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Remedial Investigation of a VOC-Contaminated Aquifer

Wisconsin Department of Natural Resources

Webster, Wisconsin

Task II

Investigation Report

Wisconsin DNR Project Number 91SW409

Prepared by

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Task II Investigation Report

Remedial Investigation & Feasibility Study
VOC-Contaminated Aquifer ■ Webster, Wisconsin

Certification

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the State of Wisconsin.

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Remedial Investigation & Feasibility Study
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INTRODUCTION

The Village of Webster is located in Section 8, Township 39 North, Range 16 West, Burnett County, Wisconsin (Figure 1).

During the spring of 1991, RREM, Inc., was retained by the Wisconsin Department of Natural Resources to conduct a remedial investigation of the VOC (volatile organic compound) contaminated aquifer that supplied water to Webster Village Well Nos. 1 and 2. The initial findings of this investigation were discussed in a *Task 1 Investigation Report* (RREM, 1992a).

This Task 2 Investigation Report presents an evaluation of the groundwater flow conditions within the area studied in the Task I investigation, taking into account the existing information on the subsurface hydrogeological conditions present. This evaluation is based upon a groundwater model that has been developed for the site. The purpose of this report is to address the following questions:

- What areas are the present contamination likely to impact in the future, and approximately how long will it be until these impacts are realized?
- Based on the model parameters, will the contamination presently recognized impact the water quality of the recently installed Village Well No. 4 (VW-4)?
- How effective might each of several proposed remedial systems be in cleaning-up or isolating the groundwater contamination?

BACKGROUND INFORMATION FROM THE TASK I REPORT

A Task I remedial investigation was conducted by RREM, Inc., during the summer and fall of 1991. This investigation included the following work:

- evaluation of the subsurface geological and hydrogeological characteristics of the study area;
- investigation of the vertical and horizontal distribution of volatile organic compound VOC-contamination in the soil and groundwater;
- evaluation of potential impacts resulting from VOC-contaminated soil and groundwater;
- identification of possible sources for the halogenated VOC contamination present in the area.

The *Task 1 Investigation Report* (RREM, 1992a), in part, included the following findings:

- The aquifer supplying water to Village Well Nos. 1 and 2 is unconfined and consists of fine- to coarse-grained, well-rounded, well-sorted sand deposits, which locally contain lenses of pebbly to gravelly sand and silt to silty sand. Sieve analyses of the sediments indicate that the composition of the aquifer varies from poorly graded sand (SP) to poorly graded sand and silt (SP-SM) to silty sand (SM).
- Water table elevations were monitored from June through October 1991 in the ten wells installed by RREM, Inc., and in nine wells installed for a previous study conducted by Ayres Associates (1987). The water table was consistently measured between depths of 32 and 37 feet below grade. Groundwater flows from east to west, with a gradient between 8×10^{-4} ft/ft and 9×10^{-4} ft/ft.

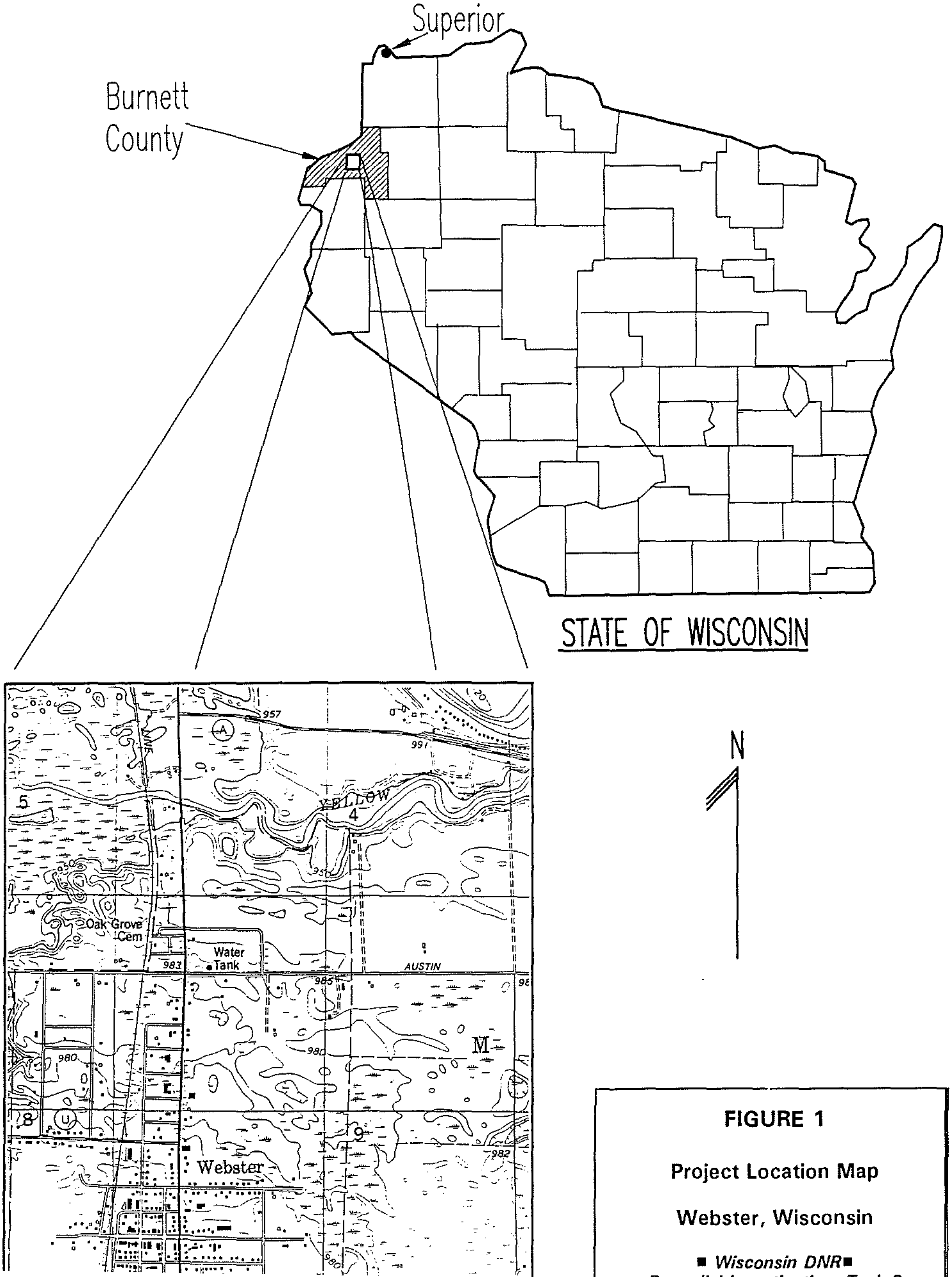

FIGURE 1

Project Location Map

Webster, Wisconsin

■ *Wisconsin DNR* ■

- Based on pressure transducer data collected during in-situ hydraulic conductivity tests, the sediments underlying the study site have a geometric mean hydraulic conductivity of 1.77×10^{-2} cm/sec and an arithmetic mean hydraulic conductivity of 1.82×10^{-2} cm/sec.

- The groundwater flow velocity (seepage velocity) was determined to be between 44 and 48 feet per year, assuming a porosity of 35 percent for the fine- to medium-grained, well-sorted, well-rounded sand aquifer.

- Tetrachloroethylene-contaminated soil was detected at depths of 34 to 36 feet in soil borings SB-1 (34.9 μg/g), SB-6 (2.4 μg/g), and SB-18 (9.3 μg/g). Soil contaminated by tetrachloroethylene was also found in a sample taken from 69 to 71 feet in soil boring SB-4 (5.8 μg/g). The locations of the soil borings are shown on Figure 2.

- 1,2-dichloroethane was not detected in any of the soil samples that were analyzed. It is possible that this compound has passed through the unsaturated zone, although it should be noted that direct encounters of dense non-aqueous phase liquids (DNAPLs) in boreholes are rare (Cherry, 1991).

- The most widespread contamination of groundwater appears to be from the halogenated compounds 1,2-dichloroethane and tetrachloroethylene. A plume of 1,2-dichloroethane-contaminated groundwater, approximately 1050 feet long and up to 250 feet wide appears to be restricted to the south-central and southwestern portions of the study area, whereas the region of tetrachloroethylene-contaminated groundwater occurs within a northeast-southwest trending plume, approximately 1600 feet long and up to 400 feet wide, west of Highway 35 between Elm and Cedar Streets (Figure 2).

- Based on the distribution of the two plumes (Figure 2), it is believed that the 1,2-dichloroethane and tetrachloroethylene contamination resulted from different sources.

Given the above information, a groundwater flow model and contaminant transport model have been developed for the Webster area.

GROUNDWATER MODEL

COMPUTER MODEL

An integrated groundwater software package developed by HYDROSOFT, INC. (Lake Wales, Florida) has been used to model groundwater flow and contaminant transport in the Webster area. The groundwater flow model was simulated using InterSat Version 3.00 (Voorhees, 1985), whereas the contaminant transport modeling was performed by the companion program InterTrans Version 2.00 (Voorhees and Rice, 1987). A brief description of the methods used by these programs to perform aquifer and contaminant transport simulations is presented below.

The InterSat Three-Dimensional Aquifer Simulation Model

The InterSat program was used to model the direction of groundwater flow and the hydraulic gradient in the Webster area. InterSat performs interactive one-, two- and three-dimensional modeling using a node-centered, finite difference method to solve groundwater flow equations. A full description of this method is included in Prickett and Lonnquist (1971).

A user-defined grid is superimposed over a map of the aquifer. The intersections of the grid lines are called nodes. Each node is referenced with a column (i), a row (j), and a layer (k) coordinate. The model is limited to a maximum of 32 columns, 32 rows, and two layers. Grid dimensions may be varied by as much as 50 percent for adjacent nodes.

Aquifer parameters, such as permeability (in the x, y, and z directions), storage coefficients, (for both confined and unconfined aquifer systems), leakage coefficients, recharge rates, water table elevations, and the geometry of the aquifer are entered into the program. Space and time are entered into the program, as well. Using the finite difference method, these parameters are treated as a set of discrete elements.

Flow rate terms contained within the model include node-to-node water transfer rates, the amount of water taken into or released from storage per unit time increment, a constant withdrawal rate, leakage, induced infiltration and evapotranspiration. These flow rates are arbitrarily assigned flow directions. It is necessary to define the portion of the aquifer represented by each individual flow rate term.

Flow rates are restricted to the x and y directions, so the portion of the aquifer included in the flow rate terms is referred to as a vector volume. The vector volume is calculated by the program from the following equation.

$$\text{Vector Volume} = m \Delta x \Delta y$$

where

m = thickness of the aquifer

Δx, Δy = finite approximations of the differentials δx, δy contained in the groundwater flow equations (Prickett and Lonnquist, 1971).

A differential equation describing the groundwater flow conditions within each vector volume is constructed within the program. These equations are then solved simultaneously to calculate the head values at each node location. Calibration is achieved when the head values calculated by the model reasonably approximate head valves measured in the field.

Natural conditions, such as the presence of lakes or rivers, can be simulated in InterSat by setting the appropriate model cells as constant head boundaries. This is accomplished by artificially setting the storativity in the cells to a very large number (for example, 1×10^{10}). Boundary conditions, such as constant-flow or no-flow boundaries, can be simulated in the model by setting the hydraulic conductivity (permeability) of the appropriate cell or cells. No-flow boundaries are simulated by setting the hydraulic conductivity of the cell to zero.

The InterTrans Particle Transport Model

The InterTrans Particle Transport Model was used to simulate the migration of tetrachloroethylene dissolved in the groundwater at Webster. This software comprises a three-dimensional solute transport model in which the solute mass balance equation and groundwater flow mass balance equations are separated and solved independently.

Five discretizations have an effect on the numerical solution obtained in InterTrans. These are the *X*, *Y*, *Z*, and *T* (time) coordinates, which are determined by the InterSat model, and the discretization of contaminant mass, *M*, which is defined by InterTrans. The program uses a node-centered, finite difference method to solve particle transport equations. Advective and dispersive effects on the migration of contaminant particles are represented by partial differential equations that are solved by a random walk technique, in which dispersion is considered a random process (Prickett and Lonnquist, 1971).

Typically, before the InterTrans model can be used, an InterSat groundwater flow model must be developed to define the advective transport for the model area. InterTrans can then be used independently of InterSat to simulate three-dimensional hydrodynamic dispersion (this includes the effects of mechanical dispersion and diffusion).

During the initial contaminant transport modeling runs, it was found that the InterSat groundwater model file was not being properly imported into the InterTrans program. This problem was remedied by using the manual flow model mode within InterTrans. Within this mode, appropriate values for regional groundwater velocities (in the x, y, and z directions), retardation factors, dispersivities (longitudinal, transverse, and vertical), particle mass, contaminant half-life, effective transport porosity, and top and bottom elevations are entered for the various soil layers present. For the purpose of modeling tetrachloroethylene migration in Webster, a three-layer model was developed in which:

- layer one represented the upper, unconfined sandy aquifer;
- layer two represented the silty clay to clay confining layer; and,
- layer three represented the confined sand and gravel aquifer in which Village Well Nos. 3 and 4 are screened.

GROUNDWATER FLOW MODEL DESIGN

The purpose of this computer model is to simulate groundwater flow patterns and conditions in the downtown area of Webster. This area was the focus of the *Task I Investigation Report* (RREM, 1992a).

The groundwater model presented here represents one possible solution for the distribution of groundwater elevations measured at the site in February 1992. A degree of homogeneity—both vertical and horizontal—has been assumed during the formulation of this model. Based upon the geology of the area as presented in the *Task I Investigation Report* (RREM, 1992a), heterogeneities in the unconsolidated materials underlying Webster are known to exist. Although these variations do not appear to be laterally extensive, they still will affect groundwater flow through the system. Therefore, the actual groundwater profile within the Village may vary from what has been simulated by this model.

The area included in this model was divided into a series of 32 columns and 31 rows. The spacing between the nodes is not uniform. A spacing of 100 feet was used in the central area of the grid, corresponding to the location of the study area in the *Task I Investigation Report*, (RREM, 1992a). Larger grid spacings were used along the margins of the grid. The orientation and spacing of the grid are illustrated in Figure 3.

The model area is substantially larger than required to model the initial study area outlined in the *Task I Investigation Report*, (RREM, 1992a). This was done to allow several natural hydrogeologic boundaries to be incorporated into the model. These boundaries include the Yellow and Clam Rivers, located north and south of town, respectively, and swampy areas or wetlands depicted on the U.S.G.S. 7.5-minute (Webster, Yellow Lake, Siren East, and Siren West) quadrangle maps. Standing water in these locations was simulated by setting the appropriate nodes to constant head conditions by setting the water table storage coefficients to very high values (for example, 1×10^{10}). In most of the swampy areas, constant head nodes were not set, because it has been assumed that much of the water in these locations is perched upon the uppermost clay layers. These layers were encountered between the surface and 7 feet deep during the drilling of the RREM soil borings (1992). Perched water at the surface may not be indicative of the water table measurements within the unconfined aquifer. Nodes that were not assigned as constant head nodes were set as variable head cells.

The site is characterized by deposits that vary from poorly graded sand to poorly graded sand and silt to silty sand, which are interlayered with lenses of pebbly to gravelly sand deposits. These unconsolidated materials comprise the unconfined aquifer that supplied water to Village Well No. 1 and presently supplies water to Village Well No. 2. This aquifer is the source of the groundwater samples that were collected from the nine wells installed by Ayres Associates (1987) and the ten wells installed by RREM.

Although no underlying confining layer was encountered in any of the soil borings drilled by Ayres (1987) or RREM (1992), the

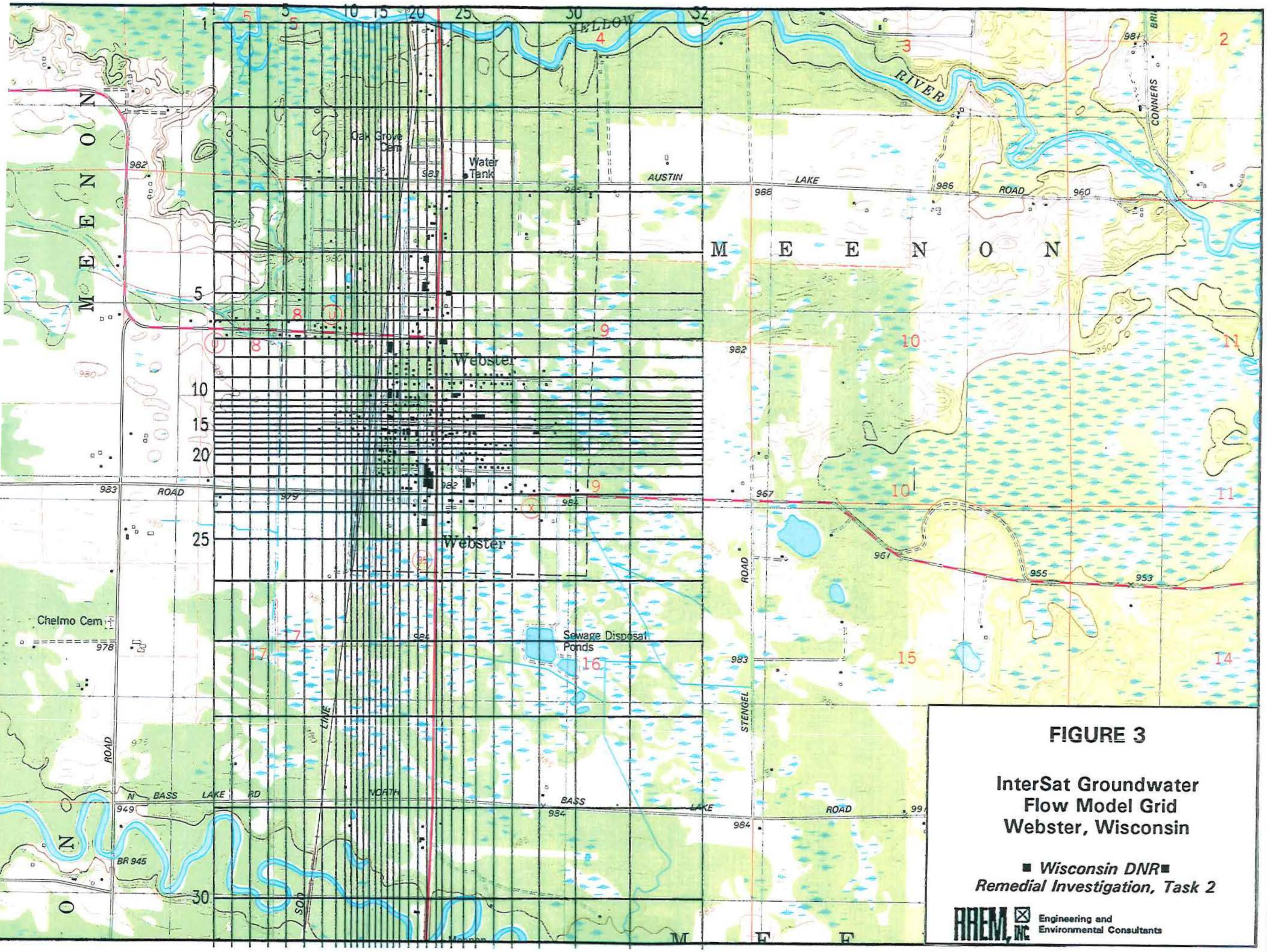

FIGURE 3

InterSat Groundwater Flow Model Grid Webster, Wisconsin

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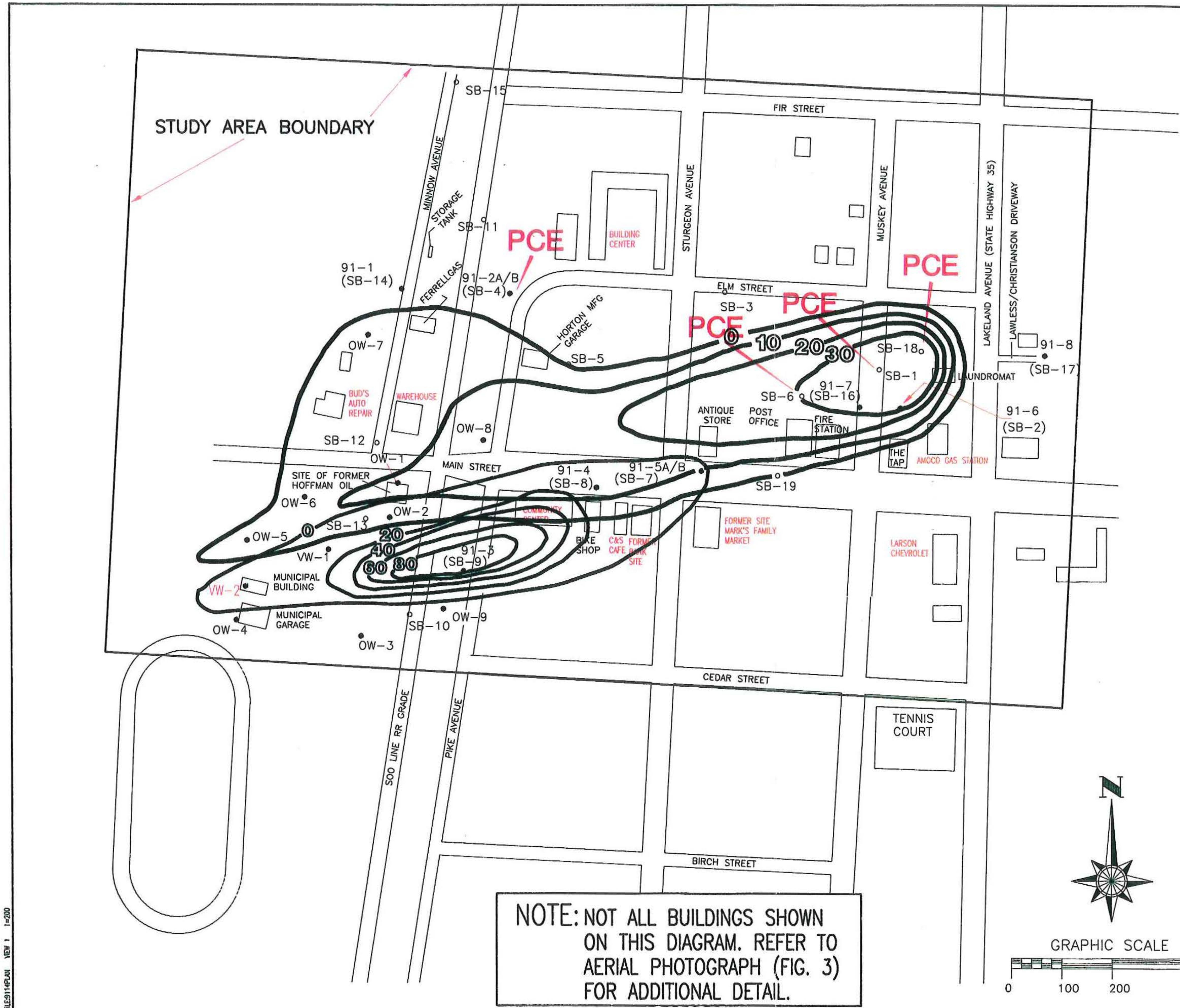

LEGEND

91-6 • SB-2	LOCATION OF MONITORING WELL AND SOIL BORING
SB-6 ∘	LOCATION OF SOIL BORING ONLY
VW-1 •	LOCATION OF VILLAGE WELL 1
VW-2	LOCATION OF VILLAGE WELL 2
PCE	TETRACHLOROETHYLENE DETECTED IN SOIL
—20—	TETRACHLOROETHYLENE ISOCON AT TOP OF WATER TABLE (CONTOURED IN $\mu g/l$)
—20—	1.2 – DICHLOROETHANE ISOCON (CONTOURED IN $\mu g/l$)

CONTAMINANT CONCENTRATION DATA ($\mu g/l$)

WELL#	1.2-DCE	PCE
91-1	ND	ND
91-2A	ND	ND
91-2B	ND	112
91-3	83.6	ND
91-4	2.9	15.3
91-5A	ND	8.0
91-5B	0.8	ND
91-6	ND	31.8
91-7	ND	ND
91-8	ND	ND
OW-1	ND	13.8
OW-2	4.3	2.3
OW-3	ND	ND
OW-4	ND	ND
OW-5	ND	3.5
OW-6	ND	1.3
OW-7	ND	1.3
OW-8	ND	13.2
OW-9	ND	ND
VW-2	2.8	ND

* ROUND 1 GROUNDWATER GEOCHEMISTRY RESULTS (RREM, 1992)

NOTE: NOT ALL BUILDINGS SHOWN ON THIS DIAGRAM. REFER TO AERIAL PHOTOGRAPH (FIG. 3) FOR ADDITIONAL DETAIL.

FIGURE 2

Distribution of 1,2-Dichloroethane- and Tetrachloroethylene-contaminated groundwater Webster, Wisconsin

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FILE:9114PLAN VIEW 1 1=200

presence of a confining layer beneath the unconfined aquifer has been documented within well drillers' logs of boreholes completed in the area. These boreholes were drilled substantially deeper than those borings associated with the studies previously mentioned. Based on well constructor's reports provided by the Wisconsin Geological and Natural History Survey (Appendix A), four borings in the study area penetrate through the unconfined aquifer. These borings are:

Test Hole #1	(Keys Well Drilling, 1952)
Test Hole #2	(Keys Well Drilling, 1952)
Webster Village Well No. 3	(Miller Well & Pump Company, 1984)
Don Wester (Private Well)	(Clarence Beecroft and Sons, 1984)

In addition, Thein Well Drilling Company, under the direction of Mid-States Associates, Inc., drilled a boring that passed through the unconfined aquifer (Mid-States Associates, 1991):

Webster Village Well No. 4 (Thein Well Drilling, 1991)

Based on the geological logs for these borings, it appears that the unconfined aquifer in Webster is underlain by a 45-104 foot thick layer of silty clay and clay deposits that vary from red to pink to gray in color. These deposits were also referred to as till in one log.

Hydraulic conductivity is a coefficient that describes the rate at which water can move through a permeable medium: it is a measure of the ability of an aquifer or water-bearing formation to transmit fluids (Fetter, 1988). Hydraulic conductivities for the unconfined aquifer in the vicinity of downtown Webster were determined in the Task 1 study (RREM, 1992a). Hydraulic conductivities of this same aquifer have recently been determined by RREM at two other sites in the Village. These sites are the Cenex Co-op station, (RREM, 1992b), located north of the original study area at the southwest corner of the intersection of Hickory Street and Sturgeon Avenue, and the

Wisconsin Department of Natural Resources Ranger Station, (RREM 1992c), located south of the study area on Apple Street west of Highway 35.

The hydraulic conductivities at all sites within the Village are contained in Table 1. The geometric mean hydraulic conductivity for these sites was determined to be 1.80×10^{-2} cm/sec (380 gallons per day per foot squared), whereas the arithmetic mean hydraulic conductivity was determined to be 1.83×10^{-2} cm/sec (388 GPD/FT^2). In preliminary simulations, the geometric mean hydraulic conductivity was applied to all nodes in the model area, except those nodes that had in-situ hydraulic conductivity data.

Hydraulic conductivities for the silty-clay to clay deposits underneath the unconfined aquifer are expected to have values that vary from 1×10^{-6} to 1×10^{-9} cm/sec, according to Fetter (1988; Table 2). These hydraulic conductivities are several orders of magnitude less than those in the unconfined aquifer (Table 1). Therefore, the silty clay to clay unit is considered to be the lower confining layer for the unconfined aquifer.

TABLE 1
In-situ Hydraulic Conductivity Data
Webster, Wisconsin

Monitoring Well Number	Hvorslev (cm/sec)	Hvorslev (GPD/FT^2)(1)	Source
91-1	1.35×10^{-2}	286	A
91-2A	1.70×10^{-2}	360	A
91-2B	ND	ND	A
91-3	ND	ND	A
91-4	2.42×10^{-2}	513	A
91-5A	1.23×10^{-2}	261	A
91-5B	ND	ND	A
91-6	1.57 × 10-2	333	A
91-7	ND	ND	A

TABLE 1 In-situ Hydraulic Conductivity Data Webster, Wisconsin			
Monitoring Well Number	Hvorslev (cm/sec)	Hvorslev (GPD/FT^2)[(1)]	Source
91-8	ND	ND	A
OW-1	2.25×10^{-2}	477	A
OW-2	1.63×10^{-2}	345	A
OW-3	1.65×10^{-2}	350	A
OW-4	1.83×10^{-2}	388	A
OW-5	1.93×10^{-2}	409	A
OW-6	1.74×10^{-2}	369	A
OW-7	2.90×10^{-2}	614	A
OW-8	1.33×10^{-2}	282	A
OW-9	1.97×10^{-2}	417	A
WC-91-1	ND	ND	B
WC-91-2	ND	ND	B
WC-91-3	1.86×10^{-2}	394	B
WC-91-4	1.68×10^{-2}	356	B
WD-91-1	1.71×10^{-2}	362	C
WD-91-2	2.25×10^{-2}	477	C
WD-91-3	1.86×10^{-2}	394	C

(1) Gallons Per Day Per Foot Squared

ND No Data,

A RREM 1992 a

B RREM 1992 b

C RREM 1992 c

TABLE 2
Ranges of Hydraulic Conductivities For Unconsolidated Sediments (Fetter, 1988)

Material	Hydraulic Conductivity (cm/sec)
Clay	10^{-9} - 10^{-6}
Silt, sandy silt, clayey sand, till	10^{-6} - 10^{-4}
Silty sand, fine sand	10^{-5} - 10^{-3}
Well-sorted sand, glacial outwash	10^{-3} - 10^{-1}
Well-sorted gravel	10^{-2} - 1

The elevations of the top and the bottom of the unconfined aquifer were set in the model using sea level as a datum. The aquifer top elevation was set at 975.7 feet, the average elevation at which the top of the aquifer was encountered in the 19 soil borings completed for the Task 1 investigation (RREM, 1992a).

Since the base of this aquifer was not encountered in borings completed for the Task 1 study, aquifer thickness in the area has also been approximated using the geological data from the well constructor's reports contained in Appendix A. The thickness of the aquifer was based on the depth at which the contact between the unconfined aquifer and the silty-clay to clay confining layer occurred in the following borings:

Borehole	Elevation at Which the Confining Layer Occurs
Test Hole 2 (VW-1)	846 feet
Village Well No. 3	860 feet
Village Well No. 4	889 feet
Wester Private Well	900 feet

Based on the elevations where the contact between the unconfined aquifer and the silty-clay to clay confining layer occurs in these borings, the slope (or dip) of the confining layer was calculated. The data above suggests that the top of the confining layer underneath the downtown area of Webster slopes to the west-northwest with a gradient of approximately 4.4 percent (this corresponds to a dip of 2.55 degrees). In the eastern part of the model area (east of a line extending from VW-3 south through VW-4), the top of the confining layer slopes to the northwest with a gradient of 2.4 percent (1.4-degree dip).

Using these gradients, the elevation of the contact between the unconfined aquifer and the silty-clay to clay confining layer was estimated at each node in the model. The elevations were then rounded off in intervals of 10 feet to the nearest elevation ending with the number 5 (e.g. 835, 845). These estimated elevations were then entered at each node in the model, using the Detailed Node Data Menu in InterSat.

It should be noted that these elevations are gross estimates, given the small number of data points available. This model assumes that the top surface of the confining layer is smooth, with no local depressions or mounds present. In all likelihood, such topographic features are present along this surface. Therefore, the estimated gradients in this model may vary considerably from the natural conditions that occur locally at the contact between the unconfined aquifer and the confining layer.

Storativity is a measure of the volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head (Fetter, 1988). Aquifer storativity values within InterSat are entered as water table storage coefficients when the aquifer is unconfined. These values are dimensionless and typically vary from 0.02 to 0.30 in unconfined aquifers (Fetter, 1988). The water table storage coefficients within the area modeled were estimated from data reported by Ayres (1987). In the Ayres study, storativity values for the unconfined aquifer were calculated at various locations within the study area using data from adjacent wells. Ayres calculated the following storativity values:

WELL PAIR	STORATIVITY
OW1 - OW2	0.064
OW3 - OW9	0.085
OW4 - OW5	0.210
OW6 - OW7	0.038

The average of the storativity values listed above is 0.099.

Water table storage coefficients were assigned values of 0.10 for all variable head nodes within the area modeled. At locations where constant head nodes were simulated, the water table storage coefficients were set at a value of 1×10^{10}.

Recharge to the model area has been simulated by two methods. In the first method, recharge has been provided by estimating the amount of infiltration that occurs as a result of precipitation that falls over the area. It is believed that recharge varies locally within the modeled region, depending upon whether or not the area has been developed, and whether or not the area is continually saturated (e.g., a wetland).

Groundwater flow into the region from outside the model area is also believed to provide recharge. Regional groundwater flow, based on the orientation of the Yellow and Clam Rivers, is believed to be from the east-southeast to the west-northwest. Therefore, additional recharge has been added to the eastern most nodes in the model to simulate this flux.

GROUNDWATER FLOW MODEL RESULTS AND DISCUSSION

As preliminary flow modeling was performed, the geometric mean hydraulic conductivities from all sites studied by RREM (1992a, 1992b, 1992c) in Webster were applied to the nodes in the model area, with the exception of those nodes that had detailed in-situ hydraulic conductivity data. As these simulations progressed, it was realized that the model was not responding to the detailed node hydraulic conductivity data. This situation was remedied by calculating the geometric mean hydraulic conductivities for several individual regions in the model area, and using these values instead of the overall geometric mean values. Within these regions, however, detailed in-situ hydraulic conductivities were maintained. Values for all parameters that were used in the InterSat model are contained in Appendix B.

Once the hydraulic conductivity nodes were established, recharge values in the model were varied in an effort to match the groundwater elevations measured at the site in February 1992. Different values of recharge were used for developed or well-drained ares, and areas that are constantly wet. According to recent climatological data supplied by the National Climatic Data Center, the average annual rainfall at Danbury, Wisconsin is 30.57 inches. As the simulations continued, it was determined that levels of recharge equivalent to one-third of the annual rainfall for the area would not produce model head values equivalent to those measured in the field.

In an effort to decrease the migration of water out of the central portion of the model area, and thus increase the model head values, hydraulic conductivities for the six northernmost and southernmost rows were set at values of 261 GPD/FT^2, which is equivalent to the lowest hydraulic conductivity measured at the site. Although this improved the model heads, calibration was still not achieved.

From these results, it was determined that a significant flux of groundwater must be entering into the model area from the east. This flux was modeled by increasing the recharge values in the eastern-most nodes of the model. The value of recharge for each node was estimated by measuring the percentage of dryland and wetland along a line approximately 20 degrees south of east, which is the approximate trend of both the Yellow and Clam Rivers, east of the model area. The proportion of developed or dry land was multiplied by a factor representing 4 inches/year of recharge; whereas, the proportion of wetland was multiplied by a factor representing 6 inches/year of recharge. These values were then multiplied by a ratio representing approximate proportions of this recharge that would actually flow into the model, based upon estimates of the groundwater contours present.

Model heads were found to more closely match those measured in the field once the flux was added to the eastern margin of the model. Recharge over the model area was varied until the model heads closely approximated the actual field conditions. This occurred when recharge was set at 4.25 inches/year over developed and dry areas, and 6.00 inches/year over areas that are continually saturated. A comparison of water levels measured at monitoring wells to those calculated by the model is presented in Table 3.

TABLE 3
Comparison of Measured and Calculated Water Levels for the Calibrated Groundwater Model

Well No.	Measured Groundwater Elevation Feb. 4, 1992	Elevation Calculated by the Computer Model	Difference(1)	Model Grid Location	
				Columns	Rows
91-1	947.52	947.3	-0.22	12	11
91-2A	947.69	947.5	-0.19	15	11
91-2B	947.69	947.5	-0.19	15	11
91-3	947.68	947.8	0.12	14	17
91-4	947.88	947.9	0.02	16	15
91-5A	948.04	948	-0.04	18	15
91-5B	948.06	948	-0.06	18	15
91-6	948.39	948.3	-0.09	21	13
91-7	948.37	948.2	-0.17	20	13
91-8	948.52	948.5	-0.02	23	12
OW-1	947.55	947.6	0.05	12	15

TABLE 3 Comparison of Measured and Calculated Water Levels for the Calibrated Groundwater Model					
Well No.	Measured Groundwater Elevation Feb. 4, 1992	Elevation Calculated by the Computer Model	Difference[(1)]	Model Grid Location	
				Columns	Rows
OW-2	947.53	947.6	0.07	12	16
OW-3	947.52	947.8	0.28	12	18
OW-4	947.26	947.6	0.34	9	18
OW-5	947.28	947.5	0.22	9	16
OW-6	947.38	947.5	0.12	11	15
OW-7	947.50	947.4	-0.1	12	12
OW-8	947.71	947.6	-0.11	15	13
OW-9	947.68	947.9	0.22	14	18
MW-1	947.71	946.7	-1.01	18	7
MW-2	947.61	946.9	-0.71	16	8
MW-3	947.51	946.5	-1.01	15	7
MW-4	947.63	946.6	-1.03	17	7
WC-91-1	946.91	946.6	-0.31	17	7
WC-91-2	947.39	946.6	-0.79	16	7
WC-91-3	947.27	946.2	-1.07	16	6
WC-91-4	947.29	946.4	-0.89	14	7
WD-91-1	947.80	949.1	1.3	21	24
WD-91-2	947.81	949.1	1.29	21	24
WD-91-3	947.81	949.1	1.29	21	24

(1) Calculated Elevaton minus Measured Groundwater Elevation.

Figure 4 illustrates the distribution of the groundwater contours within the calibrated model. According to the model, groundwater flow within the village will be in a west-northwesterly direction.

One aspect of the model that requires explanation is the apparent lack of water balance (see Appendix B). As stated earlier, river nodes along the northern and southern margins of the model area were set as constant head nodes. In the InterSat model, this requires that the storativity values (water table storage coefficients) be set at extremely large numbers. Over the time interval modeled, the water balance term is affected because large quantities of water are being placed into storage in the model. Because of this lack of water balance, the model presented here should be considered a transient flow model. The reader is cautioned that use of the model to predict conditions far into the future may not be representative of actual conditions.

CONTAMINANT TRANSPORT MODEL DESIGN

The purpose of the contaminant transport model presented in this report is to simulate the migration of tetrachloroethylene (perchloroethylene [PCE]), one of the two major contaminants present in the groundwater beneath Webster. A manual flow mode model was constructed for this purpose, using InterTrans software.

The model consisted of a 3900 foot by 3000 foot grid composed of 40 by 31 nodes equally spaced at 100 foot intervals (Figure 5). In order to simulate contaminant migration from the upper, unconfined sand aquifer into the lower, confined sand aquifer, a three-layer model was constructed. Layer one was modeled to represent the upper, unconfined sandy aquifer. Layer two was modeled as the silty clay to clay confining layer. Layer three was modeled as the lower, confined sandy aquifer.

The processes that govern the migration of contaminants dissolved in groundwater passing through porous media, such as glacial outwash, are complex. Although these processes can be expressed mathematically, a full understanding of how to obtain the necessary field data for application in the equations has not yet been fully achieved (Fetter, 1988).

Several processes contribute to the migration of solutes in groundwater. Advection is the process by which contaminants are transported by moving groundwater. Where advection is the only transport process, the contamination moves through the soil at the same rate as the groundwater.

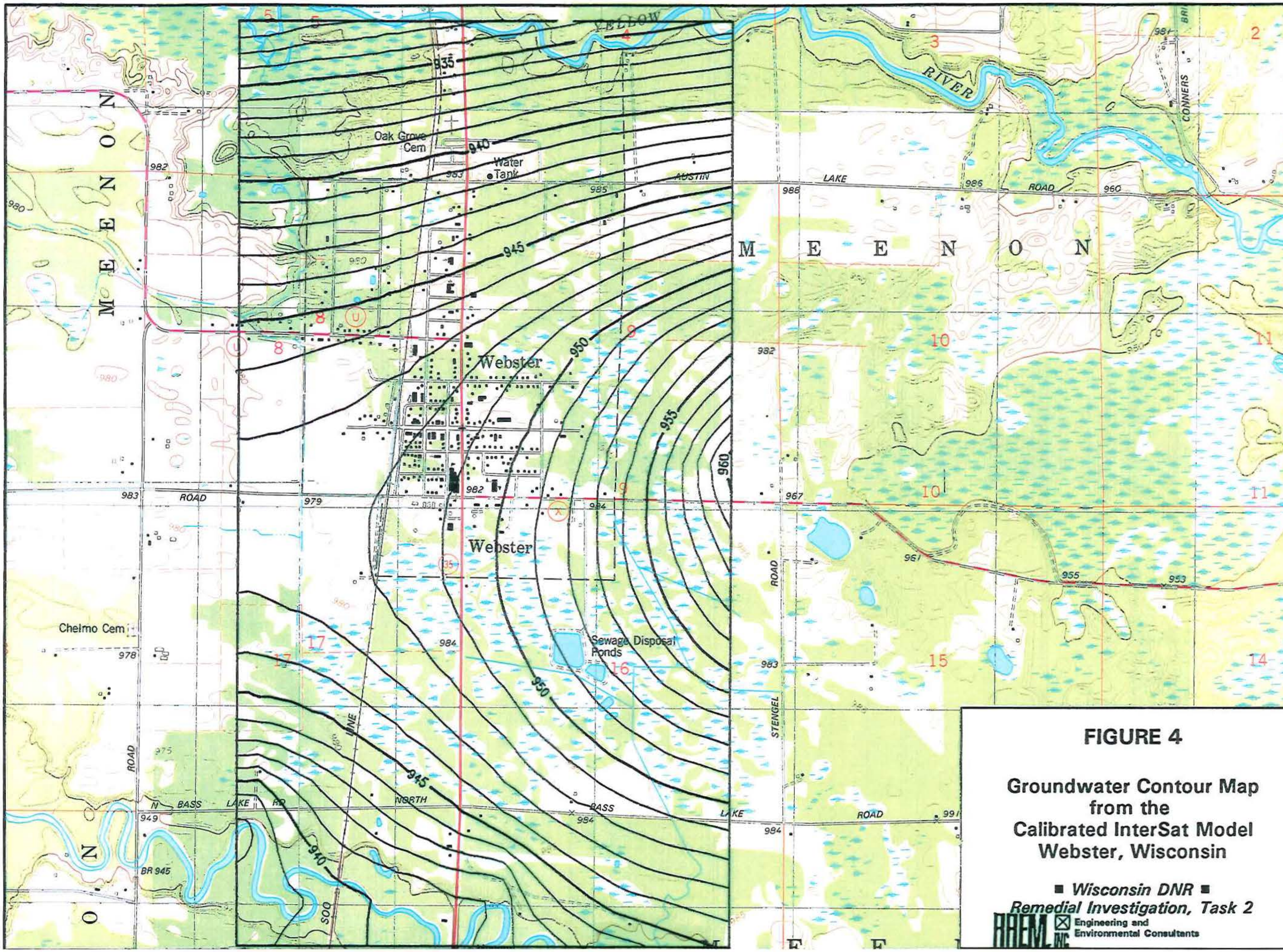

FIGURE 4

Groundwater Contour Map from the Calibrated InterSat Model Webster, Wisconsin

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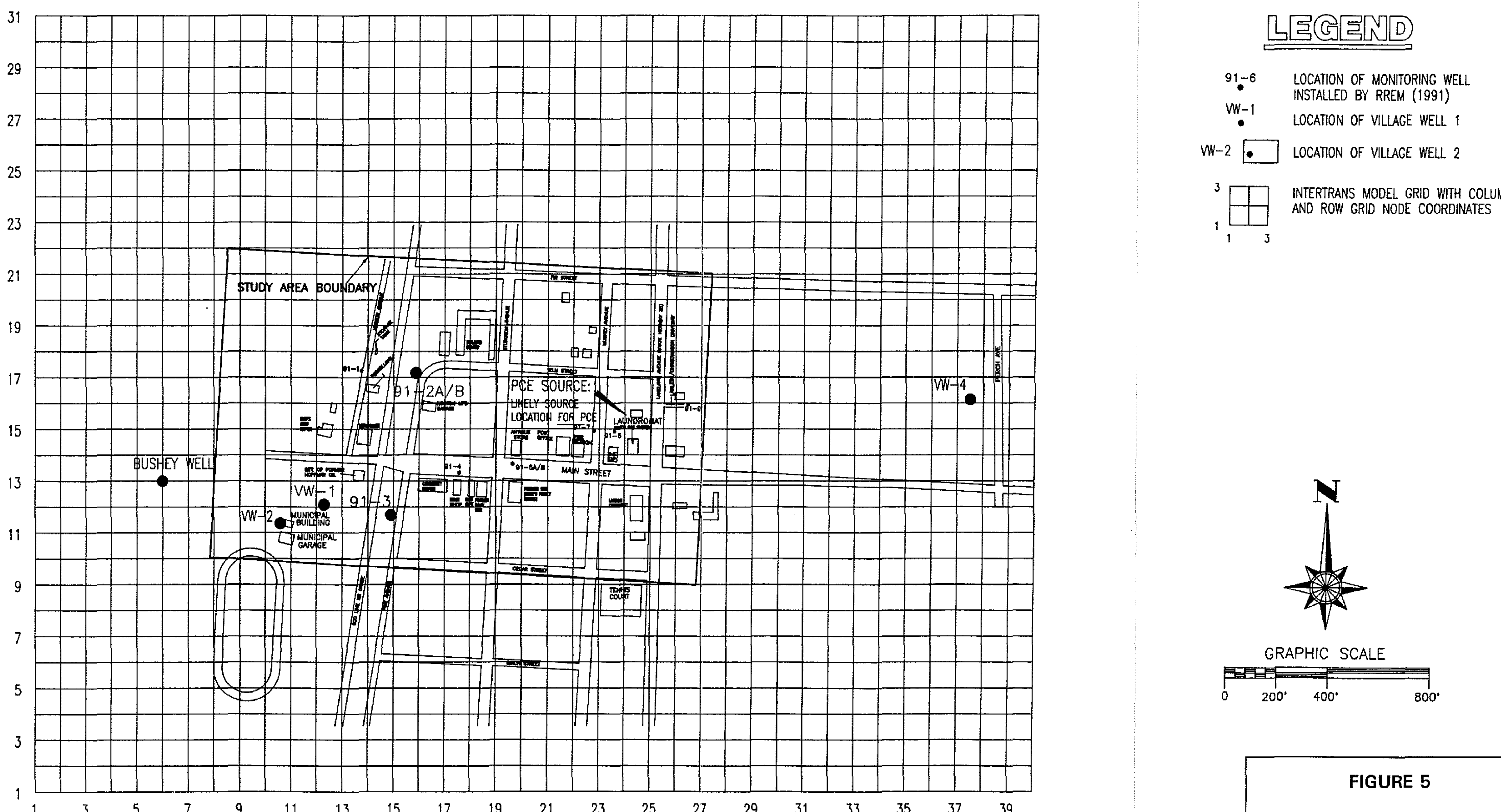

FIGURE 5

InterTrans Manual Flow Mode Model Grid Webster, Wisconsin

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The seepage velocity, or rate of speed at which groundwater is moving through the unconfined, sandy aquifer at Webster, varies from 44 to 48 feet per year (RREM, 1992a). Based on groundwater contours constructed from average groundwater elevations during the period from August through October, 1991, groundwater flow beneath the downtown area of Webster is in a westerly to northwesterly direction.

The manual flow model mode used to simulate solute transport requires that regional groundwater flow velocities in the x, y, and z directions be input into the model. These velocities are used to simulate advection within the area. Previous pumping that occurred at the Village Well Nos. 1 and 2 resulted in groundwater flow toward these wells. This pumping apparently attracted the contaminants toward the wells, and elongated the plumes along southwest-trending axes. Within the manual flow model mode, there is no option to simulate this pumping. Therefore, in order to compensate for the effects of natural groundwater gradients to the west and northwest, and artificial (pump-induced) gradients formerly to the southwest, regional groundwater flow within the contaminant transport model was set in a westerly direction. Within layer one, the regional velocity in the x direction was set at 0.13 feet per day (which is equivalent to 48 feet per year to the west) and at 0.0 feet per day in the y direction. These values represent the fastest rate that groundwater is expected to flow in the area, and is therefore a worst-case scenario as far as the migration of the solute is concerned.

For layer two, the clay confining layer, the regional velocity in the x direction was set at 5.35×10^{-6} feet/day. This value was computed by calculating the seepage velocity for a clay layer with a hydraulic conductivity of 1×10^{-6} cm/sec, a porosity of 45 percent, and a groundwater gradient of 8.5×10^{-4} ft/ft. It should be noted that the hydraulic conductivity of 1×10^{-6} cm/sec is relatively fast for silty clay to clay deposits according to Table 2 (Fetter, 1988). This value was used to simulate the worst-case scenario in which the contaminants are moving at the fastest rate possible through the confining layer.

The contaminants present in the Webster groundwater are more dense than water. According to Huling and Weaver (1991), pure 1,2-dichloroethane has a density of 1.175 g/cm^3, and pure tetrachloroethylene has a density of 1.625 g/cm^3. Groundwater contaminated by these substances should be slightly more dense than uncontaminated groundwater. The density of the contaminated groundwater will be dependent upon the concentration of the contaminants present, as well as their densities. Because of its relatively higher density, the contaminated groundwater plume will have a tendency to sink over a period of time.

The InterTrans model neglects the effects of the density of the contaminated groundwater. In order to model solute plumes that are more dense than groundwater, a regional vertical velocity must be entered into the manual flow model used to simulate contaminant migration. The vertical velocity of the contaminant plume was approximated by measuring the gradients of several of the contaminant isocons of tetrachloroethylene, as illustrated in Figure 27 of the *Task I Investigation Report* (RREM, 1992a). Vertical velocities approximated in this way varied from 0.003 feet per day to 0.06 feet per day. Many of the calculations were found to be in the range between 0.01 and 0.02 feet per day. Therefore, a value of 0.02 feet per day (equivalent to 7.3 feet per year) was used to model the rate at which the contaminant plume appears to be sinking within the upper unconfined aquifer, as well as the lower confined aquifer. For the clay confining layer (layer two) the vertical velocity was set at 8.2×10^{-7} feet/day.

Another solute transport phenomenon is molecular diffusion. Molecular diffusion carries solutes from areas of high concentrations to areas of low concentrations (or from areas of higher to lower chemical activity) when there is a hydraulic connection (Devinny et al., 1990). Diffusion is considered a more important solute transport process than advection in materials of low hydraulic conductivity, such as clay-rich soils. In these soils, diffusion may allow the solute to travel at a faster rate than the groundwater is flowing.

In addition to advection and diffusion, dispersion also has an effect on solute migration. Dispersion is the process by which the solute in the flowing groundwater is mixed with uncontaminated water and becomes reduced in concentration. This process is caused by differences in the velocity that water flows at the pore level, as well as by differences in the rates at which water travels through different strata in the path of the contaminated water (Fetter, 1988). Hydrodynamic dispersion takes into account these processes, as well as the effects that diffusion has on solute migration. The mixing that occurs along the direction of fluid flow is known as longitudinal dispersion, whereas the dispersion that occurs normal to fluid flow is called lateral dispersion. Within InterTrans, dispersion that occurs normal to fluid flow along a horizontal direction is called transverse dispersivity, whereas dispersion that occurs normal to fluid flow, but in a vertical direction, is called vertical dispersivity.

Dispersion is difficult to measure in the field because contaminant movement is also affected by such parameters as aquifer heterogeneity, stratification, soil-water-solute relationships, ion exchange, filtration, and other conditions and processes (Devinny et al., 1990). According to Fetter (1988), the values of the dispersivity coefficients appear to be scale-dependent. Values of dispersivity determined by laboratory experiments have typically been measured in terms of centimeters, whereas field values are generally in the range of meters. Longitudinal dispersivity values for alluvial sediments range from 39 to 200 feet, while lateral dispersivities range from 13 to 98 feet. According to Fetter (1988), a study on glacial deposits yielded a longitudinal dispersivity of 69 feet and a lateral dispersivity of 13 feet. However, in extremely homogenous materials, it appears that longitudinal dispersivity can become constant at values of 3 feet or less at distances approximately 165 feet from the source (Fetter, 1988). Freyberg (1986) has calculated a longitudinal dispersivity coefficient of 0.36 meters (1.18 feet) and a transverse dispersivity coefficient of 0.039 meters (0.13 feet) for the shallow sand aquifer at Canadian Forces Air Base Borden.

Because no determinations of dispersivity values were conducted during the Task I study field work, dispersivity coefficients used in this model were approximated. For layers one and three (the upper unconfined sand aquifer and the lower confined sand and gravel aquifer, respectively), the values of longitudinal, transverse, and vertical dispersivities were set at 10 feet, 1.5 feet, and 1.5 feet, respectively. For the silty-clay to clay confining layer, longitudinal dispersivity was set at 20 feet, and transverse and vertical dispersivity were each set at 3.0 feet.

According to Fetter (1988), solutes can be considered to belong to two broad classes called conservative solutes and reactive solutes. Conservative solutes are unreactive with their surroundings, whereas reactive solutes may undergo interactions with the soil present, the groundwater, or undergo biological or radioactive decay. The most common types of reactions that occur between contaminated groundwater and soil involve adsorption-desorption and cation exchange.

Because 1,2-dichloroethane and tetrachloroethylene have both been found to be reactive solutes, these contaminants, when dissolved in groundwater, will travel at a slower rate than the groundwater. This is the process of retardation. The retardation of the solute front as it migrates through the soil can be computed by the following equation (Fetter, 1988):

$$R_f = 1 + \frac{P_b}{\theta} (K_d)$$

where
R_f is the retardation factor,
P_b is the dry bulk density of the soil,
θ is the porosity of the soil,
K_d is the distribution coefficient for the solute with the soil.

The retardation factor is the ratio of the rate of groundwater movement to the rate of contaminant movement (Devinny et al., 1990).

In order to determine the retardation factors for the contaminants present in Webster, the value of K_d had to first be determined. The value of K_d for a specific soil can be estimated from the following equation (Fetter, 1988):

$$K_d = K_{oc} \times f_{oc}$$

where
K_{oc} is the soil - water partition coefficient
f_{oc} is the percent of organic carbon in the soil.

Six fine- to medium-grained, well-rounded, well-sorted sand samples and one silty sand sample from Webster were analyzed for percent organic carbon by James K. Huber of the Archaeometry Laboratory at the University of Minnesota-Duluth. The methods employed in these analyses are described in Dean (1974).

The results of the organic carbon analyses for the Webster samples, as well as the calculated retardation factors, are contained in Table 4. In order to calculate the retardation factor, R_f, the dry bulk density of the soil was estimated to be 1.6 g/cm^3, and the porosity of the soil was estimated to be 35 percent. Using these values, the retardation factors for 1,2-dichloroethane and tetrachloroethylene within the fine- to medium-grained, well-rounded, well-sorted sand aquifer were determined to be 1.50 and 5.22, respectively. For the silty sand sample, retardation factors of 2.43 and 13.05 were determined for 1,2-dichloroethane and tetrachloroethylene, respectively.

TABLE 4
Retardation Factor Parameters for 1,2-dichloroethane and tetrachloroethylene, Webster, Wisconsin

Sample	foc	$\frac{P_b}{\theta}$	DCE Koc	DCE Kd	DCE Rf	PCE Koc	PCE Kd	PCE Rf	Soil Type
85B7	0.0026	4.5714	36	0.0936	1.4279	303	0.7878	4.6014	SP
7SB10	0.0023	4.5714	36	0.0828	1.3785	303	0.6969	4.1858	SP
8SB14	0.0031	4.5714	36	0.1116	1.1502	303	0.9393	5.2939	SP
14SB16	0.0028	4.5714	36	0.1008	1.4608	303	0.8484	4.8784	SP
13SB17	0.0029	4.5714	36	0.1044	1.4773	303	0.8787	5.0169	SP
11SB4	0.0046	4.5714	36	0.1656	1.7570	303	1.3938	7.3717	SP
17SB9	0.0087	4.5714	36	0.3132	2.4318	303	2.6361	13.0507	MH
Average (Excluding 17SB9)					1.5019			5.2247	

foc = organic carbon content of media (Results of analyses performed at UMD by James K. Huber)

P_b = bulk density of media =1.6g/cm^3

θ = porosity of media = 0.35

Koc = organic carbon partition coefficient (Fetter, 1988)
Rf = Retardation factor
DCE = 1,2-dichloroethane
PCE = tetrachloroethylene

Kd = Koc*foc
Rf = 1 + (Db/n*Kd)

SP = Fine to medium grained, well rounded, well sorted sand
MH = Silt with trace fine sand

The retardation factors for layers one and three were each set at 5.22 during the tetrachloroethylene migration simulations. Retardation factors for the silty-clay to clay confining layer could not be determined because this unit was not encountered within any of the soil borings drilled for the Task I study. Therefore, the retardation factor for the silty clay to clay confining layer was set at 13.05, the value determined for the silty sand sample. This value is believed to be a conservative estimate of the retardation factor for the silty-clay to clay confining layer.

In addition to transport parameters, the InterTrans model requires that a specific mass of contaminant be used within the model. This parameter is very difficult to define given the scope of field work presently completed in the area.

Tetrachloroethylene contamination may have entered the upper unconfined aquifer through a drywell located near the present laundromat. According to Village officials, city sanitary sewer service was optional in the downtown Webster area in the the mid-1950s. It has been assumed that this contamination entered the aquifer just prior to the sanitary sewer service.

According to Martin and Fulton (1958), the high costs of drycleaning fluids prohibit them from being discarded in the same manner that water is from a washing machine. The most common method of reclaiming the drycleaning fluids during the mid-1950s was by a combination of distillation (to remove nonvolatile matter), absorbents (to remove color), and filtration (to remove insoluble soil). Given this information, it seems possible that the tetrachloroethylene contamination present in Webster may have occurred as the result of a single spill.

Within the solute transport model, a mass of tetrachloroethylene of 745 pounds (equivalent to the weight of 55 gallons of PCE) was used as the mass of the contaminant. This mass was broken into 2000 particles given equal masses of 0.3725 pounds each.

The half-life of the contaminant was set at a value of 1×10^{10} days, which essentially negated the effects of contaminant breakdown with time.

The porosity of the soil through which the solute is traveling also plays a role in the rate at which the contamination spreads. According to Fetter (1988), porosity ranges from 25 to 50 percent for well-sorted sand and gravel deposits, 35 to 50 percent for silty deposits, and 33 to 60 percent for clay deposits. Porosity values were set at 35 percent for the unconfined sand aquifer and the confined sand and gravel aquifer (layers one and three, respectively), and at 45 percent for the silty-clay to clay confining unit (layer two).

Layer top and layer bottom elevations that were set for each of the model layers within the contaminant transport model were based on information from the soil boring logs for Test Hole 2 (VW-1) and from Village Well No. 4. The upper elevation of layer one was set at 947 feet, which is the approximate elevation of the water table under the downtown area of the Village within the unconfined sand aquifer. The silty-clay to clay confining layer (layer two) extended from 846 feet to 801 foot, based on the Test Hole 2 log. It should be kept in mind that this unit is 104 feet thick in the vicinity of Village Well No. 4. The lower, confined sand and gravel aquifer (layer three) extended from 801 feet to 783 feet. This is based on the Village Well No. 4 log, in which this unit has a thickness of 18 feet.

Table 5 summarizes the InterTrans manual flow mode model parameter settings previously discussed.

TABLE 5
InterTrans Manual Flow Mode Model Parameter Settings

Parameter	Settings		
	Layer 1	Layer 2	Layer 3
Regional Velocity in X-Direction (FT/DAY)	-0.13[1]	-5.36×10^{-6}	-0.13
Regional Velocity in Y-Direction (FT/DAY)	0.00	0.00	0.00
Regional Velocity in Z-Direction (FT/DAY)	-0.02[2]	-8.2×10^{-7}	-0.02
Retardation Factor (PCE)	5.22	13.05	5.22
Longitudinal Dispersivity (FT)	10.0	20.0	10.0
Transverse Dispersivity (FT)	1.50	3.00	1.50
Vertical Dispersivity (FT)	1.50	3.00	1.50
Particle Mass (LBS)	0.3725	0.3725	0.3725
Particle Half-life (DAYS)	1×10^{10}	1×10^{10}	1×10^{10}
Effective Transport Porosity	0.35	0.45	0.35
Layer Top (FT)	947.0	846.0	801
Layer Bottom (FT)	846.0	801.0	783

(1) Negative Valve Required for Flow from East to West
(2) Negative Valve Required for Sinking Plume

CONTAMINANT TRANSPORT MODEL RESULTS AND DISCUSSION

In order to predict the future distribution of the tetrachloroethylene contamination in the groundwater at Webster, a technique for simulating the presently defined groundwater contamination had to be developed. The distribution of the tetrachloroethylene contamination with respect to depth within the Village remains poorly defined. Therefore, calibration was established within the contaminant transport model by allowing the 745 pound mass of tetrachloroethylene to migrate as a slug until the concentrations of this solute at the screened interval (900 to 910 feet elevation) of well No. 91-2B (the location of the highest recorded tetrachloroethylene concentrations in the groundwater according to RREM, 1992a) were closely approximated. For the purposes of this simulation, calibration was achieved when the concentration of tetrachloroethylene in the model was calculated to be 98 μg/l, which closely approximated the 112 μg/l and 105 μg/l measured during the first and second rounds of sampling for the Task I report (RREM, 1992a). At the point when this calibration was achieved, the date for the model was set at the year 1992.

Once model calibration was established, successive simulations at 10-year intervals were performed to monitor the downgradient margin of the 0.1 μg/l tetrachloroethylene isocon. This concentration is equivalent to the presently defined Wisconsin Department of Natural Resources Preventive Action Limit (PAL). Figures 6 and 7 illustrate the predicted position of this isocon during the years 1992, 2000, 2020, and 2040, at elevations of 900-910 feet (the elevation of the screened interval in well No. 91-2B) and 840-846 feet (the uppermost six feet of the silty-clay to clay confining layer) respectively. The particle placement file data produced by InterTrans for the simulations for 1992, 2000, 2010, 2020, 2030, and 2040 are contained in Appendix C.

The particle placement data indicate that with time, the tetrachloroethylene contamination migrates to the west while simultaneously sinking. The highest concentration of contamination in 1992 in the interval between 940 and 950 feet (the top of the unconfined sand aquifer) was calculated to be 65.4 μg/l, whereas no contamination was determined to exist within the same screened interval during the year 2040. In the interval between 846 and 850 feet (the lowermost 4 feet of the unconfined sand aquifer), the highest calculated concentration of tetrachloroethylene in 1992 was found to be 326 μg/l, whereas in the year 2040, the model predicted the highest concentration of tetrachloroethylene to be 3644 μg/l over the same interval. It appears, therefore, that as time proceeds, the upper parts of the unconfined sand aquifer will become less contaminated while the lowermost parts of the aquifer will become more contaminated as a result of the solute sinking.

Based on the results of the model shown in Figure 6, between the present time and the year 2040, the 0.1 μg/l isocon will migrate between 400 and 500 feet to the west within the 900-910 foot interval in the unconfined sand aquifer. Tetrachloroethylene contamination was detected in monitoring well OW-5 during the Task I study (3.5 μg/l and 2.1 μg/l in groundwater analyzed from the first and second rounds of sampling). The Bushey well is located approximately 500 feet west of this well. Therefore, based on the results of the model, the 0.1 μg/l tetrachloroethylene isocon is expected to be in the area of the Bushey well within 40 to 50 years.

Figure 7 illustrates the position of the 0.1 μg/l tetrachloroethylene isocon within the uppermost 6 feet of the silty clay to clay confining layer, according to the model. The position of this isocon does not differ significantly from the position of the isocon within the middle of the unconfined sandy aquifer (Figure 6). This spatial distribution of the contamination reflects that solute is migrating from the sand into the top of the clay layer.

Based on the modeling, it appears that the tetrachloroethylene contamination may continue to increase in concentration within the silty-clay to clay confining layer. For the year 1992, the model calculated the highest concentration of contamination in the uppermost 6 feet of the confining layer (840-846 foot elevation) to be 3627 μg/l, and the highest concentration in the interval from 820 to 830 feet to be 610 μg/l. No contamination was present below an elevation of 820 feet. For the year 2040, however, the model predicted a concentration of tetrachloroethylene in groundwater of 3644 μg/l for the 840 to 846 foot interval, and solute concentrations of 610 μg/l within the interval of 820 to 830 feet. Again, no contamination was predicted to occur below an elevation of 820 feet.

The tetrachloroethylene contamination does not appear to migrate through the silty clay to clay confining layer within the next 50 years. Therefore, the lower, confined sand and gravel aquifer should not be adversely affected by the tetrachloroethylene contamination within the same time interval.

The results discussed above are based on several assumptions. Within the model, the presence of residual saturation within the soil (especially within the vadose zone), and its effects on future groundwater contamination, cannot be adequately represented. According to Huling and Weaver (1991), residual saturation provides a major source for future groundwater contamination as the product is dissolved by water migrating downward in the vadose zone until it reaches the water table. The presence of tetrachloroethylene within the soil in the vadose zone beneath Webster has been confirmed (RREM, 1992a). Therefore, until all the contaminant has been dissolved from the soil, it is unlikely that the upper parts of the unconfined aquifer will be uncontaminated.

Additionally, the model cannot adequately portray the distribution of the contaminant if free product is present. Because of its relatively high density relative to water, free phase tetrachloroethylene (as well as 1,2-dichloroethane) will sink through the saturated zone at a much greater rate than modeled in this simulation. The migration of free phase tetrachloroethylene and 1,2-dichloroethane is discussed in detail in Appendix D.

It must also be kept in mind that the present simulation is based on a uniform groundwater flow field. Local heterogeneities within the subsurface at Webster will certainly result in non-uniform groundwater flow conditions. These conditions may result in contaminant migration patterns that differ from those modeled above.

CONTAMINANT TRANSPORT MODEL SENSITIVITY ANALYSES

Sensitivity analyses were run to determine the effects that changing the mass parameter and the dispersivity parameters had on the location of the 0.1 μg/l tetrachloroethylene isocon. The particle placement files from these analyses are contained in Appendix C.

FIGURE 6

Position of the 0.1 μg/l Concentration of Tetrachloroethane in Groundwater at an Interval between 900-910' according to the InterTrans Model
Webster, Wisconsin
■ ***Wisconsin DNR*** ■
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FIGURE 7

Position of the 0.1 μg/l Concentration of Tetrachloroethylene in Groundwater at an Interval between 840-846' according to the InterTrans Model
Webster, Wisconsin
■ *Wisconsin DNR* ■
Remedial Investigation, Task 2

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Mass Sensitivity Analysis

The amount of contaminant that was used within the mass sensitivity analysis was 1490 pounds. This is twice the mass used within the previously discussed contaminant transport model. All other parameters within the model were left unchanged.

The initial particle positions for the mass sensitivity analysis were those within the calibrated transport model for 1992 (particle placement file PCE92 contained in Appendix C). The mass sensitivity simulation was run to determine the position of the 0.1 μg/l tetrachloroethylene isocon in the year 2040. The particle placement file (Appendix C) that contains the results of this simulation is named PCEMASS.

The results of the mass sensitivity analysis indicate that tetrachloroethylene contamination will be located within the lower parts of the unconfined aquifer and the uppermost 26 feet of the silty clay to clay confining layer. The contamination is restricted to elevations between 820 and 850 feet, according to the results.

Because no contamination was found to exist within the interval between 900 and 910 feet in the unconfined aquifer, the position of the 0.1 μg/l isocon for the mass sensitivity analysis does not appear on Figure 6. Within this aquifer, contamination was found to exist only within the 846 to 850 foot interval, which coincides with the lowermost 4 feet of the aquifer. Contamination was found to exist within grid lines 7 and 23 east between grid lines 14 and 16 north. The highest contaminant concentration within this area was calculated to be 490 μg/l, which was located at the intersection of grid lines 21 east and 15 north.

The position of the 0.1 μg/l tetrachloroethylene isocon in the uppermost 6 feet of the silty clay to clay confining layer is illustrated in Figure 7. There is little change in the position of the 0.1 μg/l tetrachloroethylene isocon that resulted from the mass sensitivity analysis and the original contaminant transport simulation. The highest concentration of tetrachloroethylene calculated by the model within the mass sensitivity analysis is 3610 μg/l. This concentration is located within the upper 6 feet of the clay confining layer at grid position 22 east and 17 north. This is the same location that the highest contamination within the original contaminant transport model (3644 μg/l) was located. Because no contamination was simulated to exist below 820 feet, it appears that increasing the mass of solute within the model will not affect the water quality within the lower, confined aquifer that is the present Village water supply.

Dispersivity Sensitivity Analysis

A simulation in which the longitudinal, lateral, and vertical dispersivity coefficients were varied from those in the original contaminant transport model was run to determine the effects these parameters have on the position of the contamination in the year 2040. All dispersivity parameters were increased six times relative to those in the original model for this analysis. Therefore, the values of the longitudinal, lateral, and vertical dispersivity coefficients within layers one and three were set at 60 feet, 9 feet, and 9 feet respectively. In layer two, these coefficients were set at 120 feet, 18 feet, and 18 feet within the sensitivity simulation.

The initial particle positions for the dispersivity sensitivity analysis were those for the calibrated transport model for 1992 (particle placement file PCE92). The simulation was run to determine the position of the 0.1 μg/l tetrachloroethylene isocon in the year 2040. The results of this simulation are contained in Appendix C (particle placement file PCEDISP).

The results of the dispersivity sensitivity analysis indicate the tetrachloroethylene contamination will be located within the lower parts of the unconfined aquifer and throughout the silty clay to clay confining layer. Contamination was found to exist within the interval between 890 to 900 feet and 846 to 860 feet within the unconfined sand aquifer, and within the interval between 801 to 846 feet within the silty clay to clay confining layer, according to the results of this simulation.

significantly high concentrations of contaminants in the groundwater. The lack of measurable tetrachloroethylene and 1,2-dichloroethane in monitoring well No. 91-8, which is located approximately 200 feet upgradient from relatively high concentrations of tetrachloroethylene-contaminated groundwater, appears to support this hypothesis.

The results of InterTrans contaminant transport simulations also appear to support these hypotheses. Based on the particle placement data (Appendix C), the 0.1 μg/l tetrachloroethylene isocon at 840-846 feet should be located only as far east as Highway 35 by the year 2040 when using longitudinal transverse, and vertical dispersivity coefficients of 10 feet, 1.5 feet, and 1.4 feet, respectively. When these coefficients are increased to 60 feet, 9 feet, and 9 feet, the contamination will extend to the east only as far as well No. 91-8, which is located approximately 1000 feet downgradient from Village Well No. 4. Therefore, it appears unlikely that high levels of dissolved contamination will be present in the vicinity of Village Well No. 4.

Further evidence suggesting that groundwater quality in Village Well No. 4 will not be adversely affected by the halogenated VOC contamination present in the western edge of the Village is related to the location of the screened interval from which this well obtains water. Village Well No. 4 is not obtaining water from the same aquifer as Village Well Nos. 1 and 2.

According to Ayres (1987), Village Well Nos. 1 and 2 are screened at elevations of 915 to 925 feet (55 to 65 feet below grade) and 909 to 921 feet (60 to 72 feet below grade) within the unconfined aquifer consisting of fine- to medium-grained sandy outwash. These two wells have produced groundwater samples contaminated by halogenated volatile organic compounds. Village Well No. 4, however, is screened at an elevation of 767 to 783 feet (200 to 216 feet below grade) according to Mid-States Associates (1991). The aquifer in this interval is confined and consists of sand and gravel. Based on the well constructor's reports (Appendix A), a 104 foot thick silty clay to clay unit separates these two aquifers.

The silty-clay to clay layer represents a confining layer between the deposits that provide water to Village Well Nos. 1 and 2, and those that provide water to Village Well No. 4. Therefore, the halogenated volatile organic compounds present in groundwater from the upper aquifer would have to migrate into the lower aquifer before these contaminants could affect the water quality in Village Well No. 4. This could happen in two ways:

- Direct migration of the heavy contaminants through the silty-clay to clay confining layer via preferred pathways through the confining layer;

- Seepage of the contaminants through the silty-clay to clay unit over a period of time.

According to Huling and Weaver (1991), formations containing a high clay content are typically assumed to be impervious to vertical dense non-aqueous phase liquids (DNAPL's). Both 1,2-dichloroethane and tetrachloroethylene are considered to be DNAPLs in their pure states. Once DNAPLs encounter a stratigraphic unit of low permeability, they tend to migrate laterally upon the surface of the unit. During this lateral movement, DNAPLs will tend to migrate into zones of higher permeability. These zones include naturally occurring pathways such as cracks, fractures, joints, and rootholes within and through the unit. Other vertical pathways for DNAPL movement may also include man-made features such as disposal wells (dry wells), unsealed geotechnical boreholes, improperly sealed hydrogeological investigation sampling holes and monitoring wells, and old uncased or unsealed water supply wells. DNAPLs can move rapidly through these structures, because of their low retentive capacity. This allows rapid migration of DNAPLs deep into the low permeability unit or completely through it (refer to Huling and Weaver, Figure 14).

Inspection of soil cores at one Superfund site (Conner et al., 1989) indicated that DNAPL flow was not uniformly distributed through the soil mass and occurred primarily through preferential pathways. Apparently, the complex distribution of these pathways precluded an exact characterization of the volume distribution of the DNAPL.

For several reasons, naturally occurring structures, such as those listed above, are not expected to allow large quantities of halogenated volatile organic compounds to migrate into the lower aquifer. The clay confining layer should be situated deeply enough below the ground surface that disturbance by roots should not occur. Vertical migration of the contaminant through structures such as cracks, fractures, and joints in the confining layer is not expected to be a significant process. This is because the confining layer is saturated, and clays have a tendency to "swell" when they are wet. The swelling would tend to decrease the distribution of these structures, and those structures that persist would be expected to be decreased in size. Capillary pressures within small structures would also tend to inhibit the migration of the contaminants. The most likely natural structures through which the contaminants would be expected to migrate are local areas of higher permeability within the confining layer that are a result of compositional heterogeneity.

The results of the contaminant transport simulations indicate that tetrachloroethylene-contaminated groundwater will not be present in the lower, confined aquifer by the year 2040 under all conditions that were simulated. Based on the model results, contamination will not be present below a depth of 820 feet within the silty-clay to clay confining layer. Therefore the migration will have penetrated a maximum of 26 feet into the confining layer, using a contaminant mass of 2000 pounds and 10 feet, 1.5 feet, and 1.5 feet for the longitudinal, and vertical dispersivity coefficients. In the vicinity of Village Well No. 4, this is approximately one-quarter of the thickness of the confining layer.

Boreholes and wells that have punctured through the silty clay to clay confining layer that have not been properly sealed appear to be the most likely pathways through which that dense halogenated VOCs could migrate quickly into the lower confined aquifer. Based on geological data from the well constructor's reports (Appendix A), few wells or boreholes have penetrated the clay confining layer in the vicinity of downtown Webster. Borings BT-1 and BT-3, which were drilled in 1952 near the present site of the village office, breach the clay confining layer. The well constructor's reports give no indication that these holes were sealed when they were abandoned. In a worst-case situation, these borings would be filled by highly permeable sand deposits from the upper unconfined aquifer. Vertical migration of DNAPL through sand would occur at a rate several orders of magnitude faster than migration through the silty clay to clay deposits.

Assuming, however, that groundwater migration is in the same direction in the lower aquifer as it is in the upper aquifer, any contamination entering the lower aquifer at these locations would be a considerable distance downgradient from VW-4. Therefore, significant contamination of water that would be pumped by Village Well No. 4 is not expected to occur.

As noted above, halogenated VOCs may also enter the lower aquifer after seeping through the clay confining layer. Hydraulic conductivities for silty clay to clay deposits typically range from 1×10^{-6} cm/sec to 1×10^{-9} cm/sec (Fetter, 1988). According to Bower (1978), it is not uncommon for materials to have vertical conductivities that are one-fifth to one-tenth their horizontal values. Therefore, vertical conductivities might be as low as 2×10^{-7} cm/sec to 1×10^{-10} cm/sec for these deposits.

POSSIBLE REMEDIAL ACTIONS AND RECOMMENDATIONS

Two simulated pump tests were performed using the water table data generated by the calibrated InterSat groundwater model to investigate the effectiveness of groundwater extraction as a remedial action. In the first pump test, Village Well No. 2 was used as the extraction well. In the second test, three high capacity pump wells placed at various locations within the Village were used to extract contaminated water.

Village Well No. 2 Pump Test

A computer-simulated pump test was performed using InterSat software to determine the effectiveness of using Village Well No. 2 within a groundwater extraction system and treatment system. According to Jay Heyer and Butch Beers, both of whom run and keep records on the well performance for the Village of Webster, Village Well No. 2 has a working pumping capacity of 110 gallons per minute. Therefore, within the simulation, a pump running at 110 gallons per minute was placed into the calibrated groundwater model at the location of Village Well No. 2. The simulation was run for a period of ten days, during which essentially steady-state drawdowns at the well were established.

Figure 8 illustrates the groundwater contours that result from modeling the pumping under the conditions described above. Also shown on this figure are the 1,2-dichloroethane and tetrachloroethylene concentrations in the Webster groundwater, based on the results of the round one sampling performed for the Task I study (RREM, 1992a). The distribution of these two contaminants seems to indicate that pumping of Village Well No. 2 in the past has drawn the contamination toward this well, and elongated the plumes to the southwest.

The results of the pump test indicate that the calibrated model groundwater contours are depressed within a radius of approximately 500 feet from the site of the pumping well. At the site of the well, maximum drawdown is 2.00 feet, from an elevation of 947.5 feet in the calibrated model to an elevation of 945.5 feet during this simulation.

The InterSat pump test results from pumping Village Well No. 2 were independently verified using the Hantush (1964) model within Toolkit software package developed by W. C. Walton.

This model simulates the drawdown that occurs as the result of pumping from a well that partially penetrates the aquifer. The aquifer parameters used in this model (Table 6) were consistent with those used within the InterSat simulations. In the case of the Walton simulation, the 101 foot thick aquifer was pumped at 110 gallons per minute for 10 days from a well that has a 12 foot long screen (The length of the well screen in Village Well No. 2). The results of this analysis show that total drawdown from the partially penetrating well is 2.58 feet at an observation well 1.0 foot away from the pumping well.

TABLE 6
AQUIFER PARAMETERS AND RESULTS
VILLAGE WELL 2 PUMP TEST
WALTON ADAPTATION OF THE HANTUSH (1964) MODEL.
TOOLKIT SOFTWARE PACKAGE

PARAMETER	VALUE
Aquifer Transmissivity	38400 GPD/FT^2
Aquifer Storativity	0.10
P_V/P_H[1]	1.00
Discharge Rate of Well	110 GPM
Time of Pump Test	10 DAYS
Radial Distance to Observation Well	1.0 FEET
Aquifer Thickness	101.0 FEET
Pumping Well Screen Length	12.0 FEET
Depth to Pumping Well Screen	26.0 FEET
Length of Observation Well	38.0 FEET
RESULTS:	
Drawdown with Full Penetration	4.58 FEET
Drawdown with Partial Penetration	2.58 FEET

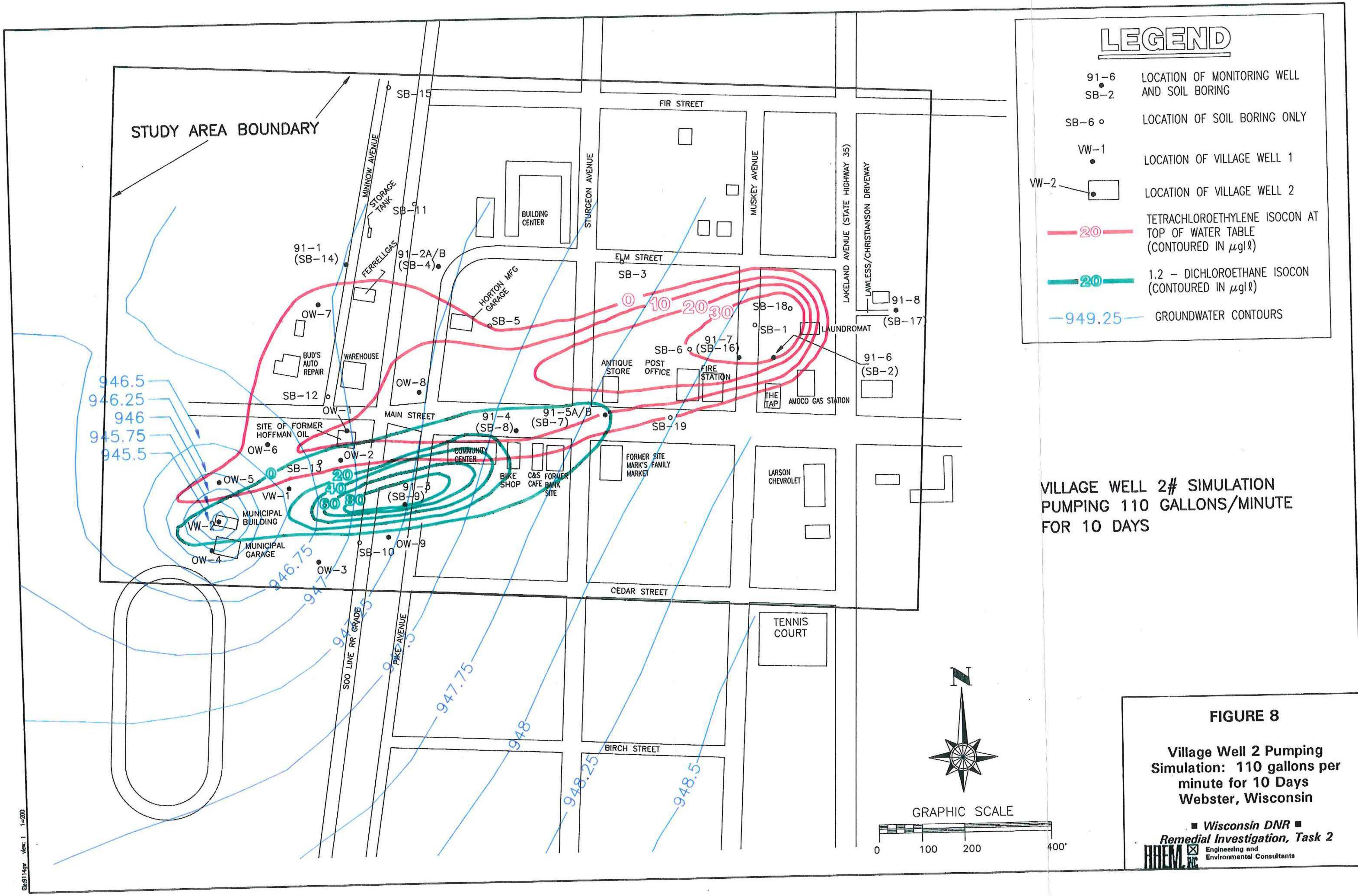

FIGURE 8

Village Well 2 Pumping Simulation: 110 gallons per minute for 10 Days Webster, Wisconsin

■ *Wisconsin DNR* ■ *Remedial Investigation, Task 2*

RREM INC Engineering and Environmental Consultants

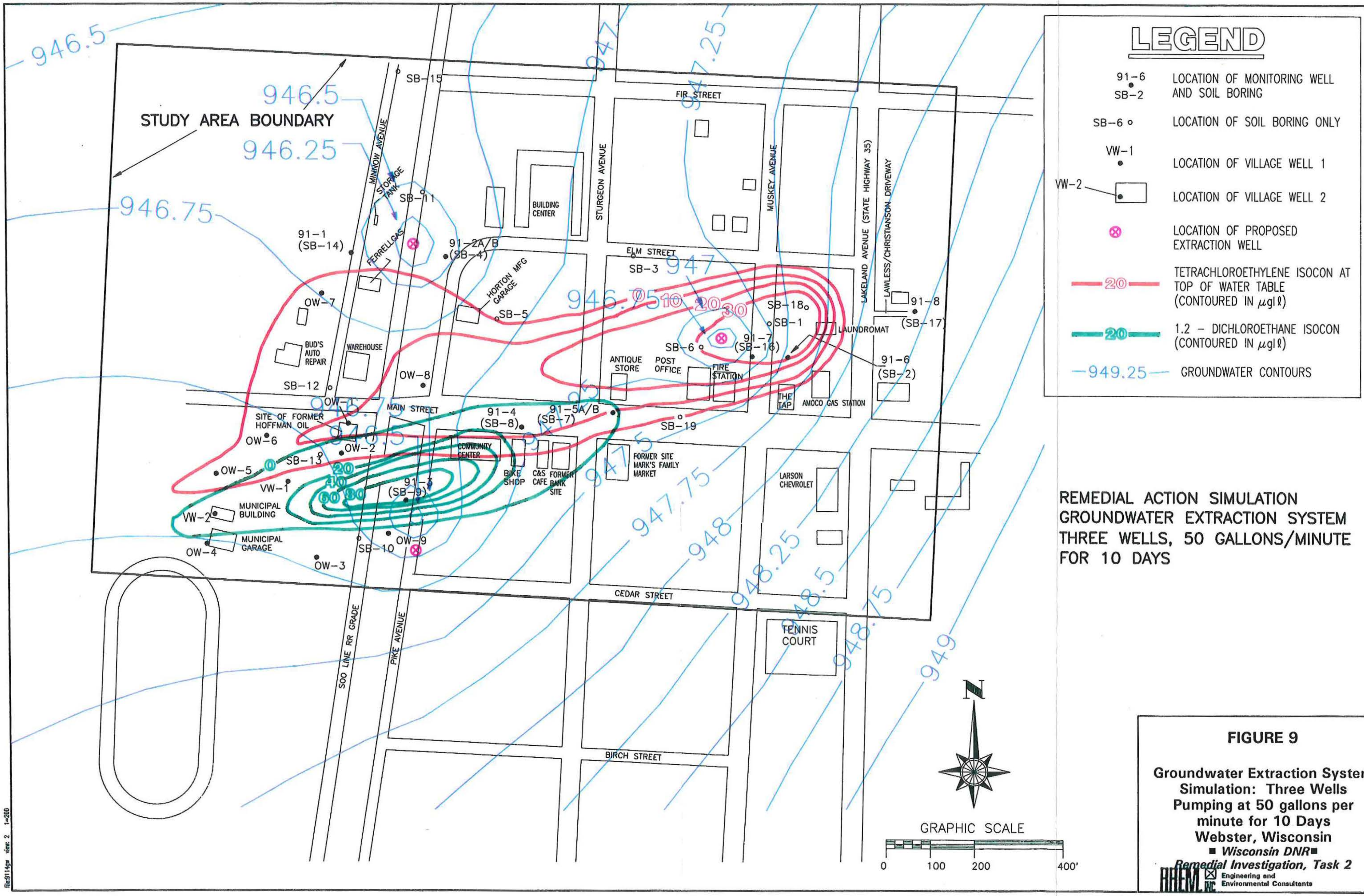

FIGURE 9

Groundwater Extraction System Simulation: Three Wells Pumping at 50 gallons per minute for 10 Days
Webster, Wisconsin
■ Wisconsin DNR ■
Remedial Investigation, Task 2

RMT Engineering and Environmental Consultants

The results of the InterSat and Hantush (1964) models were somewhat surprising given that a pump test of Village Well No. 2 conducted from June 20, 1991 through July 23, 1991 resulted in a 17-foot drawdown in the water table within the well. This large value of drawdown during the actual test may be attributed to inefficiency within the well, which could possibly be the result of clogging of the well screen.

According to the results of the InterTrans model, both 1,2-dichloroethane and tetrachloroethylene-contaminated groundwater will be pumped from the aquifer using Village Well No. 2 as an extraction well. This method may prove beneficial for extraction of 1,2-dichloroethane from the upper parts of the aquifer, as the presently defined contaminant plume for this solute will be captured within the cone of depression that results from the pumping. Because the distribution of the 1,2-dichloroethane contamination in the groundwater near the base of the aquifer is not well established at the present time, it is difficult to say with certainty how effective this technique will be in removing contamination located at depth.

Tetrachloroethylene-contaminated groundwater also will be extracted by Village Well No. 2 as a groundwater extraction well. As shown in Figure 8, the tetrachloroethylene plume as presently defined at the top of the water table will also be captured within the limits of the cone of depression. It must be kept in mind, however, that the highest concentrations of tetrachloroethylene contamination found during the sampling for the Task I study (RREM, 1992a) are from depths of 65-70 feet below the surface from monitoring well No. 91-2B. Based on the model groundwater contours, this contamination does not appear to be intersected by the cone of depression, and therefore could continue to migrate in a westerly direction even if pumping is occurring at Village Well No. 2.

<u>Three-Well Groundwater Extraction System Pump Test</u>

A computer-simulated pump test was carried out using InterSat software to determine the effectiveness of using a three-well groundwater extraction system to treat the contaminated groundwater at Webster. Three high capacity wells, each pumping at a rate of 50 gallons per minute, were modeled during this simulation. The wells were placed approximately at the locations of monitoring well Nos. 91-7, 91-2B, and 91-3. These locations were selected because of their proximities to the margins of the contaminant plumes. The wells were, as in the previous example, pumped constantly for a period of ten days in the simulation.

Figure 9 illustrates the 1,2-dichloroethane and tetrachloroethylene plumes as defined within the Task I study, as well as the groundwater contours that result from pumping the wells using the conditions described above. Three cones of depression were formed around the locations where the wells were being pumped. Drawdown values in the three simulated wells relative to the calibrated groundwater model were determined to be 1.62 feet near monitoring well No. 91-7, 1.37 feet near monitoring well No. 91-2B, and 1.37 feet in the vicinity of monitoring well No. 91-3. The differences in the drawdowns at the wells reflect differences in the hydraulic conductivities modeled at these locations.

The results of this simulation suggest that the three high-capacity wells, pumping at a rate 50 gallons per minute, could inhibit the downgradient migration of the contaminant plumes as they are presently defined. Based on the groundwater contours in Figure 9, groundwater contaminated by 1,2-dichloroethane should be extracted primarily by the high-capacity pump in the vicinity of monitoring well No. 91-3. Groundwater containing 1,2-dichloroethane contamination near the vicinity of Village Well No. 2 could be captured by the extraction well located in the vicinity of monitoring well No. 91-2B.

Tetrachloroethylene-contaminated groundwater should be captured by each of the three high-capacity wells. The simulated well located in the vicinity of monitoring well No. 91-7 should capture the most highly contaminated groundwater containing this solute. This well may also result in the migration of tetrachloroethylene that is presently contaminating the soil in this area of the village. The migration of this residual saturation could result in locally higher concentrations of tetrachloroethylene being pumped from this well than have been sampled to date.

Groundwater tainted by tetrachloroethylene in the western part of the Village should be captured by the simulated wells in the vicinities of monitoring well Nos. 91-3 and 91-2B, based on the results of this computer simulation. Pumping at these two wells should be a more efficient method of capturing contamination in the western portion of the Village than pumping from Village Well No. 2. In addition, the highly contaminated water present in the northwestern area of the Village should be more effectively captured by the simulated well in the vicinity of monitoring well No. 91-2B than by pumping Village Well No. 2 solely. Again, it is difficult to establish the efficiency of these wells in capturing contaminated groundwater near the base of the sand aquifer, since the distribution of groundwater contamination in this part of the aquifer remains poorly defined.

DISCUSSION

In the January 1992 *Task I Investigation Report,* recommendations were made to further define the extent of contamination in the Village of Webster. These options have been examined in more detail to allow estimates of expected cost to be prepared. The assumptions made in preparing these estimates are listed in the following paragraphs.

Estimates of Expected Costs

Source definition through soil borings, soil and water sample analyses.

Assumptions:

	Estimated Cost
• 8 soil borings @ 40' each (including boring abandonment) @ $26/foot	$ 8,320
• Geologist drilling field time (1 week)	$ 1,880

• 8 groundwater samples (from borings) analyzed for VOCs (EPA 8010/8020)	$ 1,200
• OVA screening	$ 400
• Miscellaneous Expenses (lodging, meals, miles)	$ 500
	$15,500

Definition of vertical and horizontal extent of the contaminant plumes.

Assumptions:

• 4-40' soil borings/monitoring wells	$10,400
• 4-80' soil borings/monitoring wells	$20,800
• Analysis of 12 soil samples (8010/8020) @ $200/each	$ 2,400
• Analysis of 8 groundwater samples (8010/8020) @ $150/each	$ 1,200
• Geologist field time:	
Drilling (60 hours)	$ 2,820
Sampling new wells (32 hours)	$ 1,504
• Data Evaluation and Report Preparation	$ 8,545
	$47,669

Identification of depth to lower confining unit:

• 4 soil borings:	
2 each 95 feet	$ 4,940
2 each 135 feet	$ 8,100
• Geologist field time (40 hours)	$ 1,880
	$14,920

Continued groundwater sampling (annual cost):

• 3 rounds of analysis for existing wells 20 wells @ $150/sample (includes 3 QA/QC samples)	$10,350
• Sampling Cost (2 people) 96/hours @ $94/hour	$ 9,024
• Annual Summary	$ 2,715
	$22,089

Sampling and analysis of one downgradient domestic well (Vernon Bushey residence):

• 3 samples per year @ $150/each	$ 450
• Sampling Cost	$ 150
	$ 600

The total estimated cost for implementing the recommendations outlined is: **$100,778**

Remedial Options

In addition to the recommendations outlined in the *Task I Investigation Report*, three remedial action alternatives have been reviewed for this site:

- No action
- Well-head treatment
- Groundwater extraction and treatment

No Action

A "no action" scenario at this site will result in continued migration of existing contamination and additional low level groundwater contamination resulting from groundwater contacting contaminated soils and/or free phase compounds. The continued migration of this contamination may require that restrictions be placed on future use of groundwater downgradient of this contamination. The "no action" scenario may limit the possibility of exposure to these compounds since at this time the only direct exposure pathway lies in consumption of the impacted groundwater. If the "no action" scenario is chosen, we recommend, that periodic groundwater sampling and analysis be completed from the existing monitoring system to allow fluctuations in concentrations to be tracked. The annual cost associated with groundwater sampling and analysis (outlined previously) is approximately $22,089.

Well-head Treatment

Well-head treatment was considered as a remedial option mainly because it allows continued use of the existing Village Well No. 2. This remedial option represents a technically feasible means of providing a potable water supply, economically; however, this option has limited merits due to the installation of Village Well No. 4.

The merits associated with this option include:

- Water supply can be provided.
- Some aquifer restoration/groundwater treatment will take place.

Negative aspects include:

- The cost associated with purchase, operation and maintenance of a treatment system.
- Amount of water treated is use-dependent.
- Limited use will not prevent contaminant movement.
- Restrictions on downgradient groundwater use may still be required.
- Periodic groundwater sampling and analysis is still necessary.

Estimated costs associated with Well-head Treatment:

	Estimated Cost
• Air-stripping unit (100 gpm)	$62,000
• Annual operation and treatment costs	$15,000
• Continued groundwater monitoring of existing wells	$22,089
Estimated First Year Cost	$99,089*

* Additional costs associated with equipment housing and installation, gas phase treatments and sample analyses may result depending on final design.

Groundwater Extraction and Treatment

Groundwater extraction and treatment represents the most ambitious and expensive method for remediating this site. It is also probably the most effective. This option requires design and installation of high capacity groundwater extraction wells, pumps and appropriate treatment systems. Varying degrees of success have been achieved at other sites using this technology, ranging from total aquifer restoration to simply limiting the further migration of contamination. Since the contaminants are denser than water, location and removal of possible free-phase contaminants will be difficult, inhibiting the complete restoration of the aquifer. This system would, however, be designed to allow capture of the contaminant plume and prevent further migration. This option does not represent a short-term solution to the problem. If it is assumed that removal of only one pore volume from the area of the contaminant plume would remediate the site, the time required to complete this work would be dependent upon:

- the volume of water within the contaminant plume,
- the pumping rate.

Assuming a zone of contaminated groundwater approximately 1600 feet long by 800 feet wide by 100 feet thick and a porosity of 35 percent, one plume volume would be approximately 3.55×10^8 gallons. If a pumping rate of 100 gallons per minute were used to remove groundwater, it would require slightly over six years of continuous pumping to remove this volume. By doubling the pumping rate, the time for volume removal decreases; however, the concentration of the contaminants in the water may decrease because the contaminants may not have time to equilibrate with the groundwater. The only situation under which removal of one plume volume is likely to remediate the site would involve simultaneous source identification and removal. If source removal does not occur, it is likely that at least ten years would be necessary for remediation.

Preliminary estimates of cost associated with a groundwater extraction system are as follows:

Additional Plume Definition (as described previously)	$ 39,124
Air-stripper (100 gpm)	$ 62,000*
3 6" I.D. high capacity wells	$ 36,000
3 pumps	$ 9,000
Estimated Capital Cost	$146,124*

* Additional air-strippers may be required if treatment system cannot be linked easily to wells.

Annual Costs

Annual costs associated with this system would include:

• Pump repair and maintenance or replacement	$ 9,000
• Continued sampling of monitoring wells	$ 22,089
• Equipment operation and maintenance	$ 10,000
• Annual evaluation of system effectiveness	$ 20,000
Annual Estimated Cost	$ 61,089
Total Estimated First Year Cost	$207,213*

* Additional costs associated with equipment housing and installation, gas phase treatment, and sample analyses may result depending on final design. Costs associated with disposal of treated groundwater have not been estimated.

SUMMARY

Remedial options for this site are limited, due to the type of contaminant and the subsurface characteristics. Continued groundwater monitoring of this site is recommended regardless of the final option chosen. Additional site investigation is necessary to accurately define the overall vertical and horizontal extent of subsurface contamination and to effect source clean-up. Given adequate funding, it is our contention that the spread of contamination can be arrested and the contaminants levels greatly reduced over time.

Given no remediation, the contaminant concentrations are likely to decrease over time at the top of the aquifer and increase with depth, the concentrations at depth and residual soil contamination will represent a continued source for further groundwater contamination. The contamination at the base of the aquifer may not result in any overall human health impacts, if adequate restrictions are placed on groundwater use downgradient.

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Appendix A

Well Constructor's Reports

TEST HOLE NO. 1, WEBSTER, WIS.

NE$\frac{1}{4}$, SE$\frac{1}{4}$, SE$\frac{1}{4}$ Sec. 8, T. 39 N., R. 16 W.

General Engineering Co., Keys Well Drilling Co., 1952

Samples examined by F. T. Thwaites, Nos. 159002-159059

Elevation = 982' ETM

	Depth	Thickness	Description
	0-60	60	Sand, fine to coarse, red-gray above, light gray below
	60-70	10	Silt, light pink, dolomitic
	70-80	10	Sand, fine, light gray, dolomitic
	80-85	5	Silt, light pink, dolomitic
	85-105	20	Sand, fine to very fine, light pink-gray, dolomitic
	105-115	10	Sand, fine, light pink-gray, dolomitic
	115-140	25	Sand, very fine to fine, silty, light pink-gray to red, dolomitic
	140-165	25	Till, red, dolomitic
	165-180	15	Sand, very fine, silty, pink-gray, dolomitic
	180-190	10	Clay, pink-gray, dolomitic
	190-200	10	Clay, gray, dolomitic
	200-210	10	Gravel, fine, much silt
	210-215	5	Silt, pink-gray, dolomitic; sand, coarse
	215-230	15	Gravel, very fine, much silt, red, dolomitic
	230-240	10	Till, pink-gray, dolomitic
	240-248	8	Clay, red, dolomitic
	248-255	7	Gravel, coarse to fine, silty
	255-260	5	Silt, sandy, pink, dolomitic
270	260-265	5	Till, gray
	265-270	5	Silt, sandy, pink, dolomitic
4	270-274	4	Basalt, red; black

nations: Drift; Keweenawan flow

andoned as dry hole

Webster Village- **TEST HOLE NO. 2, WEBSTER, WIS.**

SE¼, NE¼, NE¼, SW¼, SE¼, **Sec. 8, T. 39 N., R. 16 W.**

General Engineering Co.; Keys Well Drilling Co., 1952

Samples examined by F. T. Thwaites, Nos. 159060-159113

Elevation = 982' ETM

0-65	65		Sand, medium to fine, some silt, gray at top, light gray below
65-75	10		Silt, gray, dolomitic
75-80	5		Sand, very fine, light gray, dolomitic
80-90	10		Sand, fine to medium, light gray, dolomitic
90-120	30		Sand, very fine, silty, light gray, dolomitic
120-135	15		Sand, very fine, much silt, light gray, dolomitic
135-175	40		Silt, much clay, red to pink, dolomitic.
175-190	15		Clay, silty, red to pink, dolomitic
190-210	20		Clay, silty, gray, dolomitic
210-215	5		Gravel, fine, much silt
215-220	5		Clay, silty, pink, dolomitic
220-225	5		Sand, medium to fine, silty, pink, dolomitic
225-235	10		Gravel, fine, much silt
235-242	7		Gravel, fine, much silt, dolomitic(till?)
242-248	6		Gravel, very fine, silty
248-252	4		Gravel, fine, silty; sand, medium-crs, gy, si

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* Field Located; by USGS, 1/69

3817 Mineral Point Rd., Madison, Wisconsin 53705

Well name	Webster Village Well #3	County:	Burnett
Owner....	Village of Webster	Completed...	7/17/84
Address..	Box 86	Field check.	
	Webster, WI 54893	Altitude....	981' ETM
Driller..	Miller Well & Pump Co.	Use.........	Municipal
Engineer.		Static w.l..	33'
		Spec. cap...	29 GPM/ft.

T. 39 N. R.16 W. Sec. 4

Quad. Webster 7½'

Drill Hole						Casing & Liner Pipe or Curbing							
Dia.	from	to	Dia.	from	to	Dia.	Wgt.& Kind	from	to	Dia.	Wgt.& Kind	from	to
[illegible]"	0	20'				22"	New Steel .375 wall A53GRB welded	0	100'	10"	New Steel .365 A53GRB welded	+2'	212'
[illegible]"	20'	127'				16"	New Steel .375 wall A53GRB welded	+1'	200'	10"	Stainless Steel Screen .025 slot	212'	242'
21"	127'	242'											

Drilling method: Reverse rotary

Samples from 0 to 242' Rec'd: 7/20/84

Studied by: Tom Hanson

Grout	from	to
Neat cement	0	200'
Gravel pack	+1'	242'

Issued: 9/9/85

Formations: Drift

Remarks: Well tested for 48 hours at 350 GPM with 12 feet of drawdown.

LOG OF WELL:

Depths	Graphic Section	Rock Type	Color	Grain Size Mode	Grain Size Range	Miscellaneous Characteristics
0-5		NO SAMPLE.	Driller reports		sand & clay	0-3', gray clay 3'-5'.
5-10		Sand	Strg brown	C	Vfn/VC	Trace gravel(Gran/S peb), silt.
10-15		"	"	M	"	Same.
15-20		"	"	"	"	"
20-25		"	Dk rd bn	C	"	Much gravel(Gran/S peb). Trace silt.
25-30		Gravel	Mixed	Gr/MP	Gran/VL peb	Grnt, hem cemtd ss, qtz, volc, trap, rhy, cht. Much sand. Trace silt.
30-35		Sand	Rd brown	M	Vfn/VC	Much gravel(Gran/L peb). Trace silt.
35-40		"	"	"	"	Trace granules, silt.
40-45		"	"	"	"	Same.
45-50		"	"	"	"	"
50-55		"	"	Vfn	Vfn/C	Much silt.
55-60		"	"	Fn	"	Little silt.
60-65		"	"	M	Vfn/VC	Trace granules, silt.
65-70		"	"	Fn	"	Same.
70-75		Silt	"	—	—	Siliceous. Much clay. Little sand.
75-80		"	"	—	—	Same.
80-85		Sand	"	Vfn	Vfn/M	Much silt, clay.
85-90		"	"	"	"	Same.
90-95		"	"	"	"	"
95-100		"	"	"	"	"
100-105		"	"	"	"	"
105-110		"	"	"	"	"
110-115		Silt	"	—	—	Dolomitic. Much sand, clay.
115-120		"	"	—	—	Same.
120-125		Clay	"	—	—	Dolomitic. Much sand, silt.
125-130		Sand	"	Vfn	Vfn/C	Much silt, clay.
130-135		"	"	Fn	Vfn/M	Same.
135-140		Silt	"	—	—	Dolomitic. Much clay. Little sand.
140-145		"	"	—	—	Same.
145-150		"	"	—	—	"
150-155		"	"	—	—	"
155-160		"	"	—	—	"

Well name: Webster Village Well #3

	Depths	Graphic Section	Rock Type	Color	Grain Size Mode	Grain Size Range	Miscellaneous Characteristics
	160-165		Silt	Rd brown	—	—	Dolomitic. Much sand,clay.
	165-170		Sand	"	Fn	Vfn/VC	Trace granules,silt.
	170-175		"	"	"	"	Much silt. Trace granules,clay.
D	175-180		"	"	"	Vfn/C	Little silt. Trace clay.
R	180-185		"	"	M	Vfn/VC	Trace silt.
I	185-190		"	"	"	"	Same.
F	190-195		"	"	M	"	Trace granules,silt.
T	195-200		NO SAMPLE.	Driller reports same as following intervals.			
	200-205		Sand	Rd brown	M	Vfn/VC	Trace granules,silt.
	205-210		"	"	"	"	Same.
	210-215		"	"	"	"	"
	215-220		"	"	"	"	Little gravel(Gran/S peb). Trace silt.
	220-225		"	"	"	"	Same.
	225-230		"	"	"	"	Trace granules,silt.
	230-235		"	"	"	"	Little gravel(Gran/S peb). Trace silt.
	235-240		"	"	"	"	Same.
242	240-242		"	"	"	"	"

END OF LOG

Private Water Supply
Box 7921
Madison, Wisconsin 53707

White Copy – Division's Copy
Green Copy – Driller's Copy
Yellow Copy – Owner's Copy

Form 3300-15 Rev. 2-79

MAR 27 1985

1. COUNTY: Burnett

CHECK (✓) ONE: ☑ Town ☐ Village ☐ City

Name: Webster | Meenon

2. LOCATION: ¼ Section or Gov't. Lot: NW-SE | Section: 9 | Township: 39N | Range: 16W

OR – Grid or Street No. | Street or Road Name

AND – If available subdivision name, lot & block No.

3. NAME ☑ OWNER ☐ AGENT AT TIME OF DRILLING CHECK (✓) ONE: Don Wester

ADDRESS: P.O. Box

POST OFFICE: Webster Wis

ZIP CODE

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building: 20

Sanitary Bldg. Drain (C.I. / Other) | Sanitary Bldg. Sewer (C.I. / Other) | Floor Drain Connected To: (C.I. Sewer / Other Sewer) | Storm Bldg. Drain (C.I. / Other) | Storm Bldg. Sewer (C.I. / Other)

Street Sewer (San. / Storm) | Other Sewers (C.I. / Other) | Foundation Drain Connected to (Sewer / Clearwater Dr. / Sewage Sump / Clearwater Sump) | Sewage Sump (C.I. / Other) | Clearwater Sump | Septic Tank | Holding Tank | Sewage Absorption Unit (Seepage Pit / Seepage Bed / Seepage Trench) | Manure Hopper or Retention or Pneumatic Tank

(written across): No Sewer

Privy | Pet Waste Pit | Pit: Nonconforming Existing (Well / Pump / Tank) | Subsurface Pumproom Nonconforming Existing | Barn Gutter | Animal Barn Pen | Animal Yard | Silo With Pit | Glass Lined Storage Facility | Silo w/o Pit | Earthen Silage Storage Trench Or Pit | Earthen Manure Basin

Temporary Manure Stack or Platform | Watertight Liquid Manure Tank or Basin | Manure Pressure Pipe | Subsurface Gasoline or Oil Tank | Waste Pond or Land Disposal Unit (Specify Type) | Manure Storage Basin: Concrete Floor Only / Concrete Floor and Partial Concrete Walls | Other (Describe)

5. Well is intended to supply water for: Private

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
6	Surface	185			

7. CASING, LINER, CURBING AND SCREEN

Dia. (in.)	Material, Weight, Specification Mfg. & Method of Assembly	From (ft.)	To (ft.)
6	new black steel	Surface	184
	19.6 A53		
	welded		
	Nippon Kokan K.K.		

8. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
none	Surface	

9. FORMATIONS

Kind	From (ft.)	To (ft.)
sand	Surface	70
sandy clay	70	82
clay	82	155
sandy clay	155	180
gravel	180	185

10. TYPE OF DRILLING MACHINE USED

☑ Cable Tool ☐ Rotary-air w/drilling mud ☐ Rotary-w/drilling mud ☐ Rotary-hammer w/drilling mud & air ☐ Rotary-hammer & air ☐ Reverse Rotary ☐ Jetting with ☐ Air ☐ Water

Well construction completed on Dec. 7 19 84

11. MISCELLANEOUS DATA

Yield Test: 12 Hrs. at 20 GPM

Depth from surface to normal water level 37 Ft.

Depth of water level when pumping 100 Ft. Stabilized ☑ Yes ☐ No

Well is terminated 12 inches ☑ above ☐ below final grade

Well disinfected upon completion ☑ Yes ☐ No

Well sealed watertight upon completion ☑ Yes ☐ No

Water sample sent to Madison laboratory on 6-3 19 85

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature: Roger Beecroft — Registered Well Driller

Business Name and Complete Mailing Address: Clarence Beecroft & Sons, Rt. 2 Frederic

VILLAGE WELL NO. 2 BORING LOG (After Mid-States Associates, 1991)	
FEET	**SOIL TYPE**
0 - 4	SAND
4 - 10	YELLOW CLAY
10 - 94	FINE SAND
94 - 170	RED CLAY
170 - 180	GRAY CLAY
180 - 198	RED SILTY CLAY
198 - 216	SAND AND GRAVEL
216	RED CLAY

Appendix B

InterSat Model Data and Results

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***** DATA MANIPULATION MENU 1.1 ****
(ENTER NEG VALUE FOR HELP ON MENU ITEM,0 FOR MENU DESCR.)
    1.  BASIC DATA
    2.  LAYER DEFAULTS
    3.  VARIABLE GRIDDING
    4.  DETAILED NODE DATA
    5.  RETURN TO MAIN MENU 1
InterSat> 1

 ***** BASIC DATA MENU 1.1.1 *****
 (ENTER NEG VALUE FOR HELP ON MENU ITEM,0 FOR MENU DESCR.)
1. READ
2. ENTER/CHANGE
3. WRITE TO FILE
4. SHOW
5. RETURN TO PREVIOUS MENU
InterSat> 4

 *****BASIC MODEL DATA*****
  NO. OF MODEL COLUMNS           32
  NO. OF MODEL ROWS              31
  NO. OF MODEL LAYERS             1
  DEFAULT GRID SPACE(FT)    100.000
  TIME INCREMENT (DAYS)     49.0485
 Hit Any Key to Continue ....

1. READ
2. ENTER/CHANGE
3. WRITE TO FILE
4. SHOW
5. RETURN TO PREVIOUS MENU
InterSat> 4


*****PARAMETER DEFAULTS FOR LAYER MENU 1.1.2.12*****   1
(ENTER NEG VALUE FOR HELP ON MENU ITEM,0 FOR MENU DESCR.)

1. PERMEABILITY (GPD/FT^2)               380.000
2. ARTESIAN STORAGE COEFF.              0.300000E-02
3. WATER TABLE STORAGE COEFF.           0.150000
4. GLOBAL DEFAULT HEADS (FT)             947.300
5. GLOBAL DEFAULT NODE Q'S (GPD/FT2)   -0.102300E-02
6. VER. PERMEABILITY (GPD/FT^2)          380.000
7. GLOBAL LAYER BOTTOM ELEV. (FT)        887.000
8. GLOBAL DEFAULT TOP ELEV. (FT)         975.740
9. GLOBAL DEFAULT LAYER POROSITY        0.350000
10.GLOBAL EXTERNAL CONDUCTANCE(GPD/FT)   0.000000
11.GLOBAL EXTERNAL DRIVING HEAD (FT)     0.000000
12.GLOBAL LOWER LIMIT ON DRIVING HEAD    0.000000
13.EXIT DEFAULT ENTRY FOR THIS LAYER
InterSat>
```

BASIC DATA & PARAMETER DEFAULTS

5. RETURN TO PREVIOUS MENU
InterSat>
4

GRIDDING

D I S P L A Y O F C O L U M N G R I D D I N G

	1	2	3	4	5	6	7
1	300.0	300.0	300.0	300.0	300.0	300.0	225.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	150.0	100.0	100.0	100.0	100.0	100.0	100.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	100.0	100.0	100.0	150.0	150.0	150.0	150.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	100.0	150.0	200.0	200.0	300.0	300.0	450.0

Hit Any Key to Continue ....

	29	30	31
1	600.0	900.0	1200.

Hit Any Key to Continue ....

	29	30	31
1	600.0	900.0	1200.

Hit Any Key to Continue ....

D I S P L A Y O F R O W G R I D D I N G

	1	2	3	4	5	6	7
1	1400.	1400.	1000.	675.0	450.0	300.0	300.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	330.0	225.0	150.0	100.0	100.0	100.0	100.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	100.0	100.0	100.0	100.0	100.0	150.0	200.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	300.0	300.0	450.0	675.0	1000.	1250.	1500.

Hit Any Key to Continue ....

	29	30
1	1500.	1000.

Hit Any Key to Continue ....

MAP OF PERMI (GPD/FT^2)   1   32   1   31
1   1

	1	2	3	4	5	6	7
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	261.0	261.0	261.0	380.0	380.0	395.0	395.0
8	261.0	261.0	261.0	380.0	380.0	395.0	395.0
9	261.0	261.0	261.0	380.0	380.0	395.0	395.0

7. RETURN PREVIOUS MENU 1.2.2.1   HEADS   WR6WM18 4-1-92 ~~2:15PM~~ 2:00PM

InterSat) 5

Post Simulation heads

	1	2	3	4	5	6	7
1	930.8	930.9	931.0	931.3	931.6	931.7	931.8
2	936.2	936.3	936.3	936.4	936.5	936.6	936.7
3	940.5	940.5	940.5	940.6	940.6	940.7	940.9
4	942.9	942.9	942.9	943.0	943.1	943.2	943.3
5	944.3	944.3	944.3	944.4	944.5	944.6	944.7
6	945.0	945.1	945.1	945.2	945.3	945.4	945.5
7	945.5	945.5	945.6	945.7	945.8	945.9	946.0
8	945.9	945.9	945.9	946.0	946.1	946.2	946.3
9	946.2	946.3	946.3	946.4	946.4	946.5	946.7
10	946.5	946.5	946.5	946.6	946.6	946.7	946.8
11	946.6	946.6	946.6	946.7	946.8	946.9	947.0
12	946.7	946.7	946.7	946.8	946.8	946.9	947.0
13	946.7	946.8	946.8	946.9	946.9	947.0	947.1
14	946.8	946.8	946.9	946.9	947.0	947.1	947.2
15	946.9	946.9	946.9	947.0	947.1	947.1	947.2
16	947.0	947.0	947.0	947.0	947.1	947.2	947.3
17	947.0	947.0	947.1	947.1	947.2	947.3	947.4
18	947.1	947.1	947.1	947.2	947.2	947.3	947.4
19	947.1	947.1	947.2	947.2	947.3	947.4	947.5
20	947.2	947.2	947.2	947.3	947.3	947.4	947.5

Hit Any Key to Continue ....

11	946.6	946.6	946.6	946.7	946.8	946.9	947.0
12	946.7	946.7	946.7	946.8	946.8	946.9	947.0
13	946.7	946.8	946.8	946.9	946.9	947.0	947.1
14	946.8	946.8	946.9	946.9	947.0	947.1	947.2
15	946.9	946.9	946.9	947.0	947.1	947.1	947.2
16	947.0	947.0	947.0	947.0	947.1	947.2	947.3
17	947.0	947.0	947.1	947.1	947.2	947.3	947.4
18	947.1	947.1	947.1	947.2	947.2	947.3	947.4
19	947.1	947.1	947.2	947.2	947.3	947.4	947.5
20	947.2	947.2	947.2	947.3	947.3	947.4	947.5

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	947.2	947.2	947.3	947.3	947.4	947.5	947.6
22	947.3	947.3	947.3	947.4	947.5	947.6	947.7
23	947.4	947.4	947.4	947.5	947.5	947.6	947.8
24	947.4	947.4	947.5	947.5	947.6	947.7	947.8
25	947.4	947.4	947.4	947.5	947.6	947.7	947.8
26	947.1	947.1	947.2	947.3	947.4	947.5	947.7
27	946.2	946.2	946.3	946.4	946.5	946.7	946.9
28	943.9	944.0	944.1	944.3	944.6	944.8	945.2
29	938.2	938.3	939.3	940.1	940.8	941.5	942.0
30	938.6	938.6	938.7	938.9	939.0	939.5	939.7
31	939.0	939.0	939.1	939.2	939.4	939.6	939.8

Hit Any Key to Continue ....

31	939.0	939.0	939.1	939.2	939.4	939.6	939.8

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	931.9	932.0	932.0	932.1	932.2	932.2	932.2
2	936.8	936.9	936.9	937.0	937.0	937.1	937.1
3	941.0	941.0	941.1	941.1	941.2	941.2	941.3
4	943.4	943.5	943.5	943.6	943.6	943.7	943.8
5	944.8	944.9	944.9	945.0	945.1	945.1	945.2
6	945.6	945.7	945.8	945.8	945.9	946.0	946.1
7	946.1	946.2	946.3	946.3	946.3	946.4	946.4
8	946.4	946.5	946.6	946.6	946.7	946.7	946.8
9	946.7	946.8	946.9	946.9	947.0	947.0	947.1
10	946.9	947.0	947.1	947.1	947.2	947.2	947.3
11	947.1	947.1	947.2	947.2	947.3	947.3	947.4
12	947.1	947.2	947.3	947.3	947.4	947.4	947.5
13	947.2	947.3	947.3	947.4	947.4	947.5	947.6
14	947.3	947.3	947.4	947.5	947.5	947.6	947.6
15	947.3	947.4	947.5	947.5	947.6	947.6	947.7
16	947.4	947.5	947.5	947.6	947.6	947.7	947.8
17	947.5	947.5	947.6	947.6	947.7	947.8	947.8
18	947.5	947.6	947.6	947.7	947.8	947.8	947.9
19	947.6	947.7	947.7	947.8	947.8	947.9	948.0
20	947.6	947.7	947.8	947.8	947.9	947.9	948.0

Hit Any Key to Continue ....

11	947.1	947.1	947.2	947.2	947.3	947.3	947.4
12	947.1	947.2	947.3	947.3	947.4	947.4	947.5
13	947.2	947.3	947.3	947.4	947.4	947.5	947.6

14	947.3	947.3	947.4	947.5	947.5	947.6	947.6
15	947.3	947.4	947.5	947.5	947.6	947.6	947.7
16	947.4	947.5	947.5	947.6	947.6	947.7	947.8
17	947.5	947.5	947.6	947.6	947.7	947.8	947.8
18	947.5	947.6	947.6	947.7	947.8	947.8	947.9
19	947.6	947.7	947.7	947.8	947.8	947.9	948.0
20	947.6	947.7	947.8	947.8	947.9	947.9	948.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	947.7	947.8	947.8	947.9	947.9	948.0	948.1
22	947.8	947.9	947.9	948.0	948.0	948.1	948.2
23	947.9	947.9	948.0	948.1	948.1	948.2	948.3
24	947.9	948.0	948.1	948.1	948.2	948.3	948.3
25	947.9	948.0	948.1	948.2	948.2	948.3	948.4
26	947.8	947.9	948.0	948.1	948.1	948.2	948.3
27	947.1	947.2	947.3	947.4	947.5	947.6	947.7
28	945.4	945.6	945.7	945.8	945.9	946.0	946.1
29	942.4	942.6	942.8	943.0	943.1	943.3	943.4
30	939.8	939.9	940.0	940.0	940.0	940.1	940.2
31	939.9	940.0	940.0	940.1	940.1	940.2	940.2

Hit Any Key to Continue ....

31	939.9	940.0	940.0	940.1	940.1	940.2	940.2

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	932.3	932.3	932.4	932.5	932.5	932.5	932.6
2	937.2	937.2	937.3	937.4	937.5	937.6	937.7
3	941.4	941.4	941.5	941.6	941.7	941.8	941.9
4	943.8	943.9	944.0	944.0	944.1	944.2	944.3
5	945.3	945.3	945.4	945.4	945.6	945.7	945.8
6	946.1	946.2	946.2	946.3	946.4	946.5	946.6
7	946.5	946.6	946.6	946.7	946.8	946.9	947.1
8	946.8	946.9	947.0	947.0	947.2	947.3	947.4
9	947.1	947.2	947.3	947.4	947.5	947.6	947.8
10	947.4	947.4	947.5	947.6	947.7	947.9	948.0
11	947.5	947.6	947.6	947.7	947.8	948.0	948.1
12	947.6	947.6	947.7	947.8	947.9	948.1	948.2
13	947.6	947.7	947.8	947.9	948.0	948.2	948.3
14	947.7	947.8	947.9	947.9	948.1	948.2	948.4
15	947.8	947.9	947.9	948.0	948.2	948.3	948.5
16	947.8	947.9	948.0	948.1	948.2	948.4	948.5
17	947.9	948.0	948.1	948.2	948.3	948.4	948.6
18	948.0	948.1	948.1	948.2	948.4	948.5	948.7
19	948.0	948.1	948.2	948.3	948.4	948.6	948.7
20	948.1	948.2	948.3	948.3	948.5	948.6	948.8

Hit Any Key to Continue ....

11	947.5	947.6	947.6	947.7	947.8	948.0	948.1
12	947.6	947.6	947.7	947.8	947.9	948.1	948.2
13	947.6	947.7	947.8	947.9	948.0	948.2	948.3
14	947.7	947.8	947.9	947.9	948.1	948.2	948.4
15	947.8	947.9	947.9	948.0	948.2	948.3	948.5
16	947.8	947.9	948.0	948.1	948.2	948.4	948.5
17	947.9	948.0	948.1	948.2	948.3	948.4	948.6
18	948.0	948.1	948.1	948.2	948.4	948.5	948.7
19	948.0	948.1	948.2	948.3	948.4	948.6	948.7
20	948.1	948.2	948.3	948.3	948.5	948.6	948.8

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	948.2	948.2	948.3	948.4	948.6	948.7	948.9
22	948.2	948.3	948.4	948.5	948.6	948.8	948.9
23	948.4	948.4	948.5	948.6	948.8	948.9	949.1
24	948.4	948.5	948.6	948.7	948.8	949.0	949.1
25	948.5	948.5	948.6	948.7	948.9	949.0	949.2
26	948.4	948.5	948.6	948.7	948.8	949.0	949.1
27	947.7	947.8	947.9	948.1	948.2	948.4	948.5
28	946.3	946.4	946.5	946.6	946.8	947.0	947.2
29	943.6	943.7	943.9	944.0	944.2	944.4	944.6
30	940.2	940.3	940.3	940.3	940.5	940.7	940.8
31	940.3	940.3	940.3	940.4	940.4	940.5	940.6

Hit Any Key to Continue ....

31	940.3	940.3	940.3	940.4	940.4	940.5	940.6

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	932.7	932.8	932.8	932.9	933.0	933.1	933.3
2	937.8	937.8	937.9	938.1	938.2	938.5	938.7
3	942.0	942.0	942.2	942.3	942.5	942.7	943.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	945.9	946.0	946.1	946.3	946.6	946.9	947.2
6	946.7	946.9	947.0	947.2	947.5	947.8	948.2
7	947.3	947.4	947.5	947.8	948.0	948.4	948.8
8	947.6	947.7	947.9	948.2	948.4	948.8	949.2
9	948.0	948.1	948.3	948.5	948.8	949.2	949.6
10	948.2	948.3	948.5	948.7	949.0	949.4	949.8
11	948.3	948.4	948.6	948.9	949.1	949.5	950.0
12	948.4	948.5	948.7	949.0	949.2	949.6	950.1
13	948.5	948.6	948.8	949.0	949.3	949.7	950.2
14	948.6	948.7	948.9	949.1	949.4	949.8	950.2
15	948.6	948.7	948.9	949.2	949.4	949.8	950.3
16	948.7	948.8	949.0	949.3	949.5	949.9	950.4
17	948.8	948.9	949.1	949.3	949.6	950.0	950.5
18	948.8	948.9	949.1	949.4	949.6	950.1	950.5
19	948.9	949.0	949.2	949.4	949.7	950.1	950.6
20	948.9	949.1	949.2	949.5	949.8	950.2	950.7

Hit Any Key to Continue ....

11	948.3	948.4	948.6	948.9	949.1	949.5	950.0
12	948.4	948.5	948.7	949.0	949.2	949.6	950.1
13	948.5	948.6	948.8	949.0	949.3	949.7	950.2
14	948.6	948.7	948.9	949.1	949.4	949.8	950.2
15	948.6	948.7	948.9	949.2	949.4	949.8	950.3
16	948.7	948.8	949.0	949.3	949.5	949.9	950.4
17	948.8	948.9	949.1	949.3	949.6	950.0	950.5
18	948.8	948.9	949.1	949.4	949.6	950.1	950.5
19	948.9	949.0	949.2	949.4	949.7	950.1	950.6
20	948.9	949.1	949.2	949.5	949.8	950.2	950.7

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	949.0	949.1	949.3	949.6	949.8	950.3	950.7
22	949.1	949.2	949.4	949.7	949.9	950.3	950.8
23	949.2	949.3	949.5	949.7	950.0	950.4	950.9
24	949.3	949.4	949.6	949.8	950.1	950.5	951.0
25	949.3	949.4	949.6	949.9	950.1	950.6	951.1
26	949.3	949.4	949.6	949.8	950.1	950.5	951.0
27	948.7	948.8	949.0	949.3	949.6	950.0	950.5
28	947.4	947.5	947.7	948.0	948.2	948.7	949.2
29	944.9	945.0	945.2	945.5	945.9	946.3	946.8
30	940.9	940.9	940.8	940.9	941.1	942.3	943.1
31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

	29	30	31	32
1	933.6	934.0	934.4	935.2
2	939.0	939.4	939.8	940.3
3	943.4	943.8	944.6	945.4
4	946.1	946.8	947.8	949.2
5	947.8	948.6	949.9	951.7
6	948.9	949.8	951.3	953.3
7	949.5	950.5	952.1	954.5
8	949.9	950.9	952.7	955.3
9	950.3	951.4	953.3	956.2
10	950.6	951.7	953.7	956.9
11	950.7	951.9	954.0	957.4
12	950.9	952.0	954.2	957.7
13	951.0	952.2	954.4	958.1
14	951.1	952.3	954.5	958.4
15	951.1	952.4	954.7	958.8
16	951.2	952.5	954.8	959.1
17	951.3	952.6	955.0	959.5
18	951.4	952.7	955.1	959.9
19	951.4	952.8	955.2	960.2
20	951.5	952.8	955.3	960.6

Hit Any Key to Continue ....

11	950.7	951.9	954.0	957.4
12	950.9	952.0	954.2	957.7
13	951.0	952.2	954.4	958.1
14	951.1	952.3	954.5	958.4
15	951.1	952.4	954.7	958.8
16	951.2	952.5	954.8	959.1
17	951.3	952.6	955.0	959.5
18	951.4	952.7	955.1	959.9
19	951.4	952.8	955.2	960.2
20	951.5	952.8	955.3	960.6

Hit Any Key to Continue ....

	29	30	31	32
21	951.6	952.9	955.5	960.4
22	951.7	953.1	955.6	960.2
23	951.8	953.2	955.6	959.8
24	951.9	953.2	955.6	959.3
25	951.9	953.2	955.4	958.6
26	951.8	953.0	954.9	957.7
27	951.2	952.2	953.7	955.8
28	949.8	950.6	951.7	952.8
29	947.4	948.1	948.9	949.6
30	944.1	945.1	945.8	946.4
31	942.4	943.0	943.3	944.4

Hit Any Key to Continue ....

10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	939.8	939.9	940.0	940.0	940.0	940.1	940.2
31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	932.3	932.3	932.4	932.5	932.5	932.5	932.6
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3

12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	940.2	940.3	940.3	940.3	947.3	947.3	947.3
31	947.3	947.3	947.3	947.3	940.4	940.5	940.6

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	940.4	940.5	940.6

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	932.7	932.8	932.8	932.9	933.0	933.1	933.3
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3

23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	947.3	947.3	940.8	940.9	941.1	947.3	947.3
31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

	29	30	31	32
1	933.6	934.0	934.4	935.2
2	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	29	30	31	32
21	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3
30	947.3	947.3	947.3	947.3
31	942.4	943.0	943.3	944.4

Hit Any Key to Continue ....

SIMULATION PARAMETERS

WRGWM 18
4-1-92
2:00PM

```
***** SIMULATION PARAMETER SET MENU 1.2 *****
(ENTER NEG VALUE FOR HELP ON MENU ITEM,0 FOR MENU DESCR.)
1-ENTER START OF SIMULATION TIME (YEAR @ JAN 1ST)      1990.00
   1.00000
2-CORRECTION TO ADD TO INITIAL READ-IN H"S              0.000000
3-DETAILED DEBUG OUTPUT TO PRINTER (T/F)             F
4-IMPACT TYPE MODEL (T/F)                            F
5-READ PUMPAGES FROM THIS FILE                      NUL
6-READ INITIAL HEADS FROM THIS FILE                 NUL
7-WRITE OUTPUT TO THIS FILE ("PRN" FOR PRINTER)      WR18
8-CHANGE ITERATION EXIT FROM                                10
9-CHANGE ERROR FROM                                  0.992000
10-ALTERNATING DIRECTIONS ACTIVE                      T T F
11-CALL USER ROUTINE USER1
12-CHANGE MAX ITERATIONS FROM                               50
13-SOLUTION BY TURBO (T) OR PRICKETT (F)              F
14-INDUCED INFIL. TYPE 1 (T) OR TYPE 2 (F)            F
15-HERCULES GRAPHICS                                  F
16-InterTrans TRANSPORT MODEL OUTPUT  (T/F)           T
17-InterTrans TRANSPORT OUTPUT FILENAME             WR18.DAT
18-SET PRESENT PROGRAM PARAMETERS PERMANENTLY
19-START SIMULATION
InterSat>
```

Pre Simm- heads

PRE-SIMULATION HEADS

MAP OF HEAD ARRAY (FT) 1 32 1 31

1 1

	1	2	3	4	5	6	7
1	930.8	930.9	931.0	931.3	931.6	931.7	931.8
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	938.2	938.3	947.3	947.3	947.3	947.3	947.3
30	947.3	938.6	938.7	938.9	939.0	939.5	939.7
31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	931.9	932.0	932.0	932.1	932.2	932.2	932.2
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3

InterSat> 21

SIMULATION CALCULATIONS

WRGWM 18
4-1-92
2:00PM

```
SIMULATION TIME =   49.049     YEAR =   1990.0     DAYS =   50.049
ERROR (FT) = 537.539      ITER=          1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) =  8.21741      AT   1 30  1
ERROR (FT) = 95.0879      ITER=          2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) =  1.10309      AT  31 20  1
ERROR (FT) = 47.1930      ITER=          3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.628082      AT  32 18  1
ERROR (FT) = 24.8952      ITER=          4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.151993      AT  31 19  1
ERROR (FT) = 17.8279      ITER=          5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.107330      AT  32 17  1
ERROR (FT) = 12.0423      ITER=          6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.387726E-01 AT  27 19  1
ERROR (FT) = 10.4019      ITER=          7 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.368805E-01 AT  28 17  1
ERROR (FT) = 7.90399      ITER=          8 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.248718E-01 AT  27 19  1
ERROR (FT) = 7.42906      ITER=          9 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.256348E-01 AT  28 17  1
ERROR (FT) = 5.95689      ITER=         10 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.176849E-01 AT  25 18  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 5.81540      ITER=         11 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.181580E-01 AT  28 17  1
ERROR (FT) = 4.84064      ITER=         12 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.137482E-01 AT  25 17  1
ERROR (FT) = 4.81964      ITER=         13 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.141144E-01 AT  26 17  1
ERROR (FT) = 4.14285      ITER=         14 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.108490E-01 AT  25 17  1
ERROR (FT) = 4.15390      ITER=         15 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.114288E-01 AT  26 17  1
ERROR (FT) = 3.66367      ITER=         16 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.865173E-02 AT  25 17  1
ERROR (FT) = 3.67227      ITER=         17 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.939941E-02 AT  26 16  1
ERROR (FT) = 3.28886      ITER=         18 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.706482E-02 AT  25 17  1
ERROR (FT) = 3.28011      ITER=         19 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.779724E-02 AT  26 16  1
ERROR (FT) = 2.96712      ITER=         20 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.598145E-02 AT  19 15  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 2.94676      ITER=         21 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.656128E-02 AT  26 16  1
ERROR (FT) = 2.68878      ITER=         22 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.535583E-02 AT  19 15  1
ERROR (FT) = 2.65910      ITER=         23 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.559998E-02 AT  26 16  1
ERROR (FT) = 2.44252      ITER=         24 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.482178E-02 AT  19 15  1
ERROR (FT) = 2.40884      ITER=         25 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.492859E-02 AT  16 22  1
ERROR (FT) = 2.22414      ITER=         26 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.431824E-02 AT  19 15  1
ERROR (FT) = 2.18886      ITER=         27 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.444031E-02 AT  16 22  1
ERROR (FT) = 2.02698      ITER=         28 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.387573E-02 AT  19 15  1
ERROR (FT) = 1.99153      ITER=         29 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.401306E-02 AT  16 22  1
ERROR (FT) = 1.84923      ITER=         30 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.350952E-02 AT  19 15  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F
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ERROR (FT) = 1.81332      ITER=        31 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.366211E-02 AT  16 22  1
ERROR (FT) = 1.68878      ITER=        32 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.320435E-02 AT  14  9  1
ERROR (FT) = 1.65402      ITER=        33 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.329590E-02 AT  16 22  1
ERROR (FT) = 1.54610      ITER=        34 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.297546E-02 AT  14  9  1
ERROR (FT) = 1.51204      ITER=        35 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.302124E-02 AT  16 22  1
ERROR (FT) = 1.41347      ITER=        36 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.276184E-02 AT  14  9  1
ERROR (FT) = 1.38251      ITER=        37 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.273132E-02 AT  16 22  1
ERROR (FT) = 1.29684      ITER=        38 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.254822E-02 AT  14  9  1
ERROR (FT) = 1.26328      ITER=        39 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.250244E-02 AT  15 22  1
ERROR (FT) = 1.18684      ITER=        40 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.236511E-02 AT   1 15  1
 EXIT (T/F) ?
InterSat> F


ERROR (FT) = 1.15768      ITER=        41 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.228882E-02 AT  16 22  1
ERROR (FT) = 1.08734      ITER=        42 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.222778E-02 AT   1 15  1
ERROR (FT) = 1.06160      ITER=        43 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.210571E-02 AT  15 22  1
ERROR (FT) =0.997665      ITER=        44 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.204468E-02 AT   1 15  1
ERROR (FT) =0.970657      ITER=        45 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.192261E-02 AT  14 22  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   107.91     YEAR =    1990.0     DAYS =    108.91
ERROR (FT) = 322.225      ITER=         1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) =  8.01643      AT   1 30  1
ERROR (FT) = 37.3710      ITER=         2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.519485      AT  31 20  1
ERROR (FT) = 15.4894      ITER=         3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.223083      AT  32 18  1
ERROR (FT) = 8.34439      ITER=         4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.549316E-01 AT  31 18  1
ERROR (FT) = 5.75546      ITER=         5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.288391E-01 AT  32 16  1
ERROR (FT) = 4.61023      ITER=         6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198517E-01 AT   1 12  1

 MAX ERROR/NODE (FT) = 0.192261E-02 AT  14 22  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   107.91     YEAR =    1990.0     DAYS =    108.91
ERROR (FT) = 322.225      ITER=         1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) =  8.01643      AT   1 30  1
ERROR (FT) = 37.3710      ITER=         2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.519485      AT  31 20  1
ERROR (FT) = 15.4894      ITER=         3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.223083      AT  32 18  1
ERROR (FT) = 8.34439      ITER=         4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.549316E-01 AT  31 18  1
ERROR (FT) = 5.75546      ITER=         5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.288391E-01 AT  32 16  1
ERROR (FT) = 4.61023      ITER=         6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198517E-01 AT   1 12  1
ERROR (FT) = 3.69774      ITER=         7 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.123596E-01 AT  11  8  1
ERROR (FT) = 3.32619      ITER=         8 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.176697E-01 AT   1 13  1
ERROR (FT) = 2.80554      ITER=         9 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.923157E-02 AT   3 12  1
ERROR (FT) = 2.61484      ITER=        10 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.153809E-01 AT   1 13  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 2.25021      ITER=        11 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.785828E-02 AT   3 12  1
ERROR (FT) = 2.13405      ITER=        12 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.131226E-01 AT   1 13  1
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 MAX ERROR/NODE (FT) = 0.666809E-02 AT   3 12  1
ERROR (FT) = 1.79242      ITER=        14 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.111084E-01 AT   1 14  1
ERROR (FT) = 1.58511      ITER=        15 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.559998E-02 AT   3 13  1
ERROR (FT) = 1.53468      ITER=        16 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.942993E-02 AT   1 14  1
ERROR (FT) = 1.37888      ITER=        17 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.474548E-02 AT   3 14  1
ERROR (FT) = 1.34921      ITER=        18 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.799561E-02 AT   1 14  1
ERROR (FT) = 1.23145      ITER=        19 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.402832E-02 AT   3 14  1
ERROR (FT) = 1.20609      ITER=        20 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.680542E-02 AT   1 14  1
 EXIT (T/F) ?
InterSat>


ERROR (FT) = 1.12244      ITER=        21 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.343323E-02 AT   3 15  1
ERROR (FT) = 1.10103      ITER=        22 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.578308E-02 AT   1 14  1
ERROR (FT) = 1.03209      ITER=        23 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.292969E-02 AT   3 14  1
ERROR (FT) = 1.01015      ITER=        24 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.497437E-02 AT   1 14  1
ERROR (FT) =0.952667      ITER=        25 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.253296E-02 AT   3 14  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   178.54     YEAR =   1990.0     DAYS =   179.54
ERROR (FT) = 88.2584      ITER=         1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.997543     AT  22  5  1
ERROR (FT) = 34.1128      ITER=         2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.278168     AT  11  5  1
ERROR (FT) = 18.5364      ITER=         3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.112503     AT  10  6  1
ERROR (FT) = 12.7474      ITER=         4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.782623E-01 AT  10  4  1
ERROR (FT) = 8.87830      ITER=         5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.443268E-01 AT   1  5  1
ERROR (FT) = 6.85483      ITER=         6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.394287E-01 AT   2  4  1

 MAX ERROR/NODE (FT) = 0.253296E-02 AT   3 14  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   178.54     YEAR =   1990.0     DAYS =   179.54
ERROR (FT) = 88.2584      ITER=         1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.997543     AT  22  5  1
ERROR (FT) = 34.1128      ITER=         2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.278168     AT  11  5  1
ERROR (FT) = 18.5364      ITER=         3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.112503     AT  10  6  1
ERROR (FT) = 12.7474      ITER=         4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.782623E-01 AT  10  4  1
ERROR (FT) = 8.87830      ITER=         5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.443268E-01 AT   1  5  1
ERROR (FT) = 6.85483      ITER=         6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.394287E-01 AT   2  4  1
ERROR (FT) = 5.39175      ITER=         7 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.228882E-01 AT   1  5  1
ERROR (FT) = 4.41994      ITER=         8 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.203857E-01 AT   2  4  1
ERROR (FT) = 3.76884      ITER=         9 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.118408E-01 AT   1  5  1
ERROR (FT) = 3.16042      ITER=        10 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.108490E-01 AT   2  4  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 2.84203      ITER=        11 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.631714E-02 AT   1  5  1
ERROR (FT) = 2.40765      ITER=        12 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.593567E-02 AT   2  4  1
ERROR (FT) = 2.25539      ITER=        13 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.451660E-02 AT  14 22  1
ERROR (FT) = 1.92770      ITER=        14 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.370789E-02 AT   7 19  1
ERROR (FT) = 1.87007      ITER=        15 ERR TOL=0.992000
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 MAX ERROR/NODE (FT) = 0.415039E-02 AT  15 22  1
ERROR (FT) = 1.61615     ITER=        16 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.323486E-02 AT   7 19  1
ERROR (FT) = 1.60704     ITER=        17 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.381470E-02 AT  14 22  1
ERROR (FT) = 1.41245     ITER=        18 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.288391E-02 AT   7 18  1
ERROR (FT) = 1.43005     ITER=        19 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.346375E-02 AT  15 22  1
ERROR (FT) = 1.28110     ITER=        20 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.257874E-02 AT   7 18  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 1.30547     ITER=        21 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.314331E-02 AT  15 22  1
ERROR (FT) = 1.19176     ITER=        22 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.234985E-02 AT  19 18  1
ERROR (FT) = 1.21504     ITER=        23 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.282288E-02 AT  15 22  1
ERROR (FT) = 1.12097     ITER=        24 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.215149E-02 AT   7 18  1
ERROR (FT) = 1.13713     ITER=        25 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.256348E-02 AT  15 22  1
ERROR (FT) = 1.05534     ITER=        26 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198364E-02 AT   7 17  1
ERROR (FT) = 1.06624     ITER=        27 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.233459E-02 AT  16 22  1
ERROR (FT) =0.992126     ITER=        28 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.186157E-02 AT   7 17  1
ERROR (FT) =0.996170     ITER=        29 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.210571E-02 AT  16 22  1
ERROR (FT) =0.929794     ITER=        30 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.172424E-02 AT   7 17  1
 EXIT (T/F) ?
InterSat>


 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   263.29     YEAR =   1990.0     DAYS =    264.29
ERROR (FT) = 46.7600     ITER=         1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.605698      AT   5 11  1
ERROR (FT) = 16.0554     ITER=         2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198761      AT   1 11  1
ERROR (FT) = 9.39636     ITER=         3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.571747E-01 AT   3 11  1
ERROR (FT) = 6.91447     ITER=         4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.544128E-01 AT   1 11  1
ERROR (FT) = 5.15385     ITER=         5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.220337E-01 AT  11  8  1
ERROR (FT) = 4.29387     ITER=         6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.261841E-01 AT   1 11  1
ERROR (FT) = 3.50180     ITER=         7 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.128784E-01 AT  11  8  1
ERROR (FT) = 3.01242     ITER=         8 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.158539E-01 AT   1 11  1
ERROR (FT) = 2.53445     ITER=         9 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.828552E-02 AT  11  8  1
ERROR (FT) = 2.20305     ITER=        10 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.108795E-01 AT   1 11  1
 EXIT (T/F) ?
InterSat>


ERROR (FT) = 1.89308     ITER=        11 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.566101E-02 AT   1  8  1
ERROR (FT) = 1.65074     ITER=        12 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.791931E-02 AT   1 11  1
ERROR (FT) = 1.44264     ITER=        13 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.401306E-02 AT   1  8  1
ERROR (FT) = 1.26062     ITER=        14 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.599670E-02 AT   1 12  1
ERROR (FT) = 1.11519     ITER=        15 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.296021E-02 AT   3 11  1
ERROR (FT) =0.972992     ITER=        16 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.462341E-02 AT   1 12  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   365.00     YEAR =   1991.0     DAYS =  0.99933
ERROR (FT) = 25.7565     ITER=         1 ERR TOL=0.992000
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ERROR (FT) = 8.76714      ITER=           2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.557556E-01 AT    7 16  1
ERROR (FT) = 5.55579      ITER=           3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.208740E-01 AT    6 19  1
ERROR (FT) = 4.32755      ITER=           4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198822E-01 AT    1 20  1
ERROR (FT) = 3.51497      ITER=           5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.117493E-01 AT    5 19  1

 MAX ERROR/NODE (FT) = 0.462341E-02 AT    1 12  1
 NOTE: WRITING InterTrans OUTPUT FILE ....
SIMULATION TIME =   365.00      YEAR =    1991.0      DAYS =   0.99933
ERROR (FT) = 25.7565      ITER=           1 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.307480      AT    9 16  1
ERROR (FT) = 8.76714      ITER=           2 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.557556E-01 AT    7 16  1
ERROR (FT) = 5.55579      ITER=           3 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.208740E-01 AT    6 19  1
ERROR (FT) = 4.32755      ITER=           4 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.198822E-01 AT    1 20  1
ERROR (FT) = 3.51497      ITER=           5 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.117493E-01 AT    5 19  1
ERROR (FT) = 3.07433      ITER=           6 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.172882E-01 AT    1 19  1
ERROR (FT) = 2.62469      ITER=           7 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.886536E-02 AT    3 18  1
ERROR (FT) = 2.40770      ITER=           8 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.145721E-01 AT    1 18  1
ERROR (FT) = 2.09471      ITER=           9 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.752258E-02 AT    3 17  1
ERROR (FT) = 1.97426      ITER=          10 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.125885E-01 AT    1 16  1
 EXIT (T/F) ?
InterSat>

 EXIT (T/F) ?
InterSat> F

ERROR (FT) = 1.74181      ITER=          11 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.645447E-02 AT    3 16  1
ERROR (FT) = 1.67279      ITER=          12 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.109253E-01 AT    1 15  1
ERROR (FT) = 1.48889      ITER=          13 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.556946E-02 AT    3 16  1
ERROR (FT) = 1.45126      ITER=          14 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.946045E-02 AT    1 15  1
ERROR (FT) = 1.30521      ITER=          15 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.483704E-02 AT    3 15  1
ERROR (FT) = 1.28690      ITER=          16 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.825500E-02 AT    1 14  1
ERROR (FT) = 1.16978      ITER=          17 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.419617E-02 AT    3 15  1
ERROR (FT) = 1.15900      ITER=          18 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.717163E-02 AT    1 14  1
ERROR (FT) = 1.06741      ITER=          19 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.364685E-02 AT    3 15  1
ERROR (FT) = 1.05989      ITER=          20 ERR TOL=0.992000
 MAX ERROR/NODE (FT) = 0.625610E-02 AT    1 15  1
 EXIT (T/F) ?
InterSat>
```

WATER BALANCE

WRGWM 1E
4-1-92
2:00PM

19-InterTrans TRANSPORT MODEL OUTPUT
20-WRITE TRAVEL TIME DATA FILE
21-CONTINUE SIMULATION
InterSat> 12

LAYER	FLOW INTO STORAGE	FLOW INTO FROM ABOVE	LATERAL FLOW BALANCE	PUMPAGE FLOW	FLOW FROM Q-ARRAY
1	-0.8613E+10	0.0000E+00	0.3263E+06	0.0000E+00	0.1419E+07

LAYER	EAST	WEST	NORTH	SOUTH
1	0.3664E+06	-0.3711E+05	-0.6780E+06	-0.4552E+05

MODEL BOUNDARY BALANCES -394174.
TOTAL INPUTS = 0.141947E+07
TOTAL OUTPUTS = -0.861302E+10
GLOBAL BALANCE (GPD) -0.861200E+10
CONVERGENCE OF WATER BALANCE = -0.60671E+06 %
100*(GLOBAL BALANCE)/(INPUTS)
CONVERGENCE OF WATER BALANCE = 99.988 %
100*(GLOBAL BALANCE)/(OUTPUT)
Hit Any Key to Continue ....

Pre Simulation heads

PRE-SIMULATION HEADS

MAP OF HEAD ARRAY (FT) 1 32 1 31

1 1

	1	2	3	4	5	6	7
1	930.8	930.9	931.0	931.3	931.6	931.7	931.8
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	938.2	938.3	947.3	947.3	947.3	947.3	947.3
30	947.3	938.6	938.7	938.9	939.0	939.5	939.7
31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	931.9	932.0	932.0	932.1	932.2	932.2	932.2
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3

10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	939.8	939.9	940.0	940.0	940.0	940.1	940.2
31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	932.3	932.3	932.4	932.5	932.5	932.5	932.6
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3

12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	940.2	940.3	940.3	940.3	947.3	947.3	947.3
31	947.3	947.3	947.3	947.3	940.4	940.5	940.6

Hit Any Key to Continue ....

31	947.3	947.3	947.3	947.3	940.4	940.5	940.6

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	932.7	932.8	932.8	932.9	933.0	933.1	933.3
2	947.3	947.3	947.3	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	947.3	947.3	947.3	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3	947.3	947.3	947.3

23	947.3	947.3	947.3	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3	947.3	947.3	947.3
30	947.3	947.3	940.8	940.9	941.1	947.3	947.3
31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

31	940.7	940.7	941.3	941.2	941.6	941.8	942.0

Hit Any Key to Continue ....

	29	30	31	32
1	933.6	934.0	934.4	935.2
2	947.3	947.3	947.3	947.3
3	947.3	947.3	947.3	947.3
4	947.3	947.3	947.3	947.3
5	947.3	947.3	947.3	947.3
6	947.3	947.3	947.3	947.3
7	947.3	947.3	947.3	947.3
8	947.3	947.3	947.3	947.3
9	947.3	947.3	947.3	947.3
10	947.3	947.3	947.3	947.3
11	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

11	947.3	947.3	947.3	947.3
12	947.3	947.3	947.3	947.3
13	947.3	947.3	947.3	947.3
14	947.3	947.3	947.3	947.3
15	947.3	947.3	947.3	947.3
16	947.3	947.3	947.3	947.3
17	947.3	947.3	947.3	947.3
18	947.3	947.3	947.3	947.3
19	947.3	947.3	947.3	947.3
20	947.3	947.3	947.3	947.3

Hit Any Key to Continue ....

	29	30	31	32
21	947.3	947.3	947.3	947.3
22	947.3	947.3	947.3	947.3
23	947.3	947.3	947.3	947.3
24	947.3	947.3	947.3	947.3
25	947.3	947.3	947.3	947.3
26	947.3	947.3	947.3	947.3
27	947.3	947.3	947.3	947.3
28	947.3	947.3	947.3	947.3
29	947.3	947.3	947.3	947.3
30	947.3	947.3	947.3	947.3
31	942.4	943.0	943.3	944.4

Hit Any Key to Continue ....

```
MAP OF STORAGE FACTOR (GAL/FT)          1          32          1          31

          1          1
        1          2          3          4          5          6          7
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  3 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  4 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  5 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  6 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  7 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  8 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  9 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 10 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 11 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 12 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 13 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 14 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 15 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 16 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 17 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 18 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 19 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 20 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

 11 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 12 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 13 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 14 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 15 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 16 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 17 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 18 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 19 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 20 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

        1          2          3          4          5          6          7
 21 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 22 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 23 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 24 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 25 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 26 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 27 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 28 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 29 0.1000E+110.1000E+110.1000     0.1000     0.1000     0.1000     0.1000
 30 0.1000     0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
 31 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

 31 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

        8          9         10         11         12         13         14
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  3 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  4 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  5 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  6 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  7 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  8 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  9 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
```

EXECUTION
STORAGE
FACTOR

```
 10 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

          8         9        10        11        12        13        14
 21 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 22 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 23 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 24 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 25 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 26 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 27 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 28 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 29 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 30 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
 31 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 31 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

         15        16        17        18        19        20        21
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  3 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  4 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  5 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  6 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  7 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  8 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  9 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 10 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
```

12	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
13	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
14	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
15	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
16	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
17	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
18	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
19	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
20	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
22	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
23	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
24	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
25	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
26	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
27	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
28	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
29	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
30	0.1000E+11	0.1000E+11	0.1000E+11	0.1000E+11	0.1000	0.1000	0.1000
31	0.1000	0.1000	0.1000	0.1000	0.1000E+11	0.1000E+11	0.1000E+11

Hit Any Key to Continue ....

31	0.1000	0.1000	0.1000	0.1000	0.1000E+11	0.1000E+11	0.1000E+11

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	0.1000E+11	0.1000E+11	0.1000E+11	0.1000E+11	0.1000E+11	0.1000E+11	0.1000E+11
2	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
3	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
4	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
5	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
6	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
7	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
8	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
9	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
10	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
11	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
12	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
13	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
14	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
15	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
16	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
17	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
18	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
19	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
20	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000

Hit Any Key to Continue ....

11	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
12	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
13	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
14	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
15	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
16	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
17	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
18	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
19	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
20	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
22	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000	0.1000

```
23 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
24 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
25 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
26 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
27 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
28 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
29 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
30 0.1000    0.1000    0.1000E+110.1000E+110.1000E+110.1000    0.1000
31 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

31 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

      29        30        31        32
 1 0.1000E+110.1000E+110.1000E+110.1000E+11
 2 0.1000    0.1000    0.1000    0.1000
 3 0.1000    0.1000    0.1000    0.1000
 4 0.1000    0.1000    0.1000    0.1000
 5 0.1000    0.1000    0.1000    0.1000
 6 0.1000    0.1000    0.1000    0.1000
 7 0.1000    0.1000    0.1000    0.1000
 8 0.1000    0.1000    0.1000    0.1000
 9 0.1000    0.1000    0.1000    0.1000
10 0.1000    0.1000    0.1000    0.1000
11 0.1000    0.1000    0.1000    0.1000
12 0.1000    0.1000    0.1000    0.1000
13 0.1000    0.1000    0.1000    0.1000
14 0.1000    0.1000    0.1000    0.1000
15 0.1000    0.1000    0.1000    0.1000
16 0.1000    0.1000    0.1000    0.1000
17 0.1000    0.1000    0.1000    0.1000
18 0.1000    0.1000    0.1000    0.1000
19 0.1000    0.1000    0.1000    0.1000
20 0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

11 0.1000    0.1000    0.1000    0.1000
12 0.1000    0.1000    0.1000    0.1000
13 0.1000    0.1000    0.1000    0.1000
14 0.1000    0.1000    0.1000    0.1000
15 0.1000    0.1000    0.1000    0.1000
16 0.1000    0.1000    0.1000    0.1000
17 0.1000    0.1000    0.1000    0.1000
18 0.1000    0.1000    0.1000    0.1000
19 0.1000    0.1000    0.1000    0.1000
20 0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

      29        30        31        32
21 0.1000    0.1000    0.1000    0.1000
22 0.1000    0.1000    0.1000    0.1000
23 0.1000    0.1000    0.1000    0.1000
24 0.1000    0.1000    0.1000    0.1000
25 0.1000    0.1000    0.1000    0.1000
26 0.1000    0.1000    0.1000    0.1000
27 0.1000    0.1000    0.1000    0.1000
28 0.1000    0.1000    0.1000    0.1000
29 0.1000    0.1000    0.1000    0.1000
30 0.1000    0.1000    0.1000    0.1000
31 0.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....
```

```
MAP OF WATER TABLE STORAGE COEFF.           1          32           1
        31          1          1
        1          2          3          4          5          6          7
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  3 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  4 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  5 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  6 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  7 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  8 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  9 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 10 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 11 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 12 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 13 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 14 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 15 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 16 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 17 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 18 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 19 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 20 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

 11 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 12 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 13 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 14 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 15 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 16 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 17 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 18 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 19 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 20 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

        1          2          3          4          5          6          7
 21 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 22 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 23 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 24 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 25 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 26 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 27 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 28 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
 29 0.1000E+110.1000E+110.1000     0.1000     0.1000     0.1000     0.1000
 30 0.1000     0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
 31 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

 31 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
Hit Any Key to Continue ....

        8          9         10         11         12         13         14
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  3 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  4 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  5 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  6 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  7 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  8 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
  9 0.1000     0.1000     0.1000     0.1000     0.1000     0.1000     0.1000
```

WATER TABLE STORAGE COEFFICIENT (UNCONFINED)

```
 10 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

         8         9        10        11        12        13        14
 21 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 22 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 23 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 24 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 25 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 26 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 27 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 28 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 29 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 30 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
 31 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 31 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

        15        16        17        18        19        20        21
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  3 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  4 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  5 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  6 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  7 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  8 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  9 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 10 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
```

```
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

        15        16        17        18        19        20        21
 21 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 22 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 23 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 24 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 25 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 26 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 27 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 28 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 29 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 30 0.1000E+110.1000E+110.1000E+110.1000E+110.1000    0.1000    0.1000
 31 0.1000    0.1000    0.1000    0.1000    0.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

 31 0.1000    0.1000    0.1000    0.1000    0.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

        22        23        24        25        26        27        28
  1 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
  2 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  3 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  4 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  5 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  6 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  7 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  8 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
  9 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 10 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

 11 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 12 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 13 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 14 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 15 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 16 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 17 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 18 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 19 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 20 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

        22        23        24        25        26        27        28
 21 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
 22 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
```

```
23 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
24 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
25 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
26 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
27 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
28 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
29 0.1000    0.1000    0.1000    0.1000    0.1000    0.1000    0.1000
30 0.1000    0.1000    0.1000E+110.1000E+110.1000E+110.1000    0.1000
31 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

31 0.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....

      29        30        31        32
 1 0.1000E+110.1000E+110.1000E+110.1000E+11
 2 0.1000    0.1000    0.1000    0.1000
 3 0.1000    0.1000    0.1000    0.1000
 4 0.1000    0.1000    0.1000    0.1000
 5 0.1000    0.1000    0.1000    0.1000
 6 0.1000    0.1000    0.1000    0.1000
 7 0.1000    0.1000    0.1000    0.1000
 8 0.1000    0.1000    0.1000    0.1000
 9 0.1000    0.1000    0.1000    0.1000
10 0.1000    0.1000    0.1000    0.1000
11 0.1000    0.1000    0.1000    0.1000
12 0.1000    0.1000    0.1000    0.1000
13 0.1000    0.1000    0.1000    0.1000
14 0.1000    0.1000    0.1000    0.1000
15 0.1000    0.1000    0.1000    0.1000
16 0.1000    0.1000    0.1000    0.1000
17 0.1000    0.1000    0.1000    0.1000
18 0.1000    0.1000    0.1000    0.1000
19 0.1000    0.1000    0.1000    0.1000
20 0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

11 0.1000    0.1000    0.1000    0.1000
12 0.1000    0.1000    0.1000    0.1000
13 0.1000    0.1000    0.1000    0.1000
14 0.1000    0.1000    0.1000    0.1000
15 0.1000    0.1000    0.1000    0.1000
16 0.1000    0.1000    0.1000    0.1000
17 0.1000    0.1000    0.1000    0.1000
18 0.1000    0.1000    0.1000    0.1000
19 0.1000    0.1000    0.1000    0.1000
20 0.1000    0.1000    0.1000    0.1000
Hit Any Key to Continue ....

      29        30        31        32
21 0.1000    0.1000    0.1000    0.1000
22 0.1000    0.1000    0.1000    0.1000
23 0.1000    0.1000    0.1000    0.1000
24 0.1000    0.1000    0.1000    0.1000
25 0.1000    0.1000    0.1000    0.1000
26 0.1000    0.1000    0.1000    0.1000
27 0.1000    0.1000    0.1000    0.1000
28 0.1000    0.1000    0.1000    0.1000
29 0.1000    0.1000    0.1000    0.1000
30 0.1000    0.1000    0.1000    0.1000
31 0.1000E+110.1000E+110.1000E+110.1000E+11
Hit Any Key to Continue ....
```

RECHARGE

```
MAP OF Q-ARRAY (GPD/FT^2)             1          32          1          31
          1            1
         1         2         3         4         5         6         7
  1 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  2 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  3 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  4 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  5 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  6 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  7 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  8 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  9 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 10 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

 11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

         1         2         3         4         5         6         7
 21 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 22 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 23 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 24 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 25 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 26 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 27 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01
 28 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 29 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 30 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

 31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

         8         9        10        11        12        13        14
  1 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  2 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  3 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  4 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  5 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  6 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  7 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  8 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
  9 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
```

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10 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

         8         9         10        11        12        13        14
21 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
22 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
23 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
24 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
25 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
26 -.7250E-02-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
27 -.1022E-01-.1022E-01-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.1022E-01
28 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
29 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01
30 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

         15        16        17        18        19        20        21
 1 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 2 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 3 -.7250E-02-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.7250E-02
 4 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 5 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 6 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 7 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 8 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 9 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
10 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
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12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

        15         16         17         18         19         20         21
21 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
22 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
23 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
24 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
25 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
26 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
27 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
28 -.1022E-01-.1022E-01-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01
29 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
30 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

        22         23         24         25         26         27         28
 1 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 2 -.7250E-02-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01-.1022E-01
 3 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 4 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 5 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 6 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
 7 -.7250E-02-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01-.1022E-01
 8 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01
 9 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
10 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

11 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
12 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
13 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
14 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
15 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
16 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
17 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
18 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
19 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
20 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

        22         23         24         25         26         27         28
21 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
22 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
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23 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
24 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
25 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
26 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
27 -.1022E-01-.7250E-02-.7250E-02-.1022E-01-.1022E-01-.1022E-01-.1022E-01
28 -.1022E-01-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.1022E-01
29 -.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01-.1022E-01
30 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

31 -.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02-.7250E-02
Hit Any Key to Continue ....

       29        30        31        32
 1 -.7250E-02-.7250E-02-.7250E-02-.6000E-01
 2 -.1022E-01-.1022E-01-.7250E-02-.8300E-02
 3 -.7250E-02-.7250E-02-.7250E-02-.1640E-01
 4 -.7250E-02-.7250E-02-.7250E-02-.3460E-01
 5 -.7250E-02-.7250E-02-.1022E-01-.5290E-01
 6 -.1022E-01-.1022E-01-.1022E-01-.4930E-01
 7 -.7250E-02-.1022E-01-.1022E-01-.5760E-01
 8 -.7250E-02-.1022E-01-.1022E-01-.6360E-01
 9 -.1022E-01-.1022E-01-.1022E-01-.7570E-01
10 -.1022E-01-.1022E-01-.1022E-01-.7670E-01
11 -.1022E-01-.1022E-01-.1022E-01-.7600E-01
12 -.1022E-01-.1022E-01-.7250E-02-.7570E-01
13 -.1022E-01-.1022E-01-.7250E-02-.9360E-01
14 -.1022E-01-.1022E-01-.7250E-02-.1022
15 -.1022E-01-.1022E-01-.7250E-02-.9910E-01
16 -.1022E-01-.1022E-01-.7250E-02-.1045
17 -.1022E-01-.1022E-01-.7250E-02-.1055
18 -.1022E-01-.1022E-01-.7250E-02-.9890E-01
19 -.1022E-01-.1022E-01-.7250E-02-.9710E-01
20 -.7250E-02-.1022E-01-.7250E-02-1.059
Hit Any Key to Continue ....

11 -.1022E-01-.1022E-01-.1022E-01-.7600E-01
12 -.1022E-01-.1022E-01-.7250E-02-.7570E-01
13 -.1022E-01-.1022E-01-.7250E-02-.9360E-01
14 -.1022E-01-.1022E-01-.7250E-02-.1022
15 -.1022E-01-.1022E-01-.7250E-02-.9910E-01
16 -.1022E-01-.1022E-01-.7250E-02-.1045
17 -.1022E-01-.1022E-01-.7250E-02-.1055
18 -.1022E-01-.1022E-01-.7250E-02-.9890E-01
19 -.1022E-01-.1022E-01-.7250E-02-.9710E-01
20 -.7250E-02-.1022E-01-.7250E-02-1.059
Hit Any Key to Continue ....

       29        30        31        32
21 -.7250E-02-.1022E-01-.1022E-01-.1151
22 -.7250E-02-.1022E-01-.1022E-01-.1383
23 -.7250E-02-.7250E-02-.1022E-01-.1456
24 -.7250E-02-.1022E-01-.1022E-01-.1108
25 -.7250E-02-.1022E-01-.1022E-01-.8070E-01
26 -.7250E-02-.7250E-02-.1022E-01-.5690E-01
27 -.1022E-01-.1022E-01-.1022E-01-.5230E-01
28 -.1022E-01-.1022E-01-.1022E-01-.2280E-01
29 -.1022E-01-.7250E-02-.7250E-02-.1360E-01
30 -.7250E-02-.1022E-01-.7250E-02-.8100E-02
31 -.7250E-02-.7250E-02-.7250E-02-.1000E-03
Hit Any Key to Continue ....
```

MAP OF BOTTOM (FT)   1   32   1   31   1

AQUIFER BOTTOM ELEVATIONS

1

	1	2	3	4	5	6	7
1	775.0	785.0	785.0	795.0	795.0	805.0	805.0
2	785.0	785.0	795.0	795.0	805.0	805.0	815.0
3	785.0	795.0	795.0	805.0	805.0	815.0	815.0
4	795.0	795.0	805.0	805.0	815.0	815.0	825.0
5	795.0	805.0	805.0	815.0	815.0	825.0	825.0
6	795.0	805.0	805.0	815.0	815.0	825.0	825.0
7	795.0	805.0	805.0	815.0	815.0	825.0	825.0
8	795.0	805.0	805.0	815.0	825.0	825.0	835.0
9	805.0	805.0	815.0	815.0	825.0	825.0	835.0
10	805.0	805.0	815.0	815.0	825.0	825.0	835.0
11	805.0	805.0	815.0	815.0	825.0	825.0	835.0
12	805.0	805.0	815.0	815.0	825.0	825.0	835.0
13	805.0	805.0	815.0	815.0	825.0	825.0	835.0
14	805.0	805.0	815.0	815.0	825.0	825.0	835.0
15	805.0	805.0	815.0	815.0	825.0	835.0	835.0
16	805.0	805.0	815.0	825.0	825.0	835.0	835.0
17	805.0	805.0	815.0	825.0	825.0	835.0	835.0
18	805.0	815.0	815.0	825.0	825.0	835.0	835.0
19	805.0	815.0	815.0	825.0	825.0	835.0	835.0
20	805.0	815.0	815.0	825.0	825.0	835.0	835.0

Hit Any Key to Continue ....

11	805.0	805.0	815.0	815.0	825.0	825.0	835.0
12	805.0	805.0	815.0	815.0	825.0	825.0	835.0
13	805.0	805.0	815.0	815.0	825.0	825.0	835.0
14	805.0	805.0	815.0	815.0	825.0	825.0	835.0
15	805.0	805.0	815.0	815.0	825.0	835.0	835.0
16	805.0	805.0	815.0	825.0	825.0	835.0	835.0
17	805.0	805.0	815.0	825.0	825.0	835.0	835.0
18	805.0	815.0	815.0	825.0	825.0	835.0	835.0
19	805.0	815.0	815.0	825.0	825.0	835.0	835.0
20	805.0	815.0	815.0	825.0	825.0	835.0	835.0

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	805.0	815.0	815.0	825.0	825.0	835.0	835.0
22	805.0	815.0	815.0	825.0	825.0	835.0	835.0
23	805.0	815.0	815.0	825.0	825.0	835.0	845.0
24	815.0	815.0	825.0	825.0	835.0	835.0	845.0
25	815.0	815.0	825.0	825.0	835.0	835.0	845.0
26	815.0	825.0	825.0	835.0	835.0	845.0	845.0
27	815.0	825.0	825.0	835.0	835.0	845.0	855.0
28	825.0	825.0	835.0	835.0	845.0	855.0	855.0
29	835.0	835.0	845.0	845.0	855.0	855.0	865.0
30	835.0	845.0	845.0	855.0	855.0	865.0	865.0
31	845.0	845.0	855.0	855.0	865.0	865.0	875.0

Hit Any Key to Continue ....

31	845.0	845.0	855.0	855.0	865.0	865.0	875.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	815.0	815.0	815.0	815.0	825.0	825.0	825.0
2	815.0	825.0	825.0	825.0	825.0	825.0	825.0
3	825.0	825.0	825.0	825.0	835.0	835.0	835.0
4	825.0	835.0	835.0	835.0	835.0	835.0	835.0
5	835.0	835.0	835.0	835.0	835.0	835.0	845.0
6	835.0	835.0	835.0	835.0	845.0	845.0	845.0
7	835.0	835.0	835.0	835.0	845.0	845.0	845.0
8	835.0	835.0	835.0	845.0	845.0	845.0	845.0
9	835.0	835.0	845.0	845.0	845.0	845.0	845.0

10	835.0	835.0	845.0	845.0	845.0	845.0	845.0
11	835.0	845.0	845.0	845.0	845.0	845.0	845.0
12	835.0	845.0	845.0	845.0	845.0	845.0	845.0
13	835.0	845.0	845.0	845.0	845.0	845.0	845.0
14	835.0	845.0	845.0	845.0	845.0	845.0	855.0
15	835.0	845.0	845.0	845.0	845.0	845.0	855.0
16	835.0	845.0	845.0	845.0	845.0	845.0	855.0
17	845.0	845.0	845.0	845.0	845.0	845.0	855.0
18	845.0	845.0	845.0	845.0	845.0	865.0	865.0
19	845.0	845.0	845.0	845.0	845.0	855.0	855.0
20	845.0	845.0	845.0	845.0	845.0	855.0	855.0

Hit Any Key to Continue ....

11	835.0	845.0	845.0	845.0	845.0	845.0	845.0
12	835.0	845.0	845.0	845.0	845.0	845.0	845.0
13	835.0	845.0	845.0	845.0	845.0	845.0	845.0
14	835.0	845.0	845.0	845.0	845.0	845.0	855.0
15	835.0	845.0	845.0	845.0	845.0	845.0	855.0
16	835.0	845.0	845.0	845.0	845.0	845.0	855.0
17	845.0	845.0	845.0	845.0	845.0	845.0	855.0
18	845.0	845.0	845.0	845.0	845.0	865.0	865.0
19	845.0	845.0	845.0	845.0	845.0	855.0	855.0
20	845.0	845.0	845.0	845.0	845.0	855.0	855.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	845.0	845.0	845.0	845.0	845.0	855.0	855.0
22	845.0	845.0	845.0	845.0	855.0	855.0	855.0
23	845.0	845.0	845.0	855.0	855.0	855.0	855.0
24	845.0	845.0	845.0	855.0	855.0	855.0	855.0
25	845.0	845.0	855.0	855.0	855.0	855.0	855.0
26	855.0	855.0	855.0	855.0	855.0	855.0	865.0
27	855.0	855.0	855.0	865.0	865.0	865.0	865.0
28	855.0	865.0	865.0	865.0	865.0	865.0	875.0
29	865.0	865.0	875.0	875.0	875.0	875.0	875.0
30	875.0	875.0	875.0	875.0	885.0	885.0	885.0
31	875.0	875.0	885.0	885.0	885.0	885.0	885.0

Hit Any Key to Continue ....

31	875.0	875.0	885.0	885.0	885.0	885.0	885.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	825.0	825.0	825.0	835.0	835.0	835.0	835.0
2	835.0	835.0	835.0	835.0	835.0	845.0	845.0
3	835.0	835.0	845.0	845.0	845.0	845.0	845.0
4	845.0	845.0	845.0	845.0	845.0	855.0	855.0
5	845.0	845.0	845.0	845.0	855.0	855.0	855.0
6	845.0	845.0	845.0	855.0	855.0	855.0	855.0
7	845.0	845.0	855.0	855.0	855.0	855.0	855.0
8	845.0	845.0	855.0	855.0	855.0	855.0	865.0
9	845.0	855.0	855.0	855.0	855.0	855.0	865.0
10	855.0	855.0	855.0	855.0	855.0	865.0	865.0
11	855.0	855.0	855.0	855.0	855.0	865.0	865.0
12	855.0	855.0	855.0	855.0	855.0	865.0	865.0
13	855.0	855.0	855.0	855.0	855.0	865.0	865.0
14	855.0	855.0	855.0	855.0	855.0	865.0	865.0
15	855.0	855.0	855.0	855.0	865.0	865.0	865.0
16	855.0	855.0	855.0	855.0	865.0	865.0	865.0
17	855.0	855.0	855.0	855.0	865.0	865.0	865.0
18	865.0	865.0	865.0	865.0	865.0	865.0	865.0
19	855.0	855.0	855.0	855.0	865.0	865.0	865.0
20	855.0	855.0	855.0	855.0	865.0	865.0	865.0

Hit Any Key to Continue ....

11	855.0	855.0	855.0	855.0	855.0	865.0	865.0

12	855.0	855.0	855.0	855.0	855.0	865.0	865.0
13	855.0	855.0	855.0	855.0	855.0	865.0	865.0
14	855.0	855.0	855.0	855.0	855.0	865.0	865.0
15	855.0	855.0	855.0	855.0	865.0	865.0	865.0
16	855.0	855.0	855.0	855.0	865.0	865.0	865.0
17	855.0	855.0	855.0	855.0	865.0	865.0	865.0
18	865.0	865.0	865.0	865.0	865.0	865.0	865.0
19	855.0	855.0	855.0	855.0	865.0	865.0	865.0
20	855.0	855.0	855.0	855.0	865.0	865.0	865.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	855.0	855.0	855.0	865.0	865.0	865.0	865.0
22	855.0	855.0	855.0	865.0	865.0	865.0	865.0
23	855.0	855.0	865.0	865.0	865.0	865.0	875.0
24	855.0	865.0	865.0	865.0	865.0	865.0	875.0
25	865.0	865.0	865.0	865.0	865.0	875.0	875.0
26	865.0	865.0	865.0	865.0	875.0	875.0	875.0
27	865.0	865.0	875.0	875.0	875.0	875.0	885.0
28	875.0	875.0	875.0	875.0	885.0	885.0	885.0
29	875.0	885.0	885.0	885.0	885.0	885.0	895.0
30	885.0	885.0	885.0	895.0	895.0	895.0	895.0
31	885.0	895.0	895.0	895.0	895.0	905.0	905.0

Hit Any Key to Continue ....

31	885.0	895.0	895.0	895.0	895.0	905.0	905.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	845.0	845.0	845.0	845.0	855.0	855.0	865.0
2	845.0	845.0	855.0	855.0	855.0	865.0	865.0
3	855.0	855.0	855.0	865.0	865.0	865.0	865.0
4	855.0	855.0	865.0	865.0	865.0	875.0	875.0
5	855.0	865.0	865.0	865.0	875.0	875.0	875.0
6	865.0	865.0	865.0	865.0	875.0	875.0	875.0
7	865.0	865.0	865.0	875.0	875.0	875.0	885.0
8	865.0	865.0	865.0	875.0	875.0	885.0	885.0
9	865.0	865.0	865.0	875.0	875.0	885.0	885.0
10	865.0	865.0	875.0	875.0	875.0	885.0	885.0
11	865.0	865.0	875.0	875.0	875.0	885.0	885.0
12	865.0	865.0	875.0	875.0	875.0	885.0	885.0
13	865.0	865.0	875.0	875.0	875.0	885.0	885.0
14	865.0	865.0	875.0	875.0	875.0	885.0	885.0
15	865.0	865.0	875.0	875.0	875.0	885.0	895.0
16	865.0	875.0	875.0	875.0	885.0	885.0	895.0
17	865.0	875.0	875.0	875.0	885.0	885.0	895.0
18	865.0	875.0	875.0	875.0	885.0	885.0	895.0
19	865.0	875.0	875.0	875.0	885.0	885.0	895.0
20	875.0	875.0	875.0	875.0	885.0	885.0	895.0

Hit Any Key to Continue ....

11	865.0	865.0	875.0	875.0	875.0	885.0	885.0
12	865.0	865.0	875.0	875.0	875.0	885.0	885.0
13	865.0	865.0	875.0	875.0	875.0	885.0	885.0
14	865.0	865.0	875.0	875.0	875.0	885.0	885.0
15	865.0	865.0	875.0	875.0	875.0	885.0	895.0
16	865.0	875.0	875.0	875.0	885.0	885.0	895.0
17	865.0	875.0	875.0	875.0	885.0	885.0	895.0
18	865.0	875.0	875.0	875.0	885.0	885.0	895.0
19	865.0	875.0	875.0	875.0	885.0	885.0	895.0
20	875.0	875.0	875.0	875.0	885.0	885.0	895.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	875.0	875.0	875.0	875.0	885.0	885.0	895.0
22	875.0	875.0	875.0	875.0	885.0	885.0	895.0

23	875.0	875.0	875.0	885.0	885.0	885.0	895.0
24	875.0	875.0	875.0	885.0	885.0	895.0	895.0
25	875.0	875.0	885.0	885.0	885.0	895.0	895.0
26	875.0	885.0	885.0	885.0	895.0	895.0	905.0
27	885.0	885.0	885.0	895.0	895.0	905.0	905.0
28	885.0	895.0	895.0	895.0	905.0	905.0	905.0
29	895.0	895.0	895.0	905.0	905.0	905.0	905.0
30	905.0	905.0	905.0	905.0	905.0	905.0	905.0
31	905.0	905.0	905.0	905.0	905.0	905.0	905.0

Hit Any Key to Continue ....

31	905.0	905.0	905.0	905.0	905.0	905.0	905.0

Hit Any Key to Continue ....

	29	30	31	32
1	865.0	865.0	865.0	875.0
2	865.0	865.0	875.0	875.0
3	865.0	875.0	885.0	885.0
4	875.0	885.0	885.0	885.0
5	885.0	885.0	895.0	895.0
6	885.0	885.0	895.0	905.0
7	885.0	885.0	895.0	905.0
8	885.0	895.0	895.0	905.0
9	885.0	895.0	895.0	905.0
10	895.0	895.0	905.0	905.0
11	895.0	895.0	905.0	905.0
12	895.0	895.0	905.0	905.0
13	895.0	895.0	905.0	905.0
14	895.0	895.0	905.0	905.0
15	895.0	895.0	905.0	905.0
16	895.0	895.0	905.0	905.0
17	895.0	895.0	905.0	905.0
18	895.0	905.0	905.0	905.0
19	895.0	905.0	905.0	905.0
20	895.0	905.0	905.0	905.0

Hit Any Key to Continue ....

11	895.0	895.0	905.0	905.0
12	895.0	895.0	905.0	905.0
13	895.0	895.0	905.0	905.0
14	895.0	895.0	905.0	905.0
15	895.0	895.0	905.0	905.0
16	895.0	895.0	905.0	905.0
17	895.0	895.0	905.0	905.0
18	895.0	905.0	905.0	905.0
19	895.0	905.0	905.0	905.0
20	895.0	905.0	905.0	905.0

Hit Any Key to Continue ....

	29	30	31	32
21	895.0	905.0	905.0	905.0
22	895.0	905.0	905.0	905.0
23	905.0	905.0	905.0	905.0
24	905.0	905.0	905.0	905.0
25	905.0	905.0	905.0	905.0
26	905.0	905.0	905.0	905.0
27	905.0	905.0	905.0	905.0
28	905.0	905.0	905.0	905.0
29	905.0	905.0	905.0	905.0
30	905.0	905.0	905.0	905.0
31	905.0	905.0	905.0	905.0

Hit Any Key to Continue ....

MAP OF TOP (FT) 1 32 1 31 1
1

AQUIFER TOP ELEVATIONS

	1	2	3	4	5	6	7
1	975.7	975.7	975.7	975.7	975.7	975.7	975.7
2	975.7	975.7	975.7	975.7	975.7	975.7	975.7
3	975.7	975.7	975.7	975.7	975.7	975.7	975.7
4	975.7	975.7	975.7	975.7	975.7	975.7	975.7
5	975.7	975.7	975.7	975.7	975.7	975.7	975.7
6	975.7	975.7	975.7	975.7	975.7	975.7	975.7
7	975.7	975.7	975.7	975.7	975.7	975.7	975.7
8	975.7	975.7	975.7	975.7	975.7	975.7	975.7
9	975.7	975.7	975.7	975.7	975.7	975.7	975.7
10	975.7	975.7	975.7	975.7	975.7	975.7	975.7
11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	975.7	975.7	975.7	975.7	975.7	975.7	975.7
22	975.7	975.7	975.7	975.7	975.7	975.7	975.7
23	975.7	975.7	975.7	975.7	975.7	975.7	975.7
24	975.7	975.7	975.7	975.7	975.7	975.7	975.7
25	975.7	975.7	975.7	975.7	975.7	975.7	975.7
26	975.7	975.7	975.7	975.7	975.7	975.7	975.7
27	975.7	975.7	975.7	975.7	975.7	975.7	975.7
28	975.7	975.7	975.7	975.7	975.7	975.7	975.7
29	975.7	975.7	975.7	975.7	975.7	975.7	975.7
30	975.7	975.7	975.7	975.7	975.7	975.7	975.7
31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	975.7	975.7	975.7	975.7	975.7	975.7	975.7
2	975.7	975.7	975.7	975.7	975.7	975.7	975.7
3	975.7	975.7	975.7	975.7	975.7	975.7	975.7
4	975.7	975.7	975.7	975.7	975.7	975.7	975.7
5	975.7	975.7	975.7	975.7	975.7	975.7	975.7
6	975.7	975.7	975.7	975.7	975.7	975.7	975.7
7	975.7	975.7	975.7	975.7	975.7	975.7	975.7
8	975.7	975.7	975.7	975.7	975.7	975.7	975.7
9	975.7	975.7	975.7	975.7	975.7	975.7	975.7

10	975.7	975.7	975.7	975.7	975.7	975.7	975.7
11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	975.7	975.7	975.7	975.7	975.7	975.7	975.7
22	975.7	975.7	975.7	975.7	975.7	975.7	975.7
23	975.7	975.7	975.7	975.7	975.7	975.7	975.7
24	975.7	975.7	975.7	975.7	975.7	975.7	975.7
25	975.7	975.7	975.7	975.7	975.7	975.7	975.7
26	975.7	975.7	975.7	975.7	975.7	975.7	975.7
27	975.7	975.7	975.7	975.7	975.7	975.7	975.7
28	975.7	975.7	975.7	975.7	975.7	975.7	975.7
29	975.7	975.7	975.7	975.7	975.7	975.7	975.7
30	975.7	975.7	975.7	975.7	975.7	975.7	975.7
31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	975.7	975.7	975.7	975.7	975.7	975.7	975.7
2	975.7	975.7	975.7	975.7	975.7	975.7	975.7
3	975.7	975.7	975.7	975.7	975.7	975.7	975.7
4	975.7	975.7	975.7	975.7	975.7	975.7	975.7
5	975.7	975.7	975.7	975.7	975.7	975.7	975.7
6	975.7	975.7	975.7	975.7	975.7	975.7	975.7
7	975.7	975.7	975.7	975.7	975.7	975.7	975.7
8	975.7	975.7	975.7	975.7	975.7	975.7	975.7
9	975.7	975.7	975.7	975.7	975.7	975.7	975.7
10	975.7	975.7	975.7	975.7	975.7	975.7	975.7
11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

11	975.7	975.7	975.7	975.7	975.7	975.7	975.7

12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	975.7	975.7	975.7	975.7	975.7	975.7	975.7
22	975.7	975.7	975.7	975.7	975.7	975.7	975.7
23	975.7	975.7	975.7	975.7	975.7	975.7	975.7
24	975.7	975.7	975.7	975.7	975.7	975.7	975.7
25	975.7	975.7	975.7	975.7	975.7	975.7	975.7
26	975.7	975.7	975.7	975.7	975.7	975.7	975.7
27	975.7	975.7	975.7	975.7	975.7	975.7	975.7
28	975.7	975.7	975.7	975.7	975.7	975.7	975.7
29	975.7	975.7	975.7	975.7	975.7	975.7	975.7
30	975.7	975.7	975.7	975.7	975.7	975.7	975.7
31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	975.7	975.7	975.7	975.7	975.7	975.7	975.7
2	975.7	975.7	975.7	975.7	975.7	975.7	975.7
3	975.7	975.7	975.7	975.7	975.7	975.7	975.7
4	975.7	975.7	975.7	975.7	975.7	975.7	975.7
5	975.7	975.7	975.7	975.7	975.7	975.7	976.7
6	975.7	975.7	975.7	975.7	975.7	975.7	975.7
7	975.7	975.7	975.7	975.7	975.7	975.7	975.7
8	975.7	975.7	975.7	975.7	975.7	975.7	975.7
9	975.7	975.7	975.7	975.7	975.7	975.7	975.7
10	975.7	975.7	975.7	975.7	975.7	975.7	975.7
11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

11	975.7	975.7	975.7	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	975.7	975.7	975.7	975.7	975.7	975.7	975.7
22	975.7	975.7	975.7	975.7	975.7	975.7	975.7

23	975.7	975.7	975.7	975.7	975.7	975.7	975.7
24	975.7	975.7	975.7	975.7	975.7	975.7	975.7
25	975.7	975.7	975.7	975.7	975.7	975.7	975.7
26	975.7	975.7	975.7	975.7	975.7	975.7	975.7
27	975.7	975.7	975.7	975.7	975.7	975.7	975.7
28	975.7	975.7	975.7	975.7	975.7	975.7	975.7
29	975.7	975.7	975.7	975.7	975.7	975.7	975.7
30	975.7	975.7	975.7	975.7	975.7	975.7	975.7
31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

31	975.7	975.7	975.7	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	29	30	31	32
1	975.7	975.7	975.7	975.7
2	975.7	975.7	975.7	975.7
3	975.7	975.7	975.7	975.7
4	975.7	975.7	975.7	975.7
5	975.7	975.7	975.7	975.7
6	975.7	975.7	975.7	975.7
7	975.7	975.7	975.7	975.7
8	975.7	975.7	975.7	975.7
9	975.7	975.7	975.7	975.7
10	975.7	975.7	975.7	975.7
11	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

11	975.7	975.7	975.7	975.7
12	975.7	975.7	975.7	975.7
13	975.7	975.7	975.7	975.7
14	975.7	975.7	975.7	975.7
15	975.7	975.7	975.7	975.7
16	975.7	975.7	975.7	975.7
17	975.7	975.7	975.7	975.7
18	975.7	975.7	975.7	975.7
19	975.7	975.7	975.7	975.7
20	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

	29	30	31	32
21	975.7	975.7	975.7	975.7
22	975.7	975.7	975.7	975.7
23	975.7	975.7	975.7	975.7
24	975.7	975.7	975.7	975.7
25	975.7	975.7	975.7	975.7
26	975.7	975.7	975.7	975.7
27	975.7	975.7	975.7	975.7
28	975.7	975.7	975.7	975.7
29	975.7	975.7	975.7	975.7
30	975.7	975.7	975.7	975.7
31	975.7	975.7	975.7	975.7

Hit Any Key to Continue ....

VERTICAL PERMEABILITY

MAP OF PERMK (GPD/FT^2)   1   32   1   31
1   1

	1	2	3	4	5	6	7
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	261.0	261.0	261.0	380.0	380.0	395.0	395.0
8	261.0	261.0	261.0	380.0	380.0	395.0	395.0
9	261.0	261.0	261.0	380.0	380.0	395.0	395.0
10	261.0	261.0	261.0	380.0	380.0	395.0	395.0
11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	261.0	261.0	261.0	380.0	380.0	395.0	395.0
22	261.0	261.0	261.0	380.0	380.0	395.0	395.0
23	261.0	261.0	261.0	380.0	380.0	395.0	395.0
24	261.0	261.0	261.0	380.0	380.0	395.0	395.0
25	261.0	261.0	261.0	380.0	380.0	395.0	395.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	376.0	376.0
7	395.0	395.0	395.0	395.0	395.0	376.0	376.0
8	395.0	395.0	395.0	395.0	395.0	376.0	376.0
9	395.0	395.0	395.0	395.0	395.0	395.0	354.0

10	395.0	395.0	395.0	395.0	395.0	395.0	354.0
11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	395.0	395.0	395.0	395.0	395.0	395.0	354.0
22	395.0	395.0	395.0	395.0	395.0	395.0	354.0
23	395.0	395.0	395.0	395.0	395.0	395.0	354.0
24	395.0	395.0	395.0	395.0	395.0	395.0	354.0
25	395.0	395.0	395.0	395.0	395.0	395.0	354.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	376.0	376.0	376.0	376.0	376.0	261.0	261.0
7	376.0	376.0	376.0	376.0	376.0	333.0	333.0
8	376.0	376.0	376.0	376.0	376.0	333.0	333.0
9	354.0	354.0	354.0	354.0	354.0	333.0	333.0
10	354.0	354.0	354.0	354.0	354.0	333.0	333.0
11	360.0	354.0	354.0	354.0	354.0	333.0	333.0
12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

11	360.0	354.0	354.0	354.0	354.0	333.0	333.0

12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	354.0	354.0	354.0	354.0	354.0	333.0	333.0
22	354.0	354.0	354.0	354.0	354.0	333.0	333.0
23	354.0	354.0	354.0	407.0	407.0	407.0	407.0
24	354.0	354.0	354.0	407.0	407.0	407.0	407.0
25	354.0	354.0	354.0	354.0	407.0	407.0	407.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	333.0	333.0	333.0	380.0	380.0	380.0	380.0
8	333.0	333.0	333.0	380.0	380.0	380.0	380.0
9	333.0	333.0	333.0	380.0	380.0	380.0	380.0
10	333.0	333.0	333.0	380.0	380.0	380.0	380.0
11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	333.0	333.0	333.0	380.0	380.0	380.0	380.0
22	333.0	333.0	333.0	380.0	380.0	380.0	380.0

23	407.0	407.0	407.0	380.0	380.0	380.0	380.0
24	407.0	407.0	407.0	380.0	380.0	380.0	380.0
25	407.0	407.0	407.0	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	29	30	31	32
1	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0
7	380.0	380.0	380.0	380.0
8	380.0	380.0	380.0	380.0
9	380.0	380.0	380.0	380.0
10	380.0	380.0	380.0	380.0
11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	29	30	31	32
21	380.0	380.0	380.0	380.0
22	380.0	380.0	380.0	380.0
23	380.0	380.0	380.0	380.0
24	380.0	380.0	380.0	380.0
25	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

MAP OF PERMJ (GPD/FT^2) 1 32 1 31
1 1

PERM J

	1	2	3	4	5	6	7
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	261.0	261.0	261.0	380.0	380.0	395.0	395.0
8	261.0	261.0	261.0	380.0	380.0	395.0	395.0
9	261.0	261.0	261.0	380.0	380.0	395.0	395.0
10	261.0	261.0	261.0	380.0	380.0	395.0	395.0
11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	261.0	261.0	261.0	380.0	380.0	395.0	395.0
22	261.0	261.0	261.0	380.0	380.0	395.0	395.0
23	261.0	261.0	261.0	380.0	380.0	395.0	395.0
24	261.0	261.0	261.0	380.0	380.0	395.0	395.0
25	261.0	261.0	261.0	380.0	380.0	395.0	395.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	376.0	376.0
7	395.0	395.0	395.0	395.0	395.0	376.0	376.0
8	395.0	395.0	395.0	395.0	395.0	376.0	376.0
9	395.0	395.0	395.0	395.0	395.0	395.0	354.0

10	395.0	395.0	395.0	395.0	395.0	395.0	354.0
11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	395.0	395.0	395.0	395.0	395.0	395.0	354.0
22	395.0	395.0	395.0	395.0	395.0	395.0	354.0
23	395.0	395.0	395.0	395.0	395.0	395.0	354.0
24	395.0	395.0	395.0	395.0	395.0	395.0	354.0
25	395.0	395.0	395.0	395.0	395.0	395.0	354.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	376.0	376.0	376.0	376.0	376.0	261.0	261.0
7	376.0	376.0	376.0	376.0	376.0	333.0	333.0
8	376.0	376.0	376.0	376.0	376.0	333.0	333.0
9	354.0	354.0	354.0	354.0	354.0	333.0	333.0
10	354.0	354.0	354.0	354.0	354.0	333.0	333.0
11	360.0	354.0	354.0	354.0	354.0	333.0	333.0
12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

11	360.0	354.0	354.0	354.0	354.0	333.0	333.0

12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	354.0	354.0	354.0	354.0	354.0	333.0	333.0
22	354.0	354.0	354.0	354.0	354.0	333.0	333.0
23	354.0	354.0	354.0	407.0	407.0	407.0	407.0
24	354.0	354.0	354.0	407.0	407.0	407.0	407.0
25	354.0	354.0	354.0	354.0	407.0	407.0	407.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	333.0	333.0	333.0	380.0	380.0	380.0	380.0
8	333.0	333.0	333.0	380.0	380.0	380.0	380.0
9	333.0	333.0	333.0	380.0	380.0	380.0	380.0
10	333.0	333.0	333.0	380.0	380.0	380.0	380.0
11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	333.0	333.0	333.0	380.0	380.0	380.0	380.0
22	333.0	333.0	333.0	380.0	380.0	380.0	380.0

23	407.0	407.0	407.0	380.0	380.0	380.0	380.0
24	407.0	407.0	407.0	380.0	380.0	380.0	380.0
25	407.0	407.0	407.0	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	29	30	31	32
1	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0
7	380.0	380.0	380.0	380.0
8	380.0	380.0	380.0	380.0
9	380.0	380.0	380.0	380.0
10	380.0	380.0	380.0	380.0
11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	29	30	31	32
21	380.0	380.0	380.0	380.0
22	380.0	380.0	380.0	380.0
23	380.0	380.0	380.0	380.0
24	380.0	380.0	380.0	380.0
25	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

5. RETURN TO PREVIOUS MENU
InterSat>
4

GRIDDING

DISPLAY OF COLUMN GRIDDING

	1	2	3	4	5	6	7
1	300.0	300.0	300.0	300.0	300.0	300.0	225.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	150.0	100.0	100.0	100.0	100.0	100.0	100.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	100.0	100.0	100.0	150.0	150.0	150.0	150.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	100.0	150.0	200.0	200.0	300.0	300.0	450.0

Hit Any Key to Continue ....

	29	30	31
1	600.0	900.0	1200.

Hit Any Key to Continue ....

	29	30	31
1	600.0	900.0	1200.

Hit Any Key to Continue ....

DISPLAY OF ROW GRIDDING

	1	2	3	4	5	6	7
1	1400.	1400.	1000.	675.0	450.0	300.0	300.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	330.0	225.0	150.0	100.0	100.0	100.0	100.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	100.0	100.0	100.0	100.0	100.0	150.0	200.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	300.0	300.0	450.0	675.0	1000.	1250.	1500.

Hit Any Key to Continue ....

	29	30
1	1500.	1000.

Hit Any Key to Continue ....

MAP OF PERMI (GPD/FT^2)　　1　32　1　31

1　1

	1	2	3	4	5	6	7
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	261.0	261.0	261.0	380.0	380.0	395.0	395.0
8	261.0	261.0	261.0	380.0	380.0	395.0	395.0
9	261.0	261.0	261.0	380.0	380.0	395.0	395.0

PERM I

MAP OF PERMI (GPD/FT^2)   1   32   1   31

1   1

	1	2	3	4	5	6	7
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	261.0	261.0	261.0	380.0	380.0	395.0	395.0
8	261.0	261.0	261.0	380.0	380.0	395.0	395.0
9	261.0	261.0	261.0	380.0	380.0	395.0	395.0
10	261.0	261.0	261.0	380.0	380.0	395.0	395.0
11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

11	261.0	261.0	261.0	380.0	380.0	395.0	395.0
12	261.0	261.0	261.0	380.0	380.0	395.0	395.0
13	261.0	261.0	261.0	380.0	380.0	395.0	395.0
14	261.0	261.0	261.0	380.0	380.0	395.0	395.0
15	261.0	261.0	261.0	380.0	380.0	395.0	395.0
16	261.0	261.0	261.0	380.0	380.0	395.0	395.0
17	261.0	261.0	261.0	380.0	380.0	395.0	395.0
18	261.0	261.0	261.0	380.0	380.0	395.0	395.0
19	261.0	261.0	261.0	380.0	380.0	395.0	395.0
20	261.0	261.0	261.0	380.0	380.0	395.0	395.0

Hit Any Key to Continue ....

	1	2	3	4	5	6	7
21	261.0	261.0	261.0	380.0	380.0	395.0	395.0
22	261.0	261.0	261.0	380.0	380.0	395.0	395.0
23	261.0	261.0	261.0	380.0	380.0	395.0	395.0
24	261.0	261.0	261.0	380.0	380.0	395.0	395.0
25	261.0	261.0	261.0	380.0	380.0	395.0	395.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	376.0	376.0
7	395.0	395.0	395.0	395.0	395.0	376.0	376.0
8	395.0	395.0	395.0	395.0	395.0	376.0	376.0
9	395.0	395.0	395.0	395.0	395.0	395.0	354.0

10	395.0	395.0	395.0	395.0	[illegible]	[illegible]	354.0
11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

11	395.0	395.0	395.0	395.0	286.0	395.0	354.0
12	395.0	395.0	395.0	395.0	614.0	395.0	354.0
13	395.0	395.0	395.0	395.0	395.0	395.0	354.0
14	395.0	395.0	395.0	395.0	395.0	395.0	354.0
15	395.0	395.0	395.0	369.0	477.0	395.0	354.0
16	395.0	409.0	395.0	395.0	345.0	395.0	354.0
17	395.0	395.0	395.0	395.0	395.0	395.0	354.0
18	395.0	388.0	395.0	395.0	350.0	395.0	417.0
19	395.0	395.0	395.0	395.0	395.0	395.0	354.0
20	395.0	395.0	395.0	395.0	395.0	395.0	354.0

Hit Any Key to Continue ....

	8	9	10	11	12	13	14
21	395.0	395.0	395.0	395.0	395.0	395.0	354.0
22	395.0	395.0	395.0	395.0	395.0	395.0	354.0
23	395.0	395.0	395.0	395.0	395.0	395.0	354.0
24	395.0	395.0	395.0	395.0	395.0	395.0	354.0
25	395.0	395.0	395.0	395.0	395.0	395.0	354.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	376.0	376.0	376.0	376.0	376.0	261.0	261.0
7	376.0	376.0	376.0	376.0	376.0	333.0	333.0
8	376.0	376.0	376.0	376.0	376.0	333.0	333.0
9	354.0	354.0	354.0	354.0	354.0	333.0	333.0
10	354.0	354.0	354.0	354.0	354.0	333.0	333.0
11	360.0	354.0	354.0	354.0	354.0	333.0	333.0
12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

11	360.0	354.0	354.0	354.0	354.0	333.0	333.0

12	354.0	354.0	354.0	354.0	354.0	333.0	333.0
13	282.0	354.0	354.0	354.0	354.0	333.0	333.0
14	354.0	354.0	354.0	354.0	354.0	333.0	333.0
15	354.0	513.0	354.0	261.0	354.0	333.0	333.0
16	354.0	354.0	354.0	354.0	354.0	333.0	333.0
17	354.0	354.0	354.0	354.0	354.0	333.0	333.0
18	354.0	354.0	354.0	354.0	354.0	333.0	333.0
19	354.0	354.0	354.0	354.0	354.0	333.0	333.0
20	354.0	354.0	354.0	354.0	354.0	333.0	333.0

Hit Any Key to Continue ....

	15	16	17	18	19	20	21
21	354.0	354.0	354.0	354.0	354.0	333.0	333.0
22	354.0	354.0	354.0	354.0	354.0	333.0	333.0
23	354.0	354.0	354.0	407.0	407.0	407.0	407.0
24	354.0	354.0	354.0	407.0	407.0	407.0	407.0
25	354.0	354.0	354.0	354.0	407.0	407.0	407.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
1	261.0	261.0	261.0	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0	261.0	261.0	261.0
7	333.0	333.0	333.0	380.0	380.0	380.0	380.0
8	333.0	333.0	333.0	380.0	380.0	380.0	380.0
9	333.0	333.0	333.0	380.0	380.0	380.0	380.0
10	333.0	333.0	333.0	380.0	380.0	380.0	380.0
11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	333.0	333.0	333.0	380.0	380.0	380.0	380.0
12	333.0	333.0	333.0	380.0	380.0	380.0	380.0
13	333.0	333.0	333.0	380.0	380.0	380.0	380.0
14	333.0	333.0	333.0	380.0	380.0	380.0	380.0
15	333.0	333.0	333.0	380.0	380.0	380.0	380.0
16	333.0	333.0	333.0	380.0	380.0	380.0	380.0
17	333.0	333.0	333.0	380.0	380.0	380.0	380.0
18	333.0	333.0	333.0	380.0	380.0	380.0	380.0
19	333.0	333.0	333.0	380.0	380.0	380.0	380.0
20	333.0	333.0	333.0	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	22	23	24	25	26	27	28
21	333.0	333.0	333.0	380.0	380.0	380.0	380.0
22	333.0	333.0	333.0	380.0	380.0	380.0	380.0

23	407.0	407.0	407.0	380.0	380.0	380.0	380.0
24	407.0	407.0	407.0	380.0	380.0	380.0	380.0
25	407.0	407.0	407.0	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

31	261.0	261.0	261.0	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

	29	30	31	32
1	261.0	261.0	261.0	261.0
2	261.0	261.0	261.0	261.0
3	261.0	261.0	261.0	261.0
4	261.0	261.0	261.0	261.0
5	261.0	261.0	261.0	261.0
6	261.0	261.0	261.0	261.0
7	380.0	380.0	380.0	380.0
8	380.0	380.0	380.0	380.0
9	380.0	380.0	380.0	380.0
10	380.0	380.0	380.0	380.0
11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

11	380.0	380.0	380.0	380.0
12	380.0	380.0	380.0	380.0
13	380.0	380.0	380.0	380.0
14	380.0	380.0	380.0	380.0
15	380.0	380.0	380.0	380.0
16	380.0	380.0	380.0	380.0
17	380.0	380.0	380.0	380.0
18	380.0	380.0	380.0	380.0
19	380.0	380.0	380.0	380.0
20	380.0	380.0	380.0	380.0

Hit Any Key to Continue ....

	29	30	31	32
21	380.0	380.0	380.0	380.0
22	380.0	380.0	380.0	380.0
23	380.0	380.0	380.0	380.0
24	380.0	380.0	380.0	380.0
25	380.0	380.0	380.0	380.0
26	261.0	261.0	261.0	261.0
27	261.0	261.0	261.0	261.0
28	261.0	261.0	261.0	261.0
29	261.0	261.0	261.0	261.0
30	261.0	261.0	261.0	261.0
31	261.0	261.0	261.0	261.0

Hit Any Key to Continue ....

Appendix C

Results of InterTrans Manual Flow Model Simulation
Particle Placement File Data

The data contained in this appendix are the results of the InterTrans contaminant transport simulations that were performed for this study. This data is presented in the form of particle placement files. Theses files contain the *x*-coordinate, *y*-coordinates, and elevation (all units are in feet) of each simulated particle contained in the model. The files are made within the InterTrans Program, and are in the ASCII file format.

InterTrans calculates solute concentrations based on the results in these files. The concentration solute within a given model cell is calculated by the following equation:

$$C_s = \frac{N\,m}{V\,\theta\,R_f}$$

Where C_s = solute concentration
N = number of particles in the cell
m = mass of each particle
V = defined volume of the cell
θ = porosity
R_f = retardation factor

A hard copy of one of the particle placement files (PCE2030 is contained in this appendix to illustrate the data format within the file. Within the ASCII format, only one set of data (the three columns *x*-coordinates, *y*-coordinate, and elevation will be printed at a time. The data in the file presented here has been edited using WordPerfect 5.1 software for the purpose of efficient presentation.

Also contained in this appendix is a 3½" floppy disc. This disc contains the particle placement files that were produced during the contaminant transport simulations. The particle placement filenames and the simulation conditions that the files represent are listed below.

Particle Placement Filename	Simulation Conditions
PCE92	Particle positions for simulation year 1992
PCE2000	Particle positions for simulation year 2000
PCE2010	Particle positions for simulation year 2010
PCE2020	Particle positions for simulation year 2020
PCE2030	Particle positions for simulation year 2030
PCE2040	Particle positions for simulation year 2040
PCEDISP	Particle positions for dispersivity sensitivity analysis (2040)
PCEMASS	Particle positions for mass sensitivity analysis (2040)

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1551.95	1699.31	831.910
2027.55	1595.44	845.587
1840.85	1618.72	842.862
2146.32	1591.58	839.807
1918.95	1632.81	843.078
1403.19	1612.73	841.533
2265.92	1605.14	842.416
1523.36	1629.57	842.976
1774.42	1571.15	836.459
1257.56	1574.30	845.286
2064.99	1593.09	843.723
2273.00	1590.70	838.972
2004.93	1596.63	843.926
1704.13	1523.93	838.631
2300.74	1597.74	843.890
1724.96	1609.44	837.834
1987.00	1594.98	843.298
2175.50	1582.02	831.991
1919.35	1566.21	843.971
2303.89	1604.08	844.342
1992.64	1609.56	842.122
1956.76	1605.21	843.879
1805.42	1577.78	839.939
1754.15	1596.26	835.541
2291.02	1594.30	844.049
1992.15	1687.41	838.480
1199.20	1612.75	838.572
1628.14	1570.35	843.256
2024.32	1620.96	843.928
1735.05	1602.34	843.642
1854.88	1583.08	845.565
1276.42	1581.68	854.098
1729.17	1616.39	839.931
1594.80	1633.95	844.664
1564.31	1509.01	840.594
2081.29	1616.09	835.204
1533.59	1506.73	843.027
1450.03	1627.24	844.969
1942.60	1639.88	842.557
1744.40	1591.57	835.275
1908.44	1624.91	825.287
2220.17	1586.46	843.287
2189.09	1601.76	835.287
1978.21	1602.48	845.454
1904.59	1660.68	844.148
1709.90	1589.36	841.784
1829.04	1600.66	841.388
1966.70	1596.55	844.455
2101.12	1606.59	835.469
2063.50	1547.77	844.714
1683.79	1551.07	841.975
1734.94	1575.26	832.912
1829.90	1618.12	831.607
1903.78	1636.62	844.773
1429.18	1639.73	869.321
2071.49	1597.02	842.933
1809.49	1625.94	844.052
1967.10	1585.09	834.441
2116.47	1593.83	841.246
1785.36	1569.69	845.273
1980.27	1612.44	839.498
1259.62	1602.62	878.995
1813.07	1591.11	845.425
2213.56	1662.36	842.965
1929.13	1601.69	843.077
2200.33	1582.34	836.179
2140.99	1614.33	836.306
2067.34	1584.41	842.654
2219.49	1615.53	836.543
2098.95	1608.66	840.953
2198.00	1600.66	845.287
2056.22	1601.79	843.011
2021.67	1557.73	843.177
1953.31	1592.91	834.099
1889.54	1562.37	843.563
2094.63	1580.75	844.457
1998.25	1624.31	844.003
1889.58	1620.77	845.092
2015.36	1578.51	844.615
2209.50	1606.64	840.519
2033.19	1625.26	839.637
2169.91	1631.52	844.976
2178.38	1612.72	845.679
2256.24	1577.96	829.439
2250.46	1618.75	842.001
2015.25	1572.30	830.942
1889.34	1599.99	842.496

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
2197.11	1593.23	842.868
1732.84	1635.31	842.625
1577.05	1716.05	842.624
2233.82	1585.52	843.537
1578.86	1556.58	842.547
2142.28	1612.72	840.512
2062.38	1605.42	838.105
1767.21	1619.04	837.867
1881.58	1547.93	841.957
2323.54	1609.92	841.007
2167.75	1594.46	845.953
2239.52	1586.01	843.027
2237.84	1605.85	839.811
1672.66	1582.15	844.488
1930.59	1601.34	840.802
1750.46	1533.62	845.917
2029.66	1600.60	840.839
2091.45	1583.58	844.767
1411.42	1616.83	879.125
1885.57	1629.35	836.938
1648.92	1566.42	836.669
2066.74	1611.17	845.375
2219.24	1609.68	837.113
1943.41	1560.33	842.561
1971.96	1593.28	837.445
2289.12	1581.99	844.462
1769.18	1598.36	845.836
2044.62	1651.90	839.724
1763.92	1561.82	845.471
2004.59	1610.88	844.016
1827.39	1554.02	841.378
1791.96	1559.79	833.605
2056.24	1579.60	845.372
2270.57	1624.67	843.520
2197.97	1529.53	841.338
2246.89	1611.70	838.259
1806.01	1547.89	842.330
2142.19	1631.49	840.419
2148.07	1597.72	844.902
2174.58	1592.61	840.589
2013.11	1621.71	844.688
1981.41	1558.32	844.974
1447.90	1640.36	840.328
1716.88	1625.02	845.080
2167.04	1616.17	827.490
1514.24	1505.14	923.524
1575.17	1553.19	843.877
1973.66	1582.74	845.206
1971.85	1614.01	844.912
1683.67	1608.65	842.099
2030.09	1596.65	836.598
2130.90	1554.71	840.007
1990.88	1618.01	845.004
2001.22	1606.53	833.913
2274.41	1599.92	839.065
1698.47	1580.58	841.209
2250.06	1604.24	844.783
1841.96	1554.74	842.449
2205.00	1641.73	844.219
2105.39	1586.61	840.183
1754.66	1614.10	843.394
1815.02	1592.98	840.811
1901.27	1573.90	842.062
1302.38	1653.42	833.854
1828.16	1646.90	836.821
1992.67	1578.66	844.595
2299.87	1601.29	845.372
1951.39	1604.67	834.315
2118.33	1653.75	842.473
1911.63	1606.21	841.018
1861.29	1620.58	844.414
2055.50	1613.09	844.529
2253.13	1611.34	842.690
2097.47	1573.51	830.957
2026.03	1602.35	843.243
1873.46	1607.71	845.006
1799.21	1556.90	837.521
1849.29	1604.69	843.682
1131.78	1564.27	843.868
1933.61	1610.81	845.482
1619.05	1599.16	844.456
1723.63	1628.81	845.963
2039.99	1612.05	841.162
1880.72	1610.65	845.909
2114.10	1601.96	836.312
1713.93	1604.27	842.215
2231.80	1598.93	840.423

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
2007.85	1620.83	837.730
2183.70	1616.18	838.321
1964.65	1601.50	845.794
2188.45	1619.32	843.686
1881.21	1538.39	844.349
1810.63	1546.14	837.978
1609.33	1523.33	841.905
1841.64	1656.04	840.281
1935.84	1640.66	843.138
1873.45	1568.45	841.300
1954.39	1597.62	842.564
2209.77	1597.50	844.026
1765.91	1514.59	842.856
1439.71	1597.62	842.597
2037.55	1578.51	842.601
2120.89	1594.99	843.610
2286.87	1609.45	839.052
2130.96	1642.67	841.227
2263.19	1597.83	842.822
2154.20	1629.27	837.104
2243.10	1609.60	842.391
1843.80	1605.62	842.773
2074.13	1632.87	845.323
1692.89	1560.65	844.211
2007.64	1613.72	839.731
2144.33	1589.90	845.824
1883.78	1605.63	842.639
2021.24	1568.55	836.902
1770.39	1582.79	833.665
1808.92	1577.50	840.306
1862.52	1591.44	845.180
1352.63	1652.06	861.149
1237.11	1601.82	842.474
1822.20	1633.42	841.751
2199.15	1617.27	842.343
2145.32	1602.67	843.276
1665.36	1659.24	837.622
1846.16	1631.78	842.382
1819.79	1615.16	837.807
1308.65	1530.92	832.304
1468.73	1629.84	841.160
2120.98	1604.52	841.057
2077.04	1600.10	840.679
1943.48	1559.71	842.520
1884.72	1607.35	844.607
2231.81	1551.09	841.459
1924.74	1583.85	845.828
2215.79	1598.65	837.081
1957.89	1599.84	842.545
1258.94	1587.91	849.557
1905.56	1625.53	840.043
2196.61	1587.56	839.467
1999.37	1597.18	842.643
1903.46	1619.24	843.284
1577.10	1603.41	844.971
2172.80	1561.69	841.971
1638.98	1659.89	841.506
2003.07	1592.57	842.759
2157.97	1566.21	845.178
1767.61	1648.91	845.679
2180.62	1605.27	844.981
1792.45	1610.84	843.502
2075.63	1621.66	841.475
2022.90	1576.65	841.169
2160.70	1585.81	839.910
2085.93	1594.44	840.846
1349.59	1555.68	845.265
1724.51	1578.71	845.144
1486.58	1576.68	842.846
2139.82	1590.45	842.092
2015.01	1637.01	839.920
1719.26	1655.92	843.765
2083.09	1590.59	843.334
2195.85	1629.59	836.673
2272.95	1603.81	841.773
1501.68	1501.05	838.400
2291.92	1597.29	843.670
1453.82	1679.81	845.781
1831.24	1639.92	842.619
2164.46	1597.90	843.414
1995.57	1672.24	836.452
2077.97	1578.75	844.091
1575.25	1637.81	834.348
2102.20	1598.24	835.782
2195.40	1580.40	845.636
2089.26	1601.59	842.549
1791.22	1586.74	843.162

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1722.09	1584.17	838.597	2158.77	1606.75	845.387	1232.36	1507.27	841.648
1642.87	1666.62	844.804	1998.13	1555.25	839.183	2098.84	1592.57	840.377
2101.83	1625.49	845.093	1817.16	1488.98	835.671	1781.59	1623.44	844.900
1519.10	1594.68	842.791	2079.21	1592.87	839.024	2137.44	1566.99	842.452
2282.00	1596.67	838.162	1681.88	1635.51	844.585	2065.38	1542.59	839.635
2205.41	1587.75	839.746	2218.25	1609.59	842.572	1869.23	1603.53	835.423
2267.76	1616.23	840.239	1895.79	1572.21	843.984	2127.35	1615.18	840.403
1873.13	1643.82	834.187	1088.23	1629.65	879.271	2083.10	1654.55	843.007
2259.56	1568.19	840.862	1900.90	1601.35	836.234	2072.42	1610.54	840.270
1524.34	1673.99	842.637	1973.71	1650.33	840.349	2136.05	1581.90	838.982
1849.41	1595.41	840.764	2282.57	1580.19	838.069	2317.69	1591.18	845.801
2246.82	1598.42	832.005	1430.55	1578.38	840.814	2220.76	1588.02	838.572
1497.21	1442.40	844.758	2120.52	1590.97	845.442	2040.18	1594.73	832.311
1857.80	1657.28	843.510	1722.94	1601.29	840.840	1998.92	1576.97	839.931
2265.67	1592.58	838.760	2021.15	1615.93	838.675	1985.44	1540.58	844.478
2061.71	1626.10	840.175	2237.83	1600.79	843.925	1886.76	1566.98	840.675
2235.36	1599.72	832.043	2023.26	1586.70	842.271	1606.88	1579.01	851.682
1863.32	1628.17	836.931	2096.83	1591.29	838.613	2170.15	1566.73	838.619
2282.09	1598.06	845.791	1988.16	1642.26	841.995	1979.00	1564.86	845.612
2289.78	1582.48	843.576	2135.05	1588.44	836.933	1888.64	1528.55	843.601
1789.98	1594.87	845.270	1366.36	1670.39	876.460	2183.19	1618.11	838.730
2163.86	1574.95	840.500	2295.26	1604.03	840.407	1600.56	1645.83	834.750
1983.72	1598.75	830.568	1319.94	1605.50	845.872	2036.76	1613.20	836.557
2225.25	1608.37	844.329	1735.47	1559.24	844.039	2051.67	1601.83	843.644
1695.62	1579.69	828.630	2110.20	1623.56	842.923	1988.84	1581.46	841.618
2051.80	1615.91	844.782	2074.34	1645.00	844.991	1724.90	1604.36	843.979
2097.57	1610.77	843.762	1819.31	1597.76	843.024	1786.77	1556.67	845.723
1863.20	1635.59	844.611	1607.34	1564.91	842.009	2262.20	1602.83	844.564
2068.13	1612.97	839.592	1784.23	1620.45	836.622	2145.36	1596.95	844.761
2193.79	1601.07	836.692	1831.10	1578.23	840.479	2154.43	1571.06	837.915
1729.40	1632.42	842.315	2326.24	1605.31	845.252	1864.89	1509.19	843.477
2251.18	1581.18	842.201	2196.19	1601.07	839.903	2253.40	1580.46	838.646
2042.62	1631.06	833.205	1543.44	1643.37	838.138	1858.09	1617.65	843.577
2046.27	1611.21	841.883	1719.12	1567.00	843.808	2090.38	1601.93	837.454
1907.70	1599.48	838.763	2273.08	1594.75	837.875	2152.49	1605.33	843.803
1342.31	1651.33	874.858	1508.31	1625.81	845.758	2043.54	1548.90	845.488
2065.26	1570.11	844.724	2092.47	1622.56	845.093	1343.30	1605.71	844.546
2016.93	1574.63	838.524	1862.40	1660.03	845.592	1837.19	1576.91	843.881
1457.03	1632.51	836.299	2020.94	1594.44	840.935	1768.56	1578.75	843.396
1792.71	1548.20	843.991	2173.93	1620.16	845.004	1447.31	1597.32	879.690
2119.53	1626.47	842.021	2228.93	1633.80	841.586	1767.06	1593.10	834.172
1741.38	1620.64	844.341	1400.43	1518.63	864.359	2283.84	1589.12	845.488
1714.28	1673.14	843.374	1945.15	1653.00	845.064	1248.36	1540.81	867.706
2186.48	1611.14	845.178	1438.65	1581.73	946.997	2235.61	1609.19	844.857
2213.41	1592.58	839.145	2223.37	1589.42	836.990	1448.31	1595.24	840.706
2233.77	1590.29	843.807	2210.16	1627.31	845.614	2231.36	1562.08	841.002
2246.69	1583.64	842.331	2283.18	1602.70	837.239	1577.99	1579.14	842.918
1646.79	1659.05	844.225	1838.27	1553.56	839.590	1747.97	1636.13	843.738
2226.95	1626.75	841.640	2148.41	1622.67	845.468	2205.37	1611.19	841.886
2126.31	1598.80	841.832	2073.36	1607.38	842.148	1659.44	1657.82	845.672
2296.49	1588.33	842.604	2210.36	1635.31	836.988	2170.35	1565.63	845.889
2053.15	1612.43	837.469	2166.88	1625.43	844.372	2311.37	1587.86	840.211
2277.82	1599.88	842.370	1410.29	1630.99	841.779	1851.50	1606.77	842.081
1678.21	1624.34	839.840	2209.87	1602.80	833.319	1947.73	1613.11	843.522
2181.92	1583.09	835.058	2195.03	1643.12	835.543	2092.89	1567.59	838.337
1591.42	1585.74	837.257	2258.98	1614.87	841.797	1335.80	1587.42	845.450
1227.71	1586.11	843.815	1932.81	1547.28	843.684	2176.92	1547.27	843.916
2228.71	1622.48	842.187	2212.90	1592.65	840.204	2067.67	1616.94	843.903
2249.91	1598.74	844.259	2241.60	1602.15	843.292	1787.90	1591.58	844.227
1948.53	1578.24	843.559	1860.25	1602.22	834.140	2127.05	1584.95	844.699
1657.95	1575.30	843.062	2064.21	1624.40	841.700	2231.50	1585.95	837.544
2130.11	1614.59	844.688	1853.94	1620.76	839.735	1921.37	1623.65	831.977
2164.49	1592.46	831.225	1741.52	1655.78	844.722	2224.36	1568.05	841.324
2076.91	1597.72	834.507	2154.98	1626.79	836.571	2268.85	1600.39	842.565
2184.57	1637.43	841.780	1664.41	1679.65	836.643	2027.45	1606.29	845.710
1983.82	1620.26	841.933	2260.33	1599.20	837.034	1579.30	1613.64	844.105
2157.83	1607.19	839.018	1418.10	1673.22	836.526	1717.13	1611.66	839.360
2138.99	1590.03	842.928	1952.79	1582.49	841.633	2228.63	1602.04	837.858
1919.52	1599.21	845.034	2007.24	1554.46	844.783	2004.93	1580.07	841.151
1880.29	1641.98	844.951	2248.07	1600.27	844.370	2207.91	1584.41	841.539
2237.78	1586.23	844.677	1912.35	1626.80	843.980	1482.54	1546.98	840.103
1783.48	1577.93	844.005	2278.57	1593.46	834.528	2160.85	1593.91	842.494
2253.77	1565.98	844.874	1816.77	1607.42	838.725	2053.53	1575.12	837.432
1583.90	1573.94	836.906	1244.04	1623.32	918.492	2000.21	1615.90	839.809
1963.39	1583.36	841.777	2104.14	1588.01	843.965	2126.97	1601.07	833.823
1299.56	1554.61	844.323	1935.17	1525.38	845.379	2180.79	1610.42	843.095
1516.00	1688.62	843.932	1889.45	1600.59	840.956	1890.08	1618.20	845.120
1946.01	1615.68	833.418	2093.68	1612.06	844.267	2007.94	1625.90	841.443
2075.84	1578.67	843.623	2059.32	1610.93	839.724	2281.52	1600.06	838.865
2103.63	1606.26	838.524	1722.85	1625.21	839.566	1883.76	1591.64	835.734
1790.38	1541.59	842.823	2035.53	1645.29	843.567	2201.44	1626.00	835.153
2030.50	1638.78	845.251	1891.57	1599.22	844.176	1948.96	1559.02	845.642
2242.67	1596.42	843.594	1633.94	1579.36	844.812	2266.06	1578.97	841.077
1195.73	1617.07	845.197	1864.26	1578.90	838.693	1768.60	1666.12	844.145
2109.24	1609.29	841.246	2241.20	1598.85	842.348	2298.26	1591.49	845.481
2113.50	1582.50	840.514	1527.13	1569.16	837.944	2101.41	1573.08	840.709
1484.56	1592.19	836.741	1370.94	1597.59	843.515	2269.59	1566.14	843.098

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1604.81	1581.54	844.387	2285.92	1591.62	843.460	1915.13	1596.60	844.664
2047.48	1604.60	838.204	1610.17	1605.38	842.693	1471.24	1574.07	843.068
2153.32	1601.35	839.216	1853.98	1633.37	839.316	1995.30	1595.47	845.169
1794.59	1629.70	838.744	2124.31	1611.31	838.948	1614.12	1648.37	843.935
1491.19	1752.63	852.972	2026.99	1610.42	843.294	2209.76	1592.71	845.017
2288.94	1597.27	837.151	2027.92	1622.73	836.908	2266.03	1608.04	837.290
2015.26	1623.80	833.652	1232.45	1642.78	856.718	1836.74	1632.41	845.110
1955.71	1605.80	838.759	1755.51	1584.66	827.829	2185.63	1613.50	843.814
1649.17	1598.02	845.491	2209.96	1595.89	829.943	2121.15	1609.70	840.487
2229.62	1615.82	845.883	1183.04	1662.59	925.603	1655.94	1603.69	831.080
2279.87	1599.05	844.010	1958.92	1574.37	836.211	2085.42	1566.43	845.275
2111.47	1568.76	844.432	2094.69	1602.60	845.550	1755.86	1602.38	842.454
1624.94	1594.14	840.114	1462.77	1583.77	842.903	1996.00	1629.15	841.866
2150.44	1607.80	842.495	2211.73	1588.89	844.918	2070.95	1620.02	842.165
2047.03	1575.56	843.093	1537.15	1677.77	839.984	2144.29	1635.77	845.429
2259.16	1606.56	839.441	1801.94	1596.56	838.610	2040.88	1580.62	844.792
1928.59	1595.87	837.875	2135.42	1576.48	837.651	1795.50	1559.69	832.008
1429.01	1500.18	839.016	2073.47	1556.18	841.656	2223.43	1588.51	828.429
2041.73	1583.02	832.769	1943.22	1651.25	842.038	1228.00	1589.10	843.682
1755.11	1599.16	840.032	1737.54	1506.25	844.187	2235.74	1627.84	843.123
1992.86	1640.20	841.537	1974.95	1587.22	838.705	1651.98	1655.11	838.305
2038.06	1628.40	841.206	1834.56	1616.65	836.455	1713.24	1691.50	841.687
1802.50	1592.17	838.313	2160.89	1632.23	841.752	1557.23	1674.12	844.308
1842.82	1509.00	842.359	1217.10	1506.50	839.466	1984.96	1601.26	842.338
2212.11	1625.14	843.727	2050.20	1597.28	839.510	1998.35	1569.31	828.374
2270.08	1575.71	830.313	1449.42	1531.55	840.652	2228.15	1599.08	832.620
1783.27	1599.35	844.995	2217.81	1580.64	832.422	2141.26	1611.77	840.707
2160.52	1621.35	844.944	1979.10	1629.72	840.115	1854.03	1556.56	845.487
1686.32	1549.29	844.399	2238.48	1603.99	844.582	1864.93	1610.87	825.965
1833.08	1608.69	841.554	1799.73	1548.54	842.794	2087.52	1533.35	830.075
1865.80	1620.91	844.515	2186.67	1638.69	841.192	1451.74	1540.35	842.479
1858.44	1573.09	843.276	1937.43	1560.86	839.599	1298.58	1623.92	838.963
1285.05	1527.23	839.961	1495.32	1592.92	841.556	2136.35	1643.63	840.272
1883.89	1623.56	843.080	2019.16	1610.05	839.980	1187.58	1604.64	870.963
1748.35	1577.86	842.792	2029.39	1577.68	839.014	1821.05	1559.59	840.528
1888.10	1656.17	845.625	1305.76	1596.95	836.620	1408.40	1670.16	866.466
2224.21	1597.98	838.201	2102.45	1588.86	845.065	2267.43	1600.24	841.739
1394.25	1717.83	842.642	2005.60	1616.95	837.817	2081.84	1588.20	843.723
1815.08	1622.48	834.671	2015.84	1592.14	845.517	1356.40	1598.24	844.993
1692.57	1544.74	835.804	1990.79	1581.18	841.200	1539.46	1637.48	841.694
2250.78	1600.60	833.994	2085.70	1583.91	841.675	2084.79	1624.81	845.466
2088.57	1595.72	840.200	1934.94	1603.91	842.481	2097.09	1612.93	842.422
2102.27	1601.09	844.944	1959.80	1554.76	843.494	1659.15	1531.92	844.369
1702.42	1576.52	838.879	1677.92	1702.03	834.884	1990.72	1607.76	833.891
2125.95	1629.31	830.608	2146.88	1582.18	842.749	1850.24	1555.67	826.940
1999.79	1567.11	842.995	1375.80	1566.03	901.012	2214.79	1584.32	842.894
2228.69	1620.78	844.381	1669.49	1565.89	841.344	2244.31	1584.16	845.490
1921.36	1583.31	841.367	1363.78	1643.34	841.088	2166.59	1610.06	840.285
2207.41	1564.76	842.968	2031.16	1584.19	838.923	1829.43	1567.64	840.239
1529.03	1594.76	837.423	1985.46	1636.96	839.009	1951.90	1569.91	840.137
2098.85	1595.62	839.203	1973.87	1632.02	845.677	2249.67	1623.45	839.645
2129.63	1638.04	836.338	2226.85	1580.81	840.844	2035.17	1606.17	838.277
1679.36	1684.90	841.852	1891.43	1570.17	842.255	2085.16	1574.69	843.217
2021.45	1595.99	842.920	2145.39	1599.19	844.974	2224.65	1598.10	843.955
1513.51	1618.91	946.502	2054.80	1639.46	845.256	2282.99	1615.83	836.936
2082.18	1587.66	840.014	2087.53	1614.71	843.586	1608.08	1590.00	840.849
2271.86	1583.99	840.023	1803.77	1574.43	844.447	2230.02	1574.08	844.308
2093.29	1559.42	844.621	1773.36	1663.70	831.852	1810.86	1558.77	840.463
2218.56	1604.41	843.810	1818.77	1534.25	841.985	2124.04	1578.41	845.244
1969.70	1626.45	842.976	1830.52	1569.23	834.641	2073.18	1587.91	840.116
2038.95	1620.99	839.876	2047.74	1575.01	844.632	1847.90	1632.84	838.784
1993.35	1611.17	841.089	1814.95	1557.72	832.375	1706.90	1562.26	839.802
2256.90	1579.73	826.857	2204.04	1571.49	843.846	1906.18	1577.91	842.791
1942.00	1581.46	841.100	2003.02	1607.58	840.423	2255.72	1616.88	845.986
1669.14	1576.41	839.237	2230.74	1598.64	843.648	2154.29	1557.91	839.701
2269.75	1635.41	843.070	2010.46	1637.65	837.967	1887.10	1587.22	839.556
2068.71	1592.45	843.042	1699.25	1594.48	833.991	1851.21	1639.01	844.616
1784.41	1596.14	841.759	1859.61	1561.68	845.368	1795.66	1591.45	833.870
2214.89	1622.49	840.172	2016.54	1618.42	838.548	1918.35	1631.33	844.130
1196.27	1601.65	839.974	1905.37	1605.04	845.469	2288.45	1596.80	838.122
1531.67	1589.82	839.890	1625.89	1540.31	840.125	2250.00	1580.99	841.120
2062.49	1576.14	834.846	1868.12	1597.83	838.841	2238.31	1597.41	830.783
1795.71	1553.65	842.292	2189.85	1587.65	844.109	2166.90	1610.91	842.175
1749.14	1550.65	839.990	1983.75	1575.15	841.877	1769.52	1592.07	840.611
1539.28	1626.34	845.855	1823.74	1574.99	842.376	1178.92	1678.02	882.722
2122.66	1572.08	839.565	2113.53	1571.33	844.684	2040.38	1614.53	845.458
1835.24	1569.74	845.451	2172.59	1606.48	843.778	1979.75	1638.90	840.927
2185.77	1576.74	843.448	1471.01	1597.08	842.731	2252.39	1608.68	837.399
2003.49	1629.01	845.147	2004.36	1601.39	842.789	2153.40	1607.23	838.530
1415.04	1640.56	900.866	1282.08	1673.33	855.037	2024.29	1584.49	840.862
1695.43	1662.07	845.062	1969.77	1650.20	841.612	2141.45	1567.26	840.276
1881.63	1627.30	836.443	1435.95	1569.66	837.892	1295.50	1643.99	833.312
1729.54	1628.22	845.112	1878.57	1680.59	845.543	1823.08	1596.19	838.016
1145.63	1512.24	878.853	2231.22	1603.61	844.896	2189.41	1634.26	843.132
2078.51	1628.39	840.069	1869.97	1580.16	845.710	1954.38	1576.23	842.231
2306.68	1583.33	840.388	1919.53	1580.37	830.832	2289.08	1578.12	838.669
1399.86	1560.61	874.291	1192.60	1625.32	858.675	1747.72	1597.99	842.159

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1871.87	1608.24	844.880	1972.91	1560.42	838.936	1817.90	1594.67	842.566
2085.71	1622.78	843.737	2165.57	1584.11	836.622	2114.06	1559.03	841.595
2161.07	1592.15	833.658	2090.54	1599.11	844.826	2073.36	1535.74	833.423
1732.82	1621.71	844.610	1583.51	1583.92	844.983	2205.08	1576.53	845.267
2177.09	1571.65	844.598	2121.41	1619.94	842.304	1687.30	1568.46	845.884
1999.25	1594.62	841.849	1970.37	1566.06	836.652	1790.24	1557.15	827.038
2281.74	1602.48	841.752	2194.97	1587.38	844.374	1946.56	1602.05	833.745
1965.43	1627.98	835.569	1558.92	1590.46	844.648	1697.85	1599.38	843.733
1803.38	1608.59	842.297	1557.48	1603.05	838.839	2030.88	1588.83	845.132
1910.45	1578.04	836.282	1729.60	1567.94	837.946	1982.49	1638.25	838.941
2158.73	1553.28	841.884	1704.31	1587.88	837.387	2120.65	1582.76	837.949
1858.33	1628.06	844.817	1042.56	1598.49	831.854	2236.67	1591.65	836.561
2262.33	1588.25	838.122	2257.23	1605.35	839.688	1473.54	1681.93	842.573
1797.72	1577.48	838.301	2184.45	1607.95	845.231	2199.46	1613.04	843.184
2285.87	1589.65	844.316	2101.07	1631.38	840.884	1947.87	1557.74	842.387
1747.90	1594.42	843.470	1841.65	1626.35	844.397	2271.94	1624.30	835.321
2226.19	1609.51	843.600	2170.16	1592.68	837.795	1470.76	1620.03	843.458
2169.59	1652.99	841.208	1891.80	1659.70	839.192	1704.36	1613.31	845.198
2143.19	1618.55	839.533	2268.66	1610.04	845.290	1816.10	1640.39	844.763
1534.77	1609.31	840.153	2138.20	1593.61	844.098	1815.16	1593.70	845.513
1308.65	1652.90	833.045	1785.29	1570.14	841.370	1832.55	1651.97	845.356
2033.75	1581.08	844.507	1424.22	1641.70	844.922	2268.43	1598.30	840.800
1909.47	1614.58	840.758	2072.73	1621.35	839.766	2276.38	1596.04	843.352
2043.01	1622.34	842.101	1345.17	1544.46	845.806	1728.28	1605.35	834.163
2241.49	1634.76	834.794	2211.85	1582.19	838.625	2048.10	1630.19	844.266
1477.97	1610.27	883.845	2123.04	1635.21	843.107	1948.17	1513.30	843.555
2018.78	1554.48	845.479	2191.37	1575.37	838.968	2072.39	1589.00	839.686
1879.30	1567.56	839.051	1309.12	1627.41	847.657	1935.24	1605.47	838.345
2208.53	1581.05	845.599	2219.13	1611.77	845.221	2119.86	1596.84	842.285
2128.67	1596.37	845.205	2034.01	1561.44	844.633	1921.09	1618.50	838.129
2186.69	1606.04	843.183	2239.58	1622.89	839.496	1915.71	1653.29	838.483
2097.25	1543.93	839.949	1508.27	1616.02	908.423	2285.24	1613.69	845.784
2281.82	1591.88	844.014	1868.83	1655.44	831.551	1893.49	1558.69	844.621
2239.89	1597.59	835.055	1244.07	1571.65	839.922	2299.75	1597.09	842.629
2146.67	1618.39	840.991	1762.81	1475.93	841.391	2285.77	1591.20	839.500
2110.73	1624.78	842.051	2220.69	1579.70	840.456	2074.61	1562.89	835.666
2036.43	1592.57	841.917	1803.34	1593.51	835.231	1731.43	1614.07	843.550
2171.26	1609.07	843.745	1950.57	1572.59	845.673	2288.78	1587.45	843.039
2006.56	1610.01	833.317	1126.29	1553.29	861.424	1788.47	1615.37	835.869
2025.14	1629.08	840.469	2006.25	1562.79	844.008	2168.36	1590.17	844.561
1749.29	1628.84	844.409	1241.30	1651.23	838.729	1204.75	1630.60	873.998
1067.15	1531.00	861.595	2178.04	1618.65	837.214	1778.59	1611.01	828.655
1917.97	1533.66	843.134	2067.58	1602.22	833.953	2114.84	1654.02	844.001
1474.49	1639.48	838.369	2014.58	1635.44	843.570	1874.04	1643.71	844.271
1941.63	1583.44	845.066	2052.37	1627.44	842.611	2227.97	1588.22	836.093
1933.12	1519.86	827.544	1920.89	1594.33	834.728	2123.71	1594.20	845.588
2037.83	1609.83	843.817	2066.65	1614.18	844.420	1663.48	1552.14	842.838
1909.40	1600.26	831.869	2220.43	1617.85	845.447	2147.98	1609.87	839.441
2164.56	1602.86	837.858	2246.90	1604.17	837.112	1897.18	1625.25	840.614
1890.98	1589.58	839.010	1971.45	1595.94	840.363	2186.81	1618.14	845.010
2169.75	1621.79	844.069	2081.45	1602.72	845.672	2256.75	1605.01	842.447
2255.45	1589.03	838.095	1604.30	1653.92	843.562	1292.43	1630.04	837.370
1982.69	1615.83	837.580	2103.71	1591.12	845.297	1802.29	1527.43	827.802
1558.24	1604.62	845.539	1891.59	1581.38	844.784	1881.63	1646.28	843.951
2263.40	1599.55	836.579	2189.41	1590.96	838.164	1792.64	1593.40	845.282
2298.94	1605.60	842.183	1236.78	1612.82	861.279	1507.11	1561.19	845.512
2243.43	1592.43	842.916	2103.15	1614.99	845.085	2005.93	1639.51	830.563
1659.94	1567.40	840.489	2094.53	1580.22	844.016	1719.20	1584.35	843.420
1447.35	1596.35	842.953	2304.23	1590.13	843.263	2187.35	1569.96	834.166
1827.82	1583.32	841.038	2148.07	1603.73	838.487	2232.55	1574.54	842.832
2147.24	1597.38	826.353	1936.73	1591.73	842.849	2172.07	1571.37	827.148
1553.35	1620.70	843.368	1905.46	1648.34	844.589	2103.69	1582.82	841.274
2183.81	1574.63	834.537	2293.01	1609.08	843.015	2103.44	1544.96	845.979
1857.34	1670.02	836.428	2018.60	1575.83	843.547	1588.25	1572.67	839.737
1928.94	1537.95	839.643	1875.83	1558.67	841.822	2090.66	1613.12	839.150
2279.73	1586.57	843.576	1780.89	1551.35	839.609	1750.43	1591.64	843.711
2081.52	1639.74	838.648	1760.08	1567.89	842.241	2251.78	1606.18	838.622
1900.10	1588.68	842.647	1215.36	1552.86	832.397	2270.96	1591.48	841.262
1797.80	1651.44	843.845	1772.57	1589.92	835.543	2015.96	1621.97	843.378
2145.73	1615.79	845.253	2092.53	1591.17	844.115	2063.00	1588.80	834.789
2136.42	1561.82	844.282	1563.54	1652.37	845.486	2158.19	1611.84	836.858
2276.82	1603.86	843.073	1744.06	1604.36	838.671	1832.92	1579.06	843.213
2004.05	1581.07	843.231	2291.18	1590.73	844.722	1335.85	1627.00	877.726
1999.06	1674.37	839.709	2147.82	1574.00	840.492	1152.70	1653.38	882.755
2183.16	1597.30	841.353	1598.17	1585.71	839.791	1849.36	1612.97	845.564
2227.08	1605.39	836.242	1841.46	1603.05	842.494	2164.92	1582.33	843.813
1540.28	1510.95	843.753	2033.20	1585.00	828.120	2273.80	1613.14	840.735
2239.92	1627.81	840.514	2057.95	1611.60	835.793	2111.34	1616.92	839.561
1380.74	1605.56	836.424	1508.38	1671.69	841.872	1647.85	1623.35	842.317
2053.92	1606.21	844.969	2106.39	1610.54	843.702	1954.91	1661.01	842.622
2205.59	1610.00	838.248	1732.67	1527.20	844.272	1880.91	1551.66	836.894
1927.73	1603.13	845.328	2205.19	1604.51	839.182	2193.80	1599.74	837.135
1709.59	1566.39	841.010	2138.61	1581.83	843.430	2001.32	1581.78	839.204
2279.97	1595.68	837.989	2146.20	1625.06	845.285	1878.76	1583.35	843.867
2097.92	1605.09	839.089	1884.12	1614.42	843.995	1927.02	1618.16	843.229
1832.77	1614.00	838.386	1801.78	1534.36	834.393	1846.86	1632.45	843.534
2087.92	1653.53	841.112	1787.43	1590.31	845.387	1963.33	1603.16	831.268

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
2287.02	1573.98	844.327
1646.09	1561.83	836.360
1915.31	1659.54	842.678
2169.71	1612.63	844.695
2204.08	1580.86	830.049
2219.91	1639.64	842.523
1960.86	1604.73	843.527
1439.47	1589.66	844.013
2078.08	1574.32	843.715
1523.04	1643.00	837.926
2254.23	1582.55	845.025
1790.24	1570.85	839.545
1349.42	1663.84	844.486
2231.86	1601.02	837.777
2111.36	1638.56	844.415
2241.25	1593.36	825.774
1898.83	1625.17	839.204
2035.18	1657.60	845.070
1662.02	1557.95	844.039
2123.83	1570.49	844.765
2205.02	1586.78	842.341
1592.70	1563.74	836.692
2241.29	1615.20	838.972
1614.69	1612.87	834.922
1595.48	1645.48	843.963
2125.10	1596.60	841.128
2066.27	1522.50	844.525
1841.19	1589.61	841.021
1739.11	1562.31	842.071
2074.00	1558.18	840.512
1577.44	1514.67	845.719
1820.52	1591.37	837.103
1882.99	1604.03	840.660
1076.21	1495.01	882.090
2226.13	1581.39	838.086
1184.49	1524.33	880.849
2048.72	1608.74	836.691
2070.77	1596.38	836.801
1183.22	1682.06	840.398
2209.84	1612.64	843.054
1836.70	1597.40	831.783
1363.31	1615.40	842.960
2176.48	1588.70	844.465
1733.30	1589.07	844.239
1903.38	1619.22	843.083
1639.69	1522.26	841.618
2294.42	1590.35	845.629
2168.48	1592.62	839.886
2050.79	1563.35	838.361
1782.23	1651.49	828.423
2076.72	1608.50	845.199
2021.83	1618.22	842.489
2197.82	1597.80	836.657
1891.38	1615.14	843.979
2005.12	1553.25	845.648
1816.72	1607.85	844.710
1887.56	1552.53	842.059
1940.48	1551.75	842.334
1896.64	1610.12	844.789
1510.04	1531.85	845.176
2282.85	1594.32	845.143
2008.29	1594.17	843.883
2096.97	1645.82	838.577
1813.46	1643.12	842.166
2075.09	1598.99	845.071
2203.71	1603.50	845.138
2086.88	1560.19	845.690
2058.01	1588.33	836.908
2207.73	1598.34	836.008
2057.91	1588.35	843.136
1960.49	1567.96	839.279
1238.35	1650.36	852.127
2272.27	1592.59	844.648
2270.20	1601.69	843.480
1617.79	1617.18	842.011
1686.59	1539.27	835.823
1285.93	1628.39	885.650
1928.99	1598.26	844.244
1436.97	1599.95	837.257
2110.07	1628.96	834.123
2157.13	1623.24	844.788
2009.78	1644.59	846.148
1664.51	1531.67	836.285
2171.98	1574.23	841.733
1599.60	1585.26	834.835
2142.48	1581.34	844.230
2166.63	1545.02	839.370

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1793.32	1597.93	845.121
2189.47	1558.55	844.626
2252.56	1611.14	843.835
1705.52	1589.81	844.164
2202.41	1591.52	842.592
1735.92	1534.67	843.616
1716.75	1610.11	837.399
1692.54	1542.90	845.054
1895.84	1599.10	834.591
2128.42	1588.58	845.502
1674.92	1557.72	841.906
1724.00	1583.64	840.659
1757.90	1529.99	842.183
2010.75	1630.78	840.956
2300.39	1619.01	844.039
2129.15	1605.06	836.889
1929.51	1604.58	838.572
2083.69	1625.49	840.549
1668.47	1662.62	843.761
2258.81	1582.52	843.033
1566.50	1585.66	840.521
2045.31	1597.99	843.599
1809.32	1619.37	843.408
2006.42	1606.76	837.293
2064.34	1640.62	836.423
2137.48	1565.78	843.179
1646.46	1615.00	845.867
1663.10	1581.98	844.610
1803.56	1599.39	835.768
1809.96	1641.05	839.735
1866.47	1605.98	838.957
1808.43	1587.52	834.796
2032.28	1630.27	845.179
1572.72	1686.00	841.706
2140.28	1569.21	841.023
2262.96	1606.15	837.572
2076.41	1612.05	839.908
1838.01	1651.48	842.966
1682.41	1663.04	827.926
1827.16	1646.68	840.441
2169.82	1586.87	839.313
2098.53	1575.18	843.819
2189.44	1613.58	831.380
2087.63	1618.05	836.732
2162.24	1595.53	836.138
2013.08	1606.98	841.151
1212.81	1557.05	840.530
1208.72	1560.27	900.285
2051.15	1627.11	841.268
2182.69	1584.34	841.996
1964.58	1603.29	841.778
2182.34	1601.62	842.863
2275.95	1605.51	838.007
1582.25	1608.14	842.392
2073.02	1575.07	844.169
2192.04	1607.33	843.543
2116.77	1601.06	844.380
1502.44	1606.97	916.052
1883.23	1537.35	843.477
1660.35	1580.54	840.267
1772.04	1623.43	845.500
2183.06	1599.49	840.597
2254.08	1598.55	844.826
1687.90	1598.34	837.724
2206.45	1594.51	844.546
2081.42	1596.10	838.958
2058.10	1619.60	844.373
2185.50	1599.67	834.977
2278.21	1628.83	846.024
1923.04	1606.07	840.618
2002.04	1570.79	843.300
2239.80	1594.28	824.827
2057.17	1585.27	840.478
2035.24	1598.98	845.186
2013.32	1614.34	841.337
2256.80	1623.57	844.618
2099.19	1626.63	844.419
1847.79	1515.62	844.703
2228.59	1605.73	830.354
2297.63	1619.46	845.111
1427.15	1588.82	837.250
2035.72	1625.25	843.853
1471.17	1637.29	842.608
2236.26	1596.27	840.367
2150.07	1622.32	845.566
1231.73	1549.62	916.009
1626.53	1629.40	833.975

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1488.27	1618.62	867.908
2247.95	1616.87	835.401
1585.52	1647.87	842.754
2246.61	1610.02	842.718
1529.81	1553.32	843.076
1884.13	1593.45	827.984
2061.45	1583.11	843.294
1996.86	1626.98	842.875
1707.58	1504.62	845.754
1693.94	1622.76	838.971
1693.10	1597.69	836.920
2216.45	1584.63	843.824
1456.77	1585.38	838.003
1790.50	1559.82	843.910
2069.45	1610.75	844.850
2263.63	1614.84	843.843
1658.08	1592.64	837.742
1821.85	1559.11	837.672
2069.09	1612.46	844.247
1888.43	1558.62	842.279
2283.02	1582.10	841.887
2159.70	1559.14	840.223
1590.56	1590.16	841.883
2049.96	1554.24	841.544
2224.27	1603.05	832.254
1959.74	1598.18	843.375
2012.02	1600.31	839.564
2205.95	1593.94	845.180
1602.27	1535.64	831.610
2265.18	1586.58	843.203
1975.22	1567.65	838.484
2300.40	1589.98	843.665
2009.05	1636.32	843.513
1728.64	1651.69	843.431
2195.73	1570.92	841.464
2290.30	1605.87	833.743
2116.68	1571.41	836.296
2207.33	1588.33	841.109
1928.32	1557.07	845.521
2185.54	1583.77	839.391
2113.45	1618.88	832.798
2073.73	1602.75	845.613
2064.77	1628.57	836.085
2249.15	1607.67	838.981
1600.27	1509.81	843.234
2066.03	1548.85	841.360
1860.03	1570.88	845.772
1342.45	1646.98	843.862
1817.86	1563.43	837.105
2162.63	1609.98	845.028
1917.00	1579.14	840.651
1714.22	1567.05	839.231
2142.75	1608.52	844.683
2126.89	1629.60	842.600
2194.62	1611.73	838.414
2219.41	1616.15	843.507
1807.21	1609.93	836.623
2238.51	1607.16	845.670
1765.85	1640.94	833.585
2049.96	1567.74	838.633
2205.95	1593.32	838.900
1939.95	1586.31	840.129
2210.51	1602.38	843.809
1654.81	1598.12	840.520
2116.82	1585.04	844.824
2263.69	1606.33	844.242
1583.08	1560.06	843.860
1976.57	1506.77	835.967
1162.90	1602.98	845.902
2273.80	1589.53	844.592
2156.71	1580.96	831.988
1660.12	1575.54	842.019
1945.72	1646.18	833.639
2139.84	1600.88	845.343
2048.48	1596.60	842.752
2148.06	1624.23	843.899
2263.24	1602.76	839.300
2083.08	1545.55	840.850
1937.59	1543.63	843.471
2189.62	1599.28	837.763
1986.30	1605.07	838.460
1485.39	1595.88	855.709
2209.45	1595.29	832.393
2001.16	1614.54	837.834
1769.86	1567.49	844.872
2210.40	1583.57	843.803
2255.99	1599.03	842.157

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
2067.13	1642.44	837.151	2307.23	1600.19	843.529	1349.69	1562.15	872.544
2061.59	1575.01	843.151	1593.64	1612.36	841.571	2239.48	1614.37	834.524
2126.54	1587.36	842.634	2073.06	1656.75	840.264	2250.36	1599.66	845.597
1537.72	1681.42	845.340	1967.18	1574.56	843.210	1719.77	1598.54	841.786
1642.14	1558.82	841.927	1579.57	1558.93	840.284	1716.08	1607.53	843.875
1948.74	1598.93	843.866	1987.28	1592.05	842.385	2217.35	1625.90	834.235
2091.52	1598.50	841.816	1552.74	1645.60	842.215	1810.92	1623.32	828.724
1691.69	1547.70	843.293	1913.43	1639.48	842.416	2044.40	1667.54	845.556
1247.69	1614.79	843.358	1773.49	1527.89	845.568	1632.41	1604.25	840.789
1701.85	1559.14	828.041	1254.13	1614.71	832.064	2171.63	1607.41	841.865
2268.16	1608.15	843.195	2273.20	1590.50	843.532	1866.55	1617.94	845.564
2000.75	1583.02	844.997	2106.29	1612.74	838.995	2078.57	1592.49	844.616
2162.23	1603.84	843.197	2197.36	1593.76	844.492	1762.85	1627.83	839.010
1833.10	1582.07	841.197	1912.96	1576.24	839.434	1983.84	1566.75	839.798
2154.45	1628.27	835.327	2064.96	1591.37	841.428	2163.58	1575.42	844.218
1663.01	1585.28	839.827	1642.03	1639.23	842.441	2261.13	1588.77	838.144
2274.86	1600.58	842.233	1680.40	1609.16	845.516	2260.17	1592.55	829.549
2007.71	1586.47	840.968	1703.88	1544.92	833.253	1869.26	1633.14	842.490
2232.12	1613.69	841.028	2110.13	1625.12	845.168	2010.99	1574.81	844.150
1991.62	1596.84	845.630	1937.18	1577.40	840.773	2198.47	1601.86	844.129
2047.15	1599.02	843.807	1918.42	1661.05	839.631	1707.96	1714.51	843.476
2261.46	1599.20	838.114	1776.62	1570.01	841.838	1812.21	1580.39	838.216
1853.28	1618.01	843.766	2119.94	1603.97	843.948	2213.18	1639.74	841.410
2218.98	1621.25	842.492	2004.91	1612.04	843.145	1951.18	1652.95	838.553
1992.95	1600.16	839.256	2209.99	1612.59	836.676	2186.34	1577.15	835.066
2309.00	1588.86	844.245	1835.48	1581.41	838.206	1390.42	1662.73	872.645
2009.36	1628.10	840.907	2055.92	1622.66	843.201	1982.94	1591.07	843.221
1720.83	1603.12	842.570	2022.35	1573.78	839.823	2256.56	1583.49	836.018
2153.31	1564.76	837.627	2043.78	1588.09	838.957	2276.02	1578.28	844.872
1791.87	1627.10	833.491	2269.47	1607.75	840.190	1884.67	1545.88	840.854
2106.79	1603.92	845.324	1885.99	1609.98	844.495	1880.13	1623.91	841.932
1506.42	1714.51	842.731	1510.34	1581.54	844.131	2165.02	1582.40	843.710
2168.36	1583.79	837.845	1770.34	1630.95	842.209	1852.54	1572.77	845.035
1955.83	1579.80	845.241	2021.36	1604.84	837.320	2205.43	1602.89	841.782
1169.96	1546.93	845.084	2050.08	1552.66	839.744	1946.99	1595.75	844.064
1880.01	1627.06	834.220	2069.77	1611.08	832.687	1553.97	1591.08	844.240
2289.93	1583.17	837.825	2016.62	1598.81	838.258	2188.59	1607.19	843.815
1845.72	1551.49	836.664	1743.35	1572.85	842.537	2067.10	1618.72	833.611
2065.12	1563.79	840.191	1889.38	1579.10	838.460	2182.83	1620.22	839.833
2261.60	1599.82	844.601	1728.25	1671.51	844.872	2168.74	1558.51	834.334
1468.66	1589.24	845.177	1913.04	1551.02	838.480	2023.27	1585.09	843.208
2060.47	1620.29	841.647	1560.98	1647.85	842.588	2222.31	1634.61	841.025
1290.12	1606.64	839.568	2051.91	1620.89	840.880	1835.97	1592.09	842.179
1759.92	1542.66	845.107	1991.18	1594.90	844.169	2100.02	1592.41	838.139
2097.43	1596.54	842.696	2115.93	1557.09	844.743	1272.03	1578.71	854.461
1389.38	1683.76	842.107	2024.20	1578.21	842.934	1431.11	1589.74	841.332
1913.92	1595.60	842.948	1893.17	1582.43	845.700	2090.45	1607.08	844.443
2192.43	1619.86	841.068	2156.83	1596.18	835.857	2079.40	1561.07	843.284
2097.34	1591.04	843.831	2055.90	1541.93	840.434	1973.32	1551.61	838.285
2104.81	1618.32	835.454	1934.69	1599.95	841.457	2283.79	1590.49	845.021
2203.94	1632.36	845.632	2110.00	1630.83	842.852	1325.54	1600.20	906.197
1448.46	1625.17	839.522	2228.34	1601.19	835.881	1724.89	1617.55	838.141
2269.45	1591.71	842.299	2076.54	1607.33	838.091	1266.73	1666.63	840.162
1859.01	1584.32	840.763	1941.14	1653.51	845.906	2142.38	1658.14	844.747
1610.57	1643.01	844.291	2092.24	1588.56	843.346	2037.07	1517.71	845.252
1666.45	1575.76	836.308	1919.28	1603.68	843.924	1520.07	1654.80	837.526
2052.82	1613.34	840.440	2058.72	1600.89	837.711	1379.79	1565.19	932.130
2260.88	1582.39	845.488	1948.63	1610.49	845.403	2314.39	1628.45	841.931
1873.76	1545.04	841.811	1903.31	1645.24	842.292	1980.42	1596.28	845.112
1832.26	1685.23	836.272	1501.83	1711.86	837.477	1684.94	1626.71	845.148
2088.14	1604.29	836.325	1704.85	1547.65	837.962	1858.22	1579.43	843.993
1994.41	1589.65	843.345	2073.83	1600.80	843.186	1877.81	1583.07	845.192
2257.33	1589.24	843.659	2287.28	1596.89	838.692	1651.69	1608.25	842.030
1942.69	1601.42	822.896	2281.61	1603.28	840.639	2240.08	1607.96	837.481
2090.79	1570.99	838.792	2141.25	1623.68	844.591	1862.86	1648.81	837.656
2147.21	1612.94	843.584	1826.08	1581.27	838.036	1982.11	1605.96	839.523
2175.99	1576.96	841.951	1910.27	1609.60	836.569	2161.53	1574.16	842.383
2152.10	1584.13	838.609	2302.82	1612.05	843.001	2098.32	1623.72	842.318
2007.34	1627.82	837.935	2286.33	1607.63	844.771	1811.69	1549.47	842.748
2284.88	1592.08	842.568	2327.69	1597.86	842.453	1957.62	1566.99	842.805
2290.61	1597.00	843.235	1903.74	1606.37	842.967	1768.91	1559.39	834.012
2080.79	1630.87	838.519	2095.18	1630.10	841.761	1965.54	1588.78	844.173
2009.30	1546.81	842.943	2085.21	1606.74	838.426	1293.89	1612.84	859.386
2148.04	1588.10	839.337	2220.60	1616.22	844.059	2008.77	1609.14	845.590
2119.90	1615.70	839.302	2196.20	1606.97	845.445	2267.24	1588.46	828.816
2087.54	1567.15	841.411	1553.57	1545.25	832.018	1446.41	1571.92	845.468
1757.62	1607.29	844.646	1729.01	1574.28	839.902	1941.10	1606.92	839.571
1883.53	1609.59	828.063	2046.42	1607.74	843.994	1180.14	1556.17	847.361
2247.82	1608.28	838.683	1944.19	1570.44	845.329	1848.90	1658.07	841.849
2156.30	1624.26	842.482	1991.85	1582.39	844.428	1984.60	1633.31	843.534
1636.65	1621.43	840.081	1906.40	1590.46	843.083	2105.89	1607.81	843.547
2235.57	1614.58	835.024	2228.06	1597.46	844.947	1586.32	1702.79	838.591
2171.76	1561.75	839.118	1988.45	1642.06	842.577	2256.85	1597.65	830.591
2245.82	1580.67	843.897	2241.26	1624.72	842.542	1933.43	1597.97	845.588
1930.03	1569.30	834.750	1413.96	1609.05	842.591	1696.89	1604.06	841.124
2232.02	1612.36	840.635	1852.43	1607.30	837.416	2099.48	1546.43	843.628
1959.18	1618.15	831.742	2150.87	1559.15	844.193	2132.66	1610.89	840.193

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)	X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1899.66	1620.62	836.913	2032.63	1620.13	845.887	1639.38	1600.52	837.289
1527.48	1625.77	845.606	1927.76	1590.51	839.908	1954.98	1607.23	841.472
1839.80	1660.48	845.097	1808.45	1565.00	840.396	2091.61	1640.28	842.539
2079.20	1584.08	844.138	1790.69	1562.82	844.193	1845.09	1620.08	842.879
2186.56	1589.52	844.789	1854.54	1570.64	844.090	1973.69	1591.88	844.714
2173.49	1590.26	841.614	2149.61	1600.26	844.834	2263.89	1624.03	843.113
2238.65	1578.70	845.801	1768.54	1658.69	839.840	1733.54	1600.60	843.490
2244.02	1591.82	845.254	2182.96	1605.03	845.054	1469.40	1613.50	838.553
2286.17	1593.17	844.619	1843.17	1604.23	842.232	2101.30	1601.52	841.103
1797.60	1573.48	837.980	2193.79	1598.66	840.163	2268.18	1625.69	844.605
1714.62	1591.20	841.471	2011.37	1624.03	836.380	2261.86	1610.79	843.686
1908.81	1578.73	844.903	2136.35	1610.21	839.597	2309.38	1607.33	838.429
1922.33	1612.34	842.610	2081.26	1576.19	838.207	1923.91	1619.01	841.823
1958.58	1601.75	842.835	1736.19	1712.64	845.043	2276.98	1600.92	840.293
1846.23	1551.11	843.457	2257.89	1586.86	831.571	2130.22	1638.66	842.702
1820.64	1634.56	844.648	1728.94	1620.42	845.042	1617.30	1644.52	844.153
2164.01	1608.90	841.935	2258.53	1572.32	841.636	1557.58	1669.99	845.939
1997.16	1580.49	832.192	1771.12	1572.18	838.383	2249.23	1628.57	835.968
1962.11	1600.98	841.320	2321.68	1594.86	842.027	2271.42	1609.27	842.487
1987.30	1628.35	834.256	1986.32	1593.88	839.724	1760.59	1622.98	844.917
1857.43	1590.64	837.359	2071.28	1582.43	845.068	2013.28	1620.46	842.237
1929.44	1643.91	841.998	2222.08	1616.22	837.049	1607.60	1618.49	844.328
2272.83	1605.82	843.208	1923.64	1635.21	841.913	2109.14	1610.71	843.348
1653.78	1596.23	836.436	2192.66	1600.35	837.795	1982.91	1568.17	836.792
2152.35	1623.04	837.624	1107.64	1586.44	844.622	1717.29	1585.41	841.773
2095.59	1628.40	832.731	2103.65	1558.71	842.868	1971.40	1592.86	827.771
1988.45	1616.15	838.841	1785.35	1560.01	845.592	2144.22	1557.53	845.674
1701.58	1551.76	844.564	1670.01	1582.57	830.700	2282.40	1615.60	839.371
2108.61	1611.37	841.393	1981.13	1563.13	844.819	2188.67	1602.39	844.059
1410.92	1645.14	835.554	1541.98	1679.33	842.405	1990.18	1574.05	843.813
1949.24	1558.35	838.190	2291.41	1597.83	844.093	1946.53	1643.20	844.625
2114.25	1610.85	836.841	1649.42	1577.21	843.045	2027.87	1584.25	843.029
1916.39	1638.71	832.265	1641.51	1611.29	845.837	2117.32	1574.34	834.011
2076.51	1597.99	836.634	1763.14	1580.18	841.083	2010.39	1634.27	841.575
2277.96	1597.60	841.818	1704.21	1632.91	839.291	2228.31	1598.05	844.101
1963.50	1602.23	844.747	1842.53	1635.10	842.800	2216.49	1606.48	841.655
1639.58	1599.10	843.358	2250.08	1596.32	838.956	2078.97	1630.18	840.887
1847.38	1597.31	842.648	1842.52	1607.65	843.834	1992.35	1603.52	828.248
1932.33	1591.78	842.931	2011.76	1543.87	836.313	1738.88	1559.63	841.091
2237.97	1604.77	845.316	2142.59	1580.51	839.869	1789.26	1580.56	843.198
1628.26	1593.35	842.344	1890.54	1599.56	838.818	1771.85	1599.64	840.370
2143.28	1607.48	838.293	2189.07	1617.97	843.442	1838.37	1561.36	842.050
1361.82	1593.91	885.742	1781.45	1603.48	844.439	1787.71	1574.42	835.640
2207.72	1631.81	839.361	1964.61	1551.83	845.134	2078.00	1623.35	843.327
1872.15	1639.84	842.536	1683.80	1523.02	842.335	1410.88	1629.51	838.607
1739.27	1643.58	844.132	2232.09	1594.07	835.721	2280.23	1584.71	843.920
2197.33	1607.89	840.289	2105.94	1557.45	836.729	1920.07	1561.12	842.764
1522.75	1598.86	831.857	1932.89	1611.77	843.593	1788.17	1595.07	833.130
1612.36	1627.90	838.071	2253.52	1627.73	831.912	2102.30	1632.07	845.454
2247.04	1597.57	841.619	1636.20	1658.59	843.592	2087.58	1577.25	840.731
1794.94	1578.02	843.911	1679.73	1575.19	835.666	2252.43	1589.70	844.755
2269.69	1597.19	845.027	2174.41	1571.21	839.613	2224.56	1573.41	843.254
1853.83	1599.20	843.656	2079.98	1575.07	837.814	2239.10	1602.56	845.545
2183.78	1602.63	845.068	1844.81	1546.47	827.295	1859.20	1600.24	842.280
2285.13	1599.72	844.184	1886.08	1591.17	834.385	2279.47	1572.72	843.318
1796.71	1585.97	838.407	1945.87	1587.06	836.965	1792.63	1597.49	845.055
1831.16	1609.66	843.342	1613.98	1562.47	841.135	2129.76	1578.57	842.295
2078.12	1622.36	845.000	2293.10	1608.36	833.145	2209.55	1586.15	841.809
1227.94	1592.26	845.201	1710.32	1582.47	828.044	2240.59	1595.86	843.716
2125.09	1568.12	845.337	2137.64	1586.14	844.062	2009.73	1630.40	839.365
2296.32	1595.32	838.526	1635.04	1636.14	845.330	2166.29	1603.38	840.412
1973.30	1580.19	830.444	2026.97	1634.60	843.867	2082.85	1553.00	844.037
1961.62	1617.15	842.225	1432.30	1602.11	845.804	2109.16	1641.14	838.151
1889.41	1622.06	844.657	1935.29	1570.31	841.376	2269.20	1601.51	837.776
1979.90	1554.15	841.123	1538.09	1608.12	889.173	2242.86	1599.66	836.259
1742.37	1602.59	844.129	2164.30	1583.16	836.392	1690.86	1508.60	843.862
2119.69	1592.08	839.364	2337.63	1602.37	839.538	1933.96	1547.41	844.494
1849.90	1621.37	843.801	1845.79	1624.99	845.940	2003.30	1578.44	845.513
2213.12	1558.87	841.129	1814.25	1639.53	836.914	2168.85	1613.04	844.329
1647.63	1625.59	843.909	2182.17	1593.16	844.777	2199.14	1605.51	843.002
2292.49	1588.66	845.574	2308.10	1593.50	844.797	1940.71	1602.33	845.423
2055.71	1579.29	843.112	1949.95	1640.29	833.954	1633.72	1599.32	836.970
1835.00	1641.98	839.697	1716.23	1612.67	842.786	1481.85	1608.02	842.692
2125.88	1573.80	843.788	2253.53	1614.47	843.585	2132.79	1591.56	844.815
1811.96	1627.21	845.535	1905.89	1552.52	842.569	1912.13	1604.78	836.603
1748.38	1530.55	841.096	1935.27	1593.75	838.568	1931.42	1558.73	838.058
1764.55	1638.97	839.682	2137.65	1642.92	842.573	1737.14	1626.41	845.648
2300.22	1606.98	839.005	2103.77	1551.49	843.706	1888.26	1596.70	842.283
2063.59	1594.60	845.563	2127.89	1610.90	838.600	1914.57	1585.68	845.509
2285.60	1592.19	841.818	1993.56	1600.37	836.826	2032.41	1638.24	836.702
2157.80	1594.85	843.693	2157.44	1620.50	845.471	2290.17	1608.15	842.619
1376.00	1539.65	845.099	2097.75	1613.02	839.467	1860.39	1665.82	843.526
1952.55	1606.85	845.104	1834.47	1648.52	844.904	1876.36	1644.49	845.237
2259.04	1607.01	839.038	1910.72	1613.08	845.176	1987.01	1603.12	845.340
2095.43	1604.17	843.865	2156.79	1605.61	840.270	2147.19	1625.66	839.904
2082.83	1577.62	841.798	1853.81	1539.86	835.428	2188.40	1618.50	836.430
2267.75	1604.10	834.438	2122.34	1579.86	836.660	1902.91	1632.92	844.055

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
2025.93	1596.34	845.570
1781.19	1582.46	840.773
1598.23	1598.58	841.447
1993.90	1527.28	842.597
1962.01	1642.03	842.443
2188.97	1634.75	844.466
2301.36	1602.19	844.504
1761.30	1570.53	842.593
1805.11	1670.85	840.384
1531.58	1636.23	841.198
1671.14	1586.53	840.068
1942.27	1614.23	833.964
1740.40	1575.64	844.388
2165.34	1623.08	839.304
1778.30	1671.06	844.681
1937.93	1607.63	840.380
1700.82	1549.95	840.638
1199.96	1609.36	870.204
1595.99	1590.11	842.801
2023.40	1602.87	842.299
2161.86	1637.04	841.472
1613.19	1589.77	840.893
2063.86	1572.65	841.850
2010.95	1584.67	844.730
2140.66	1613.52	844.992
1734.61	1623.17	842.741
1847.58	1591.00	843.589
2275.08	1579.75	844.328
2262.00	1625.04	841.754
1960.35	1582.18	838.540
1786.46	1662.59	836.326
2236.11	1608.51	841.040
2117.33	1606.13	845.185
2170.55	1614.12	841.115
1861.70	1625.81	837.948
1973.17	1551.44	841.496
1962.87	1558.80	836.734
1606.64	1632.49	844.618
2084.83	1586.74	838.351
1869.05	1594.17	843.810
1829.71	1618.96	844.321
2100.47	1573.37	845.097
2122.20	1535.43	841.582
1892.31	1608.15	841.822
2203.47	1626.82	845.025
1832.84	1625.86	842.420
2218.38	1602.55	843.691
1882.62	1594.01	840.517
2092.96	1650.42	838.288
1926.41	1558.35	838.651
1982.16	1612.58	845.760
1973.03	1575.98	843.518
2167.63	1584.35	839.508
1900.57	1596.85	842.447
2244.11	1598.35	839.080
1854.46	1562.49	843.394
1796.63	1594.12	843.898
1627.22	1555.81	841.583
2085.79	1573.39	845.178
2233.51	1594.84	844.093
1859.77	1529.25	839.236
2283.09	1584.86	845.295
1689.78	1602.27	845.135
2208.60	1570.72	838.331
1088.42	1610.99	820.511
1509.04	1689.98	844.264
1464.43	1574.20	845.573
1928.65	1593.39	842.355
2187.18	1603.48	836.028
2197.45	1600.40	841.941
2209.71	1587.30	833.588
2282.80	1620.36	844.663
1921.91	1521.30	832.222
1919.99	1562.20	845.385
2005.41	1617.72	843.819
1644.64	1586.80	842.025
2018.22	1575.82	845.307
2231.82	1587.26	835.625
1798.98	1625.24	842.141
2134.01	1599.16	845.587
2139.65	1603.52	843.315
2135.06	1617.45	835.394
2011.78	1622.53	844.509
1459.15	1533.62	828.429
2126.23	1617.34	843.215
2074.48	1587.61	845.282
1891.41	1605.12	845.283

X-coordinate (Feet)	Y-coordinate (Feet)	Elevation (Feet)
1963.55	1598.28	841.421
2292.82	1591.48	839.196
2142.70	1577.11	842.590
1972.90	1571.76	844.696
1875.03	1622.20	842.059
1444.19	1559.71	842.252
1624.48	1555.73	844.145
2119.02	1611.31	840.981
1935.83	1635.34	838.725
1934.61	1601.80	838.608
2285.06	1596.92	841.481
1775.70	1575.71	840.107
2087.57	1613.52	842.420
1772.08	1579.56	843.863
2160.82	1628.35	839.668
1873.74	1587.48	838.568
2178.89	1594.94	842.498
2280.55	1597.75	841.123
1763.91	1656.43	832.535
1828.62	1600.76	843.536
2209.17	1561.63	841.139
1502.65	1553.42	842.709
1952.81	1617.01	842.526
1892.49	1523.22	840.703
2202.20	1613.32	834.254
2262.67	1589.83	844.386
1528.27	1551.62	845.051
1845.98	1640.46	843.907
1702.94	1652.32	844.038
2115.89	1608.73	833.565
2277.49	1608.09	841.952
1983.54	1649.69	829.908
2254.50	1594.58	839.135
2205.00	1599.16	842.737
2116.27	1624.33	837.361
1302.87	1574.80	885.035
1501.45	1594.31	840.400
2265.80	1602.16	839.923
2038.08	1592.13	844.733
1728.99	1622.52	834.835
1977.97	1606.07	841.639
1133.81	1627.90	857.574
2099.81	1621.09	841.344
2054.77	1619.19	843.672
1857.46	1542.21	833.348
2027.95	1564.46	843.328
1698.23	1589.71	845.049
2126.88	1601.83	837.640
1389.80	1619.94	831.954
1639.95	1627.35	841.794
2011.60	1561.40	837.276
1436.09	1644.76	840.180
1988.46	1610.23	838.793
1915.56	1605.28	843.652
2149.56	1634.82	843.694
2025.46	1592.44	841.809
2188.24	1537.82	845.480
1827.18	1576.39	839.254
2284.45	1594.48	842.539
1887.70	1571.73	835.642
2145.58	1617.72	841.222
1829.76	1598.33	839.651
2207.97	1585.46	843.788
2269.52	1592.41	840.112
2199.26	1606.28	839.910
1665.46	1634.59	845.043
1645.75	1687.23	837.726
2228.35	1569.80	844.648
2067.18	1597.65	825.444
2202.28	1603.68	844.986
2215.84	1579.14	844.960
2307.49	1582.29	839.958
1634.07	1641.29	843.649
2224.52	1619.63	834.621
1672.58	1592.96	844.723
1707.21	1574.79	844.547
1866.15	1590.92	841.385
1935.52	1514.23	835.429
1678.47	1663.44	836.610
2242.92	1583.36	845.629
1551.61	1641.84	841.118
1969.57	1623.35	843.434
1891.62	1561.92	843.623
2263.49	1572.67	843.524
1612.16	1629.23	845.661
2273.74	1604.94	840.070

Appendix D

Discussion of Free Phase 1,2-dichloroethane and Tetrachloroethylene Migration

According to Huling and Weaver (1991), hydraulic conductivity is a function of the density and viscosity of the fluid, as well as the permeability of the porous medium. This relationship is expressed by the equation:

$$K = k\rho \frac{g}{\mu}$$

where
K = *hydraulic conductivity*
k = *intrinsic permeability of the medium*
ρ = *fluid mass density*
g = *gravity*
μ = *dynamic (absolute) viscosity of the fluid*

Therefore, the ratio of the hydraulic conductivity of the fluid through the porous medium to the hydraulic conductivity of the water through the same porous medium can be written as:

$$\frac{K_c = \dfrac{k\rho_c g}{\mu_c}}{K_w = \dfrac{k\rho_w g}{\mu_w}}$$

where
K_c = *hydraulic conductivity with respect to the contaminant free phase fluid.*
K_w = *hydraulic conductivity with respect to water*
ρ_c = *fluid mass density of the free phase contaminant*
ρ_w = *fluid mass density of water*
g = *gravity*
μ_c = *viscosity of the free phase contaminant fluid*
μ_w = *viscosity of water*

This relationship simplifies to:

$$\frac{K_c}{K_w} = \frac{\frac{\rho_c}{\mu_c}}{\frac{\rho_w}{\mu_w}}$$

The relative hydraulic conductivity for tetrachloroethylene (PCE) with respect to water can be determined by the following relationship:

$$\frac{K_{PCE} = \frac{\rho_{PCE}}{\mu_{PCE}}}{K_w = \frac{\rho_w}{\mu_w}}$$

Substituting the appropriate valves for ρ_{PCE}, ρ_w, μ_{PCE}, μ_w (Huling and Weaver, 1991), we obtain:

$$\frac{K_{PCE}}{K_w} = \frac{\frac{1.625}{0.89}}{\frac{1.00}{1.00}} = 1.83$$

Therefore, the hydraulic conductivity of free phase tetrachloroethylene will be 1.83 times that of water. The geometric mean hydraulic conductivity of the upper, unconfined sand aquifer was found to be 1.77×10^{-2} cm/sec (RREM, 1992a). The hydraulic conductivity for free phase tetrachloroethylene in this unconfined aquifer is:

$$K_{PCE} = (1.77\times10^{-2}\ cm/\text{sec})\ \ (1.83) = 3.24\times10^{-2}\ \ cm/\text{sec}$$

The average linear seepage velocity can be calculated using the following formula (Fetter, 1988).

$$V_s = \frac{k}{\theta}\left(\frac{dh}{dl}\right)$$

where

V_s = *seepage velocity*

K = *hydraulic conductivity*

θ = *porosity*

$\frac{dh}{dl}$ = *groundwater gradient*

Using the values of K_{PCE} = 3.24x10^{-2} *cm/sec*, θ =0.35, *and* $\frac{dh}{dl}$ = 0.00085 (RREM,1992a), the seepage velocity of PCE can be determined to be:

$$V_s = \frac{3.24\times10^{-2} cm/sec}{0.35}(0.00085)$$

$$V_s = 7.86\times10^{-5}\ cm/sec$$

$$\approx 80.2\ feet/year$$

$$\approx 0.22\ feet/day$$

According to Huling and Weaver (1991), free phase tetrachloroethylene, upon encountering a relatively impermeable confining layer, will migrate down the dip (or slope) of the top of the layer. According to the groundwater model, the top of the confining layer underneath the downtown area of Webster slopes to the west-northwest with a gradient of approximately 4.4 percent. Using this value for *dh/dl*, the rate at which free phase tetrachloroethylene can move down-dip can be calculated:

$$V_s = \frac{3.24\times10^{-2}\ cm/sec}{0.35}(0.00085)$$

$$V_s = 4.07\times10^{-3}\ cm/sec$$

$$\approx 4197.5\ ft/year$$

$$\approx 11.5\ ft/day$$

Using the calculated retardation factor of 5.22 within the upper, unconfined sand aquifer the seepage velocity using the measured groundwater gradient of 0.00085 is reduced to 15.36 feet per year and the migration along the top to the confining layer is cut to 804.1 feet per year.

Similar relationships can be constructed for the migration of free phase 1,2-dichloroethane. the relative hydraulic conductivity for 1,2-dichloroethane with respect to water is determined by the following relationship.

$$\frac{K_{DCE}}{K_w} = \frac{\frac{\rho_{DCE}}{\mu_{DCE}}}{\frac{\rho_w}{\mu_w}}$$

where

K_{DCE} = *hydraulic conductivity of* 1,2-*dichloroethane*

ρ_{DCE} = *fluid mass density of free phase* 1,2-*dichloroethane*

μ_{DCE} = *viscosity of free phase* 1,2-*dichloroethane*

This relationship simplifies to:

$$\frac{K_c}{K_w} = \frac{\frac{\rho_c}{\mu_c}}{\frac{\rho_w}{\mu_w}}$$

The relative hydraulic conductivity for tetrachloroethylene (PCE) with respect to water can be determined by the following relationship:

$$\frac{K_{PCE} = \frac{\rho_{PCE}}{\mu_{PCE}}}{K_w = \frac{\rho_w}{\mu_w}}$$

Substituting the appropriate valves for ρ_{PCE}, ρ_w, μ_{PCE}, μ_w (Huling and Weaver, 1991), we obtain:

$$\frac{K_{PCE}}{K_w} = \frac{\frac{1.625}{0.89}}{\frac{1.00}{1.00}} = 1.83$$

Therefore, the hydraulic conductivity of free phase tetrachloroethylene will be 1.83 times that of water. The geometric mean hydraulic conductivity of the upper, unconfined sand aquifer was found to be 1.77×10^{-2} cm/sec (RREM, 1992a). The hydraulic conductivity for free phase tetrachloroethylene in this unconfined aquifer is:

$$K_{PCE} = (1.77 \times 10^{-2}\ cm/\text{sec})\ \ (1.83) = 3.24 \times 10^{-2}\ \ cm/\text{sec}$$

The average linear seepage velocity can be calculated using the following formula (Fetter,1988).

$$V_s = \frac{k}{\theta}\left(\frac{dh}{dl}\right)$$

where

V_s = *seepage velocity*

K = *hydraulic conductivity*

θ = *porosity*

$\frac{dh}{dl}$ = *groundwater gradient*