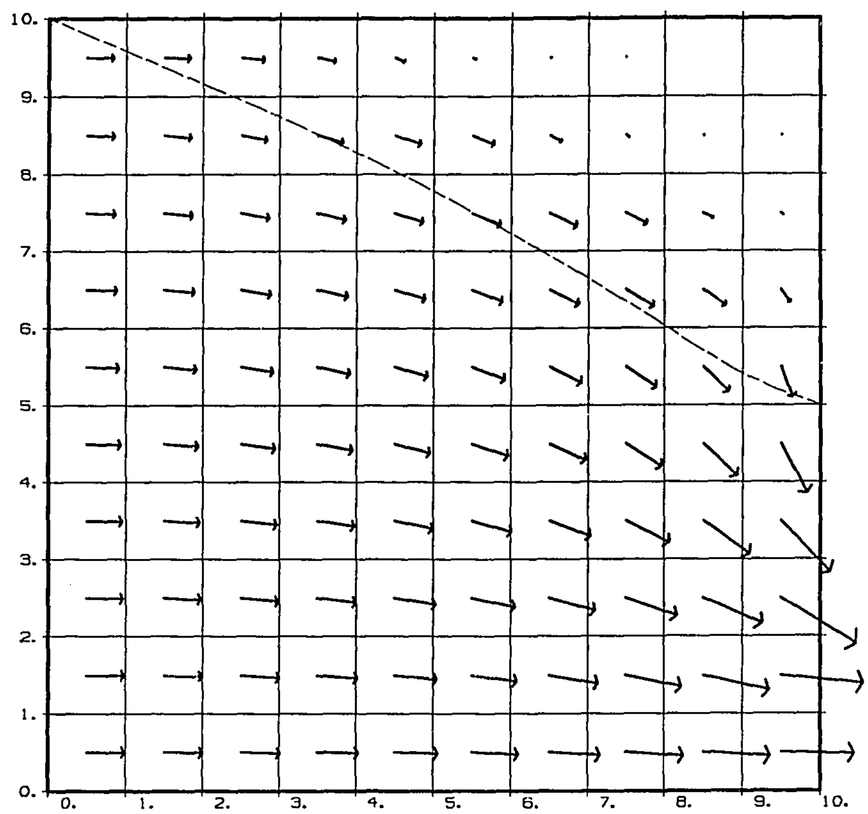

Figure 19: Velocity vector plot of the seepage face problem.

B.4 Trial 4 - Leaky Aquifer

The leaky aquifer system is used to test a multi-layer cross-sectional system with differing hydraulic conductivities. The heads and conductivities prescribed in each layer determine the amount of leakage occuring. The input file is contained in Figure 20, the schematic in Figure 21, and the velocity vector plot in Figure 22. The analytic solution given by Bear (1979) is matched to three significant digits.

```
    1
 Leaky aquifer system
    1     0     0     1     0     0     0     1     0     1                    CARD 3
    0     1     1     1    90    70     0     0     3     0     0     0     0    CARD 4
    1     1     9     9     0      0.001                                         CARD 5
    0     0     0     0     0     1     1     1     1     0     0     1     0     0 CARD 6
   3.00e+2                                                                      CARD 8a
    1     1     1     2     3     1     1     1     2     3     1     1     1     2     3     1
    1     1     2     3     1     1     1     2     3     1     1     1     2     3     1     1
    1     2     3     1     1     1     2     3     1     1     1     2     3     1     1     1
    2     3     1     1     1     2     3     1     1     1     2     3     1     1     1     2
    3     1     1     1     2     3                                             CARD 9
  5.00e-02  5.00e-02        0.0         0.0         0.0         0.0     0     0 CARD 10
  1.00e-03  1.00e-03        0.0         0.0         0.0         0.0     0     0
  1.00e-02  1.00e-02        0.0         0.0         0.0         0.0     0     0
    6    15    300.00    300.00     0         0.0                               CARD 14
   300.000   300.000  4200.000  1500.000       1.00        1.00        0.00       0.00
   23     0     0     0                                                         CARD 19a
    1     1     0   4.700e+2                                                    CARD 19b
    2     1     0   4.700e+2                                                    CARD 19b
    3     1     0   4.700e+2
    4     1     0   4.700e+2
    6     1     0   2.000e+2
   12     1     0   2.000e+2
   18     1     0   2.000e+2
   24     1     0   2.000e+2
   30     1     0   2.000e+2
   36     1     0   2.000e+2
   42     1     0   2.000e+2
   48     1     0   2.000e+2
   54     1     0   2.000e+2
   60     1     0   2.000e+2
   66     1     0   2.000e+2
   72     1     0   2.000e+2
   78     1     0   2.000e+2
   84     1     0   2.000e+2
   85     1     0   4.500e+2
   86     1     0   4.500e+2
   87     1     0   4.500e+2
   88     1     0   4.500e+2                                                    CARD 19b
   90     1     0   2.000e+2                                                    CARD 19b
```

Figure 20: Input data for the leaky aquifer problem.

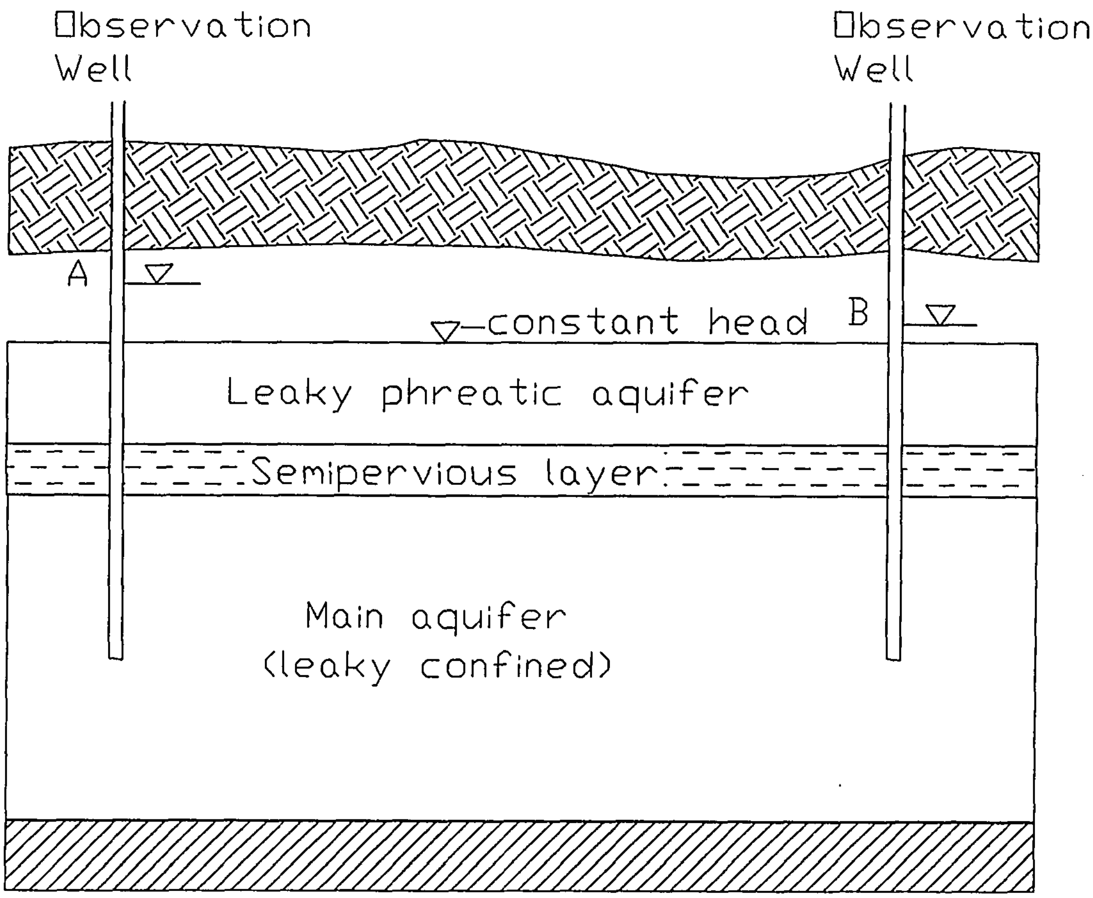

Figure 21: Schematic of the leaky aquifer problem.

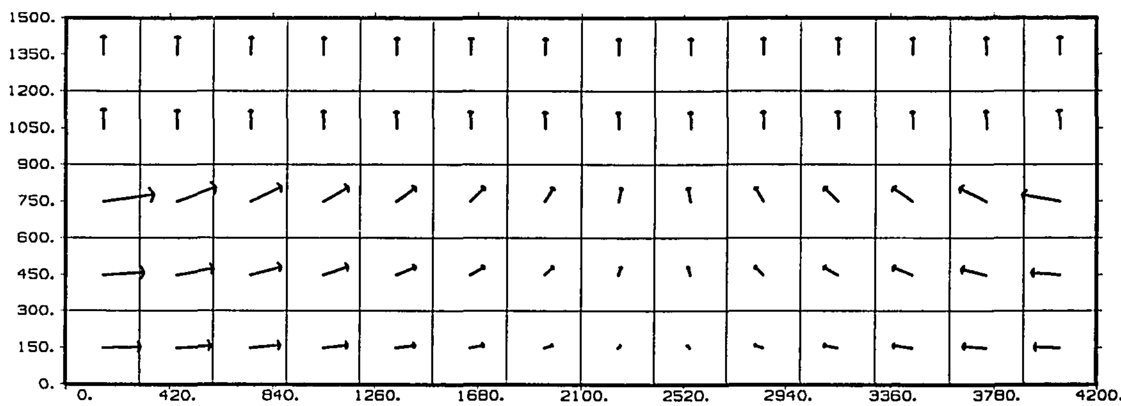

Figure 22: Velocity vector plot of the leaky aquifer problem.

C Model Output

Following are the input and output files for the two scenarios simulated in this model. Recharge is not included in these files.

```
   1
Yucca Mountain unconfined, cross-sectional flow
   1     0     0     0     0     1     1     1     1     1                           CARD 3
   0     1     1     1  1378  1260     0     0    12     0     0     0     0         CARD 4
   1     0    15     1     0  5.00e-01                                               CARD 5
   0     1     0     0     3     1     1     1     1     0     1     1     0     0   CARD 6
 6.000e+02                                                                           CARD 8a
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     3     3     2     2     2     2     2     2     1     1     1     4     3     3     2
   2     2     2     2     2     1     1     1     4     3     3     2     2     2     2     2
   2     1     1     1     4     3     3     2     2     2     2     2     2     1     1     1
   4     4     3     2     2     2     2     2     2     1     1     1     4     4     3     2
   2     2     2     2     2     1     1     1     4     4     3     2     2     2     2     2
   2     1     1     1     4     4     3     2     2     2     2     2     2     1     1     1
   4     4     3     2     2     2     2     2     2     1     1     1     4     4     3     2
   2     2     2     2     2     1     1     1     4     4     3     2     2     2     2     2
   2     1     1     1     4     4     3     2     2     2     2     2     2     1     1     1
   4     4     4     2     2     2     2     2     2     1     1     1     4     4     4     2
   2     2     2     2     2     1     1     1     4     4     4     2     2     2     2     2
   2     1     1     1     4     4     4     2     2     2     2     2     2     1     1     1
   4     4     4    10     2     2     2     2     2     1     1     1     4     4     4    10
   2     2     2     2     2     1     1     1     4     4     4    10     2     2     2     2
   2     1     1     1     4     4     4    10     7     2     2     2     2     1     1     1
   4     4     4    10     7     2     2     2     2     1     1     1     4     4     4    10
   7     2     2     2     2     1     1     1     4     4     4    10     7     2     2     2
   2     1     1     1     4     4     4    10     7     2     2     2     2     1     1     1
   4     4     4    10     7     2     2     2     2     1     1     1     4     4     4    10
   7     7     2     2     2     2     1     1     4     4     4    10     7     7     2     2
   2     2     1     1     4     4     4    10     7     7     2     2     2     2     1     1
   4     4     4    10     7     7     7     2     2     2     1     1     4     4     4    10
   7     7     7     7     2     2     1     1     4     4     4    10     7     7     7     7
   2     2     1     1     4     4     4    10     7     7     7     7     2     2     1     1
   4     4     4    10     7     7     7     7     2     2     1     1     4     4     4    10
   7     7     7     7     2     2     1     1     4     4     4    10     7     7     7     7
   7     2     1     1     4     4     4    10     7     7     7     7     7     2     1     1
   4     4     4    10     7     7     7     7     7     2     1     1     4     4     4    10
   7     7     7     7     7     2     2     1     4     4     4    10     7     7     7     7
   7     7     2     1     4     4     4    10     7     7     7     7     7     7     2     1
   4     4     4    10     7     7     7     7     7     7     2     1     4     4     4    10
```

Case I input file

```
      7      7      7      7      7      7      7      1      4      4      4     11      7      7      7      7
      7      7      7      1      4      4      4     11      7      7      7      7      7      7      7      7
      5      5      5     11      8      8      8      8      8      8      8      8      5      5      5     11
      8      8      8      8      8      8      8      8      5      5      5     11      8      8      8      8
      8      8      8      8      5      5      5     11      8      8      8      8      8      8      8      8
      5      5      5     11      8      8      8      8      8      8      8      8      5      5      5     11
      8      8      8      8      8      8      8      8      5      5      5     11      8      8      8      8
      8      8      8      8      5      5      5     11      8      8      8      8      8      8      8      8
      5      5      5     11      8      8      8      8      8      8      8      8      5      5      5     11
      8      8      8      8      8      8      8      8      5      5      5     11      8      8      8      8
      8      8      8      8      5      5      5     11      8      8      8      8      8      8      8      8
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9      6      6      6     12
      9      9      9      9      9      9      9      9      6      6      6     12      9      9      9      9
      9      9      9      9      6      6      6     12      9      9      9      9      9      9      9      9
      6      6      6     12      9      9      9      9      9      9      9      9                CARD 9
3.660e-06 3.660e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
4.660e-05 4.660e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
1.800e-05 1.800e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
1.800e-05 1.800e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
3.000e-06 3.000e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
2.400e-06 2.400e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
3.600e-05 3.600e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
5.100e-07 5.100e-07  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
1.800e-06 1.800e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
6.000e-08 6.000e-08  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
6.000e-09 6.000e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
6.000e-09 6.000e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00      0      0 CARD 10
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                          CARD 12a
   13   106  1000.000   300.000    1    0.000                              CARD 14
     0.00   1000.00   2000.00   3000.00   4000.00   5000.00   6000.00   7000.00
```

Case I input file

```
  8000.00   9000.00  10000.00  11000.00  12000.00  13000.00  14000.00  15000.00
 16000.00  17000.00  18000.00  19000.00  20000.00  21000.00  22000.00  23000.00
 24000.00  25000.00  26000.00  27000.00  28000.00  29000.00  30000.00  31000.00
 32000.00  33000.00  34000.00  35000.00  36000.00  37000.00  38000.00  39000.00
 40000.00  41000.00  42000.00  43000.00  44000.00  45000.00  46000.00  47000.00
 48000.00  49000.00  50000.00  51000.00  52000.00  53000.00  54000.00  55000.00
 56000.00  57000.00  58000.00  58700.00  59425.00  60150.00  60875.00  61600.00
 62575.00  63550.00  64525.00  65500.00  66150.00  66800.00  67230.00  67660.00
 68090.00  68520.00  68950.00  69380.00  69810.00  70240.00  70670.00  71100.00
 71600.00  72100.00  72600.00  73100.00  73600.00  74100.00  74600.00  75100.00
 75600.00  76100.00  76600.00  77100.00  77600.00  78100.00  78600.00  79100.00
 79600.00  80100.00  80600.00  81100.00  81600.00  82100.00  82600.00  83100.00
 83600.00  84300.00                                                    CARD 15a
 -1380.00   -980.00   -680.00   -380.00   -180.00     20.00    220.00    420.00
   620.00    820.00   1020.00   1220.00   1420.00                      CARD 15b
    1                                                                  CARD 18a
    1   738   803  1.79e-09   13                                       CARD 18b
   21     5     0     0                                                CARD 19a
    1     1     0   2000.00
    2     1     0   1600.00
    3     1     0   1300.00
    4     1     0   1000.00
    5     1     0    800.00
    6     1     0    600.00
    7     1     0    400.00
    8     1     0    200.00
    9     1     0     00.00
 1366     1     0   2620.00
 1367     1     0   2220.00
 1368     1     0   1920.00
 1369     1     0   1620.00
 1370     1     0   1400.00
 1371     1     0   1200.00
 1372     1     0   1000.00
 1373     1     0    800.00
 1374     1     0    600.00
 1375     1     0    400.00
 1376     1     0    200.00
 1377     1     0     00.00                                            CARD 19b
   10     1     0     00.00     00.00
   11     1     0     00.00     00.00
   12     1     0     00.00     00.00
   13     1     0     00.00     00.00
 1378     1     0     00.00     00.00                                  CARD 19a
   26                                                                  CARD 27a
    1     2     3     4     5     6     7     8     9    10    11    12    13  1366  1367  1368
 1369  1370  1371  1372  1373  1374  1375  1376  1377  1378            CARD 27b
  106     1                                                            CARD 28a
    1    13    14    26    27    39    40    52    53    65    66    78    79    91    92   104
  105   117   118   130   131   143   144   156   157   169   170   182   183   195   196   208
  209   221   222   234   235   247   248   260   261   273   274   286   287   299   300   312
  313   325   326   338   339   351   352   364   365   377   378   390   391   403   404   416
  417   429   430   442   443   455   456   468   469   481   482   494   495   507   508   520
  521   533   534   546   547   559   560   572   573   585   586   598   599   611   612   624
  625   637   638   650   651   663   664   676   677   689   690   702   703   715   716   728
  729   741   742   754   755   767   768   780   781   793   794   806   807   819   820   832
```

Case I input file

```
 833  845  846  858  859  871  872  884  885  897  898  910  911  923  924  936
 937  949  950  962  963  975  976  988  989 1001 1002 1014 1015 1027 1028 1040
1041 1053 1054 1066 1067 1079 1080 1092 1093 1105 1106 1118 1119 1131 1132 1144
1145 1157 1158 1170 1171 1183 1184 1196 1197 1209 1210 1222 1223 1235 1236 1248
1249 1261 1262 1274 1275 1287 1288 1300 1301 1313 1314 1326 1327 1339 1340 1352
1353 1365 1366 1378                                                  CARD 28b
```

Case I input file

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

                    THIS OUTPUT GENERATED BY VAM2DH-1.1
                    INPUT FILE NAME - CaseI.dat

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


NUMBER OF PROBLEMS TO BE SOLVED -  1 (GROUP 1)

PROBLEM NUMBER:  1

PROBLEM TITLE (GROUP 2)
-------------------------------------------------------------------------------

Yucca Mountain unconfined, cross-sectional flow

-------------------------------------------------------------------------------


PROBLEM SPECIFICATION PARAMETERS (GROUP 3)
------------------------------------------

MODEL TYPE INDEX (1=FLOW, 0=TRANSPORT) ...(IMODL) -    1
AXISYMMETRIC SIMULATION (1=YES,0=NO) ....(IAXSYM) -    0
AREAL FULL AQUIFER THICKNESS (1=YES,0=NO)(IAREAL) -    0
SATURATED FLOW (1=WHOLLY, 0=VARIABLY) .....(ISAT) -    0
HYSTERESIS (0=NO, 1=YES) .................(IHYST) -    0
GRAVITY TERMS USED IN FLOW EQUATION (0=NO,
  (1=YES) .................................(MARK) -    1
PRESSURE HEAD WT ELEVATIONS (1=YES,0=NO)..(IWMAP) -    1
INDEX FOR RELATIVE PERMEABILITY/SATURATION  &
  PRESSURE HEAD/SATURATION (0=TAB, 1=FUNC)(KPROP) -    1
CONVERT INITIAL HEAD VALUES(1=YES, 0=NO).(INTSPC) -    1
UPDATE SAT. THICKNESS (1=YES, 0=NO) .....(IWUPDT) -    1

SIMULATION CONTROL PARAMETERS (GROUP 4)
---------------------------------------

TRANSIENT OR STEADY (1=TRANS,0=STEADY)...(ITRANS) -    0
TIME STEP GENERATION INDEX (1=YES, 0=NO) .(ITSGN) -    1
NUMBER OF TIME STEPS ......................(NTS) -    1
MESH GENERATION INDEX (1=YES, 0=NO) .....(IMSHGN) -    1
TOTAL NUMBER OF NODES ......................(NP) - 1378
TOTAL NUMBER OF ELEMENTS ...................(NE) - 1260
TRIANGULAR ELEMENTS USED (1=YES, 0=NO) ..(NTRIAN) -    0
SEQUENTIAL NUMBERING INDEX (0=Y, 1=X-DIR) (ISWAP) -    0
NUMBER OF POROUS MATRIX MATERIALS .........(NMAT) -   12
INITIAL CONDITION NON-UNIFORMITY INDEX.....(NONU) -    0
NUMBER OF GRID LINES ON SEEPAGE FACE .....(NSEEP) -    0
```

Case I output file

```
NUMBER OF INFIL./EVAP. ELEMENTS .........(NEIEVP) =    0
NUMBER PLANT SPECIES ....................(NPLANT) =    0


TIME STEPPING AND ITERATION CONTROL PARAMETERS (GROUP 5)
--------------------------------------------------------
TIME STEPPING INDEX (0=CNTRL, 1=BCKWD) ...(IKALL) =    1
TYPE OF ITERATION SCHEME (1=NEWT,0=PICARD)(INEWT) =    0
MAXIMUM NON-LINEAR ITERATIONS ...........(NITMAX) =   15
MAXIMUM NUMBER OF TIME STEP REFINEMENTS .(IRESOL) =    1
LUMPING OF ELEMENT MATRIX (1=YES, 0=NO) ..(ILUMP) =    0
ITERATION TOLERANCE FOR HEAD...............(HTOL) = 0.50000e+00
UNDER RELAXATION FACTOR FOR HEAD...........(HWWT) = 0.10000e+01


INPUT / OUTPUT CONTROL PARAMETERS (GROUP 6)
-------------------------------------------
VELOCITY/SATURATION INPUT................(NVREAD) =    0
GROUNDWATER RECHARGE (1=YES, 0=NO) ......(IVRECH) =    0
BOUNDARY NODE DATA READ (1=YES, 0=NO)....(IOUTLT) =    0
NUMBER OF NODES FOR WHICH I.C. ARE READ....(NPIN) =    0
OUTPUT REQUIREMENT INDICATOR:
 (0=ALL DATA, 1=NO ELEMENT DATA,
  2=NO DATA, 3=NO MESH AND I.C. DATA.......(IPRD) =    3
UNIT 9 OUTPUT OF VEL / SAT (1=YES, 0=NO).(NVWRIT) =    1
VELOCITY PRINTOUT CONTROL INDEX............(NVPR) =    1
UNIT 10 OUTPUT HEAD/CONC. (O=NONE, N=NTH).(NPLOT) =    1
NODAL VALUE PRINTOUT CONTROL INDEX........(NSTEP) =    1
OBSERVATION NODE INDEX...................(IOBSND) =    0
MASS BALANCE TO BE PERFORMED (1=YES,0=NO).(IMBAL) =    1
UNIT 8 OUTPUT OF HEAD/CONC (1=YES, 0=NO).(NOWRIT) =    1
PRINT CHECK OPTION INDEX.................(IPRCHK) =    0
TAPE DUMP OF EACH ITERATION(1=YES, 0=NO)..(IDUMP) =    0


DEFAULT INITIAL VALUE OF VARIABLE TO BE SOLVED (GROUP 8A)
---------------------------------------------------------

         0.6000e+03

ELEMENT PROPERTY NUMBERS (GROUP 9)
----------------------------------


   4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
   2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
   2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
   4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
   2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
   2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
   4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
   2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
   2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
   4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
   2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
   2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
```

Case I output file

4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	4	3	2	2	2	2	2	2	1	1	1	4	4	3	2
2	2	2	2	2	1	1	1	4	4	3	2	2	2	2	2
2	1	1	1	4	4	3	2	2	2	2	2	2	1	1	1
4	4	3	2	2	2	2	2	2	1	1	1	4	4	3	2
2	2	2	2	2	1	1	1	4	4	3	2	2	2	2	2
2	1	1	1	4	4	3	2	2	2	2	2	2	1	1	1
4	4	4	2	2	2	2	2	2	1	1	1	4	4	4	2
2	2	2	2	2	1	1	1	4	4	4	2	2	2	2	2
2	1	1	1	4	4	4	2	2	2	2	2	2	1	1	1
4	4	4	10	2	2	2	2	2	1	1	1	4	4	4	10
2	2	2	2	2	1	1	1	4	4	4	10	2	2	2	2
2	1	1	1	4	4	4	10	7	2	2	2	2	1	1	1
4	4	4	10	7	2	2	2	2	1	1	1	4	4	4	10
7	2	2	2	2	1	1	1	4	4	4	10	7	2	2	2
2	1	1	1	4	4	4	10	7	2	2	2	2	1	1	1
4	4	4	10	7	2	2	2	2	1	1	1	4	4	4	10
7	7	2	2	2	2	1	1	4	4	4	10	7	7	2	2
2	2	1	1	4	4	4	10	7	7	2	2	2	2	1	1
4	4	4	10	7	7	7	2	2	2	1	1	4	4	4	10
7	7	7	7	2	2	1	1	4	4	4	10	7	7	7	7
2	2	1	1	4	4	4	10	7	7	7	7	2	2	1	1
4	4	4	10	7	7	7	7	2	2	1	1	4	4	4	10
7	7	7	7	2	2	1	1	4	4	4	10	7	7	7	7
7	2	1	1	4	4	4	10	7	7	7	7	7	2	1	1
4	4	4	10	7	7	7	7	7	2	1	1	4	4	4	10
7	7	7	7	7	2	2	1	4	4	4	10	7	7	7	7
7	7	2	1	4	4	4	10	7	7	7	7	7	7	2	1
4	4	4	10	7	7	7	7	7	7	2	1	4	4	4	10
7	7	7	7	7	7	7	1	4	4	4	11	7	7	7	7
7	7	7	1	4	4	4	11	7	7	7	7	7	7	7	7
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9
9	9	9	9	6	6	6	12	9	9	9	9	9	9	9	9
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9
9	9	9	9	6	6	6	12	9	9	9	9	9	9	9	9
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9

Case I output file

```
   9    9    9    9    6    6    6   12    9    9    9    9    9    9    9    9
   6    6    6   12    9    9    9    9    9    9    9    9    6    6    6   12
   9    9    9    9    9    9    9    9    6    6    6   12    9    9    9    9
   9    9    9    9    6    6    6   12    9    9    9    9    9    9    9    9
   6    6    6   12    9    9    9    9    9    9    9    9    6    6    6   12
   9    9    9    9    9    9    9    9    6    6    6   12    9    9    9    9
   9    9    9    9    6    6    6   12    9    9    9    9    9    9    9    9
   6    6    6   12    9    9    9    9    9    9    9    9    6    6    6   12
   9    9    9    9    9    9    9    9    6    6    6   12    9    9    9    9
   9    9    9    9    6    6    6   12    9    9    9    9    9    9    9    9
   6    6    6   12    9    9    9    9    9    9    9    9

HYDRAULIC PROPERTIES OF POROUS MEDIA (GROUP 10)
-----------------------------------------------

MATERIAL NUMBER:    1  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.3660e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.3660e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    2  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.3660e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.3660e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    3  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1800e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1800e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    4  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1800e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1800e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    5  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.3000e-05
```

Case I output file

```
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.3000e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    6  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.2400e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.2400e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    7  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.3600e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.3600e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    8  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.5100e-06
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.5100e-06
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    9  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1800e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1800e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   10  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6000e-07
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6000e-07
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   11  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6000e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6000e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
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SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   12  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6000e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6000e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00


FUNCTIONAL COEFFICIENTS OF ANALYTICAL RELATIONSHIPS FOR Krw AND Sw (GROUP 12)
-----------------------------------------------------------------------------

MATERIAL NUMBER:    1  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    2  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    3  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    4  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    5  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01
```

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MATERIAL NUMBER:    6  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    7  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    8  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    9  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   10  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   11  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   12  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01
```

Case I output file

X-COORDINATES OF GRID LINES (GROUP 15A)

0.00	1000.00	2000.00	3000.00	4000.00	5000.00	6000.00	7000.00
8000.00	9000.00	10000.00	11000.00	12000.00	13000.00	14000.00	15000.00
16000.00	17000.00	18000.00	19000.00	20000.00	21000.00	22000.00	23000.00
24000.00	25000.00	26000.00	27000.00	28000.00	29000.00	30000.00	31000.00
32000.00	33000.00	34000.00	35000.00	36000.00	37000.00	38000.00	39000.00
40000.00	41000.00	42000.00	43000.00	44000.00	45000.00	46000.00	47000.00
48000.00	49000.00	50000.00	51000.00	52000.00	53000.00	54000.00	55000.00
56000.00	57000.00	58000.00	58700.00	59425.00	60150.00	60875.00	61600.00
62575.00	63550.00	64525.00	65500.00	66150.00	66800.00	67230.00	67660.00
68090.00	68520.00	68950.00	69380.00	69810.00	70240.00	70670.00	71100.00
71600.00	72100.00	72600.00	73100.00	73600.00	74100.00	74600.00	75100.00
75600.00	76100.00	76600.00	77100.00	77600.00	78100.00	78600.00	79100.00
79600.00	80100.00	80600.00	81100.00	81600.00	82100.00	82600.00	83100.00
83600.00	84300.00						

Y-COORDINATES OF GRID LINES (GROUP 15B)

-1380.00	-980.00	-680.00	-380.00	-180.00	20.00	220.00	420.00
620.00	820.00	1020.00	1220.00	1420.00			

BOUNDARY CONDITION DATA (GROUP 19A)

NUMBER OF STEADY DIRICHLET BOUNDARIES .... (NBTO) = 21
NUMBER OF STEADY FLUX BOUNDARIES .... (NDFLUX) = 5
NUMBER OF TRANSIENT DIRICHLET BOUNDARIES.... (NBHVAR) = 0
NUMBER OF TRANSIENT FLUX BOUNDARIES.... .... (NBFVAR) = 0

DIRICHLET BOUNDARY CONDITION DATA (GROUP 19B)

INDEX	NODE NUMBER	B.C. CODE	PRESCRIBED VALUE
1	1	0	2000.
2	2	0	1600.
3	3	0	1300.
4	4	0	1000.
5	5	0	800.0
6	6	0	600.0
7	7	0	400.0
8	8	0	200.0
9	9	0	0.
10	1366	0	2620.
11	1367	0	2220.

Case I output file

12	1368	0	1920.
13	1369	0	1620.
14	1370	0	1400.
15	1371	0	1200.
16	1372	0	1000.
17	1373	0	800.0
18	1374	0	600.0
19	1375	0	400.0
20	1376	0	200.0
21	1377	0	0.

FLUX BOUNDARY CONDITION DATA (GROUP 19C)

NODE #	D.O.F. #	B.C. CODE	FLUID FLUX	DUMMY ARRAY
10	1	0	0.	0.
11	1	0	0.	0.
12	1	0	0.	0.
13	1	0	0.	0.
1378	1	0	0.	0.

LIST OF BOUNDARY NODE NUMBERS (GROUP 27B)

```
   1    2    3    4    5    6    7    8    9   10   11   12   13 1366 1367 1368
1369 1370 1371 1372 1373 1374 1375 1376 1377 1378
```

WATER TABLE COMPUTATION DATA (GROUP 28)

LINE NUMBER AND LOWEST, HIGHEST NODE

1	1	13	2	14	26	3	27	39	4	40	52	5	53	65
6	66	78	7	79	91	8	92	104	9	105	117	10	118	130
11	131	143	12	144	156	13	157	169	14	170	182	15	183	195
16	196	208	17	209	221	18	222	234	19	235	247	20	248	260
21	261	273	22	274	286	23	287	299	24	300	312	25	313	325
26	326	338	27	339	351	28	352	364	29	365	377	30	378	390
31	391	403	32	404	416	33	417	429	34	430	442	35	443	455
36	456	468	37	469	481	38	482	494	39	495	507	40	508	520
41	521	533	42	534	546	43	547	559	44	560	572	45	573	585
46	586	598	47	599	611	48	612	624	49	625	637	50	638	650
51	651	663	52	664	676	53	677	689	54	690	702	55	703	715
56	716	728	57	729	741	58	742	754	59	755	767	60	768	780
61	781	793	62	794	806	63	807	819	64	820	832	65	833	845
66	846	858	67	859	871	68	872	884	69	885	897	70	898	910
71	911	923	72	924	936	73	937	949	74	950	962	75	963	975
76	976	988	77	989	1001	78	1002	1014	79	1015	1027	80	1028	1040
81	1041	1053	82	1054	1066	83	1067	1079	84	1080	1092	85	1093	1105

Case I output file

86	1106	1118	87	1119	1131	88	1132	1144	89	1145	1157	90	1158	1170
91	1171	1183	92	1184	1196	93	1197	1209	94	1210	1222	95	1223	1235
96	1236	1248	97	1249	1261	98	1262	1274	99	1275	1287	100	1288	1300
101	1301	1313	102	1314	1326	103	1327	1339	104	1340	1352	105	1353	1365
106	1366	1378												

——— ACTUAL HALF BAND WIDTH = 14 FULL BANDWIDTH = 29 ———

++++++++++++ STEADY-STATE SOLUTION +++++++++++

**** ELAPSED SIMULATION TIME : 1.000 TIME STEP NUMBER : 1 TIME STEP SIZE: 0.100e+01 ****

ITERATION	NUMBER OF NON-CONVERGENT NODES	MAXIMUM ERROR	NODE NUMBER	RELAXATION FACTOR
1	1357	621.4	1353	1.00
2	1313	38.41	1025	1.00
3	440	9.655	999	1.00
4	33	-1.786	1234	0.884
5	0	-0.2417	1234	1.00

*** NODAL HEAD VALUES ***

NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE
1	2000.	2	1600.	3	1300.	4	1000.	5	800.0
6	600.0	7	400.0	8	200.0	9	0.	10	-199.9
11	-399.7	12	-599.5	13	-799.4	14	2002.	15	1602.
16	1302.	17	1002.	18	801.9	19	601.9	20	401.9
21	201.9	22	1.886	23	-198.1	24	-398.2	25	-598.2
26	-798.2	27	2004.	28	1604.	29	1304.	30	1004.
31	803.8	32	603.8	33	403.8	34	203.8	35	3.773
36	-196.2	37	-396.2	38	-596.2	39	-796.2	40	2006.
41	1606.	42	1306.	43	1006.	44	805.7	45	605.7
46	405.7	47	205.7	48	5.659	49	-194.3	50	-394.3
51	-594.3	52	-794.3	53	2008.	54	1608.	55	1308.
56	1008.	57	807.5	58	607.5	59	407.5	60	207.5

Case I output file

61	7.546	62	-192.5	63	-392.5	64	-592.5	65	-792.5
66	2009.	67	1609.	68	1309.	69	1009.	70	809.4
71	609.4	72	409.4	73	209.4	74	9.432	75	-190.6
76	-390.6	77	-590.6	78	-790.6	79	2011.	80	1611.
81	1311.	82	1011.	83	811.3	84	611.3	85	411.3
86	211.3	87	11.32	88	-188.7	89	-388.7	90	-588.7
91	-788.7	92	2013.	93	1613.	94	1313.	95	1013.
96	813.2	97	613.2	98	413.2	99	213.2	100	13.20
101	-186.8	102	-386.8	103	-586.8	104	-786.8	105	2015.
106	1615.	107	1315.	108	1015.	109	815.1	110	615.1
111	415.1	112	215.1	113	15.09	114	-184.9	115	-384.9
116	-584.9	117	-784.9	118	2017.	119	1617.	120	1317.
121	1017.	122	817.0	123	617.0	124	417.0	125	217.0
126	16.98	127	-183.0	128	-383.0	129	-583.0	130	-783.0
131	2019.	132	1619.	133	1319.	134	1019.	135	818.9
136	618.9	137	418.9	138	218.9	139	18.86	140	-181.1
141	-381.1	142	-581.1	143	-781.1	144	2021.	145	1621.
146	1321.	147	1021.	148	820.8	149	620.8	150	420.8
151	220.8	152	20.75	153	-179.2	154	-379.2	155	-579.2
156	-779.2	157	2023.	158	1623.	159	1323.	160	1023.
161	822.6	162	622.6	163	422.6	164	222.6	165	22.64
166	-177.4	167	-377.4	168	-577.4	169	-777.4	170	2025.
171	1625.	172	1325.	173	1025.	174	824.5	175	624.5
176	424.5	177	224.5	178	24.52	179	-175.5	180	-375.5
181	-575.5	182	-775.5	183	2026.	184	1626.	185	1326.
186	1026.	187	826.4	188	626.4	189	426.4	190	226.4
191	26.41	192	-173.6	193	-373.6	194	-573.6	195	-773.6
196	2028.	197	1628.	198	1328.	199	1028.	200	828.3
201	628.3	202	428.3	203	228.3	204	28.30	205	-171.7
206	-371.7	207	-571.7	208	-771.7	209	2030.	210	1630.
211	1330.	212	1030.	213	830.2	214	630.2	215	430.2
216	230.2	217	30.18	218	-169.8	219	-369.8	220	-569.8
221	-769.8	222	2032.	223	1632.	224	1332.	225	1032.
226	832.1	227	632.1	228	432.1	229	232.1	230	32.07
231	-167.9	232	-367.9	233	-567.9	234	-767.9	235	2034.
236	1634.	237	1334.	238	1034.	239	834.0	240	634.0
241	434.0	242	234.0	243	33.96	244	-166.0	245	-366.0
246	-566.0	247	-766.0	248	2036.	249	1636.	250	1336.
251	1036.	252	835.8	253	635.8	254	435.8	255	235.8
256	35.84	257	-164.2	258	-364.2	259	-564.2	260	-764.2
261	2038.	262	1638.	263	1338.	264	1038.	265	837.7
266	637.7	267	437.7	268	237.7	269	37.73	270	-162.3
271	-362.3	272	-562.3	273	-762.3	274	2040.	275	1640.
276	1340.	277	1040.	278	839.6	279	639.6	280	439.6
281	239.6	282	39.61	283	-160.4	284	-360.4	285	-560.4
286	-760.4	287	2042.	288	1642.	289	1342.	290	1042.
291	841.5	292	641.5	293	441.5	294	241.5	295	41.50
296	-158.5	297	-358.5	298	-558.5	299	-758.5	300	2043.
301	1643.	302	1343.	303	1043.	304	843.4	305	643.4
306	443.4	307	243.4	308	43.39	309	-156.6	310	-356.6
311	-556.6	312	-756.6	313	2045.	314	1645.	315	1345.
316	1045.	317	845.3	318	645.3	319	445.3	320	245.3
321	45.27	322	-154.7	323	-354.7	324	-554.7	325	-754.7
326	2047.	327	1647.	328	1347.	329	1047.	330	847.2
331	647.2	332	447.2	333	247.2	334	47.16	335	-152.8
336	-352.8	337	-552.8	338	-752.8	339	2049.	340	1649.

Case I output file

341	1349.	342	1049.	343	849.0	344	649.0	345	449.0
346	249.0	347	49.05	348	-151.0	349	-351.0	350	-551.0
351	-751.0	352	2051.	353	1651.	354	1351.	355	1051.
356	850.9	357	650.9	358	450.9	359	250.9	360	50.93
361	-149.1	362	-349.1	363	-549.1	364	-749.1	365	2053.
366	1653.	367	1353.	368	1053.	369	852.8	370	652.8
371	452.8	372	252.8	373	52.82	374	-147.2	375	-347.2
376	-547.2	377	-747.2	378	2055.	379	1655.	380	1355.
381	1055.	382	854.7	383	654.7	384	454.7	385	254.7
386	54.70	387	-145.3	388	-345.3	389	-545.3	390	-745.3
391	2057.	392	1657.	393	1357.	394	1057.	395	856.6
396	656.6	397	456.6	398	256.6	399	56.59	400	-143.4
401	-343.4	402	-543.4	403	-743.4	404	2058.	405	1658.
406	1358.	407	1058.	408	858.5	409	658.5	410	458.5
411	258.5	412	58.48	413	-141.5	414	-341.5	415	-541.5
416	-741.5	417	2060.	418	1660.	419	1360.	420	1060.
421	860.4	422	660.4	423	460.4	424	260.4	425	60.36
426	-139.6	427	-339.6	428	-539.6	429	-739.6	430	2062.
431	1662.	432	1362.	433	1062.	434	862.2	435	662.2
436	462.2	437	262.2	438	62.25	439	-137.7	440	-337.7
441	-537.7	442	-737.7	443	2064.	444	1664.	445	1364.
446	1064.	447	864.1	448	664.1	449	464.1	450	264.1
451	64.13	452	-135.9	453	-335.9	454	-535.9	455	-735.9
456	2066.	457	1666.	458	1366.	459	1066.	460	866.0
461	666.0	462	466.0	463	266.0	464	66.02	465	-134.0
466	-334.0	467	-534.0	468	-734.0	469	2068.	470	1668.
471	1368.	472	1068.	473	867.9	474	667.9	475	467.9
476	267.9	477	67.90	478	-132.1	479	-332.1	480	-532.1
481	-732.1	482	2070.	483	1670.	484	1370.	485	1070.
486	869.8	487	669.8	488	469.8	489	269.8	490	69.79
491	-130.2	492	-330.2	493	-530.2	494	-730.2	495	2072.
496	1672.	497	1372.	498	1072.	499	871.7	500	671.7
501	471.7	502	271.7	503	71.68	504	-128.3	505	-328.3
506	-528.3	507	-728.3	508	2074.	509	1674.	510	1374.
511	1074.	512	873.6	513	673.6	514	473.6	515	273.6
516	73.55	517	-126.4	518	-326.4	519	-526.4	520	-726.4
521	2076.	522	1676.	523	1375.	524	1075.	525	875.4
526	675.4	527	475.5	528	275.5	529	75.48	530	-124.5
531	-324.5	532	-524.5	533	-724.5	534	2078.	535	1678.
536	1378.	537	1078.	538	877.6	539	677.6	540	477.6
541	277.6	542	77.59	543	-122.4	544	-322.4	545	-522.4
546	-722.4	547	2080.	548	1680.	549	1380.	550	1080.
551	879.7	552	679.7	553	479.7	554	279.7	555	79.75
556	-120.2	557	-320.2	558	-520.2	559	-720.2	560	2082.
561	1682.	562	1382.	563	1082.	564	881.9	565	681.9
566	481.9	567	281.9	568	81.89	569	-118.1	570	-318.1
571	-518.1	572	-718.1	573	2084.	574	1684.	575	1384.
576	1084.	577	884.0	578	684.0	579	484.0	580	284.0
581	84.04	582	-115.9	583	-315.9	584	-515.9	585	-715.9
586	2087.	587	1687.	588	1387.	589	1087.	590	886.2
591	686.2	592	486.2	593	286.2	594	86.19	595	-113.8
596	-313.8	597	-513.8	598	-713.8	599	2089.	600	1689.
601	1389.	602	1089.	603	888.3	604	688.3	605	488.3
606	288.3	607	88.33	608	-111.7	609	-311.7	610	-511.7
611	-711.7	612	2091.	613	1691.	614	1391.	615	1091.
616	890.5	617	690.5	618	490.5	619	290.5	620	90.46

Case I output file

621	-109.5	622	-309.5	623	-509.5	624	-709.5	625	2093.
626	1693.	627	1393.	628	1093.	629	892.6	630	692.6
631	492.6	632	292.6	633	92.58	634	-107.4	635	-307.4
636	-507.4	637	-707.4	638	2096.	639	1696.	640	1396.
641	1096.	642	894.7	643	694.7	644	494.7	645	294.7
646	94.69	647	-105.3	648	-305.2	649	-505.2	650	-705.2
651	2098.	652	1698.	653	1398.	654	1098.	655	896.8
656	696.8	657	496.8	658	296.8	659	96.76	660	-103.2
661	-303.2	662	-503.2	663	-703.2	664	2100.	665	1700.
666	1400.	667	1100.	668	898.7	669	698.7	670	498.7
671	298.8	672	98.81	673	-101.1	674	-301.1	675	-501.2
676	-701.2	677	2103.	678	1703.	679	1403.	680	1103.
681	900.5	682	700.5	683	500.5	684	300.5	685	100.5
686	-99.45	687	-299.4	688	-499.4	689	-699.4	690	2105.
691	1705.	692	1405.	693	1105.	694	902.2	695	702.2
696	502.2	697	302.2	698	102.2	699	-97.80	700	-297.8
701	-497.8	702	-697.8	703	2107.	704	1707.	705	1407.
706	1107.	707	903.9	708	703.9	709	503.9	710	303.9
711	103.9	712	-96.15	713	-296.1	714	-496.1	715	-696.1
716	2110.	717	1710.	718	1410.	719	1110.	720	905.5
721	705.5	722	505.5	723	305.5	724	105.5	725	-94.52
726	-294.5	727	-494.5	728	-694.5	729	2112.	730	1712.
731	1412.	732	1112.	733	907.1	734	707.1	735	507.1
736	307.1	737	107.1	738	-92.94	739	-292.9	740	-492.9
741	-692.9	742	2115.	743	1715.	744	1415.	745	1115.
746	908.6	747	708.6	748	508.6	749	308.6	750	108.6
751	-91.40	752	-291.4	753	-491.4	754	-691.4	755	2118.
756	1718.	757	1418.	758	1118.	759	910.1	760	710.1
761	510.1	762	310.1	763	110.1	764	-89.91	765	-289.9
766	-489.9	767	-689.9	768	2120.	769	1720.	770	1420.
771	1120.	772	911.1	773	711.1	774	511.1	775	311.1
776	111.1	777	-88.89	778	-288.9	779	-488.9	780	-688.9
781	2122.	782	1722.	783	1422.	784	1122.	785	912.2
786	712.1	787	512.1	788	312.1	789	112.1	790	-87.88
791	-287.9	792	-487.9	793	-687.9	794	2124.	795	1724.
796	1424.	797	1124.	798	913.1	799	713.1	800	513.1
801	313.1	802	113.1	803	-86.92	804	-286.9	805	-486.8
806	-686.8	807	2126.	808	1726.	809	1426.	810	1126.
811	914.1	812	714.0	813	514.0	814	314.0	815	114.0
816	-86.00	817	-286.0	818	-486.0	819	-686.0	820	2129.
821	1729.	822	1429.	823	1129.	824	914.9	825	714.9
826	514.9	827	314.9	828	114.9	829	-85.13	830	-285.1
831	-485.1	832	-685.1	833	2132.	834	1732.	835	1432.
836	1132.	837	916.0	838	716.0	839	516.0	840	315.9
841	115.9	842	-84.06	843	-284.1	844	-484.1	845	-684.1
846	2136.	847	1736.	848	1436.	849	1136.	850	917.0
851	716.9	852	516.9	853	316.9	854	116.9	855	-83.12
856	-283.1	857	-483.1	858	-683.1	859	2140.	860	1740.
861	1440.	862	1140.	863	917.7	864	717.7	865	517.7
866	317.7	867	117.7	868	-82.31	869	-282.3	870	-482.3
871	-682.3	872	2144.	873	1744.	874	1444.	875	1144.
876	918.4	877	718.4	878	518.4	879	318.4	880	118.4
881	-81.60	882	-281.6	883	-481.6	884	-681.5	885	2147.
886	1747.	887	1447.	888	1147.	889	918.9	890	718.9
891	518.9	892	318.9	893	118.9	894	-81.14	895	-281.1
896	-481.1	897	-681.1	898	2164.	899	1764.	900	1464.

Case I output file

901	1164.	902	950.8	903	750.7	904	550.6	905	350.5
906	150.5	907	-49.52	908	-248.7	909	-448.3	910	-648.2
911	2175.	912	1775.	913	1475.	914	1175.	915	971.4
916	771.4	917	571.4	918	371.3	919	171.3	920	-28.67
921	-227.9	922	-427.4	923	-627.2	924	2186.	925	1786.
926	1486.	927	1186.	928	992.0	929	792.0	930	592.1
931	392.1	932	192.2	933	-7.836	934	-206.9	935	-406.4
936	-606.2	937	2197.	938	1797.	939	1497.	940	1197.
941	1013.	942	812.8	943	612.9	944	413.0	945	213.0
946	13.07	947	-185.8	948	-385.2	949	-585.0	950	2208.
951	1809.	952	1509.	953	1209.	954	1033.	955	833.6
956	633.9	957	434.0	958	234.1	959	34.16	960	-164.3
961	-363.7	962	-563.4	963	2220.	964	1820.	965	1520.
966	1220.	967	1054.	968	854.7	969	655.1	970	455.3
971	255.5	972	55.64	973	-142.4	974	-341.2	975	-540.6
976	2231.	977	1831.	978	1531.	979	1231.	980	1075.
981	875.8	982	676.4	983	477.1	984	277.7	985	77.68
986	-117.2	987	-316.5	988	-516.4	989	2242.	990	1842.
991	1542.	992	1242.	993	1096.	994	896.7	995	697.5
996	498.7	997	300.3	998	103.4	999	-92.54	1000	-294.2
1001	-494.9	1002	2253.	1003	1853.	1004	1553.	1005	1253.
1006	1116.	1007	917.0	1008	717.8	1009	518.7	1010	319.7
1011	120.4	1012	-79.87	1013	-278.3	1014	-477.8	1015	2263.
1016	1863.	1017	1564.	1018	1264.	1019	1136.	1020	937.0
1021	737.7	1022	538.3	1023	338.8	1024	139.1	1025	-60.71
1026	-260.1	1027	-459.7	1028	2274.	1029	1874.	1030	1574.
1031	1274.	1032	1156.	1033	957.3	1034	758.0	1035	558.5
1036	358.9	1037	159.1	1038	-40.88	1039	-240.0	1040	-439.7
1041	2286.	1042	1886.	1043	1586.	1044	1287.	1045	1182.
1046	982.1	1047	782.5	1048	582.7	1049	382.9	1050	183.0
1051	-16.92	1052	-216.6	1053	-416.5	1054	2301.	1055	1901.
1056	1601.	1057	1302.	1058	1189.	1059	989.5	1060	789.7
1061	589.9	1062	390.1	1063	190.1	1064	-9.828	1065	-209.7
1066	-409.7	1067	2316.	1068	1916.	1069	1616.	1070	1316.
1071	1197.	1072	997.1	1073	797.3	1074	597.4	1075	397.5
1076	197.6	1077	-2.358	1078	-202.2	1079	-402.2	1080	2330.
1081	1930.	1082	1630.	1083	1331.	1084	1205.	1085	1005.
1086	805.1	1087	605.2	1088	405.3	1089	205.4	1090	5.419
1091	-194.4	1092	-394.4	1093	2344.	1094	1944.	1095	1645.
1096	1345.	1097	1213.	1098	1013.	1099	813.2	1100	613.3
1101	413.4	1102	213.4	1103	13.46	1104	-186.4	1105	-386.3
1106	2358.	1107	1958.	1108	1659.	1109	1359.	1110	1221.
1111	1021.	1112	821.5	1113	621.6	1114	421.7	1115	221.7
1116	21.74	1117	-178.1	1118	-378.0	1119	2372.	1120	1972.
1121	1672.	1122	1373.	1123	1230.	1124	1030.	1125	830.0
1126	630.1	1127	430.2	1128	230.2	1129	30.24	1130	-169.6
1131	-369.5	1132	2386.	1133	1986.	1134	1686.	1135	1386.
1136	1238.	1137	1039.	1138	838.7	1139	638.8	1140	438.9
1141	238.9	1142	38.94	1143	-160.8	1144	-360.8	1145	2399.
1146	1999.	1147	1699.	1148	1400.	1149	1247.	1150	1047.
1151	847.6	1152	647.7	1153	447.8	1154	247.8	1155	47.82
1156	-151.9	1157	-351.9	1158	2413.	1159	2013.	1160	1713.
1161	1413.	1162	1256.	1163	1057.	1164	856.7	1165	656.8
1166	456.8	1167	256.9	1168	56.87	1169	-142.8	1170	-342.8
1171	2426.	1172	2026.	1173	1726.	1174	1426.	1175	1266.
1176	1066.	1177	865.9	1178	666.0	1179	466.0	1180	266.1

Case I output file

1181	66.08	1182	-133.5	1183	-333.5	1184	2439.	1185	2039.
1186	1739.	1187	1439.	1188	1275.	1189	1075.	1190	875.2
1191	675.3	1192	475.4	1193	275.4	1194	75.48	1195	-124.1
1196	-324.0	1197	2452.	1198	2052.	1199	1752.	1200	1452.
1201	1284.	1202	1084.	1203	884.6	1204	684.8	1205	484.9
1206	285.1	1207	85.00	1208	-113.9	1209	-313.6	1210	2465.
1211	2065.	1212	1765.	1213	1465.	1214	1293.	1215	1094.
1216	893.8	1217	694.0	1218	494.4	1219	295.0	1220	96.10
1221	-102.5	1222	-303.1	1223	2477.	1224	2077.	1225	1777.
1226	1477.	1227	1302.	1228	1102.	1229	902.6	1230	702.8
1231	503.1	1232	303.3	1233	103.4	1234	-96.70	1235	-296.3
1236	2490.	1237	2090.	1238	1790.	1239	1490.	1240	1311.
1241	1111.	1242	911.2	1243	711.3	1244	511.4	1245	311.5
1246	111.5	1247	-88.45	1248	-288.4	1249	2503.	1250	2103.
1251	1803.	1252	1503.	1253	1320.	1254	1120.	1255	919.7
1256	719.8	1257	519.8	1258	319.8	1259	119.9	1260	-80.14
1261	-280.1	1262	2515.	1263	2115.	1264	1815.	1265	1515.
1266	1328.	1267	1128.	1268	928.2	1269	728.3	1270	528.3
1271	328.3	1272	128.3	1273	-71.68	1274	-271.6	1275	2528.
1276	2128.	1277	1828.	1278	1528.	1279	1337.	1280	1137.
1281	936.8	1282	736.8	1283	536.8	1284	336.8	1285	136.8
1286	-63.17	1287	-263.1	1288	2540.	1289	2140.	1290	1840.
1291	1540.	1292	1345.	1293	1145.	1294	945.3	1295	745.3
1296	545.4	1297	345.4	1298	145.4	1299	-54.63	1300	-254.6
1301	2553.	1302	2153.	1303	1853.	1304	1553.	1305	1354.
1306	1154.	1307	953.9	1308	753.9	1309	553.9	1310	353.9
1311	153.9	1312	-46.07	1313	-246.0	1314	2565.	1315	2165.
1316	1865.	1317	1565.	1318	1363.	1319	1163.	1320	962.5
1321	762.5	1322	562.5	1323	362.5	1324	162.5	1325	-37.51
1326	-237.4	1327	2577.	1328	2177.	1329	1877.	1330	1577.
1331	1371.	1332	1171.	1333	971.1	1334	771.1	1335	571.1
1336	371.1	1337	171.0	1338	-28.95	1339	-228.9	1340	2590.
1341	2190.	1342	1890.	1343	1590.	1344	1380.	1345	1180.
1346	979.6	1347	779.6	1348	579.6	1349	379.6	1350	179.6
1351	-20.41	1352	-220.4	1353	2602.	1354	2202.	1355	1902.
1356	1602.	1357	1388.	1358	1188.	1359	988.2	1360	788.1
1361	588.1	1362	388.1	1363	188.1	1364	-11.90	1365	-211.4
1366	2620.	1367	2220.	1368	1920.	1369	1620.	1370	1400.
1371	1200.	1372	1000.	1373	800.0	1374	600.0	1375	400.0
1376	200.0	1377	0.	1378	-201.5				

*** LIST OF PARTIALLY SATURATED ELEMENTS ***

ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE
9	0.3139	10	0.3047	11	0.3028	12	0.3020	21	0.3141
22	0.3047	23	0.3028	24	0.3020	33	0.3144	34	0.3047
35	0.3028	36	0.3020	45	0.3147	46	0.3047	47	0.3028
48	0.3020	57	0.3150	58	0.3048	59	0.3028	60	0.3020
69	0.3153	70	0.3048	71	0.3028	72	0.3020	81	0.3156
82	0.3048	83	0.3029	84	0.3020	93	0.3159	94	0.3049
95	0.3029	96	0.3020	105	0.3163	106	0.3049	107	0.3029

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108	0.3020	117	0.3167	118	0.3049	119	0.3029	120	0.3020
129	0.3170	130	0.3050	131	0.3029	132	0.3021	141	0.3174
142	0.3050	143	0.3029	144	0.3021	153	0.3179	154	0.3050
155	0.3029	156	0.3021	165	0.3183	166	0.3051	167	0.3029
168	0.3021	177	0.3188	178	0.3051	179	0.3029	180	0.3021
189	0.3192	190	0.3051	191	0.3030	192	0.3021	201	0.3198
202	0.3052	203	0.3030	204	0.3021	213	0.3203	214	0.3052
215	0.3030	216	0.3021	225	0.3209	226	0.3052	227	0.3030
228	0.3021	237	0.3215	238	0.3053	239	0.3030	240	0.3021
249	0.3221	250	0.3053	251	0.3030	252	0.3021	261	0.3228
262	0.3054	263	0.3030	264	0.3021	273	0.3235	274	0.3054
275	0.3030	276	0.3021	285	0.3243	286	0.3054	287	0.3031
288	0.3021	297	0.3251	298	0.3055	299	0.3031	300	0.3021
309	0.3260	310	0.3055	311	0.3031	312	0.3021	321	0.3269
322	0.3056	323	0.3031	324	0.3021	333	0.3279	334	0.3056
335	0.3031	336	0.3022	345	0.3290	346	0.3056	347	0.3031
348	0.3022	357	0.3302	358	0.3057	359	0.3031	360	0.3022
369	0.3315	370	0.3057	371	0.3031	372	0.3022	381	0.3329
382	0.3058	383	0.3032	384	0.3022	393	0.3344	394	0.3058
395	0.3032	396	0.3022	405	0.3361	406	0.3059	407	0.3032
408	0.3022	417	0.3379	418	0.3059	419	0.3032	420	0.3022
429	0.3400	430	0.3060	431	0.3032	432	0.3022	441	0.3422
442	0.3060	443	0.3032	444	0.3022	453	0.3448	454	0.3061
455	0.3032	456	0.3022	465	0.3476	466	0.3061	467	0.3033
468	0.3022	477	0.3510	478	0.3062	479	0.3033	480	0.3022
489	0.3550	490	0.3062	491	0.3033	492	0.3022	501	0.3600
502	0.3063	503	0.3033	504	0.3022	513	0.3661	514	0.3063
515	0.3033	516	0.3023	525	0.3736	526	0.3064	527	0.3033
528	0.3023	537	0.3830	538	0.3065	539	0.3034	540	0.3023
549	0.3950	550	0.3065	551	0.3034	552	0.3023	561	0.4111
562	0.3066	563	0.3034	564	0.3023	573	0.4337	574	0.3067
575	0.3034	576	0.3023	585	0.4675	586	0.3067	587	0.3034
588	0.3023	597	0.5236	598	0.3068	599	0.3034	600	0.3023
609	0.6338	610	0.3069	611	0.3035	612	0.3023	621	0.9067
622	0.3069	623	0.3035	624	0.3023	634	0.3070	635	0.3035
636	0.3023	646	0.3070	647	0.3035	648	0.3023	658	0.3071
659	0.3035	660	0.3023	670	0.3072	671	0.3035	672	0.3024
682	0.3072	683	0.3036	684	0.3024	694	0.3073	695	0.3036
696	0.3024	706	0.3073	707	0.3036	708	0.3024	718	0.3074
719	0.3036	720	0.3024	730	0.3074	731	0.3036	732	0.3024
742	0.3074	743	0.3036	744	0.3024	754	0.3075	755	0.3036
756	0.3024	766	0.3075	767	0.3036	768	0.3024	778	0.3075
779	0.3036	780	0.3024	790	0.3076	791	0.3036	792	0.3024
802	0.3076	803	0.3036	804	0.3024	814	0.3076	815	0.3037
816	0.3024	826	0.3084	827	0.3038	828	0.3025	838	0.3100
839	0.3041	840	0.3026	850	0.3117	851	0.3044	852	0.3027
862	0.3142	863	0.3047	864	0.3028	874	0.3180	875	0.3051
876	0.3029	886	0.3249	887	0.3055	888	0.3031	898	0.3417
899	0.3061	900	0.3033	910	0.4528	911	0.3068	912	0.3034
923	0.3074	924	0.3036	935	0.3082	936	0.3038	947	0.3092
948	0.3040	959	0.3107	960	0.3042	971	0.3121	972	0.3044
983	0.3130	984	0.3045	995	0.3139	996	0.3047	1007	0.3151
1008	0.3048	1019	0.3166	1020	0.3049	1031	0.3184	1032	0.3051
1043	0.3208	1044	0.3052	1055	0.3239	1056	0.3054	1067	0.3283
1068	0.3056	1079	0.3347	1080	0.3058	1091	0.3452	1092	0.3061
1103	0.3655	1104	0.3063	1115	0.4293	1116	0.3067	1128	0.3069

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1140	0.3072	1152	0.3075	1164	0.3079	1176	0.3083	1188	0.3087
1200	0.3092	1212	0.3097	1224	0.3104	1236	0.3111	1248	0.3119
1260	0.3129								

*** ELEMENTAL FLUID VELOCITY ***

ELEMENT	X-VELOCITY	Y-VELOCITY	ELEMENT	X-VELOCITY	Y-VELOCITY	ELEMENT	X-VELOCITY	Y-VELOCITY
1	-3.396e-08	-6.834e-15	2	-3.396e-08	-2.194e-14	3	-3.396e-08	-3.834e-14
4	-6.904e-08	-6.324e-14	5	-6.904e-08	-9.984e-14	6	-6.904e-08	-1.472e-13
7	-6.904e-08	-2.125e-13	8	-6.904e-08	-3.076e-13	9	-2.598e-11	-3.491e-12
10	-2.632e-13	-7.134e-14	11	-8.368e-14	-2.365e-14	12	-3.904e-14	-5.828e-15
13	-3.396e-08	-1.425e-14	14	-3.396e-08	-4.368e-14	15	-3.396e-08	-7.159e-14
16	-6.904e-08	-1.069e-13	17	-6.904e-08	-1.533e-13	18	-6.904e-08	-2.036e-13
19	-6.904e-08	-2.590e-13	20	-6.904e-08	-3.194e-13	21	-2.833e-11	6.849e-13
22	-3.159e-13	7.366e-15	23	-1.142e-13	1.045e-15	24	-5.821e-14	8.345e-17
25	-3.396e-08	-1.430e-14	26	-3.396e-08	-4.214e-14	27	-3.396e-08	-6.507e-14
28	-6.904e-08	-8.804e-14	29	-6.904e-08	-1.140e-13	30	-6.904e-08	-1.354e-13
31	-6.904e-08	-1.490e-13	32	-6.904e-08	-1.496e-13	33	-2.912e-11	-3.009e-13
34	-3.111e-13	-1.286e-15	35	-1.113e-13	9.748e-17	36	-5.669e-14	7.930e-17
37	-3.396e-08	-1.420e-14	38	-3.396e-08	-4.211e-14	39	-3.396e-08	-6.589e-14
40	-6.904e-08	-9.212e-14	41	-6.904e-08	-1.250e-13	42	-6.904e-08	-1.594e-13
43	-6.904e-08	-1.973e-13	44	-6.904e-08	-2.423e-13	45	-3.036e-11	-7.685e-14
46	-3.168e-13	-6.625e-16	47	-1.126e-13	-2.631e-16	48	-5.710e-14	-6.879e-17
49	-3.396e-08	-1.513e-14	50	-3.396e-08	-4.478e-14	51	-3.396e-08	-7.020e-14
52	-6.904e-08	-9.826e-14	53	-6.904e-08	-1.326e-13	54	-6.904e-08	-1.664e-13
55	-6.904e-08	-1.989e-13	56	-6.904e-08	-2.285e-13	57	-3.158e-11	-1.389e-13
58	-3.205e-13	-6.135e-16	59	-1.134e-13	-1.167e-16	60	-5.743e-14	-2.210e-17
61	-3.396e-08	-1.619e-14	62	-3.396e-08	-4.767e-14	63	-3.396e-08	-7.461e-14
64	-6.904e-08	-1.044e-13	65	-6.904e-08	-1.409e-13	66	-6.904e-08	-1.774e-13
67	-6.904e-08	-2.142e-13	68	-6.904e-08	-2.521e-13	69	-3.290e-11	-1.340e-13
70	-3.248e-13	-6.711e-16	71	-1.143e-13	-1.583e-16	72	-5.773e-14	-3.335e-17
73	-3.396e-08	-1.735e-14	74	-3.396e-08	-5.084e-14	75	-3.396e-08	-7.953e-14
76	-6.904e-08	-1.114e-13	77	-6.904e-08	-1.502e-13	78	-6.904e-08	-1.890e-13
79	-6.904e-08	-2.276e-13	80	-6.904e-08	-2.659e-13	81	-3.430e-11	-1.458e-13
82	-3.290e-13	-6.652e-16	83	-1.151e-13	-1.504e-16	84	-5.805e-14	-3.140e-17
85	-3.396e-08	-1.861e-14	86	-3.396e-08	-5.431e-14	87	-3.396e-08	-8.487e-14
88	-6.904e-08	-1.190e-13	89	-6.904e-08	-1.603e-13	90	-6.904e-08	-2.016e-13
91	-6.904e-08	-2.429e-13	92	-6.904e-08	-2.843e-13	93	-3.578e-11	-1.546e-13
94	-3.333e-13	-6.812e-16	95	-1.160e-13	-1.540e-16	96	-5.837e-14	-3.205e-17
97	-3.396e-08	-1.998e-14	98	-3.396e-08	-5.808e-14	99	-3.396e-08	-9.070e-14
100	-6.904e-08	-1.272e-13	101	-6.904e-08	-1.713e-13	102	-6.904e-08	-2.154e-13
103	-6.904e-08	-2.595e-13	104	-6.904e-08	-3.034e-13	105	-3.737e-11	-1.651e-13
106	-3.377e-13	-6.911e-16	107	-1.169e-13	-1.552e-16	108	-5.869e-14	-3.225e-17
109	-3.396e-08	-2.148e-14	110	-3.396e-08	-6.220e-14	111	-3.396e-08	-9.706e-14
112	-6.904e-08	-1.362e-13	113	-6.904e-08	-1.834e-13	114	-6.904e-08	-2.305e-13
115	-6.904e-08	-2.775e-13	116	-6.904e-08	-3.245e-13	117	-3.907e-11	-1.764e-13
118	-3.422e-13	-7.031e-16	119	-1.179e-13	-1.569e-16	120	-5.902e-14	-3.253e-17
121	-3.395e-08	-2.312e-14	122	-3.395e-08	-6.671e-14	123	-3.395e-08	-1.040e-13
124	-6.904e-08	-1.461e-13	125	-6.904e-08	-1.965e-13	126	-6.904e-08	-2.470e-13
127	-6.904e-08	-2.973e-13	128	-6.904e-08	-3.476e-13	129	-4.088e-11	-1.887e-13
130	-3.468e-13	-7.149e-16	131	-1.188e-13	-1.585e-16	132	-5.934e-14	-3.280e-17

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133	-3.395e-08	-2.492e-14	134	-3.395e-08	-7.165e-14	135	-3.395e-08	-1.117e-13
136	-6.904e-08	-1.569e-13	137	-6.904e-08	-2.110e-13	138	-6.904e-08	-2.650e-13
139	-6.904e-08	-3.190e-13	140	-6.904e-08	-3.729e-13	141	-4.282e-11	-2.023e-13
142	-3.515e-13	-7.270e-16	143	-1.197e-13	-1.601e-16	144	-5.967e-14	-3.307e-17
145	-3.395e-08	-2.689e-14	146	-3.395e-08	-7.708e-14	147	-3.395e-08	-1.200e-13
148	-6.904e-08	-1.687e-13	149	-6.904e-08	-2.268e-13	150	-6.904e-08	-2.848e-13
151	-6.904e-08	-3.428e-13	152	-6.904e-08	-4.006e-13	153	-4.491e-11	-2.171e-13
154	-3.563e-13	-7.395e-16	155	-1.207e-13	-1.618e-16	156	-6.000e-14	-3.334e-17
157	-3.395e-08	-2.907e-14	158	-3.395e-08	-8.306e-14	159	-3.395e-08	-1.293e-13
160	-6.904e-08	-1.818e-13	161	-6.904e-08	-2.443e-13	162	-6.904e-08	-3.067e-13
163	-6.904e-08	-3.690e-13	164	-6.904e-08	-4.312e-13	165	-4.715e-11	-2.335e-13
166	-3.612e-13	-7.522e-16	167	-1.216e-13	-1.635e-16	168	-6.034e-14	-3.362e-17
169	-3.395e-08	-3.147e-14	170	-3.395e-08	-8.966e-14	171	-3.395e-08	-1.395e-13
172	-6.904e-08	-1.962e-13	173	-6.904e-08	-2.635e-13	174	-6.904e-08	-3.308e-13
175	-6.904e-08	-3.979e-13	176	-6.904e-08	-4.650e-13	177	-4.956e-11	-2.516e-13
178	-3.661e-13	-7.653e-16	179	-1.226e-13	-1.652e-16	180	-6.068e-14	-3.390e-17
181	-3.395e-08	-3.413e-14	182	-3.395e-08	-9.697e-14	183	-3.395e-08	-1.508e-13
184	-6.904e-08	-2.121e-13	185	-6.904e-08	-2.848e-13	186	-6.904e-08	-3.574e-13
187	-6.904e-08	-4.299e-13	188	-6.904e-08	-5.023e-13	189	-5.217e-11	-2.716e-13
190	-3.712e-13	-7.787e-16	191	-1.236e-13	-1.669e-16	192	-6.102e-14	-3.419e-17
193	-3.395e-08	-3.708e-14	194	-3.395e-08	-1.051e-13	195	-3.395e-08	-1.633e-13
196	-6.904e-08	-2.298e-13	197	-6.904e-08	-3.085e-13	198	-6.904e-08	-3.870e-13
199	-6.904e-08	-4.654e-13	200	-6.904e-08	-5.437e-13	201	-5.498e-11	-2.938e-13
202	-3.764e-13	-7.924e-16	203	-1.246e-13	-1.687e-16	204	-6.136e-14	-3.447e-17
205	-3.395e-08	-4.036e-14	206	-3.395e-08	-1.141e-13	207	-3.395e-08	-1.772e-13
208	-6.904e-08	-2.495e-13	209	-6.904e-08	-3.348e-13	210	-6.904e-08	-4.199e-13
211	-6.904e-08	-5.049e-13	212	-6.904e-08	-5.897e-13	213	-5.803e-11	-3.184e-13
214	-3.817e-13	-8.065e-16	215	-1.256e-13	-1.705e-16	216	-6.171e-14	-3.476e-17
217	-3.395e-08	-4.402e-14	218	-3.395e-08	-1.242e-13	219	-3.395e-08	-1.928e-13
220	-6.904e-08	-2.715e-13	221	-6.904e-08	-3.641e-13	222	-6.904e-08	-4.567e-13
223	-6.904e-08	-5.490e-13	224	-6.904e-08	-6.411e-13	225	-6.133e-11	-3.459e-13
226	-3.871e-13	-8.209e-16	227	-1.266e-13	-1.723e-16	228	-6.206e-14	-3.506e-17
229	-3.395e-08	-4.813e-14	230	-3.395e-08	-1.354e-13	231	-3.395e-08	-2.102e-13
232	-6.904e-08	-2.961e-13	233	-6.904e-08	-3.970e-13	234	-6.904e-08	-4.978e-13
235	-6.904e-08	-5.983e-13	236	-6.904e-08	-6.986e-13	237	-6.493e-11	-3.767e-13
238	-3.926e-13	-8.357e-16	239	-1.276e-13	-1.741e-16	240	-6.241e-14	-3.535e-17
241	-3.395e-08	-5.274e-14	242	-3.395e-08	-1.481e-13	243	-3.395e-08	-2.297e-13
244	-6.904e-08	-3.237e-13	245	-6.904e-08	-4.339e-13	246	-6.904e-08	-5.439e-13
247	-6.904e-08	-6.537e-13	248	-6.904e-08	-7.631e-13	249	-6.886e-11	-4.113e-13
250	-3.983e-13	-8.509e-16	251	-1.286e-13	-1.760e-16	252	-6.276e-14	-3.565e-17
253	-3.395e-08	-5.793e-14	254	-3.395e-08	-1.624e-13	255	-3.395e-08	-2.517e-13
256	-6.904e-08	-3.549e-13	257	-6.904e-08	-4.755e-13	258	-6.904e-08	-5.959e-13
259	-6.904e-08	-7.160e-13	260	-6.904e-08	-8.359e-13	261	-7.315e-11	-4.502e-13
262	-4.040e-13	-8.664e-16	263	-1.297e-13	-1.778e-16	264	-6.312e-14	-3.595e-17
265	-3.395e-08	-6.381e-14	266	-3.395e-08	-1.785e-13	267	-3.395e-08	-2.767e-13
268	-6.904e-08	-3.901e-13	269	-6.904e-08	-5.225e-13	270	-6.904e-08	-6.547e-13
271	-6.904e-08	-7.866e-13	272	-6.904e-08	-9.181e-13	273	-7.786e-11	-4.942e-13
274	-4.099e-13	-8.824e-16	275	-1.308e-13	-1.798e-16	276	-6.348e-14	-3.626e-17
277	-3.395e-08	-7.049e-14	278	-3.395e-08	-1.969e-13	279	-3.395e-08	-3.050e-13
280	-6.904e-08	-4.301e-13	281	-6.904e-08	-5.759e-13	282	-6.904e-08	-7.215e-13
283	-6.904e-08	-8.666e-13	284	-6.904e-08	-1.011e-12	285	-8.303e-11	-5.441e-13
286	-4.159e-13	-8.988e-16	287	-1.318e-13	-1.817e-16	288	-6.385e-14	-3.657e-17
289	-3.395e-08	-7.810e-14	290	-3.395e-08	-2.178e-13	291	-3.395e-08	-3.373e-13
292	-6.904e-08	-4.757e-13	293	-6.904e-08	-6.368e-13	294	-6.904e-08	-7.976e-13
295	-6.904e-08	-9.579e-13	296	-6.904e-08	-1.118e-12	297	-8.874e-11	-6.010e-13
298	-4.221e-13	-9.156e-16	299	-1.329e-13	-1.837e-16	300	-6.421e-14	-3.688e-17

Case I output file

301	-3.395e-08	-8.683e-14	302	-3.395e-08	-2.418e-13	303	-3.395e-08	-3.743e-13
304	-6.903e-08	-5.279e-13	305	-6.903e-08	-7.066e-13	306	-6.903e-08	-8.848e-13
307	-6.903e-08	-1.062e-12	308	-6.903c-08	-1.240e-12	309	-9.506e-11	-6.661e-13
310	-4.284e-13	-9.329e-16	311	-1.340e-13	-1.857e-16	312	-6.459e-14	-3.719e-17
313	-3.395e-08	-9.688e-14	314	-3.395e-08	-2.694e-13	315	-3.395e-08	-4.169e-13
316	-6.903e-08	-5.881e-13	317	-6.903e-08	-7.868e-13	318	-6.903e-08	-9.851e-13
319	-6.903e-08	-1.183e-12	320	-6.903e-08	-1.380e-12	321	-1.021e-10	-7.411e-13
322	-4.348e-13	-9.506e-16	323	-1.352e-13	-1.877e-16	324	-6.496e-14	-3.751e-17
325	-3.395e-08	-1.085e-13	326	-3.395e-08	-3.014e-13	327	-3.395e-08	-4.662e-13
328	-6.903e-08	-6.577e-13	329	-6.903e-08	-8.797e-13	330	-6.903e-08	-1.101e-12
331	-6.903e-08	-1.322e-12	332	-6.903e-08	-1.542e-12	333	-1.099e-10	-8.277e-13
334	-4.414e-13	-9.688e-16	335	-1.363e-13	-1.897e-16	336	-6.534e-14	-3.783e-17
337	-3.395e-08	-1.221e-13	338	-3.395e-08	-3.385e-13	339	-3.395e-08	-5.237e-13
340	-6.903e-08	-7.385e-13	341	-6.903e-08	-9.876e-13	342	-6.903e-08	-1.236e-12
343	-6.903e-08	-1.483e-12	344	-6.903e-08	-1.730e-12	345	-1.187e-10	-9.283e-13
346	-4.481e-13	-9.875e-16	347	-1.374e-13	-1.918e-16	348	-6.572e-14	-3.815e-17
349	-3.395e-08	-1.378e-13	350	-3.395e-08	-3.824e-13	351	-3.395e-08	-5.903e-13
352	-6.903e-08	-8.340e-13	353	-6.903e-08	-1.115e-12	354	-6.903e-08	-1.393e-12
355	-6.903e-08	-1.673e-12	356	-6.903e-08	-1.950e-12	357	-1.285e-10	-1.046e-12
358	-4.550e-13	-1.007e-15	359	-1.386e-13	-1.939e-16	360	-6.610e-14	-3.847e-17
361	-3.395e-08	-1.568e-13	362	-3.395e-08	-4.322e-13	363	-3.395e-08	-6.718e-13
364	-6.903e-08	-9.425e-13	365	-6.903e-08	-1.260e-12	366	-6.903e-08	-1.582e-12
367	-6.903e-08	-1.896e-12	368	-6.903e-08	-2.209e-12	369	-1.397e-10	-1.184e-12
370	-4.621e-13	-1.026e-15	371	-1.398e-13	-1.960e-16	372	-6.649e-14	-3.880e-17
373	-3.395e-08	-1.782e-13	374	-3.395e-08	-4.995e-13	375	-3.395e-08	-7.551e-13
376	-6.903e-08	-1.088e-12	377	-6.903e-08	-1.451e-12	378	-6.903e-08	-1.791e-12
379	-6.903e-08	-2.156e-12	380	-6.903e-08	-2.516e-12	381	-1.523e-10	-1.348e-12
382	-4.693e-13	-1.047e-15	383	-1.410e-13	-1.981e-16	384	-6.688e-14	-3.912e-17
385	-3.395e-08	-2.051e-13	386	-3.395e-08	-5.438e-13	387	-3.395e-08	-9.109e-13
388	-6.902e-08	-1.189e-12	389	-6.902e-08	-1.596e-12	390	-6.902e-08	-2.098e-12
391	-6.902e-08	-2.490e-12	392	-6.903e-08	-2.885e-12	393	-1.667e-10	-1.544e-12
394	-4.766e-13	-1.067e-15	395	-1.422e-13	-2.002e-16	396	-6.727e-14	-3.944e-17
397	-3.395e-08	-2.409e-13	398	-3.395e-08	-7.363e-13	399	-3.395e-08	-8.378e-13
400	-6.902e-08	-1.605e-12	401	-6.902e-08	-2.130e-12	402	-6.902e-08	-2.230e-12
403	-6.902e-08	-2.763e-12	404	-6.902e-08	-3.302e-12	405	-1.833e-10	-1.780e-12
406	-4.842e-13	-1.089e-15	407	-1.434e-13	-2.026e-16	408	-6.766e-14	-3.981e-17
409	-3.394e-08	-1.774e-13	410	-3.394e-08	-3.258e-13	411	-3.394e-08	-1.813e-12
412	-6.902e-08	-7.689e-13	413	-6.902e-08	-1.075e-12	414	-6.902e-08	-3.254e-12
415	-6.902e-08	-3.702e-12	416	-6.902e-08	-3.975e-12	417	-2.025e-10	-2.066e-12
418	-4.919e-13	-1.110e-15	419	-1.446e-13	-2.040e-16	420	-6.806e-14	-3.993e-17
421	-3.394e-08	-6.783e-13	422	-3.394e-08	-2.041e-12	423	-3.394e-08	2.317e-12
424	-6.901e-08	-4.894e-12	425	-6.902e-08	-7.019e-12	426	-6.902e-08	-8.973e-13
427	-6.902e-08	-1.641e-12	428	-6.902e-08	-3.736e-12	429	-2.249e-10	-2.414e-12
430	-4.998e-13	-1.131e-15	431	-1.459e-13	-2.076e-16	432	-6.847e-14	-4.078e-17
433	-3.394e-08	3.434e-12	434	-3.394e-08	7.140e-12	435	-3.394e-08	-1.334e-11
436	-6.902e-08	1.569e-11	437	-6.901e-08	2.271e-11	438	-6.901e-08	-7.703e-12
439	-6.901e-08	-1.186e-11	440	-6.901e-08	-8.263e-12	441	-2.512e-10	-2.863e-12
442	-5.079e-13	-1.178e-15	443	-1.472e-13	-2.106e-16	444	-6.888e-14	-4.045e-17
445	-3.395e-08	-7.876e-12	446	-3.397e-08	-4.270e-12	447	-3.394e-08	8.727e-11
448	-6.895e-08	-5.069e-11	449	-6.900e-08	-1.026e-10	450	-6.903e-08	1.420e-11
451	-6.901e-08	3.223e-11	452	-6.899e-08	9.879e-12	453	-2.823e-10	-3.315e-12
454	-5.159e-13	-8.741e-16	455	-1.483e-13	-1.211e-16	456	-6.921e-14	-1.990e-17
457	-3.400e-08	6.654e-11	458	-3.393e-08	7.340e-11	459	-3.404e-08	-2.559e-10
460	-6.938e-08	4.494e-10	461	-6.905e-08	7.784e-10	462	-6.880e-08	2.769e-10
463	-6.876e-08	6.578e-11	464	-6.877e-08	1.535e-12	465	-3.187e-10	-4.095e-12
466	-5.233e-13	-1.864e-15	467	-1.495e-13	-4.925e-16	468	-6.966e-14	-1.175e-16

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469	-3.530e-08	5.863e-10	470	-3.467e-08	1.714e-09	471	-3.310e-08	2.969e-09
472	-6.552e-08	-1.325e-09	473	-6.721e-08	-4.227e-09	474	-6.908e-08	-2.809e-09
475	-7.008e-08	-1.614e-09	476	-7.051e-08	-5.365e-10	477	-3.747e-10	-7.987e-12
478	-5.485e-13	-7.999e-15	479	-1.558e-13	-2.147e-15	480	-7.248e-14	-4.967e-16
481	-3.900e-08	5.449e-10	482	-3.969e-08	1.584e-09	483	-4.137e-08	2.712e-09
484	-1.382e-10	1.234e-11	485	-8.079e-08	-4.000e-09	486	-7.885e-08	-2.675e-09
487	-7.781e-08	-1.543e-09	488	-7.736e-08	-5.173e-10	489	-4.765e-10	-1.071e-11
490	-6.060e-13	-7.984e-15	491	-1.696e-13	-2.104e-15	492	-7.832e-14	-4.844e-16
493	-4.002e-08	2.403e-11	494	-4.002e-08	-4.968e-11	495	-3.978e-08	-4.619e-10
496	-1.299e-10	4.041e-11	497	-7.833e-08	9.115e-10	498	-7.868e-08	3.750e-10
499	-7.878e-08	1.153e-10	500	-7.879e-08	8.627e-12	501	-5.793e-10	-1.059e-11
502	-6.318e-13	-2.067e-15	503	-1.757e-13	-4.887e-16	504	-8.099e-14	-1.127e-16
505	-4.000e-08	-1.391e-12	506	-3.998e-08	2.231e-11	507	-4.002e-08	1.563e-10
508	-1.312e-10	6.180e-11	509	-7.855e-08	-2.050e-10	510	-7.852e-08	-1.044e-10
511	-7.855e-08	-4.021e-11	512	-7.858e-08	-2.759e-11	513	-7.013e-10	-1.408e-11
514	-6.431e-13	-1.591e-15	515	-1.774e-13	-2.428e-16	516	-8.156e-14	-4.436e-17
517	-4.007e-08	2.040e-11	518	-4.008e-08	5.219e-11	519	-4.006e-08	4.856e-11
520	-1.313e-10	8.435e-11	521	-7.749e-08	5.868e-11	522	-7.876e-08	-5.208e-11
523	-7.872e-08	-5.217e-11	524	-7.870e-08	-4.407e-11	525	-8.697e-10	-1.953e-11
526	-6.564e-13	-1.793e-15	527	-1.793e-13	-3.203e-16	528	-8.215e-14	-5.986e-17
529	-4.017e-08	2.100e-11	530	-4.017e-08	5.787e-11	531	-4.016e-08	9.720e-11
532	-1.313e-10	1.079e-10	533	-7.727e-08	8.691e-11	534	-7.856e-08	6.165e-11
535	-7.856e-08	1.268e-11	536	-7.857e-08	-3.335e-11	537	-1.104e-09	-2.749e-11
538	-6.686e-13	-1.669e-15	539	-1.809e-13	-1.741e-16	540	-8.262e-14	-3.272e-17
541	-4.029e-08	2.731e-11	542	-4.029e-08	7.514e-11	543	-4.028e-08	1.139e-10
544	-1.313e-10	1.353e-10	545	-7.704e-08	1.085e-10	546	-7.832e-08	5.082e-11
547	-7.832e-08	-1.576e-12	548	-7.832e-08	-5.497e-11	549	-1.444e-09	-4.088e-11
550	-6.798e-13	-7.985e-16	551	-1.822e-13	-3.705e-16	552	-8.298e-14	-5.991e-17
553	-4.044e-08	3.359e-11	554	-4.044e-08	9.217e-11	555	-4.043e-08	1.426e-10
556	-1.313e-10	1.672e-10	557	-7.672e-08	1.316e-10	558	-7.800e-08	5.618e-11
559	-7.800e-08	-2.168e-11	560	-7.801e-08	-9.738e-11	561	-1.968e-09	-6.452e-11
562	-6.921e-13	-4.339e-15	563	-1.838e-13	4.813e-16	564	-8.321e-14	9.919e-17
565	-4.063e-08	4.125e-11	566	-4.063e-08	1.133e-10	567	-4.062e-08	1.745e-10
568	-1.312e-10	2.050e-10	569	-7.627e-08	1.437e-10	570	-7.755e-08	4.096e-11
571	-7.756e-08	-5.677e-11	572	-7.756e-08	-1.582e-10	573	-2.833e-09	-1.097e-10
574	-6.969e-13	1.317e-14	575	-1.828e-13	-1.843e-15	576	-8.308e-14	-3.795e-16
577	-4.086e-08	5.051e-11	578	-4.085e-08	1.387e-10	579	-4.084e-08	2.137e-10
580	-1.310e-10	2.510e-10	581	-7.557e-08	1.867e-10	582	-7.683e-08	-2.417e-11
583	-7.687e-08	-2.456e-10	584	-7.695e-08	-4.196e-10	585	-4.417e-09	-2.122e-10
586	-7.330e-13	-7.225e-14	587	-1.951e-13	1.343e-15	588	-8.703e-14	3.033e-16
589	-4.114e-08	6.225e-11	590	-4.113e-08	1.707e-10	591	-4.112e-08	2.625e-10
592	-1.307e-10	3.079e-10	593	-7.468e-08	1.460e-10	594	-7.473e-08	-2.346e-10
595	-7.603e-08	-5.527e-10	596	-7.606e-08	-6.595e-10	597	-7.767e-09	-4.648e-10
598	-6.948e-12	-7.390e-13	599	-1.749e-13	8.646e-16	600	-7.946e-14	2.262e-16
601	-4.149e-08	7.906e-11	602	-4.148e-08	2.164e-10	603	-4.146e-08	3.315e-10
604	-1.285e-10	3.877e-10	605	-7.134e-08	-1.760e-10	606	-7.157e-08	-1.302e-09
607	-7.330e-08	-2.474e-09	608	-7.428e-08	-3.772e-09	609	-1.711e-08	-1.525e-09
610	-7.280e-12	2.375e-13	611	-1.849e-13	1.587e-15	612	-8.167e-14	4.124e-16
613	-4.194e-08	1.048e-10	614	-4.192e-08	2.870e-10	615	-4.189e-08	4.404e-10
616	-1.237e-10	5.156e-10	617	-6.457e-08	-9.385e-11	618	-6.434e-08	-1.347e-09
619	-6.494e-08	-2.774e-09	620	-6.414e-08	-4.362e-09	621	-4.720e-08	-3.355e-09
622	-6.075e-12	4.796e-14	623	-1.550e-13	4.504e-15	624	-6.981e-14	1.015e-15
625	-4.255e-08	1.402e-10	626	-4.253e-08	3.849e-10	627	-4.249e-08	5.930e-10
628	-1.213e-10	6.964e-10	629	-6.060e-08	4.824e-10	630	-6.043e-08	7.758e-11
631	-6.013e-08	-3.183e-10	632	-6.070e-08	-6.514e-10	633	-6.041e-08	-2.035e-10
634	-5.998e-12	-1.192e-14	635	-1.504e-13	-5.062e-16	636	-6.689e-14	-6.387e-17

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637	-4.336e-08	1.827e-10	638	-4.333e-08	5.019e-10	639	-4.328e-08	7.743e-10
640	-1.216e-10	9.101e-10	641	-5.945e-08	8.331e-10	642	-5.943e-08	6.833e-10
643	-5.943e-08	5.638e-10	644	-5.947e-08	4.032e-10	645	-6.049e-08	9.773e-11
646	-6.109e-12	-5.495e-15	647	-1.518e-13	7.470e-17	648	-6.731e-14	1.498e-17
649	-4.439e-08	2.304e-10	650	-4.436e-08	6.330e-10	651	-4.430e-08	9.766e-10
652	-1.226e-10	1.148e-09	653	-5.849e-08	1.036e-09	654	-5.846e-08	8.082e-10
655	-5.842e-08	5.685e-10	656	-5.840e-08	3.310e-10	657	-5.936e-08	1.213e-10
658	-6.097e-12	4.369e-15	659	-1.504e-13	4.070e-16	660	-6.654e-14	1.076e-16
661	-4.567e-08	2.838e-10	662	-4.564e-08	7.797e-10	663	-4.558e-08	1.203e-09
664	-1.236e-10	1.414e-09	665	-5.723e-08	1.273e-09	666	-5.718e-08	9.914e-10
667	-5.715e-08	7.122e-10	668	-5.712e-08	4.336e-10	669	-5.806e-08	1.436e-10
670	-6.062e-12	5.251e-15	671	-1.483e-13	4.945e-16	672	-6.541e-14	1.219e-16
673	-4.724e-08	3.443e-10	674	-4.720e-08	9.458e-10	675	-4.713e-08	1.459e-09
676	-1.249e-10	1.715e-09	677	-5.568e-08	1.546e-09	678	-5.563e-08	1.206e-09
679	-5.559e-08	8.610e-10	680	-5.556e-08	5.104e-10	681	-5.648e-08	1.674e-10
682	-5.992e-12	1.097e-14	683	-1.454e-13	6.892e-16	684	-6.395e-14	1.851e-16
685	-4.913e-08	4.132e-10	686	-4.908e-08	1.135e-09	687	-4.900e-08	1.752e-09
688	-1.265e-10	2.059e-09	689	-5.385e-08	1.864e-09	690	-5.378e-08	1.473e-09
691	-5.372e-08	1.084e-09	692	-5.366e-08	6.989e-10	693	-5.451e-08	2.548e-10
694	-5.873e-12	1.345e-14	695	-1.414e-13	8.068e-16	696	-6.208e-14	1.345e-16
697	-5.101e-08	4.791e-10	698	-5.096e-08	1.316e-09	699	-5.087e-08	2.031e-09
700	-1.281e-10	2.387e-09	701	-5.208e-08	2.160e-09	702	-5.202e-08	1.706e-09
703	-5.199e-08	1.253e-09	704	-5.200e-08	8.024e-10	705	-5.203e-08	2.878e-10
706	-5.777e-12	1.128e-14	707	-1.382e-13	6.707e-16	708	-6.041e-14	5.088e-16
709	-5.283e-08	5.413e-10	710	-5.277e-08	1.487e-09	711	-5.267e-08	2.294e-09
712	-1.297e-10	2.697e-09	713	-5.032e-08	2.431e-09	714	-5.025e-08	1.897e-09
715	-5.020e-08	1.357e-09	716	-5.016e-08	8.090e-10	717	-5.014e-08	2.664e-10
718	-5.612e-12	5.595e-14	719	-1.324e-13	3.362e-15	720	-5.796e-14	-5.261e-16
721	-5.491e-08	6.116e-10	722	-5.485e-08	1.680e-09	723	-5.474e-08	2.593e-09
724	-1.314e-10	3.047e-09	725	-4.826e-08	2.745e-09	726	-4.818e-08	2.137e-09
727	-4.811e-08	1.528e-09	728	-4.807e-08	9.184e-10	729	-4.805e-08	3.069e-10
730	-5.513e-12	-1.365e-13	731	-1.383e-13	-1.653e-14	732	-6.226e-14	9.640e-16
733	-5.727e-08	6.901e-10	734	-5.720e-08	1.896e-09	735	-5.708e-08	2.922e-09
736	-1.333e-10	3.437e-09	737	-4.592e-08	3.093e-09	738	-4.583e-08	2.411e-09
739	-4.576e-08	1.724e-09	740	-4.572e-08	1.035e-09	741	-4.570e-08	3.449e-10
742	-5.164e-12	-1.350e-13	743	-1.134e-12	-1.562e-13	744	-4.738e-14	9.850e-16
745	-5.992e-08	7.757e-10	746	-5.985e-08	2.133e-09	747	-5.971e-08	3.303e-09
748	-1.355e-10	3.872e-09	749	-4.330e-08	3.500e-09	750	-4.319e-08	2.717e-09
751	-4.311e-08	1.940e-09	752	-4.306e-08	1.164e-09	753	-4.304e-08	3.882e-10
754	-4.900e-12	8.408e-14	755	-1.180e-12	4.086e-14	756	-5.140e-14	-4.527e-16
757	-6.348e-08	8.982e-10	758	-6.338e-08	2.457e-09	759	-6.325e-08	3.754e-09
760	-1.385e-10	4.453e-09	761	-3.976e-08	3.966e-09	762	-3.966e-08	3.113e-09
763	-3.957e-08	2.237e-09	764	-3.951e-08	1.347e-09	765	-3.948e-08	4.497e-10
766	-4.533e-12	6.880e-14	767	-1.071e-12	8.144e-15	768	-4.651e-14	8.102e-16
769	-6.823e-08	1.048e-09	770	-6.812e-08	2.919e-09	771	-6.785e-08	4.609e-09
772	-1.422e-10	5.211e-09	773	-3.518e-08	4.900e-09	774	-3.496e-08	3.750e-09
775	-3.483e-08	2.644e-09	776	-3.476e-08	1.572e-09	777	-3.473e-08	5.218e-10
778	-4.031e-12	8.584e-14	779	-9.495e-13	1.513e-14	780	-4.122e-14	3.229e-16
781	-7.326e-08	9.060e-10	782	-7.354e-08	2.554e-09	783	-7.406e-08	4.154e-09
784	-1.478e-10	6.105e-09	785	-2.880e-08	4.432e-09	786	-2.921e-08	3.307e-09
787	-2.950e-08	2.299e-09	788	-2.968e-08	1.357e-09	789	-2.977e-08	4.488e-10
790	-3.496e-12	7.708e-14	791	-8.052e-13	2.032e-14	792	-3.510e-14	1.444e-15
793	-7.658e-08	4.413e-10	794	-7.692e-08	1.158e-09	795	-7.762e-08	1.591e-09
796	-1.509e-11	7.127e-10	797	-2.524e-08	1.609e-09	798	-2.580e-08	1.403e-09
799	-2.615e-08	1.067e-09	800	-2.637e-08	6.627e-10	801	-2.647e-08	2.243e-10
802	-3.140e-12	1.579e-14	803	-7.343e-13	-2.709e-14	804	-3.417e-14	-4.069e-15

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805	-7.773e-08	1.932e-10	806	-7.768e-08	4.895e-10	807	-7.737e-08	6.563e-10
808	-1.503e-11	8.007e-10	809	-2.581e-08	8.353e-10	810	-2.543e-08	6.990e-10
811	-2.528e-08	5.312e-10	812	-2.523e-08	3.327e-10	813	-2.521e-08	1.132e-10
814	-3.027e-12	-1.171e-13	815	-6.897e-13	-5.344e-14	816	-2.730e-13	-3.886e-14
817	-7.811e-08	4.248e-11	818	-7.808e-08	1.372e-10	819	-7.802e-08	2.943e-10
820	-2.255e-10	6.093e-10	821	-2.502e-08	2.476e-10	822	-2.491e-08	1.343e-10
823	-2.485e-08	7.314e-11	824	-2.482e-08	3.638e-11	825	-2.481e-08	1.084e-11
826	-3.600e-12	-1.570e-13	827	-7.613e-13	-1.375e-14	828	-3.214e-13	-1.811e-15
829	-7.823e-08	3.521e-11	830	-7.829e-08	1.168e-10	831	-7.844e-08	2.323e-10
832	-2.220e-10	2.436e-10	833	-2.449e-08	2.700e-10	834	-2.462e-08	1.633e-10
835	-2.468e-08	9.213e-11	836	-2.472e-08	4.582e-11	837	-2.473e-08	1.316e-11
838	-4.994e-12	-4.281e-13	839	-8.559e-13	-3.584e-14	840	-3.410e-13	-5.610e-15
841	-7.827e-08	-8.594e-12	842	-7.835e-08	-2.024e-11	843	-7.848e-08	-3.499e-11
844	-2.221e-10	-3.565e-11	845	-2.445e-08	-4.308e-11	846	-2.455e-08	-2.788e-11
847	-2.463e-08	-2.285e-11	848	-2.468e-08	-1.681e-11	849	-2.470e-08	-6.380e-12
850	-6.909e-12	-6.269e-13	851	-9.775e-13	-4.636e-14	852	-3.701e-13	-7.598e-15
853	-7.819e-08	-6.381e-11	854	-7.827e-08	-1.755e-10	855	-7.841e-08	-2.688e-10
856	-2.223e-10	-3.158e-10	857	-2.451e-08	-2.855e-10	858	-2.462e-08	-2.298e-10
859	-2.470e-08	-1.683e-10	860	-2.476e-08	-1.021e-10	861	-2.479e-08	-3.828e-11
862	-1.020e-11	-1.094e-12	863	-1.129e-12	-5.866e-14	864	-4.058e-13	-9.056e-15
865	-7.799e-08	-1.207e-10	866	-7.808e-08	-3.313e-10	867	-7.822e-08	-5.106e-10
868	-2.231e-10	-5.993e-10	869	-2.468e-08	-5.501e-10	870	-2.480e-08	-4.464e-10
871	-2.490e-08	-3.339e-10	872	-2.497e-08	-2.148e-10	873	-2.501e-08	-6.403e-11
874	-1.671e-11	-2.253e-12	875	-1.331e-12	-7.600e-14	876	-4.505e-13	-1.230e-14
877	-7.767e-08	-1.783e-10	878	-7.776e-08	-4.900e-10	879	-7.790e-08	-7.562e-10
880	-2.240e-10	-8.887e-10	881	-2.490e-08	-8.451e-10	882	-2.506e-08	-7.410e-10
883	-2.522e-08	-5.851e-10	884	-2.533e-08	-3.615e-10	885	-2.542e-08	-1.926e-10
886	-3.252e-11	-5.545e-12	887	-1.620e-12	-1.435e-13	888	-5.210e-13	-2.237e-14
889	-7.723e-08	-2.363e-10	890	-7.731e-08	-6.501e-10	891	-7.745e-08	-1.005e-09
892	-2.239e-10	-1.183e-09	893	-2.498e-08	-1.210e-09	894	-2.522e-08	-1.247e-09
895	-2.560e-08	-1.220e-09	896	-2.607e-08	-9.881e-10	897	-2.623e-08	-1.162e-10
898	-9.936e-11	-3.166e-11	899	-2.214e-12	-1.897e-13	900	-6.255e-13	-1.739e-14
901	-7.666e-08	-2.942e-10	902	-7.674e-08	-8.094e-10	903	-7.688e-08	-1.253e-09
904	-2.214e-10	-1.476e-09	905	-2.464e-08	-1.603e-09	906	-2.487e-08	-1.887e-09
907	-2.529e-08	-2.271e-09	908	-2.618e-08	-2.875e-09	909	-2.868e-08	-3.958e-09
910	-1.426e-09	-5.529e-10	911	-2.598e-12	1.051e-13	912	-6.267e-13	1.973e-14
913	-7.596e-08	-3.514e-10	914	-7.604e-08	-9.667e-10	915	-7.618e-08	-1.495e-09
916	-2.172e-10	-1.760e-09	917	-2.401e-08	-1.891e-09	918	-2.405e-08	-2.182e-09
919	-2.393e-08	-2.614e-09	920	-2.343e-08	-3.360e-09	921	-2.156e-08	-4.840e-09
922	-1.756e-08	-4.790e-09	923	-1.910e-12	1.387e-14	924	-5.184e-13	4.486e-15
925	-7.515e-08	-4.094e-10	926	-7.523e-08	-1.123e-09	927	-7.537e-08	-1.734e-09
928	-2.149e-10	-2.037e-09	929	-2.371e-08	-2.020e-09	930	-2.366e-08	-2.031e-09
931	-2.343e-08	-2.001e-09	932	-2.295e-08	-1.852e-09	933	-2.242e-08	-1.200e-09
934	-2.246e-08	7.913e-11	935	-3.009e-12	-3.767e-13	936	-6.270e-13	-3.600e-14
937	-7.420e-08	-4.724e-10	938	-7.430e-08	-1.293e-09	939	-7.444e-08	-1.969e-09
940	-2.155e-10	-2.317e-09	941	-2.405e-08	-2.238e-09	942	-2.410e-08	-1.820e-09
943	-2.399e-08	-1.447e-09	944	-2.383e-08	-1.046e-09	945	-2.372e-08	-6.340e-10
946	-2.360e-08	-3.134e-10	947	-4.075e-12	-3.322e-13	948	-7.660e-13	-2.798e-14
949	-7.302e-08	-5.425e-10	950	-7.312e-08	-1.502e-09	951	-7.334e-08	-2.341e-09
952	-2.253e-10	-2.656e-09	953	-2.554e-08	-1.784e-09	954	-2.512e-08	-1.322e-09
955	-2.483e-08	-9.813e-10	956	-2.464e-08	-6.921e-10	957	-2.450e-08	-4.198e-10
958	-2.444e-08	-1.208e-10	959	-5.658e-12	-3.437e-13	960	-8.711e-13	-1.758e-14
961	-7.172e-08	-4.799e-10	962	-7.177e-08	-1.344e-09	963	-7.185e-08	-2.161e-09
964	-1.352e-10	-2.740e-09	965	-2.686e-08	-3.148e-09	966	-2.630e-08	-2.663e-09
967	-2.596e-08	-2.105e-09	968	-2.574e-08	-1.517e-09	969	-2.561e-08	-9.128e-10
970	-2.555e-08	-3.115e-10	971	-7.591e-12	-5.122e-13	972	-1.000e-12	-3.348e-14

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973	-7.050e-08	-4.888e-10	974	-7.047e-08	-1.360e-09	975	-7.039e-08	-2.146e-09
976	-1.335e-10	-2.523e-09	977	-2.732e-08	-2.269e-09	978	-2.726e-08	-1.990e-09
979	-2.714e-08	-1.615e-09	980	-2.702e-08	-1.184e-09	981	-2.694e-08	-7.216e-10
982	-2.690e-08	-2.413e-10	983	-9.232e-12	-3.573e-13	984	-1.137e-12	-2.295e-14
985	-6.930e-08	-4.632e-10	986	-6.925e-08	-1.276e-09	987	-6.918e-08	-1.969e-09
988	-1.336e-10	-2.319e-09	989	-2.825e-08	-2.150e-09	990	-2.818e-08	-1.761e-09
991	-2.811e-08	-1.385e-09	992	-2.806e-08	-1.001e-09	993	-2.802e-08	-6.056e-10
994	-2.800e-08	-2.037e-10	995	-1.111e-11	-4.708e-13	996	-1.243e-12	-2.141e-14
997	-6.819e-08	-4.273e-10	998	-6.814e-08	-1.174e-09	999	-6.807e-08	-1.812e-09
1000	-1.337e-10	-2.130e-09	1001	-2.915e-08	-1.953e-09	1002	-2.909e-08	-1.608e-09
1003	-2.903e-08	-1.255e-09	1004	-2.899e-08	-8.991e-10	1005	-2.897e-08	-5.412e-10
1006	-2.895e-08	-1.814e-10	1007	-1.355e-11	-5.995e-13	1008	-1.357e-12	-2.365e-14
1009	-6.716e-08	-3.923e-10	1010	-6.712e-08	-1.078e-09	1011	-6.705e-08	-1.663e-09
1012	-1.338e-10	-1.954e-09	1013	-2.999e-08	-1.794e-09	1014	-2.993e-08	-1.471e-09
1015	-2.988e-08	-1.147e-09	1016	-2.985e-08	-8.211e-10	1017	-2.983e-08	-4.938e-10
1018	-2.981e-08	-1.658e-10	1019	-1.679e-11	-7.987e-13	1020	-1.479e-12	-2.550e-14
1021	-6.622e-08	-3.597e-10	1022	-6.619e-08	-9.883e-10	1023	-6.612e-08	-1.525e-09
1024	-1.339e-10	-1.792e-09	1025	-3.076e-08	-1.644e-09	1026	-3.070e-08	-1.348e-09
1027	-3.066e-08	-1.051e-09	1028	-3.063e-08	-7.523e-10	1029	-3.061e-08	-4.527e-10
1030	-3.060e-08	-1.524e-10	1031	-2.126e-11	-1.105e-12	1032	-1.613e-12	-2.801e-14
1033	-6.536e-08	-3.294e-10	1034	-6.533e-08	-9.051e-10	1035	-6.527e-08	-1.396e-09
1036	-1.340e-10	-1.641e-09	1037	-3.146e-08	-1.506e-09	1038	-3.141e-08	-1.235e-09
1039	-3.138e-08	-9.632e-10	1040	-3.135e-08	-6.900e-10	1041	-3.133e-08	-4.155e-10
1042	-3.132e-08	-1.410e-10	1043	-2.769e-11	-1.600e-12	1044	-1.761e-12	-3.104e-14
1045	-6.458e-08	-3.013e-10	1046	-6.454e-08	-8.277e-10	1047	-6.449e-08	-1.277e-09
1048	-1.341e-10	-1.501e-09	1049	-3.211e-08	-1.378e-09	1050	-3.206e-08	-1.132e-09
1051	-3.203e-08	-8.836e-10	1052	-3.200e-08	-6.340e-10	1053	-3.198e-08	-3.836e-10
1054	-3.198e-08	-1.301e-10	1055	-3.745e-11	-2.464e-12	1056	-1.925e-12	-3.445e-14
1057	-6.386e-08	-2.751e-10	1058	-6.383e-08	-7.557e-10	1059	-6.377e-08	-1.166e-09
1060	-1.342e-10	-1.370e-09	1061	-3.269e-08	-1.260e-09	1062	-3.265e-08	-1.039e-09
1063	-3.262e-08	-8.159e-10	1064	-3.260e-08	-5.885e-10	1065	-3.259e-08	-3.559e-10
1066	-3.258e-08	-1.297e-10	1067	-5.331e-11	-4.079e-12	1068	-2.109e-12	-3.991e-14
1069	-6.320e-08	-2.506e-10	1070	-6.317e-08	-6.885e-10	1071	-6.312e-08	-1.062e-09
1072	-1.342e-10	-1.249e-09	1073	-3.320e-08	-1.157e-09	1074	-3.317e-08	-9.692e-10
1075	-3.315e-08	-7.737e-10	1076	-3.315e-08	-5.708e-10	1077	-3.316e-08	-3.622e-10
1078	-3.315e-08	-1.081e-10	1079	-8.187e-11	-7.776e-12	1080	-2.323e-12	-4.427e-14
1081	-6.260e-08	-2.274e-10	1082	-6.257e-08	-6.251e-10	1083	-6.253e-08	-9.650e-10
1084	-1.341e-10	-1.135e-09	1085	-3.357e-08	-1.085e-09	1086	-3.357e-08	-9.746e-10
1087	-3.361e-08	-8.294e-10	1088	-3.367e-08	-6.307e-10	1089	-3.369e-08	-3.906e-10
1090	-3.377e-08	-2.704e-10	1091	-1.413e-10	-1.613e-11	1092	-2.562e-12	-5.516e-14
1093	-6.206e-08	-2.052e-10	1094	-6.203e-08	-5.641e-10	1095	-6.199e-08	-8.716e-10
1096	-1.334e-10	-1.026e-09	1097	-3.360e-08	-1.076e-09	1098	-3.367e-08	-1.168e-09
1099	-3.387e-08	-1.222e-09	1100	-3.419e-08	-1.174e-09	1101	-3.457e-08	-8.637e-10
1102	-3.451e-08	1.501e-10	1103	-3.092e-10	-5.954e-11	1104	-3.019e-12	-1.576e-13
1105	-6.158e-08	-1.830e-10	1106	-6.155e-08	-5.036e-10	1107	-6.150e-08	-7.790e-10
1108	-1.319e-10	-9.174e-10	1109	-3.303e-08	-1.094e-09	1110	-3.308e-08	-1.468e-09
1111	-3.328e-08	-1.906e-09	1112	-3.375e-08	-2.477e-09	1113	-3.487e-08	-3.297e-09
1114	-3.780e-08	-4.605e-09	1115	-1.385e-09	-3.809e-10	1116	-3.582e-12	1.169e-13
1117	-6.115e-08	-1.605e-10	1118	-6.112e-08	-4.418e-10	1119	-6.107e-08	-6.837e-10
1120	-1.297e-10	-8.055e-10	1121	-3.198e-08	-1.015e-09	1122	-3.189e-08	-1.458e-09
1123	-3.172e-08	-1.988e-09	1124	-3.137e-08	-2.699e-09	1125	-3.053e-08	-3.776e-09
1126	-2.820e-08	-5.622e-09	1127	-2.362e-08	-5.779e-09	1128	-2.225e-12	9.982e-14
1129	-6.077e-08	-1.373e-10	1130	-6.075e-08	-3.779e-10	1131	-6.070e-08	-5.846e-10
1132	-1.278e-10	-6.885e-10	1133	-3.112e-08	-8.110e-10	1134	-3.097e-08	-1.053e-09
1135	-3.070e-08	-1.281e-09	1136	-3.027e-08	-1.452e-09	1137	-2.966e-08	-1.433e-09
1138	-2.914e-08	-8.206e-10	1139	-2.932e-08	4.088e-10	1140	-3.067e-12	-1.935e-13

Case I output file

1141	-6.046e-08	-1.137e-10	1142	-6.043e-08	-3.126e-10	1143	-6.038e-08	-4.831e-10
1144	-1.268e-10	-5.685e-10	1145	-3.077e-08	-5.977e-10	1146	-3.067e-08	-6.442e-10
1147	-3.053e-08	-6.535e-10	1148	-3.037e-08	-5.955e-10	1149	-3.024e-08	-4.503e-10
1150	-3.015e-08	-2.945e-10	1151	-3.003e-08	-2.463e-10	1152	-3.465e-12	-4.921e-14
1153	-6.021e-08	-8.988e-11	1154	-6.018e-08	-2.471e-10	1155	-6.013e-08	-3.816e-10
1156	-1.264e-10	-4.487e-10	1157	-3.075e-08	-4.379e-10	1158	-3.069e-08	-4.114e-10
1159	-3.063e-08	-3.718e-10	1160	-3.056e-08	-3.162e-10	1161	-3.050e-08	-2.493e-10
1162	-3.045e-08	-1.626e-10	1163	-3.044e-08	-2.558e-11	1164	-3.846e-12	-8.574e-14
1165	-6.001e-08	-6.627e-11	1166	-5.998e-08	-1.821e-10	1167	-5.993e-08	-2.811e-10
1168	-1.263e-10	-3.305e-10	1169	-3.083e-08	-3.133e-10	1170	-3.078e-08	-2.776e-10
1171	-3.074e-08	-2.386e-10	1172	-3.070e-08	-1.946e-10	1173	-3.067e-08	-1.434e-10
1174	-3.065e-08	-8.659e-11	1175	-3.063e-08	-3.584e-11	1176	-4.271e-12	-8.861e-14
1177	-5.987e-08	-4.292e-11	1178	-5.985e-08	-1.179e-10	1179	-5.980e-08	-1.820e-10
1180	-1.263e-10	-2.139e-10	1181	-3.091e-08	-2.008e-10	1182	-3.086e-08	-1.739e-10
1183	-3.083e-08	-1.458e-10	1184	-3.080e-08	-1.160e-10	1185	-3.077e-08	-8.466e-11
1186	-3.076e-08	-5.214e-11	1187	-3.075e-08	-1.625e-11	1188	-4.754e-12	-1.037e-13
1189	-5.980e-08	-1.977e-11	1190	-5.977e-08	-5.435e-11	1191	-5.972e-08	-8.382e-11
1192	-1.262e-10	-9.856e-11	1193	-3.095e-08	-9.218e-11	1194	-3.091e-08	-7.950e-11
1195	-3.088e-08	-6.627e-11	1196	-3.085e-08	-5.253e-11	1197	-3.083e-08	-3.815e-11
1198	-3.082e-08	-2.309e-11	1199	-3.081e-08	-8.209e-12	1200	-5.313e-12	-1.206e-13
1201	-5.978e-08	3.232e-12	1202	-5.975e-08	9.040e-12	1203	-5.970e-08	1.371e-11
1204	-1.262e-10	1.626e-11	1205	-3.097e-08	1.437e-11	1206	-3.093e-08	1.172e-11
1207	-3.089e-08	8.740e-12	1208	-3.087e-08	6.164e-12	1209	-3.085e-08	3.990e-12
1210	-3.084e-08	2.100e-12	1211	-3.083e-08	5.482e-13	1212	-5.968e-12	-1.407e-13
1213	-5.981e-08	2.636e-11	1214	-5.978e-08	7.187e-11	1215	-5.974e-08	1.123e-10
1216	-1.262e-10	1.312e-10	1217	-3.094e-08	1.226e-10	1218	-3.090e-08	1.004e-10
1219	-3.087e-08	8.090e-11	1220	-3.084e-08	6.194e-11	1221	-3.082e-08	4.348e-11
1222	-3.081e-08	2.563e-11	1223	-3.081e-08	8.260e-12	1224	-6.748e-12	-1.763e-13
1225	-5.991e-08	4.952e-11	1226	-5.988e-08	1.375e-10	1227	-5.983e-08	2.053e-10
1228	-1.262e-10	2.470e-10	1229	-3.086e-08	2.194e-10	1230	-3.083e-08	1.882e-10
1231	-3.080e-08	1.498e-10	1232	-3.077e-08	1.119e-10	1233	-3.076e-08	7.683e-11
1234	-3.075e-08	4.461e-11	1235	-3.075e-08	1.432e-11	1236	-7.638e-12	-1.454e-13
1237	-6.005e-08	6.261e-11	1238	-6.004e-08	1.888e-10	1239	-5.998e-08	3.385e-10
1240	-1.262e-10	3.642e-10	1241	-3.075e-08	3.724e-10	1242	-3.069e-08	2.714e-10
1243	-3.067e-08	1.944e-10	1244	-3.066e-08	1.355e-10	1245	-3.066e-08	8.894e-11
1246	-3.066e-08	5.030e-11	1247	-3.066e-08	1.603e-11	1248	-9.040e-12	-6.702e-13
1249	-6.021e-08	3.210e-11	1250	-6.028e-08	1.028e-10	1251	-6.041e-08	2.144e-10
1252	-1.260e-10	5.116e-10	1253	-3.029e-08	2.420e-10	1254	-3.040e-08	1.551e-10
1255	-3.048e-08	1.027e-10	1256	-3.053e-08	6.814e-11	1257	-3.056e-08	4.339e-11
1258	-3.058e-08	2.413e-11	1259	-3.059e-08	7.710e-12	1260	-9.562e-12	1.612e-12

*** NODAL FLUID FLUX VALUES ***

NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX
1	-6.7912e-06	2	-1.1885e-05	3	-1.0187e-05	4	-1.1998e-05	5	-1.3809e-05
6	-1.3809e-05	7	-1.3809e-05	8	-1.3809e-05	9	-6.9096e-06	10	0.
11	0.	12	0.	13	-9.9262e-24	1366	1.2049e-05	1367	2.1100e-05
1368	1.8127e-05	1369	9.2193e-06	1370	2.9057e-06	1371	6.0501e-06	1372	6.0765e-06
1373	6.0928e-06	1374	6.1030e-06	1375	6.1094e-06	1376	6.1129e-06	1377	3.0589e-06
1378	0.								

Case I output file

```
.....................................
SUM OF ABOVE FLUX VALUES =-2.66551e-15
.....................................

*** MASS BALANCE, FLUID, AND FLOW INFORMATION ***

TOTAL FLOW RATE DUE TO BOUNDARY FLUX AND SINKS ............. -2.66551e-15
RATE OF FLUID ACCUMULATION ................................   0.
MASS BALANCE ERROR ........................................ -2.66551e-15
NORMALIZED MASS BALANCE ERROR .............................  1.29387e-11

CUMULATIVE FLUID STORAGE ..................................   0.
```

*** POSITION OF WATER TABLE ***

NODE	X-COOR.	Y-COOR.	NODE	X-COOR.	Y-COOR.	NODE	X-COOR.	Y-COOR.
1	0.00	620.00	2	1000.00	621.89	3	2000.00	623.77
4	3000.00	625.66	5	4000.00	627.55	6	5000.00	629.43
7	6000.00	631.32	8	7000.00	633.21	9	8000.00	635.09
10	9000.00	636.98	11	10000.00	638.86	12	11000.00	640.75
13	12000.00	642.64	14	13000.00	644.52	15	14000.00	646.41
16	15000.00	648.30	17	16000.00	650.18	18	17000.00	652.07
19	18000.00	653.96	20	19000.00	655.84	21	20000.00	657.73
22	21000.00	659.61	23	22000.00	661.50	24	23000.00	663.39
25	24000.00	665.27	26	25000.00	667.16	27	26000.00	669.05
28	27000.00	670.93	29	28000.00	672.82	30	29000.00	674.70
31	30000.00	676.59	32	31000.00	678.48	33	32000.00	680.36
34	33000.00	682.25	35	34000.00	684.13	36	35000.00	686.02
37	36000.00	687.91	38	37000.00	689.79	39	38000.00	691.68
40	39000.00	693.56	41	40000.00	695.49	42	41000.00	697.60
43	42000.00	699.75	44	43000.00	701.90	45	44000.00	704.05
46	45000.00	706.20	47	46000.00	708.34	48	47000.00	710.47
49	48000.00	712.59	50	49000.00	714.70	51	50000.00	716.78
52	51000.00	718.83	53	52000.00	720.55	54	53000.00	722.20
55	54000.00	723.85	56	55000.00	725.48	57	56000.00	727.06
58	57000.00	728.61	59	58000.00	730.09	60	58700.00	731.11
61	59425.00	732.12	62	60150.00	733.08	63	60875.00	734.00
64	61600.00	734.87	65	62575.00	735.94	66	63550.00	736.88
67	64525.00	737.69	68	65500.00	738.40	69	66150.00	738.86
70	66800.00	770.48	71	67230.00	791.33	72	67660.00	812.16
73	68090.00	833.15	74	68520.00	854.42	75	68950.00	876.18
76	69380.00	899.71	77	69810.00	925.56	78	70240.00	940.23
79	70670.00	959.23	80	71100.00	979.11	81	71600.00	1003.08
82	72100.00	1010.17	83	72600.00	1017.64	84	73100.00	1025.42
85	73600.00	1033.47	86	74100.00	1041.76	87	74600.00	1050.27
88	75100.00	1058.98	89	75600.00	1067.88	90	76100.00	1076.96

Case I output file

91	76600.00	1086.21	92	77100.00	1095.66	93	77600.00	1105.45
94	78100.00	1116.79	95	78600.00	1123.37	96	79100.00	1131.52
97	79600.00	1139.86	98	80100.00	1148.32	99	80600.00	1156.83
100	81100.00	1165.37	101	81600.00	1173.93	102	82100.00	1182.49
103	82600.00	1191.05	104	83100.00	1199.59	105	83600.00	1208.10
106	84300.00	1220.00						

***** VAM2D HAS FULLY EXCECUTED *****

Case I output file

```
    1
Yucca Mountain unconfined, cross-sectional flow
    1    0    0    0    0    1    1    1    1    1                      CARD 3
    0    1    1    1 1378 1260    0    0   13    0    0    0    0      CARD 4
    1    0   10    2    0 1.00e-01                                    CARD 5
    0    0    0    0    3    1    1    1    1    0    1    1    0    0 CARD 6
6.000e+02                                                             CARD 8a
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    3    3    2    2    2    2    2    2    1    1    1    4    3    3    2
    2    2    2    2    2    1    1    1    4    3    3    2    2    2    2    2
    2    1    1    1    4    3    3    2    2    2    2    2    2    1    1    1
    4    4    3    2    2    2    2    2    2    1    1    1    4    4    3    2
    2    2    2    2    2    1    1    1    4    4    3    2    2    2    2    2
    2    1    1    1    4    4    3    2    2    2    2    2    2    1    1    1
    4    4    3    2    2    2    2    2    2    1    1    1    4    4    3    2
    2    2    2    2    2    1    1    1    4    4    3    2    2    2    2    2
    2    1    1    1    4    4    3    2    2    2    2    2    2    1    1    1
    4    4    4    2    2    2    2    2    2    1    1    1    4    4    4    2
    2    2    2    2    2    1    1    1    4    4    4    2    2    2    2    2
    2    1    1    1    4    4    4    2    2    2    2    2    2    1    1    1
    4    4    4   10    2    2    2    2    2    1    1    1    4    4    4   10
    2    2    2    2    2    1    1    1    4    4    4   10    2    2    2    2
    2    1    1    1    4    4    4   10    7    2    2    2    2    1    1    1
    4    4    4   10    7    2    2    2    2    1    1    1    4    4    4   10
    7    2    2    2    2    1    1    1    4    4    4   10    7    2    2    2
    2    1    1    1    4    4    4   10    7    2    2    2    2    1    1    1
    4    4    4   10    7    2    2    2    2    1    1    1    4    4    4   10
    7    7    2    2    2    2    1    1    4    4    4   10    7    7    2    2
    2    2    1    1    4    4    4   10    7    7    2    2    2    2    1    1
    4    4    4   10    7    7    7    2    2    2    1    1    4    4    4   10
    7    7    7    7    2    2    1    1    4    4    4   10    7    7    7    7
    2    2    1    1    4    4    4   10    7    7    7    7    2    2    1    1
    4    4    4   10    7    7    7    7    2    2    1    1    4    4    4   10
    7    7    7    7    2    2    1    1    4    4    4   10    7    7    7    7
    7    2    1    1    4    4    4   10    7    7    7    7    7    2    1    1
    4    4    4   10    7    7    7    7    7    2    1    1    4    4    4   10
    7    7    7    7    7    2    2    1    4    4    4   10    7    7    7    7
    7    7    2    1    4    4    4   10    7    7    7    7    7    7    2    1
    4    4    4   10    7    7    7    7    7    7    2    1    4    4    4   10
```

Case II input file

```
   7     7     7     7     7     7     7     1     4     4     4    13     7     7     7     7
   7     7     7     1     4     4     4    11     7     7     7     7     7     7     7     7
   5     5     5    11     8     8     8     8     8     8     8     8     5     5     5    11
   8     8     8     8     8     8     8     8     5     5     5    11     8     8     8     8
   8     8     8     8     5     5     5    11     8     8     8     8     8     8     8     8
   5     5     5    11     8     8     8     8     8     8     8     8     5     5     5    11
   8     8     8     8     8     8     8     8     5     5     5    11     8     8     8     8
   8     8     8     8     5     5     5    11     8     8     8     8     8     8     8     8
   5     5     5    11     8     8     8     8     8     8     8     8     5     5     5    11
   8     8     8     8     8     8     8     8     5     5     5    11     8     8     8     8
   8     8     8     8     5     5     5    11     8     8     8     8     8     8     8     8
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9     6     6     6    12
   9     9     9     9     9     9     9     9     6     6     6    12     9     9     9     9
   9     9     9     9     6     6     6    12     9     9     9     9     9     9     9     9
   6     6     6    12     9     9     9     9     9     9     9     9           CARD 9
6.385e-07 6.385e-07  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
5.338e-05 5.338e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
4.187e-06 4.187e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
4.187e-06 4.187e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
4.187e-06 4.187e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
4.187e-06 4.187e-06  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
6.176e-05 6.176e-05  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
2.303e-09 2.303e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
1.047e-07 1.047e-07  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
1.748e-09 1.748e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
1.748e-09 1.748e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
1.748e-09 1.748e-09  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
6.490e-07 6.490e-07  0.00e+00  0.00e+00  0.00e+00  0.00e+00     0     0 CARD 10
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
 3.00e-01  2.00e+00  5.00e-01  1.00e+00  1.00e+00                         CARD 12a
```

Case II input file

```
  13   106   1000.000    300.000    1       0.000                                   CARD 14
    0.00    1000.00    2000.00    3000.00    4000.00    5000.00    6000.00    7000.00
 8000.00    9000.00   10000.00   11000.00   12000.00   13000.00   14000.00   15000.00
16000.00   17000.00   18000.00   19000.00   20000.00   21000.00   22000.00   23000.00
24000.00   25000.00   26000.00   27000.00   28000.00   29000.00   30000.00   31000.00
32000.00   33000.00   34000.00   35000.00   36000.00   37000.00   38000.00   39000.00
40000.00   41000.00   42000.00   43000.00   44000.00   45000.00   46000.00   47000.00
48000.00   49000.00   50000.00   51000.00   52000.00   53000.00   54000.00   55000.00
56000.00   57000.00   58000.00   58700.00   59425.00   60150.00   60875.00   61600.00
62575.00   63550.00   64525.00   65500.00   66150.00   66800.00   67230.00   67660.00
68090.00   68520.00   68950.00   69380.00   69810.00   70240.00   70670.00   71100.00
71600.00   72100.00   72600.00   73100.00   73600.00   74100.00   74600.00   75100.00
75600.00   76100.00   76600.00   77100.00   77600.00   78100.00   78600.00   79100.00
79600.00   80100.00   80600.00   81100.00   81600.00   82100.00   82600.00   83100.00
83600.00   84300.00                                                         CARD 15a
-1380.00    -980.00    -680.00    -380.00    -180.00      20.00     220.00     420.00
  620.00     820.00    1020.00    1220.00    1420.00                        CARD 15b
  21     5     0     0                                                      CARD 19a
   1     1     0   2000.00
   2     1     0   1600.00
   3     1     0   1300.00
   4     1     0   1000.00
   5     1     0    800.00
   6     1     0    600.00
   7     1     0    400.00
   8     1     0    200.00
   9     1     0     00.00
1366     1     0   2610.00
1367     1     0   2210.00
1368     1     0   1910.00
1369     1     0   1610.00
1370     1     0   1400.00
1371     1     0   1200.00
1372     1     0   1000.00
1373     1     0    800.00
1374     1     0    600.00
1375     1     0    400.00
1376     1     0    200.00
1377     1     0     00.00                                                  CARD 19b
  10     1     0     00.00     00.00
  11     1     0     00.00     00.00
  12     1     0     00.00     00.00
  13     1     0     00.00     00.00
1378     1     0     00.00     00.00                                        CARD 19a
  26                                                                        CARD 27a
   1     2     3     4     5     6     7     8     9    10    11    12    13 1366 1367 1368
1369  1370  1371  1372  1373  1374  1375  1376  1377  1378                  CARD 27b
 106     1                                                                  CARD 28a
   1    13    14    26    27    39    40    52    53    65    66    78    79    91    92   104
 105   117   118   130   131   143   144   156   157   169   170   182   183   195   196   208
 209   221   222   234   235   247   248   260   261   273   274   286   287   299   300   312
 313   325   326   338   339   351   352   364   365   377   378   390   391   403   404   416
 417   429   430   442   443   455   456   468   469   481   482   494   495   507   508   520
 521   533   534   546   547   559   560   572   573   585   586   598   599   611   612   624
 625   637   638   650   651   663   664   676   677   689   690   702   703   715   716   728
 729   741   742   754   755   767   768   780   781   793   794   806   807   819   820   832
```

Case II input file

```
 833  845  846  858  859  871  872  884  885  897  898  910  911  923  924  936
 937  949  950  962  963  975  976  988  989 1001 1002 1014 1015 1027 1028 1040
1041 1053 1054 1066 1067 1079 1080 1092 1093 1105 1106 1118 1119 1131 1132 1144
1145 1157 1158 1170 1171 1183 1184 1196 1197 1209 1210 1222 1223 1235 1236 1248
1249 1261 1262 1274 1275 1287 1288 1300 1301 1313 1314 1326 1327 1339 1340 1352
1353 1365 1366 1378                                                   CARD 28b
```

Case II input file

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

                    THIS OUTPUT GENERATED BY VAM2DH-1.1
                    INPUT FILE NAME = CaseII.dat

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


NUMBER OF PROBLEMS TO BE SOLVED =  1 (GROUP 1)


PROBLEM NUMBER:  1

PROBLEM TITLE (GROUP 2)
-------------------------------------------------------------------------------

Yucca Mountain unconfined, cross-sectional flow

-------------------------------------------------------------------------------



PROBLEM SPECIFICATION PARAMETERS (GROUP 3)
------------------------------------------

MODEL TYPE INDEX (1=FLOW, 0=TRANSPORT) ...(IMODL) =    1
AXISYMMETRIC SIMULATION (1=YES,0=NO) ....(IAXSYM) =    0
AREAL FULL AQUIFER THICKNESS (1=YES,0=NO)(IAREAL) =    0
SATURATED FLOW (1=WHOLLY, 0=VARIABLY) .....(ISAT) =    0
HYSTERESIS (0=NO, 1=YES) .................(IHYST) =    0
GRAVITY TERMS USED IN FLOW EQUATION (0=NO,
  (1=YES) ................................(MARK) =    1
PRESSURE HEAD WT ELEVATIONS (1=YES,0=NO)..(IWMAP) =    1
INDEX FOR RELATIVE PERMEABILITY/SATURATION  &
  PRESSURE HEAD/SATURATION (0=TAB, 1=FUNC)(KPROP) =    1
CONVERT INITIAL HEAD VALUES(1=YES, 0=NO).(INTSPC) =    1
UPDATE SAT. THICKNESS (1=YES, 0=NO) .....(IWUPDT) =    1

SIMULATION CONTROL PARAMETERS (GROUP 4)
---------------------------------------

TRANSIENT OR STEADY (1=TRANS,0=STEADY)...(ITRANS) =    0
TIME STEP GENERATION INDEX (1=YES, 0=NO) .(ITSGN) =    1
NUMBER OF TIME STEPS .......................(NTS) =    1
MESH GENERATION INDEX (1=YES, 0=NO) .....(IMSHGN) =    1
TOTAL NUMBER OF NODES ......................(NP) = 1378
TOTAL NUMBER OF ELEMENTS ...................(NE) = 1260
TRIANGULAR ELEMENTS USED (1=YES, 0=NO) ..(NTRIAN) =    0
SEQUENTIAL NUMBERING INDEX (0=Y, 1=X-DIR) (ISWAP) =    0
NUMBER OF POROUS MATRIX MATERIALS .........(NMAT) =   13
INITIAL CONDITION NON-UNIFORMITY INDEX.....(NONU) =    0
NUMBER OF GRID LINES ON SEEPAGE FACE .....(NSEEP) =    0
```

Case II output file

```
NUMBER OF INFIL./EVAP. ELEMENTS .........(NEIEVP) =   0
NUMBER PLANT SPECIES ....................(NPLANT) =   0

TIME STEPPING AND ITERATION CONTROL PARAMETERS (GROUP 5)
--------------------------------------------------------
TIME STEPPING INDEX (0=CNTRL, 1=BCKWD) ...(IKALL) =   1
TYPE OF ITERATION SCHEME (1=NEWT,0=PICARD)(INEWT) =   0
MAXIMUM NON-LINEAR ITERATIONS ...........(NITMAX) =  10
MAXIMUM NUMBER OF TIME STEP REFINEMENTS .(IRESOL) =   2
LUMPING OF ELEMENT MATRIX (1=YES, 0=NO) ..(ILUMP) =   0
ITERATION TOLERANCE FOR HEAD...............(HTOL) = 0.10000e+00
UNDER RELAXATION FACTOR FOR HEAD...........(HWWT) = 0.10000e+01

INPUT / OUTPUT CONTROL PARAMETERS (GROUP 6)
-------------------------------------------
VELOCITY/SATURATION INPUT................(NVREAD) =   0
GROUNDWATER RECHARGE (1=YES, 0=NO) ......(IVRECH) =   0
BOUNDARY NODE DATA READ (1=YES, 0=NO)....(IOUTLT) =   0
NUMBER OF NODES FOR WHICH I.C. ARE READ....(NPIN) =   0
OUTPUT REQUIREMENT INDICATOR:
 (0=ALL DATA, 1=NO ELEMENT DATA,
  2=NO DATA, 3=NO MESH AND I.C. DATA.......(IPRD) =   3
UNIT 9 OUTPUT OF VEL / SAT (1=YES, 0=NO).(NVWRIT) =   1
VELOCITY PRINTOUT CONTROL INDEX............(NVPR) =   1
UNIT 10 OUTPUT HEAD/CONC. (0=NONE, N=NTH).(NPLOT) =   1
NODAL VALUE PRINTOUT CONTROL INDEX........(NSTEP) =   1
OBSERVATION NODE INDEX...................(IOBSND) =   0
MASS BALANCE TO BE PERFORMED (1=YES,0=NO).(IMBAL) =   1
UNIT 8 OUTPUT OF HEAD/CONC (1=YES, 0=NO).(NOWRIT) =   1
PRINT CHECK OPTION INDEX.................(IPRCHK) =   0
TAPE DUMP OF EACH ITERATION(1=YES, 0=NO)..(IDUMP) =   0

DEFAULT INITIAL VALUE OF VARIABLE TO BE SOLVED (GROUP 8A)
---------------------------------------------------------

         0.6000e+03

ELEMENT PROPERTY NUMBERS (GROUP 9)
----------------------------------
```

4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1

Case II output file

4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	3	3	2	2	2	2	2	2	1	1	1	4	3	3	2
2	2	2	2	2	1	1	1	4	3	3	2	2	2	2	2
2	1	1	1	4	3	3	2	2	2	2	2	2	1	1	1
4	4	3	2	2	2	2	2	2	1	1	1	4	4	3	2
2	2	2	2	2	1	1	1	4	4	3	2	2	2	2	2
2	1	1	1	4	4	3	2	2	2	2	2	2	1	1	1
4	4	3	2	2	2	2	2	2	1	1	1	4	4	3	2
2	2	2	2	2	1	1	1	4	4	3	2	2	2	2	2
2	1	1	1	4	4	3	2	2	2	2	2	2	1	1	1
4	4	4	2	2	2	2	2	2	1	1	1	4	4	4	2
2	2	2	2	2	1	1	1	4	4	4	2	2	2	2	2
2	1	1	1	4	4	4	2	2	2	2	2	2	1	1	1
4	4	4	10	2	2	2	2	2	1	1	1	4	4	4	10
2	2	2	2	2	1	1	1	4	4	4	10	2	2	2	2
2	1	1	1	4	4	4	10	7	2	2	2	2	1	1	1
4	4	4	10	7	2	2	2	2	1	1	1	4	4	4	10
7	2	2	2	2	1	1	1	4	4	4	10	7	2	2	2
2	1	1	1	4	4	4	10	7	2	2	2	2	1	1	1
4	4	4	10	7	2	2	2	2	1	1	1	4	4	4	10
7	7	2	2	2	2	1	1	4	4	4	10	7	7	2	2
2	2	1	1	4	4	4	10	7	7	2	2	2	2	1	1
4	4	4	10	7	7	7	2	2	2	1	1	4	4	4	10
7	7	7	7	2	2	1	1	4	4	4	10	7	7	7	7
2	2	1	1	4	4	4	10	7	7	7	7	2	2	1	1
4	4	4	10	7	7	7	7	2	2	1	1	4	4	4	10
7	7	7	7	2	2	1	1	4	4	4	10	7	7	7	7
7	2	1	1	4	4	4	10	7	7	7	7	7	2	1	1
4	4	4	10	7	7	7	7	7	2	1	1	4	4	4	10
7	7	7	7	7	2	2	1	4	4	4	10	7	7	7	7
7	7	2	1	4	4	4	10	7	7	7	7	7	7	2	1
4	4	4	10	7	7	7	7	7	7	2	1	4	4	4	10
7	7	7	7	7	7	7	1	4	4	4	13	7	7	7	7
7	7	7	1	4	4	4	11	7	7	7	7	7	7	7	7
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
5	5	5	11	8	8	8	8	8	8	8	8	5	5	5	11
8	8	8	8	8	8	8	8	5	5	5	11	8	8	8	8
8	8	8	8	5	5	5	11	8	8	8	8	8	8	8	8
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9
9	9	9	9	6	6	6	12	9	9	9	9	9	9	9	9
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9
9	9	9	9	6	6	6	12	9	9	9	9	9	9	9	9
6	6	6	12	9	9	9	9	9	9	9	9	6	6	6	12
9	9	9	9	9	9	9	9	6	6	6	12	9	9	9	9

Case II output file

```
  9   9   9   9   6   6   6  12   9   9   9   9   9   9   9   9
  6   6   6  12   9   9   9   9   9   9   9   9   6   6   6  12
  9   9   9   9   9   9   9   9   6   6   6  12   9   9   9   9
  9   9   9   9   6   6   6  12   9   9   9   9   9   9   9   9
  6   6   6  12   9   9   9   9   9   9   9   9   6   6   6  12
  9   9   9   9   9   9   9   9   6   6   6  12   9   9   9   9
  9   9   9   9   6   6   6  12   9   9   9   9   9   9   9   9
  6   6   6  12   9   9   9   9   9   9   9   9   6   6   6  12
  9   9   9   9   9   9   9   9   6   6   6  12   9   9   9   9
  9   9   9   9   6   6   6  12   9   9   9   9   9   9   9   9
  6   6   6  12   9   9   9   9   9   9   9   9

HYDRAULIC PROPERTIES OF POROUS MEDIA (GROUP 10)
-----------------------------------------------

MATERIAL NUMBER:    1  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6385e-06
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6385e-06
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    2  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.5338e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.5338e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    3  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.4187e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.4187e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    4  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.4187e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.4187e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    5  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.4187e-05
```

Case II output file

```
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.4187e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    6  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.4187e-05
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.4187e-05
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    7  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6176e-04
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6176e-04
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    8  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.2303e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.2303e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:    9  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1047e-06
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1047e-06
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   10  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1748e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1748e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   11  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1748e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1748e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
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Case II output file

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SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   12  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.1748e-08
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.1748e-08
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00

MATERIAL NUMBER:   13  (I)

X-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,1)) =  0.6490e-06
Y-DIRECTION HYDRAULIC CONDUCTIVITY ... (PROP(I,2)) =  0.6490e-06
XY-DIRECTION HYDRAULIC CONDUCTIVITY .. (PROP(I,3)) =  0.0000e+00
SPECIFIC STORAGE ..................... (PROP(I,4)) =  0.0000e+00
EFFECTIVE POROSITY ................... (PROP(I,5)) =  0.0000e+00
AIR-ENTRY PRESSURE HEAD VALUE ........ (PROP(I,6)) =  0.0000e+00


FUNCTIONAL COEFFICIENTS OF ANALYTICAL RELATIONSHIPS FOR Krw AND Sw (GROUP 12)
-----------------------------------------------------------------------------

MATERIAL NUMBER:    1  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    2  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PRCP(I,11))=  0.1000e+01

MATERIAL NUMBER:    3  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    4  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
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POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    5  (I)

RESIDUAL (MINIMUM) WATER SATURATION.... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    6  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    7  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    8  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:    9  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   10  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   11  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
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POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   12  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01

MATERIAL NUMBER:   13  (I)

RESIDUAL (MINIMUM) WATER SATURATION... (PROP(I,7)) =  0.3000e+00
POWER INDEX (N) OF K(REL) VS SAT...... (PROP(I,8)) =  0.2000e+01
COEFF (ALPHA) OF SAT. VS CAPIL. HEAD.. (PROP(I,9)) =  0.5000e+00
POWER INDEX (BETA) OF SAT. VS CAP. HEAD(PROP(I,10))=  0.1000e+01
POWER INDEX (GAMMA) OF SAT VS CAP. HEAD(PROP(I,11))=  0.1000e+01
```

X-COORDINATES OF GRID LINES (GROUP 15A)

0.00	1000.00	2000.00	3000.00	4000.00	5000.00	6000.00	7000.00
8000.00	9000.00	10000.00	11000.00	12000.00	13000.00	14000.00	15000.00
16000.00	17000.00	18000.00	19000.00	20000.00	21000.00	22000.00	23000.00
24000.00	25000.00	26000.00	27000.00	28000.00	29000.00	30000.00	31000.00
32000.00	33000.00	34000.00	35000.00	36000.00	37000.00	38000.00	39000.00
40000.00	41000.00	42000.00	43000.00	44000.00	45000.00	46000.00	47000.00
48000.00	49000.00	50000.00	51000.00	52000.00	53000.00	54000.00	55000.00
56000.00	57000.00	58000.00	58700.00	59425.00	60150.00	60875.00	61600.00
62575.00	63550.00	64525.00	65500.00	66150.00	66800.00	67230.00	67660.00
68090.00	68520.00	68950.00	69380.00	69810.00	70240.00	70670.00	71100.00
71600.00	72100.00	72600.00	73100.00	73600.00	74100.00	74600.00	75100.00
75600.00	76100.00	76600.00	77100.00	77600.00	78100.00	78600.00	79100.00
79600.00	80100.00	80600.00	81100.00	81600.00	82100.00	82600.00	83100.00
83600.00	84300.00						

Y-COORDINATES OF GRID LINES (GROUP 15B)

-1380.00	-980.00	-680.00	-380.00	-180.00	20.00	220.00	420.00
620.00	820.00	1020.00	1220.00	1420.00			

BOUNDARY CONDITION DATA (GROUP 19A)

```
NUMBER OF STEADY DIRICHLET BOUNDARIES ........ (NBTO) =   21
NUMBER OF STEADY FLUX BOUNDARIES ........... (NDFLUX) =    5
NUMBER OF TRANSIENT DIRICHLET BOUNDARIES.... (NBHVAR) =    0
NUMBER OF TRANSIENT FLUX BOUNDARIES.... .... (NBFVAR) =    0
```

DIRICHLET BOUNDARY CONDITION DATA (GROUP 19B)

INDEX	NODE NUMBER	B.C. CODE	PRESCRIBED VALUE
1	1	0	2000.
2	2	0	1600.
3	3	0	1300.
4	4	0	1000.
5	5	0	800.0
6	6	0	600.0
7	7	0	400.0
8	8	0	200.0
9	9	0	0.
10	1366	0	2610.
11	1367	0	2210.
12	1368	0	1910.
13	1369	0	1610.
14	1370	0	1400.
15	1371	0	1200.
16	1372	0	1000.
17	1373	0	800.0
18	1374	0	600.0
19	1375	0	400.0
20	1376	0	200.0
21	1377	0	0.

FLUX BOUNDARY CONDITION DATA (GROUP 19C)

NODE #	D.O.F. #	B.C. CODE	FLUID FLUX	DUMMY ARRAY
10	1	0	0.	0.
11	1	0	0.	0.
12	1	0	0.	0.
13	1	0	0.	0.
1378	1	0	0.	0.

LIST OF BOUNDARY NODE NUMBERS (GROUP 27B)

```
   1    2    3    4    5    6    7    8    9   10   11   12   13 1366 1367 1368
1369 1370 1371 1372 1373 1374 1375 1376 1377 1378
```

WATER TABLE COMPUTATION DATA (GROUP 28)

LINE NUMBER AND LOWEST, HIGHEST NODE

Case II output file

1	1	13	2	14	26	3	27	39	4	40	52	5	53	65
6	66	78	7	79	91	8	92	104	9	105	117	10	118	130
11	131	143	12	144	156	13	157	169	14	170	182	15	183	195
16	196	208	17	209	221	18	222	234	19	235	247	20	248	260
21	261	273	22	274	286	23	287	299	24	300	312	25	313	325
26	326	338	27	339	351	28	352	364	29	365	377	30	378	390
31	391	403	32	404	416	33	417	429	34	430	442	35	443	455
36	456	468	37	469	481	38	482	494	39	495	507	40	508	520
41	521	533	42	534	546	43	547	559	44	560	572	45	573	585
46	586	598	47	599	611	48	612	624	49	625	637	50	638	650
51	651	663	52	664	676	53	677	689	54	690	702	55	703	715
56	716	728	57	729	741	58	742	754	59	755	767	60	768	780
61	781	793	62	794	806	63	807	819	64	820	832	65	833	845
66	846	858	67	859	871	68	872	884	69	885	897	70	898	910
71	911	923	72	924	936	73	937	949	74	950	962	75	963	975
76	976	988	77	989	1001	78	1002	1014	79	1015	1027	80	1028	1040
81	1041	1053	82	1054	1066	83	1067	1079	84	1080	1092	85	1093	1105
86	1106	1118	87	1119	1131	88	1132	1144	89	1145	1157	90	1158	1170
91	1171	1183	92	1184	1196	93	1197	1209	94	1210	1222	95	1223	1235
96	1236	1248	97	1249	1261	98	1262	1274	99	1275	1287	100	1288	1300
101	1301	1313	102	1314	1326	103	1327	1339	104	1340	1352	105	1353	1365
106	1366	1378												

——— ACTUAL HALF BAND WIDTH = 14 FULL BANDWIDTH = 29 ———

++++++++++++ STEADY-STATE SOLUTION +++++++++++

**** ELAPSED SIMULATION TIME : 1.000 TIME STEP NUMBER : 1 TIME STEP SIZE: 0.100e+01 ****

ITERATION	NUMBER OF NON-CONVERGENT NODES	MAXIMUM ERROR	NODE NUMBER	RELAXATION FACTOR
1	1357	619.1	1378	1.00
2	1192	25.85	1025	1.00
3	252	-9.486	1025	0.782
4	117	-2.081	1025	1.00
5	2	0.1897	999	0.941
6	0	1.3590e-02	999	1.00

Case II output file

*** NODAL HEAD VALUES ***

NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE	NODE	HEAD VALUE
1	2000.	2	1600.	3	1300.	4	1000.	5	800.0
6	600.0	7	400.0	8	200.0	9	0.	10	-199.9
11	-399.7	12	-599.5	13	-799.5	14	2002.	15	1602.
16	1302.	17	1002.	18	801.8	19	601.8	20	401.8
21	201.8	22	1.789	23	-198.2	24	-398.3	25	-598.3
26	-798.3	27	2004.	28	1604.	29	1304.	30	1004.
31	803.6	32	603.6	33	403.6	34	203.6	35	3.579
36	-196.4	37	-396.4	38	-596.4	39	-796.4	40	2005.
41	1605.	42	1305.	43	1005.	44	805.4	45	605.4
46	405.4	47	205.4	48	5.368	49	-194.6	50	-394.6
51	-594.6	52	-794.6	53	2007.	54	1607.	55	1307.
56	1007.	57	807.2	58	607.2	59	407.2	60	207.2
61	7.157	62	-192.8	63	-392.8	64	-592.8	65	-792.8
66	2009.	67	1609.	68	1309.	69	1009.	70	808.9
71	608.9	72	408.9	73	208.9	74	8.947	75	-191.1
76	-391.1	77	-591.1	78	-791.1	79	2011.	80	1611.
81	1311.	82	1011.	83	810.7	84	610.7	85	410.7
86	210.7	87	10.74	88	-189.3	89	-389.3	90	-589.3
91	-789.3	92	2013.	93	1613.	94	1313.	95	1013.
96	812.5	97	612.5	98	412.5	99	212.5	100	12.53
101	-187.5	102	-387.5	103	-587.5	104	-787.5	105	2014.
106	1614.	107	1314.	108	1014.	109	814.3	110	614.3
111	414.3	112	214.3	113	14.31	114	-185.7	115	-385.7
116	-585.7	117	-785.7	118	2016.	119	1616.	120	1316.
121	1016.	122	816.1	123	616.1	124	416.1	125	216.1
126	16.10	127	-183.9	128	-383.9	129	-583.9	130	-783.9
131	2018.	132	1618.	133	1318.	134	1018.	135	817.9
136	617.9	137	417.9	138	217.9	139	17.89	140	-182.1
141	-382.1	142	-582.1	143	-782.1	144	2020.	145	1620.
146	1320.	147	1020.	148	819.7	149	619.7	150	419.7
151	219.7	152	19.68	153	-180.3	154	-380.3	155	-580.3
156	-780.3	157	2021.	158	1621.	159	1321.	160	1021.
161	821.5	162	621.5	163	421.5	164	221.5	165	21.47
166	-178.5	167	-378.5	168	-578.5	169	-778.5	170	2023.
171	1623.	172	1323.	173	1023.	174	823.3	175	623.3
176	423.3	177	223.3	178	23.26	179	-176.7	180	-376.7
181	-576.7	182	-776.7	183	2025.	184	1625.	185	1325.
186	1025.	187	825.0	188	625.0	189	425.0	190	225.0
191	25.05	192	-174.9	193	-374.9	194	-574.9	195	-774.9
196	2027.	197	1627.	198	1327.	199	1027.	200	826.8
201	626.8	202	426.8	203	226.8	204	26.84	205	-173.2
206	-373.2	207	-573.2	208	-773.2	209	2029.	210	1629.
211	1329.	212	1029.	213	828.6	214	628.6	215	428.6
216	228.6	217	28.63	218	-171.4	219	-371.4	220	-571.4
221	-771.4	222	2030.	223	1630.	224	1330.	225	1030.
226	830.4	227	630.4	228	430.4	229	230.4	230	30.42
231	-169.6	232	-369.6	233	-569.6	234	-769.6	235	2032.
236	1632.	237	1332.	238	1032.	239	832.2	240	632.2
241	432.2	242	232.2	243	32.21	244	-167.8	245	-367.8
246	-567.8	247	-767.8	248	2034.	249	1634.	250	1334.

Case II output file

251	1034.	252	834.0	253	634.0	254	434.0	255	234.0
256	34.00	257	-166.0	258	-366.0	259	-566.0	260	-766.0
261	2036.	262	1636.	263	1336.	264	1036.	265	835.8
266	635.8	267	435.8	268	235.8	269	35.78	270	-164.2
271	-364.2	272	-564.2	273	-764.2	274	2038.	275	1638.
276	1338.	277	1038.	278	837.6	279	637.6	280	437.6
281	237.6	282	37.57	283	-162.4	284	-362.4	285	-562.4
286	-762.4	287	2039.	288	1639.	289	1339.	290	1039.
291	839.4	292	639.4	293	439.4	294	239.4	295	39.36
296	-160.6	297	-360.6	298	-560.6	299	-760.6	300	2041.
301	1641.	302	1341.	303	1041.	304	841.2	305	641.2
306	441.2	307	241.2	308	41.15	309	-158.8	310	-358.8
311	-558.8	312	-758.8	313	2043.	314	1643.	315	1343.
316	1043.	317	842.9	318	642.9	319	442.9	320	242.9
321	42.94	322	-157.1	323	-357.1	324	-557.1	325	-757.1
326	2045.	327	1645.	328	1345.	329	1045.	330	844.7
331	644.7	332	444.7	333	244.7	334	44.73	335	-155.3
336	-355.3	337	-555.3	338	-755.3	339	2047.	340	1647.
341	1347.	342	1047.	343	846.5	344	646.5	345	446.5
346	246.5	347	46.52	348	-153.5	349	-353.5	350	-553.5
351	-753.5	352	2048.	353	1648.	354	1348.	355	1048.
356	848.3	357	648.3	358	448.3	359	248.3	360	48.31
361	-151.7	362	-351.7	363	-551.7	364	-751.7	365	2050.
366	1650.	367	1350.	368	1050.	369	850.1	370	650.1
371	450.1	372	250.1	373	50.10	374	-149.9	375	-349.9
376	-549.9	377	-749.9	378	2052.	379	1652.	380	1352.
381	1052.	382	851.9	383	651.9	384	451.9	385	251.9
386	51.89	387	-148.1	388	-348.1	389	-548.1	390	-748.1
391	2054.	392	1654.	393	1354.	394	1054.	395	853.7
396	653.7	397	453.7	398	253.7	399	53.68	400	-146.3
401	-346.3	402	-546.3	403	-746.3	404	2055.	405	1655.
406	1355.	407	1055.	408	855.5	409	655.5	410	455.5
411	255.5	412	55.46	413	-144.5	414	-344.5	415	-544.5
416	-744.5	417	2057.	418	1657.	419	1357.	420	1057.
421	857.3	422	657.3	423	457.3	424	257.3	425	57.25
426	-142.7	427	-342.7	428	-542.7	429	-742.7	430	2059.
431	1659.	432	1359.	433	1059.	434	859.0	435	659.0
436	459.0	437	259.0	438	59.04	439	-141.0	440	-341.0
441	-541.0	442	-741.0	443	2061.	444	1661.	445	1361.
446	1061.	447	860.8	448	660.8	449	460.8	450	260.8
451	60.83	452	-139.2	453	-339.2	454	-539.2	455	-739.2
456	2063.	457	1663.	458	1363.	459	1063.	460	862.6
461	662.6	462	462.6	463	262.6	464	62.62	465	-137.4
466	-337.4	467	-537.4	468	-737.4	469	2064.	470	1664.
471	1364.	472	1064.	473	864.4	474	664.4	475	464.4
476	264.4	477	64.41	478	-135.6	479	-335.6	480	-535.6
481	-735.6	482	2066.	483	1666.	484	1366.	485	1066.
486	866.2	487	666.2	488	466.2	489	266.2	490	66.20
491	-133.8	492	-333.8	493	-533.8	494	-733.8	495	2068.
496	1668.	497	1368.	498	1068.	499	868.0	500	668.0
501	468.0	502	268.0	503	67.98	504	-132.0	505	-332.0
506	-532.0	507	-732.0	508	2070.	509	1670.	510	1370.
511	1070.	512	869.8	513	669.8	514	469.8	515	269.8
516	69.77	517	-130.2	518	-330.2	519	-530.2	520	-730.2
521	2072.	522	1672.	523	1372.	524	1071.	525	871.5
526	671.5	527	471.6	528	271.6	529	71.62	530	-128.4

Case II output file

531	-328.4	532	-528.3	533	-728.3	534	2074.	535	1674.
536	1374.	537	1074.	538	873.7	539	673.7	540	473.7
541	273.7	542	73.71	543	-126.3	544	-326.3	545	-526.3
546	-726.3	547	2077.	548	1677.	549	1377.	550	1077.
551	875.9	552	675.9	553	475.9	554	275.9	555	75.86
556	-124.1	557	-324.1	558	-524.1	559	-724.1	560	2080.
561	1680.	562	1380.	563	1080.	564	878.0	565	678.0
566	478.0	567	278.0	568	78.00	569	-122.0	570	-322.0
571	-522.0	572	-722.0	573	2083.	574	1683.	575	1383.
576	1083.	577	880.1	578	680.1	579	480.1	580	280.1
581	80.07	582	-119.9	583	-319.9	584	-519.9	585	-719.9
586	2085.	587	1685.	588	1385.	589	1085.	590	882.1
591	682.1	592	482.1	593	282.1	594	82.13	595	-117.9
596	-317.9	597	-517.9	598	-717.9	599	2088.	600	1688.
601	1388.	602	1088.	603	884.2	604	684.2	605	484.2
606	284.2	607	84.19	608	-115.8	609	-315.8	610	-515.8
611	-715.8	612	2091.	613	1691.	614	1391.	615	1091.
616	886.2	617	686.2	618	486.2	619	286.2	620	86.24
621	-113.7	622	-313.7	623	-513.7	624	-713.7	625	2093.
626	1693.	627	1393.	628	1093.	629	888.3	630	688.3
631	488.3	632	288.3	633	88.30	634	-111.7	635	-311.7
636	-511.7	637	-711.7	638	2096.	639	1696.	640	1396.
641	1096.	642	890.3	643	690.3	644	490.3	645	290.3
646	90.34	647	-109.6	648	-309.5	649	-509.5	650	-709.6
651	2099.	652	1699.	653	1399.	654	1099.	655	892.3
656	692.3	657	492.3	658	292.3	659	92.32	660	-107.7
661	-307.7	662	-507.7	663	-707.7	664	2102.	665	1702.
666	1402.	667	1102.	668	894.3	669	694.3	670	494.3
671	294.3	672	94.28	673	-105.7	674	-305.7	675	-505.7
676	-705.7	677	2105.	678	1705.	679	1405.	680	1105.
681	896.2	682	696.2	683	496.2	684	296.2	685	96.22
686	-103.8	687	-303.8	688	-503.8	689	-703.8	690	2107.
691	1707.	692	1407.	693	1107.	694	898.0	695	698.0
696	498.1	697	298.1	698	98.09	699	-101.9	700	-301.9
701	-501.9	702	-701.9	703	2110.	704	1710.	705	1410.
706	1110.	707	899.7	708	699.7	709	499.7	710	299.8
711	99.79	712	-100.2	713	-300.2	714	-500.2	715	-700.2
716	2113.	717	1713.	718	1413.	719	1113.	720	901.3
721	701.3	722	501.3	723	301.3	724	101.3	725	-98.74
726	-298.7	727	-498.7	728	-698.7	729	2116.	730	1716.
731	1416.	732	1116.	733	902.8	734	702.8	735	502.8
736	302.8	737	102.8	738	-97.21	739	-297.2	740	-497.2
741	-697.2	742	2119.	743	1719.	744	1419.	745	1119.
746	904.3	747	704.3	748	504.3	749	304.3	750	104.3
751	-95.71	752	-295.7	753	-495.7	754	-695.7	755	2122.
756	1722.	757	1422.	758	1122.	759	905.8	760	705.8
761	505.8	762	305.8	763	105.8	764	-94.18	765	-294.2
766	-494.2	767	-694.2	768	2124.	769	1724.	770	1424.
771	1124.	772	906.8	773	706.8	774	506.8	775	306.8
776	106.8	777	-93.17	778	-293.2	779	-493.2	780	-693.2
781	2126.	782	1726.	783	1426.	784	1126.	785	907.9
786	707.9	787	507.9	788	307.9	789	107.9	790	-92.10
791	-292.1	792	-492.1	793	-692.1	794	2128.	795	1728.
796	1428.	797	1128.	798	909.0	799	709.0	800	509.0
801	309.0	802	109.0	803	-91.04	804	-291.0	805	-490.9
806	-690.9	807	2130.	808	1730.	809	1430.	810	1130.

Case II output file

811	910.0	812	710.0	813	510.0	814	310.0	815	110.0
816	-89.98	817	-290.0	818	-490.0	819	-690.0	820	2133.
821	1733.	822	1433.	823	1133.	824	911.1	825	711.1
826	511.1	827	311.1	828	111.1	829	-88.93	830	-288.9
831	-488.9	832	-688.9	833	2136.	834	1736.	835	1436.
836	1136.	837	912.5	838	712.5	839	512.5	840	312.5
841	112.5	842	-87.51	843	-287.5	844	-487.5	845	-687.5
846	2139.	847	1739.	848	1439.	849	1139.	850	913.9
851	713.9	852	513.9	853	313.9	854	113.9	855	-86.08
856	-286.1	857	-486.1	858	-686.1	859	2144.	860	1743.
861	1441.	862	1138.	863	915.6	864	715.4	865	515.3
866	315.3	867	115.2	868	-84.80	869	-284.8	870	-484.8
871	-684.9	872	2157.	873	1756.	874	1454.	875	1150.
876	916.4	877	716.2	878	516.1	879	316.0	880	115.9
881	-84.07	882	-284.1	883	-484.1	884	-684.1	885	2171.
886	1771.	887	1470.	888	1171.	889	916.1	890	716.1
891	516.1	892	316.1	893	116.1	894	-83.95	895	-284.0
896	-484.0	897	-684.0	898	2187.	899	1787.	900	1487.
901	1186.	902	981.1	903	770.0	904	563.8	905	360.3
906	158.4	907	-42.15	908	-241.6	909	-441.9	910	-642.2
911	2197.	912	1797.	913	1497.	914	1197.	915	991.4
916	788.4	917	585.0	918	382.4	919	180.9	920	-19.58
921	-219.4	922	-419.8	923	-620.0	924	2208.	925	1808.
926	1508.	927	1208.	928	1005.	929	802.7	930	601.1
931	399.8	932	198.9	933	-1.355	934	-201.1	935	-401.3
936	-601.5	937	2218.	938	1818.	939	1518.	940	1218.
941	1017.	942	816.0	943	615.2	944	414.6	945	214.2
946	14.12	947	-185.5	948	-385.5	949	-585.5	950	2229.
951	1829.	952	1529.	953	1229.	954	1029.	955	828.5
956	628.5	957	428.4	958	228.4	959	28.34	960	-171.1
961	-370.8	962	-570.8	963	2239.	964	1839.	965	1539.
966	1239.	967	1040.	968	841.0	969	641.6	970	442.0
971	242.3	972	42.41	973	-156.7	974	-356.3	975	-556.0
976	2250.	977	1850.	978	1550.	979	1250.	980	1052.
981	853.9	982	655.4	983	456.5	984	257.2	985	57.50
986	-141.3	987	-340.0	988	-539.3	989	2261.	990	1861.
991	1561.	992	1261.	993	1065.	994	867.8	995	670.6
996	472.9	997	274.6	998	74.69	999	-120.8	1000	-319.1
1001	-518.5	1002	2271.	1003	1871.	1004	1571.	1005	1271.
1006	1078.	1007	883.3	1008	687.9	1009	492.0	1010	295.8
1011	100.3	1012	-94.64	1013	-296.0	1014	-496.3	1015	2282.
1016	1882.	1017	1582.	1018	1282.	1019	1094.	1020	900.8
1021	708.1	1022	513.9	1023	318.2	1024	120.8	1025	-78.91
1026	-276.1	1027	-474.7	1028	2292.	1029	1892.	1030	1592.
1031	1292.	1032	1108.	1033	926.2	1034	736.4	1035	542.6
1036	346.4	1037	148.4	1038	-50.84	1039	-248.4	1040	-447.4
1041	2304.	1042	1904.	1043	1604.	1044	1305.	1045	1182.
1046	984.1	1047	785.6	1048	586.7	1049	387.4	1050	187.8
1051	-12.02	1052	-211.8	1053	-411.6	1054	2317.	1055	1917.
1056	1617.	1057	1317.	1058	1186.	1059	986.9	1060	787.9
1061	588.7	1062	389.2	1063	189.6	1064	-10.29	1065	-210.1
1066	-410.0	1067	2329.	1068	1929.	1069	1629.	1070	1329.
1071	1190.	1072	990.7	1073	791.5	1074	592.1	1075	392.5
1076	192.8	1077	-7.102	1078	-207.0	1079	-406.9	1080	2341.
1081	1941.	1082	1641.	1083	1341.	1084	1195.	1085	995.4
1086	796.0	1087	596.6	1088	397.0	1089	197.2	1090	-2.736

Case II output file

1091	-202.6	1092	-402.5	1093	2353.	1094	1953.	1095	1653.
1096	1353.	1097	1200.	1098	1001.	1099	801.5	1100	602.0
1101	402.3	1102	202.5	1103	2.601	1104	-197.3	1105	-397.2
1106	2365.	1107	1965.	1108	1665.	1109	1365.	1110	1207.
1111	1007.	1112	807.8	1113	608.3	1114	408.5	1115	208.7
1116	8.777	1117	-191.1	1118	-391.0	1119	2377.	1120	1977.
1121	1677.	1122	1377.	1123	1214.	1124	1014.	1125	814.9
1126	615.2	1127	415.5	1128	215.6	1129	15.69	1130	-184.2
1131	-384.1	1132	2389.	1133	1989.	1134	1689.	1135	1390.
1136	1222.	1137	1022.	1138	822.5	1139	622.8	1140	423.1
1141	223.2	1142	23.24	1143	-176.6	1144	-376.5	1145	2402.
1146	2002.	1147	1702.	1148	1402.	1149	1230.	1150	1030.
1151	830.7	1152	631.0	1153	431.2	1154	231.3	1155	31.37
1156	-168.4	1157	-368.3	1158	2414.	1159	2014.	1160	1714.
1161	1414.	1162	1239.	1163	1039.	1164	839.4	1165	639.7
1166	439.9	1167	240.0	1168	39.99	1169	-159.8	1170	-359.7
1171	2426.	1172	2026.	1173	1726.	1174	1426.	1175	1248.
1176	1048.	1177	848.6	1178	648.8	1179	448.9	1180	249.0
1181	49.07	1182	-150.6	1183	-350.6	1184	2438.	1185	2038.
1186	1738.	1187	1438.	1188	1258.	1189	1058.	1190	858.1
1191	658.3	1192	458.4	1193	258.5	1194	58.54	1195	-141.1
1196	-341.0	1197	2450.	1198	2050.	1199	1750.	1200	1450.
1201	1267.	1202	1068.	1203	867.9	1204	668.1	1205	468.3
1206	268.3	1207	68.37	1208	-131.1	1209	-331.0	1210	2462.
1211	2062.	1212	1762.	1213	1462.	1214	1278.	1215	1078.
1216	878.1	1217	678.3	1218	478.4	1219	278.5	1220	78.57
1221	-120.8	1222	-320.6	1223	2474.	1224	2074.	1225	1774.
1226	1474.	1227	1288.	1228	1088.	1229	888.4	1230	688.6
1231	488.9	1232	289.2	1233	89.24	1234	-109.2	1235	-309.0
1236	2486.	1237	2086.	1238	1786.	1239	1486.	1240	1298.
1241	1098.	1242	898.6	1243	698.9	1244	499.3	1245	300.0
1246	101.1	1247	-97.60	1248	-298.1	1249	2498.	1250	2098.
1251	1798.	1252	1498.	1253	1308.	1254	1108.	1255	908.5
1256	708.7	1257	509.0	1258	309.3	1259	109.4	1260	-90.69
1261	-290.3	1262	2510.	1263	2110.	1264	1810.	1265	1510.
1266	1318.	1267	1118.	1268	918.2	1269	718.3	1270	518.4
1271	318.5	1272	118.6	1273	-81.36	1274	-281.3	1275	2521.
1276	2121.	1277	1821.	1278	1522.	1279	1328.	1280	1128.
1281	927.9	1282	728.0	1283	528.0	1284	328.1	1285	128.1
1286	-71.89	1287	-271.8	1288	2533.	1289	2133.	1290	1833.
1291	1533.	1292	1338.	1293	1138.	1294	937.6	1295	737.7
1296	537.7	1297	337.7	1298	137.8	1299	-62.23	1300	-262.1
1301	2545.	1302	2145.	1303	1845.	1304	1545.	1305	1347.
1306	1147.	1307	947.4	1308	747.5	1309	547.5	1310	347.5
1311	147.5	1312	-52.50	1313	-252.4	1314	2557.	1315	2157.
1316	1857.	1317	1557.	1318	1357.	1319	1157.	1320	957.3
1321	757.3	1322	557.3	1323	357.3	1324	157.3	1325	-42.73
1326	-242.6	1327	2569.	1328	2169.	1329	1869.	1330	1569.
1331	1367.	1332	1167.	1333	967.1	1334	767.1	1335	567.1
1336	367.1	1337	167.0	1338	-32.96	1339	-232.8	1340	2581.
1341	2181.	1342	1881.	1343	1581.	1344	1377.	1345	1177.
1346	976.9	1347	776.9	1348	576.8	1349	376.8	1350	176.8
1351	-23.21	1352	-223.2	1353	2593.	1354	2193.	1355	1893.
1356	1593.	1357	1387.	1358	1187.	1359	986.6	1360	786.6
1361	586.5	1362	386.5	1363	186.5	1364	-13.52	1365	-212.9
1366	2610.	1367	2210.	1368	1910.	1369	1610.	1370	1400.

Case II output file

1371	1200.	1372	1000.	1373	800.0	1374	600.0	1375	400.0
1376	200.0	1377	0.	1378	-201.8				

*** LIST OF PARTIALLY SATURATED ELEMENTS ***

ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE	ELEM.	SAT. VALUE
9	0.3139	10	0.3047	11	0.3028	12	0.3020	21	0.3141
22	0.3047	23	0.3028	24	0.3020	33	0.3144	34	0.3047
35	0.3028	36	0.3020	45	0.3146	46	0.3047	47	0.3028
48	0.3020	57	0.3149	58	0.3048	59	0.3028	60	0.3020
69	0.3152	70	0.3048	71	0.3028	72	0.3020	81	0.3155
82	0.3048	83	0.3029	84	0.3020	93	0.3158	94	0.3049
95	0.3029	96	0.3020	105	0.3161	106	0.3049	107	0.3029
108	0.3020	117	0.3165	118	0.3049	119	0.3029	120	0.3020
129	0.3168	130	0.3049	131	0.3029	132	0.3020	141	0.3172
142	0.3050	143	0.3029	144	0.3021	153	0.3176	154	0.3050
155	0.3029	156	0.3021	165	0.3180	166	0.3050	167	0.3029
168	0.3021	177	0.3184	178	0.3051	179	0.3029	180	0.3021
189	0.3189	190	0.3051	191	0.3030	192	0.3021	201	0.3193
202	0.3051	203	0.3030	204	0.3021	213	0.3198	214	0.3052
215	0.3030	216	0.3021	225	0.3203	226	0.3052	227	0.3030
228	0.3021	237	0.3209	238	0.3052	239	0.3030	240	0.3021
249	0.3214	250	0.3053	251	0.3030	252	0.3021	261	0.3220
262	0.3053	263	0.3030	264	0.3021	273	0.3227	274	0.3053
275	0.3030	276	0.3021	285	0.3234	286	0.3054	287	0.3030
288	0.3021	297	0.3241	298	0.3054	299	0.3031	300	0.3021
309	0.3248	310	0.3055	311	0.3031	312	0.3021	321	0.3256
322	0.3055	323	0.3031	324	0.3021	333	0.3265	334	0.3055
335	0.3031	336	0.3021	345	0.3274	346	0.3056	347	0.3031
348	0.3022	357	0.3284	358	0.3056	359	0.3031	360	0.3022
369	0.3295	370	0.3057	371	0.3031	372	0.3022	381	0.3307
382	0.3057	383	0.3031	384	0.3022	393	0.3319	394	0.3057
395	0.3032	396	0.3022	405	0.3333	406	0.3058	407	0.3032
408	0.3022	417	0.3348	418	0.3058	419	0.3032	420	0.3022
429	0.3364	430	0.3059	431	0.3032	432	0.3022	441	0.3382
442	0.3059	443	0.3032	444	0.3022	453	0.3401	454	0.3060
455	0.3032	456	0.3022	465	0.3423	466	0.3060	467	0.3032
468	0.3022	477	0.3447	478	0.3061	479	0.3032	480	0.3022
489	0.3477	490	0.3061	491	0.3033	492	0.3022	501	0.3515
502	0.3062	503	0.3033	504	0.3022	513	0.3559	514	0.3062
515	0.3033	516	0.3022	525	0.3610	526	0.3063	527	0.3033
528	0.3022	537	0.3670	538	0.3063	539	0.3033	540	0.3023
549	0.3743	550	0.3064	551	0.3033	552	0.3023	561	0.3834
562	0.3065	563	0.3034	564	0.3023	573	0.3951	574	0.3065
575	0.3034	576	0.3023	585	0.4105	586	0.3066	587	0.3034
588	0.3023	597	0.4313	598	0.3066	599	0.3034	600	0.3023
609	0.4610	610	0.3067	611	0.3034	612	0.3023	621	0.5078
622	0.3068	623	0.3034	624	0.3023	633	0.5898	634	0.3068
635	0.3035	636	0.3023	645	0.7592	646	0.3069	647	0.3035
648	0.3023	658	0.3069	659	0.3035	660	0.3023	670	0.3070
671	0.3035	672	0.3023	682	0.3071	683	0.3035	684	0.3023

Case II output file

694	0.3071	695	0.3035	696	0.3023	706	0.3072	707	0.3035
708	0.3024	718	0.3072	719	0.3035	720	0.3024	730	0.3072
731	0.3036	732	0.3024	742	0.3073	743	0.3036	744	0.3024
754	0.3073	755	0.3036	756	0.3024	766	0.3074	767	0.3036
768	0.3024	778	0.3074	779	0.3036	780	0.3024	790	0.3075
791	0.3036	792	0.3024	802	0.3075	803	0.3036	804	0.3024
814	0.3075	815	0.3036	816	0.3024	826	0.3085	827	0.3038
828	0.3025	838	0.3106	839	0.3042	840	0.3026	850	0.3125
851	0.3045	852	0.3027	862	0.3147	863	0.3047	864	0.3028
874	0.3174	875	0.3050	876	0.3029	886	0.3211	887	0.3053
888	0.3030	898	0.3272	899	0.3056	900	0.3031	910	0.3406
911	0.3060	912	0.3032	922	0.4156	923	0.3067	924	0.3034
935	0.3074	936	0.3036	947	0.3085	948	0.3038	959	0.3105
960	0.3042	971	0.3124	972	0.3045	983	0.3127	984	0.3045
995	0.3131	996	0.3046	1007	0.3137	1008	0.3046	1019	0.3145
1020	0.3047	1031	0.3156	1032	0.3048	1043	0.3170	1044	0.3050
1055	0.3188	1056	0.3051	1067	0.3211	1068	0.3053	1079	0.3244
1080	0.3054	1091	0.3291	1092	0.3056	1103	0.3365	1104	0.3059
1115	0.3496	1116	0.3061	1127	0.3798	1128	0.3065	1139	0.5291
1140	0.3068	1152	0.3071	1164	0.3075	1176	0.3078	1188	0.3083
1200	0.3088	1212	0.3094	1224	0.3100	1236	0.3108	1248	0.3116
1260	0.3128								

*** ELEMENTAL FLUID VELOCITY ***

ELEMENT	X-VELOCITY	Y-VELOCITY	ELEMENT	X-VELOCITY	Y-VELOCITY	ELEMENT	X-VELOCITY	Y-VELOCITY
1	-7.492e-09	-2.001e-15	2	-7.492e-09	-6.304e-15	3	-7.492e-09	-1.098e-14
4	-9.551e-08	-3.843e-14	5	-9.551e-08	-9.770e-14	6	-9.551e-08	-1.686e-13
7	-9.551e-08	-2.614e-13	8	-9.551e-08	-3.918e-13	9	-3.594e-11	-4.694e-12
10	-4.360e-14	-1.181e-14	11	-1.386e-14	-3.916e-15	12	-6.466e-15	-9.649e-16
13	-7.492e-09	-4.160e-15	14	-7.492e-09	-1.254e-14	15	-7.492e-09	-2.050e-14
16	-9.551e-08	-5.837e-14	17	-9.551e-08	-1.376e-13	18	-9.551e-08	-2.205e-13
19	-9.551e-08	-3.086e-13	20	-9.551e-08	-4.026e-13	21	-3.907e-11	9.418e-13
22	-5.222e-14	1.237e-15	23	-1.889e-14	1.777e-16	24	-9.630e-15	1.490e-17
25	-7.492e-09	-4.172e-15	26	-7.492e-09	-1.211e-14	27	-7.492e-09	-1.865e-14
28	-9.551e-08	-4.219e-14	29	-9.551e-08	-9.094e-14	30	-9.551e-08	-1.345e-13
31	-9.551e-08	-1.682e-13	32	-9.551e-08	-1.856e-13	33	-4.009e-11	-4.043e-13
34	-5.140e-14	-2.102e-16	35	-1.839e-14	1.682e-17	36	-9.374e-15	1.329e-17
37	-7.492e-09	-4.142e-15	38	-7.492e-09	-1.210e-14	39	-7.492e-09	-1.889e-14
40	-9.551e-08	-4.632e-14	41	-9.551e-08	-1.049e-13	42	-9.551e-08	-1.655e-13
43	-9.551e-08	-2.307e-13	44	-9.551e-08	-3.051e-13	45	-4.170e-11	-9.491e-14
46	-5.230e-14	-1.034e-16	47	-1.860e-14	-4.222e-17	48	-9.440e-15	-1.112e-17
49	-7.492e-09	-4.397e-15	50	-7.492e-09	-1.283e-14	51	-7.492e-09	-2.006e-14
52	-9.551e-08	-4.945e-14	53	-9.551e-08	-1.107e-13	54	-9.551e-08	-1.713e-13
55	-9.551e-08	-2.302e-13	56	-9.551e-08	-2.853e-13	57	-4.328e-11	-1.795e-13
58	-5.288e-14	-9.568e-17	59	-1.873e-14	-1.797e-17	60	-9.491e-15	-3.372e-18
61	-7.492e-09	-4.681e-15	62	-7.492e-09	-1.360e-14	63	-7.492e-09	-2.124e-14
64	-9.551e-08	-5.253e-14	65	-9.551e-08	-1.173e-13	66	-9.551e-08	-1.823e-13
67	-9.551e-08	-2.477e-13	68	-9.551e-08	-3.144e-13	69	-4.498e-11	-1.713e-13
70	-5.354e-14	-1.050e-16	71	-1.887e-14	-2.486e-17	72	-9.539e-15	-5.242e-18
73	-7.492e-09	-4.989e-15	74	-7.492e-09	-1.445e-14	75	-7.492e-09	-2.255e-14

Case II output file

76	-9.551e-08	-5.609e-14	77	-9.551e-08	-1.249e-13	78	-9.551e-08	-1.936e-13
79	-9.551e-08	-2.622e-13	80	-9.551e-08	-3.302e-13	81	-4.678e-11	-1.862e-13
82	-5.420e-14	-1.038e-16	83	-1.900e-14	-2.351e-17	84	-9.589e-15	-4.910e-18
85	-7.492e-09	-5.324e-15	86	-7.492e-09	-1.537e-14	87	-7.492e-09	-2.398e-14
88	-9.551e-08	-5.988e-14	89	-9.551e-08	-1.329e-13	90	-9.551e-08	-2.059e-13
91	-9.551e-08	-2.789e-13	92	-9.551e-08	-3.520e-13	93	-4.869e-11	-1.966e-13
94	-5.488e-14	-1.063e-16	95	-1.914e-14	-2.409e-17	96	-9.638e-15	-5.014e-18
97	-7.492e-09	-5.688e-15	98	-7.492e-09	-1.637e-14	99	-7.492e-09	-2.552e-14
100	-9.551e-08	-6.400e-14	101	-9.551e-08	-1.416e-13	102	-9.551e-08	-2.193e-13
103	-9.551e-08	-2.968e-13	104	-9.551e-08	-3.743e-13	105	-5.072e-11	-2.093e-13
106	-5.556e-14	-1.077e-16	107	-1.929e-14	-2.425e-17	108	-9.689e-15	-5.044e-18
109	-7.492e-09	-6.082e-15	110	-7.492e-09	-1.745e-14	111	-7.492e-09	-2.719e-14
112	-9.551e-08	-6.847e-14	113	-9.551e-08	-1.511e-13	114	-9.551e-08	-2.337e-13
115	-9.551e-08	-3.163e-13	116	-9.551e-08	-3.988e-13	117	-5.288e-11	-2.227e-13
118	-5.626e-14	-1.095e-16	119	-1.943e-14	-2.450e-17	120	-9.739e-15	-5.084e-18
121	-7.492e-09	-6.511e-15	122	-7.492e-09	-1.863e-14	123	-7.492e-09	-2.902e-14
124	-9.551e-08	-7.334e-14	125	-9.551e-08	-1.614e-13	126	-9.551e-08	-2.495e-13
127	-9.551e-08	-3.375e-13	128	-9.551e-08	-4.254e-13	129	-5.518e-11	-2.374e-13
130	-5.697e-14	-1.112e-16	131	-1.957e-14	-2.473e-17	132	-9.790e-15	-5.124e-18
133	-7.492e-09	-6.979e-15	134	-7.492e-09	-1.992e-14	135	-7.492e-09	-3.100e-14
136	-9.551e-08	-7.865e-14	137	-9.551e-08	-1.727e-13	138	-9.551e-08	-2.667e-13
139	-9.551e-08	-3.606e-13	140	-9.551e-08	-4.544e-13	141	-5.763e-11	-2.533e-13
142	-5.770e-14	-1.130e-16	143	-1.972e-14	-2.498e-17	144	-9.842e-15	-5.164e-18
145	-7.492e-09	-7.490e-15	146	-7.492e-09	-2.133e-14	147	-7.492e-09	-3.317e-14
148	-9.551e-08	-8.444e-14	149	-9.551e-08	-1.850e-13	150	-9.551e-08	-2.854e-13
151	-9.551e-08	-3.858e-13	152	-9.551e-08	-4.861e-13	153	-6.025e-11	-2.708e-13
154	-5.844e-14	-1.148e-16	155	-1.986e-14	-2.522e-17	156	-9.894e-15	-5.205e-18
157	-7.491e-09	-8.050e-15	158	-7.491e-09	-2.286e-14	159	-7.491e-09	-3.555e-14
160	-9.551e-08	-9.078e-14	161	-9.551e-08	-1.984e-13	162	-9.551e-08	-3.059e-13
163	-9.551e-08	-4.134e-13	164	-9.551e-08	-5.208e-13	165	-6.305e-11	-2.899e-13
166	-5.920e-14	-1.167e-16	167	-2.001e-14	-2.547e-17	168	-9.946e-15	-5.246e-18
169	-7.491e-09	-8.663e-15	170	-7.491e-09	-2.455e-14	171	-7.491e-09	-3.815e-14
172	-9.551e-08	-9.773e-14	173	-9.551e-08	-2.131e-13	174	-9.551e-08	-3.284e-13
175	-9.551e-08	-4.437e-13	176	-9.551e-08	-5.588e-13	177	-6.605e-11	-3.108e-13
178	-5.997e-14	-1.186e-16	179	-2.016e-14	-2.572e-17	180	-9.998e-15	-5.287e-18
181	-7.491e-09	-9.337e-15	182	-7.491e-09	-2.640e-14	183	-7.491e-09	-4.101e-14
184	-9.551e-08	-1.054e-13	185	-9.551e-08	-2.293e-13	186	-9.551e-08	-3.532e-13
187	-9.551e-08	-4.769e-13	188	-9.551e-08	-6.005e-13	189	-6.927e-11	-3.338e-13
190	-6.075e-14	-1.205e-16	191	-2.032e-14	-2.598e-17	192	-1.005e-14	-5.329e-18
193	-7.491e-09	-1.008e-14	194	-7.491e-09	-2.844e-14	195	-7.491e-09	-4.416e-14
196	-9.551e-08	-1.138e-13	197	-9.551e-08	-2.471e-13	198	-9.551e-08	-3.804e-13
199	-9.551e-08	-5.135e-13	200	-9.551e-08	-6.465e-13	201	-7.273e-11	-3.591e-13
202	-6.155e-14	-1.225e-16	203	-2.047e-14	-2.623e-17	204	-1.011e-14	-5.371e-18
205	-7.491e-09	-1.090e-14	206	-7.491e-09	-3.070e-14	207	-7.491e-09	-4.764e-14
208	-9.551e-08	-1.231e-13	209	-9.551e-08	-2.668e-13	210	-9.551e-08	-4.104e-13
211	-9.551e-08	-5.539e-13	212	-9.551e-08	-6.973e-13	213	-7.646e-11	-3.870e-13
214	-6.237e-14	-1.246e-16	215	-2.063e-14	-2.650e-17	216	-1.016e-14	-5.413e-18
217	-7.491e-09	-1.181e-14	218	-7.491e-09	-3.319e-14	219	-7.491e-09	-5.150e-14
220	-9.551e-08	-1.333e-13	221	-9.551e-08	-2.886e-13	222	-9.551e-08	-4.437e-13
223	-9.551e-08	-5.986e-13	224	-9.551e-08	-7.534e-13	225	-8.048e-11	-4.180e-13
226	-6.320e-14	-1.267e-16	227	-2.078e-14	-2.676e-17	228	-1.021e-14	-5.456e-18
229	-7.491e-09	-1.281e-14	230	-7.491e-09	-3.596e-14	231	-7.491e-09	-5.577e-14
232	-9.550e-08	-1.447e-13	233	-9.550e-08	-3.127e-13	234	-9.550e-08	-4.806e-13
235	-9.550e-08	-6.483e-13	236	-9.550e-08	-8.157e-13	237	-8.483e-11	-4.522e-13
238	-6.405e-14	-1.288e-16	239	-2.094e-14	-2.703e-17	240	-1.027e-14	-5.500e-18
241	-7.491e-09	-1.394e-14	242	-7.491e-09	-3.904e-14	243	-7.491e-09	-6.053e-14

Case II output file

244	-9.550e-08	-1.574e-13	245	-9.550e-08	-3.396e-13	246	-9.550e-08	-5.216e-13
247	-9.550e-08	-7.035e-13	248	-9.550e-08	-8.850e-13	249	-8.954e-11	-4.904e-13
250	-6.491e-14	-1.310e-16	251	-2.110e-14	-2.730e-17	252	-1.032e-14	-5.544e-18
253	-7.491e-09	-1.519e-14	254	-7.491e-09	-4.248e-14	255	-7.491e-09	-6.584e-14
256	-9.550e-08	-1.716e-13	257	-9.550e-08	-3.696e-13	258	-9.550e-08	-5.674e-13
259	-9.550e-08	-7.650e-13	260	-9.550e-08	-9.624e-13	261	-9.465e-11	-5.330e-13
262	-6.580e-14	-1.333e-16	263	-2.127e-14	-2.758e-17	264	-1.038e-14	-5.588e-18
265	-7.491e-09	-1.659e-14	266	-7.491e-09	-4.633e-14	267	-7.491e-09	-7.179e-14
268	-9.550e-08	-1.875e-13	269	-9.550e-08	-4.032e-13	270	-9.550e-08	-6.187e-13
271	-9.550e-08	-8.340e-13	272	-9.550e-08	-1.049e-12	273	-1.002e-10	-5.806e-13
274	-6.670e-14	-1.356e-16	275	-2.143e-14	-2.785e-17	276	-1.044e-14	-5.632e-18
277	-7.491e-09	-1.816e-14	278	-7.491e-09	-5.066e-14	279	-7.491e-09	-7.847e-14
280	-9.550e-08	-2.053e-13	281	-9.550e-08	-4.409e-13	282	-9.550e-08	-6.763e-13
283	-9.550e-08	-9.114e-13	284	-9.550e-08	-1.146e-12	285	-1.063e-10	-6.341e-13
286	-6.762e-14	-1.379e-16	287	-2.160e-14	-2.814e-17	288	-1.049e-14	-5.677e-18
289	-7.491e-09	-1.994e-14	290	-7.491e-09	-5.554e-14	291	-7.491e-09	-8.600e-14
292	-9.550e-08	-2.253e-13	293	-9.550e-08	-4.834e-13	294	-9.550e-08	-7.412e-13
295	-9.550e-08	-9.987e-13	296	-9.550e-08	-1.256e-12	297	-1.129e-10	-6.944e-13
298	-6.856e-14	-1.403e-16	299	-2.177e-14	-2.842e-17	300	-1.055e-14	-5.723e-18
301	-7.491e-09	-2.195e-14	302	-7.491e-09	-6.107e-14	303	-7.491e-09	-9.453e-14
304	-9.550e-08	-2.481e-13	305	-9.550e-08	-5.315e-13	306	-9.550e-08	-8.146e-13
307	-9.550e-08	-1.097e-12	308	-9.550e-08	-1.380e-12	309	-1.202e-10	-7.625e-13
310	-6.952e-14	-1.428e-16	311	-2.194e-14	-2.871e-17	312	-1.061e-14	-5.768e-18
313	-7.491e-09	-2.424e-14	314	-7.491e-09	-6.734e-14	315	-7.491e-09	-1.042e-13
316	-9.550e-08	-2.738e-13	317	-9.550e-08	-5.861e-13	318	-9.550e-08	-8.980e-13
319	-9.550e-08	-1.209e-12	320	-9.550e-08	-1.520e-12	321	-1.282e-10	-8.399e-13
322	-7.050e-14	-1.454e-16	323	-2.211e-14	-2.900e-17	324	-1.066e-14	-5.814e-18
325	-7.490e-09	-2.684e-14	326	-7.490e-09	-7.451e-14	327	-7.490e-09	-1.152e-13
328	-9.550e-08	-3.035e-13	329	-9.550e-08	-6.483e-13	330	-9.550e-08	-9.930e-13
331	-9.550e-08	-1.337e-12	332	-9.550e-08	-1.681e-12	333	-1.370e-10	-9.281e-13
334	-7.150e-14	-1.480e-16	335	-2.229e-14	-2.930e-17	336	-1.072e-14	-5.861e-18
337	-7.490e-09	-2.984e-14	338	-7.490e-09	-8.267e-14	339	-7.490e-09	-1.280e-13
340	-9.549e-08	-3.359e-13	341	-9.549e-08	-7.198e-13	342	-9.549e-08	-1.102e-12
343	-9.549e-08	-1.483e-12	344	-9.549e-08	-1.864e-12	345	-1.468e-10	-1.029e-12
346	-7.252e-14	-1.506e-16	347	-2.246e-14	-2.960e-17	348	-1.078e-14	-5.907e-18
349	-7.490e-09	-3.323e-14	350	-7.490e-09	-9.231e-14	351	-7.490e-09	-1.422e-13
352	-9.549e-08	-3.800e-13	353	-9.549e-08	-8.012e-13	354	-9.549e-08	-1.226e-12
355	-9.549e-08	-1.652e-12	356	-9.549e-08	-2.076e-12	357	-1.577e-10	-1.145e-12
358	-7.357e-14	-1.534e-16	359	-2.264e-14	-2.990e-17	360	-1.084e-14	-5.954e-18
361	-7.490e-09	-3.734e-14	362	-7.490e-09	-1.024e-13	363	-7.490e-09	-1.604e-13
364	-9.549e-08	-4.036e-13	365	-9.549e-08	-8.982e-13	366	-9.549e-08	-1.376e-12
367	-9.549e-08	-1.847e-12	368	-9.549e-08	-2.319e-12	369	-1.698e-10	-1.280e-12
370	-7.463e-14	-1.562e-16	371	-2.282e-14	-3.021e-17	372	-1.090e-14	-6.001e-18
373	-7.490e-09	-4.150e-14	374	-7.490e-09	-1.180e-13	375	-7.490e-09	-1.739e-13
376	-9.549e-08	-5.415e-13	377	-9.549e-08	-1.004e-12	378	-9.549e-08	-1.524e-12
379	-9.549e-08	-2.070e-12	380	-9.549e-08	-2.605e-12	381	-1.834e-10	-1.436e-12
382	-7.572e-14	-1.590e-16	383	-2.301e-14	-3.051e-17	384	-1.096e-14	-6.048e-18
385	-7.490e-09	-4.676e-14	386	-7.490e-09	-1.185e-13	387	-7.490e-09	-2.193e-13
388	-9.548e-08	-2.509e-13	389	-9.548e-08	-1.131e-12	390	-9.548e-08	-1.806e-12
391	-9.548e-08	-2.358e-12	392	-9.548e-08	-2.937e-12	393	-1.986e-10	-1.618e-12
394	-7.683e-14	-1.620e-16	395	-2.319e-14	-3.082e-17	396	-1.102e-14	-6.094e-18
397	-7.489e-09	-5.157e-14	398	-7.489e-09	-1.775e-13	399	-7.489e-09	-1.287e-13
400	-9.548e-08	-1.735e-12	401	-9.548e-08	-1.354e-12	402	-9.548e-08	-1.665e-12
403	-9.548e-08	-2.512e-12	404	-9.548e-08	-3.301e-12	405	-2.159e-10	-1.833e-12
406	-7.797e-14	-1.651e-16	407	-2.338e-14	-3.116e-17	408	-1.108e-14	-6.149e-18
409	-7.489e-09	1.500e-15	410	-7.489e-09	8.062e-14	411	-7.489e-09	-5.219e-13

Case II output file

412	-9.548e-08	4.112e-12	413	-9.548e-08	-7.416e-13	414	-9.548e-08	-3.382e-12
415	-9.548e-08	-3.699e-12	416	-9.548e-08	-3.971e-12	417	-2.355e-10	-2.089e-12
418	-7.914e-14	-1.678e-16	419	-2.357e-14	-3.131e-17	420	-1.114e-14	-6.151e-18
421	-7.489e-09	-8.756e-14	422	-7.489e-09	-3.928e-13	423	-7.489e-09	1.908e-12
424	-9.547e-08	-1.957e-11	425	-9.548e-08	-5.176e-12	426	-9.548e-08	2.728e-12
427	-9.547e-08	6.031e-13	428	-9.547e-08	-3.015e-12	429	-2.578e-10	-2.390e-12
430	-8.032e-14	-1.712e-16	431	-2.376e-14	-3.206e-17	432	-1.121e-14	-6.339e-18
433	-7.492e-09	2.409e-12	434	-7.489e-09	5.541e-12	435	-7.490e-09	-3.403e-12
436	-9.549e-08	8.428e-11	437	-9.545e-08	2.643e-11	438	-9.545e-08	-1.749e-11
439	-9.546e-08	-1.987e-11	440	-9.547e-08	-1.094e-11	441	-2.836e-10	-2.777e-12
442	-8.155e-14	-1.787e-16	443	-2.396e-14	-3.219e-17	444	-1.127e-14	-6.156e-18
445	-7.508e-09	1.438e-12	446	-7.510e-09	9.959e-12	447	-7.490e-09	5.639e-11
448	-9.534e-08	-3.235e-10	449	-9.549e-08	-1.341e-10	450	-9.551e-08	5.354e-11
451	-9.547e-08	7.357e-11	452	-9.543e-08	2.621e-11	453	-3.132e-10	-3.079e-12
454	-8.271e-14	-1.145e-16	455	-2.412e-14	-1.419e-17	456	-1.132e-14	-2.123e-18
457	-7.610e-09	6.794e-11	458	-7.546e-09	1.268e-10	459	-7.550e-09	-7.688e-12
460	-9.624e-08	1.732e-09	461	-9.541e-08	1.227e-09	462	-9.506e-08	3.624e-10
463	-9.505e-08	3.364e-11	464	-9.510e-08	-2.169e-11	465	-3.469e-10	-3.889e-12
466	-8.386e-14	-3.749e-16	467	-2.434e-14	-1.088e-16	468	-1.141e-14	-2.667e-17
469	-8.550e-09	3.711e-10	470	-8.205e-09	1.084e-09	471	-7.349e-09	1.875e-09
472	-8.829e-08	-7.189e-09	473	-9.281e-08	-8.273e-09	474	-9.623e-08	-5.496e-09
475	-9.805e-08	-3.147e-09	476	-9.884e-08	-1.036e-09	477	-4.050e-10	-8.892e-12
478	-8.911e-14	-1.726e-15	479	-2.574e-14	-4.777e-16	480	-1.205e-14	-1.115e-16
481	-1.078e-08	3.222e-10	482	-1.119e-08	9.317e-10	483	-1.218e-08	1.580e-09
484	-4.665e-12	2.936e-12	485	-1.184e-07	-7.510e-09	486	-1.148e-07	-5.018e-09
487	-1.128e-07	-2.912e-09	488	-1.119e-07	-9.683e-10	489	-5.191e-10	-1.151e-11
490	-1.012e-13	-1.699e-15	491	-2.876e-14	-4.628e-16	492	-1.335e-14	-1.076e-16
493	-1.137e-08	1.068e-11	494	-1.138e-08	-3.811e-11	495	-1.123e-08	-2.820e-10
496	-4.170e-12	8.806e-12	497	-1.137e-07	1.515e-09	498	-1.145e-07	4.570e-10
499	-1.148e-07	1.315e-10	500	-1.148e-07	9.793e-12	501	-6.204e-10	-9.812e-12
502	-1.064e-13	-3.568e-16	503	-3.005e-14	-8.562e-17	504	-1.392e-14	-1.975e-17
505	-1.134e-08	-5.285e-12	506	-1.133e-08	7.845e-13	507	-1.135e-08	7.201e-11
508	-4.268e-12	1.355e-11	509	-1.152e-07	3.377e-10	510	-1.145e-07	1.161e-09
511	-1.140e-07	7.125e-10	512	-1.138e-07	2.260e-10	513	-7.242e-10	-1.063e-11
514	-1.074e-13	1.312e-16	515	-3.008e-14	7.112e-17	516	-1.390e-14	1.882e-17
517	-1.136e-08	5.837e-12	518	-1.136e-08	1.375e-11	519	-1.135e-08	2.573e-12
520	-4.155e-12	1.888e-11	521	-1.265e-07	9.243e-10	522	-1.099e-07	1.253e-09
523	-1.104e-07	6.906e-10	524	-1.106e-07	2.048e-10	525	-8.398e-10	-1.348e-11
526	-1.067e-13	9.320e-17	527	-2.967e-14	5.321e-17	528	-1.369e-14	1.495e-17
529	-1.138e-08	4.516e-12	530	-1.138e-08	1.255e-11	531	-1.138e-08	2.405e-11
532	-4.178e-12	2.465e-11	533	-1.274e-07	-1.564e-10	534	-1.100e-07	-1.840e-10
535	-1.099e-07	-7.396e-11	536	-1.099e-07	-4.378e-11	537	-1.007e-09	-1.966e-11
538	-1.078e-13	-2.714e-16	539	-2.971e-14	-2.289e-17	540	-1.365e-14	-3.752e-18
541	-1.141e-08	6.161e-12	542	-1.141e-08	1.701e-11	543	-1.141e-08	2.514e-11
544	-4.179e-12	3.042e-11	545	-1.271e-07	5.954e-11	546	-1.099e-07	2.603e-11
547	-1.099e-07	-2.931e-11	548	-1.099e-07	-4.692e-11	549	-1.239e-09	-2.682e-11
550	-1.098e-13	-1.483e-16	551	-2.997e-14	-8.227e-17	552	-1.374e-14	-1.471e-17
553	-1.144e-08	7.250e-12	554	-1.144e-08	1.989e-11	555	-1.144e-08	3.102e-11
556	-4.185e-12	3.629e-11	557	-1.270e-07	-1.133e-11	558	-1.098e-07	-1.744e-11
559	-1.098e-07	-8.789e-12	560	-1.098e-07	-5.694e-11	561	-1.560e-09	-3.767e-11
562	-1.120e-13	-8.665e-16	563	-3.031e-14	8.074e-17	564	-1.381e-14	1.563e-17
565	-1.148e-08	8.453e-12	566	-1.148e-08	2.326e-11	567	-1.148e-08	3.587e-11
568	-4.191e-12	4.225e-11	569	-1.268e-07	1.123e-10	570	-1.096e-07	-2.292e-11
571	-1.096e-07	-1.867e-10	572	-1.097e-07	-1.283e-10	573	-2.025e-09	-5.592e-11
574	-1.130e-13	2.552e-15	575	-3.020e-14	-3.828e-16	576	-1.384e-14	-8.021e-17
577	-1.153e-08	9.680e-12	578	-1.153e-08	2.660e-11	579	-1.152e-08	4.110e-11

Case II output file

580	-4.197e-12	4.832e-11	581	-1.267e-07	-2.812e-10	582	-1.096e-07	1.344e-10
583	-1.093e-07	6.128e-10	584	-1.091e-07	8.514e-11	585	-2.715e-09	-8.060e-11
586	-1.196e-13	-1.394e-14	587	-3.259e-14	3.245e-16	588	-1.460e-14	7.511e-17
589	-1.158e-08	1.099e-11	590	-1.158e-08	3.021e-11	591	-1.158e-08	4.666e-11
592	-4.136e-12	5.487e-11	593	-1.214e-07	-2.968e-10	594	-1.214e-07	7.851e-11
595	-1.052e-07	5.549e-10	596	-1.055e-07	2.564e-11	597	-3.715e-09	-1.283e-10
598	-9.163e-12	-1.151e-12	599	-2.798e-14	3.203e-16	600	-1.284e-14	7.331e-17
601	-1.164e-08	1.239e-11	602	-1.164e-08	3.407e-11	603	-1.163e-08	5.265e-11
604	-4.141e-12	6.193e-11	605	-1.211e-07	1.102e-10	606	-1.211e-07	-4.711e-11
607	-1.046e-07	-4.565e-10	608	-1.046e-07	-5.661e-10	609	-5.546e-09	-2.424e-10
610	-9.720e-12	2.550e-13	611	-3.044e-14	-3.749e-16	612	-1.363e-14	-7.730e-17
613	-1.170e-08	1.387e-11	614	-1.170e-08	3.813e-11	615	-1.170e-08	5.889e-11
616	-4.134e-12	6.925e-11	617	-1.196e-07	-3.289e-10	618	-1.199e-07	-1.051e-09
619	-1.039e-07	-6.721e-10	620	-1.039e-07	-5.511e-10	621	-9.156e-09	-4.822e-10
622	-9.711e-12	-6.060e-14	623	-2.996e-14	2.156e-16	624	-1.348e-14	4.722e-17
625	-1.178e-08	1.550e-11	626	-1.177e-08	4.259e-11	627	-1.177e-08	6.574e-11
628	-4.058e-12	7.728e-11	629	-1.132e-07	-7.470e-10	630	-1.132e-07	-2.424e-09
631	-1.137e-07	-3.115e-09	632	-9.905e-08	-2.511e-09	633	-1.708e-08	-1.135e-09
634	-9.517e-12	5.571e-14	635	-2.910e-14	2.739e-16	636	-1.301e-14	7.150e-17
637	-1.186e-08	1.736e-11	638	-1.186e-08	4.771e-11	639	-1.185e-08	7.365e-11
640	-3.946e-12	8.658e-11	641	-1.040e-07	-8.981e-10	642	-1.041e-07	-2.895e-09
643	-1.042e-07	-5.281e-09	644	-1.045e-07	-7.158e-09	645	-3.900e-08	-3.218e-09
646	-8.783e-12	1.181e-13	647	-2.658e-14	6.903e-16	648	-1.185e-14	1.586e-16
649	-1.195e-08	1.949e-11	650	-1.195e-08	5.357e-11	651	-1.195e-08	8.274e-11
652	-3.845e-12	9.729e-11	653	-9.542e-08	-4.494e-10	654	-9.500e-08	-1.550e-09
655	-9.412e-08	-2.587e-09	656	-9.255e-08	-3.824e-09	657	-7.822e-08	-3.041e-09
658	-7.651e-12	3.287e-14	659	-2.327e-14	2.251e-16	660	-1.046e-14	5.565e-17
661	-1.205e-08	2.180e-11	662	-1.205e-08	5.995e-11	663	-1.205e-08	9.263e-11
664	-3.836e-12	1.090e-10	665	-9.339e-08	9.382e-11	666	-9.337e-08	9.670e-11
667	-9.337e-08	1.794e-10	668	-9.352e-08	4.898e-10	669	-8.114e-08	5.644e-10
670	-8.119e-12	-4.532e-14	671	-2.417e-14	-1.783e-16	672	-1.071e-14	-3.865e-17
673	-1.217e-08	2.421e-11	674	-1.217e-08	6.658e-11	675	-1.216e-08	1.029e-10
676	-3.860e-12	1.210e-10	677	-9.341e-08	1.146e-10	678	-9.342e-08	1.046e-10
679	-9.344e-08	1.082e-10	680	-9.338e-08	1.088e-10	681	-8.058e-08	-8.392e-12
682	-8.186e-12	-1.188e-14	683	-2.434e-14	-3.198e-17	684	-1.081e-14	-2.897e-18
685	-1.229e-08	2.669e-11	686	-1.229e-08	7.335e-11	687	-1.229e-08	1.134e-10
688	-3.878e-12	1.334e-10	689	-9.279e-08	-9.796e-12	690	-9.288e-08	-3.066e-10
691	-9.310e-08	-6.377e-10	692	-9.354e-08	-1.030e-09	693	-8.128e-08	-5.733e-10
694	-8.387e-12	1.254e-14	695	-2.460e-14	9.246e-17	696	-1.085e-14	7.079e-18
697	-1.241e-08	2.882e-11	698	-1.241e-08	7.948e-11	699	-1.241e-08	1.223e-10
700	-3.881e-12	1.442e-10	701	-9.121e-08	-1.984e-11	702	-9.110e-08	-3.567e-10
703	-9.082e-08	-7.279e-10	704	-9.026e-08	-1.160e-09	705	-8.961e-08	-7.534e-10
706	-8.090e-12	1.828e-15	707	-2.383e-14	3.278e-17	708	-1.054e-14	8.862e-17
709	-1.252e-08	3.076e-11	710	-1.252e-08	8.385e-11	711	-1.251e-08	1.318e-10
712	-3.893e-12	1.535e-10	713	-9.054e-08	1.120e-10	714	-9.051e-08	3.496e-11
715	-9.046e-08	9.488e-12	716	-9.045e-08	8.866e-11	717	-9.051e-08	9.524e-11
718	-8.232e-12	2.784e-14	719	-2.367e-14	4.358e-16	720	-1.043e-14	-2.018e-16
721	-1.263e-08	3.292e-11	722	-1.263e-08	9.241e-11	723	-1.263e-08	1.328e-10
724	-3.916e-12	1.633e-10	725	-9.038e-08	1.385e-10	726	-9.038e-08	1.225e-10
727	-9.038e-08	9.087e-11	728	-9.038e-08	3.754e-11	729	-9.037e-08	-2.289e-12
730	-8.454e-12	-2.825e-13	731	-2.629e-14	-4.226e-15	732	-1.202e-14	1.343e-16
733	-1.275e-08	3.110e-11	734	-1.276e-08	8.459e-11	735	-1.275e-08	1.759e-10
736	-3.934e-12	1.732e-10	737	-9.027e-08	2.020e-10	738	-9.025e-08	1.174e-10
739	-9.025e-08	7.626e-11	740	-9.026e-08	4.899e-11	741	-9.026e-08	1.947e-11
742	-8.349e-12	-4.528e-13	743	-1.858e-12	-3.240e-13	744	-9.239e-15	1.430e-16
745	-1.289e-08	6.041e-11	746	-1.285e-08	1.344e-10	747	-1.291e-08	1.272e-11

Case II output file

748	-3.986e-12	1.834e-10	749	-9.008e-08	-4.216e-11	750	-9.017e-08	1.116e-10
751	-9.015e-08	1.259e-10	752	-9.013e-08	8.517e-11	753	-9.011e-08	2.847e-11
754	-9.798e-12	-9.901e-14	755	-2.045e-12	6.265e-14	756	-1.077e-14	-1.971e-16
757	-1.306e-08	-3.693e-11	758	-1.315e-08	6.442e-11	759	-1.291e-08	7.134e-10
760	-3.917e-12	1.952e-10	761	-9.017e-08	9.099e-10	762	-8.987e-08	2.877e-10
763	-8.987e-08	2.554e-11	764	-8.994e-08	-4.283e-11	765	-8.998e-08	-2.245e-11
766	-9.955e-12	-3.030e-16	767	-2.041e-12	-1.076e-14	768	-1.066e-14	3.886e-17
769	-1.280e-08	7.447e-11	770	-1.283e-08	-4.789e-10	771	-1.425e-08	-2.589e-09
772	-4.480e-12	2.117e-10	773	-8.841e-08	-3.166e-09	774	-8.987e-08	-1.269e-09
775	-9.025e-08	-2.535e-10	776	-9.021e-08	1.067e-10	777	-9.011e-08	7.811e-11
778	-1.011e-11	-3.315e-14	779	-2.066e-12	-1.234e-14	780	-1.079e-14	-5.942e-18
781	-2.009e-08	4.421e-09	782	-1.452e-08	1.174e-08	783	-3.534e-09	1.627e-08
784	-7.744e-13	2.104e-10	785	-1.021e-07	1.718e-08	786	-9.315e-08	1.473e-08
787	-8.718e-08	1.099e-08	788	-8.356e-08	6.717e-09	789	-8.186e-08	2.255e-09
790	-9.197e-12	3.285e-13	791	-2.117e-12	4.200e-14	792	-9.371e-15	3.920e-16
793	-5.638e-08	9.085e-09	794	-5.535e-08	2.694e-08	795	-5.180e-08	4.834e-08
796	-4.078e-09	9.120e-08	797	-5.075e-08	5.326e-08	798	-4.782e-08	3.640e-08
799	-4.668e-08	2.395e-08	800	-4.622e-08	1.370e-08	801	-4.603e-08	4.466e-09
802	-5.290e-12	7.111e-13	803	-1.237e-12	9.877e-14	804	-5.738e-15	-2.595e-17
805	-9.162e-08	6.106e-09	806	-9.962e-08	1.688e-08	807	-1.202e-07	2.547e-08
808	-2.767e-11	3.849e-10	809	2.114e-08	2.237e-08	810	2.681e-09	2.161e-08
811	-5.687e-09	1.707e-08	812	-9.416e-09	1.075e-08	813	-1.084e-08	3.658e-09
814	-1.310e-12	6.555e-13	815	-2.915e-13	1.249e-13	816	-9.529e-14	8.055e-16
817	-1.019e-07	1.254e-09	818	-1.038e-07	1.877e-09	819	-1.030e-07	-2.302e-09
820	-1.086e-10	2.623e-10	821	-2.107e-10	6.371e-11	822	-1.799e-10	3.574e-11
823	-1.627e-10	2.048e-11	824	-1.533e-10	1.072e-11	825	-1.491e-10	3.346e-12
826	-2.193e-14	-4.582e-16	827	-4.494e-15	6.309e-17	828	-1.861e-15	2.178e-17
829	-1.029e-07	-3.507e-11	830	-1.027e-07	-1.585e-10	831	-1.031e-07	8.064e-10
832	-4.248e-11	4.843e-11	833	-7.664e-11	8.128e-11	834	-1.060e-10	5.513e-11
835	-1.162e-10	3.498e-11	836	-1.197e-10	1.932e-11	837	-1.207e-10	6.173e-12
838	-2.722e-14	-9.245e-16	839	-4.293e-15	1.393e-16	840	-1.675e-15	4.195e-17
841	-1.029e-07	3.737e-12	842	-1.029e-07	8.924e-11	843	-1.029e-07	-5.493e-11
844	-4.895e-11	3.731e-11	845	-7.468e-11	2.958e-11	846	-8.154e-11	2.899e-11
847	-8.947e-11	2.217e-11	848	-9.462e-11	1.353e-11	849	-9.702e-11	4.519e-12
850	-3.101e-14	-7.343e-16	851	-4.036e-15	1.261e-16	852	-1.507e-15	3.482e-17
853	-1.029e-07	1.017e-11	854	-1.029e-07	5.493e-12	855	-1.029e-07	3.161e-11
856	-4.597e-11	1.796e-11	857	-6.783e-11	1.754e-11	858	-7.347e-11	1.414e-11
859	-7.767e-11	1.095e-11	860	-8.081e-11	6.942e-12	861	-8.247e-11	2.377e-12
862	-3.657e-14	-1.658e-15	863	-3.865e-15	5.116e-17	864	-1.389e-15	1.788e-17
865	-1.029e-07	1.197e-12	866	-1.029e-07	6.382e-12	867	-1.029e-07	4.058e-12
868	-4.536e-11	6.427e-12	869	-6.501e-11	5.811e-12	870	-6.903e-11	5.097e-12
871	-7.235e-11	3.827e-12	872	-7.465e-11	2.393e-12	873	-7.584e-11	7.926e-13
874	-4.726e-14	-3.473e-15	875	-3.957e-15	-7.298e-17	876	-1.364e-15	-6.130e-18
877	-1.029e-07	-6.513e-13	878	-1.029e-07	-2.390e-12	879	-1.029e-07	-2.809e-12
880	-4.523e-11	-3.533e-12	881	-6.466e-11	-3.260e-12	882	-6.854e-11	-2.830e-12
883	-7.169e-11	-2.165e-12	884	-7.396e-11	-1.411e-12	885	-7.509e-11	-4.070e-13
886	-6.950e-14	-7.854e-15	887	-4.401e-15	-2.134e-16	888	-1.451e-15	-3.679e-17
889	-1.029e-07	-3.537e-12	890	-1.029e-07	-9.157e-12	891	-1.029e-07	-1.310e-11
892	-4.576e-11	-1.435e-11	893	-6.659e-11	-1.348e-11	894	-7.154e-11	-1.160e-11
895	-7.562e-11	-8.957e-12	896	-7.845e-11	-5.553e-12	897	-8.015e-11	-2.359e-12
898	-1.229e-13	-1.842e-14	899	-5.388e-15	-6.169e-16	900	-1.742e-15	-1.141e-16
901	-1.029e-07	-7.063e-12	902	-1.029e-07	-1.848e-11	903	-1.029e-07	-2.596e-11
904	-4.691e-11	-2.880e-11	905	-7.070e-11	-2.712e-11	906	-7.801e-11	-2.430e-11
907	-8.485e-11	-1.976e-11	908	-9.064e-11	-1.326e-11	909	-9.263e-11	-2.592e-12
910	-3.396e-13	-1.106e-13	911	-8.230e-15	-1.276e-15	912	-2.404e-15	-1.612e-16
913	-1.029e-07	-1.263e-11	914	-1.029e-07	-3.243e-11	915	-1.029e-07	-4.540e-11

Case II output file

916	-4.845e-11	-4.905e-11	917	-7.690e-11	-4.766e-11	918	-8.753e-11	-4.232e-11
919	-9.714e-11	-3.711e-11	920	-1.079e-10	-3.139e-11	921	-1.255e-10	-2.656e-11
922	-3.778e-12	-1.502e-12	923	-1.201e-14	-2.175e-16	924	-2.896e-15	-2.687e-17
925	-1.029e-07	-2.337e-11	926	-1.029e-07	-5.774e-11	927	-1.029e-07	-7.417e-11
928	-5.293e-11	-8.227e-11	929	-8.836e-11	-7.202e-11	930	-1.011e-10	-6.820e-11
931	-1.129e-10	-5.736e-11	932	-1.188e-10	-4.684e-11	933	-1.150e-10	-4.077e-11
934	-9.710e-11	-3.067e-11	935	-1.073e-14	-9.591e-16	936	-2.949e-15	-1.562e-16
937	-1.028e-07	-4.415e-11	938	-1.028e-07	-1.133e-10	939	-1.029e-07	-1.415e-10
940	-5.143e-11	-1.219e-10	941	-1.076e-10	-1.454e-10	942	-1.441e-10	-1.006e-10
943	-1.528e-10	-6.925e-11	944	-1.523e-10	-4.640e-11	945	-1.492e-10	-2.658e-11
946	-1.490e-10	-5.842e-12	947	-2.181e-14	-4.407e-15	948	-4.461e-15	-4.120e-16
949	-1.027e-07	-7.589e-11	950	-1.027e-07	-2.123e-10	951	-1.028e-07	-3.389e-10
952	-1.501e-10	-4.079e-10	953	-3.026e-10	-1.164e-10	954	-2.464e-10	-6.750e-11
955	-2.147e-10	-4.187e-11	956	-1.959e-10	-2.581e-11	957	-1.853e-10	-1.413e-11
958	-1.802e-10	-5.131e-12	959	-3.942e-14	-3.496e-15	960	-6.053e-15	-2.381e-16
961	-1.024e-07	-1.025e-10	962	-1.024e-07	-2.941e-10	963	-1.025e-07	-4.991e-10
964	-2.864e-11	-6.403e-10	965	-7.304e-10	-8.282e-10	966	-5.328e-10	-6.512e-10
967	-4.434e-10	-4.919e-10	968	-3.980e-10	-3.444e-10	969	-3.741e-10	-2.041e-10
970	-3.638e-10	-6.745e-11	971	-1.108e-13	-3.043e-14	972	-1.407e-14	-2.932e-15
973	-1.021e-07	-1.084e-10	974	-1.021e-07	-3.041e-10	975	-1.021e-07	-4.818e-10
976	-2.786e-11	-5.681e-10	977	-7.894e-10	-4.954e-10	978	-7.746e-10	-4.529e-10
979	-7.358e-10	-3.699e-10	980	-7.029e-10	-2.703e-10	981	-6.810e-10	-1.639e-10
982	-6.703e-10	-5.496e-11	983	-2.178e-13	-2.492e-14	984	-2.750e-14	-2.442e-15
985	-1.019e-07	-1.001e-10	986	-1.019e-07	-2.754e-10	987	-1.018e-07	-4.246e-10
988	-2.969e-11	-4.991e-10	989	-9.944e-10	-4.667e-10	990	-9.685e-10	-3.798e-10
991	-9.501e-10	-2.999e-10	992	-9.340e-10	-2.176e-10	993	-9.220e-10	-1.321e-10
994	-9.157e-10	-4.428e-11	995	-3.200e-13	-2.514e-14	996	-3.877e-14	-2.124e-15
997	-1.017e-07	-8.858e-11	998	-1.016e-07	-2.430e-10	999	-1.016e-07	-3.742e-10
1000	-3.113e-11	-4.388e-10	1001	-1.178e-09	-4.020e-10	1002	-1.160e-09	-3.329e-10
1003	-1.143e-09	-2.602e-10	1004	-1.131e-09	-1.867e-10	1005	-1.123e-09	-1.125e-10
1006	-1.119e-09	-3.760e-11	1007	-4.299e-13	-2.744e-14	1008	-4.907e-14	-2.016e-15
1009	-1.014e-07	-7.800e-11	1010	-1.014e-07	-2.140e-10	1011	-1.014e-07	-3.291e-10
1012	-3.247e-11	-3.859e-10	1013	-1.345e-09	-3.548e-10	1014	-1.328e-09	-2.914e-10
1015	-1.315e-09	-2.278e-10	1016	-1.304e-09	-1.633e-10	1017	-1.298e-09	-9.823e-11
1018	-1.294e-09	-3.282e-11	1019	-5.589e-13	-3.242e-14	1020	-5.907e-14	-1.997e-15
1021	-1.013e-07	-6.868e-11	1022	-1.012e-07	-1.884e-10	1023	-1.012e-07	-2.897e-10
1024	-3.364e-11	-3.397e-10	1025	-1.491e-09	-3.119e-10	1026	-1.477e-09	-2.565e-10
1027	-1.465e-09	-2.003e-10	1028	-1.456e-09	-1.435e-10	1029	-1.451e-09	-8.631e-11
1030	-1.448e-09	-2.885e-11	1031	-7.202e-13	-4.045e-14	1032	-6.916e-14	-2.044e-15
1033	-1.011e-07	-6.054e-11	1034	-1.011e-07	-1.660e-10	1035	-1.011e-07	-2.554e-10
1036	-3.468e-11	-2.994e-10	1037	-1.621e-09	-2.750e-10	1038	-1.608e-09	-2.260e-10
1039	-1.598e-09	-1.765e-10	1040	-1.590e-09	-1.265e-10	1041	-1.585e-09	-7.606e-11
1042	-1.583e-09	-2.545e-11	1043	-9.321e-13	-5.311e-14	1044	-7.960e-14	-2.138e-15
1045	-1.010e-07	-5.343e-11	1046	-1.009e-07	-1.465e-10	1047	-1.009e-07	-2.254e-10
1048	-3.560e-11	-2.643e-10	1049	-1.735e-09	-2.427e-10	1050	-1.724e-09	-1.995e-10
1051	-1.715e-09	-1.558e-10	1052	-1.708e-09	-1.117e-10	1053	-1.704e-09	-6.718e-11
1054	-1.702e-09	-2.251e-11	1055	-1.225e-12	-7.354e-14	1056	-9.064e-14	-2.281e-15
1057	-1.008e-07	-4.726e-11	1058	-1.008e-07	-1.296e-10	1059	-1.008e-07	-1.994e-10
1060	-3.641e-11	-2.338e-10	1061	-1.835e-09	-2.147e-10	1062	-1.826e-09	-1.765e-10
1063	-1.818e-09	-1.379e-10	1064	-1.813e-09	-9.885e-11	1065	-1.809e-09	-5.951e-11
1066	-1.807e-09	-2.001e-11	1067	-1.652e-12	-1.082e-13	1068	-1.025e-13	-2.483e-15
1069	-1.007e-07	-4.190e-11	1070	-1.007e-07	-1.149e-10	1071	-1.007e-07	-1.768e-10
1072	-3.712e-11	-2.073e-10	1073	-1.924e-09	-1.904e-10	1074	-1.916e-09	-1.567e-10
1075	-1.910e-09	-1.225e-10	1076	-1.905e-09	-8.790e-11	1077	-1.902e-09	-5.303e-11
1078	-1.900e-09	-1.790e-11	1079	-2.318e-12	-1.716e-13	1080	-1.156e-13	-2.733e-15
1081	-1.006e-07	-3.726e-11	1082	-1.006e-07	-1.022e-10	1083	-1.006e-07	-1.572e-10

Case II output file

1084	-3.775e-11	-1.844e-10	1085	-2.003e-09	-1.696e-10	1086	-1.996e-09	-1.399e-10
1087	-1.991e-09	-1.097e-10	1088	-1.987e-09	-7.902e-11	1089	-1.984e-09	-4.780e-11
1090	-1.983e-09	-1.650e-11	1091	-3.451e-12	-2.993e-13	1092	-1.302e-13	-3.194e-15
1093	-1.005e-07	-3.323e-11	1094	-1.005e-07	-9.116e-11	1095	-1.005e-07	-1.403e-10
1096	-3.830e-11	-1.646e-10	1097	-2.071e-09	-1.521e-10	1098	-2.066e-09	-1.269e-10
1099	-2.062e-09	-1.007e-10	1100	-2.060e-09	-7.343e-11	1101	-2.059e-09	-4.540e-11
1102	-2.059e-09	-1.552e-11	1103	-5.644e-12	-6.161e-13	1104	-1.472e-13	-3.400e-15
1105	-1.005e-07	-2.967e-11	1106	-1.005e-07	-8.146e-11	1107	-1.004e-07	-1.255e-10
1108	-3.872e-11	-1.474e-10	1109	-2.124e-09	-1.389e-10	1110	-2.122e-09	-1.212e-10
1111	-2.124e-09	-1.010e-10	1112	-2.127e-09	-7.692e-11	1113	-2.130e-09	-4.831e-11
1114	-2.134e-09	-2.121e-11	1115	-1.078e-11	-1.485e-12	1116	-1.677e-13	-5.875e-15
1117	-1.004e-07	-2.640e-11	1118	-1.004e-07	-7.259e-11	1119	-1.004e-07	-1.121e-10
1120	-3.891e-11	-1.319e-10	1121	-2.150e-09	-1.308e-10	1122	-2.152e-09	-1.281e-10
1123	-2.162e-09	-1.238e-10	1124	-2.183e-09	-1.147e-10	1125	-2.212e-09	-9.219e-11
1126	-2.231e-09	-3.285e-11	1127	-3.033e-11	-7.557e-12	1128	-2.066e-13	-8.395e-15
1129	-1.003e-07	-2.320e-11	1130	-1.003e-07	-6.388e-11	1131	-1.003e-07	-9.893e-11
1132	-3.877e-11	-1.166e-10	1133	-2.134e-09	-1.237e-10	1134	-2.134e-09	-1.391e-10
1135	-2.142e-09	-1.591e-10	1136	-2.165e-09	-1.881e-10	1137	-2.222e-09	-2.343e-10
1138	-2.373e-09	-3.147e-10	1139	-2.628e-10	-8.113e-11	1140	-2.233e-13	7.591e-15
1141	-1.003e-07	-1.988e-11	1142	-1.003e-07	-5.476e-11	1143	-1.003e-07	-8.492e-11
1144	-3.840e-11	-1.002e-10	1145	-2.089e-09	-1.092e-10	1146	-2.080e-09	-1.287e-10
1147	-2.065e-09	-1.532e-10	1148	-2.040e-09	-1.879e-10	1149	-1.986e-09	-2.421e-10
1150	-1.847e-09	-3.360e-10	1151	-1.596e-09	-3.116e-10	1152	-1.598e-13	2.578e-15
1153	-1.002e-07	-1.635e-11	1154	-1.002e-07	-4.503e-11	1155	-1.002e-07	-6.978e-11
1156	-3.811e-11	-8.226e-11	1157	-2.055e-09	-8.653e-11	1158	-2.042e-09	-9.482e-11
1159	-2.022e-09	-1.021e-10	1160	-1.994e-09	-1.057e-10	1161	-1.957e-09	-9.777e-11
1162	-1.927e-09	-5.562e-11	1163	-1.935e-09	1.556e-11	1164	-2.171e-13	-1.265e-14
1165	-1.002e-07	-1.268e-11	1166	-1.002e-07	-3.490e-11	1167	-1.002e-07	-5.396e-11
1168	-3.803e-11	-6.349e-11	1169	-2.047e-09	-6.303e-11	1170	-2.037e-09	-6.142e-11
1171	-2.026e-09	-5.760e-11	1172	-2.014e-09	-4.988e-11	1173	-2.004e-09	-3.721e-11
1174	-1.997e-09	-2.408e-11	1175	-1.990e-09	-1.546e-11	1176	-2.497e-13	-5.001e-15
1177	-1.002e-07	-8.974e-12	1178	-1.002e-07	-2.466e-11	1179	-1.001e-07	-3.806e-11
1180	-3.808e-11	-4.472e-11	1181	-2.054e-09	-4.278e-11	1182	-2.047e-09	-3.863e-11
1183	-2.040e-09	-3.370e-11	1184	-2.034e-09	-2.782e-11	1185	-2.028e-09	-2.123e-11
1186	-2.024e-09	-1.341e-11	1187	-2.022e-09	-3.065e-12	1188	-2.831e-13	-7.414e-15
1189	-1.001e-07	-5.287e-12	1190	-1.001e-07	-1.453e-11	1191	-1.001e-07	-2.239e-11
1192	-3.815e-11	-2.629e-11	1193	-2.063e-09	-2.480e-11	1194	-2.057e-09	-2.178e-11
1195	-2.051e-09	-1.852e-11	1196	-2.046e-09	-1.496e-11	1197	-2.042e-09	-1.096e-11
1198	-2.040e-09	-6.640e-12	1199	-2.038e-09	-2.568e-12	1200	-3.213e-13	-8.132e-15
1201	-1.001e-07	-1.644e-12	1202	-1.001e-07	-4.492e-12	1203	-1.001e-07	-6.962e-12
1204	-3.819e-11	-8.153e-12	1205	-2.068e-09	-7.768e-12	1206	-2.062e-09	-6.815e-12
1207	-2.057e-09	-5.851e-12	1208	-2.052e-09	-4.749e-12	1209	-2.049e-09	-3.527e-12
1210	-2.047e-09	-2.201e-12	1211	-2.046e-09	-6.874e-13	1212	-3.658e-13	-9.616e-15
1213	-1.001e-07	2.009e-12	1214	-1.001e-07	5.424e-12	1215	-1.001e-07	8.547e-12
1216	-3.818e-11	9.893e-12	1217	-2.067e-09	9.277e-12	1218	-2.061e-09	7.355e-12
1219	-2.056e-09	5.813e-12	1220	-2.052e-09	4.362e-12	1221	-2.049e-09	3.000e-12
1222	-2.047e-09	1.743e-12	1223	-2.046e-09	5.416e-13	1224	-4.192e-13	-1.206e-14
1225	-1.001e-07	5.690e-12	1226	-1.001e-07	1.580e-11	1227	-1.001e-07	2.328e-11
1228	-3.811e-11	2.814e-11	1229	-2.059e-09	2.471e-11	1230	-2.054e-09	2.135e-11
1231	-2.049e-09	1.691e-11	1232	-2.045e-09	1.252e-11	1233	-2.043e-09	8.516e-12
1234	-2.041e-09	4.911e-12	1235	-2.040e-09	1.586e-12	1236	-4.807e-13	-1.038e-14
1237	-1.002e-07	7.993e-12	1238	-1.002e-07	2.433e-11	1239	-1.001e-07	4.418e-11
1240	-3.803e-11	4.680e-11	1241	-2.045e-09	4.851e-11	1242	-2.036e-09	3.490e-11
1243	-2.032e-09	2.467e-11	1244	-2.031e-09	1.697e-11	1245	-2.031e-09	1.103e-11
1246	-2.031e-09	6.195e-12	1247	-2.031e-09	1.978e-12	1248	-5.774e-13	-4.486e-14
1249	-1.002e-07	4.228e-12	1250	-1.002e-07	1.369e-11	1251	-1.002e-07	2.910e-11

Case II output file

1252	-3.739e-11	7.181e-11	1253	-1.982e-09	3.278e-11	1254	-1.997e-09	2.069e-11
1255	-2.007e-09	1.349e-11	1256	-2.013e-09	8.831e-12	1257	-2.018e-09	5.563e-12
1258	-2.020e-09	3.071e-12	1259	-2.021e-09	9.787e-13	1260	-6.215e-13	1.038e-13

*** NODAL FLUID FLUX VALUES ***

NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX	NODE	FLUID FLUX
1	-1.4984e-06	2	-2.6222e-06	3	-2.2476e-06	4	-1.0675e-05	5	-1.9103e-05
6	-1.9103e-05	7	-1.9103e-05	8	-1.9103e-05	9	-9.5585e-06	10	0.
11	-3.3087e-24	12	4.1359e-25	13	-1.2408e-24	1366	2.0037e-05	1367	3.5067e-05
1368	3.0063e-05	1369	1.5056e-05	1370	1.8218e-07	1371	3.9523e-07	1372	3.9884e-07
1373	4.0102e-07	1374	4.0238e-07	1375	4.0321e-07	1376	4.0366e-07	1377	2.0203e-07
1378	1.6544e-24								

....
SUM OF ABOVE FLUX VALUES =-2.92992e-15
....

*** MASS BALANCE, FLUID, AND FLOW INFORMATION ***

```
TOTAL FLOW RATE DUE TO BOUNDARY FLUX AND SINKS ............. -2.92992e-15
RATE OF FLUID ACCUMULATION ................................      0.
MASS BALANCE ERROR ......................................... -2.92992e-15
NORMALIZED MASS BALANCE ERROR ..............................  1.42211e-11

CUMULATIVE FLUID STORAGE ..................................      0.
```

*** POSITION OF WATER TABLE ***

NODE	X-COOR.	Y-COOR.	NODE	X-COOR.	Y-COOR.	NODE	X-COOR.	Y-COOR.
1	0.00	620.00	2	1000.00	621.79	3	2000.00	623.58
4	3000.00	625.37	5	4000.00	627.16	6	5000.00	628.95
7	6000.00	630.74	8	7000.00	632.53	9	8000.00	634.31
10	9000.00	636.10	11	10000.00	637.89	12	11000.00	639.68
13	12000.00	641.47	14	13000.00	643.26	15	14000.00	645.05
16	15000.00	646.84	17	16000.00	648.63	18	17000.00	650.42
19	18000.00	652.21	20	19000.00	654.00	21	20000.00	655.79
22	21000.00	657.57	23	22000.00	659.36	24	23000.00	661.15
25	24000.00	662.94	26	25000.00	664.73	27	26000.00	666.52
28	27000.00	668.31	29	28000.00	670.10	30	29000.00	671.89
31	30000.00	673.68	32	31000.00	675.46	33	32000.00	677.25

Case II output file

34	33000.00	679.04	35	34000.00	680.83	36	35000.00	682.62
37	36000.00	684.41	38	37000.00	686.20	39	38000.00	687.98
40	39000.00	689.77	41	40000.00	691.62	42	41000.00	693.72
43	42000.00	695.87	44	43000.00	698.00	45	44000.00	700.07
46	45000.00	702.13	47	46000.00	704.19	48	47000.00	706.25
49	48000.00	708.30	50	49000.00	710.35	51	50000.00	712.32
52	51000.00	714.29	53	52000.00	716.23	54	53000.00	718.10
55	54000.00	719.80	56	55000.00	721.27	57	56000.00	722.79
58	57000.00	724.29	59	58000.00	725.82	60	58700.00	726.83
61	59425.00	727.90	62	60150.00	728.96	63	60875.00	730.02
64	61600.00	731.07	65	62575.00	732.49	66	63550.00	733.92
67	64525.00	735.21	68	65500.00	735.93	69	66150.00	736.05
70	66800.00	777.97	71	67230.00	800.47	72	67660.00	818.65
73	68090.00	834.15	74	68520.00	848.42	75	68950.00	862.60
76	69380.00	877.84	77	69810.00	896.41	78	70240.00	922.90
79	70670.00	940.98	80	71100.00	968.97	81	71600.00	1007.98
82	72100.00	1009.70	83	72600.00	1012.90	84	73100.00	1017.26
85	73600.00	1022.60	86	74100.00	1028.78	87	74600.00	1035.70
88	75100.00	1043.26	89	75600.00	1051.40	90	76100.00	1060.04
91	76600.00	1069.14	92	77100.00	1078.64	93	77600.00	1088.54
94	78100.00	1098.82	95	78600.00	1109.95	96	79100.00	1121.76
97	79600.00	1129.37	98	80100.00	1138.61	99	80600.00	1148.11
100	81100.00	1157.77	101	81600.00	1167.50	102	82100.00	1177.27
103	82600.00	1187.04	104	83100.00	1196.79	105	83600.00	1206.48
106	84300.00	1220.00						

***** VAM2D HAS FULLY EXCECUTED *****

Case II output file

D Sensitivity to Hydraulic Conductivity

The following plots show the change in the modeled water table at observation points versus hydraulic conductivity of the indicated model zone. The more sensitive the water table is to change of the hydraulic conductivity, the more likely the conductivity is estimated correctly.

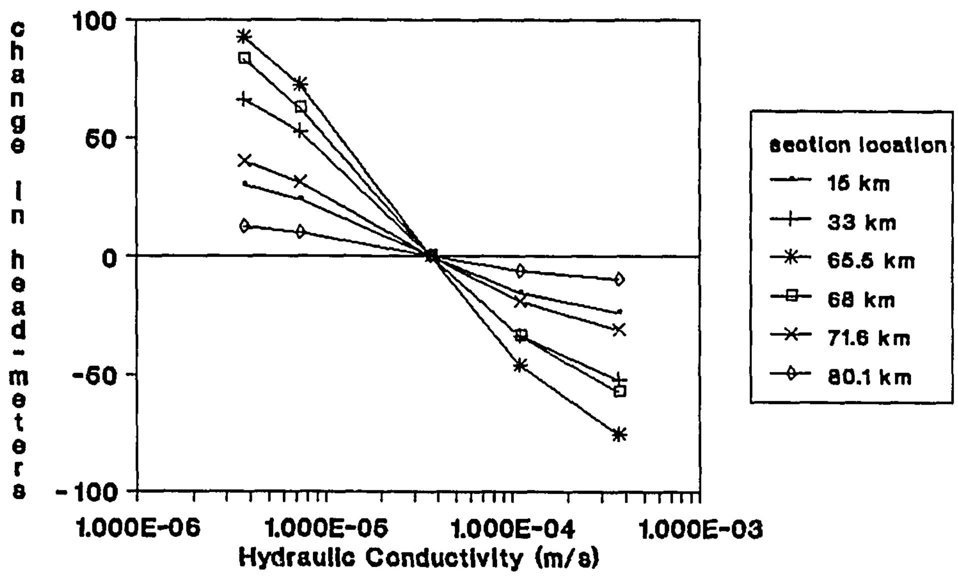

Figure 23: Change in water table elevation versus hydraulic conductivity of zone 2 at various locations along the cross section, Case I.

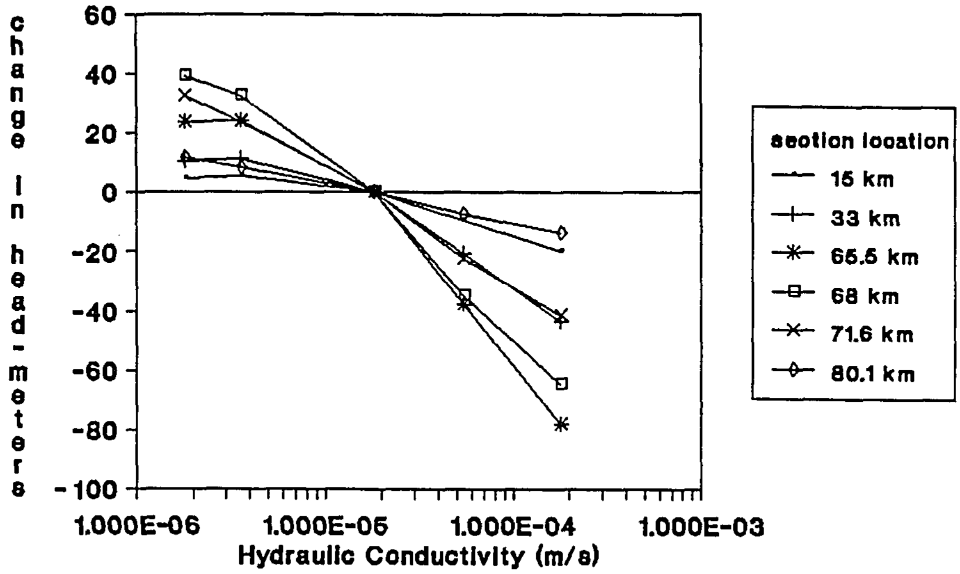

Figure 24: Change in water table elevation versus hydraulic conductivity of zone 3 at various locations along the cross section, Case I.

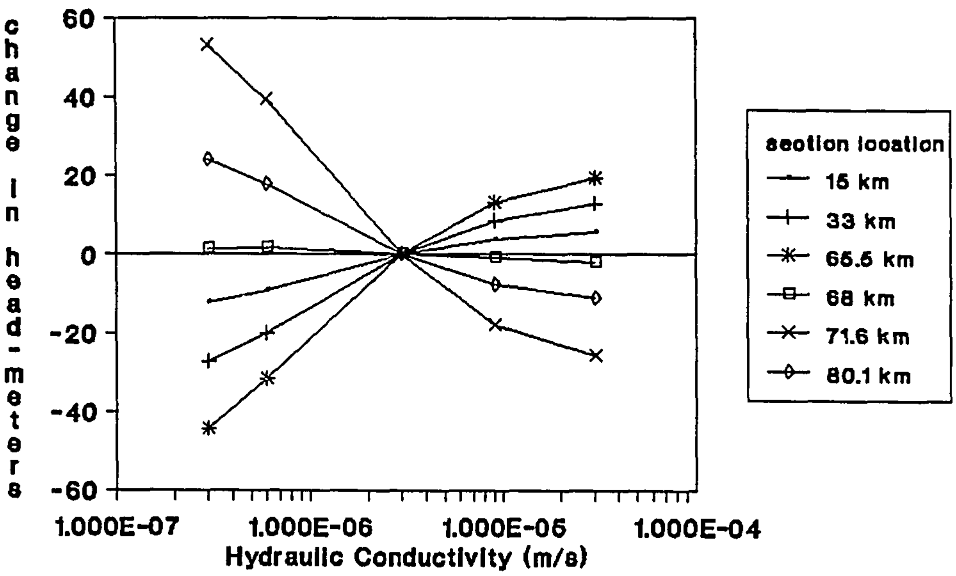

Figure 25: Change in water table elevation versus hydraulic conductivity of zone 4 at various locations along the cross section, Case I.

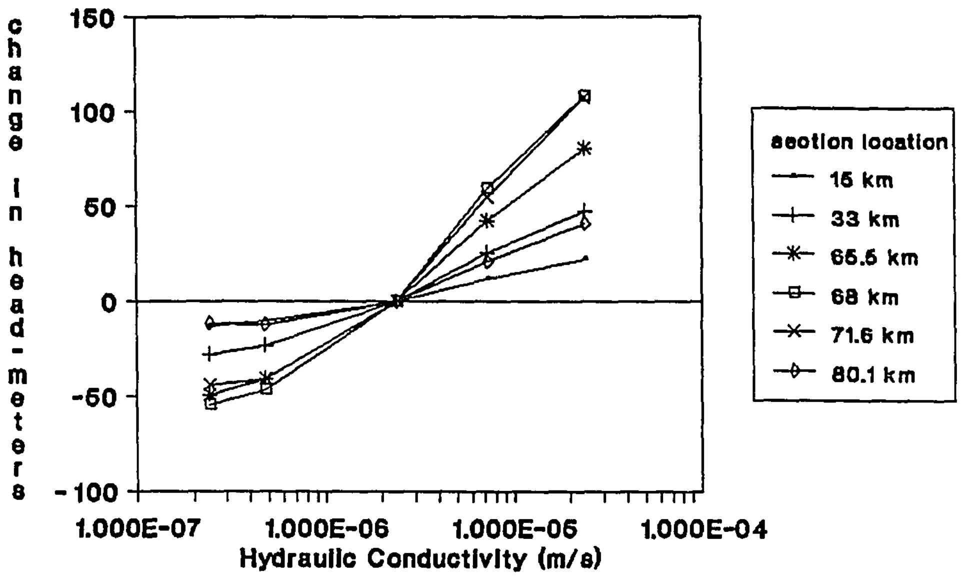

Figure 26: Change in water table elevation versus hydraulic conductivity of zone 5 at various locations along the cross section, Case I.

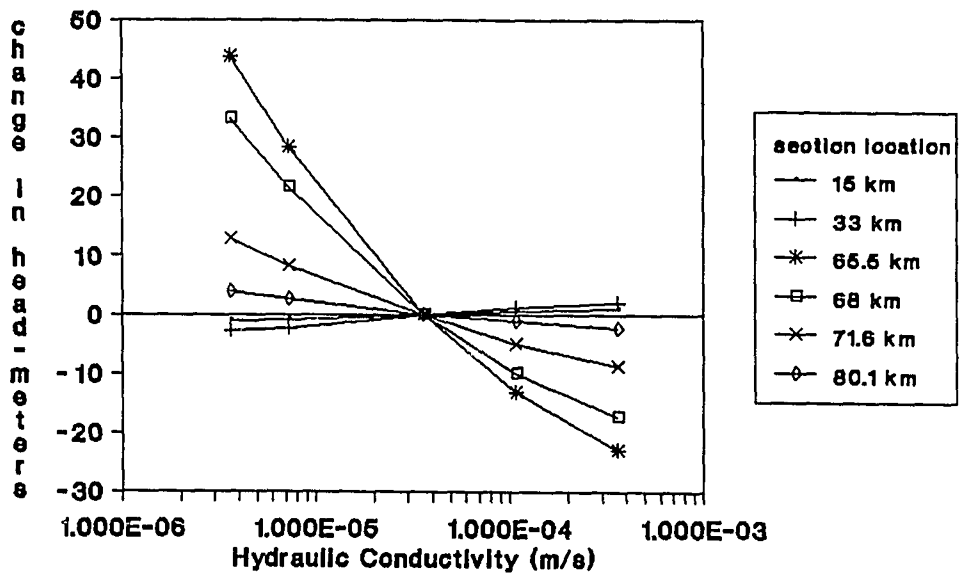

Figure 27: Change in water table elevation versus hydraulic conductivity of zone 6 at various locations along the cross section, Case I.

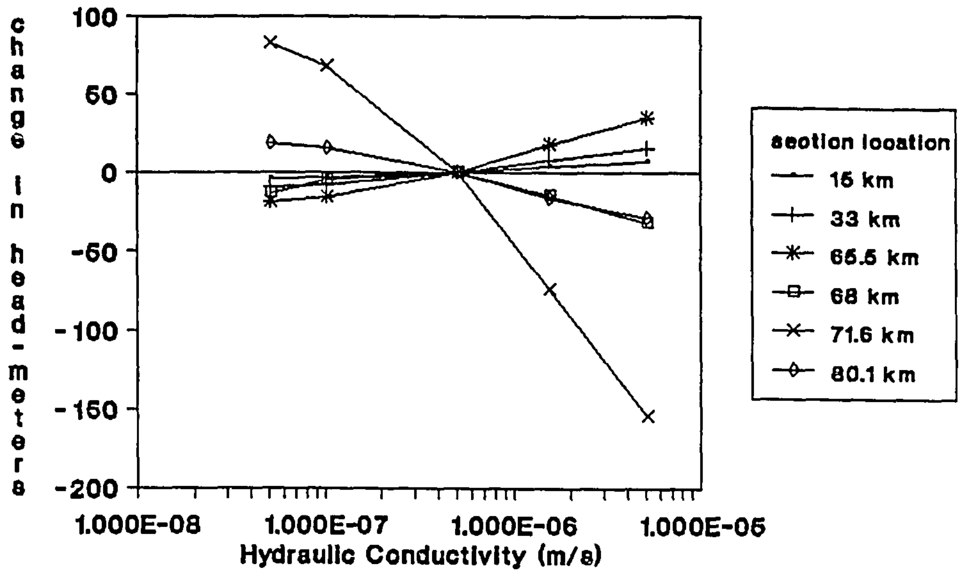

Figure 28: Change in water table elevation versus hydraulic conductivity of zone 7 at various locations along the cross section, Case I.

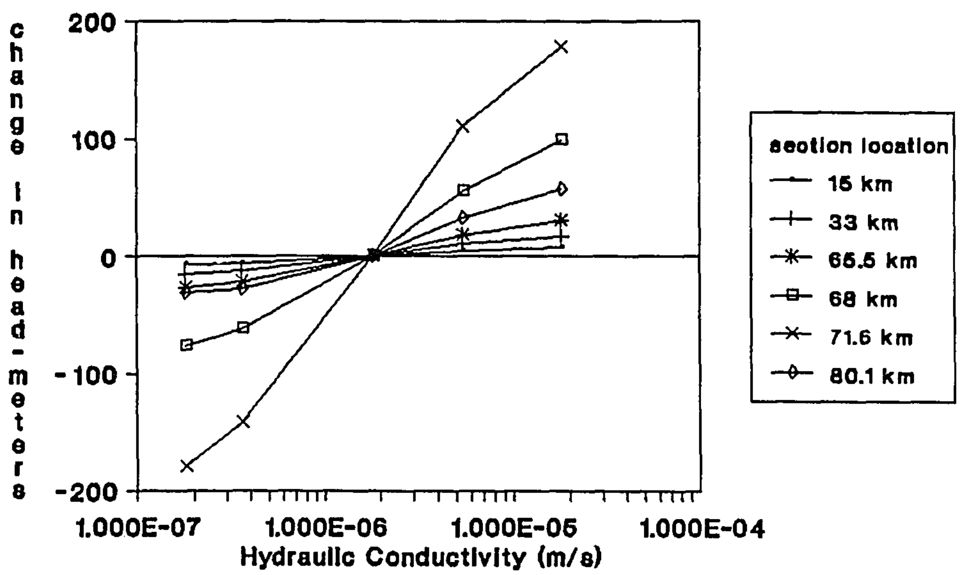

Figure 29: Change in water table elevation versus hydraulic conductivity of zone 8 at various locations along the cross section, Case I.

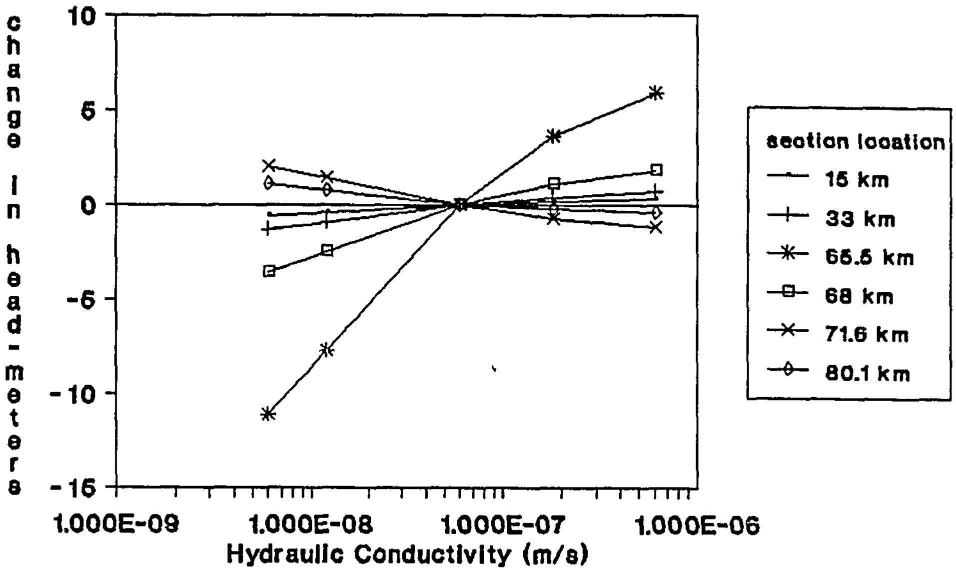

Figure 30: Change in water table elevation versus hydraulic conductivity of zone 9 at various locations along the cross section, Case I.

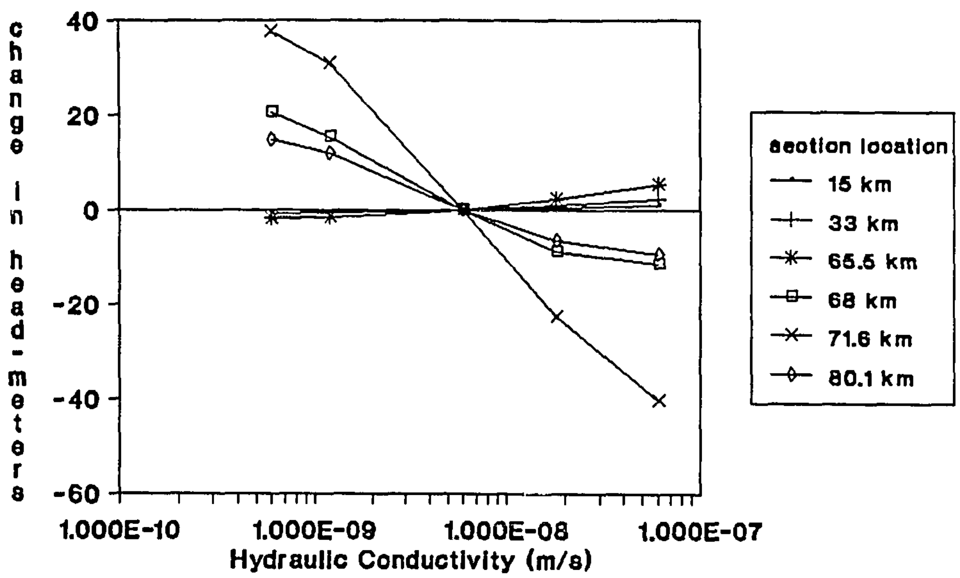

Figure 31: Change in water table elevation versus hydraulic conductivity of zone 10 at various locations along the cross section, Case I.

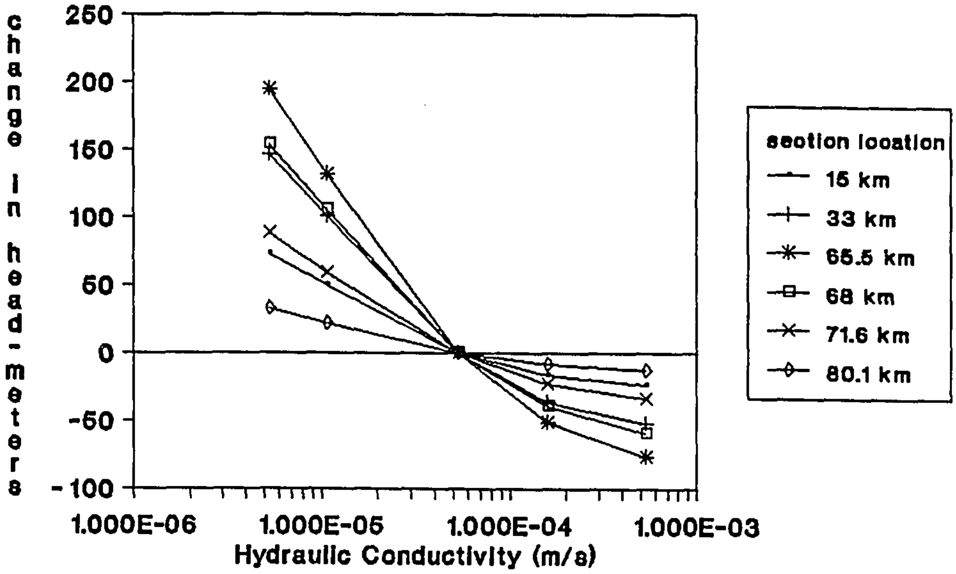

Figure 32: Change in water table elevation versus hydraulic conductivity of zone 2 at various locations along the cross section, Case II.

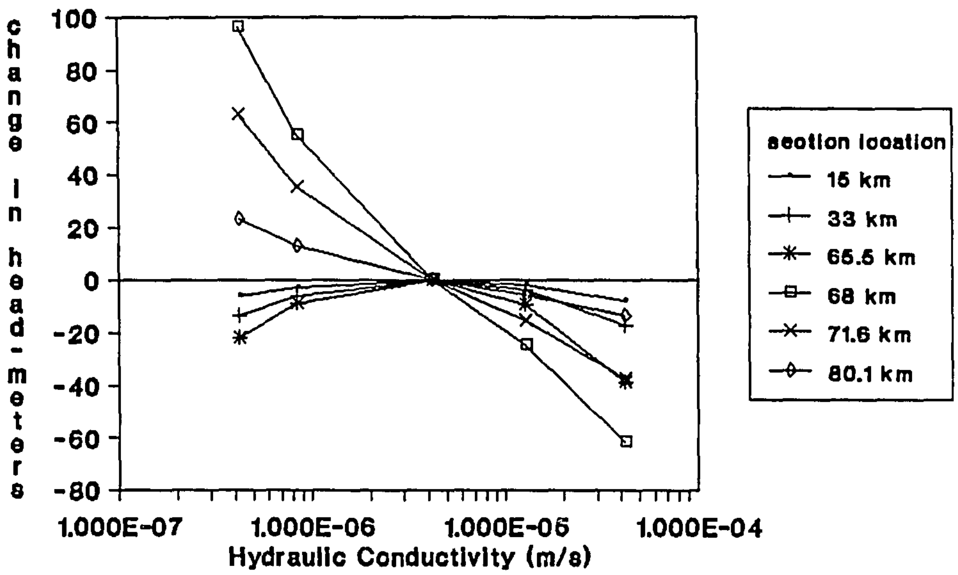

Figure 33: Change in water table elevation versus hydraulic conductivity of zone 3 at various locations along the cross section, Case II.

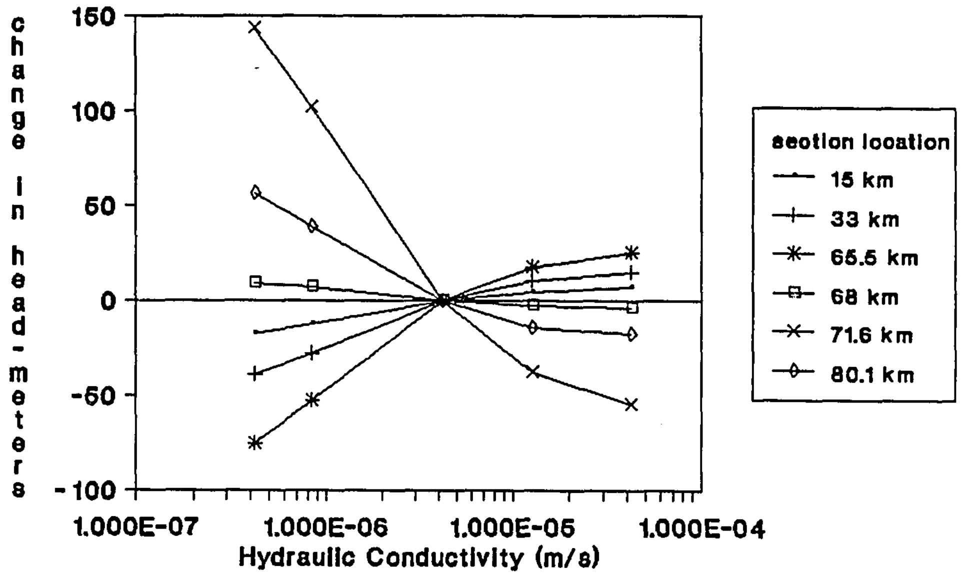

Figure 34: Change in water table elevation versus hydraulic conductivity of zone 4 at various locations along the cross section, Case II.

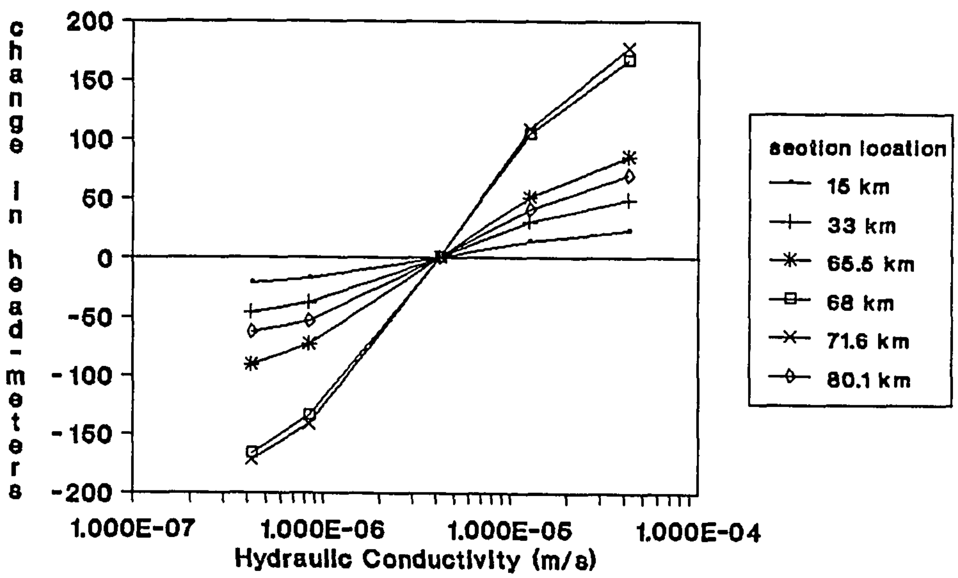

Figure 35: Change in water table elevation versus hydraulic conductivity of zone 5 at various locations along the cross section, Case II.

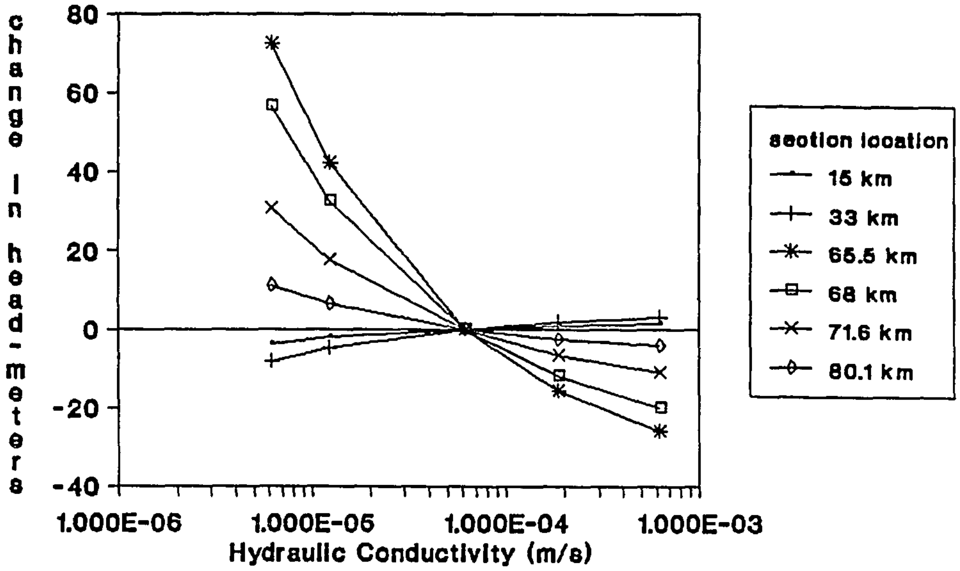

Figure 36: Change in water table elevation versus hydraulic conductivity of zone 6 at various locations along the cross section, Case II.

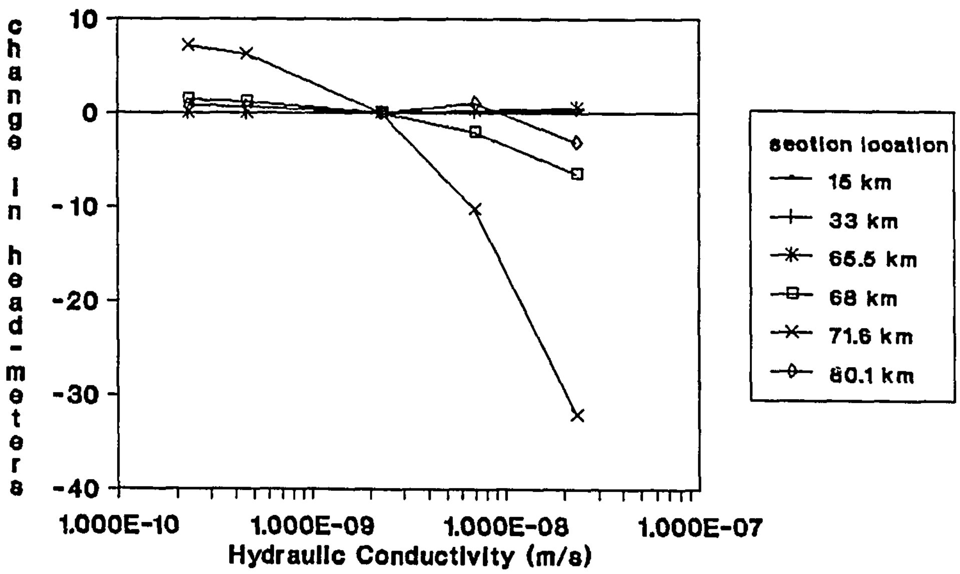

Figure 37: Change in water table elevation versus hydraulic conductivity of zone 7 at various locations along the cross section, Case II.

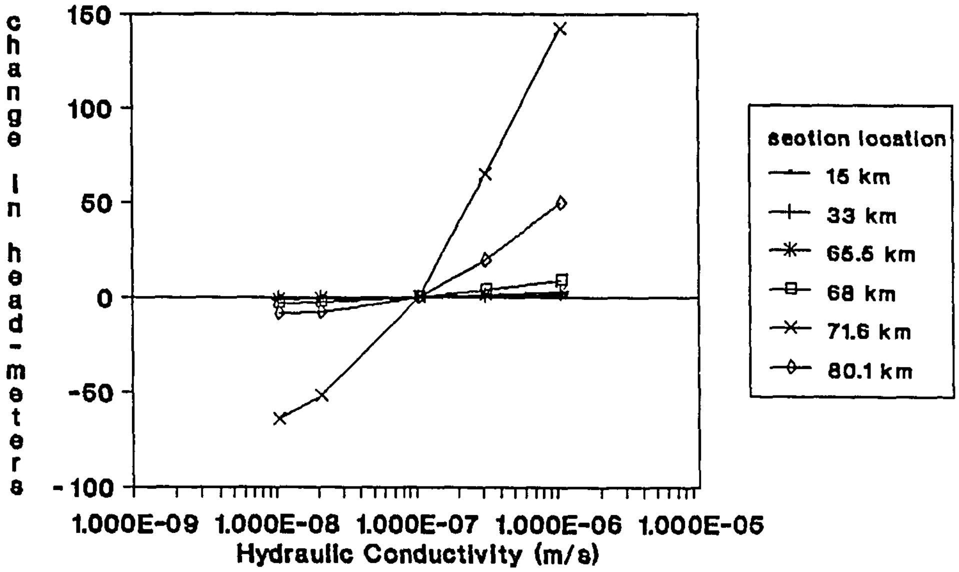

Figure 38: Change in water table elevation versus hydraulic conductivity of zone 8 at various locations along the cross section, Case II.

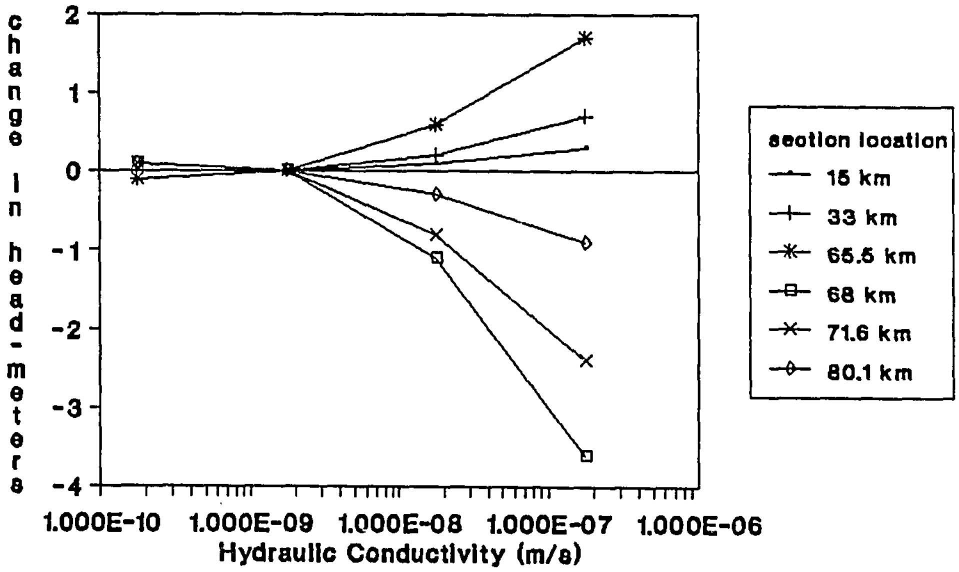

Figure 39: Change in water table elevation versus hydraulic conductivity of zone 9 at various locations along the cross section, Case II.

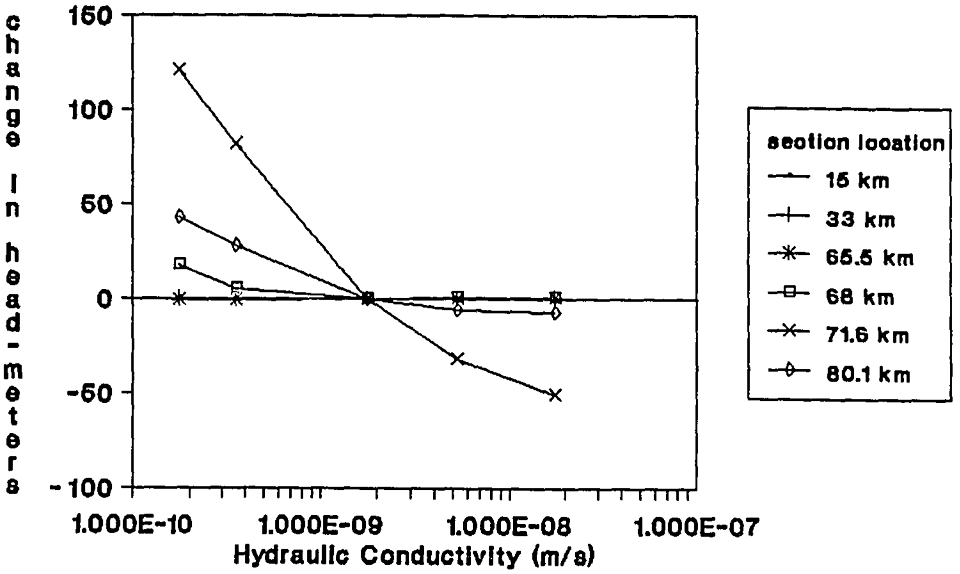

Figure 40: Change in water table elevation versus hydraulic conductivity of zone 10 at various locations along the cross section, Case II.

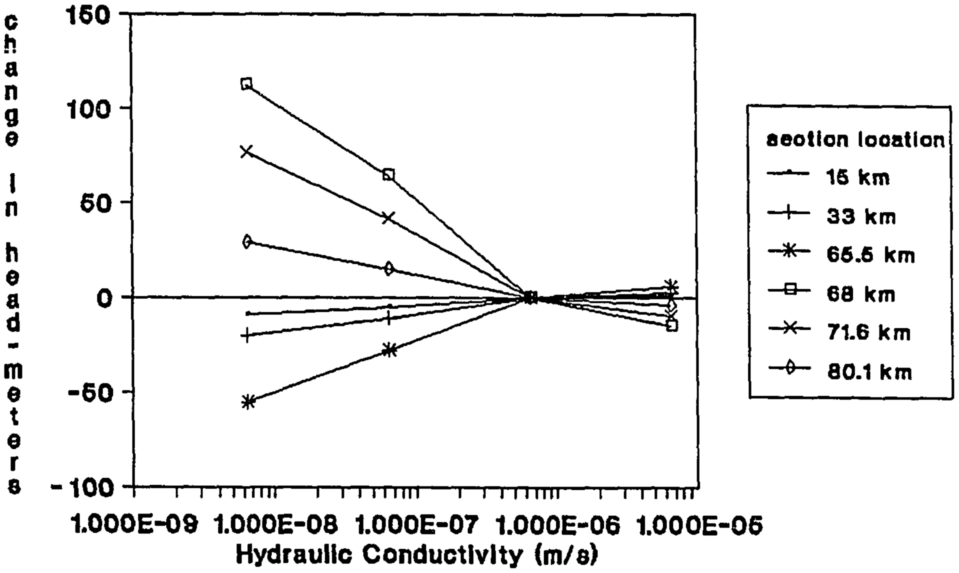

Figure 41: Change in water table elevation versus hydraulic conductivity of the break in the aquitard that allows concentrated leakage, Case II.