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HEALTH RISK ASSESSMENT

AND

HEALTH-BASED CLEANUP LEVEL RECOMMENDATION

SAFETY-KLEEN SERVICE CENTER
WICHITA, KS

DRAFT

RECEIVED
BUREAU OF
JAN 14 1992
AIR AND WASTE
MANAGEMENT

Prepared for

SAFETY-KLEEN CORP.

777 BIG TIMBER ROAD
ELGIN, ILLINOIS 60123

Prepared by

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WESTERN ENVIRONMENTAL HEALTH

EXECUTIVE SUMMARY

The subject of this Health Risk Assessment (HRA) and Health-Based Cleanup Level Recommendation (HCLR) is the property currently occupied by Safety-Kleen Corp. (S-K), which is located in Wichita, KS. Residual concentrations of organic chemicals associated with mineral spirits apparently originating from a leaking underground storage tank (UST) have been detected in soil and superficial ground water in portions of the immediate vicinity of S-K's property. Chemical residues were discovered in mid-1989 during a preliminary assessment necessary to prepare a closure plan for the USTs at the facility. Since discovery of residues, the local hydrogeologic system has been further investigated in order to characterize the areal distribution of chemical residues in soil and groundwater at the site. The HRA component of this report is conducted for the purpose of identifying and assessing any existing or potential future impacts on human health that may exist at the site due to the presence of the chemical residues in soil and ground water. With the foundation provided by the HRA, the HCLR component is conducted for the purpose of developing site-specific health-based cleanup levels for impacted soil and ground water to mitigate any current or theoretical future impacts on human health.

The HRA presents an evaluation of the potential impacts of soil residues on the health of humans who may work in the vicinity of the S-K site. In general, there is no evidence that humans who currently work in the vicinity of the site are at significant risk for adverse health effects due to the presence of chemical residues in soil or ground water. Based on maximum existing concentrations of chemical constituents in ground water, the ground water at the site is not safe for domestic purposes. However, in view of land-use trends and institutional constraints on use of local superficial ground water for domestic purposes, there is no evidence of any increase in pre-remediation risk associated with chemical residues in soil and groundwater. It should be emphasized that there are numerous sources of uncertainty in the baseline HRA that collectively are likely to produce a large over-estimation of risk. Therefore, it is highly unlikely that the actual risks posed by chemical residues present in soil and ground water at the site are greater than the findings herein. In contrast, it is highly likely that actual risks posed by chemical residues are substantially lower than the estimates reported herein. It should also be emphasized that this HRA/HCLR evaluation is based on available data; additional site assessment work during closure may provide data for re-evaluation of the findings presented in this HRA, which may augment the conclusions drawn.

A soil vapor extraction system (SVES) has been installed and placed in operation to remediate degraded soils. SVES also enhances remediation of ground water through treatment of volatile organic at the capillary fringe, including any free-floating product. S-K intends to perform additional soil and ground water assessment down-gradient of the site as soon as offsite access agreements are final. Once the extent and degree of ground water impacts have been identified, S-K plans to work with the Kansas Department of Health and Environment (KDHE) to develop and implement an appropriate ground water remediation program, if necessary.

Health Risk Assessment (HRA)

The overall goal of the baseline HRA is to evaluate the potential impact on human health of the chemical residues that have been detected in soil and ground water at the site. Potential impacts on health are evaluated under two land-use conditions: (1) current land use, which assumes that the present on-site area will remain an industrial area, and (2) future hypothetical land use, which assumes conversion of the site to a residential area. To achieve the overall goal of the HRA, specific scientific objectives are: (1) to select representative chemicals of potential concern from among the chemicals identified as present in environmental media in the Study Area, (2) to identify potentially significant routes of human exposure, if any, to chemical residues present in on-site soil, (3) to estimate, if possible, intakes (or dosages) of chemicals of concern that might be absorbed into the human body, and (4) to characterize any human health risks resulting from estimated exposures resulting from the presence of chemical residues present in soil and groundwater. These steps and the methods employed within each step are consistent with the basic methods and procedures outlined in the Risk Assessment Guidelines for Superfund (EPA, 1989a), which served as the principal guidance document for the HRA.

The first step in the evaluation was an appraisal of chemicals that have been detected in soil and groundwater samples collected at the site for the purpose of identifying those chemicals that pose the greatest potential adverse impact on human health. Thirteen (13) organic chemicals and two inorganic substances (chromium and lead) were detected in various samples of soil and ground water collected during site investigations conducted in 1989 and 1991. Eight of the 13 organic chemicals were selected as chemicals of concern. Neither lead nor chromium were selected as chemicals of potential concern, largely due to evidence suggesting that their presence in soil and ground water is not related to the introduction of mineral spirits into the subsurface environment at the site. Selection of the eight chemicals of concern employed criteria suggested by the U.S. EPA: (1) areal distribution and concentrations of residues in environmental media (e.g., soil, wa-

ter), (2) estimated potential for human exposure to chemical residues (includes mobility and persistency in soil and water), and (3) toxicity in mammals.

In order for there to be a chemical-induced adverse impact on human health, exposure must occur (i.e., a complete exposure pathway must exist). Accordingly, a comprehensive analysis of potential exposure pathways was conducted: (1) to evaluate the completeness of all current or potential hypothetical future exposure pathways that might occur for a residential setting and identify the pathway(s) believed to pose significant potential for human exposure to chemicals of concern, (2) to estimate exposure point concentrations of each chemical of concern, and (3) to estimate chemical intakes by human receptors.

The only current exposure pathway of potential concern is inhalation of chemical constituents volatilized from subsurface soil into ambient air at the site. Air concentrations were estimated by analytical modeling. Although ground water is a potentially complete exposure pathway at the site, there is no evidence that human receptors presently working in the vicinity of the S-K site are in danger due to the presence of chemical constituents in ground water; shallow groundwater is currently used only for agricultural and industrial purposes. However, the ground water with its current concentrations of chemical constituents is deemed unsafe should it be used for domestic purposes (e.g., drinking and bathing). In accordance with KDHE's requirement that "...a residential exposure scenario" (KDHE, 1991) be used to establish closure performance standards for the chemicals of concern at the site, the two potentially significant exposure pathways for the hypothetical residential setting are: (1) inhalation of chemical constituents volatilized from soil into ambient and indoor residential air, and (2) ingestion and inhalation of chemical constituents associated with usage of ground water for domestic purposes, including drinking and non-drinking usages.

For the purpose of judging potential health impacts associated with these theoretical pathway, exposure point concentrations (air concentrations in the breathing zone) were estimated by a analytical volatilization model. Since none of the chemicals of concern in soil are potential human carcinogens (according to EPA), only noncarcinogenic risk were evaluated for the indoor air pathway. Theoretical noncarcinogenic health impacts are assessed by evaluating the ratio of calculated chronic daily intakes (CDIs) to the pathway-specific reference doses (CDI:RfD). This ratio is known as the Hazard Index (HI). If the HI is less than one (i.e., exposure results in a daily intake that is less than the RfD), then the exposure is considered inconsequential (i.e., without any significant adverse health impact). At an assumed soil concentration of 500 ppm of mineral spirits and associated compounds (xylene, toluene, naphthalene, ethyl benzene), the estimated concentrations of chemicals in ambient air were found to not pose a health risk to onsite

workers. However, the estimated concentrations that might accumulate in the indoor air of a hypothetical onsite residence are potentially hazardous at the assumed soil concentration of 500 ppm. The HI associated with this theoretical exposure pathway exceeds unity by 3.18 fold, indicating that placement of a residence at the site under the various conditions assumed in the analysis (e.g., ca. 500 ppm of mineral spirits in soil extending from approximately 5 to 13 feet below grade, occupancy of a raised foundation home, occupancy rate of 365 days/year and 24 hour/day , etc.) is potentially hazardous.

Theoretical ingestion and inhalation of chemical constituents leached from soil into ground water followed by usage of ground water for domestic purposes associated with a residential setting was found to be negligible. The total HI for this theoretical exposure pathway, which was based on a soil concentration of 500 ppm extending from 5 to 13 feet below grade, does not exceed unity. Therefore, future leaching of chemicals from soil into ground water would have negligible impact on the health of a hypothetical resident based on the conservative assumption that this water is used as a residential water supply.

Therefore, the findings of the HRA are that reduction of mineral spirits and other residues in soil are needed to protect theoretical residential receptors from vapors volatilized from soil into indoor air. Also, reduction of mineral spirits and other chemicals in ground water is needed for the ground water to be considered safe for domestic usage.

Health-based Cleanup Level Recommendations (HCLRs) for Soil and Ground Water

From the HRA, it was determined that two potential pathways exist by which soil containing chemicals of concern at the site could theoretically impact a hypothetical resident: (1) volatilization of constituents from soil and accumulation in indoor air, and (2) leaching from soil into ground water followed by usage of this ground water for domestic purposes. The first pathway is much more potentially significant than the second. Based on the findings of the HRA, a site-specific soil cleanup level (HCLR) of **75 ppm** is proposed for mineral spirits.

<u>HCLR for Soil</u>. Because S-K has implemented a soil vapor extraction system (SVES) for onsite soil remediation, it is assumed that the resulting concentrations of the 5 chemicals of concern in soil would decrease proportionately. Therefore, reduction of the highest detected onsite concentration of mineral spirits (4,000 ppm) to the proposed HCLR of 75 ppm would decrease the soil concentrations of the other chemical constituents proportionately from their maximum detected concentrations. To verify that the HCLR for soil of 75 ppm does not result in an acceptable noncarcinogenic health risk, exposure of the two potentially significant exposure pathways associ-

ated with soil (i.e., volatilization of chemicals from soil into indoor residential air, and usage of water containing chemicals leached from soil) were re-evaluated. An HI associated with the indoor air pathway was found to be 0.610 and 0.004 for the exposure pathways associated with chemicals leached into ground water. The total HI, which is the sum of the HIs for the two exposure pathways is 0.614 (i.e., 0.610 + 0.004), which is less than the target Hi of 1.0. Therefore, reduction of mineral spirits to a concentration of 75 ppm and corresponding reduction of all other chemicals of concern proportionately would effectively eliminate any known noncarcinogenic risk associated with soil at the site.

HCLRs for Ground Water. Site-specific HCLRs for chemicals of concern in ground water are developed so that the combined theoretical health impacts from ground water usage and inhalation of chemicals into indoor air from soil containing 75 ppm mineral spirits are not unacceptable. Because the HI for soil at the HCLR of 75 ppm was 0.614, the HI associated with ground water should not exceed 0.386 (1.0 - 0.614 = 0.386). To achieve this HI, it was determined that the concentrations of mineral spirits, which is the main contributor to noncarcinogenic risk associated with ground water, should be reduced to **2.0 mg/L** (ppm). The total HI associated with reduction of ground water to 2.0 mg/L is 0.34, which is less than 0.386. Additionally, reduction of mineral spirits to 2.0 mg/L would result in the reduction of each of the 8 constituents to less than or equal to their respective KALs or KAL-equivalents.

Attainment of the proposed HCLRs for soil (75 ppm mineral spirits) and ground water (2.0 mg/L mineral spirits) results in a total HI of 0.95, which is less than the target level of 1.0. Therefore, attainment of these proposed HCLRs for both soil would effectively eliminate any known noncarcinogenic risk associated with impacted soil and ground water at the site.

Two of the chemicals of concern, namely 1,4-DCB and 1,1-DCA, have been classified as Group C carcinogens by the EPA. The total theoretical upperbound carcinogenic risk associated with the ground water HCLR of 2.0 mg/L is estimated to be 1.3×10^{-5} (13 theoretical new cases of cancer per 1,000,000 exposed individuals). The majority (ca. 92%) of this theoretical risk estimate is attributed to 1,1-DCA, which has been detected in only one water sample at 7 μg/L. Furthermore, an overly conservative assumption was incorporated into this assessment, namely that remediation of the ground water primarily designed to reduce mineral spirits to the HCLR of 2.0 mg/L would have little impact on either 1,4-DCB and 1,1-DCA.

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1.0 INTRODUCTION

This health risk assessment (HRA) and health-based cleanup level recommendation (HCLR) report, which has been prepared on behalf of Safety-Kleen Corp. (S-K), addresses the public health implications associated with chemicals detected in soil ground water at the S-K Service Center ("the site") located at 1311 S. Anna in Wichita, Kansas, and recommends health-based cleanup levels for soil and ground water that are intended to be fully protective of human health. This HRA and HCLR are both based on data collected at the site by S-K and it's principal consultant, TriHydro Corporation (THC), Laramie, WY. Previous work at the site, which includes both chemical monitoring and site characterization data, has been summarized in THC (1989, 1990, 1991a, b).

The overall purpose of the HRA component of this HRA/HCLR report is to identify and assess any existing or potential future impacts on human health that may exist at the site due to the presence of chemical residues in soil and ground water. Characterization of existing or potential human health impacts provides the necessary foundation for: (1) developing site-specific health-based cleanup levels (i.e., the HCLR), and (2) developing site-specific remedial activities to mitigate any current or future impacts on human health.

The HCLR section of this report presents proposed site-specific soil and ground water cleanup levels along with an explanation of the methods and assumptions used in their derivation. The proposed HCLRs are health-based and are derived in accordance with requirements setforth by the Kansas Department of Health and Environment (KDHE) and Region VII EPA (KDHE, 1991).

1.1 Background

As described in the initial characterization reports (THC, 1989; 1990), residues of chemicals associated mineral spirits were found in soil at the Wichita site during the initial site investigation which took place in mid 1989. These residues were believed to originate from a leaking underground storage tank (UST). Subsequent site investigations also revealed the presence of residues of chemicals associated with mineral spirits in ground water (THC, 1991a, b). There is not sufficient evidence to determine the timeframe during which these residues became present in the soil and ground water. After the discovery of these residues, THC, on behalf of S-K, has carried out investigations of the local hydrogeologic system in order to characterize the hydrogeologic nature of the aquifer zones and aquitards, the groundwater flow system, and the areal distribution of chemical residues in groundwater and soil. Discontinued use and removal of USTs in June

1991 has reduced the potential for further introduction of chemical residues into soil and ground water at the site.

1.2 Study Area

For the purposes of this HRA/HCLR, the Study Area is defined as the geographical region in which it is believed there may be potential for human exposure to chemical residues present in soil and groundwater. Although it is not possible to define the logistical boundaries of this area, it is assumed that this region should not extend beyond a 0.5 mile radius around the S-K property.

Within the Study Area, two geographic subareas are distinguished as follows:

1. the "on-site" area, which is defined as the area within the boundaries of the property owned by S-K, and

2. the "off-site" area, which is defined as the area outside the boundaries of the S-K property and within the Study Area.

1.3 Goals and Objectives

The overall goal of the HRA/HCLR is to develop a health-based strategy to protect the health of the people (human receptors) who live and/or work in the Study Area, either currently or in the future, from untoward levels of exposure to chemical substances present in soil and ground water at the S-K site. To achieve this goal, specific scientific objectives are:

1. to select representative chemicals of concern from among the chemicals identified as present in soil and/or ground water at the site,

2. to identify any current or potential (future) significant routes of human exposure, if any, to chemical residues present in soil and/or ground water at the site,

3. to estimate, if possible, amounts (or dosages) of residual chemicals that might be absorbed into the human body,

4. to characterize any health impacts resulting from actual or estimated (current and future) exposures to chemical residues present in soil and/or ground water in the Study Area.

5. to derive media-specific health-based cleanup levels (performance standards) such that future (post-remediation) exposure to the residues that might remain in soil and/or ground

water at the site would not be expected to result in adverse health effects under conditions of long-term exposure.

2.0 METHODOLOGY

2.1 Regulatory Guidance Documents

No specific procedures have been provided by the State of Kansas for conducting either a HRA or deriving HCLRs. Therefore, the methods used are generally based on the procedures outlined for conducting a Baseline Health Risk Assessment by the U.S. EPA (1989a). This guidance document provides the most developed State or Federal guidance procedures for health risk assessment currently available. Other guidance documents that were consulted as needed are EPA (1986a, b; 1988; 1989b).

2.2 Basic Procedures Used

2.2.1 Baseline Health Risk Assessment (HRA)

EPA has suggested five steps as a basic framework for a health risk assessment (EPA, 1989a). Each of these five steps as applied in this HRA is briefly discussed below.

1. Selection of chemicals of potential concern. Chemicals of potential concern are selected from among the inventory of chemicals that have been detected in soil and/or groundwater in the Study Area. In this HRA/HCLR report, the selection procedure is qualitative and incorporates chemical toxicity information, determinants of environmental fate (e.g., physical-chemical properties), chemical concentrations in impacted soil and ground water, and extent of chemical distribution in soil and/or groundwater in the Study Area.

2. Estimation of theoretical or actual exposure point concentrations of chemicals of concern. This step is comprised of three basic elements:

   a. identification of potential pathways by which a human subject (receptor) in the Study Area might be exposed to chemicals of potential concern,

   b. identification of the location and biological characteristics of maximally-exposed individuals (MEI) for each potentially significant exposure pathway in the Study Area, and

   c. estimation of exposure point concentrations of chemicals of potential concern in environmental transport media (e.g., groundwater, soil, air) judged as potentially significant for the MEIs in the Study Area.

3. Estimation of human intake. For each exposure pathway that is judged as complete or potentially complete in step 2 (i.e., humans are exposed to one or more environmental media

containing a quantifiable concentration of one or more chemicals of concern), individual chemical dosages (mg/kg of body weight/day). Total dosage of each chemical of concern is the sum of the dosages across all exposure routes (oral, respiratory, dermal) relevant to the site.

4. Toxicity assessment. In order to characterize the risk associated with complete exposure pathways, toxicity criteria are needed for each of the chemicals of concern. Toxicity assessment is comprised of two steps:

   a. hazard identification: For each indicator chemical, International (International Agency for Research on Cancer, IARC) and Federal (EPA) assessments and weight-of-evidence classifications are evaluated to determine whether a chemical should be treated as a carcinogen or non-carcinogen.

   b. dose-response assessment: for carcinogens, EPA-derived cancer potency factors (CPF, q1*) are generally employed; for non-carcinogens, EPA-derived reference dosages (RfDs) are employed if available and applicable to this HRA .

5. Risk characterization. Human health risks are characterized for carcinogenic and non-carcinogenic chemicals of concern by combining exposure and toxicity information developed in steps 1 through 4. Sources of uncertainty are identified and the potential impact of uncertainty on risk is evaluated.

2.2.2 Health-Based Cleanup Level Recommendations (HCLRs)

Site-specific health-based cleanup levels are estimated based on the findings of the HRA. The proposed HCLRs, which are designed to protect human health for each of the chemicals of concern and each of the exposure pathways found to be potentially significant in the HRA, are derived in accordance with requirements setforth by the Kansas Department of Health and Environment (KDHE) and Region VII EPA in a report entitled: "Modifications to the November 21, 1990 Partial Facility Closure Plan for the Safety-Kleen Corp. facility located in Wichita, Kansas; January 18, 1991 (KDHE, 1991); this report is given in Appendix A. In this report, KDHE and EPA stated that "The closure performance standard is to be developed by the facility such that no concentrations of applicable 40 CFR 264 Appendix IX hazardous constituents which are listed in Table V-1 of the closure plan remain in the soil, vadose zone, or groundwater which are above the Agency-recommended limits based on a residential exposure scenario. The Agency-recommended limits or factors include water quality standards and criteria, health-based

limits based on verified reference doses (RfDs) and Carcinogenic Potency Factors (CPFs) or site-specific Agency-approved health advisories. If no Agency recommended exposure limits exist for a hazardous constituent then the owner or operator must either remove the constituent to background levels, submit data of sufficient quality for the reviewing agencies to determine the environmental and health effects or follow closure requirements as a disposal unit." The HCLRs (i.e., performance standards) reported herein are concentrations of chemical residues that can remain in the soil and ground water at the site and not pose any known adverse impact on human health based on a residential exposure scenario.

Additionally, the same exposure and toxicologic criteria used to assess health risk in the HRA, are used in deriving HCLRs.

2.3 Definition of "Significant" and "Insignificant"

These terms will appear periodically in certain sections of this HRA/HCLR report. Whereas the terms "significant" and "insignificant" are generally applied in conjunction with a statistical analysis of data, not every situation can or needs to be quantitatively or statistically evaluated to judge whether it is or is not "significant". Statistical analyses of scientific data are generally conducted when interpretation of the information is not obvious. For example, in decision-making on the potential for adverse health impacts associated with hazardous materials, non-mathematical assessments are regularly used when scientific judgement indicates an either obvious probability or improbability of an adverse health impact under a specific set of conditions.

In some sections of this HRA/HCLR, scientific judgement rather than some statistical analysis is used for drawing conclusions as to questions of "significance." EPA (1989a) provides for this scientific latitude.

3.0 CHARACTERIZATION OF THE STUDY AREA

This section presents background information about the onsite area and the Study Area, including: information on historical and present activities related to chemical usage and releases, information on land and water usage, information on physical characteristics of the Study Area (e.g., hydrogeologic data), and information on population densities and demography in the Study Area. The information was originally collected by and described in TriHydro Corp. (THC, 1989; 1990; 1991a), Ecology and Environment (1990), and a facility description prepared by Safety-Kleen Corp.

3.1 Description of Historical and Present Industrial Chemical Usage in the Study Area

The Wichita S-K Service Center, which is located in an area of western Wichita (Figure 1), is situated on 2.45 acres at 1311 S. Anna, and is a collection point for spent solvents generated by S-K customers. These solvents are principally mineral spirits and other parts cleaning solvents that are used by repair shops, fleet operators, dry cleaners, and other government and industrial facilities. Additionally, the site collects dry-cleaning wastes and waste paints and thinners. As shown in Figure 2, the present property consists of one building housing offices and a warehouse for container storage, one loading dock with a solvent return and fill station (a three-walled concrete block structure), one enclosed shelter used for container storage, an additional building on the northeast corner of the site houses S-K offices, and a tank farm consisting of 6 above-ground storage tanks.

Two USTs were previously present onsite, one of which was previously used for storage of product mineral spirits, and the other for storage of spent mineral spirits and other solvents. In June, 1991, both USTs were decontaminated and removed. In their place, the Service Center has installed above-ground storage tanks, which have replaced the two USTs. The return/fill station and spent mineral spirits underground storage tank were determined to meet certain characteristics of hazardous waste storage facilities and were closed in accordance with RCRA interim status regulations (Partial Facility Closure Plan, November 21, 1991, Revision). The product UST also was closed in accordance with these regulations.

3.2 Description of Physical Features of the Study Area

The physical environment at the site and in the Study Area is described in the following sections.

3.2.1 Hydrogeologic characterization

The S-K Wichita facility is located in a relatively flat area, with an elevation approximately 1,300 feet above sea level. The Study Area is located in Sedwick County on an alluvial terrace, approximately 1,400 feet east of the Wichita Valley Center Floodway and 3 miles west of the Arkansas River. The alluvium is of unknown depth and primarily contains silty sand with occasional layers, and minor coarse-grained silty sand and gravel layers. The uppermost aquifer occurs within the terrace alluvium (THC, 1989). The high sand content of the soil can result in relatively high migration of organic chemicals throughout the soil and rapid, extensive migration in the shallow groundwater.

Ground water was determined to flow to the south with minor southwesterly movement also evident. The hydraulic gradient was <0.4%, contributing to differences in groundwater flow direction following pumping of local water wells. Ground water was found 11 to 13 feet below the ground surface. The sand and gravel layers hold the majority of the groundwater, and are interconnected, thus acting as a single aquifer in response to long-term withdrawals of water. The average hydraulic conductivity has been estimated at 234.5 feet/day or 8.26×10^{-2} cm/sec. Chemicals in groundwater are expected to migrate in a southeasterly direction unless water extraction from wells near the site alters the gradient.

3.2.2 Climatology/Meteorology

The regional area is characterized by short, cold winters and long, hot summers. The annual precipitation is 28.93 inches, with an average annual snowfall of 15.4 inches. Seventy-five percent of the precipitation in the region falls between April and September. The S-K facility does not lie within the 100-year flood plain. The prevailing wind is from the south.

3.3 Land and Water Use in the Study Area

3.3.1 Land use

Previous

Within the S-K site are contained the buildings and facilities described above. As shown in Figure 2, the former return/fill station was located west of the warehouse/office building, with both underground storage tanks (each with a 10,000 gallon capacity) south of the warehouse/office building (5,000 square feet). The former UST location was covered by a concrete pad, which was used as a driveway and parking area (Figure 2). The spent mineral spirits were

poured into sheltered above-ground steel receptacles (wet dumpsters) where the solvent flowed by gravity to the UST. The UST's were vented to the atmosphere. The solids settled in the dumpster.

Present

To replace the UST system, S-K has constructed an above ground storage tank farm consisting of six tanks (Figure 2): one for spent mineral spirits, one for Product 140° mineral spirits, one for Product 105° mineral spirits, and three for waste oil/antifreeze. These tanks and associated facilities are located approximately 120 feet north of the previous location of the USTs. The existing wet dumpsters have been relocated to a new sheltered containment area as part of the above ground storage facility. The new return/fill station was constructed on the east end of the warehouse building.

The land surrounding the Study Area is used exclusively for small business, industrial, and commercial facilities and is zoned for industrial use (Figure 1). The S-K site is bordered by a vacant lot to the north, an upholstery shop to the east, a heating/cooling shop to the south, and a glass shop, a machine shop, and oil field shelter manufacturer to the west. Anna Street consists of dirt and gravel without curbs and gutters. Sanitary sewer and storm sewer systems service the site. Oil or gas wells, wetlands or critical habitats are not located within one-quarter mile of the site. Moreover, no residences, parks, schools, day-care centers, hospitals or convalescent homes exist within the Study Area.

Future

Information was not found to suggest a future change in land usage in the Study Area (i.e., there is no evidence that the area within the Study Area will change from being an industrial area.

3.3.2 Ground water use

Current

Thirteen shallow ground water wells are present within 0.25 miles of the facility. Three of the wells are registered with the KDHE, the remaining ten wells are known to exist but are not recorded. Use of ground water from these wells is limited to commercial or non-drinking domestic purposes. The businesses on streets surrounding the S-K facility all appear to be served by the municipal water system. The nearest down-gradient public water supply well is located 4 to 5 miles from the site.

Future

Although specific information regarding potential well installation in the Study Area for further industrial/commercial supply was not found, the current use of such wells near the facility suggests that additional well drilling may occur in this area.

3.3.3 Surface Water

Surface runoff from the facility enters the storm sewer system near the southeast corner of the property. An approximately 4 acre open detention pond collects the drainage 600 feet to the south of the site. Outfall from the pond is returned to the sewer system and flows into the Valley Center Floodway where it meets the Arkansas River south of Wichita.

3.4 Population Densities and Demography

Approximately 280,000 of the county's 350,000 residents live in Wichita. There are no parks or schools within one-quarter mile of the facility.

4.0 IDENTIFICATION AND BACKGROUND INFORMATION ON CHEMICALS OF POTENTIAL CONCERN

Public health evaluations (or health risk assessments) of industrial sites, such as the S-K site, generally are based on "chemicals of potential concern" rather than every individual chemical ever detected in environmental media at a site. The selection of such chemicals is based primarily on their measured concentrations in the media that have been investigated (e.g., soil and ground water) and their inherent toxicities. Additional factors to be considered include physical and chemical characteristics related to the chemicals, such as environmental mobility and persistence, as well as biological characteristics such as bioaccumulation. The U.S. EPA (1986a) instituted the use of the chemicals of potential concern approach as a practical matter to avoid unnecessary effort in assessing risk at sites where multiple chemicals exist. EPA stated that only those chemicals considered to represent the most "toxic, mobile, and persistent at the site, as well as those present in the largest amounts (i.e., the highest risk chemicals)" are chosen for public health evaluation (EPA, 1986a; 1989).

For the purposes of this HRA/HCLR, chemicals of potential concern are selected from among the inventory of chemicals that have been detected in environmental media (soil, ground water) at the S-K site. Concentrations of organic and inorganic substances in soil and ground water were compiled during three separate site investigation programs. The results of these investigations are summarized below.

4.1 Description of Chemical Residues in Soil and Ground Water

The first site investigation was carried out in October/November 1989 (THC, 1989), the second site investigation was carried out in June and July, 1991(THC, 1991a), and the third site investigation was carried out in October 1991 (THC, 1991b). The purpose of the first investigation was to gather data for the development of the partial facility closure plan. The second and third investigations provided supplemental information on the areas undergoing closure as well as addressed potential subsurface impacts at the other solid waste management units (i.e., durm storage area and facility runoff area). Details of these investigations, including sampling methods and analytical data, were presented in the three reports cited (THC, 1989; 1991a; 1991b). Table 1 provides a summary of the three subsurface soil and ground water investigations in terms of sampling locations, sample depth, and analyses conducted. Results of the three investigations have revealed the presence of 9 organic and 2 inorganic substances in soil (Table 2) and 9 organic and two inorganic substances in ground water (Table 3). The identities and concentrations of these substances in soil and ground water at the S-K site are discussed below.

4.1.1 Soil

Soil quality has been evaluated from the ground surface to the ground water table, which is approximately 13 feet below grade, and below the saturated zone of the aquifer. During the 1989 investigation, which consisted on a soil gas survey, soil boring program, and ground water monitoring program, fifteen boreholes were strategically placed onsite. The locations of these boreholes were determined using the results of the soil gas survey, which measured total volatile organic chemicals. Figure 3 shows the locations of all borehole and monitoring wells. Based on these results, 12 soil samples were collected during the 1989 investigation and analyzed for:

- mineral spirits (EPA modified 8015 method),
- 40 CFR Part 264 Appendix IX volatile and semivolatile organic compounds using EPA analytical methods 8240 and 8270, respectively, and
- total lead (EPA 7421) and cadmium and chromium (EPA 6010).

The results of the 1989 investigation indicated that in addition to mineral spirits (total petroleum hydrocarbon as mineral spirits), ethyl benzene, toluene, and xylenes (all components of mineral spirits) were detected in samples collected from boreholes BH-1 and BH-2. The absence of chlorinated volatile organic compounds (commonly associated with spent mineral spirits) was taken to indicate that the subsurface degradation was due to the product UST system, not the spent UST system (THC, 1991a). Cadmium and chromium were not detected in the 12 samples during the 1989 assessment. Lead was detected at concentrations (1 to 8 mg/kg) consistent with the range of naturally-occurring levels (see discussion in Section 4.2.2 below).

Additional soil assessment activities were conducted in July 1991 following removal of the USTs, because the extent of subsurface degradation was not completely defined in areas north and west of the USTs during the 1989 investigation. Six additional boreholes were constructed, and soil samples were also taken from the walls and floor of the UST excavation. Figure 4 shows the locations of the boreholes and Figure 5 shows the locations of soil samples collected from the UST excavation site. Samples were analyzed for mineral spirits (Modified ASTM Method D3328), Appendix IX VOCs (EPA 8240), dichlorobenzenes (EPA 8240), naphthalene (EPA 8270), lead (EPA 7421), and cadmium and chromium (EPA 6010).

A third soil assessment was conducted in October 1991. Soil samples collected from borings VE-2, 3 and 4, which were completed as vapor extraction wells, were analyzed for the same constituents as the July 1991 assessment.

The collective results of these investigations have been summarized in Table 2. Figure 2 shows the areal distribution of mineral spirits residues in soil. Mineral spirits has not been detected in any of the soil samples from boreholes K-1 through K-4 and K-5 and A-5. The deepest soil sample containing mineral spirits was found in VE-1 (13.5-15.5 feet), which is directly adjacent (north) of the former USTs. At location K-3, which is approximately 60 feet northwest of the former USTs along the property boundary, 130 mg/kg of oil was tentatively identified at the 13.5-15.5 foot depth, but not at the 0.5-3.5 foot depth. These data suggest a potential influence from an offsite source since borehole K-3 is located upgradient of the former USTs.

4.1.2 Groundwater

All of the groundwater monitoring data are considered when selecting representative chemicals of concern. Data have been collected at 5 onsite monitoring wells installed on October 13-16, 1989, and one water supply well located on S-K property. One of the monitoring wells (A-1) was installed up-gradient and the remaining four wells were installed at down-gradient locations. Figures 3 and 6 shows the locations of Wells A-1, 2, 3, and 4. The location of monitoring well (A-5), which was installed in July 1991, is shown in Figures 4 and 6. Wells were sited based on expected ground water flows, the location of the former USTs, and the results of the soil gas survey and soil sampling results (THC, 1989; 1991a). Sampling dates for all six of the wells are as follows:

- A-1 10/19/89; 7/18/91; 10/14/91
- A-2 10/19/89; 7/18/91; 10/14/91
- A-3 10/19/89; 7/18/91;10/14/91
- A-4 10/19/89; 7/18/91; 10/14/91
- A-5 7/18/91; 10/14/91
- Water supply well 10/19/89; 7/18/91; 1014/91

Well A-1 is approximately 135 feet from the area of subsurface residues and approximately 162 feet from the nearest soil boring that showed chemical residues. Well A-2 is approximately 45 feet from the area of detected chemicals and approximately 58 feet from the nearest known location of chemical residues. Well A-3 is approximately 14 feet outside the zone of measured chemical migration and 40 feet from the nearest soil boring that showed chemical degradation.

Well A-4 is immediately down-gradient of the former UST location and within the area of soil degradation as determined by soil gas survey results. Well A-5 is located immediately southwest of the former USTs.

No organic chemicals were detected in the ground water samples collected on the July 1989, despite the appearance of sparse ribbons of hydrocarbon sheen and a slight hydrocarbon odor in the water taken from well A-4 (immediately down-gradient of the USTs) (THC, 1990). During the sampling conducted in July and October 1991 (THC, 1991a), free hydrocarbon product (mineral spirits) was measured in well A-4 immediately above the water surface. As of October 1991, the product thickness at Well A-4 is approximately 0.02 feet. Field screening data at wells A-4, VE-2 and VE-3 indicate ground water degradation commenced due to introduction of mineral spirits into soil at depths above 9.5 feet. Chemical constituents have been found predominantly in samples collected from Well A-4 with sporadic appearance of certain chemicals in samples collected from Wells A-2 and A-3. No chemical residues associated with mineral spirits have been found in Wells A-1 (upgradient), A-5, and the water supply well. Elevated concentrations of chromium were detected in samples collected from Well A-1 in July and October, 1991. Groundwater quality data are summarized in Table 3.

4.1.3 Summary of chemicals identified at the site

The substances found in soil and groundwater samples are:

Organic chemicals	Soil	Ground Water
Acetone	√	
2-Butanone (methyl ethyl ketone; MEK)	√	
1,2-Dichlorobenzene (1,2-DCB)		√
1,4-Dichlorobenzene (1,4-DCB)		√
1,1-Dichloroethane (1,1-DCA)		√
1,2-Dichloroethylene (1,2-DCE)		√
Di-n-butylphthalate	√	
Ethyl benzene	√	√
Methylene chloride	√	
Mineral spirits	√	√
Naphthalene	√	
1,1,1-Trichloroethane (1,1,1-TCA)		√
Toluene	√	√
Xylenes	√	√

Inorganic chemicals	Soil	Ground Water
Chromium		√
Lead	√	√

4.2 Selection of Chemicals of Potential Concern

Selection of chemicals of concern for this HRA/HCLR is based on EPA's suggested criteria (EPA, 1986a; 1989a) and "best scientific judgement." Selection criteria include consideration of:

- the areal distribution and concentrations of residues in soil and groundwater at the site,
- the potential for human exposure to chemical residues (includes mobility and persistence in soil and groundwater), and
- published toxicology information in mammals.

Seven of the 14 organic chemicals including mineral spirits (reported by the laboratory as total petroleum hydrocarbon as mineral spirits), all of which have been quantified in soil and/or water samples collected at the site, are included in this evaluation as chemicals of potential concern. Four of the individual organic compounds (ethyl benzene, toluene, xylenes, and naphthalene) are known to be naturally-occurring constituents of mineral spirits (see Appendix B). The source of the other two chemicals, 1,2-DCB and 1,4-DCB, is unsubstantiated. The two inorganic substances (lead and chromium) analyzed for and detected in onsite soil and ground water samples are excluded from this evaluation. Section 4.2.1 below presents rationale for chemicals included as chemicals of potential concern. Section 4.2.2 presents rationale for excluding certain chemicals as chemicals of potential concern.

Unless otherwise indicated, it is assumed that the analytical data quantifying the concentrations of chemicals of concern in soil and ground water provide a relatively accurate representation of the qualitative and quantitative profile of chemical residues in these media at the site.

4.2.1 Chemicals included as chemicals of potential concern

1,2-Dichorobenzene (1,2-DCB)

Although it has not been detected in any soil samples (0/15) and the detected concentrations in ground water have been found to range from 6 to 83 μg/L, which is well below the KAL of 620 μg/L, this chemical is included as a chemical of potential concern because it has been detected in

5 of 11 (45%) ground water samples, and because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991)

1,4-Dichlorobenzene (1,4-DCB)

Although it has not been detected in any soil samples (0/15) and the detected concentrations in ground water have been found to range from 11 to 36 μg/L, which is below the KAL of 75 μg/L, this chemical is included as a chemical of potential concern because it has been detected in 3 of 11 (27%) ground water samples, because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), and also because it has been classified by the EPA as a Group C carcinogen (possible human carcinogen) (see Appendix B).

Ethyl benzene

Although this chemical has been detected in ground water at concentrations (range of 13 to 60 μg/L) that are well below the KAL (680 μg/L) and in soil at relatively low concentrations (maximum of 530 μg/kg) and frequency of detection (5.7%), ethyl benzene is included as a chemical of potential concern because it has been detected in 3 of 15 (20%) ground water samples, because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), because it is a known constituent of mineral spirits (see Appendix B), and because it possesses the substantial potential for migration from soil into ground water due to its low soil sorption coefficient and moderate water solubility.

Mineral spirits

Mineral spirits is comprised of a mixture of organic chemicals (see Appendix B). Although it was not listed by KDHE as a chemical of concern at this site (KDHE, 1991), mineral spirits is included as a chemical of potential concern because it has been detected in approximately 29% of the soil samples collected at the site at concentrations ranging up to 4,000 mg/kg (Table 2), because it has been detected in ground water at two sampling locations in 3/5 (20%) at relatively high concentrations (up to 600 mg/L; Table 3), and because of the history of mineral spirits handling at the site.

Naphthalene

Although this chemical has low ability of leaching from soil into ground water because of its high soil sorption coefficient and low water solubility (Appendix B), this chemical is included as a chemical of potential concern because it has been detected in 8 of 23 (35%) soil samples at

concentrations ranging up to 4.9 mg/kg (Table 2), because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), and because it is a known constituent of mineral spirits (see Appendix B).

Toluene

Although this chemical has been detected in ground water at concentrations (range of 41 to 45 μg/L) that are well below the KAL (2,000 μg/L) and in soil at relatively low concentrations (maximum of 250 μg/kg) and frequency of detection (5.7%) (Table 2), toluene is included as a chemical of potential concern because it has been detected in 2 of 15 (13%) ground water samples (Table 3), because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), because it is a known constituent of mineral spirits (see Appendix B), and because, like ethyl benzene and xylene, it possesses a substantial potential for migration from soil into ground water due to its low soil sorption coefficient and moderate water solubility.

Xylene

Although the frequency of detection of xylene in soil is low (11%; Table 2), it is included as a chemical of potential concern because it has been detected in soil at concentrations ranging up to 4,500 μg/kg, because it has been detected in 4 of 15 (27%) ground water samples at concentrations up to 450 μg/L (Table 3), which exceeds the KAL of 440 μg/L, because it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), because it is a known constituent of mineral spirits (see Appendix B), and because, like ethyl benzene and toluene, it possesses a substantial potential for migration from soil into ground water due to its low soil sorption coefficient and moderate water solubility.

4.2.2 Chemicals excluded as chemicals of potential concern

Six organic chemicals and the two inorganic substances detected at the site are excluded as chemicals of potential concern based on the following rationale:

Acetone, 2-butanone, and methylene chloride

These chemical are excluded from further consideration in this evaluation because they all appear to be unrelated to mineral spirits; there is strong evidence that all three are laboratory contaminants. All three chemicals were detected in the laboratory blank samples prepared by the laboratory (see Appendix C), indicating intralaboratory contamination. Furthermore, acetone

and 2-butanone were not listed by KDHE as chemicals of concern at this site (KDHE, 1991); methylene chloride was listed by KDHE (KDHE, 1991).

Di-n-butylphthalate

Only one of the 32 soil samples was analyzed for di-n-butylphthalate and was found to contain a concentration 0.6 mg/kg (Table 2). This compound has not been analyzed for in ground water or in subsequent soil samples collected in 1991. Because this compound is not a known constituent of mineral spirits, because of insufficient residue data at the site, and because di-n-butylphthalate may have been introduced by the PVC surgical gloves worn by sample collection personnel (suggested in THC, 1989 as a plausible explanation for its presence), di-n-butyl phthalate was excluded as a chemical of potential concern. Furthermore, this chemical was not listed by KDHE as a chemical of concern at this site (KDHE, 1991).

1,2-Dichloroethylene (1,2-DCE)

None of the 32 soil samples and only 4/15 water samples contained a detectable concentration of 1,2-DCE (Tables 2 and 3). Moreover, the detected concentrations in ground water are very low ranging up to only 20 μg/L, which is well below the KAL for 1,2-DCE (70 μg/L). Furthermore, this chemical was not listed by KDHE as a chemical of concern at this site (KDHE, 1991) and it is not carcinogenic (EPA, 1991).

1,1,1-Trichoroethane (TCA)

Although TCA is a contaminant frequently found in S-K spent mineral spirits (S-K MSDS, 105 Parts Washing Solvent, 1990), and although it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), it is excluded because it was detected at a very low frequency of detection (none in soil, 1/15 in ground water) (Tables 2 and 3), because the one detected concentration in ground water is very low (8 μg/L) and well-below the KAL for TCA (200 μg/L), and because it is not carcinogenic (EPA, 1991).

Chromium (Cr)

Although chromium was detected in 7/15 ground water samples collected since 1989 at concentrations ranging up to 980 μg/L (see Tables 2 and 3) and although it was listed by KDHE as a chemical of concern at this site (KDHE, 1991), it is excluded as a chemical of concern because the range of soil concentrations (1-11 mg/kg) found at the site are less than the concentration of chromium for Sedwick County (Wichita area) reported by the U.S.G.S. (Shacklette and

Boerngen, 1984), and because the one ground water sample containing a concentration (980 μg/L) that exceeds the KAL for chromium (100 μg/L) was collected from Well A-1 which is located upgradient of the former USTs. Moreover, trivalent chromium, which is the most frequent form of chromium in soil, is nutritionally required in humans and animals (NRC, 1989).

Lead (Pb)

Pb was detected in 25/35 soil samples and in 8/15 groundwater samples collected from the site (Tables 2 and 3). Only one water sample contained a concentration (150 μg/L in Well A-4) that exceeded the KAL for Pb (50 μg/L). Although Pb was listed by KDHE as a chemical of concern at this site (KDHE, 1991), it is excluded as a chemical of concern because the highest soil concentration detected at the site (63 mg/kg) is not substantially elevated over the naturally-occurring level of 20 ppm reported for Sedwick County (Shacklette and Boerngen, 1984), because there is no apparent correlation of Pb distribution and chemical constituents introduced into soil from the former USTs or products stored in the USTs (i.e., distribution of soil concentrations do not correspond with distribution of mineral spirits in soil), and because the presence of Pb in ground water appears to be a regional phenomenon (i.e., except for the one detection in Well A-4, Pb is present in both upgradient and downgradient wells at relatively similar concentrations). Moreover, there are currently no EPA-derived RfD values available for Pb (EPA, 1991), which prohibits estimation of noncarcinogenic risk.

Other chemicals

Four substances cited by KDHE (1991) as "...hazardous constituents for which an acceptable residual concentration must be developed..." have not been detected at the site. These substances include: tetrachloroethylene, 1,3-dichorobenzene, propargyl alcohol, and cadmium. All of these except propargyl alcohol have been routinely analyzed for in soil and ground water (THC, 1991a), and not detected. Parpargyl alcohol has not been analyzed because neither an analytical standard nor an approved USEPA method exist to analyze this chemical (THC, 1991a).

4.2.3 Summary: chemicals of potential concern

1,1-DCA	Mineral spirits
1,2-DCB	Naphthalene
1,4-DCB	Toluene
Ethyl benzene	Xylene

The remainder of this HRA/HCLR is based on these chemicals of potential concern.

4.3 Toxicity Assessment

In this section, critical toxicity criteria are presented for each of the chemicals of potential concern. These criteria, which are used to assess potential carcinogenic and noncarcinogenic risk, have been developed for evaluation of health impacts in humans as a consequence of exposure to these chemicals.

4.3.1 Health effects classification and criteria development

For purposes of assessing potential impacts on public health, chemicals are standardly separated into toxicologic categories, depending on their toxicodynamic behavior in biological systems. The primary basis of categorization is whether a chemical exhibits noncarcinogenic or carcinogenic impacts. For potentially carcinogenic chemicals, EPA assumes that there is no level of exposure below which cancer will not occur in some individuals (i.e., there is no threshold dose for carcinogenic effects). For noncarcinogenic chemicals, it is believed that organisms have protective mechanisms that must be overcome before a toxic endpoint is produced (i.e., there is a threshold dose for a response to a toxicant). Thus, it is believed that a range of exposures up to a defined threshold can be tolerated by an organism without appreciable risk of causing the toxic effect. Presented in the following sections is a brief discussion of the toxicity criteria used in this HRA/HCLR report.

<u>Health effects criteria for assessing potential noncarcinogenic impacts</u>

Reference doses (RfDs), which are standard health effects criteria developed by EPA's RfD Work Group, are used for assessing noncarcinogenic health impacts (i.e., RfDs provide a benchmark against which human intakes of chemicals in environmental media may be compared). An RfD is an estimate of the maximum human chronic daily intake (CDI) that can occur without appreciable risk of adverse effect. They are chemical-specific and route-specific (e.g., oral, inhalation), and are standardly expressed in units of mg/kg of body weight/day (mg/kg/day). Although dose-response data from human studies are preferable for deriving RfDs (e.g., workplace exposures), they typically are based on animal studies because of a lack of human data. RfDs are generally reported by EPA in their on-line database called Integrated Risk Information System (IRIS), or in their Health Effects Assessment Summary Tables (HEAST).

RfD or RfD-equivalent values for the 8 chemicals of concern are listed in Table 4. As shown, EPA has reported oral RfDs (RfD_o) for 6 of the 8 chemicals of concern, and inhalation RfDs

(RfD_i) for 6 (a different 6) of the 8 chemicals of concern. Also, for those chemicals for which either an RfD_o or a RfD_i is lacking (see Table 4), the RfD_o is used as surrogate data for the RfD_i and vice versa.

Mineral spirits is the only one of the 10 chemicals of potential concern for which neither EPA nor any other regulatory agency has derived either a RfD_o or RfD_i, or any other toxicity criteria. Therefore, both a RfD_o and RfD_i were developed using site-specific residue data. Table 4 lists these two values for mineral spirits, and Appendix D describes in detail the procedure and toxicology data used to develop these RfD-equivalents. The procedure used to derive these RfD-equivalents for mineral spirits is the same procedure used by the EPA in calculating RfDs.

Health effects criteria for potential carcinogens

EPA assigns weight-of-evidence classifications to potential human carcinogens. Chemicals are placed in either Group A, Group B1, Group B2, Group C, Group D or Group E. For chemicals placed in Group A, EPA has determined that there is sufficient evidence to support the causal association between exposure in humans and cancer. Chemicals assigned Group B1 and B2 status are considered by EPA as "probable carcinogens"; there is limited (B1) or inadequate (B2) evidence of carcinogenesis from human studies, but sufficient evidence of carcinogenesis from animal studies. Chemicals assigned to Group C are considered by EPA to be "possible carcinogens"; there is limited evidence of carcinogenesis in animals and no evidence of carcinogenesis in humans. Chemicals given Group D status by EPA are not classified as to human carcinogenesis because of inadequate evidence in both humans and animals, or because virtually no data are available.

Table 4 lists EPA's weight-of-evidence classifications for 7 of the 8 chemicals of potential concern. As shown, all of the chemicals except 1,4-dichlorobenzene and 1,1-dichloroethane (both Group C) have been assigned Group D status by EPA. Mineral spirits has not been evaluated by EPA (Table 4). However, there is no evidence in the scientific literature that virgin mineral spirits (i.e., the chemical state of newly-produced mineral spirits at petroleum refineries) is capable of causing cancer in either animals or humans (see Appendix B). Table 4 also lists route-specific cancer potency factors (CPFs) for 1,1-DCA (both CPF_o and CPF_i) and a CPF_o for 1,4-DCB. Since EPA has not established a CPF_o for 1,4-dichlorobenzene, the CPF_i is used as surrogate data in the present evaluation.

4.3.2 Other pertinent toxicology data

In addition to the toxicodynamic information (e.g., carcinogenic weight of evidence, RfDs), toxicokinetic information may be directly pertinent to this cleanup level recommendation. The most pertinent toxicokinetic information is the absorption (amount taken up into the body) of chemicals via the routes of exposure (oral and inhalation) from different environmental media (soil, groundwater, air). For the purposes of this HCLR, all 8 of the chemicals of concern are assumed to be 100% absorbed via both the oral and inhalation pathways (i.e., no adjustments or modifications are included in the calculations).

5.0 HEALTH RISK ASSESSMENT

The principal source of chemical residues in soil and ground water at the site, namely the two USTs, were removed from the site in June 1991. However, as indicated in Section 4.1.1 above, some degree of residues of the 8 chemicals of potential concern are variably distributed at the site. Presented in this section is an evaluation of the potential human health impacts imposed by the remaining (existing) residues in soil and ground water.

5.1 Exposure assessment

Exposure assessment, as defined by the National Academy of Science (NAS, 1983), is the process of measuring or estimating the intensity, frequency, and duration of human exposure to an agent currently present in the environment. "In its most complete form, exposure assessment should describe the magnitude, duration, schedule, and route of exposure; the size, nature, and classes of populations exposed; and the uncertainties in all estimates (NAS, 1983). Exposure is defined by EPA (1989a) "...as the contact of an organism (human in the case of health risk assessment) with a chemical or physical agent. The magnitude of exposure is determined by measuring or estimating the amount of an agent available at the exchange boundaries (i.e., lungs, gut, skin) during a specified time period." An exposure pathway "...describes the course a chemical or physical agent takes from the source to the exposed individual" and it "generally consists of four elements: (1) a source and mechanism of chemical release, (2) a retention or transport medium (or media in cases involving media transfer of chemicals), (3) a point of potential human contact with the contaminated medium (referred to as the exposure point), and (4) an exposure route (e.g., ingestion) at the contact point" (EPA, 1989a).

5.1.1 Analysis of potential exposure pathways

The calculation of the human health impacts at the S-K site is based on the assumption that no remedial activities are instituted to reduce currently existing residue levels of the chemicals of concern. Potential pathways of exposure to indicator chemicals are:

1. <u>Pathways associated with ground water:</u>
   - ingestion of groundwater used for domestic purposes

2. <u>Pathways associated with soil:</u>
   - ingestion and dermal contact

3. Pathways associated with air:

- inhalation of vapors originating from soil or water
- inhalation of fugitive dust

Potential exposure pathways and hazard associated with ground water

As described in Section 3.3.2, several shallow ground water wells are located in the vicinity of the site and are used to provide water for non-drinking purposes (e.g., industrial usage only). Although we have not evaluated by direct on-site investigation uses of this ground water in the Study Area, it is assumed that shallow ground water is not used for drinking (e.g., industrial workers). Moreover, the area is served by a municipal drinking water supply.

Given the current concentrations of chemical constituents in ground water at the site, shallow ground water in the vicinity of the site is considered unsafe for drinking purposes or for any kind of domestic usage. Data presented in Table 5 show the degree of hazard associated with this water by comparing the maximum concentrations present with the KALs or KAL-equivalents for the 8 chemicals of concern. Existing KALs or KAL-equivalents were used in this analysis. A KAL-equivalent was calculated for mineral spirits; the procedure and data used in deriving this KAL-equivalent are presented in Appendix E. As shown in Table 5, mineral spirits is the only chemical of potential concern for which the ratio of the maximum detected concentration divided by the KAL or KAL-equivalent exceeds unity. The sum of these ratios for individual chemicals of concern (i.e., the Hazard Index) is 210.82, which indicates the potential magnitude of the total hazard associated with the ground water at the site based on maximum detected ground water concentrations.

Therefore, whereas the ground water at the site is not used for domestic purposes (i.e., there are no known existing "complete" pathways of human exposure), the ground water is not currently safe for domestic usage.

Potential exposure pathways and hazard associated with soil

An overview of the distribution of chemical residues in soil was discussed in Section 4.1.1 and summarized in Table 2. Detailed information is presented in THC (1989, 1991a). Residues of chemicals of potential concern are located well below grade, mostly below 5 feet. Given the fact that the on-site area containing chemical residues is predominantly covered by a concrete pad (it is a driveway/parking area), and the fact that the chemicals are well below grade, no complete exposure pathways exist for the current land use by which human receptors could come into di-

rect contact with chemical residues in soil. Similarly, if the site were to be used for residential purposes, direct contact with soil containing residues of mineral spirits (or any of the other chemicals of concern) can be discounted as a potentially significant exposure pathway. Although it is possible that excavation into the impacted soil could cause the subsurface soil to become exposed (e.g., trenching for installing utility systems, installation of a swimming pool, etc.), the extent and duration of exposure is considered insignificant.

Potential exposure pathways and hazard associated with air

Given the volatile nature and known ability of many of the chemicals of potential concern to migrate from subsurface soil into ambient air, inhalation of these constituents by on-site workers or hypothetical onsite residents (assuming a residential land use) is a theoretically complete exposure pathway. This exposure pathway is evaluated further in this assessment (see Section 5.3 below). Fugitive dust is considered an exposure pathway of negligible concern for both current industrial workers and hypothetical residents because there are no chemical residues in surface soil; residues exist mostly at depths greater than 5 feet below grade. In regards to current land use, the surface soil is covered with a concrete pad which effectively prohibits dust generation.

Another potential exposure pathway associated with air is the volatilization of chemical constituents from impacted soil into indoor residential air. This, of course, is a theoretical pathway because no residents currently exist at the site. However, in keeping with the mandate of KDHE (1991) that residential exposure scenarios are to be addressed, this exposure pathway is evaluated further in Section 5.2.1 below.

5.1.2 Summary of potential exposure pathways

The only current exposure pathway of potential concern is inhalation of chemical constituents volatilized from subsurface soil into air. Although ground water is a potentially complete exposure pathway in the Study Area, there is no evidence that the health of human receptors presently working in the area is in danger because of the presence of chemical constituents in ground water at the S-K site. However, the ground water with its current concentrations of chemical constituents is deemed unsafe should it be used for domestic purposes (e.g., drinking and bathing). In accordance with KDHE's requirement that "...a residential exposure scenario" (KDHE, 1991) be used to establish closure performance standards for the chemicals of concern at the site, the two potentially significant exposure pathways are (1) inhalation of chemical constituents volatilized from soil into ambient and indoor residential air, and (2) ingestion and inhalation of chemical constituents associated with usage of ground water for domestic purposes, including

drinking and non-drinking usages. These potential exposure pathways are the basis of the risks and HCLRs presented below.

5.2 Risk Associated with Inhalation of Volatilized Chemicals from Soil into Air

5.2.1 Estimated exposure point concentrations in ambient air

Procedure

No on-site air samples have been collected and analyzed for any of the chemicals of concern currently present in on-site soil. Therefore, an analytical model was used to estimate emission rates and air concentrations. A Box Model was used to estimate air concentrations resulting from the volatilization of chemicals from soil into ambient air under steady-state conditions. Details of this modeling process are presented in Appendix F. The environmental transport of volatile organic chemicals (VOCs) from soil into air is a function of several factors, which were incorporated into the model. These input variables include:

- The concentrations of the chemicals in soil;
- The concentrations of the chemicals in the receiving media (e.g., ambient air);
- Various climatological factors (e.g., average temperature);
- Physical-chemical properties of each of the indicator chemicals, such as the affinity to adsorb to soil particles (K_{oc}), and partitioning into the different media (as expressed by the Henry's Law constant);
- Geological characteristics of the site (soil type and porosity).

Six of the indicator chemicals were selected as surrogates for modeling purposes based on their distribution and detected concentrations. The chemicals of concern selected for analysis were: nonane, cyclohexane, toluene, xylene ethyl benzene, and naphthalene. Nonane and cyclohexane were selected to represent the major hydrocarbon fractions in mineral spirits, which is the aliphatic fraction (ca. 85% of the total). Nonane (a C9 straight-chain aliphatic hydrocarbon) was selected as representative of the the other straight-chain aliphatic hydrocarbons in mineral spirits, which comprises approximately 50% of the total aliphatic fraction of mineral spirits (Appendix B). Cyclohexane (a C6 cycloaliphatic hydrocarbon) was selected as representative of the other cycloaliphatic hydrocarbons in mineral spirits, which also comprises approximately 50% of the aliphatic fraction of mineral spirits (Appendix B). Naphthalene, toluene, ethylbenzene, and xylene were selected as representatives of the total aromatic fraction in mineral spirits, and also as representatives of themselves.

For modeling purposes, the unsaturated soil above the groundwater was assumed to consist of two layers. The first (upper) layer was assumed to be 5 feet thick (120 cm), and free of any chemical residues. The second layer (270 cm thick) was assumed to extend from 5 feet below grade to the ground water (approximately 13 feet). This layer corresponds to the areas of the highest detected soil residues as determined by the various soil investigations that have been conducted at the site. The assumed concentrations of these various chemical constituents in soil are listed in Table 4 of Appendix F. As shown, a total hydrocarbon content of approximately 500 ppm was selected, with 480 ppm of this concentration attributed to mineral spirits (i.e., 240 ppm nonane and 240 ppm cyclohexane). Although 480 ppm mineral spirits is well below the maximum concentration of mineral spirits in soil (4,000 ppm) measured in 1991, the goal of the modeling was to establish the relationship between a known soil concentration and an emission rate of chemicals from soil. So that this relationship can be used to estimate "safe" soil cleanup levels, a soil concentration in the range of an assumed soil cleanup level was selected.

Estimated concentrations in ambient air

The estimated exposure point concentrations in ambient air as predicted by the Box Model are presented in Table 6 (also, see Table 4 of Appendix F). As expected, the chemicals with the highest predicted concentrations (mg/m^3) are nonane and cyclohexane, not only because of their higher assumed concentrations, but also because of their unique physical-chemical properties. As shown in Table 4 of Appendix F, these constituents have much higher Henry's Law constants than the aromatic constituents, which promotes their volatilization. It should be noted that the Box Model conservatively assumes steady and uniform conditions of dispersion so that the emissions from an area source are uniformly distributed throughout a box defined by area of source and mixing height. The model requires steady state emission rates and a constant wind vector.

Estimated concentrations in indoor residential air

Exposure point concentrations in indoor air were estimated for a hypothetical residence placed atop the area of impacted soil at at the site. The methodology used to estimate these concentrations, which was developed to model accumulation of radon gas in indoor air, is presented in Appendix G. In brief, the soil vapor emission rate predicted by the analytical model under the assumed conditions (e.g., soil concentrations, etc.) described above were employed. Input variables used to describe the assumed living space were selected to be representative of a hypothetical home that might be constructed at the site in the future. A raised-foundation home was as-

sumed. Other variables included: fraction of crawl-space air transmitted to living space, ratio of interior volume to floor area of crawl space, ventilation rate, and outdoor ambient air concentration (see Appendix F). The results of this analysis are shown in Table 6. Like ambient air, the chemicals with the highest estimated indoor air concentrations are nonane and cyclohexane.

5.2.2 Estimated exposure point concentrations in ground water due to future leaching from soil

Estimation of future movement of chemical residues from soil into ground water and dispersion in ground water over time followed by domestic usage of such ground water is a potential exposure pathway.

Procedure

To estimate the relationship between soil concentrations of chemicals and theoretical future concentrations in groundwater, analytical modeling was employed (see Appendix F). Two models were used:

- The Seasonal Soil Compartment Model (SESOIL), developed by Arthur D. Little Inc., for the U.S. EPA, Office of Toxic Substances. This is a mathematical soil compartment model designed for long-term environmental fate simulations.

- The Analytical Transient One-, Two, and Three-Dimensional (AT123D) model developed by the Oak Ridge National Laboratory, TN, for the U.S. Department of Energy and the U.S. EPA Office of Toxic Substances. This model was designed for estimating the transport of dissolved chemicals in groundwater.

The environmental transport of chemicals from soil into ground water followed by dispersion of chemicals in ground water over time is a function of several factors, which were incorporated into the modeling runs, including:

- Concentrations of specific chemicals in soil;
- Concentrations of the chemicals in the receiving media (groundwater);
- Site-specific climatological factors (annual rainfall totals);
- Physical-chemical properties of each of the chemicals of concern, such as the affinity of a chemical to adsorb to soil particles (K_{oc}), and chemical partitioning into different media (as expressed by the Henry's Law constant);
- Geological and hydrogeological characteristics of the site (soil type and porosity, depth of and direction of flow of groundwater).

In order to evaluate a worst-case scenario, the modeling was performed using the following basic assumptions:

- It was assumed that the groundwater is devoid of any detectable concentrations of any of the chemicals of concern (i.e., the ground water has been remediated). This allowed the model to estimate the maximum potential for leaching from soil even though the actual measured concentrations of chemicals of concern in water approach the solubility limits for detected chemicals.

- The six chemicals of concern present in soil were modelea at the assumed concentrations discussed in Section 5.2.1 above.

Details of the modeling approach and variables inputted into the model are discussed in detail in Appendix F.

Results

The modeling results provide estimates of the concentrations of chemicals in ground water over a 15 year period due to the environmental transport of soil residues. The results are presented in Table 2 of Appendix F. As shown, all of the chemical concentrations are very low, and the time to reach ground water is several months. As expected, the results show that mineral spirits migrates very slowly in soil; cyclohexane would not reach ground water within 95 months.

5.2.3 Estimation of theoretical chemical intakes

Inhalation pathway

The daily intake (mg/kg/day) of individual chemicals of potential concern via inhalation of ambient air over some period of exposure gives an estimate of the Chronic Daily Intake (CDI). The CDI for the inhalation pathway can be calculated using the following equation:

$$CDI = \frac{C \times CR \times AF \times EF \times ED}{BW \times AT}$$

where:

C = chemical concentration (mg/m^3; model results);

CR = consumption rate [Assume 20 m^3/day (EPA, 1989a, b];

AF = absorption factor (Unitless; assume 100%);

EF = exposure frequency (Conservatively assume 365 days/year for residential receptors. Assume 8 hours/day, 5 days/week for the onsite worker);

ED = exposure duration [30 years; reasonable maximum ED for a residential setting (EPA, 1989a,b)];

BW = body weight [Assume 70 kg (EPA, 1989a,b)];

AT = averaging time [For estimating non-carcinogenic CDIs, the AT = EF x ED, where EF is 365 days/year and ED is 30 years. For estimating carcinogenic CDIs, the AT = EF x ED, where EF is 365 days/year and ED is 75 years (EPA, 1989a)].

The various factors used in this CDI calculation are purposefully conservative. For example, even though the on-site area is not a residential area, exposure factors corresponding to a residential exposure scenario rather than an industrial exposure scenario were used to estimate the most conservative CDIs possible. Exposure point concentrations (mg/m^3) were estimated for individual chemicals by modeling. The procedures and assumptions used in the modeling were described in Section 5.2.1 above. CDIs associated with inhalation exposure to chemicals volatilized into ambient air (onsite worker receptor) and indoor residential air (hypothetical residential receptor) are tabulated in Table 7.

Pathways associated with ground water usage

The daily intake (CDI; mg/kg/day) of individual chemicals of potential concern via hypothetical usage of ground water containing chemicals leached from soil can be calculated using the following equation:

$$CDI = \frac{C \times CR \times AF \times EF \times ED}{BW \times AT}$$

where:

C = chemical concentration (mg/L; model results);

CR = consumption rate [Assume 2 L/day (EPA, 1989a, b];

AF = absorption factor (Unitless; assume 100%);

EF = exposure frequency (Conservatively assume 365 days/year);

ED = exposure duration [30 years; reasonable maximum ED for a residential setting (EPA, 1989a,b)];

BW = body weight [Assume 70 kg (EPA, 1989a,b)];

AT = averaging time [For estimating non-carcinogenic CDIs, the AT = EF x ED, where EF is 365 days/year and ED is 30 years. For estimating carcinogenic CDIs, the AT = EF x ED, where EF is 365 days/year and ED is 75 years (EPA, 1989a)].

Since all of the chemicals of concern are considered volatile, it is necessary to account for the dosage that might result from volatilization from water in the home into air (e.g., showering, operation of dishwasher and washing machine, etc.). EPA has determined that for residential exposures to water containing volatile organic compounds (VOCs), the dose that is absorbed via inhalation of volatilized VOCs and dermal contact with impacted water is equivalent to the dose absorbed by ingestion of 2 liters of water per day (EPA, 1990).

CDIs associated with usage of ground water exposure to chemicals leached from soil into ground water followed by usage for domestic purposes are tabulated in Table 8.

5.3 Theoretical Worst-case Health Impacts Associated with Estimated Chemical Concentrations in Air

Since none of the volatilized chemicals of concern are potential human carcinogens (according to EPA), only noncarcinogenic risk is evaluated for the air pathways. Theoretical noncarcinogenic health impacts are assessed by evaluating the ratio of calculated CDIs to the pathway-specific reference doses (CDI:RfD). This ratio is known as the Hazard Index (HI) (EPA, 1989a). Inhalation RfDs (RfD_i) for each of the chemicals of potential concern were presented in Table 4. If the HI is less than one (i.e., exposure results in a daily intake that is less than the RfD), then the exposure is considered inconsequential (i.e., without any significant adverse health impact).

Current onsite worker

Since onsite workers are not currently housed in buildings located atop impacted soil, inhalation of chemicals in ambient air is the only potentially complete exposure pathway. CDIs and HIs associated with this pathway are presented in Table 7. As shown, no HI for any individual chemical or even the total HI (i.e., all individual HIs summed together) approached unity (1.0) indicating that chemicals volatilized from soil containing approximately 500 ppm of mineral spirits into ambient air does not pose a threat to onsite workers.

Hypothetical onsite residential occupant

Inhalation pathway. Chemical-specific CDIs and HIs for inhalation exposure of a hypothetical resident inhaling indoor air containing chemicals volatilized from soil containing 500 ppm are presented in Table 7. As shown, the HI associated with this theoretical exposure pathway exceeds unity by 3.18 fold, indicating that placement of a residence at the site under the various conditions assumed in this analysis (e.g., ca. 500 ppm of mineral spirits in soil extending from approximately 5-13 feet below grade, occupancy of a raised foundation home, occupancy rate of 365 days/year and 24 hour/day , etc.) is potentially hazardous.

Ground water pathway. Chemical-specific CDIs and HIs for exposure to chemicals leached from soil into ground water are presented in Table 8. As shown, the total HI for this theoretical exposure pathway, which is also based on a soil concentration of 500 ppm extending from 5 to 13 feet below grade, does not exceed unity. Therefore, future leaching of chemicals from soil into ground water would have negligible impact on the health of a hypothetical resident based on the conservative assumption that this water is used as a residential water supply.

5.4 Summary of Theoretical Health Risks at the S-K Site

Only one significant theoretically complete exposure pathway can be identified at the site, namely, inhalation of chemicals of concern volatilized from on-site soil into ambient air. For the purpose of judging potential health impacts associated with this theoretical pathway, exposure point concentrations (air concentrations in the breathing zone) were estimated by analytical modeling. At an assumed soil concentration of 500 ppm of mineral spirits and associated compounds (xylene, toluene, naphthalene, ethyl benzene), the estimated concentrations of chemicals in ambient air do not pose a health risk to onsite workers. However, the estimated concentrations accumulated in indoor air in a hypothetical onsite residence are potentially hazardous at an assumed soil concentration of 500 ppm.

6.0 HEALTH-BASED CLEANUP LEVEL RECOMMENDATIONS

This section presents health-based cleanup level recommendations (HCLRs) for each of the 8 chemicals of potential concern. Reduction of source area concentrations to these media-specific recommended levels are health protective (i.e., long-term chronic human exposure would not be expected to result in adverse effects to human health, including potentially sensitive subpopulations). In accordance with KDHE guidelines (KDHE, 1991), the HCLRs are based on a reasonable worst-case residential exposure scenario.

HCLRs are needed for the two impacted environmental media at the S-K site, namely soil and groundwater. HCLRs are intended to provide protection of human health assuming combined exposure to chemicals in ground water and indoor residential air. No regulatory criteria currently exist for this combination of exposure pathways. Although existing KALs or KAL-equivalents (mineral spirits) are attainment goals for ground water, it is necessary to establish HCLRs that reflect the theoretical combined impacts of chemical residues in both ground water and indoor residential air.

6.1 HCLR for Soil

Two potential pathways exist by which soil containing chemicals of concern at the site could theoretically impact a hypothetical resident: (1) volatilization of constituents from soil and accumulation in indoor air, and (2) leaching from soil into ground water followed by usage of this ground water for domestic purposes. The results of the HRA (above) indicated that a soil concentration of 500 ppm distributed from 5 to 13 feet constitutes a theoretical noncarcinogenic risk to a hypothetical residential receptor due to inhalation of volatilized chemicals in indoor air, but a contribution due to future leaching into ground water was found to be negligible.

Based on the finding that the HI associated with 500 ppm in soil was 3.18 due to volatilization of chemicals from soil into indoor air (see Table 7), onsite soil will require remediation. A site-specific soil cleanup level (HCLR) of **75 ppm** is proposed for mineral spirits.

S-K intends to implement a soil vapor extraction (SVE) system for onsite soil remediation (THC, 1991a). A pilot study was conducted at the site in July, 1991 and shown to be effective in removing chemical constituents from soil (THC, 1991a). Assuming that the SVE system is capable of removing each of the chemical constituents in soil at a similar rate, the resulting concentrations of the 5 chemicals of concern in soil would theoretically be reduced proportionately. If the assumption is made that the highest onsite concentration of mineral spirits (4,000 ppm; see Table 2) is reduced to its proposed HCLR of 75 ppm, then the concentrations of other chemical

constituents should reduce proportionately from their maximum concentrations (see Table 2 for maximum concentrations). Post-remediation concentrations of the 5 chemicals of concern in soil are listed in Table 9.

6.1.1 Theoretical health impacts following remediation of the soil to the HCLR of 75 ppm

To verify that the HCLR for soil of 75 ppm does not result in an acceptable noncarcinogenic health risk, exposure of the two potentially significant exposure pathways associated with soil need to be re-evaluated. These pathways are: (1) volatilization of chemicals from soil into indoor residential air, and (2) usage of water containing chemicals leached from soil.

Volatilization of chemicals into indoor air

Concentrations of chemicals in ambient and indoor air estimated for the post-remediation soil concentrations listed in Table 9 are tabulated in Table 10. Resulting CDIs and HIs corresponding to these concentrations are given in Table 11. As shown, the total HI (0.61) for all 5 chemicals of concern (i.e., summation of noncarcinogenic risk) is less than 1.0 indicating that a post-remediation soil concentration of 75 ppm mineral spirits combined with the estimated soil concentrations of the other constituents does not pose a noncarcinogenic risk to residential inhabitants.

Leaching of chemicals into ground water

Estimated water concentrations, CDIs; and HIs associated with the theoretical leaching of chemicals from onsite soil into ground water following remediation is tabulated in Table 12. As shown, virtually the entire HI, which is well below a HI of 1.0, is contributed by naphthalene.

Total noncarcinogenic hazard at the HCLR of 75 ppm

The total hazard is the sum of the HIs for the two pertinent exposure pathways is 0.614 (i.e., 0.610 + 0.004). Therefore, reduction of mineral spirits to a concentration of 75 ppm and corresponding reduction of all other chemicals of concern proportionately would effectively eliminate any known noncarcinogenic risk associated with soil at the site.

6.2 HCLR for Ground Water

Data were presented in Table 5 indicating that 2 of the 8 chemicals of concern exceed their respective KALs. Site-specific HCLRs in ground water are needed so that the combined theoretical health impacts from ground water usage plus inhalation of chemicals into indoor air from soil containing 75 ppm mineral spirits are not unacceptable. Because the HI for soil at the HCLR of

75 ppm was 0.614, the HI associated with ground water should not exceed 0.386 (1.0 - 0.614 = 0.386). To achieve this HI, it was determined that the concentrations of the various constituents in ground water should be reduced as a minimum to the concentrations shown in Table 13. These levels were derived based on the assumption that the proportion that mineral spirits is reduced from 2.9 mg/L (its KAL-equivalent) to 2.0 mg/L is applied to the maximum existing concentrations of the other 7 constituents in ground water. This is a conservative assumption, because removal of the other 7 constituents during the reduction of mineral spirits from the current maximum of 600 mg/L to 2.9 mg/L is ignored.

As shown in Table 13, the total HI based on the estimated post-remediation ground water levels is 0.34, which is less than 0.386. Moreover, the post-remediation concentrations for each of the 8 constituents are all less than or equal to their respective KALs or KAL-equivalents. Therefore, the HCLR for mineral spirits is set at **2.0 mg/L**. Attainment of this concentration will ensure that the total noncarcinogenic risk associated with all other constituents in ground water at the site is within an acceptable range (i.e., an HI less than 1.0).

6.3 Theoretical Risk After Attainment of Proposed HCLRs for Soil and Ground Water

6.3.1 Noncarcinogenic risk

Table 14 shows the combined noncarcinogenic risk for all potentially complete exposure pathways at the site. As shown the total HI is 0.95, which is less than the target level of 1.0. Therefore, attainment of the proposed HCLRs for both soil (75 ppm mineral spirits) and ground water (2.0 ppm mineral spirits) would effectively eliminate any known noncarcinogenic risk associated with impacted soil and ground water at the site.

6.3.2 Carcinogenic risk

Two of the chemicals of concern, namely 1,4-DCB and 1,1-DCA, have been classified as Group C carcinogens by the EPA (see Table 4). EPA's classification system was discussed in Section 4.3.1. The theoretical upperbound carcinogenic risk for 1,1-DCA and 1,4-DCB are given in Table 15. As shown, the total theoretical carcinogenic risk is estimated to be 1.3×10^{-5} (13 theoretical new cases of cancer per 1,000,000 exposed individuals). This level of theoretical carcinogenic risk is less than the target risk level of 1×10^{-4} sometimes cited for Group C carcinogens (Clement, 1990). It should be noted that the majority (ca. 92%) of this theoretical risk estimate is attributed to 1,1-DCA, which has been detected in only one water sample at 7 μg/L (see Table 3). Furthermore, an overly conservative assumption was incorporated into this assessment, namely

that remediation of the ground water primarily designed to reduce mineral spirits to the HCLR of 2.0 mg/L would have little impact on either 1,4-DCB and 1,1-DCA.

6.4 Summary of Health-Based Cleanup Level Recommendation (HCLRs) for Soil and Ground water

- HCLR for soil: **75 mg/kg** mineral spirits
- HCLR for ground water: **2.0 mg/L** mineral spirits

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TABLES

TABLE 1

SUMMARY OF SOIL AND GROUNDWATER SAMPLE COLLECTION

Soil Gas Survey	Date of sampling	No. of Samples
	9/28/89–11/11/89	76

Soil Sampling

Location	Sample depth [a]	Date [b]	Analyses [c]
A-2	12.5–14 ft.	10/89	VOCs, Inorganics
A-4	14.5–16 ft.	10/89	VOCs, Inorganics
BH-1	12.5–14 ft 16.5–18 ft.	10/89 10/89	VOCs, Inorganics, VOCs, Inorganics
BH-2	12.5–14 ft.	10/89	VOCs, Inorganics, Semi-volatiles
BH-3	12.5–14 ft.	10/89	VOCs, Inorganics
BH-4	16.5–18 ft.	10/89	VOCs, Inorganics
BH-5	12.5-14 ft.	10/89	VOCs, Inorganics
BH-6	12.5–14 ft.	10/89	VOCs, Inorganics
BH-8	12.5–14 ft.	10/89	VOCs, Inorganics
BH-10	16.5–18 ft.	10/89	VOCs, Inorganics
A-5	0.5–3.5 8.5–13.5 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
K-1	3.5–8.5 8.5–13.5 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
K-2	0.3–3.0 8.0–13 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
K-3	0.5–3.5 13.5-15.5 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
K-4	0–3.5 8.5–13.5 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
K-5a	53.5–55.5 ft.	7/91	VOCs, Naphthalene
VE-1	3.5–8.5 13.5-15.5 ft.	7/91 7/91	VOCs, Inorganics, Naphthalene VOCs, Inorganics, Naphthalene
VE-2	12–12.5	10/91	VOCs, Inorganics, Naphthalene

TABLE 1 (con't)

SUMMARY OF SOIL AND GROUNDWATER SAMPLE COLLECTION

Location	Sample depth	Date	Analyses
VE-3	6.5–7	10/91	VOCs, Inorganics, Naphthalene
VE-4	12–12.5	10/91	VOCs, Inorganics, Naphthalene
61991-STK1	6–8 ft.	6/91	VOCs, PAHs, Inorganics
61991-STK2	6–8 ft.	6/91	VOCs, PAHs, Inorganics
61991-SW	6–8 ft.	6/91	VOCs, PAHs, Inorganics
61991EW	6–8 ft.	6/91	VOCs, PAHs, Inorganics
61991-BE	6–8 ft.	6/91	VOCs, PAHs, Inorganics
62091-NW	6-8 ft.	6/91	VOCs, PAHs, Inorganics
62091–WW	6–8 ft.	6/91	VOCs, PAHs, Inorganics

Water sampling

Location	Date [b]	Analyses [c]
A-1	10/89	VOCs, Inorganics
	7/91	VOCs, Inorganics
	10/91	VOCs, Inorganics
A-2	10/89	VOCs, Inorganics
	7/91	VOCs, Inorganics
	10/91	VOCs, Inorganics
A-3	10/89	VOCs, Inorganics
	7/91	VOCs, Inorganics
	10/91	VOCs, Inorganics
A-4	10/89	VOCs, Inorganics
	7/91	VOCs, Inorganics
	10/91	VOCs, Inorganics
A-5	7/91	VOCs, Inorganics
	10/91	VOCs, Inorganics
S-K Well	10/89	VOCs, Inorganics

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[a] Depth of soil sample below grade surface

[b] Date sample was obtained. May not necessarily correspond with the month the sample was analyzed.

[c] All samples were analyzed for VOCs and mineral spirits using EPA method 8240. Naphthalene was analyzed for using EPA method 8270. PAHs were analyzed for using EPA method 8310.

TABLE 2

SUMMARY OF CHEMICALS IN ON-SITE SOIL

Chemical	No. samples analyzed/ Total No. samples	No. detects/ No. samples analyzed	Frequency of Detection (%)	Range of Detected Concentrations (mg/kg)	Detection Limits (mg/kg)
Organics					
Acetone	35/35	18/35	51	0.011–5.3	0.011-1.6
2-Butanone	35/35	9/35	26	0.021–12.0	0.011-1.6
Di-n-butylphthalate	1/32	1/1	100	0.6	NA
Ethyl benzene	35/35	2/35	5.7	0.140–0.530	0.0054–5
Methylene chloride	35/35	3/35	8.6	0.0098–0.890	0.0055–5
Mineral spirits	35/35	8/35	29	52–4,000	3–150
Naphthalene	23/35	8/23	35	0.076–4.9	0.05–0.330
Toluene	32/32	2/35	5.7	0.0088–0.250	0.0054–5
Xylenes (total)	32/32	4/35	11	0.750–4.6	0.0054–5
Inorganics					
Chromium	32/32	17/32	53	1.0–11.0	0.011-1.6
Lead	32/32	21/32	66	1.0–63.0	0.011-1.6

TABLE 3

SUMMARY OF CHEMICAL RESIDUES IN GROUNDWATER

Chemical	No. samples analyzed/ Total No. samples	No. detects/ No. samples analyzed	Frequency of Detection (%)	Range of Detected Concentrations (mg/L)	Detection Limit (mg/L)
1,2-Dichlorobenzene	10/17	5/10	50	0.006–0.083	0.005
1,1-Dichoroethane	15/17	1/15	6.7	0.007	0.005
1,4-Dichlorobenzene	10/17	3/10	30	0.011–0.036	0.005
1,2-DCE (Total)	15/17	1/10	27	0.020	0.005
Ethyl benzene	15/17	1/10	20	0.013–0.060	0.005
Mineral spirits	15/17	2/10	15	0.120–600	0.009–1.8
1,1,1-TCA	15/17	1/10	6.7	0.008	0.005
Toluene	15/17	1/10	13	0.041–0.045	0.005
Xylenes (total)	15/17	1/10	27	0.011–0.450	0.005
Inorganics					
Chromium	10/12	7/15	47	0.013–0.980	0.010-0.04
Lead	10/12	8/15	53	0.004–0.150	0.003–0.005

TABLE 4

CRITICAL TOXICITY VALUES
AND STATE AND FEDERAL DRINKING WATER STANDARDS
FOR CHEMICALS OF CONCERN

Chemical	Oral RfD (mg/kg-day)	Inhal RfD (mg/kg-day)	KAL (μg/L)	EPA MCL (μg/L)	CAG Weight of Evidence	Oral CPF $(mg/kg\text{-}day)^{-1}$	Inhal CPF $(mg/m^3)^{-1}$
1,2-Dichlorobenzene	0.09	0.04	620	600	D	–	–
1,4-Dichlorobenzene	[0.7][a]	0.7	75	75	C	2.4×10^{-2}	–
1,1-Dichoroethane	0.1	0.1	5	–	C	9.1×10^{-2}[b]	9.1×10^{-2}
Ethyl benzene	0.1	0.3	70	70	D	–	–
Mineral spirits	[0.6][c]	[1.3][b]	[2,880][b]	–	–	–	–
Naphthalene	0.004	[0.004][b]	143	–	D	–	–
Toluene	0.2	0.6	2,000	1,000	D	–	–
Xylenes (total)	2	0.09	440	10,000	D	–	–

TABLE 4 (con't)

CRITICAL TOXICITY VALUES
AND STATE AND FEDERAL DRINKING WATER STANDARDS
FOR CHEMICALS OF CONCERN

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[a] Numbers ion brackets indicate that EPA has not calculated an value due to lack of o inadequate data.

[b] These CPFs for 1,1-DCA have been withdrawn pending reevaluation.

[c] See Appendix D for a description of the procedures used to calculate RfD values for mineral spirits.

TABLE 5

COMPARISON OF DETECTED LEVELS OF CHEMICALS OF CONCERN IN WATER WITH KALS AND KAL-EQUIVALENTS

Chemical	KAL (μg/L)	Detected conc (μg/L)	Hazard Quotient (Det. conc: KAL ratio)
1,2-Dichlorobenzene	620	83	0.134
1,4-Dichlorobenzene	75	36	0.48
1,1-Dichloroethane	5	7	1.40
Ethyl benzene	70	60	0.86
Mineral spirits	[2,880][a]	600,000	208.3
Naphthalene	143	NA[b]	0
Toluene	2,000	45	0.022
Xylenes (total)	440	450	1.02
		Total HQ =	212.22

a Numbers in brackets indicates that KALs and/or Federal MCLs have not been established and that equivalent values have been calculated.

b Not analyzed for in water samples.

TABLE 6

ESTIMATED AMBIENT AND INDOOR AIR CONCENTRATIONS OF CHEMICALS OF CONCERN DUE TO VOLATILIZATION FROM ON-SITE SOIL[a]

Chemical	Soil Conc (mg/kg)	Emission rate mg/m^2-sec	Maximum on-site air concentration (mg/m^3)	Maximum indoor air concentration (mg/m^3)
Ethyl benzene	5	4.78×10^{-5}	2.35×10^{-6}	0.05
Mineral Spirits	480			
Cyclohexane	240	1.36×10^{-2}	6.70×10^{-4}	12.99
Nonane	240	3.77×10^{-5}	2.41×10^{-5}	4.68
Naphthalene	5	3.68×10^{-4}	1.36×10^{-8}	0.003
Toluene	5	4.11×10^{-5}	2.02×10^{-6}	0.04
Xylene	5	1.31×10^{-5}	8.07×10^{-7}	0.02

[a] See section 5.2.1 and Appendices F and G for a description of the assumptions and procedures used in the modeling.

TABLE 7

HYPOTHETICAL NONCARCINOGENIC RISK DUE TO INHALATION OF CHEMICALS VOLATILIZED FROM ON-SITE SOIL

Chemical	Soil Conc. (mg/kg)	Estimated Conc[a] (mg/m^3)	CDI[b] (mg/kd-day)	CDI:RfD
On-site Worker				
Ethyl benzene	5	2.35×10^{-6}	1.54×10^{-7}	1.01×10^{-8}
Mineral spirits	480	9.11×10^{-4}	5.96×10^{-5}	3.90×10^{-6}
Naphthalene	5	1.36×10^{-8}	8.90×10^{-10}	5.82×10^{-11}
Toluene	5	2.02×10^{-6}	1.32×10^{-7}	2.20×10^{-7}
Xylenes (total)	5	8.02×10^{-7}	5.25×10^{-8}	5.83×10^{-7}
			Total HI	4.71×10^{-6}
Residential				
Ethyl benzene	5	0.05	0.014	0.023
Mineral spirits	480	12.99	3.71	2.85
Naphthalene	5	0.003	0.0009	0.22
Toluene	5	0.04	0.011	0.018
Xylenes (total)	5	0.02	0.006	0.067
			Total HI	3.18

a Concentrations based on model results of volatilization from soil. See Section 5.2.1 and Appendix F for a detailed description of modeling procedures

b See Section 5.2.2 for a description of the exposure factors and assumptions used in this calculation

TABLE 8

HYPOTHETICAL NONCARCINOGENIC RISK ASSOCIATED WITH EXPOSURE TO ESTIMATED CHEMICAL CONCENTRATIONS IN GROUNDWATER DUE TO LEACHING FROM SOIL

Chemical	Maximum Detected Soil Conc. (mg/kg)	Estimated Conc[a] (mg/L)	CDI[b] (mg/kd-day)	CDI:RfD Ratio ingestion	CDI:RfD inhalation[c]	Total HI
Ethyl benzene	0.53	0	0	0	0	0
Mineral spirits	4,000	5.5×10^{-14}	1.57×10^{-15}	2.6×10^{-15}	1.2×10^{-15}	3.8×10^{-15}
Naphthalene	4.9	2.94×10^{-4}	8.40×10^{-6}	2.1×10^{-3}	2.1×10^{-3}	4.2×10^{-3}
Toluene	0.25	1.14×10^{-8}	3.36×10^{-10}	1.7×10^{-9}	5.6×10^{-10}	2.3×10^{-9}
Xylenes (total)	4.6	6.44×10^{-7}	1.84×10^{-8}	9.2×10^{-9}	3.7×10^{-9}	1.3×10^{-8}
					Total	4.2×10^{-3}

a Concentrations are based on modeling results and the highest detected soil levels. See Appendix F for a detailed description of the pocedures used in the modeling

b Assumes that a 70 kg adult consumes 2L of water/day.

c Region IX EPA has determined that for residential exposures to water containing VOCs, that dose that is absorbed via inhalation of is considered equivalent to the dose absorbed by ingestion of 2L of water per day.

TABLE 9

ESTIMATED CHEMICAL CONCENTRATIONS IN SOIL FOLLOWING SOIL REMEDIATION

Chemical	Existing Maximum Soil Concentration (mg/kg)	Estimated Future Soil Concentration[a] (mg/kg)
Ethyl benzene	0.53	0.010
Mineral spirits	4,000	75
Naphthalene	4.90	0.092
Toluene	0.25	0.005
Xylene	4.60	0.092

[a] Concentrations are estimated by assuming that eac chemical will be reduced in concentration from its highest detected soil level to the estimated level by the same proportion as mineral spirits. Mineral spirits is assumed to be reduced from 4,000 ppm to 75 ppm.

TABLE 10

ESTIMATED AMBIENT AND INDOOR AIR CONCENTRATIONS OF CHEMICALS OF CONCERN DUE TO VOLATILIZATION FROM ON-SITE SOIL FOLLOWING SOIL REMEDIATION[a]

Chemical	HCLR Soil Conc (mg/kg)	Maximum on-site air concentration[b] (mg/m^3)	Maximum indoor air concentration (mg/m^3)
Ethyl benzene	0.001	2.36×10^{-12}	1.0×10^{-5}
Mineral Spirits	75		
Cyclohexane	37.5	1.05×10^{-4}	2.03
Nonane	37.5	3.77×10^{-5}	0.731
Naphthalene	0.092	3.86×10^{-11}	5.5×10^{-5}
Toluene	0.005	2.02×10^{-12}	4.0×10^{-5}
Xylene	0.086	3.87×10^{-10}	3.4×10^{-4}

a See Appendix F for a description of the assumptions and procedures used in the modeling.

b Air concentrations are assumed to have a linear relationship with soil concentration. Air concentrations were calculated using the methods described in Table 6.

TABLE 11

HYPOTHETICAL RESIDENTIAL NONCARCINOGENIC RISK DUE TO INHALATION OF CHEMICALS VOLATILIZED FROM ON-SITE SOIL FOLLOWING SOIL CLEANUP

Chemical	HCLR Soil Conc. (mg/kg)	Estimated Indoor Air Conc[a] (mg/m^3)	CDI[b] (mg/kd-day)	CDI:RfD
Ethyl benzene	0.001	1.0×10^{-5}	2.9×10^{-6}	0.00001
Mineral spirits	75	2.76	0.789	0.607
Naphthalene	0.092	5.5×10^{-5}	1.6×10^{-5}	0.004
Toluene	0.005	4.0×10^{-5}	1.1×10^{-5}	0.00002
Xylenes (total)	0.086	3.4×10^{-4}	9.7×10^{-5}	0.001
			Total HI	0.61

a Concentrations based on model results of volatilization from soil. See Appendix F for an explanation of modeling procedures .

b See Section 5.2.2 for a description of the exposure factors and assumptions used in this calculation

TABLE 12

THEORETICAL NONCARCINOGENIC RISK ASSOCIATED WITH HYPOTHETICAL EXPOSURE TO ESTIMATED CHEMICAL CONCENTRATIONS IN GROUNDWATER DUE TO LEACHING FROM SOIL FOLLOWING REMEDIATION

Chemical	HCLR Soil Conc. (mg/kg)	Conc. of Chemicals in Water due to Leaching[a] (mg/L)	CDI[b] (mg/kd-day)	CDI:RfD Ratio ingestion	CDI:RfD inhalation[c]	Total HI
Ethyl benzene	0.010	0	0	0	0	0
Mineral spirits	75	5.2×10^{-16}	1.5×10^{-17}	2.5×10^{-17}	1.1×10^{-17}	3.6×10^{-17}
Naphthalene	0.092	2.9×10^{-4}	8.3×10^{-6}	2.1×10^{-3}	2.1×10^{-3}	4.2×10^{-3}
Toluene	0.005	5.0×10^{-10}	1.4×10^{-11}	7.0×10^{-11}	2.3×10^{-11}	9.3×10^{-11}
Xylenes	0.086	6.4×10^{-7}	1.8×10^{-8}	9.0×10^{-9}	2.0×10^{-7}	2.1×10^{-7}
(total)						
					Total	0.004

a See Appendix F for a description of the procedures used in the modeling

b Assumes that a 70 kg adult consumes 2L of water/day.

c Region IX EPA has determined that for residential exposures to water containing VOCs, that dose that is absorbed via inhalation of is considered equivalent to the dose absorbed by ingestion of 2L of water per day (EPA, 1990).

TABLE 13

HYPOTHETICAL NONCARCINOGENIC RISK
ASSOCIATED WITH EXPOSURE TO ESTIMATED CHEMICAL
CONCENTRATIONS IN GROUNDWATER FOLLOWING REMEDIATION

Chemical	HCLR Conc[a] (mg/L)	CDI[b] (mg/kd-day)	CDI:RfD Ratio ingestion	CDI:RfD inhalation[c]	Total HI
1,2-Dichlorobenzene	0.057	0.0016	0.02	0.04	0.06
1,4-Dichlorobenzene	0.0025	0.0007	0.001	0.001	0.002
1,1-Dichloroethane	0.005	0.0001	0.001	0.001	0.002
Ethyl benzene	0.0025	0.001	0.01	0.03	0.04
Mineral spirits	2.0	0.057	0.09	0.04	0.13
Naphthalene	0.00005	0.000001	0.0003	0.0003	0.0006
Toluene	0.031	0.0009	0.004	0.0015	0.006
Xylenes (total)	0.31	0.009	0.1	0.0045	0.1
				Total	0.34

a Estimated concentration after remediation of total mineral spirits to 2.0 mg/L. Concentrations of other chemicals assumes that they will be proportionally reduced from their highest detected concentrations while as mineral spirits concentration is reduced from 2.9 to 2.0 mg/L.

b Assumes that a 70 kg adult consumes 2L of water/day.

c Region IX EPA has determined that for residential exposures to water containing VOCs, that dose that is absorbed via inhalation of is considered equivalent to the dose absorbed by ingestion of 2L of water per day (EPA, 1990).

TABLE 14

TOTAL NONCARCINOGENIC RISK FOLLOWING
SOIL CLEANUP TO 75 PPM MINERAL SPIRITS

Exposure Pathway	
1. HI Following Soil Remediation	
Volatilization into indoor air	0.61
Leaching into groundwater	0.004
2. HI Following Groundwater Remediation	0.34
Total HI	0.95

TABLE 15

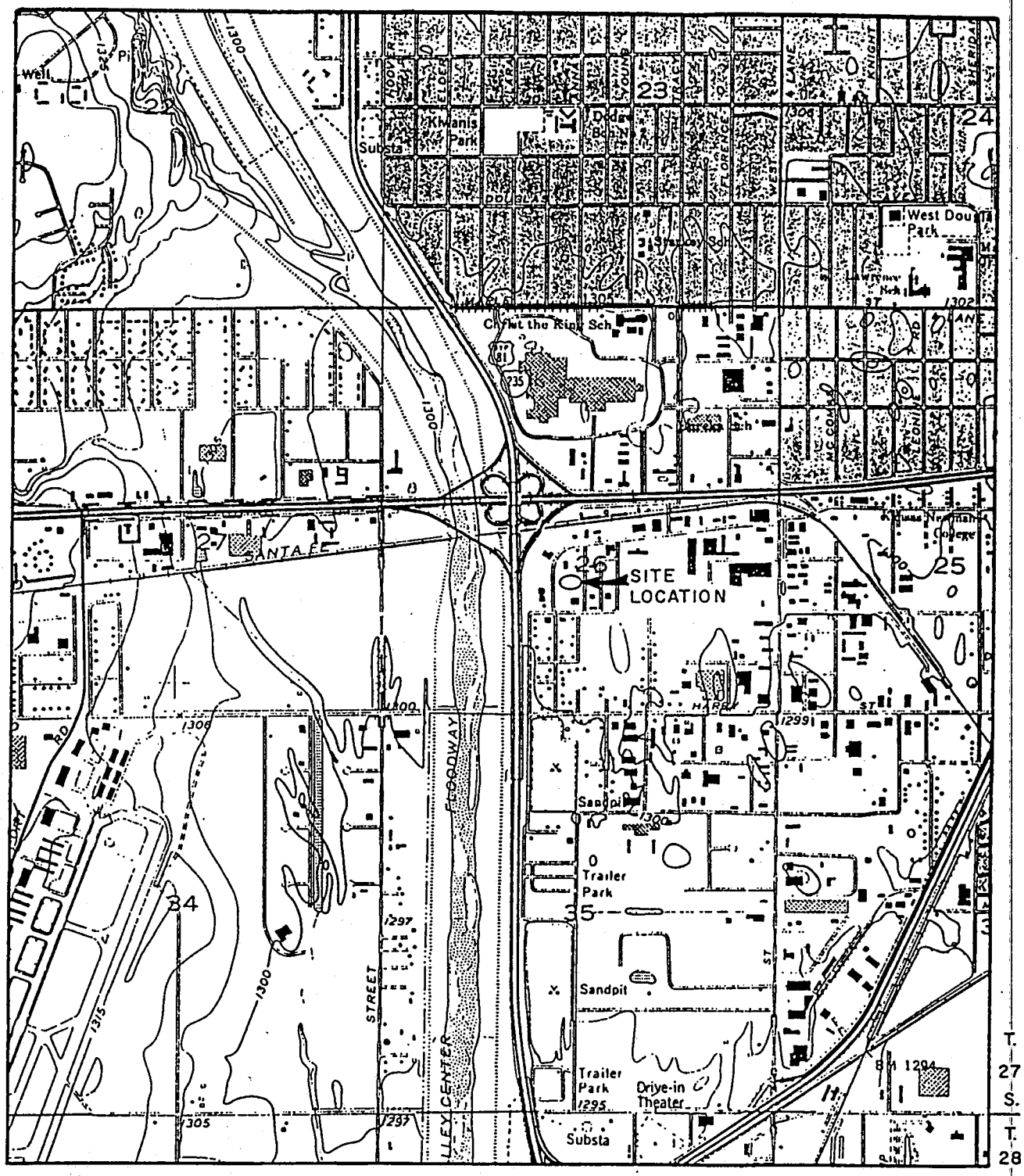
HYPOTHETICAL CARCINOGENIC RISK
ASSOCIATED WITH HYPOTHETICAL EXPOSURE TO ESTIMATED CHEMICAL
CONCENTRATIONS IN GROUNDWATER FOLLOWING REMEDIATION

Chemical	Estimated Conc[a] (mg/L)	CDI[b] (mg/kd-day)	Carcinogenic Risk ingestion	Carcinogenic Risk inhalation	Total
1,4-Dichlorobenzene	0.0025	2.86×10^{-4}	6.9×10^{-7}	6.9×10^{-7}	1.4×10^{-6}
1,1-Dichloroethane	0.005	5.7×10^{-5}	5.2×10^{-6}	5.2×10^{-6}	1.2×10^{-5}
				Total	1.3×10^{-5}

a Estimated concentration after remediation of total mineral spirits to 2.0 mg/L.

b Assumes a 70 kg adult consuming 2 of water/day for a 30 year period, 75 year lifetime.

FIGURES



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SCALE

FIGURE 1. Location of Service Center, Safety-Kleen Corporation, Wichita, Kansas

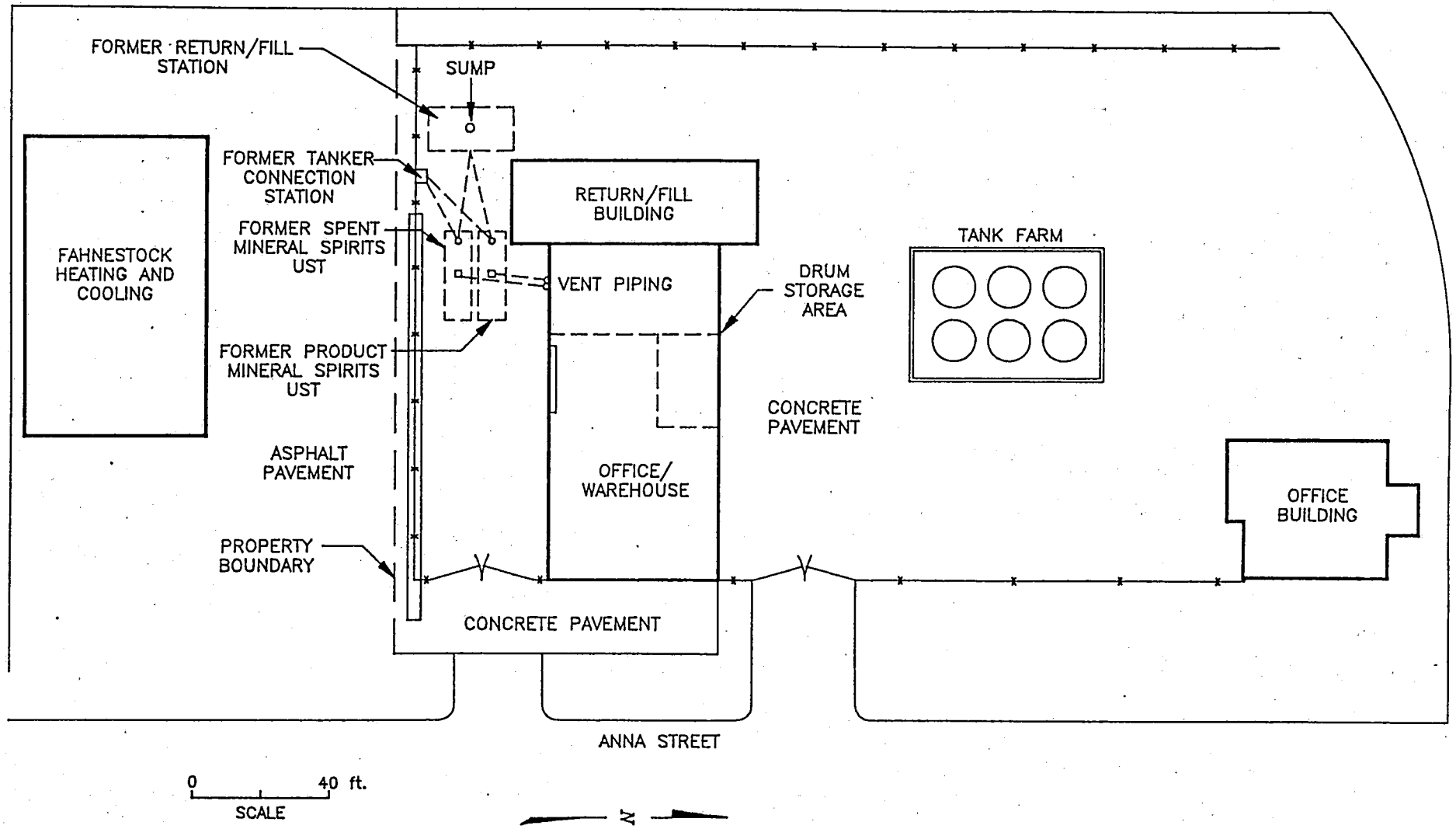

FIGURE 2. General Site Layout, Safety-Kleen Corporation Service Center, Wichita, Kansas

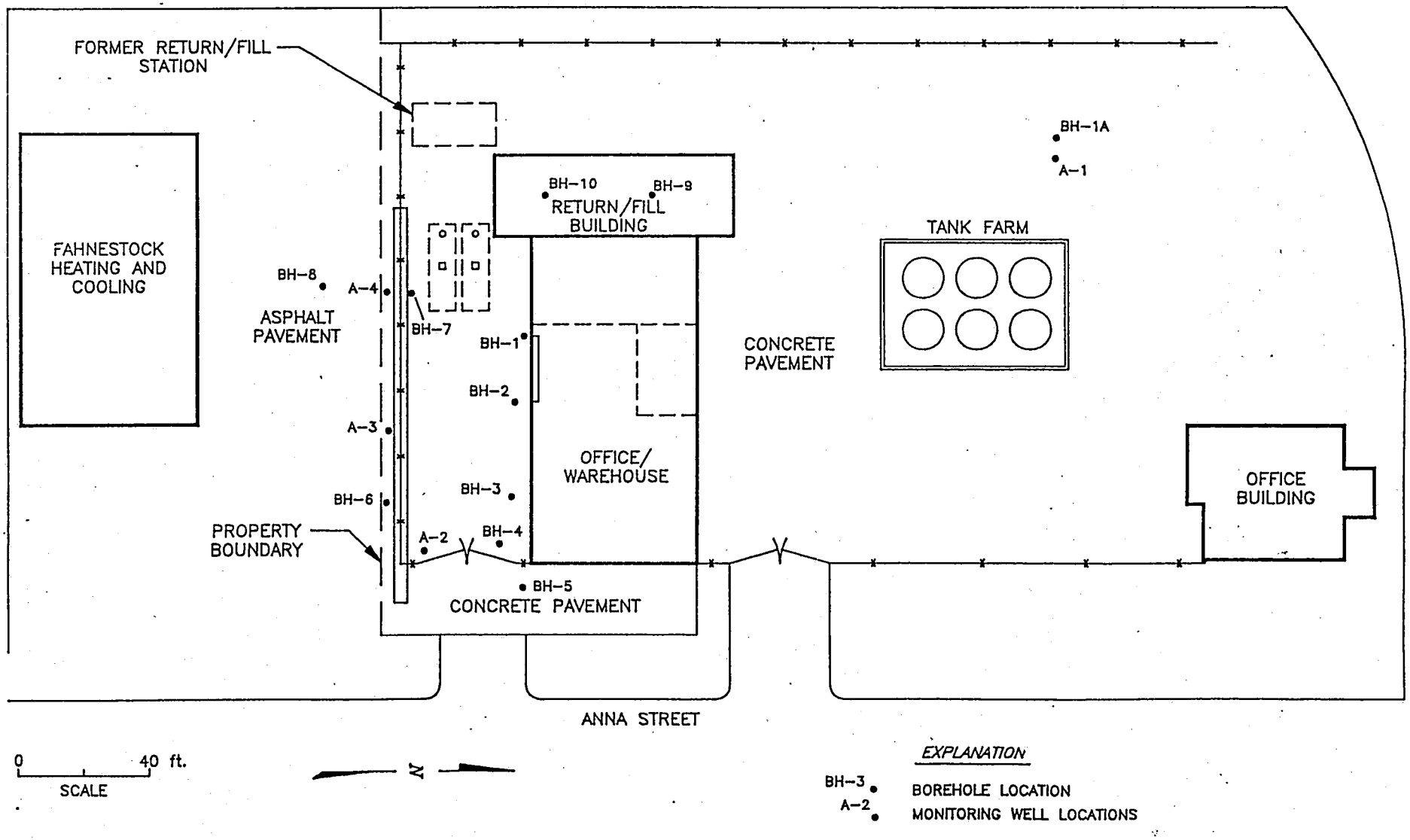

FIGURE 3. Borehole and Monitoring Well Locations, Safety-Kleen Corporation Service Center, Wichita, Kansas (October, 1989)

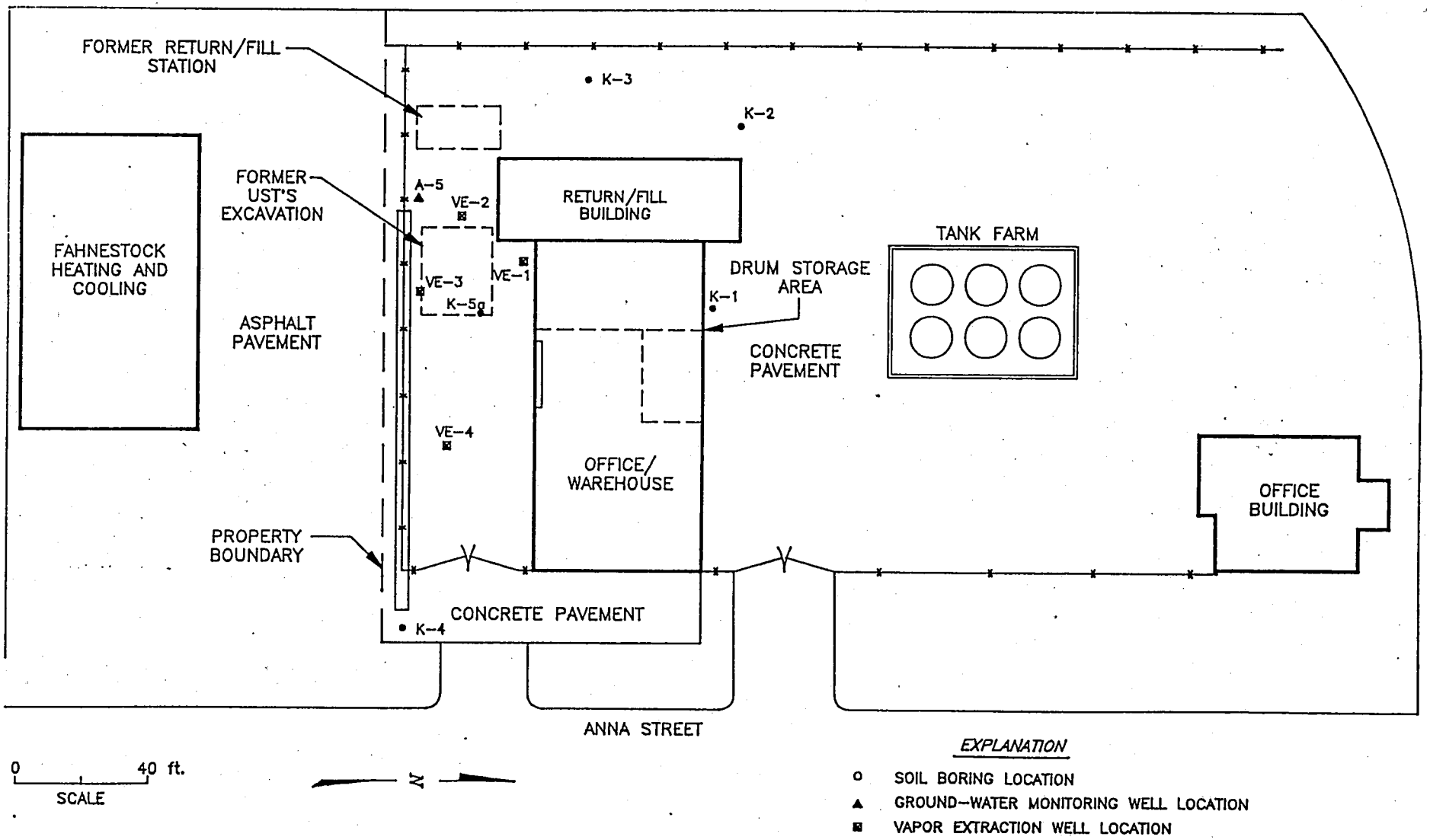

FIGURE 4. Soil Boring Locations, Additional Assessment Activities, Safety-Kleen Corporation Service Center, Wichita, Kansas (July - October, 1991)

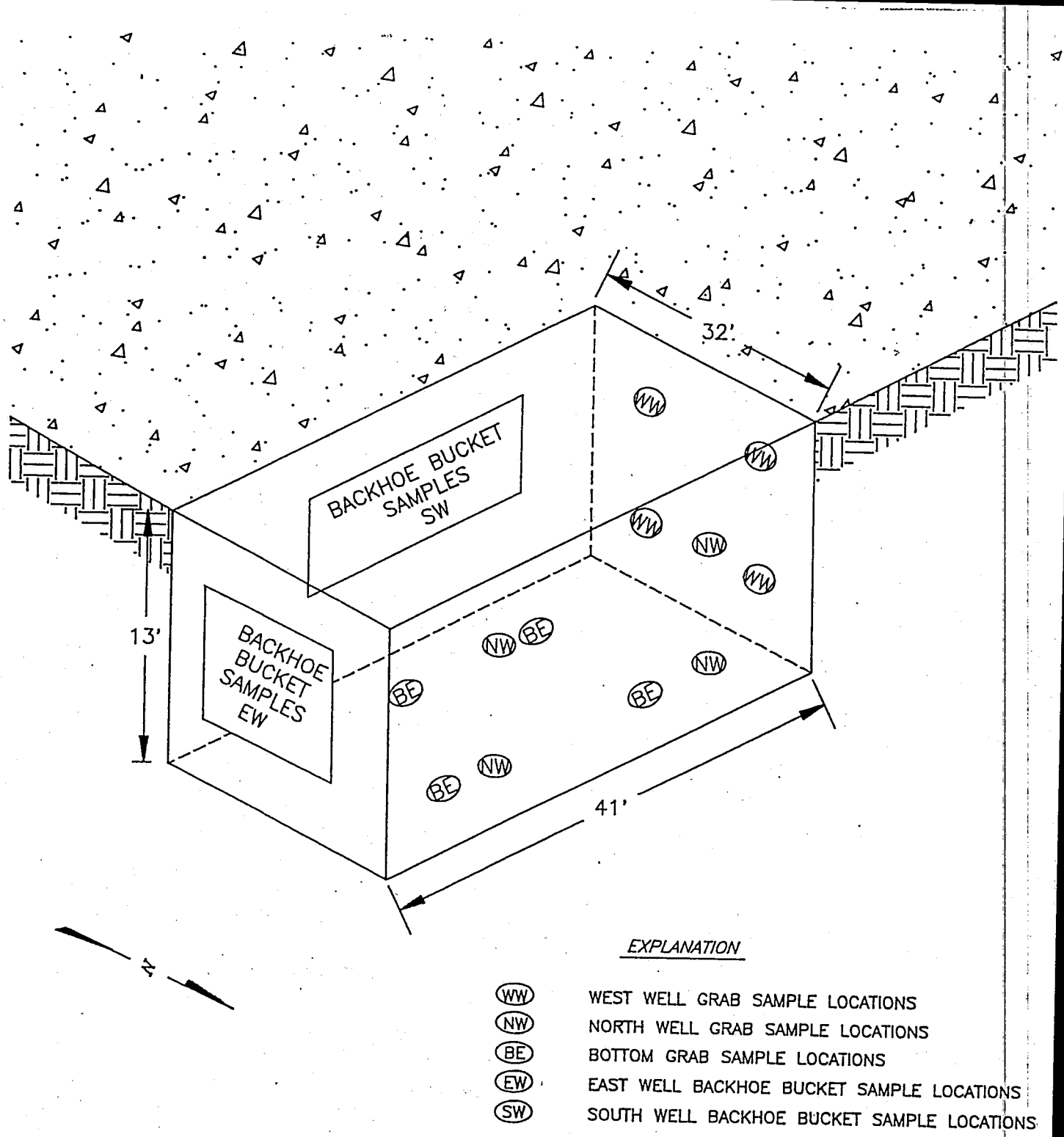

FIGURE 5. USTs Excavation Pit Soil Sample Locations, Safety-Kleen Corporation Service Center, Wichita, Kansas

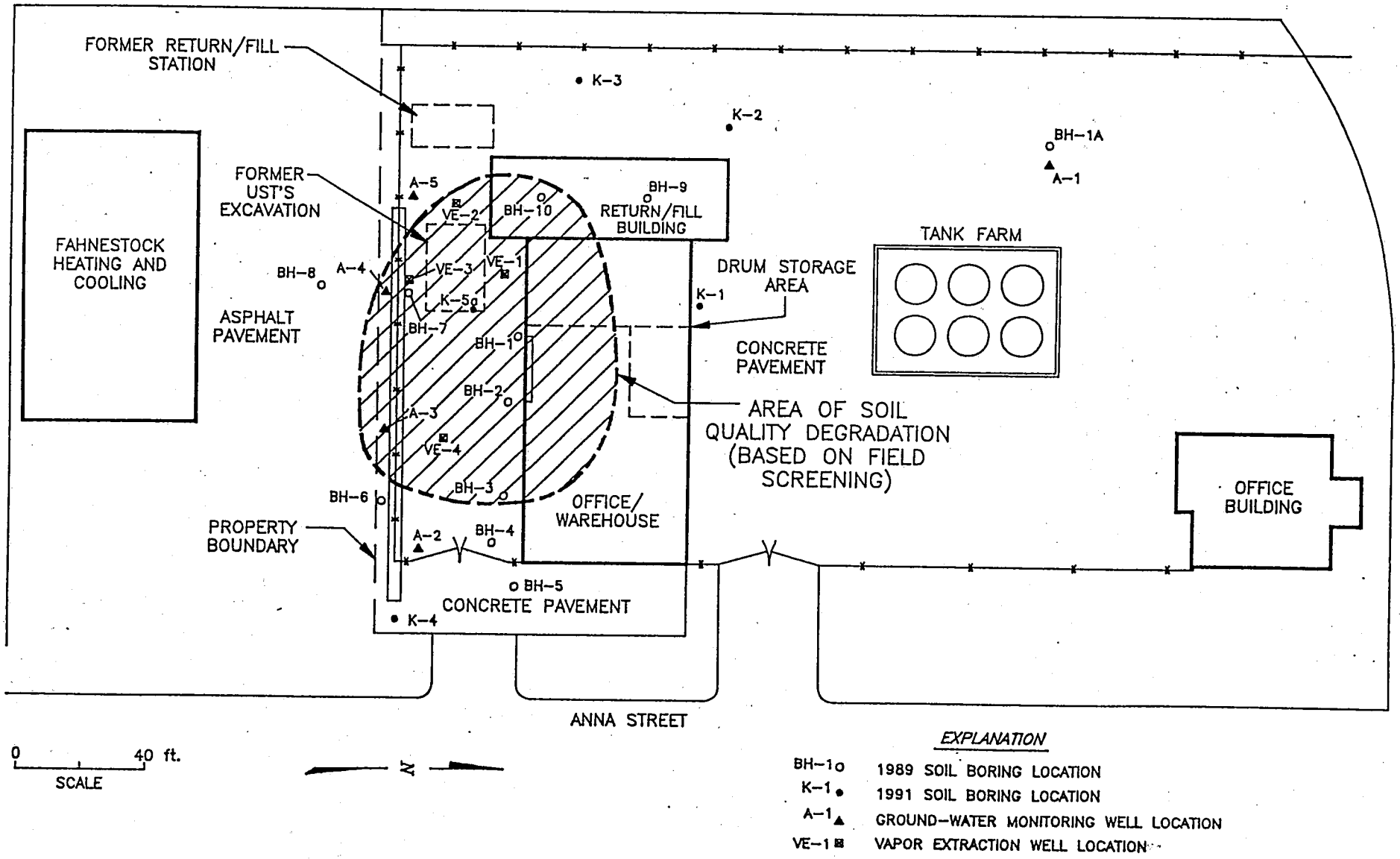

FIGURE 6. Area of Soil Quality Degradation, Partial Facility Closure, Safety-Kleen Corporation Service Center, Wichita, Kansas

APPENDIX A

MODIFICATIONS TO THE NOVEMBER 21, 1990 PARTIAL FACILITY CLOSURE PLAN FOR THE SAFETY-KLEEN CORPORATION FACILITY LOCATED IN WICHITA, KANSAS

Modifications to the November 21, 1990 Partial Facility Closure Plan for the Safety-Kleen Corp. facility located in Wichita, Kansas

January 18, 1991

The following modifications are made jointly by the Kansas Department of Health and Environment (KDHE) and the Environmental Protection Agency (EPA). These modifications and the November 21, 1990 draft of the partial facility closure plan comprise the partial closure plan for this facility. The modifications are:

1. The closure performance standard is to be developed by the facility such that no concentrations of applicable 40 CFR 264 Appendix IX hazardous constituents which are listed in Table V-1 of the closure plan remain in the soil, vadose zone, or groundwater which are above the Agency-recommended limits based on a residential exposure scenario. The Agency-recommended limits or factors include water quality standards and criteria, health-based limits based on verified reference doses (RfDs) and Carcinogenic Potency Factors (CPFs) or site-specific Agency-approved health advisories.

If no Agency recommended exposure limits exist for a hazardous constituent then the owner or operator must either remove the constituent to background levels, submit data of sufficient quality for the reviewing agencies to determine the environmental and health effects or follow closure requirements as a disposal unit. For additional discussion page 8706 of the March 19, 1987 Federal Register should be studied.

The facility proposed closure performance standards must be submitted to the KDHE as well as the EPA. The standards will be subject to agency review for consistency with the above criteria. If either agency has question regarding the assumptions used in the facility-developed risk assessment, the agency will request clarification. Safety-Kleen will respond within 15 days of receipt of the request. The KDHE and EPA will then approve or reject any proposed closure performance standard in whole or in part by certified letter.

The points of compliance for the performance standard are directly at or within the unit boundary for all routes of exposure (surface water contact, ground-water ingestion, inhalation, direct contact, and soil ingestion). Contaminant attenuation between the unit and the facility boundary will not be considered in development of the closure performance standard.

The list of hazardous constituents for which an acceptable residual concentration must be developed includes but is not limited to the following hazardous constituents:

ethyl benzene
toluene
xylene
1,1,1 trichloroethane
tetrachloroethylene
naphthalene
methylene chloride
o-dichlorobenzene
p-dichlorobenzene
m-dichlorobenzene
propargyl alcohol *
lead
chromium
cadmium

* This analyses pending availability of analytical services.

The closure performance standard will be the same performance standard for the activities conducted to comply with the corrective action provisions of the Hazardous and Solid Waste Amendments of 1984 (HSWA) permit signed on September 27, 1990. The quarterly reporting requirements of the permit remain in effect. The RCRA Facility Investigation Plan and Report, Corrective Measures Study, and Corrective Measures Implementation will not be required to the extent that all of the Solid Waste Management Units will be satisfactorily addressed in the closure plan in accordance with the schedule contained therein.

2. In the event that closure activities do not achieve the closure performance standard within the timeframe specified in the approved closure plan, the requirements found in the HSWA permit referenced above will become effective.

3. Only those procedures specified for sampling, preservation and chemical analyses found in the "EPA Manual SW 846 - Test Methods for Evaluating Solid Waste, Laboratory Manual Physical/Chemical Methods" may be used to document that the residual hazardous constituent concentrations are at or below the performance standards unless an alternative method has been approved in accordance with the provisions of 40 CFR 260.21. Methods should be selected which have a detection limit at or below the performance standard, if available. Methods used for indicator parameters; i.e. mineral spirits, should follow the above referenced manual as closely as possible.

4. The fourth paragraph on page VI-27 is modified to specify that the sampling plan is approved to the extent that the analytical data collected during the closure activities found in chapter VI will only address soil contamination. Although soil contamination has been detected at various locations, the horizontal and vertical extent of contamination has not been fully defined. The sampling plan must provide for analyses which will demonstrate that the performance standard has been achieved at all locations and at depth. The sampling plan included in the November draft of the closure plan is acceptable based on knowledge of current site conditions.

5. For development of the documentation of clean closure, the sampling protocol for soil sample analyses must be developed in accordance with the guidance found in the "EPA Manual SW 846" as noted in the November draft closure plan. In the event that contamination is noted at the specified depths, the core(s) will be sampled at thirty inch intervals up to a depth of 30 feet or achieving background concentrations as noted by field screening. Each soil sample will be analyzed separately as discussed in Activity 4.7 of the closure plan.

6. The sampling plan to address potential ground water contamination consists of three elements:

a. A sampling plan for groundwater has been developed which will determine the presence of those hazardous constituents that are lighter and denser than water and also those constituents that are soluble in water as determined by the procedures found in Table VII-1 of the closure plan.

b. In the event that hazardous constituents are detected in the base soils of the tank excavation above the closure performance standard, a soil core through the area of the tank base will be advanced with sampling at five foot intervals until such elevation as hazardous constituents are not detected based on field screening. The boring will be advanced an additional five feet. A soil sample will then be collected and analyzed for 40 CFR 264 Appendix IX organic compounds.

c. If hazardous constituent contamination continues to exist at the elevation of bedrock in excess of the closure performance standard for ground water, Safety-Kleen will develop a groundwater monitoring plan designed to define the rate and extent of hazardous constituent migration for agency review, comment and approval. Groundwater treatment will be necessary in the event that performance standards for groundwater are exceeded.

This amends the plan at page VII-8 which provides for analyses only in the event that organic hazardous constituent concentrations exceed their solubility in water.

7. Soils excavated during closure activities will be subjected to applicable TCLP testing in the event that the total contaminant concentrations exceed the regulatory level by twenty fold. Soils that exhibit any 40 CFR 261 Subpart C hazardous waste characteristic must not be returned to the excavation area but must be disposed in accordance with all applicable disposal regulations.

8. Precautions must be taken to preempt water from infiltrating the tank excavation. In the event that run-on water does enter the excavation or that the water table is encountered during the excavation, the water will be sampled and analyzed in accordance with the TCLP procedure. In the event that the water exhibits a hazardous characteristic as defined in 40 CFR 261 Subpart C, it will be managed and disposed as hazardous waste. If hazardous constituents are detected in water at total concentrations above health-based standards but do not exceed the hazardous waste criteria, the water must be removed and managed in accordance with all applicable regulations. Safety-Kleen will develop and submit a groundwater remediation plan for agency approval and effect the appropriate groundwater remediation program in the event that groundwater degradation in excess of the performance standard is noted during closure.

9. At least two (2) samples must be collected and analyzed from the base of the excavation for the tank removal and at least two distinct cores (no composites) at a depth and location outside of the excavation which have the highest anticipated contaminant concentration during site assessment activities. The location must be such that it is at least 40 feet horizontally from the anticipated tank excavation. One sample from a location as close as possible to each of the remaining possible contaminant sources (e.g. drum storage area and run-off area) shall also be collected and analyzed. The analyses must include all 40 CFR 264 Appendix IX hazardous constituents to be determined per Table V-1.

10. In the event that the closure performance standard for all hazardous constituents is not achieved for all media and areas of the facility within the schedule found in the approved closure plan, the remaining activities specified in the permit will be performed under the provisions of the corrective action permit issued to the facility on September 27, 1990.

When the provisions of these modifications and any provision of the "Partial Facility Closure Plan, November 21, 1990", are inconsistent, the modifications contained herein will modify or replace the provisions of the "Partial Facility Closure Plan, November 21, 1990.

State of Kansas
[redacted]
Joan Finney, Governor
Department of Health and Environment
Division of Environment
Forbes Field, Bldg. 740, Topeka, KS 66620-0002
Acting
Stanley C. Grant, Ph.D., Secretary
Respond to: (913) 296-1600
FAX (913) 296-6247

May 9, 1991

Mr. Scott E. Davies
Safety-Kleen Corporation
777 Big Timber Road
Elgin, Illinois 60123

Re: Safety-Kleen Corporation
Wichita, Kansas
EPA I.D. Number KSD000809723

Dear Mr. Davies:

Please be advised the public comment period for the Partial Facility Closure Plan submitted by Safety-Kleen Corporation (S-K) for the referenced facility ended on March 12, 1991. No public comments were received on the plan. We are hereby granting S-K approval to proceed with implementation of closure.

KDHE approval of the plan starts the two year time period for completion of closure activities. Closure must be completed by May 13, 1992. Certification by your company and by an independent registered professional engineer must be submitted within 60 days of completion of closure. Please send notice of completion of closure and closure certification to this department within the time frames specified above. In the event clean closure is not obtained by May 13, 1992, remediation of the site will continue in accordance with the corrective action portion of the facility's RCRA permit.

If you have any questions, please contact me at (913) 296-1609.

Sincerely,

Steve Broslavick

Steve Broslavick, P.E.
Hazardous Waste Section
Bureau of Air and Waste Management

C. Lynn Harrington
SCD
Jack Bedessem

APPENDIX B

ENVIRONMENTAL FATE AND TOXICOLOGY OF CERTAIN MINERAL SPIRITS COMPONENTS

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APPENDIX B

ENVIRONMENTAL FATE AND TOXICOLOGY OF CERTAIN MINERAL SPIRITS COMPONENTS

1.0 INTRODUCTION

Mineral spirits is one of several refined petroleum solvents of similar composition. These solvents are a complex mixture of hydrocarbons obtained primarily through the distillation of crude oil, and are typically defined by a specific boiling range, rather than chemical composition. Thus the chemical makeup of each fraction is primarily a function of physical, rather than chemical properties. By varying the techniques employed during the refining process, combined with various chemical and physical treatments, these properties can be specified within narrow limits. Even within these narrow limits however, the mixture of components will vary to some degree due to variations in the types of crude oil being processed, variations in the different processing units of each refinery, and even seasonal variations. To further complicate matters, while the term "mineral spirits" is primarily used to define a specific solvent, it is also frequently used to describe a broad range of refined petroleum solvents, and thus its definition becomes somewhat blurred. This fact makes a precise characterization of the mixture even more difficult.

Mineral spirits is one of a group of refined petroleum solvents known as white spirits. Commonly used solvents from this group are mineral spirits, Stoddard solvent, 140° flash aliphatic solvent, and low-aromatic white spirits. These solvents fall within the boiling-range of 150-220°C[1], and are intermediate between gasoline and kerosine. The blend can be modified as either low aromatic grades (typically 10-20% aromatic hydrocarbons), or high-aromatic grades (45% or more aromatic hydrocarbons).

It is important to note that the characterization of mineral spirits present in soil or ground water can be expected to differ from that of mineral spirits stored in a holding tank. The relative concentrations of the constituents will change as a factor of time and distance from the point of introduction into the environment. Some constituents of the mixture will be more mobile than others in soil and/or ground water, and degradation by biological and chemical action will affect the various constituents at different rates. This effect is known as weathering. Mineral spirits that have been exposed to this weathering process for a significant time may significantly differ

in composition than mineral spirits which have not, affecting both the potential for human exposure and the potential health effects resulting from exposure.

Although there is some variability in the composition of the mixture, its makeup can be characterized with respect to the makeup of classes of compounds on a relatively constant basis. A detailed analysis identifying and quantifying each of the isomers in mineral spirits is not available. Given the complexity of the mixture and the constant fluctuations in the content, such an analysis would be an exceedingly difficult task, as well as impractical. Despite these individual isomer variations, the relative ratios of the chemical classes (e.g. paraffins, aromatics) remain essentially constant regardless of the many factors that can influence the makeup of each individual blend. This makes possible the characterization of the mixture based on these different chemical classes, and to select from each of these classes certain compounds that are representative of that fraction based on their physical, chemical, and toxicological properties. The advantage of this approach is twofold. First, due to the effects of weathering on mineral spirits in the environment, a characterization of the makeup of the mixture actually present following the effects of weathering becomes possible. As noted above, the chemical composition of weathered mineral spirits can vary greatly from that of unweathered mineral spirits. Second, the toxicological properties of the mixture are primarily be a function of those chemicals with the highest toxicity. As a result, as the content of the mixture changes over time, its toxicological properties can be expected to vary as well. Contaminants introduced into mineral spirits through its use as a solvent are likely to present a greater risk to health than the solvent itself.

2.0 Composition

Mineral spirits handled by Safety-Kleen can be described as being one of three general categories: Virgin Mineral Spirits (VMS); Spent Mineral Spirits (SMS), and; Recycled Mineral Spirits. A brief discussion of the composition of each of these categories follows.

2.1 Virgin Mineral Spirits (VMS)

Mineral spirits is a white spirit with a boiling range of 150-200°C[1] (Safety-Kleen mineral spirits is commonly defined as encompassing the entire boiling range of white spirits[2]). The hydrocarbon range of Safety-Kleen mineral spirits is primarily C_9 to C_{13}, with C_8 hydrocarbons present only in trace amounts. Compounds in the C_{10} to C_{12} range make up approximately 85 to 88% of the total. C_{14} hydrocarbons generally account for ≤1%. A typical composition expressed by compound category is 30-50% straight and branched chain alkanes, 30-40% cycloalkanes, 10-14% aromatics (primarily C_8+ compounds), <1% olefins.[1,2,4] Toluene, xylene, and ethyl ben-

zene, as part of the aromatic fraction, account for approximately 2% of the total identified compounds.[2] Benzene is present only in trace amounts.[4] Indans and tetralins, which are a special class of substituted benzenes, are also present in small amounts (generally < 1%). Table B-1 presents detailed data of some of the hydrocarbons indentified in one sample of Stoddard Solvent.

2.2 Spent (Used) Mineral Spirits (SMS)

Mineral spirits is used primarily as a cleaning solvent and degreaser. As a result, compounds such as polynuclear aromatic hydrocarbons (PAHs), chlorinated hydrocarbons, and aromatics such as benzene, all may appear as contaminants in SMS. Additionally, it is likely that nearly any spent hydrocarbon solvent may possibly be dumped into a receptacle specified for spent mineral spirits, resulting in a much greater variability in isomer carbon numbers. For these reasons, it must be expected that the compounds present in SMS cannot be accurately represented by a characterization of mineral spirits alone. Many of these contaminants, such as those from oil and grease, will sufficiently differ from virgin mineral spirits in their environmental fate, transport and toxicological properties, to allow them to be evaluated separately.

2.3 Recycled Mineral Spirits (RMS)

The primary method used in the recycling of mineral spirits is distillation. This process separates semi-volatile contaminants such as oil, grease, and PAHs from the lighter components, which essentially consist of the virgin mineral spirits components and the chlorinated aliphatic hydrocarbons. One result of this process is a concentration of chlorinated compounds in the recycled product. This recycled distillate is then mixed with virgin mineral spirits to reduce the concentrations of chlorinated hydrocarbons to an acceptable level. The total concentration of chlorinated hydrocarbons (TCE and PCE) in Safety-Kleen RMS is <1%.

3.0 Environmental Fate

3.1 Transport in Soil/Ground-water Systems

3.1.1 Transport and Partitioning

The fate of mineral spirits in the environment is essentially a function of the volatility, sorption, and degradation of the major components. These processes in turn will be influenced by the nature and amount of the spill, soil types, and environmental conditions. Transport pathways for low concentrations in the soil can be assessed by using an equilibrium partitioning model and assessing the partitioning of several compounds which represent the various hydrocarbon classes

(alkanes, cycloalkanes, and alkylbenzenes). This model is valid only for concentrations below the aqueous solubility of the components, and where large releases exceed the sorptive capacity of the soil, the mixture will move as a bulk fluid.[5-8]

Transport processes are initially more important than transformation and degradation in determining the initial fate. For most spills, volatilization will be the primary fate pathway, with subsequent atmospheric photolysis.[13] Compounds having greater than nine carbons were found to be weathered primarily by evaporation and biodegradation[12], reduced temperatures increase persistence by retarding the rates of volatilization and biodegradation. Under such conditions, downward migration into the soil and to ground-water may be expected to occur from surface releases. Elevated temperatures, lateral spreading and adsorption onto surface vegetation may facilitate evaporation.

Significant releases of hydrocarbons into soils may exceed the sorptive capacity of the soil, filling the pore spaces with the mixture. Large releases of hydrocarbons result in a separate organic phase that moves downward through the unsaturated soil zone to the soil/groundwater boundary, where it tends to accumulate and spread horizontally. The organic phase floats on the groundwater and is carried in the general direction of groundwater flow. At the hydrocarbon-water interface, some hydrocarbons are leached according to their aqueous solubility. Due to fluctuations in the ground-water elevation, the organic layer may be transported into several zones. This can result in the migration of the hydrocarbon phase in directions quite different from the movement of the groundwater. If the hydrocarbon phase is distributed to a zone were it can volatilize into soil air, it may diffuse in all directions, including upward.[11,14,15]

Migration through soils may be slowed to some extent by sorption, but in most soils sorption is relatively weak. Migration through previously contaminated soils where the sorptive sites may be unavailable is expected to be much more rapid, while increasing soil-water content increases sorption and slows migration. For the individual components of the hydrocarbon mixture, the magnitude of the adsorption constant is dependent on the size of the molecule, and inversely to aqueous solubility. Other factors, such as organic carbon content, temperature, salinity, and pH did not have an important effect over naturally occurring ranges.[10-12]

The water solubility of many of the components of mineral spirits is quite low; the water soluble fraction would likely be aromatic due to the relative solubility of the constituents, regardless of the composition of the spill itself. These compounds thus represent the greatest threat to contamination of groundwater. Aliphatic hydrocarbons $<C_{12}$ are essentially not water soluble.[11,12,16-

18) Table B-2 presents predicted partitioning of low soil concentrations of selected mineral spirits components.

3.1.2 Summary

The chemical makeup and physical distribution of mineral spirits in soil will directly affect its impact on, and removal from the soil environment. Depending on the depth of the release, volatilization of the lighter components will be their primary method of removal from the site. Aromatic compounds, which are more water soluble than the aliphatic constituents, will migrate in the presence of water much further and rapidly from the site of the spill. The greater the span of time that the hydrocarbon mixture is environmentally exposed, the more likely it is to consist of primarily aliphatic compounds along with the heavier constituents.

3.2 Transformation Processes in Soil/Ground-water Systems

3.2.1 Chemical Transformation

Photooxidation is the primary transformation process in the chemical degradation of petroleum hydrocarbons in the environment.[13,15,19] Alkanes and monosubstituted benzenes are relatively resistant to photolysis in aqueous systems; trisubstituted benzenes and naphthalenes photolyzed at rates comparable to volatilization.[15] Penetration below the limits of exposure to solar radiation will obviously limit photooxidation.

The oxygenated products of photooxidation are generally more water-soluble than the parent hydrocarbons and are more likely to be leached from soil. Enhanced toxicity of the oxygenated hydrocarbons has also been observed.[10,15]

3.2.2 Biological Degradation

Natural ecosystems contain a wide range of various hydrocarbon degrading bacteria and fungi which are widely distributed in marine, freshwater, and soil environments. The qualitative hydrocarbon content of the mixture in large part determines its degradability. In general, microorganisms exhibit decreasing ability with increasing chain length, to degrade n-alkanes up to C_{44}.[20] n-Alkanes are more easily biodegraded than branched or cycloalkanes; and aromatics are generally more rapidly biodegraded than alkanes.

n-Alkanes, n-alkylaromatics and aromatics in the C_{10} - C_{22} range are the most readily biodegradable Those $\leq C_9$ are primarily removed by volatilization when possible, and hydrocarbons with condensed ring structures, such as PAHs, are relatively resistant to biodegradation.[15]

Although most soils contain naturally occurring hydrocarbon-degrading microorganisms, the addition of hydrocarbons to these soils selectively enhances these populations. The distribution of hydrocarbon utilizing microorganisms reflects the historical exposure of the environment to hydrocarbons.[15,19,21] In unpolluted ecosystems, hydrocarbon-utilizing microorganisms generally constitute less than 0.1% of the microbial community; in oil-polluted ecosystems, they can constitute up to 100% of the viable microorganisms.[19]

Biodegradability is related to hydrocarbon concentration. When concentrations are too low, biodegradation may cease; at high concentrations the components or their metabolic intermediates may be toxic to the bacteria and inhibit degradation.[21] Biodegradation is also dependent on other environmental factors such as temperature, moisture, availability of oxygen and nutrients, and to a lesser extent salinity and pH.[15,19,21] The highest rates of degradation were observed between 30-40°C, with no increase noted above 37°C.[23] At lower temperatures, the degradation rate roughly doubles with each 5°C increase in the 5°C to 20°C range.[24] Oxygen is necessary for the initial steps of microbial degradation; oxygen depletion has been shown to lead to sharply reduced hydrocarbon utilization in soils.[22]

In the presence of large quantities of hydrocarbon substrates, the availability of nutrients such as nitrogen and phosphorous becomes increasingly important and the addition of fertilizers enhances the rate of biodegradation.[24]

4.0 Human Health Considerations

4.1 Toxicology of Mineral Spirits

4.1.1 Animal Studies

4.1.1.1 Carcinogenicity

Mineral spirits and Stoddard solvent have not been evaluated for carcinogenicity.[1,4,5] Presently there is no evidence which suggests that these solvents, if they are free of carcinogenic aromatics such as benzene and PAHs, would cause cancer.

4.1.1.2 Genotoxicity

Stoddard solvent is not mutagenic in either *in vitro* or *in vivo* systems. In the Ames assay, it has tested negative with and without microsomal activation. Negative results were reported in the mouse lymphoma and in the dominant lethal assay.[5,35]

4.1.1.3 Other Toxicologic Effects

Short-term Toxicity

As with most petroleum solvents, high concentrations of mineral spirits vapors can have an irritating effect on skin, eyes, and mucous membranes, and exhibit a narcotic effect. Several studies are reported that have evaluated the short-term exposure effects to various petroleum solvent hydrocarbon mixtures, which confirm the occurrence of CNS depression and respiratory tract irritantcy. The major factor determining the acute inhalation hazard was the volatility oı the solvent. Those containing 9 or more carbons tend to not be sufficiently volatile to produce concentrations high enough to be lethal over short exposure periods.(1) In general, petroleum solvents are not considered highly toxic unless aspirated or inhaled in extremely high concentrations. Aromatic solvents are more toxic than nonaromatic mixtures. Skin and eye irritation are also greater with aromatic solvents.(25)

Riley et. al.(26) exposed rats to white spirit vapors (boiling range 150-190°C). The sample contained 61% paraffins, 20% naphthenes, and 19% aromatics, mainly C_9-C_{12} hydrocarbons. The animals were exposed 4 h/d for 4 consecutive days to average concentrations of 291 mg/m^3 on the first day and 188 mg/m^3 on the remaining three days. No differences in body weights, or respiratory rates were noted between the exposed animals and controls. Histological information revealed the presence of inflammatory cell infiltrate in the the nasal cavity, trachea, and larynx. The epithelial lining of the nasal cavity and the larynx showed loss of cilia, hyperplasia of the mucous or basal cells, and squamous metaplasia.

Carpenter et. al.(27) have conducted extensive investigations into the effects of various petroleum hydrocarbon solvents, including a Stoddard solvent with similar composition of mineral spirits. Rats showed no ill effects after 8 hours at 4,220 ppm while the NOEL for dogs was 510 ppm in the same time period.

Exposure to 1,400 ppm for eight hours was not lethal to rats.(27) Toxic symptoms included eye irritation, loss of coordination, and bleeding from the nostrils. Similar symptoms were seen after exposure to 800 ppm for eight hours except there was no loss of coordination. Female beagles were exposed to 1,400 pm; one exhibited eye irritation, salivation, tremors and convulsions within a 5-hour period, the other was asymptomatic during and after 8 hours of exposure. Cats exposed to 43 ppm for 6 hours showed no adverse effects.(28)

Rector et. al.[29] exposed rats, guinea pigs, rabbits, dogs, and monkeys to mineral spirits 8 hours daily, 5 day/week for 30 exposures to vapor levels of 290 ppm. The only adverse effects noted were minor congestion and emphysema of guinea pig lungs.

Chronic Toxicity

Long-term exposure to petroleum hydrocarbons has been shown to have toxic effects on the kidneys of male rats. These changes are characterized by hyaline-droplet formation in the epithelium of the proximal convoluted tubules, degenerative changes in the proximal convoluted tubules of the renal cortex, and tubular dilation and necrosis at the corticomedullary junction.[30] These changes are distinctive to the male rat and are not observed in castrated rats, female rats, or any in other species. Recent studies have shown that the male rat exhibits a metabolic peculiarity, and that these renal effects are due to a decrease in the urinary clearance of the protein $\alpha_{2\mu}$-globulin.[30,31]

When Sprague-Dawley and Fischer 344 rats of both sexes were exposed to Stoddard solvent vapor at concentrations of 100 and 800 ppm for 6 h/d, 5 d/week for 8 weeks, kidney changes were seen in male rats only.[30] Similar nephrotoxicity was observed in male rats exposed to dearomized white spirit at vapor levels of 300 or 900 ppm for 6 hours daily, 5 days per week up to 12 weeks. The incidence and severity increased with increasing concentrations and exposure duration. No other significant toxic effects were noted.[32]

In a 12-month study, male Sprague-Dawley rats exposed to vapor levels of 6,500 mg/m^3 white spirit, 8 hours daily, 5 days per week, had a decreased urinary concentrating ability, a decreased net acid excretion following a mild ammonium chloride load, and an increased urinary lactate dehydrogenase (LDH) activity.[31] No toxic effects were reported in male Harlan-Wistar rats exposed to 140° flash aliphatic solvent at vapor levels up to 37 ppm, 6 hours daily, 5 days per week for 72 days, or in dogs exposed similarly for 73 days.[28]

Rector et. al.[29] conducted a series of inhalation studies with mineral spirits containing 80-86% aliphatic hydrocarbons, 1% olefins, and 13-19% aromatics, and composed mostly of C_9-C_{12} aliphatic hydrocarbons. Five species were exposed: rats, guinea pigs, rabbits, beagle, and squirrel monkeys. Two exposure schedules were employed: 90-day trials in which the animals were exposed 23.5 h/d; and 6-week studies of 8 h/d, 5 d/week for 30 exposures, two weeks without exposure, and an additional 30 exposures. In the 90-day trials, concentration of 18-200 ppm were tested; in the 30-day studies, concentrations of 93 and 212 ppm were used. In the 90-day trials, 27% of the guinea pigs died at 57 ppm, and 79% died at 200 ppm. Three percent of the rats (in

exposed and control groups) died. No deaths were reported in other species. No deaths occurred in the 30 and 60 trials. In the 90-day studies, slight decreases in body-weight gain were noted in guinea pigs and monkeys at higher concentrations. Evidence of irritation and congestion of the lung were noted in all species, no changes were seen in the hematological and biochemical variables that could be attributed to the exposure to mineral spirits vapor.

4.1.2 Human and Epidemiological Studies

Short-term Toxicologic Effects

Mineral spirits and Stoddard solvent are eye, nose, and throat irritants in humans. Acute exposures to high vapor concentration can cause narcotic effects and headaches. Exposure for 6 hours to vapor levels of 50-200 ppm white spirit produced dryness of the mucous membranes, anorexia, nausea, vomiting, diarrhea, and fatigue.(33) One of six volunteers exposed to a vapor level of 150 ppm for 15 minutes reported eye irritation; all six reported eye irritation after 15 minutes at 470 ppm.(27)

Acute exposure to mineral spirits for up to 50 minutes at 4,000 mg/m^3 had no effect on perceptual speed, numerical ability, and manual dexterity. The exposure did result in the prolongation of reaction time and a possible impairment of short-term memory.(34)

Dermal exposure to the liquid can cause dermatitis.

Chronic Toxicologic Effects

Numerous cases of prolonged dermal and inhalation exposure to various hydrocarbon mixtures have been reported and reviewed.(4,5,34) Exposures over long periods to unknown concentrations have resulted in headaches, eye, nose and throat irritation, fatigue, bone marrow hyperplasia, and in extreme cases, death. Because of the complex nature of these mixtures, and the difficulty in ascertaining exposure to specific components, it has been difficult to assess the cause of many of these toxic effects. Exposure to hexane produces long-term neuropathic effects which are not associated with higher carbon number compounds. In addition, bone marrow effects are commonly associated with benzene exposure, and the exact origin and nature of exposure to myelotoxic agents can not be determined from these epidemiological studies.

4.3 Toxicology of Mineral Spirits Components

A review of the toxicology of some of the known constituents of virgin mineral spirits follows.

4.3.1 Cyclohexane

Synonyms

Cyclohexane, hexahydroxybenzene, hexamethylene.

General Information

Cyclohexane is a colorless, flammable liquid with a sweetish odor when pure. It is fractionated from crude oil where it it constitutes a fairly large proportion, and is also synthetically prepared from benzene or cyclopentane. Cyclohexane is used as a solvent for resins, fats, waxes, and particularly rubber an adhesives. It is also used as a raw material for chemicals such as adipic acid, and as the precursor of Nylon-66.

Toxicokinetics

Peribellini and Brugnone[36] measured the lung uptake in shoe factory workers occupationally exposed to cyclohexane. The concentration of cyclohexane in the blood (μg/L) was 42-62% of the air concentration (mg/m^3). No information on the rate of absorption in the gastrointestinal tract was located; the LD_{50} for rabbits was between 5.5 and 6.0 g/kg.[37] Inhalation data suggest that the acute toxicity of the methylated compounds (e.g. methylcyclohexane) are greater than non-methylated compounds, but that the reverse is true for prolonged exposure to low concentrations.[38]

Several metabolites of cyclohexane have been identified in mammals. About 50-90% of the administered oral dose of cyclohexane in rabbits was excreted as cyclohexanol or trans-cyclohexane-1,2-diol, partially conjugated with glucuronic acid, in the urine within 48 hrs.[36] Cyclohexanol and cyclohexanone were found as metabolites in rabbits and rats. Within 24 hrs after administration of an i.p. dose in rats, metabolites in the urine corresponded to 2% of the dose. Cyclohexanol has been identified as a metabolite in humans, although evidence suggests that cyclohexane is metabolized only to a small extent. Excreted cyclohexanol corresponded to 0.1-0.2% of the cyclohexane absorbed, with the excretion rate calculated to be 1.2–2.8 μg/min cyclohexanol.[36]

Toxic Effects/Toxicity

Acute Effects

Cyclohexane possesses relatively low acute toxicity. At high doses it is primarily a CNS depressant. Symptoms of acute exposure are excitement, loss of equilibrium, stupor and coma. The oral LD_{50} in rabbits was recorded to be 5.5–6.0 mg/kg. Within 90 minutes the animals exhibited severe diarrhea and widespread vascular damage, evidenced by toxic coagulation necrosis in the heart muscle, liver, spleen, and kidneys. No anesthesia was noted. Animals that survived smaller doses of cyclohexane (1.0 –5.5 mg/kg) exhibited extensive hepatocellular degeneration, and widespread toxic glomerulo-nephritis.(37)

Dermal LD_{50} in the rabbit was >180 mg/kg. Microscopic changes were seen in the heart, liver, and kidney, accompanied by chronic bronchitis.(37)

An exposure to a vapor concentration of 92,000 mg/m^3 for 1-hour caused rapid narcosis and was lethal to exposed rabbits. The minimum concentration to cause narcosis in mice was 51,000 mg/m^3, concentrations of 61,200–71,400 mg/m^3 were required to cause death.(38)

Chronic Effects

Cyclohexane poses a relatively low risk of chronic poisoning because it is almost completely eliminated from the body. Barely demonstrable microscopic changes were observed in the liver and kidneys of rabbits exposed to 2,700 mg/m^3 for fifty 6 hour exposures, no changes were noted at 1,490 mg/m^3. The NOEL for the rabbit was determined to be between 4,000 and 9,900 mg/m^3. A monkey exposed to 4,275 mg/m^3 for the same exposure period exhibited no gross or microscopic effects.(38) In man, exposure to a vapor level of 1,032 mg/m^3 is mildly irritating to the eyes and mucous membranes.(5)

Carcinogenicity

Presently cyclohexane has not been classified by the EPA or other agencies as to carcinogenicity due to lack of animal and/or human data. Cyclohexane has tested negative for mutagenicity.(39)

4.3.2 Ethybenzene

Synonyms

EB, Ethylbenzol, Phenylethane

General information

Ethylbenzene, a colorless, flammable liquid, is an unrecovered component in gasoline, a product of biomass combustion, and a constituent of asphalt and naptha. It is also a common industrial chemical used in the production of synthetic rubber; as a solvent or diluent for surface coatings; as a component of automotive and aviation fuels; and as a chemical intermediate in the manufacture of numerous chemicals, including cellulose acetate, diethylenebenzene, and acetophenone. Large quantities are used in the manufacture of styrene. [59,60]

Environmental Fate

In the atmosphere, ethyl benzene photodegrades via hydroxyl radical attack with a half-life of hours to 2 days. It is also removed from the air in rain. Ethyl benzene is moderately adsorbed to soil, and may leach into the groundwater. Ethyl benzene is removed from water by evaporation and biodegradation. The half-life of degradation in surface water is several days to 2 weeks, and depends on microbial activity, the water turbulence, and the season. Some ethyl benzene is adsorbed to sediments and bioconcentrated in fish, but bioconcentration is not a significant process.[56,59,60]

Toxicokinetics

Absorption

Although little information is available in humans or animals, ethyl benzene appears to be absorbed readily when ingested or inhaled. For example, approximately 90% of an oral dose (1.78 g/rabbit) was excreted as metabolites indicating that ethyl benzene was absorbed via the oral route.[59] Human volunteers exposed for 8 hours to concentrations up to 370 mg/m^3 absorbed approximately 64% in the lungs.[58] Ethyl benzene is absorbed through the skin slowly.[56] Absorption of an aqueous solution of ethyl benzene through human hand skin was equivalent to 118 $\mu g/cm^2$/hour.[59]

In rats, ethyl benzene is distributed widely throughout the body following absorption, with the highest concentrations in kidney, lung, adipose tissue, digestive tract, and liver. In humans, ethyl benzene is metabolized by the liver fairly rapidly to a number of oxidation and conjugation products, most of which are excreted in the urine. Rapid metabolism is the primary reason for lack of accumulation of ethyl benzene in the body. The metabolic pathways for humans and rodents are quite different; mandelic acid and phenylglyoxylic acid are major metabolites in humans but are

minor in rats and rabbits. The major animal metabolites were not detected in the urine of exposed workers. This metabolic difference is cited as partial reason for questioning the genotoxicity data on ethyl benzene derived from animal studies.[56-59,60]

Toxicity

Information on ethyl benzene toxicity in humans is lacking, and in animals, most data are from inhalation studies. Ethyl benzene is considered an acute toxicant, since most known effects occur as a result of acute exposure. The most sensitive target organs in acute intoxications appear to be the nervous system, eyes, and respiratory tract.[56,60] Ethyl benzene is considered the strongest irritant in the benzene class, therefore, most symptoms involved irritation of mucous membranes and erythema and inflammation of the skin.[56,58,60] Other acute adverse effects include sleepiness, fatigue, and headache in humans, and motor ataxia and unconsciousness in animals.[59,60]

The principal target organs in subchronic and chronic exposures in animals are the liver and kidneys. The most sensitive effects noted in animals exposed to ethyl benzene by inhalation (400 ppm, to 8 hours/day, 5 days/week, 186 days) or by gavage (408 mg/kg/day, 182 days) were an increase in liver and kidney weights, with associated histopathological changes.[57–60]

Perhaps the most noteworthy effects are its reproductive/teratogenic effects in rats and rabbits. In pregnant rats exposed to up to 96 ppm ethyl benzene, 7 hours/day, during days 1 to 19 of gestation, specific musculoskeletal abnormalities were noted; at 985 ppm, fetotoxicity occurred.[51] Additionally, at 97 ppm, 7 hours/day, female fertility was impaired. In rabbits exposed to 99 ppm, 7 hours/day during 1 to 18 days of gestation, litter size was decreased.[51]

Insufficient data exist for the evaluation of ethyl benzene as an animal or human carcinogen; therefore, ethyl benzene has been classified as a Group D carcinogen.[57]

4.3.3 Naphthalene

Synonyms

Naftalen, naphthene, tar camphor, white tar, naphthaline.

General Information

Naphthalene is a white crystalline solid or flakes, with a characteristic odor of tar or mothballs. It may be produced from either coal tar or petroleum, with petroleum accounting for about 30%

of naphthalene production by 1982. The principal uses of naphthalene are in the production of phthlalic anhydride, carbamate insecticides, moth repellents, toilet bowl deodorants, indigo dyes, and surface active agents and resins.[40,43]

Toxicokinetics

There is little information regarding the toxicokinetics of naphthalene regardless of the route of exposure. Evidence suggests that inhaled naphthalene may be absorbed in sufficient quantities to produce adverse health effects, but the rate and extent of absorption have not been determined.[41,42] Similarly, ingested naphthalene can be absorbed in sufficient quantities to cause toxicity, but the rate of absorption is unknown. Identification of naphthalene metabolites in the urine of rats and chimpanzees following oral gavage provides indirect evidence of absorption.[44] Reported cases of naphthalene toxicity in infants from the use of diapers which had been stored in contact with naphthalene suggest that it can be absorbed dermally, although the presence of oils applied to the babies' skin may have enhanced absorption.[45]

Naphthalene metabolism is complex and little understood. Metabolites identified in humans and other species are 2-naphthoquinones, 1,2-naphthoquinones, and 3-glutathione adducts arising from naphthalene-1,2-oxides. Oral doses of up to 200 mg/kg/day in primates did not result in any increases in excretion of premercapturic or mercapturic acids or any depletion of hepatic glutathione levels, suggesting that metabolism of naphthalene to thioesters is unlikely in humans.[46,47] The pattern of distribution in the body following absorption is unknown. In vitro studies using rat liver microsomes demonstrated that naphthalene was first metabolized to the epoxide which was then converted to the dihydrodiol or the naphthol or was conjugated.[48] Urinary mercapturic acid excretion in rats following gavage doses of 30, 75, and 200 mg/kg corresponded to the elimination of approximately 39, 32, and 26% of each dose, respectively, within 24 hours.[47] Rats administered radiolabeled naphthalene excreted 77–93% of the label in the urine within 24 hours, and 6–7% in feces during the same period.[49]

Toxicity/Toxic Effects

Acute Effects

Reported cases of deaths from naphthalene ingestion (intentional ingestion of mothballs) have indicated a fatal dose of 300–600 mg/kg. Oral doses of 300–500 mg/kg/day are lethal to mice, but rats and rabbits have tolerated doses of up to 1,000 mg/kg. Symptoms of acute poisoning from ingestion include abdominal cramps, nausea, vomiting, and diarrhea, with acute intravascular hemolysis the most common clinical effect.[43]

Chronic Effects

The hemolytic system is the primary target of naphthalene toxicity, and all reports of human toxicity feature hemolytic effects. These effects are characterized by findings of lowered hemoglobin, hematocrit, and erythrocyte values; elevated reticulocyte counts, Heinz bodies, and serum bilirubin; and fragmentation of erythrocytes. There appears to be a relationship to inherited glucose-6-phosphate dehydrogenase deficiency, however not all individuals exhibiting hemolysis have been shown to have the deficiency. Such effects have been demonstrated in dogs receiving 263 mg/kg/day in food for 7 days.[50]

Repeated oral doses of naphthalene to rats resulted in increased liver weights, and hepatic aniline hydroxylase and lipid peroxidase activities. Cataract formation following naphthalene exposure has been reported in rabbits, rats, and mice; evidence of this in humans is equivocal. The mechanism of action is unclear, one or more metabolic products of naphthalene (perhaps 1,2-naphthoquinone) reaches the eye by way of the bloodstream and reacts with the constituents of the lens, disrupting its integrity and transparency.[51]

Carcinogenicity

There is no evidence that naphthalene is carcinogenic in either animals or humans. Rats administered naphthalene at 41 mg/kg/day in a two-year feeding study showed no increased incidence of tumors.[40] Naphthalene applied dermally with benzo (a) pyrene appeared to have an inhibitory effect on the induction of skin tumors in mice.[40] Naphthalene was tested for mutagenicity in the Ames assay using the NTP approved protocol with negative results including 100μg/plate, the highest dose tested.[40,43]

4.3.4 Nonane

General description

Nonane (C_9) is a member of the aliphatic straight chain hydrocarbons known as alkanes, or paraffins. Alkanes are natural components of natural gas and/or crude oil. As would be expected, the boiling point and vapor pressures of the alkanes increases, and decreases respectively, as the number of carbons and chain length increases. The lower molecular weight alkanes (C_1–C_4) are gases at typical ambient temperatures, the middle range alkanes (C_5–C_{17}) are liquids. Octane, nonane, decane, undecane, dodecane, and tridecane (C_8–C_{13}) are all highly flammable,

colorless liquids. Paraffin mixtures are used extensively as fuels, refrigerants, propellants, pesticides, lubricants, and solvents.

Toxicokinetics

Inhalation is the primary route of exposure to alkanes. Although their permeability across the alveolar membrane decreases as chain length increases above C_7, humans exposed to a mixture of various hydrocarbons in the air showed an arterial uptake of 46–59% of the total aliphatic fraction of the inhaled air.(65) Dermal absorption of alkanes with more than eight carbons) occurs very slowly. The dermal rate of adsorption for octane has been measured to be only 0.6 $ng/cm^2/hr$ in the rat, thus dermal absorption is not considered to be an important route of exposure.

There is little information on the absorption of orally ingested alkanes. The rate of absorption would most likely be less than that of alveolar absorption, however the residence time in the gastrointestinal tract will be longer that in the lungs, allowing for greater opportunity for more complete absorption.

Once absorbed, long-chain alkanes tend to distribute to adipose tissue, the liver, and the brain. Their low aqueous solubility results in their partitioning slowly into adipose tissues, and more readily into organs that are highly perfused with blood. In mice, the distribution of n-octane in the blood, liver, and kidneys showed a linear dependence between inspired air concentration and tissue concentrations at fixed exposure times.(68) Based on the experimental data, n-alkanes can be described by a two-compartment pharmacokinetic model. The distribution of the larger alkanes (C_9–C_{12}) would be expected to follow the same pattern as that of octane.

Alkanes are believed to be metabolized in the rat via the cytochrome P–450 mixed function oxidase. The alkane is converted to a hyroxy derivative before being converted to the corresponding keto form. In vitro oxidation of alkanes to the corresponding primary alcohol has been found to occur in rat liver microsomes (decane hydroxylation has been shown to take place in microsomes isolated from the kidney and lungs as well as the liver). In vivo, the hydroxylated alkanes are conjugated with glucuronic acid or further oxidized to the corresponding glycol or acid.

Toxic Effects

Acute exposure

Information on the toxicity of the various alkanes in humans is seriously lacking and information derived from animal studies is not extensive. Although several studies have been conducted on the effects of hydrocarbon mixtures, it is difficult to assess the relative toxic effect of the individual components. The alkanes act as a central nervous system depressant in acute exposures at high concentrations. The lungs are the other primary sensitive organs affected in acute exposure. Aspiration of 0.2 ml decane caused death in rats within 24 hrs by pulmonary edema and hemorrhaging.[67] Mice exposed to octane at concentrations of 6,600–13,700 ppm showed signs of CNS depression in 30-90 minutes, and respiratory arrest at 16,000–32,000 ppm in 5 and 3 minutes respectively. Other studies have placed the CNS depressant limit at 8,000 ppm and the fatal concentration at 13,500 ppm .[68]

Subchronic/Chronic exposure

The principal target organs in subchronic and chronic exposures to higher weight alkanes (e.g. > hexane (C_6)) are the liver, lungs, and kidneys. Hepatic effects include reduced drug metabolizing capabilities, liver enlargement, and some indication of lipid peroxidation. There is no indication that octane, nonane , or any of the higher alkanes induce the peripheral neuropathy associated with hexane.[68-71] Chronic exposure to hydrocarbons is known to induce renal toxicity in male rats. Rats exposed to a mixture of essentially straight chain alkanes exhibited signs of renal toxicity at levels exceeding 34 ppm. Lesions consist primarily of excessive hyalin droplet formation in the epithelium of the convoluted tubules in the renal cortex, degenerative changes in the proximal tubules, and tubular dilation and necrosis. Inhalation studies were conducted on rats exposed to 360, 590, and 1,600 ppm nonane for 6 h/day, 5 days/wk for 13 wks, 2 deaths occurred on day 1 in the 1,600 ppm group, and 2 deaths at days 46 and 52 at the 360 ppm group occurred due to suppurative bronchopneumonia. Micropathological evaluation of the tissues at the termination of the study revealed no lesions attributable to vapor inhalation. Mean body weights of the 1,600 ppm group were significantly lower than controls throughout the duration of the study. Rats exposed to 540 ppm decane for 18 h/day, 7 days/wk for 123 days displayed a significant weight gain and increase in total leukocyte count, however there was no signs of organ toxicity noted in pathological examination.[66]

4.3.5 Toluene

General Description

Toluene is a colorless, flammable, non-corrosive liquid with a sweet, pungent, benzene-like odor, and is a unrecovered component in gasoline. Toluene is a common industrial chemical/solvent/intermediate used in the production of synthetic rubber, paint, perfumes, saccharin, medicines, dyes, detergents, synthetic leather, spot removers, antifreezes, cements, adhesives solvent in plastic toys and model airplanes, and as a thinner for inks. It is a chemical intermediate in the production of many chemicals, such as benzoic acid, cresols, and xylenes.

Toxicokinetics

The primary source of human exposure is from ambient air, especially in traffic or near filling stations, or in occupational atmospheres where toluene-based solvents are used. Inhalation is the primary route of absorption into the body, as toluene is rapidly absorbed through the lungs. Sporadic exposures result in nearly 100% absorption, whereas continuous exposure results in a steady state equilibrium in which the rate of absorption is approximately 50%. When ingested, absorption is slower but complete. The rate of dermal absorption of toluene is ~1% of the rate in the lung.

Toluene is metabolized relatively rapidly by the liver. The majority (80%) of absorbed toluene is excreted in the urine as a hippuric acid, the remainder is excreted unchanged in expired air. Toluene does not accumulate in the body to any significant degree due to its rapid metabolism and excretion, and most of an absorbed dose is excreted within 12 hours after termination of exposure.

Toxicity/Toxic Effects

Acute Exposure

At a sufficient exposure level, toluene can produce reversible effects upon the liver, kidney, and nervous systems with the latter system being the most sensitive. Exposure to low toluene concentrations (~200 ppm) causes mild upper respiratory tract irritation; 400 ppm causes mild eye irritation, lacrimation, and hilarity; 600 ppm causes lassitude, and slight nausea; 800 ppm causes rapid irritation, nausea, mucous secretion, metallic taste, drowsiness, and impaired balance. High concentrations cause narcosis, and 10,000 ppm is considered lethal. Very few studies on the nervous system have been conducted at levels of exposure below 1000 ppm. Instant death has been

recorded in "glue sniffers"; this effect has been attributed to lethal cardiac arrythmias following sensitization of the myocardium. Toluene had no significant effect on psychophysiologic functions at an exposure of 300 mg/m^3/4.5 hours; higher levels reduce mental productivity and reaction time. At 43–254 ppm, toluene changed the mood and caused difficulties in concentration and coordination such as the ability to drive a car. Oral ingestion of toluene causes vomiting, diarrhea, and depressed respiration; kidney and liver damage may result following ingestion. On the skin, toluene acts as a strong irritant. Severe dermatitis may result from its drying and defatting action. Vapors cause noticeable sensation of irritation to eyes and throat at 200–400 ppm in air, but even at 800 ppm irritation is slight.[52,53,56,61]

Chronic Exposure

Although toluene is considered primarily an acute toxicant, some chronic effects have been reported following exposure to levels expected to be encountered in an occupational setting. Painters chronically exposed to air concentrations in the range of 20–200 ppm have displayed effects on the central nervous system such as disturbances of thinking, memory and psychomotor skills, visual accuracy and sensorimotor speed. In addition, toluene is toxic to the liver and kidneys after subchronic exposure to 200–800 ppm.[52,53,56,56]

Carcinogenicity

There is no data to indicate that toluene is carcinogenic in either animals or humans. Epidemiological studies of occupational exposure in humans have not shown any relationship of increased cancer risks. Several animal studies have yielded negative results, although none of these studies have yet met the Federal carcinogenicity bioassay requirement. The EPA has classified toluene in Group D—not classifiable as to human carcinogenicity due to lack of animal bioassay and human epidemiological data.[57]

4.3.6 Xylenes (o-, m-, p-)

General description

Xylene is a colorless, non-corrosive liquid with a sweet, pungent odor, and exists in three isomeric forms which are commonly referred to as a single compound (xylene). Xylene occurs in many petroleum products, in coal napthas, and as an impurity in petrochemicals. Aside from its natural presence in petroleum products, xylene is used widely as thinners, solvents for inks, rubber, gums, resins, adhesives, and lacquers, as paint removers, in the paper coating industry, as solvents and emulsifiers for agricultural and household products, as fuel additives, and a com-

monly used replacement solvent for benzene. It is used as raw materials for such products as plasticizers, polyesters, and alkyl resins.

Toxicokinetics

The xylenes are readily absorbed. Pulmonary retention is independent of air concentration, the isomer and duration of exposure, being about 63% when inhaled for 15 minutes to 7 hours. Absorption of 100 ppm xylene through the hands immersed in xylene for 15 minutes was about equal to the extent of pulmonary absorption during exposure to 100 ppm indicating that the xylenes are readily absorbed through skin. Absorption from the human forearm varied from 4.5 to 9.6 mg/cm^2. Dermal absorption after exposure to vapors was about 10-times more efficient than exposure to liquid. Absorption was increased in broken or diseased skin.

Following absorption, xylenes are rapidly distributed throughout the body. Distribution in various organs is directly related to blood perfusion. There is some uptake into adipose tissue, but rapid elimination prohibits extensive accumulation. Xylene can easily cross the blood-brain barrier. Metabolism varies somewhat for the 3 isomers, but in general, proceeds by cytochrome P-450 oxidation of the methyl groups and ring oxidation. The resulting metabolites include methyl hippuric acid (>90%) and xylenols (<2%). Elimination of xylenes is primarily through urinary excretion of metabolites, representing nearly 95% of the absorbed dose, and the remaining 5% by pulmonary exhalation of unchanged compound.(61,63,64)

Toxicity/Toxic Effects

Acute Exposure

No effects in male volunteers inhaling 1300 mg/m^3 for 70 minutes occurred except reduced exercise performance. Inhalation of 100 ppm for 3-7 hours did not cause effects; 200 ppm caused irritation of the eyes, nose and throat. Some reversible psychophysiological functions in volunteers that inhaled 391 mg/m^3 for 5 consecutive days was observed. Similarly, inhalation 6 hours/day, 3 days/week for 2 weeks to 100 ppm caused disturbed balance and reaction times in the first week; 200–400 ppm caused EEG changes. An accidental occupational exposure to 10,000 ppm resulted in death. Patients that recovered had amnesia, unconsciousness, mental confusion, and severe liver and kidney impairment for 15 days only. Other high level exposures have reportedly caused a variety of neurologic disorders, eye effects, and myocardial damage. High level exposure can cause myocardial damage in some individuals. The lowest lethal oral dose is 50 mg/kg. Direct application of undiluted xylene to skin can cause burning, drying, blistering and defatting of the skin.(61,63,64)

Chronic Exposure

The effects of solvent poisoning on cytotechnicians exposed to xylenes for 1.5-1.8 years resulted in chronic headache, chest pain, EKG abnormalities, dyspnea, cyanosis of the hands, fever, leukopenia, malaise, impaired lung function, inability to work, and confusion; concentrations in air were not given. Other studies showed that hematology technicians are exposed to 21–120 ppm and that there are no toxic effects when exposures are well below acutely toxic exposure levels. Repeated, prolonged, relatively high exposure to fumes may produce dryness of the nose, throat, and skin. Other effects may include CNS excitation, then depression, characterized by paresthesia, impaired memory, weakness, nervous irritation headache, anorexia and nausea; liver and kidney effects may occur. Anemia, but not bone marrow aplasia may occur. Repeated, prolonged exposure to fumes may produce conjunctivitis of the eye.[61,63,64]

Carcinogenicity

EPA has listed xylene in Group D (not classified) based on lack of human data and inadequate animal data. There is little to no evidence that xylene is capable of mutagenesis or carcinogenesis. However, the animal and human in vivo database is insufficient for definitive evaluation.

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TABLE B-1

PERCENTAGE (BY WEIGHT) OF VARIOUS HYDROCARBONS IN A STODDARD SOLVENT SAMPLE

Component	Wt. %
4-Methylheptane	0.01
t-1,4-Dimethylcyclohaxane	0.02
n-Octane	0.08
2,5 +3,5-Dimethylheptane	0.20
1,3,5-Trimethylcyclohexane	0.05
Ethylbenzene	0.03
2,3-Dimethylheptane	0.19
m-Xylene	0.20
p-Xylene	0.05
3,4-Dimethylheptane	0.04
4-Methyloctane	0.32
2-Methyloctane	0.53
3-Ethylheptane	0.09
3-Methyloctane	0.59
3,3-Diethylpentane	0.07
o-Xylene	0.24
1,1,2-Trimethylcyclohexane	0.10
Isobutylcyclopentane	0.02
n-Nonane	5.27
Cumene	0.10
2,2-Dimethyloctane + Isopropylcyclohexane	1.24
2,6-Dimethyloctane	1.58
3,6-Dimethyloctane	0.40
3,3-Dimethyloctane + C_{10} Dinaphthene	0.67
n-Propylbenzene	0.27
1-Methyl-3-Ethylbenzene	1.03
1-Methyl-4-Ethylbenzene	0.42
1,3,5-Trimethylbenzene	1.13
4-Methylnonane	1.93
2-Methylnonane	2.12
1-methyl-2-Ethylbenzene	0.41

TABLE B-1(con't)

PERCENTAGE (BY WEIGHT) OF VARIOUS HYDROCARBONS IN A STODDARD SOLVENT SAMPLE

3-Methylnonane	1.92
t-Butylbenzene + 1,2,4-Trimethylbenzene	2.50
Isobutylcyclohexane	0.90
Isobutylbenzene	0.18
n-Decane	11.85
sec-Butylbenzene	0.12
1,2,3-Trimethylbenzene	0.46
1-Methyl-3-Isopropylbenzene	0.80
1-Methyl-4-Isopropylbenzene	0.21
Indan	0.08
1-Methyl-2-Isopropylbenzene	0.07
1,3-Diethylbenzene	0.19
1-Methyl-3-n-Propylbenzene	0.57
1-Methyl-4-n-Propylbenzene	0.26
n-Butylbenzene	0.16
1,2-Diethylbenzene	0.57
1,4-Diethylbezene + 1,3-Dimethyl-5-Ethylbenzene	0.06
1-Methyl-2-n-Propylbenzene	1.47
1,4-Dimethyl-2-Ethylbenzene	0.28
1,3-Dimethyl-4-ethylbenzene	0.36
1,3-Dimethyl-2-Ethylbenzene	0.14
n-Undecane	8.36
1,2,3,4-Tetramethylbenzene	0.24
Napthtalene	0.61
n-Dodecane	1.99
2-Methylnapthtalene	0.04
n-Tridecane	0.06
1-Methylnapthtalene	0.02
Total Identified Hydrocarbons	53.87
Unidentified Aliphatic Hydrocarbons	38.53
Unidentified Aromatic Hydrocarbons	7.62
Total:	100.02

TABLE B-2

EQUILIBRIUM PARTITIONING OF VARIOUS MINERAL SPIRITS HYDROCARBONS IN MODEL ENVIRONMENT[a]

Compound	Log K_{ow}	K_{oc}	H [b]	Unsaturated Topsoil (%)			Saturated Deep Soil (%)	
				Soil	Water	Air	Soil	Water
Cyclohexane	3.44	1,330	1.8×10^{-1}	91.6	0.4	8.0	84.8	15.2
Ethyl benzene	3.15	681	7.9×10^{-3}	98.0	0.75	0.7	74.1	25.9
Naphthalene	3.30	962	4.8×10^{-4}	99.4	0.5	0.03	80.2	19.8
Toluene	2.69	240	6.6×10^{-3}	96.5	1.9	1.6	52.1	47.9
Xylenes	3.16	700	7.0×10^{-3}	98.8	0.7	0.5	74.4	25.6

[a] From reference 5. Calculated percentages should be considered rough estimates.

[b] Units equal atm-m^3/mol

APPENDIX C

LAB REPORTS

APPENDIX D

DERIVATION OF RFD EQUIVALENTS FOR MINERAL SPIRITS

APPENDIX D

DERIVATION OF RfD EQUIVALENTS FOR MINERAL SPIRITS

1.0 Introduction

The EPA has established acceptable exposures to many different chemicals. These are listed in the EPAs on-line Integrated Risk Information System (IRIS) database, and are tabulated in the Health Effects Assessment Summary Tables (HEAST, available from NTIS). IRIS lists oral and inhalation reference doses (RfDs) for chronic exposure, based on data from human exposure or animal studies. It also contains information regarding the carcinogenicity of the chemical. Cancer potency factors (CPF) are listed for those compounds that are determined by EPA to be carcinogenic, and for which sufficient data exits to perform the calculations. Since they are subject to periodic review and revision, the most up-to-date version of IRIS or HEAST should be consulted before conducting any quantitative risk analysis. In addition, each individual state may establish additional acceptable exposure levels as long as they do not exceed the federal levels.

For many of the chemicals found in mineral spirits no such health-based criteria currently exists. Included in this group are the various aliphatic hydrocarbons that comprise much of mineral spirits. In the following section, equivalent reference doses are calculated for the aliphatic and aromatic fractions of mineral spirits. These RfD equivalents are calculated using the same procedure as used by EPA in deriving RfDs. By determining the total aromatic content of any given mineral spirits sample, a weighted average RfD for exposure to the mixture as a whole can be estimated.

1.2 Derivation of Risk Assessment Criteria for Selected Marker Compounds in Mineral Spirits

1.2.1 Nonane

Although n-decane is present in greater quantity in mineral spirits than n-nonane (11.85% vs 5.27%), nonane was selected as representative of the total alkane fraction because there is sufficient toxicological data existing for deriving a NOAEL. In addition, evidence suggests that nonane and higher weight alkanes do not exhibit some of the toxic effects of the lower weight alkanes (e.g. hexane induced neuropathy). Whenever possible, it is preferable to calculate risk from human rather than animal data, however little or no data is available on human exposure to higher weight aliphatic hydrocarbons.

Carpenter et. al. (1975), with inhalation experiments in rats, have established a no-effect level for nonane of 3,086 mg/m^3, administered 6 hr/day, 5 days/week for 13 weeks. Micropathological evaluation of the tissues at the termination of the study revealed no lesions attributable to vapor inhalation. From this study, it is possible to determine a NOAEL for human exposure to nonane. The study exposure is first adjusted to account for a person exposed 24 hours/day for 7 days/week. This figure is then divided by an uncertainty factor of 100; 10 to account for inter-species extrapolation and 10 to account for particularly sensitive individuals. The relationship is expressed by the following equation:

$$\text{NOAEL (human exposure)} = \frac{\text{NOAEL (animal)} \times CF_1 \times CF_2}{UF} \qquad \text{(D-1)}$$

where:

CF_1 = Exposure duration correction factor (hours/day)

CF_2 = Exposure duration correction factor (days/week)

UF = Uncertainty factor (10 for interspecies extrapolation, 10 for sensitive individuals)

Equation D-1 becomes:

$$\frac{3086\ mg/m^3 \times 6/24 \times 5/7}{100} = \boxed{5.5\ mg/m^3} \qquad \text{(D-2)}$$

An oral reference dose (RfD) equivalent in mg/kg/day can then be calculated using the following equation:

$$\text{RfD equivalent} = \frac{CA \times IR \times AB}{BW} \qquad \text{(D-3)}$$

where:

CA = Air concentration (mg/m^3).

IR = Inhalation rate (20 m^3/day).

AB = Absorption efficiency (0.5 based on the assumption that gastrointestinal absorption is twice the steady state alveolar absorption rate).

BW = Average adult body weight (70 kg).

Equation D-3 becomes:

$$\frac{5.5\ mg/m^3 \times 20\ m^3/day \times 0.5}{70\ kg} = \boxed{0.8\ mg/kg/day} \qquad \text{(D-4)}$$

1.2.2 Cyclohexane

A large fraction of mineral spirits (≈30-40%) consists of naphthenes, which are saturated cycloaliphatic hydrocarbons. As with the other fractions, a detailed analysis of all the naphthenes present is difficult to determine, both in terms of cost and the variability of the mixture. There are several different alkylated isomers of cyclohexane present in the mixture, and evidence suggests that alkylated cyclohexanes are of lower toxicity than cyclohexane for chronic inhalation exposures (Crutchfield, et. al., 1943). The cycloparaffins all exhibit narcotic properties, are CNS depressants, and exhibit the nephrotoxic effects commonly associated with hydrocarbon exposure. Of particular note is the fact that from C_6 on, the margin between narcosis and death is very narrow and symptomatically barely recognizable (Clayton, 1981). It is plausible then, to assume that cyclohexane is representative of the naphthene component of mineral spirits with respect to both toxic effect and toxicity.

Crutchfield, et.al. (1943), with inhalation experiments in rabbits, established a no-effect level of 1,745 mg/m^3 for cyclohexane administered 6 hr/day for 5 days/week for 10 weeks. Using equation D-1, the NOAEL for human exposure to cyclohexane becomes:

$$\frac{1745\ mg/m^3 \times 6/24 \times 5/7}{100} = \boxed{3.1\ mg/m^3} \qquad \text{(D-5)}$$

From this it is possible to calculate an oral reference dose for cyclohexane using equation D-3:

$$RfD = \frac{3.1\ mg/m^3 \times 20\ m^3/day \times 0.5}{70\ kg} = \boxed{0.4\ mg/kg/day} \qquad \text{(D-6)}$$

1.3 Derivation of Weighted Average Toxicity Criteria

The weighted average reference dose for the aliphatic and aromatic fractions of the mineral spirits mixtures is calculated using the following equation:

$$\sum_{i=i}^{n} (RfD_i \times F_i) \qquad \text{(D-7)}$$

where:

RfD = Reference dose of indicator chemical *n*.

F = The fraction represented by chemical *n* of the total.

1.3.1 Aliphatic Fraction of Mineral Spirits

To calculate the weighted-average reference dose for the aliphatic fraction of mineral spirits, the relative amounts of paraffins and naphthenes must be determined. Mineral spirits generally consists of 30–40% naphthenes and 30–50% paraffins, which together account for ≈85% of the total hydrocarbon content. Using these values as a general guide, paraffins represent 47–59% of the aliphatic fraction, with the naphthenes accounting for 35–40%. It must be stressed that these are only ranges, and that the actual composition of any given mineral spirits preparation will vary within these ranges. For purposes of calculating the aliphatic reference dose, paraffins and naphthenes will be assumed to represent 53 and 47%, respectively, of the total aliphatic fraction. While this breakdown tends to exaggerate the contribution of naphthenes, it will result in a more conservative estimate of the reference dose, as the naphthenes appear to be slightly more toxic than the paraffins.

Inhalation RfC

Using equation D-7, the inhalation RfC for the aliphatic fraction of mineral spirits is:

$$(5.5\ mg/m^3 \times 0.53) + (3.1\ mg/m^3 \times 0.47) = \boxed{4.4\ mg/m^3} \qquad \text{(D-8)}$$

Oral RfD

Using equation D-7, the oral RfD for the aliphatic fraction of mineral spirits is:

$$(0.8\ mg/kg/day \times 0.53) + (0.4\ mg/kg/day \times 0.47) = \boxed{0.6\ mg/kgday} \qquad \text{(D-9)}$$

1.3.2 Aromatic Fraction of Mineral Spirits

As previously described, the aromatic fraction of mineral spirits consists primarily of alkylated benzenes, with small amounts of naphthalenes and alkylated naphthalenes. 13% of this fraction is generally described as C_8+ aromatics. It is cost prohibitive to attempt to identify and quantify each of these compounds, and toxicity data is unavailable on the majority of them in any case. For purposes of calculating toxicity criteria for this aromatic fraction, the unidentified C_8+ aromatics will be assumed to be equivalent to ethylbenzene in their toxicity. The relative contribution of each of these four marker compounds to the total aromatic fraction is:

Toluene	= 0.5/15 =	0.033
Xylene	= 1.0/15 =	0.067
Naphthalene	= 0.5/15 =	0.033
Ethylbenzene	= 13/15 =	0.87

Using the appropriate RfDs for each of the four marker compounds, RfDs for inhalation and oral exposure to the total aromatic fraction of mineral spirits can now be calculated.

Inhalation RfC

Equation D-7 becomes:

$$RfC = (2.0\ mg/m^3 \times 0.033) + (0.3\ mg/m^3 \times 0.067) + (0.03\ mg/m^3 \times 0.033) + (0.7\ mg/m^3 \times 0.87) = \boxed{0.7\ mg/m^3} \quad \text{(D-10)}$$

Oral RfD

Equation D-7 becomes:

$$RfC = (0.3\ mg/kg\ day \times 0.033) + (2.0\ mg/kg/day \times 0.067) + (0.004\ mg/kg/day \times 0.033) + (0.1\ mg/kg/day \times 0.87) = \boxed{0.2\ mg/kg/day} \quad \text{(D-11)}$$

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APPENDIX E

METHODS USED FOR CALCULATING KAL-EQUIVALENT VALUES

APPENDIX E

Methods used for calculating KAL-equivalent values

This section outlines the methodology used to derive the cleanup levels for soil and groundwater at the Safety-Kleen site. In general, the potential for human health impacts resulting from exposure to detected chemicals are calculated by determining the extent of their carcinogenic and non-carcinogenic effects, using chemical specific factors [cancer potency slope factors (CPFs) and/or reference doses (RfDs)]. For noncarcinogenic effects, the RfD can be used as an acceptable measure of chemical intake without the probability of adverse health effects. By using the RfD as an acceptable intake, a health-based, "safe" water concentration can be established.

The EPAs Office of Drinking Water Standards customarily uses a 20% relative source contribution in calculating its recommended water standards. This is a conservative assumption to account for the expectation that exposure to the chemical will also result from sources other than ingestion of water. Potential sources of additional exposure include the inhalation of vapors (for volatile compounds), and via dermal contact and ingestion of contaminated soil.

Region IX EPA, has determined that for residential exposures to water containing VOCs, the dose that is absorbed via inhalation of volatilized VOCs is considered equivalent to the dose absorbed by ingestion of 2 liters of water per day. This assumption is used in the calculation of the KAL-equivalent for this document. As a further conservative assumption, the 20% relative source contribution used by EPAs ODW is also used to calculate the KAL-equivalent.

Calculation of KAL-Equivalents

The following equation and factors were used to calculate the KAL-equivalents used in this document.

$$\text{KAL-equivalent (mg/L)} = \frac{RfD_o \times RfD_i \times BW \times 0.2}{(RfD_o + RfD_i) \times IR \times ABS_o} \qquad \text{(E-1)}$$

Where:

RfD_o = oral reference dose (mg/kg/day).

RfD_i = inhalation reference dose (mg/kg/day).

BW = body weight (70 kg).

0.2 = 20% relative source contribution; assumes 80% of the chemical exposure is from sources other than the use of water.

IR = ingestion rate (2 L/day).

ABS_o = gastrointestinal absorption factor (unitless, assumed to be 100% in the absence of other data).

The KAL-equivalents for mineral spirits which were calculated using this procedure are shown in Table 4.

APPENDIX F

ENVIRONMENTAL FATE AND TRANSPORT MODELING

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COMPUTER MODELING OF CHEMICAL FATE AND TRANSPORT AT THE SAFETY-KLEEN SITE WICHITA, KANSAS

NOVEMBER 20, 1991

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November 20, 1991 SOMA 91-1009

SOIL AND GROUND-WATER MODELING STUDIES FOR EVALUATING IMPACT OF CHEMICALLY-AFFECTED SOILS ON GROUND WATER QUALITY CONDITIONS BENEATH THE TWO FORMER MINERAL SPIRITS TANKS AT SAFETY-KLEEN SITE IN WICHITA, KANSAS

1.0 BACKGROUND

A branch service center of Safety-Kleen Corp. (SKC) located at 1311 South Anna Street in Wichita, Kansas (the "Site") has used and stored mineral spirits at the Site since 1975. In September 1989, a site assessment was conducted by TriHydro Corporation to assess on-site environmental quality. The site assessment included a soil gas survey, soil boring and sampling program, and ground-water sampling and analyses activities. In June 1991, two 12,000-gallon underground storage tanks were removed from the Site. During the tank removal operations, soil samples were collected from the tank excavation area.

In July 1991, additional field investigations were conducted to define the horizontal and vertical extent of chemicals in soil and ground-water. The field investigation activities included constructing six boreholes and installing one vapor extraction well.

The results of laboratory analyses of environmental samples indicated elevated levels of acetone, 2-butanone, naphthalene, xylene and mineral spirits present in soils at 6 to 7 feet below ground surface immediately beneath the former mineral spirits tanks. Only one ground-water sample collected at Well A-4 showed a minor concentration of volatile organic chemicals. The presence of volatile organic chemicals (VOC) such as 1,2-dichloroethane, 1,1,1-trichloroethane, toluene, ethylbenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene detected in ground-water at Well A-4 can not be attributed to soils immediately below the former fuel tanks. Results of laboratory analyses of the soil samples collected from tank excavated areas and off-site locations did not indicate the presence of the VOC chemicals detected at Well A-4. Although it is likely that the presence of acetone and 2-butanone reported in the analytical results may be due to the laboratory contamination, it was assumed for purposes of this evaluation that these chemicals are present in the soils

beneath the former under-ground tanks.

The following chemicals were assumed to be the constituents of mineral spirits:

Nonane	48%
Cyclohexane	48%
Toluene	1%
Xylene	1%
Ethylbenzene	1%
Naphthalene	1%

This report evaluates the potential impact of mineral spirits affected soils on ground-water quality conditions. In a hypothetical case, the impact of 500 ppm concentration of mineral spirits in soils under Wichita, Kansas climatological conditions were evaluated.

2.0 OBJECTIVE

The objective of this study is to evaluate:

- future impact of mineral spirits affected soils on ground-water quality conditions.
- current on-site air quality conditions due to the volatilization of chemicals from the affected soils.

Using the analytical data obtained from previous and current studies conducted by TriHydro Corporation, the environmental modeling study was performed to evaluate the impact of a hypothetical concentration of 500 ppm of mineral spirits on ground-water quality conditions. Besides the assumed constituents of mineral spirits, the impact of acetone and 2-butanone on ground-water quality conditions which were reported by analytical laboratory were also evaluated.

3.0 MODELING PROCEDURES

Results of laboratory analyses of soil samples collected from different soil borings during field investigation conducted by Trihydro Corporation were used to assess the effect of chemically affected soils on ground-water. In general, chemical analysis for mineral spirits were reported in terms of its chemicals constituents. Percent distribution of the constituents found in mineral spirits were used to estimate the initial concentration of each chemical in soil based on 500 ppm concentration of

mineral spirits in soil. Table 1 shows the estimated initial chemical concentration used in modeling. These data were also used to calculate the potential emission rate of VOC chemicals to ambient air. Results of soil gas survey conducted by TriHydro Corporation could not be utilized in estimating VOC emission rates. The results of soil gas survey were reported in terms of total vapor concentrations rather than individual chemical specific vapor concentrations.

Besides the constituents of mineral spirits, certain chemicals such as acetone and 2-butanone were reported as the possible laboratory contaminants. To maintain conservativeness in this study, it was assumed that these chemicals are not laboratory contaminants, but they exist in the soil with the maximum reported concentration.

The following models were used in this study:

- the Seasonal Soil Compartment Model (SESOIL), developed by Arthur D. Little Inc. (1984) for the U.S. Environmental Protection Agency (U.S. EPA), Office of Toxic Substances;

- Analytical Transient One-, Two-, and Three-Dimensional (AT123D) model, developed in 1981 by the Oak Ridge National Laboratory of Tennessee for the Department of Energy and the U.S. EPA Office of Toxic Substances.

- A box model to evaluate on-site air quality conditions due to the volatilization of chemicals of potential concern to the ambient air.

SESOIL is a mathematical soil compartment model designed for long-term environmental hydrologic, sediment, and pollutant fate simulations. AT123D was designed for estimating the transport of dissolved chemicals in ground water. A box model is a control volume approach to evaluate the on-site air quality concentration due to the volatilization of VOC to the ambient air under steady state conditions.
The following is a brief description of the procedures and methodology used in conducting environmental modeling study.

3.1 SESOIL MODEL

The SESOIL model was used to evaluate the predicted fate and transport of residual acetone, 2-butanone, nonane, cyclohexane, toluene, xylene, ethylbenzene, and naphthalene within the soil

profile. Results of the SESOIL model were then used as input data to the AT123D model to evaluate the concentration of these chemicals in the saturated sediments.

The SESOIL modeling was conducted using a total simulation period of fifteen years to evaluate the predicted distribution of residual chemicals in three different phases along the soil profile. The three phases are the dissolved chemical concentrations in soil moisture (leachate concentration to ground water, if any), the phase adsorbed to the soil particles, and the phase volatilized into the air-in-pores. It should be emphasized that the SESOIL model results are conservative because the effects of biodegradation and other natural processes which would be expected to result in even lower concentrations are not considered in the simulation.

3.1.1 SESOIL MODEL INPUT DATA

The SESOIL model requires input data that are grouped into five classes of input parameters and stored in separate files. The input data include the following:

- Climatologic data of Wichita, Kansas such as the average monthly temperature, rainfall, and evaporation. Site-specific climatological data for the Site were obtained from the U.S. EPA Graphical Exposure Modeling Services (PCGEMS). The PCGEMS modeling package has been developed by General Sciences Corporation for the U.S. EPA. The climatologic data available in this modeling package have been obtained from the National Climatologic Data Center in Ashville, North Carolina.

- Soil property data, including the average soil porosity, intrinsic permeability and soil thickness. Since the chemically affected soils are predominantly sandy-silt, a representative porosity and intrinsic permeability of typical sandy-silt were assumed. Appendix A presents the model input and output information.

- Chemical property information, including water solubility, Henry's law coefficients and octanol/water partition coefficients. This information was also extracted from the U.S. EPA PCGEMS package for each chemical.

- The initial chemical concentration distribution at certain depths through the soil profile. Approximate depth to ground-water beneath the former under-ground tanks is about 13 feet (approximately 390 centimeter). For modeling

purposes, the unsaturated soil above ground-water was assumed to consist of three layers. The first layer was assumed to be 120 centimeter thick. Based on the laboratory results of soil samples collected at shallow depths (up to 5-6 feet), this layer was assumed to be clean. The second and third layers each were assumed to be 135 centimeter thick. Since the maximum chemical concentrations were detected at 6-7 feet below the ground surface, therefore these layers were assumed to contain the maximum detected concentration in soil for each chemical. Table 1 shows the maximum chemical concentration of each chemical used in the modeling as the initial soil concentration. Figure 1 presents the approximate location of chemically affected soils.

3.1.2 SESOIL MODEL RESULTS

The results of the SESOIL model have been presented in Table 2. Table 2 shows that the chemicals that were detected in soil would reach ground-water within 8-9 month. This is a conservative estimate, since the effects of biodegradation and other natural processes, which would significantly reduce chemical concentrations in soil, have not been considered. Figures 2-6 present simulated dissolved chemical concentration of soil leachate at different time intervals.

3.2 AT123D - CHEMICAL TRANSPORT MODEL

The AT123D model was designed to predict the spread of a chemical plume in ground water (the saturated zone). The model considers the effect of transport and transformations during the simulations. Transport is modeled using the process of advection and dispersion; transformation is modeled using an estimate of adsorption. A detailed description of the model may be found in Yeh 1981.

3.2.1 AT123D MODEL INPUT DATA

The AT123D model input data include information on saturated sediments parameters, such as porosity, hydraulic conductivity, hydraulic gradient, longitudinal, lateral and vertical dispersivity and chemical properties such as the distribution coefficient for each chemical. Leachate concentration and duration of the chemical leakage to ground water are important input data requirements for this model. This information is generated automatically by the SESOIL model during each simulation period. Using the site-specific climatologic data

(such as precipitation, temperature and evaporation), SESOIL simulation runs provided transient chemical mass flux information. In order to evaluate the long-term effect of chemically affected leachate on water-quality conditions in saturated sediments beneath the site, SESOIL was run for a total simulation period of fifteen years. The simulated leachate chemical mass flux at the end of each year was input to the AT123D model as input data.

Appendix B presents the input parameters and the model output for the AT123D model.

3.2.3 AT123D MODEL RESULTS

The results of AT123D chemical transport modeling indicate that saturated sediments beneath the site will not be significantly impacted by the leachate containing chemicals of potential concern. Figures 7-11 show the simulated maximum chemical concentration contour maps in ground-water. Table 2 presents the maximum concentration of each chemical in ground water beneath the site.

4.0 AIR QUALITY MODELING

To evaluate on-site air quality conditions due to the volatilization of VOC chemicals from soil, the emission rate of VOC chemicals should be estimated.

4.1 ESTIMATION OF VOC EMISSION RATE FROM SOILS

Farmer's model (1980) was used to calculate the emission rate from affected soils. The Farmer's model is a modified Fick's First law in which the tortuosity factor of Milligton and Quirk (1961) takes into account the reduced flow area and the increased flow pathway of diffusing gas in partially saturated soil. Figure 1 shows the approximate outlines of areas of chemically-affected soils. The soil chemical concentrations were assumed to remain constant under present and future conditions.

Farmer's model for the emission rate calculation is:

$$E_i = D_{air} * \frac{(C_g - C_i)}{L} * \frac{P_a^{\frac{10}{3}}}{P_t^2} \qquad (1)$$

Where:

E_i = estimated emission rate of chemical i in mg/(cm^2-sec)

D_{air} = chemical air diffusion coefficient in cm^2/sec

C_g = chemical concentration in gas or vapor phase (these two forms are used interchangeably) at depth L in mg/cm^3

C_i = gas phase chemical concentration immediately above the soil surface

L = the thickness of the overlying soil cover in cm

P_a = air-filled porosity of the soil cover in cm_3/cm^3

P_t = total porosity of the soil cover in cm^3/cm^3

In keeping with the conservative nature of this evaluation, it was assumed that C_i, was equal to zero. To evaluate the C_g, the total reported soil concentration of chemical was used.

The total chemical mass in soil exists in at least three phases: the vapor, the liquid, and the absorbed or solid phase. Jury et al. (1983) was used to estimate the chemical concentration in vapor phase based on total chemical concentration in soil, as reported in forms of analytical laboratory results. Jury et al assumed that Henry's law, which describes the liquid-gas phase partitioning, could be presented by:

$$C_g = Kh * C_l \qquad (2)$$

Where:

C_l = chemical concentration in liquid phase in mg/cm^3

Kh = Dimensionless Henry's law Coefficient.

Jury et al. (1983) assumes that a linear equilibrium sorption process describes the liquid-solid phase partitioning. They

assumed that:

$$C_s = K_d * C_l \tag{3}$$

Where:

C_s = sorbed chemical concentration in ug/g of dry soil
C_l = concentration of chemical in liquid phase ug/cm^3
K_d = soil partition coefficient in cm^3/g.

As was discussed earlier, K_d can be estimated by:

$$K_d = f_{oc} * K_{oc} \tag{4}$$

where f_{oc} is the mass fraction of organic carbon in the soil, and K_{oc} is the organic carbon partition coefficient.

U.S.EPA Personal Computer Graphical Exposure Modeling Services (PCGEMS) database, and Montgomery and Welkom (1990) were used to obtain the Henry's Law coefficient, Kh, and the octanol-water partition coefficient (Kow) of each chemical detected in soil.

The soil gas concentration was estimated from the total soil concentration using the relationship described by Jury el., al. (1983):

$$C_g = \frac{C_t}{R_g} \tag{5}$$

Where:

C_t = the total chemical concentration in the soil layer in mg/cm^3

R_g = the gas partition coefficient in cm^3/cm^3.

The gas partition coefficient R_g interrelates the liquid-gas and liquid-solid phases:

$$R_g = P_a + (P_1 + \rho * \frac{K_d}{Kh}) \quad (6)$$

Where:

P_a = the air-filled porosity in cm^3/cm^3
P_1 = the volumetric water content of the soil cover in cm^3/cm^3.
ρ = the dry bulk density of the cover soil in g/cm^3.

To estimate C_t from the laboratory-reported total soil concentration in soil which is not necessarily dry, the following relationship was used:

$$C_t = S * \rho * \frac{(1+G_1)}{1000} \quad (7)$$

Where:

G_1 = the gravimetric water content of the cover soil
S = lab reported total soil concentration in mg/kg of wet soil.

Parameter values used in the estimation of the emission rate from soils are listed in Table 3. By defining the above parameters the emission rate for each chemical was estimated using Farmer's Equation (Equation 1). Tables 4 presents the estimated emission rate from chemically-affected soils. To calculate the total mass flux rate of each chemical vapors from affected soils to the ambient air, the estimated emission rate was multiplied by the total surface area of the affected soils.

$$Q_i = E_i * A \quad (8)$$

Where:

Q_i = the mass flux rate for chemical i in g/second
A = total surface area of the affected soils in m^2.

Figure 1 shows the approximate area of the chemically affected soils. The mass flux rate of each chemical was used to estimate

the on-site air concentration for each chemical due to the volatilization of VOCs from affected soils.

4.2 PREDICTION OF AMBIENT AIR CONCENTRATION

After evaluating the emission rates of VOCs from affected soils, a box model was used to evaluate the concentrations of VOCs in ambient air in on-site areas.

4.2.1 ESTIMATION OF ON-SITE AIR QUALITY CONDITIONS

The box model is a control volume approach to calculating air concentrations (Pasquill, 1975). This model assumes steady and uniform conditions of dispersion, so that emissions are uniformly distributed throughout a "box" defined by the area of the source and the mixing height.

The box model equation is:

$$C_i = \frac{Q_i}{\frac{H}{2} * W * U} \tag{9}$$

where:

C_i	=	the on-site air concentration for chemical i (g/m^3)
Q_i	=	the mass flux rate of the chemical i (g/sec)
H	=	height of the box (mixing height) (m)
W	=	cross wind width of the area source (m)
U	=	annual average wind speed (m/sec).

The mass flux rate is calculated by:

$$Q_i = E_i * A_i \tag{10}$$

Where:

E_i	=	emission rate of chemical i (g/m^2-sec)
A_i	=	area of chemically-affected soil (m^2)

The mixing height (H) is estimated using the following equation presented by Pasquill (1975):

$$X=6.25*Z_0*[\frac{H}{Z_0}\ln(\frac{H}{Z_0})-1.58*(\frac{H}{Z_0})+1.58] \quad (11)$$

Where:

X	=	downwind distance aligned with wind direction along the site (m)
H	=	height of the box (m)
Z_0	=	roughness height which is used to characterize surface roughness (m).

This expression assumes a neutral stability class (D). At lower stability classes (A, B, and C), the mixing height would be larger, resulting in lower ambient concentrations. At higher stability classes (E and F), the mixing height would be smaller, resulting in higher ambient concentrations.

The height of the box represents the mean vertical height that a vapor molecule would attain after travelling across the entire length of the box. Because exposure to emissions could occur anywhere in the box and not just on the downwind edge, the average air concentration was calculated by using one-half of the calculated box height in the box-model equation. Table 5 shows the list of parameters and their selected values in conducting air quality modeling.

In estimating the height of the box, the roughness height, Z_0, was chosen as 0.70 meters, corresponding to a suburban setting with medium size buildings. This descriptor approximates Site conditions. The annual average wind speed and the prevailing direction were obtained from the PCGEMS database. The prevailing wind direction is from south to north with an average speed of 5.20 meters per second. Table 6 presents the on-site chemical air concentrations due to the presence VOC in soils.

5.0 CONCLUSION

The results of the SESOIL and AT123D modeling indicate that the presence of VOC chemicals in soil would not significantly impact the ground-water quality conditions. In general, the future simulated ground-water chemical concentrations are below the current State action levels. The computer modeling simulations indicate that all chemicals except nonane and ethylbenzene would reach ground-water after 7 to 95 month. Nonane, was used as a surrogate chemical for a group of heavy hydrocarbons (C9 and higher), cyclohexane was used as a surrogate chemical for the cyclical aliphatic hydrocarbons. Nonane and ethylbenzene would not reach to ground-water in the conceivable future. This is largely due to the low solubility and higher retardation coefficients of these chemicals.

Simulation runs indicated that none of the chemicals of potential concern in mineral spirits would affect underlying ground-water quality conditions. Other chemicals such as acetone and 2-butanone which conservatively were assumed to be present in the soil would slightly impact ground-water. Based on model output, the 2-butanone and acetone concentration in ground-water would reach as high as 6.7 and 3.0 parts per billion (ppb) in ground-water. However, due to the decreasing pattern of leachate concentrations of these chemicals from the vadose zone (see Figure 2 and 3) the ground-water concentration of these chemicals would be reduced by time after reaching to the maximum levels.

Due to the low concentration of chemicals of potential concern in soils and low Henry's law coefficients volatilization rates are rather limited. Simulated air concentration of chemicals of potential concern ranges between 1.36×10^{-5} to 0.670 microgram per cubic meter.

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List of Figures

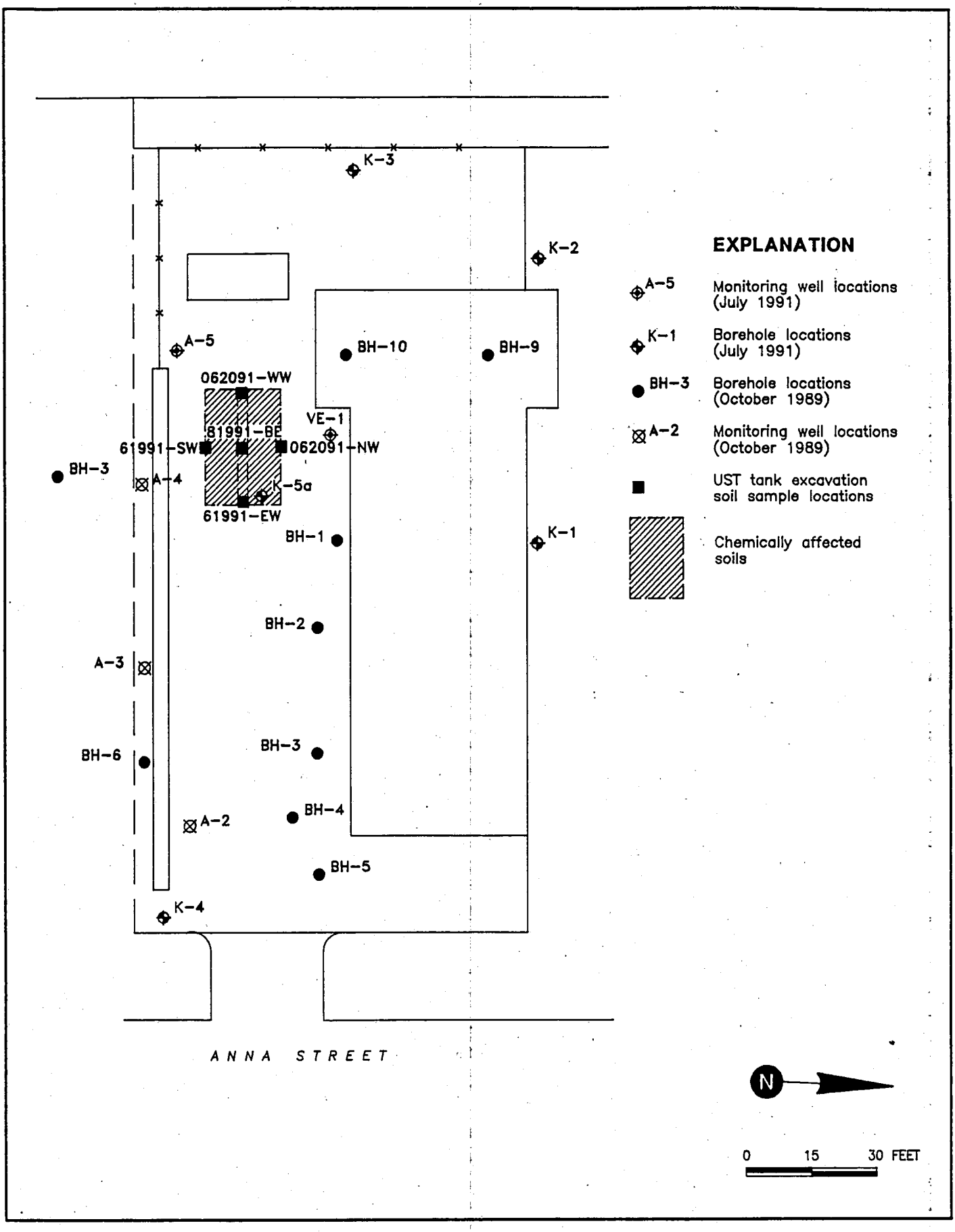


Figure 1 : SITE MAP AND LOCATION OF CHEMICALLY AFFECTED SOILS

Project No. : 91-1009
Date : 26 SEPT. 1991

SOMA ENVIRONMENTAL ENGINEERING

SOMA\91-1009\FIG1

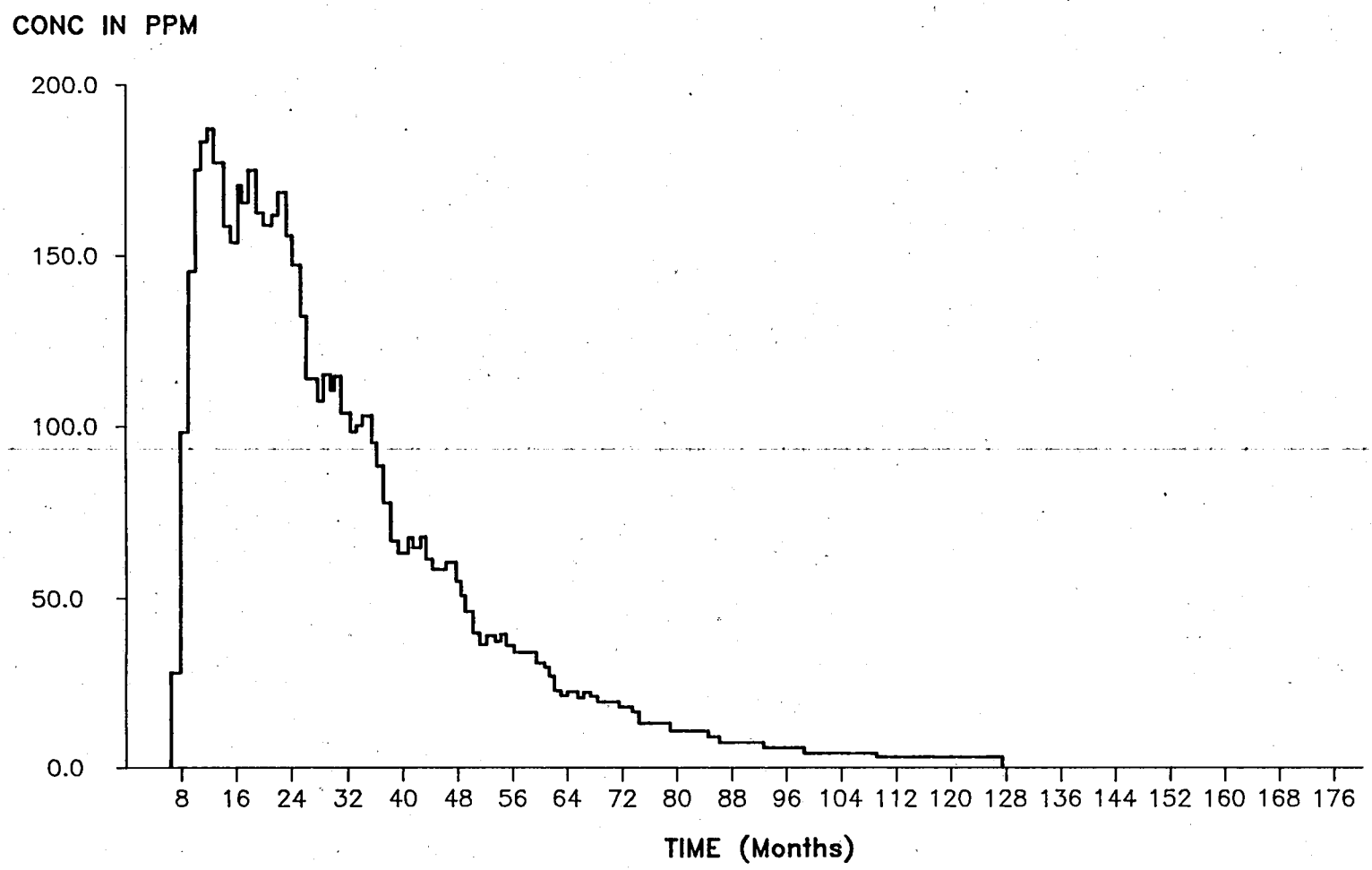


Figure 2 :
DISSOLVED ACETONE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

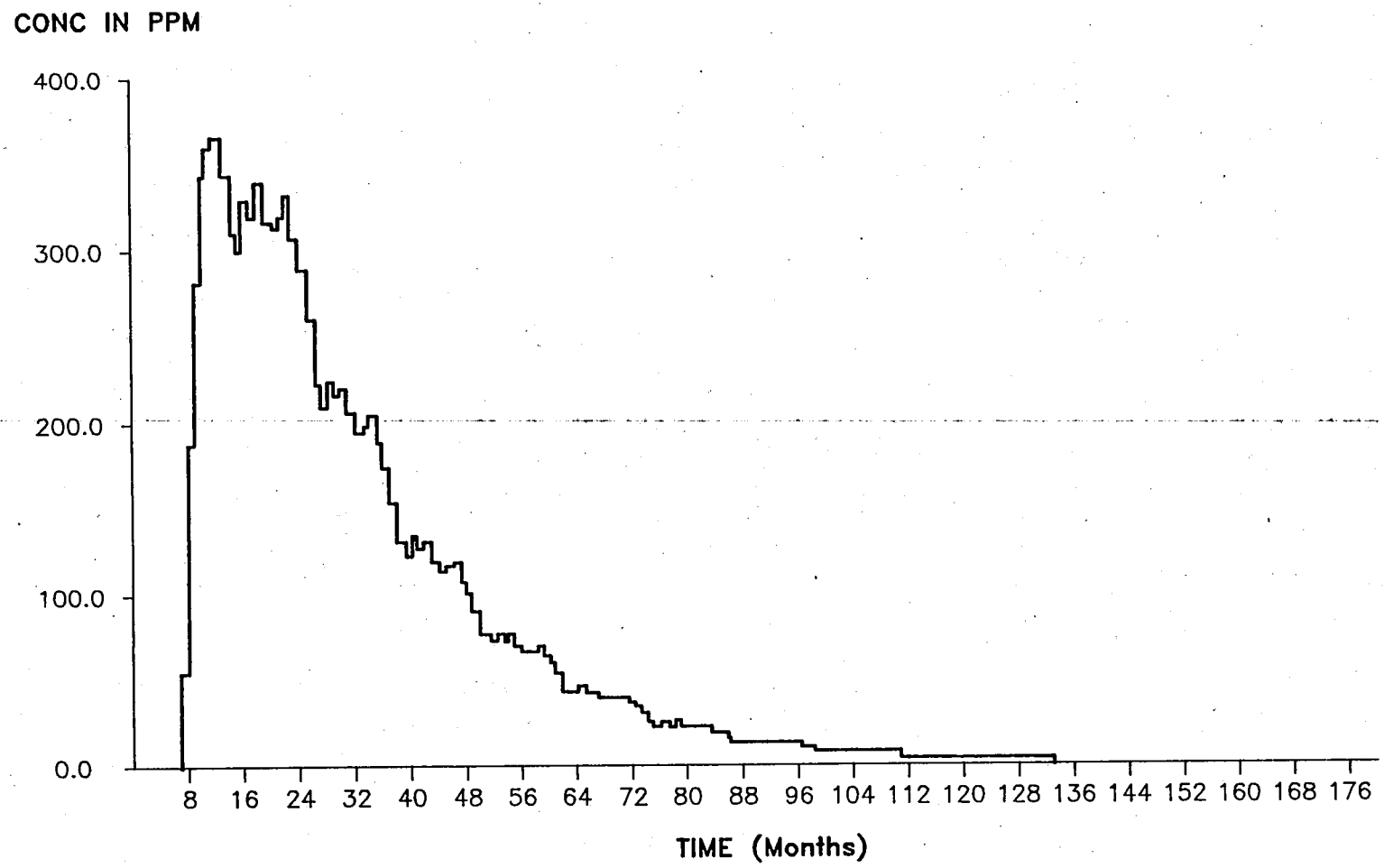


Figure 3 :
DISSOLVED 2-BUTANONE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

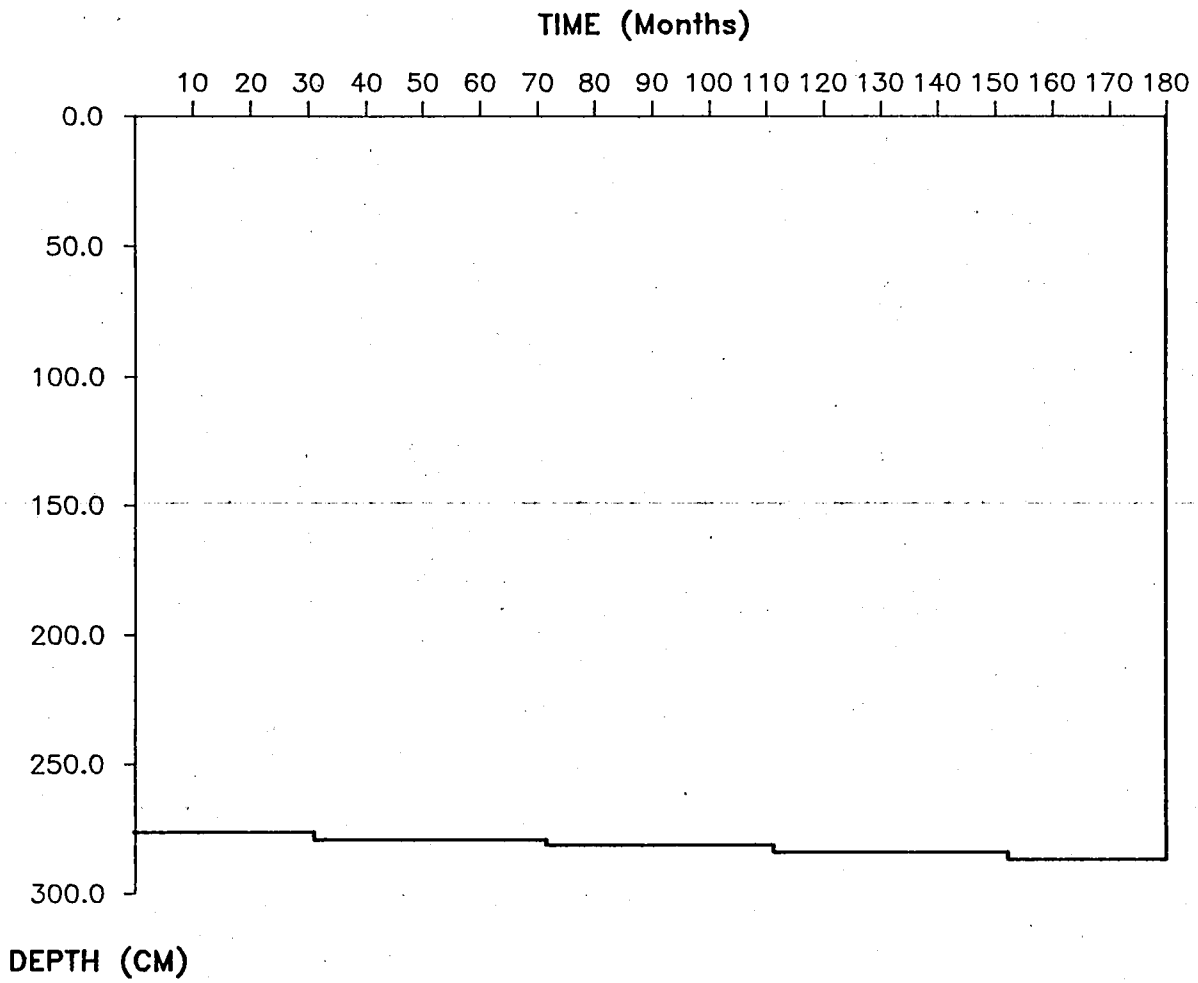


Figure 4 :
VERTICAL EXTENT OF NONANE DOWNWARD MIGRATION IN VADOSE ZONE

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

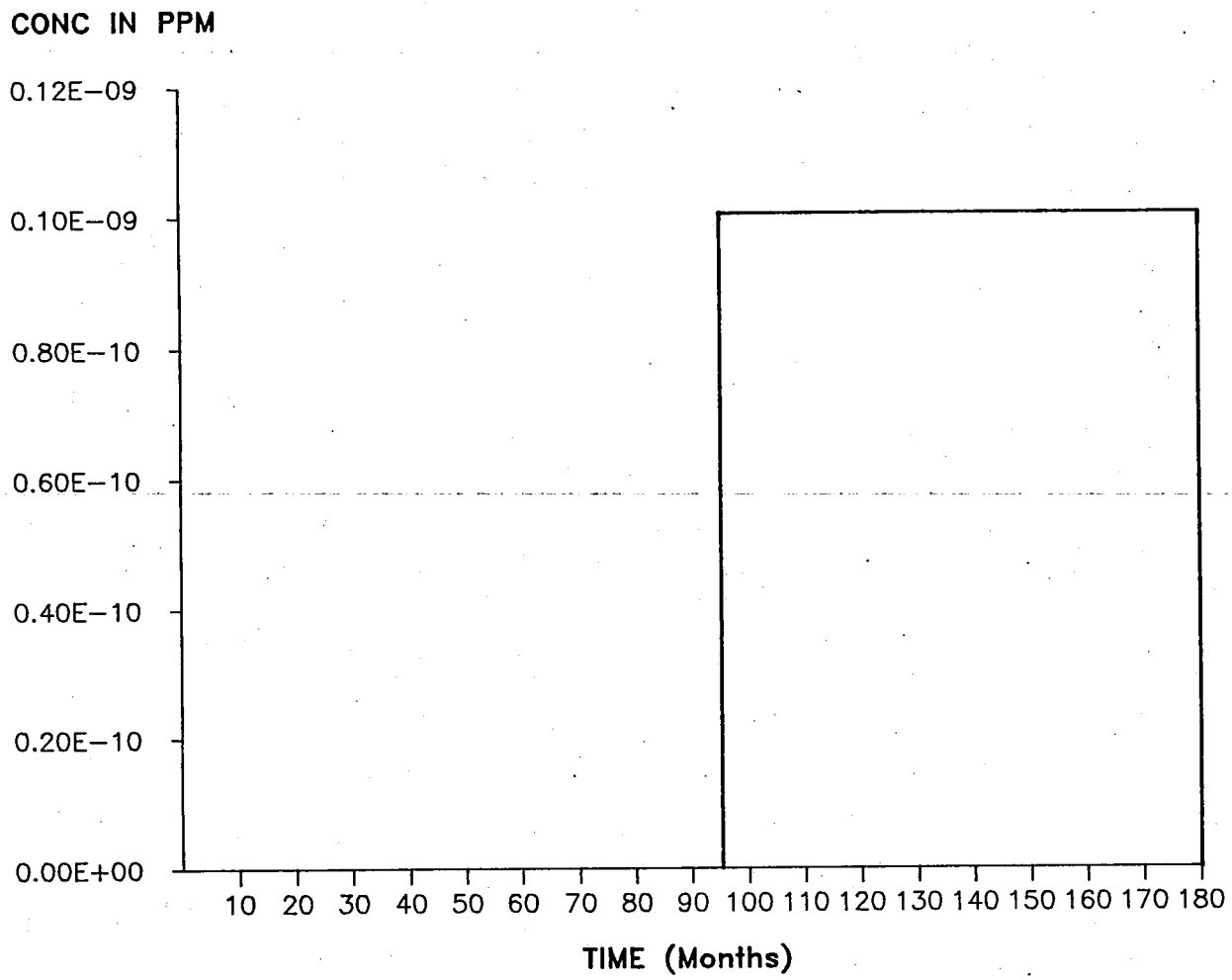


Figure 5 :
DISSOLVED CYCLOHEXANE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91−1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

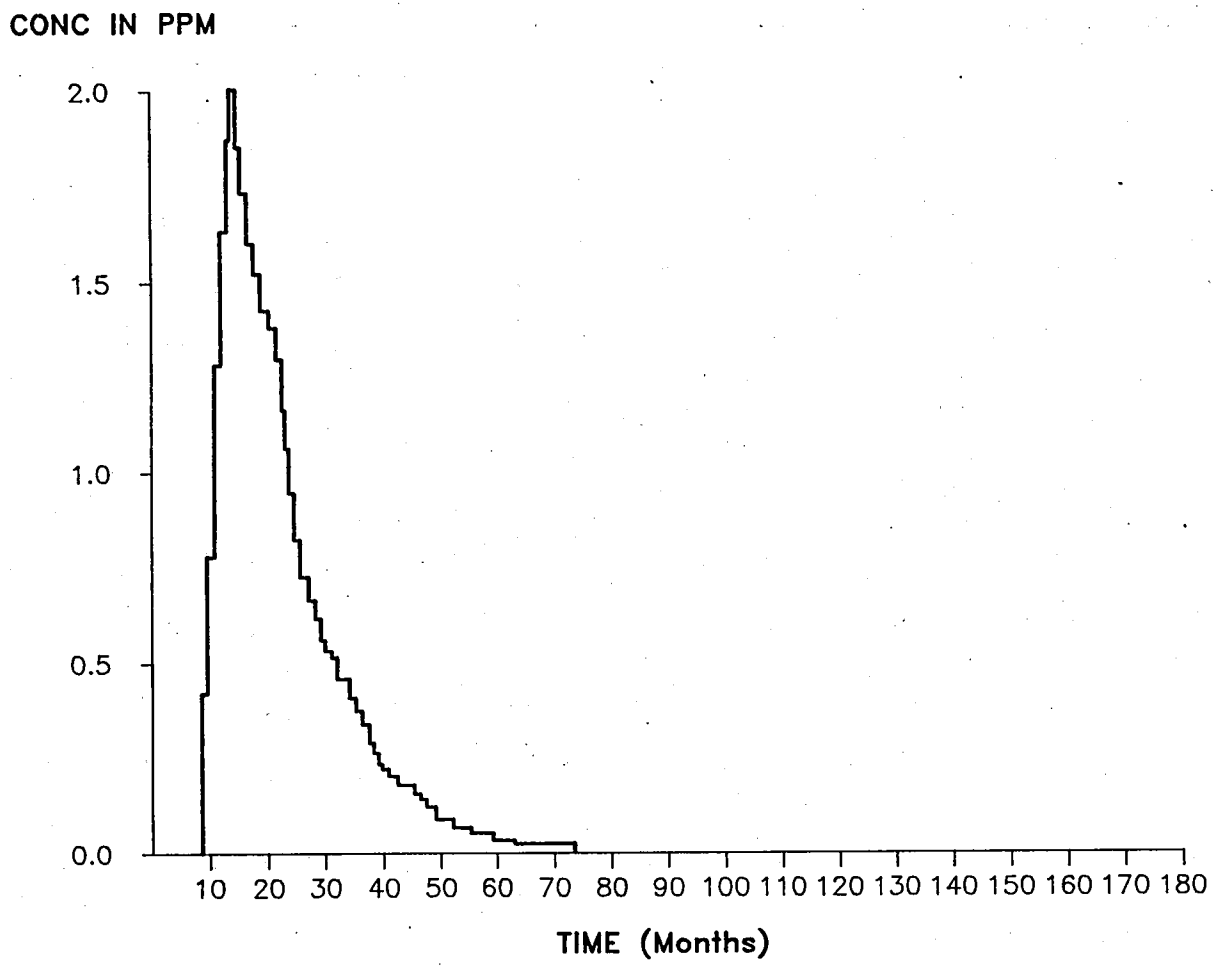


Figure 6 :
DISSOLVED TOLUENE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

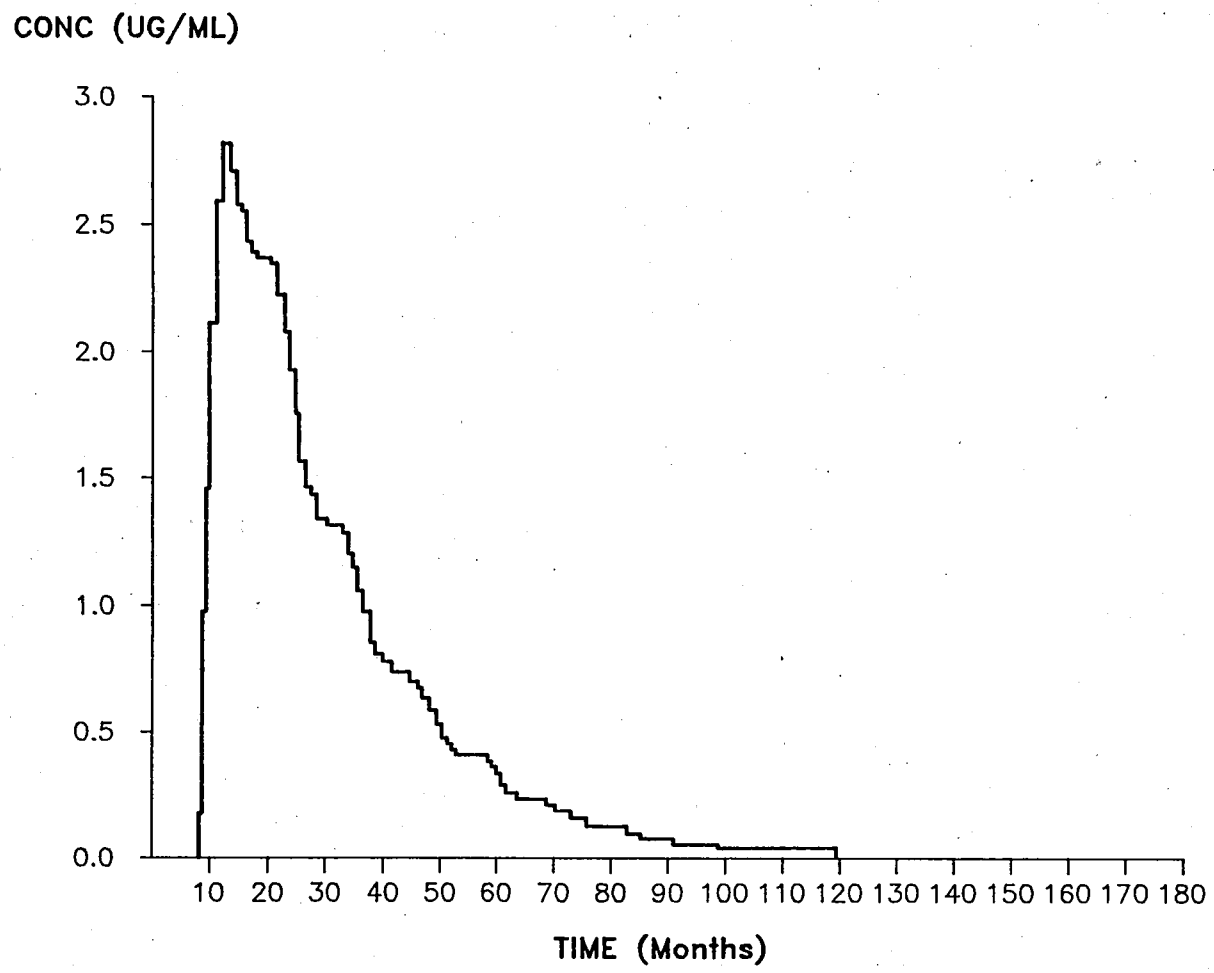


Figure 7 :
DISSOLVED XYLENE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91–1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

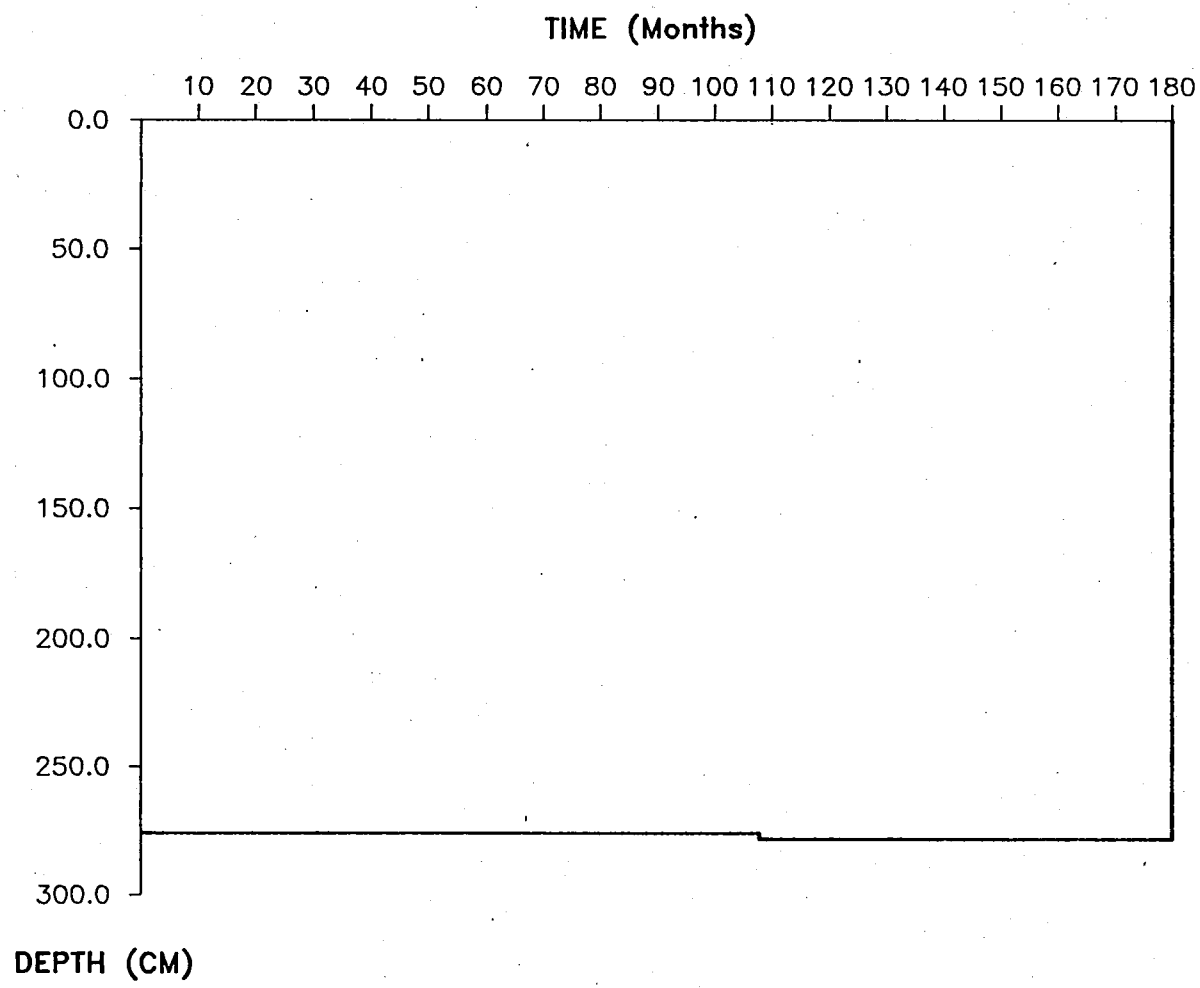


Figure 8 :
VERTICAL EXTENT OF ETHYLBENZENE DOWNWARD MIGRATION IN VADOSE ZONE

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

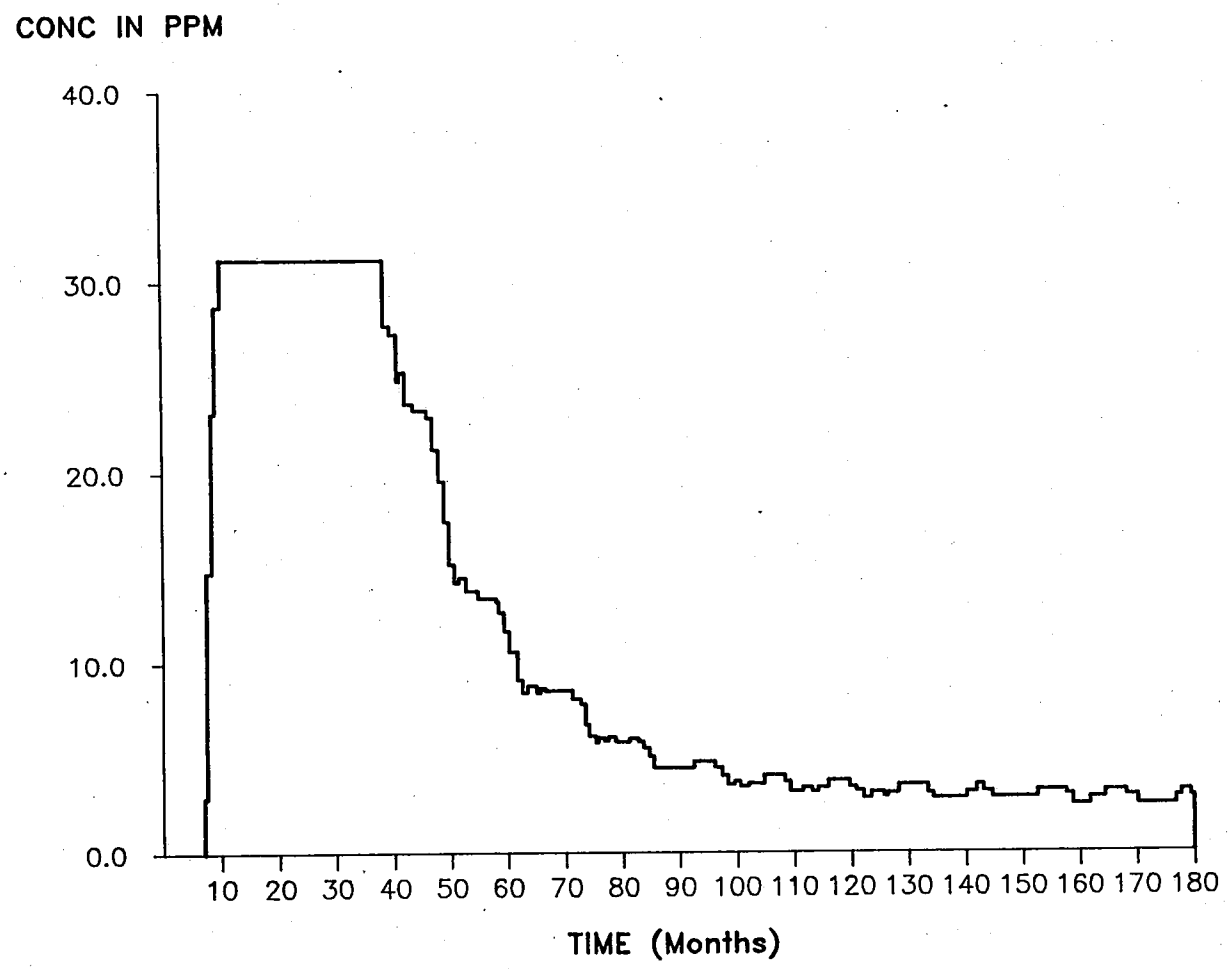
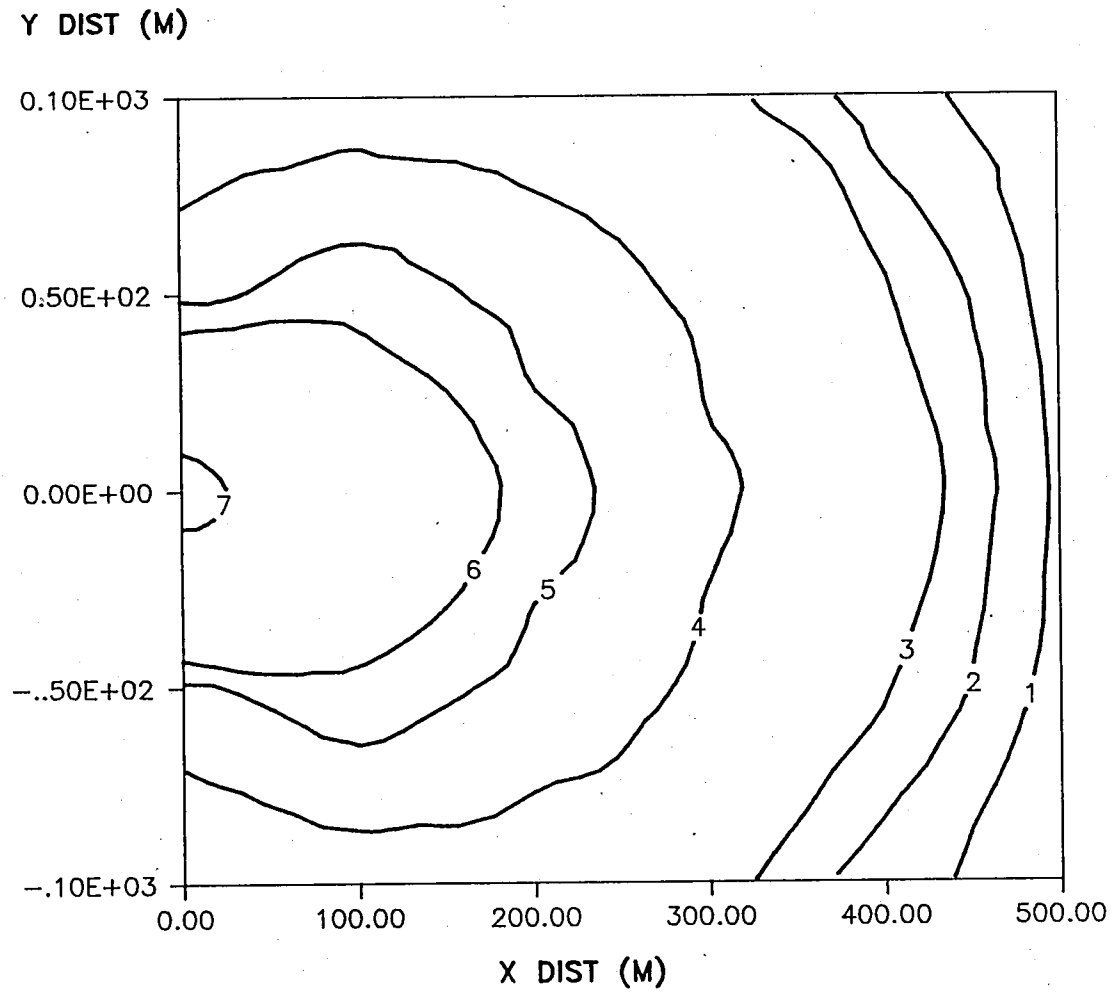


Figure 9 :
DISSOLVED NAPTHALENE CONCENTRATION IN SOIL LEACHATE AT 380 CM. DEPTH

Project No. : 91–1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

LABEL	VALUE
1	0.33E-04
2	0.67E-04
3	0.10E-03
4	0.33E-03
5	0.67E-03
6	0.10E-02
7	0.33E-02

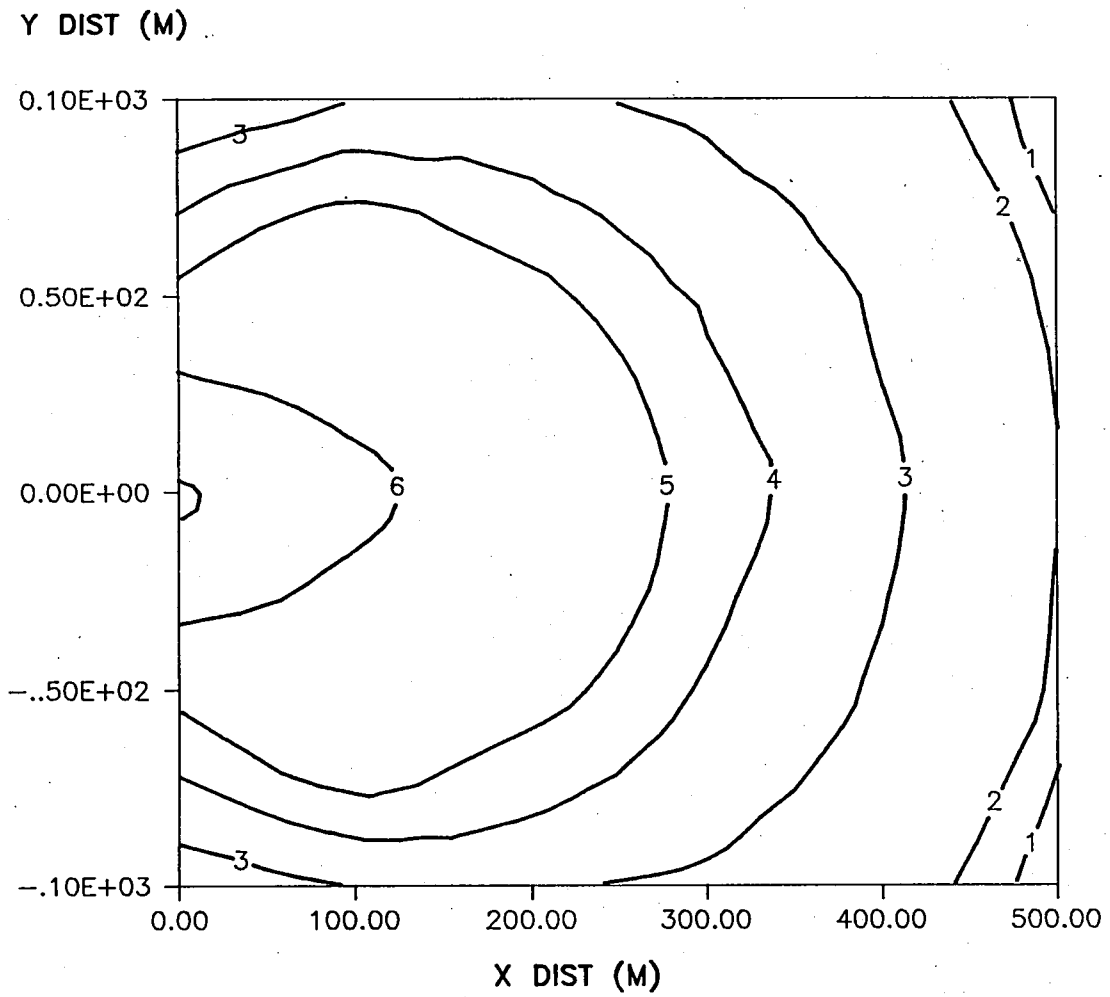
ISOLINE CONCENTRATIONS IN UNITS OF PPM

Figure 10 :

DISSOLVED ACETONE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

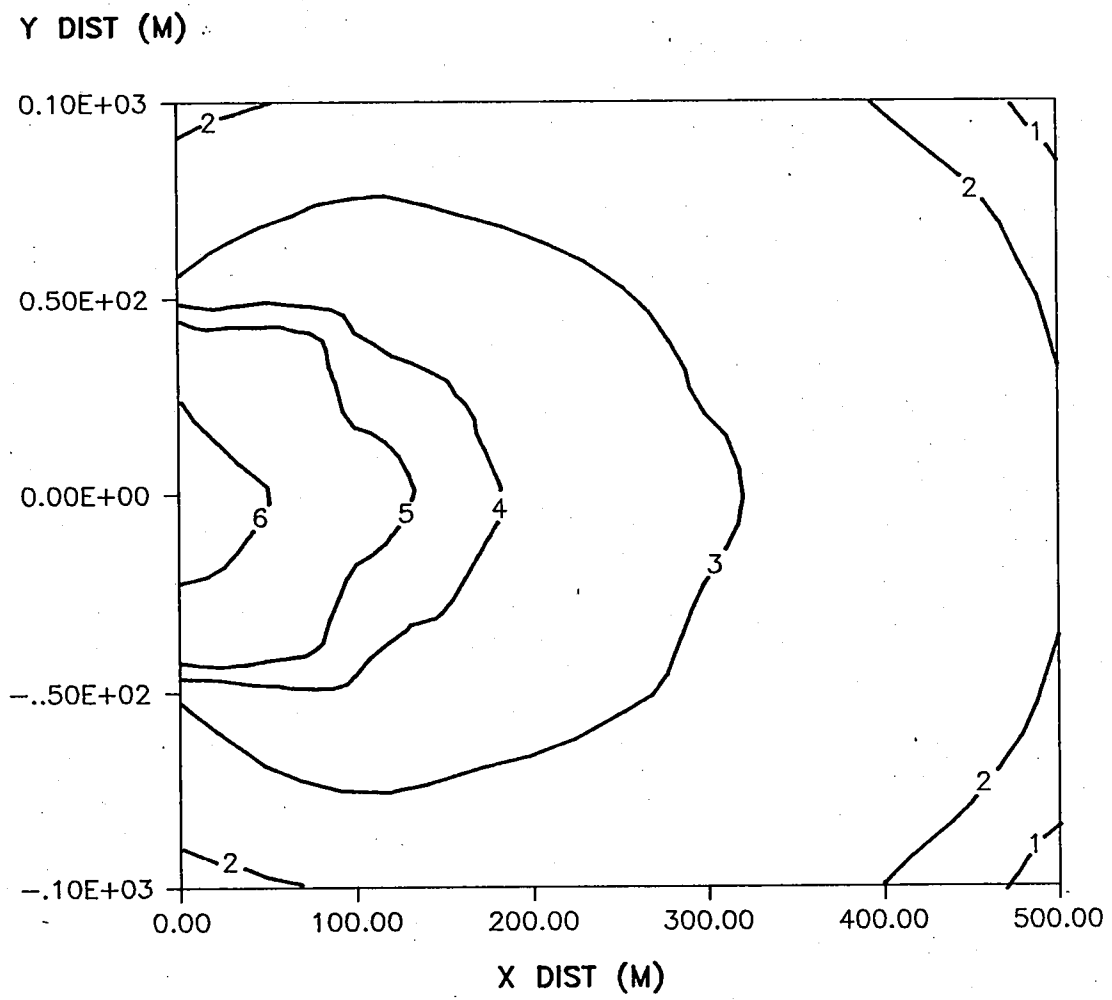
LABEL	VALUE
1	0.67E−04
2	0.10E−03
3	0.33E−03
4	0.67E−03
5	0.10E−02
6	0.33E−02
7	0.67E−02

ISOLINE CONCENTRATIONS IN UNITS OF PPM

Figure 11 :
DISSOLVED 2-BUTANONE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER

Project No. : 91−1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

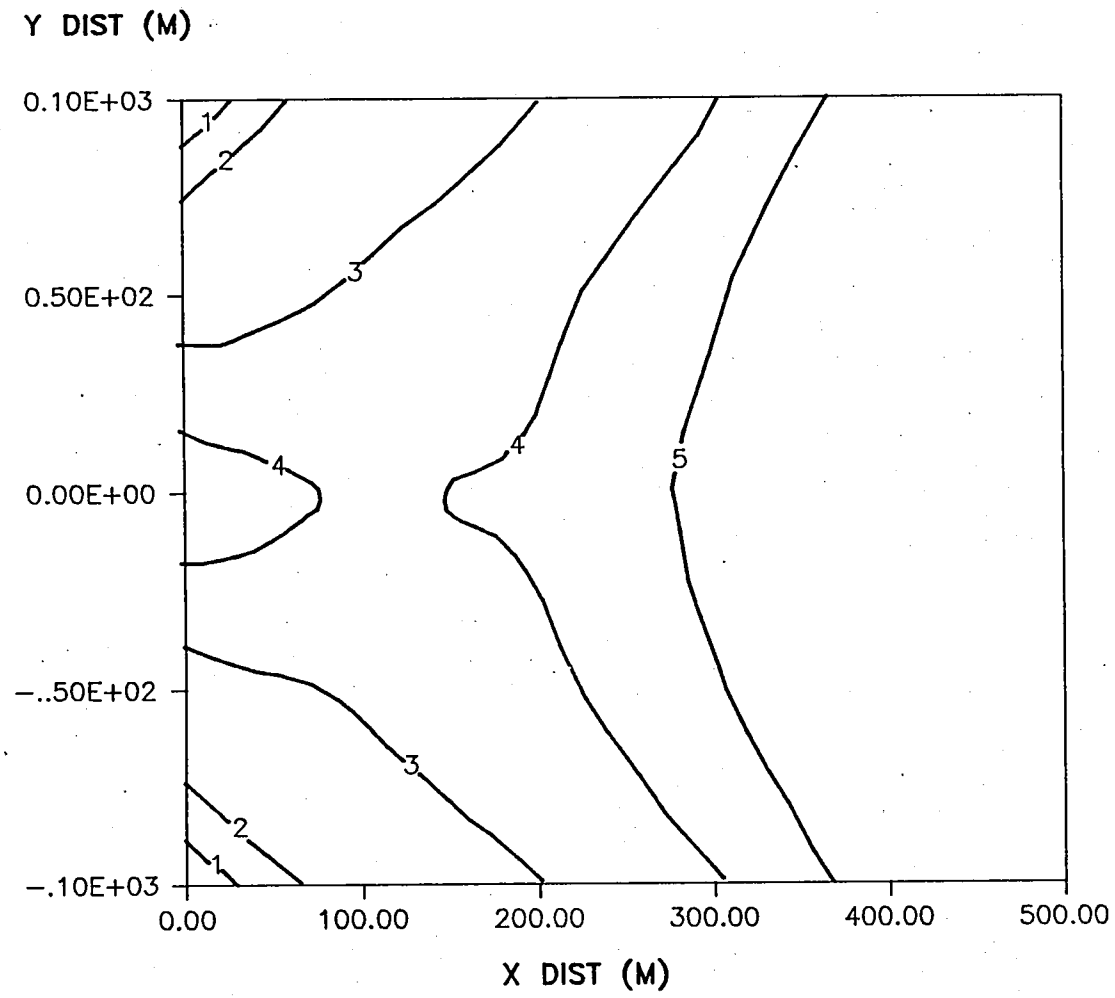
LABEL	VALUE
1	0.67E−16
2	0.10E−15
3	0.33E−15
4	0.67E−15
5	0.10E−14
6	0.33E−14

ISOLINE CONCENTRATIONS IN UNITS OF PPM

Figure 12 :
DISSOLVED CYCLOHEXANE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER.

Project No. : 91−1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

LABEL	VALUE
1	0.67E-09
2	0.10E-08
3	0.33E-08
4	0.67E-08
5	0.10E-07

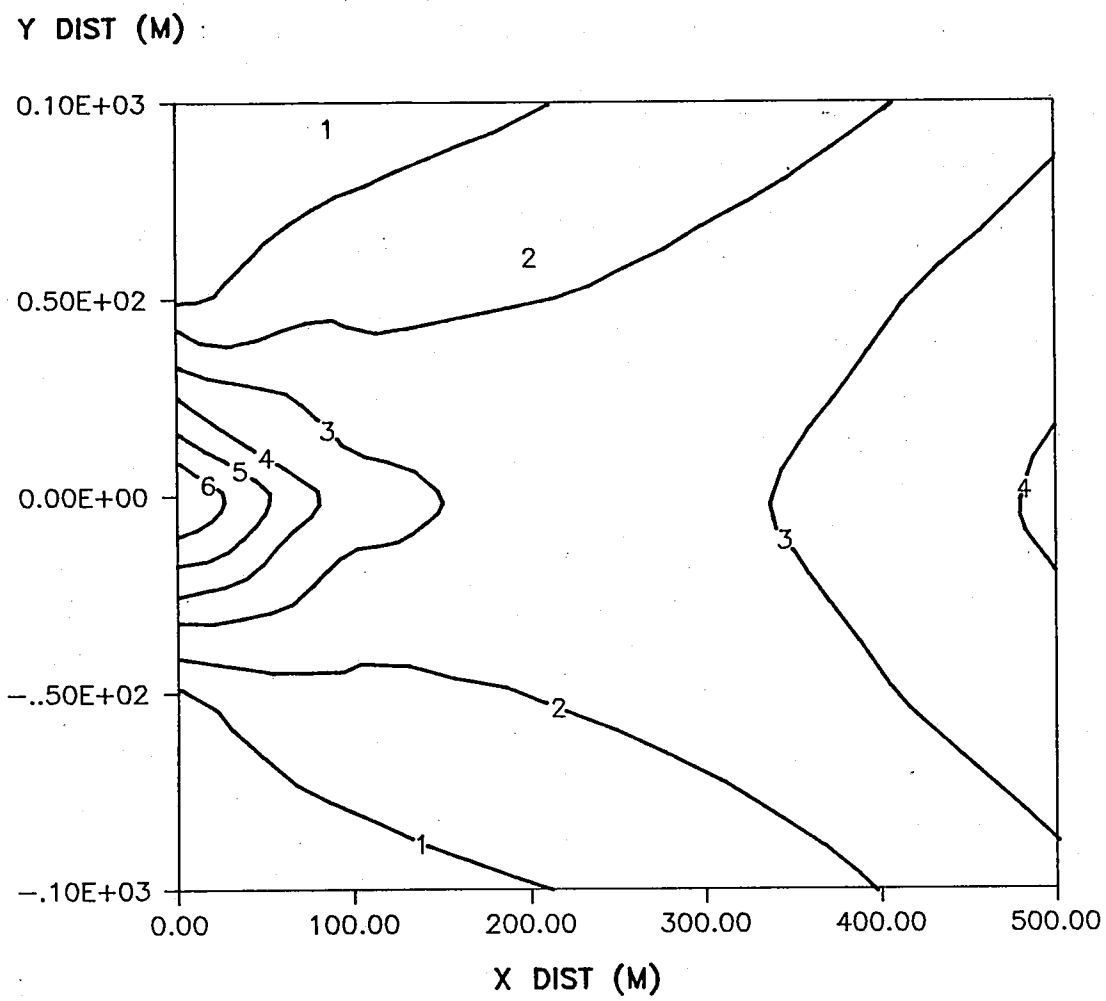
ISOLINE CONCENTRATIONS IN UNITS OF PPM

Figure 13 :

DISSOLVED TOLUENE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

LABEL	VALUE
1	0.10E-06
2	0.20E-06
3	0.30E-06
4	0.40E-06
5	0.50E-06
6	0.60E-06
7	0.70E-06

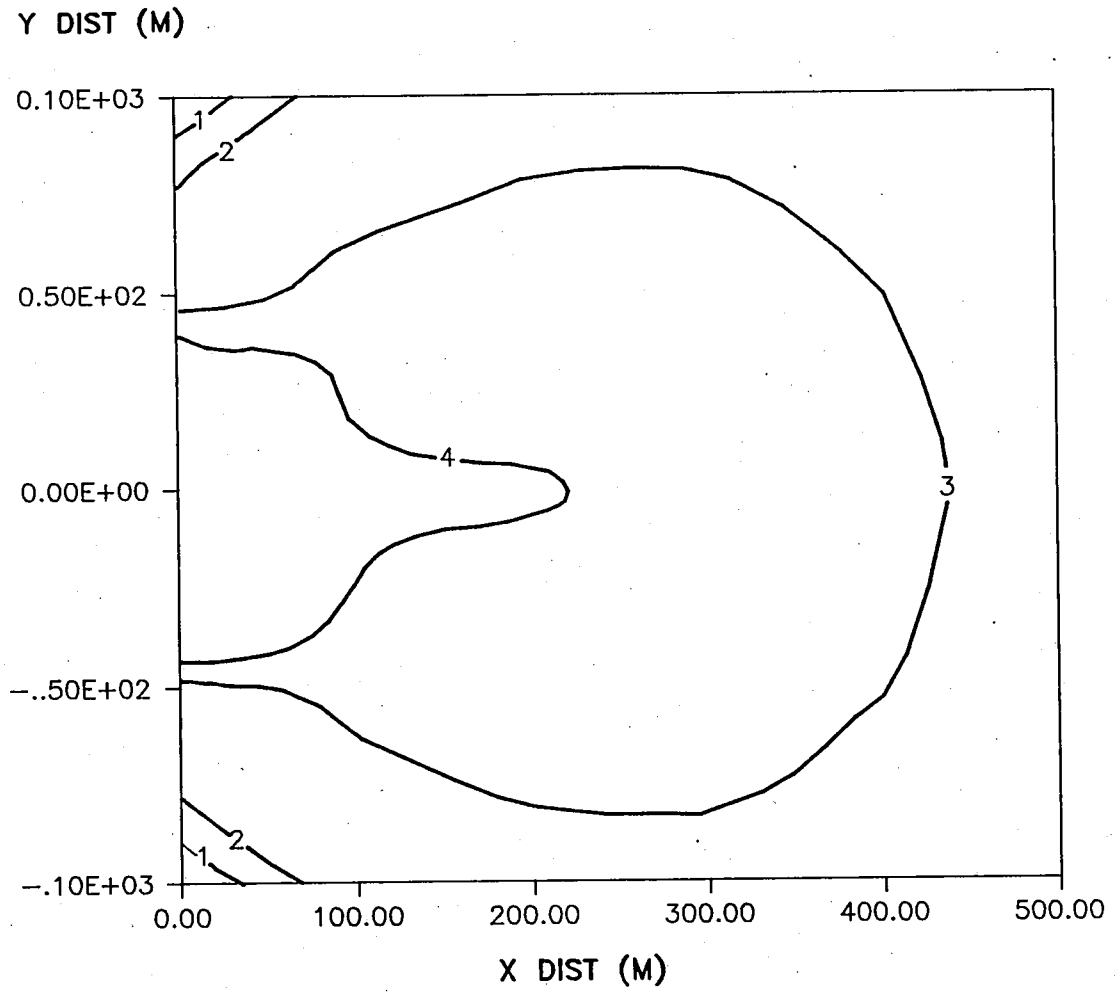
ISOLINE CONCENTRATIONS IN UNITS OF PPM

Figure 14 :

DISSOLVED XYLENE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER

Project No. : 91-1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING



ISOLINES

LABEL	VALUE
1	0.67E−05
2	0.10E−04
3	0.33E−04
4	0.67E−04
5	0.30E−03

Figure 15 :
DISSOLVED NAPHTHALENE CONCENTRATION (ppm), CONTOUR MAP IN GROUND-WATER

Project No. : 91−1009
Date : 20 NOV. 1991

SOMA ENVIRONMENTAL ENGINEERING

TABLE 1

Chemicals of Potential Concern
and Estimated Chemical Concentrations in Soil
Safety Kleen
Wichita, Kansas

Chemical	Assumed Percent of chemicals in Mineral Spirits	Assumed Soil Concentration (mg/kg soil)
Acetone	NA	5.00
2-Butanone	NA	10.00
Nonane	48	240.00
Cyclo-Hexane	48	240.00
Toluene	1	5.00
Xylene	1	5.00
Ethylbenzene	1	5.00
Naphthalene	1	5.00

Table 2
Results of Sesoil and AT123D Models
Safety-Kleen Wichita, Kansas

Chemical	Soil Concentration (mg/kg soil)	Time to Reach Ground-water (in month)	Maximum Leachate Concentration (ppm)	Maximum Ground-water Concentration (ppm)
Acetone	5.00	7	1.79E+02	3.30E-03
2-Butanone	10.00	7	3.76E+02	6.70E-03
Nonane	240.00	NA	NA	NA
Cyclo-Hexane	240.00	95	1.00E-10	3.30E-15
Toluene	5.00	9	2.01	1.00E-08
Xylene	5.00	24	2.85E+00	7.00E-07
Ethylbenzene	5.00	NA	NA	NA
Naphthalene	5.00	9	3.20E+01	3.00E-04

Table 3
Soil Properties Used in Farmer's Model

Safety Kleen
Wichita, Kansas

Parameter	Definition	Value-Units
q	Dry Soil Bulk Density	1.86 g/cm^3
P_t	Total Soil Porosity	0.30 cm^3/cm^3
P_l	Volumetric Water Content	0.20 cm^3/cm^3
G_l	Gravimetric Water Content	0.108 g/g
P_a	Air Filled Porosity	0.10 cm^3/cm^3
foc	Organic Carbon Content	0.010
D_{air}	Air Diffusion Coefficient	0.080 cm^2/s
L	Thickness of Clean Top Soil	120. cm

TABLE 4

Emission Rate of Chemicals from Chemically-Affected Soils

and Estimated on-Site Air Concentrations

Safety-Kleen

Wichita, Kansas

Chemical	Soil Concentration (mg/kg soil)	Henry's Law Constant atm-m3/mole-K	Koc (ml/g)	Ref*	Ct (mg/cm3)	Rg (cm3/cm3)	Cg (mg/cm3)	Emission Rate (mg/m2-sec)	On-Site Air Concentration (ug/m3)
Acetone	5.00	3.97E-05	3.70E-01	1	1.03E-02	1.27E+02	8.09E-05	2.78E-06	1.37E-04
2-Butanone	10.00	4.66E-05	1.23E+00	1	2.06E-02	1.17E+02	1.76E-04	6.06E-06	2.98E-04
Nonane	240.00	2.36E+00	1.75E+04	2	4.95E-01	3.47E+00	1.42E-01	4.90E-03	2.41E-01
Cyclo-Hexane	240.00	1.95E-01	4.82E+02	2	4.95E-01	1.25E+00	3.96E-01	1.36E-02	6.70E-01
Toluene	5.00	6.70E-03	1.15E+02	1	1.03E-02	8.62E+00	1.20E-03	4.11E-05	2.02E-03
Xylene	5.00	5.27E-03	2.40E+02	1	1.03E-02	2.17E+01	4.74E-04	1.63E-05	8.02E-04
Ethylbenzene	5.00	6.60E-03	9.55E+01	1	1.03E-02	7.42E+00	1.39E-03	4.78E-05	2.35E-03
Naphthalene	5.00	4.60E-04	1.29E+03	1	1.03E-02	1.28E+03	8.03E-06	2.76E-07	1.36E-05

*) Reference:

1- Groundwater Chemicals Desk Reference, by John H. Montgomery and Linda M. Welkom

2- PCGEMS Database of EPA

Table 5
Parameters Used in Box Model
Safety Kleen Site
Wichita, Kansas

Parameter	Units	Definition/Source	Value
Z_o	m	Roughness Height, California Site Mitigation Decision Tree Manual	.70
U	m/s	Average Wind Speed at Long Beach California	5.20
X	m	Legth of Site along the Primary Wind Direction	24.5
H	m	Height of the Box in Pasquill Eq.	5.6
W	m	Width of the Site, Perpendicular to the Primary Wind Direction	50.29

1

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*****************************************************************************************
*****                                                                                   *****
***** SESOIL-84 :  SEASONAL CYCLES OF WATER, SEDIMENT, AND POLLUTANTS IN SOIL ENVIRONMENTS *****
*****                                                                                   *****
***** DEVELOPERS:  M. BONAZOUNTAS,ARTHUR D. LITTLE INC.  ,(617)864-5770,X5871          *****
*****              J. WAGNER      ,DIS/ADLPIPE, INC.      ,(617)492-1991,X5820          *****
*****                                                                                   *****
***** MODIFIED EXTENSIVELY BY:                                                          *****
***** D.M. HETRICK                                                                      *****
***** OAK RIDGE NATIONAL LABORATORY                                                     *****
***** (615) 576-7556                                                                    *****
***** VERSION    :  SEPTEMBER 1986                                                      *****
*****                                                                                   *****
*****************************************************************************************
```

****** MONTHLY SESOIL MODEL OPERATION ******
MONTHLY SITE SPECIFIC SIMULATION

RUN: 1

REGION	: (	1)	WICHITA WSO AP
SOIL TYPE	: (	1)	SILTY-LOAN-KANSAS (K1 ADJUSTED)
COMPOUND	: (	1)	Benzene, methyl-
WASHLOAD DATA	: (	0)	
APPLICATION AREA	: (	1)	DEFAULT APPLIC DATA

WARNING- SOIL PERMEABILITY VARYS CONSIDERABLY AMONG LAYERS
SESOIL MAY NOT BE ACCURATE FOR SUCH AN INHOMOGENEOUS COLUMN

GENERAL INPUT PARAMETERS

-- SOIL INPUT PARAMETERS --

SOIL DENSITY (G/CM**3):	1.86
INTRINSIC PERMEABILITY (CM**2):	.700E-08
DISCONNECTEDNESS INDEX (-):	6.00
POROSITY (-):	.350
ORGANIC CARBON CONTENT (%):	2.90
CLAY CONTENT (%):	.000
CATION EXCHANGE CAPACITY (MILLI EQ./100G DRY SOIL):	.000
FREUNDLICH EXPONENT (-):	1.00

1

-- CHEMICAL INPUT PARAMETERS --

SOLUBILITY (UG/ML):	526.
DIFFUSION COEFFICIENT IN AIR (CM**2/SEC):	.992E-01
HENRYS LAW CONSTANT (M**3-ATM/MOLE):	.664E-02
ADSORPTION COEFFICIENT ON ORGANIC CARBON(KOC):	95.0
ADSORPTION COEFFICIENT ON SOIL (K):	.000
MOLECULAR WEIGHT (G/MOL):	92.0
VALENCE (-):	.000
NEUTRAL HYDROLYSIS CONSTANT (/DAY):	.000
BASE HYDROLYSIS CONSTANT (L/MOL-DAY):	.000
ACID HYDROLYSIS CONSTANT (L/MOL-DAY):	.000
DEGRADATION RATE IN MOISTURE (/DAY):	.000
DEGRADATION RATE ON SOIL (/DAY):	.000
LIGAND-POLLUTANT STABILITY CONSTANT (-):	.000
NO. MOLES LIGAND/MOLE POLLUTANT (-):	.000
LIGAND MOLECULAR WEIGHT (G/MOL):	.000

-- APPLICATION INPUT PARAMETERS --

NUMBER OF SOIL LAYERS:	3		
YEARS TO BE SIMULATED:	20		
AREA (CM**2):	0.360E+06		
APPLICATION AREA LATITUDE (DEG.):	36.0		
SPILL (1) OR STEADY APPLICATION (0):	1		
DEPTHS (CM):	0.12E+03	0.13E+03	0.13E+03
NUMBER OF SUBLAYERS/LAYER	3	3	3
PH (CM):	7.0	7.0	7.0
INTRINSIC PERMEABILITIES (CM**2):	0.70E-08	0.70E-08	0.70E-08
KDEL RATIOS (-):	1.0	1.0	
KDES RATIOS (-):	1.0	1.0	
OC RATIOS (-):	0.00	0.00	
CEC RATIOS (-):	1.0	1.0	
FRN RATIOS(-):	1.0	1.0	
ADS RATIOS(-):	1.0	1.0	

1

YEAR - 1 MONTHLY INPUT PARAMETERS

-- CLIMATIC INPUT PARAMETERS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
TEMP. (DEG C)	15.550	7.270	1.660	0.110	2.830	6.660	13.830	19.000	24.380	27.110	26.550	21.610

CLOUD CVR (FRAC.)	0.450	0.450	0.550	0.600	0.600	0.550	0.600	0.600	0.500	0.500	0.350	0.350
REL. HUM.(FRAC.)	0.600	0.600	0.650	0.700	0.650	0.600	0.600	0.650	0.650	0.600	0.600	0.600
ALBEDO (-)	0.170	0.200	0.210	0.220	0.220	0.210	0.170	0.170	0.170	0.170	0.170	0.170
EVAPOT. (CM/DAY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PRECIP. (CM)	6.510	3.790	2.570	1.920	2.040	5.250	5.870	10.290	10.770	8.760	7.000	8.590
M.TIME RAIN(DAYS)	0.420	0.440	0.490	0.380	0.450	0.440	0.370	0.310	0.280	0.240	0.270	0.360
M. STORM NO. (-)	3.300	2.230	2.090	1.600	1.900	3.460	4.190	6.200	5.760	4.500	3.860	4.360
M. SEASON (DAYS)	30.400	30.400	30.400	30.400	30.400	30.400	30.400	30.400	30.400	30.400	30.400	30.400

-- POLLUTANT INPUT PARAMETERS --

POL. INP-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LIG.INPUT-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILIZATION MULT.-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
SURFACE RUNOFF MULT.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POL. IN RAIN (FRAC-SL)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POL. INP-2 (UG/CM**2)	1.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LIG.INPUT-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILIZATION MULT.-2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
POL. INP-L (UG/CM**2)	1.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LIG.INPUT-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILIZATION MULT.-L	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

1

YEAR - 2 MONTHLY INPUT PARAMETERS

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

-- POLLUTANT INPUT PARAMETERS --

POL. INP-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LIG.INPUT-1 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILIZATION MULT.-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
SURFACE RUNOFF MULT.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POL. IN RAIN (FRAC-SL)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
POL. INP-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LIG.INPUT-2 (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VOLATILIZATION MULT.-2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
POL. INP-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRNSFORMD-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SINKS-L (UG/CM**2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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 LIG.INPUT-L (UG/CM**2) 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0.00E+00
 VOLATILIZATION MULT.-L 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00 1.00E+00
1.00E+00
1
      YEAR - 3     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 4     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 5     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 6     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 7     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 8     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR - 9     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -10     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -11     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -12     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -13     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -14     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
      YEAR -15     MONTHLY INPUT PARAMETERS
      ========     ========================

      -- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

      -- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR
1
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YEAR -16 MONTHLY INPUT PARAMETERS
======== ==========

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR.

-- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR

1

YEAR -17 MONTHLY INPUT PARAMETERS
======== ==========

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

-- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR

1

YEAR -18 MONTHLY INPUT PARAMETERS
======== ==========

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

-- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR

1

YEAR -19 MONTHLY INPUT PARAMETERS
======== ==========

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

-- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR

1

YEAR -20 MONTHLY INPUT PARAMETERS
======== ==========

-- CLIMATIC INPUT PARAMETERS ARE SAME AS LAST YEAR

-- POLLUTANT INPUT PARAMETERS ARE SAME AS LAST YEAR

**** WARNING (MONTH 3) - PROBLEM IN HYDRO CYCLE: W EQUALS OR EXCEEDS EP
W SET TO EP

1

YEAR - 1 MONTHLY RESULTS (OUTPUT)
======== ==========

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.879	12.229	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.879	12.229	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.448	3.766	2.560	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.447	3.766	2.560	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.941	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.114	0.114	0.148	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.393	0.573	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.393	0.573	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.990	0.994	0.996	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.990	0.994	0.996	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	4.518E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	4.518E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	9.036E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED 9.832E+05 1.240E+07 3.112E+07 4.835E+07 6.906E+07 6.402E+07 6.169E+07 4.900E+07 4.405E+07 4.236E+07 4.132E+07 3.548E+07
IN SOIL MOI 1.641E+05 1.002E+06 1.929E+06 2.431E+06 2.343E+06 2.416E+06 2.194E+06 2.166E+06 1.968E+06 1.741E+06 1.542E+06 1.481E+06
ADS ON SOIL 7.078E+06 4.201E+07 7.795E+07 1.007E+08 1.098E+08 1.071E+08 9.995E+07 9.129E+07 8.318E+07 7.624E+07 7.003E+07 6.409E+07
IN SOIL AIR 8.906E+04 5.362E+05 9.953E+05 1.306E+06 1.505E+06 1.416E+06 1.299E+06 1.120E+06 1.003E+06 9.268E+05 8.681E+05 7.867E+05

SUBLAYER 2

DIFFUSED UP 9.274E+06 5.033E+07 6.931E+07 7.266E+07 7.967E+07 6.329E+07 5.688E+07 4.410E+07 3.966E+07 3.816E+07 3.711E+07 3.176E+07
IN SOIL MOI 1.329E+06 4.010E+06 5.412E+06 5.602E+06 4.797E+06 4.704E+06 4.176E+06 4.114E+06 3.743E+06 3.310E+06 2.923E+06 2.808E+06
ADS ON SOIL 5.734E+07 1.680E+08 2.187E+08 2.321E+08 2.248E+08 2.084E+08 1.902E+08 1.734E+08 1.582E+08 1.449E+08 1.327E+08 1.215E+08
IN SOIL AIR 7.214E+05 2.145E+06 2.792E+06 3.011E+06 3.081E+06 2.757E+06 2.472E+06 2.127E+06 1.907E+06 1.762E+06 1.645E+06 1.491E+06

SUBLAYER 3

DIFFUSED UP 7.431E+07 1.664E+08 1.217E+08 8.656E+07 7.238E+07 4.785E+07 3.965E+07 2.963E+07 2.675E+07 2.646E+07 2.597E+07 2.189E+07
IN SOIL MOI 8.033E+06 1.091E+07 1.032E+07 8.857E+06 6.790E+06 6.343E+06 5.525E+06 5.419E+06 4.953E+06 4.407E+06 3.884E+06 3.718E+06
ADS ON SOIL 3.465E+08 4.570E+08 4.170E+08 3.669E+08 3.182E+08 2.811E+08 2.517E+08 2.284E+08 2.094E+08 1.930E+08 1.764E+08 1.609E+08
IN SOIL AIR 4.360E+06 5.833E+06 5.324E+06 4.760E+06 4.361E+06 3.718E+06 3.271E+06 2.801E+06 2.524E+06 2.346E+06 2.187E+06 1.975E+06

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP 4.573E+08 2.690E+08 7.976E+07 3.467E+07 2.156E+07 1.037E+07 9.776E+06 6.931E+06 8.273E+06 1.024E+07 9.309E+06 6.658E+06
IN SOIL MOI 4.326E+07 2.027E+07 1.463E+07 1.127E+07 8.233E+06 7.598E+06 6.619E+06 6.529E+06 6.117E+06 5.471E+06 4.776E+06 4.546E+06
IN SOIL AIR 2.348E+07 1.084E+07 7.545E+06 6.056E+06 5.289E+06 4.454E+06 3.919E+06 3.375E+06 3.116E+06 2.912E+06 2.688E+06 2.414E+06

SUBLAYER 2

DIFFUSED UP 9.812E+07 2.350E+08 6.934E+07 2.921E+07 1.729E+07 8.176E+06 7.636E+06 5.479E+06 7.079E+06 8.996E+06 7.980E+06 5.704E+06
IN SOIL MOI 5.690E+07 2.729E+07 1.722E+07 1.234E+07 8.706E+06 7.960E+06 6.936E+06 6.871E+06 6.604E+06 5.916E+06 5.122E+06 4.854E+06
IN SOIL AIR 3.088E+07 1.460E+07 8.884E+06 6.630E+06 5.592E+06 4.666E+06 4.106E+06 3.553E+06 3.364E+06 3.149E+06 2.883E+06 2.578E+06

SUBLAYER 3

DIFFUSED UP 1.938E+08 1.847E+08 5.224E+07 2.143E+07 1.206E+07 5.647E+06 5.249E+06 3.813E+06 5.848E+06 7.425E+06 6.324E+06 4.520E+06
IN SOIL MOI 7.429E+07 3.259E+07 1.918E+07 1.309E+07 9.033E+06 8.209E+06 7.155E+06 7.111E+06 7.025E+06 6.272E+06 5.396E+06 5.097E+06
IN SOIL AIR 4.032E+07 1.743E+07 9.896E+06 7.037E+06 5.803E+06 4.812E+06 4.236E+06 3.676E+06 3.579E+06 3.338E+06 3.038E+06 2.707E+06

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 3.227E+08 1.090E+08 3.033E+07 1.189E+07 6.171E+06 2.882E+06 2.676E+06 1.971E+06 4.682E+06 5.506E+06 4.392E+06 3.142E+06
IN SOIL MOI 9.604E+07 3.561E+07 2.035E+07 1.348E+07 9.200E+06 8.336E+06 7.267E+06 7.235E+06 7.373E+06 6.521E+06 5.586E+06 5.265E+06
IN SOIL AIR 5.212E+07 1.904E+07 1.050E+07 7.246E+06 5.910E+06 4.886E+06 4.302E+06 3.740E+06 3.757E+06 3.471E+06 3.144E+06 2.796E+06

SUBLAYER 2

DIFFUSED UP 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 3.695E+06 3.220E+06 2.259E+06 1.616E+06
IN SOIL MOI 0.000E+00 0.000E+00 0.000E+00 6.623E+05 1.402E+06 2.775E+06 4.138E+06 7.122E+06 7.641E+06 6.650E+06 5.683E+06 5.352E+06
IN SOIL AIR 0.000E+00 0.000E+00 0.000E+00 3.560E+05 9.008E+05 1.627E+06 2.450E+06 3.682E+06 3.893E+06 3.539E+06 3.199E+06 2.842E+06

SUBLAYER 3

IN SOIL MOI 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 8.020E+05 1.419E+06

2.463E+06
IN SOIL AIR 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 4.269E+05 7.988E+05
1.308E+06

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 9.593E-02 5.693E-01 1.056E+00 1.365E+00 1.488E+00 1.451E+00 1.355E+00 1.237E+00 1.127E+00 1.033E+00 9.490E-01
8.685E-01
%SOLUBILITY 1.824E-02 1.082E-01 2.008E-01 2.594E-01 2.829E-01 2.758E-01 2.575E-01 2.352E-01 2.143E-01 1.964E-01 1.804E-01
1.651E-01
ADSORBED 2.643E-01 1.568E+00 2.910E+00 3.759E+00 4.100E+00 3.997E+00 3.732E+00 3.408E+00 3.105E+00 2.846E+00 2.615E+00
2.393E+00
SOIL AIR 2.675E-02 1.635E-01 3.097E-01 4.008E-01 4.344E-01 4.196E-01 3.798E-01 3.405E-01 3.044E-01 2.763E-01 2.542E-01
2.359E-01

SUBLAYER 2

MOISTURE 7.770E-01 2.277E+00 2.963E+00 3.145E+00 3.046E+00 2.825E+00 2.578E+00 2.350E+00 2.144E+00 1.964E+00 1.799E+00
1.646E+00
%SOLUBILITY 1.477E-01 4.330E-01 5.634E-01 5.979E-01 5.792E-01 5.370E-01 4.901E-01 4.467E-01 4.076E-01 3.734E-01 3.420E-01
3.130E-01
ADSORBED 2.141E+00 6.274E+00 8.164E+00 8.664E+00 8.393E+00 7.782E+00 7.102E+00 6.473E+00 5.906E+00 5.411E+00 4.956E+00
4.536E+00
SOIL AIR 2.167E-01 6.541E-01 8.688E-01 9.238E-01 8.891E-01 8.170E-01 7.229E-01 6.467E-01 5.789E-01 5.252E-01 4.818E-01
4.472E-01

SUBLAYER 3

MOISTURE 4.696E+00 6.193E+00 5.651E+00 4.973E+00 4.312E+00 3.809E+00 3.411E+00 3.095E+00 2.837E+00 2.615E+00 2.390E+00
2.180E+00
%SOLUBILITY 8.928E-01 1.177E+00 1.074E+00 9.454E-01 8.198E-01 7.241E-01 6.485E-01 5.884E-01 5.394E-01 4.971E-01 4.545E-01
4.144E-01
ADSORBED 1.294E+01 1.706E+01 1.557E+01 1.370E+01 1.188E+01 1.049E+01 9.397E+00 8.526E+00 7.816E+00 7.204E+00 6.586E+00
6.006E+00
SOIL AIR 1.310E+00 1.779E+00 1.657E+00 1.461E+00 1.259E+00 1.102E+00 9.565E-01 8.518E-01 7.661E-01 6.993E-01 6.403E-01
5.922E-01

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 2.248E+01 1.023E+01 7.118E+00 5.623E+00 4.648E+00 4.056E+00 3.632E+00 3.314E+00 3.114E+00 2.885E+00 2.612E+00
2.369E+00
%SOLUBILITY 4.273E+00 1.945E+00 1.353E+00 1.069E+00 8.836E-01 7.710E-01 6.905E-01 6.301E-01 5.921E-01 5.486E-01 4.966E-01
4.504E-01
SOIL AIR 6.268E+00 2.939E+00 2.087E+00 1.652E+00 1.357E+00 1.173E+00 1.019E+00 9.122E-01 8.410E-01 7.716E-01 6.997E-01
6.436E-01

SUBLAYER 2

MOISTURE 2.957E+01 1.378E+01 8.382E+00 6.156E+00 4.915E+00 4.249E+00 3.806E+00 3.488E+00 3.362E+00 3.120E+00 2.802E+00
2.530E+00
%SOLUBILITY 5.621E+00 2.619E+00 1.593E+00 1.170E+00 9.344E-01 8.078E-01 7.236E-01 6.632E-01 6.392E-01 5.931E-01 5.327E-01
4.810E-01
SOIL AIR 8.245E+00 3.957E+00 2.458E+00 1.808E+00 1.434E+00 1.229E+00 1.067E+00 9.601E-01 9.079E-01 8.343E-01 7.505E-01
6.872E-01

SUBLAYER 3

MOISTURE 3.861E+01 1.645E+01 9.336E+00 6.534E+00 5.100E+00 4.382E+00 3.926E+00 3.610E+00 3.577E+00 3.308E+00 2.952E+00
2.657E+00
%SOLUBILITY 7.339E+00 3.127E+00 1.775E+00 1.242E+00 9.695E-01 8.330E-01 7.464E-01 6.863E-01 6.800E-01 6.288E-01 5.612E-01
5.050E-01
SOIL AIR 1.077E+01 4.724E+00 2.737E+00 1.919E+00 1.488E+00 1.267E+00 1.101E+00 9.935E-01 9.658E-01 8.845E-01 7.906E-01
7.216E-01

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 4.991E+01 1.797E+01 9.903E+00 6.729E+00 5.194E+00 4.450E+00 3.987E+00 3.673E+00 3.754E+00 3.439E+00 3.056E+00
2.744E+00
%SOLUBILITY 9.488E+00 3.417E+00 1.883E+00 1.279E+00 9.874E-01 8.459E-01 7.581E-01 6.982E-01 7.137E-01 6.538E-01 5.809E-01
5.217E-01
SOIL AIR 1.392E+01 5.162E+00 2.904E+00 1.977E+00 1.516E+00 1.287E+00 1.118E+00 1.011E+00 1.014E+00 9.197E-01 8.184E-01
7.454E-01

SUBLAYER 2

MOISTURE 0.000E+00 0.000E+00 0.000E+00 3.305E-01 7.917E-01 1.481E+00 2.270E+00 3.616E+00 3.890E+00 3.507E+00 3.109E+00
2.789E+00
%SOLUBILITY 0.000E+00 0.000E+00 0.000E+00 6.284E-02 1.505E-01 2.816E-01 4.316E-01 6.874E-01 7.396E-01 6.667E-01 5.910E-01
5.303E-01
SOIL AIR 0.000E+00 0.000E+00 0.000E+00 9.710E-02 2.311E-01 4.285E-01 6.367E-01 9.951E-01 1.051E+00 9.378E-01 8.327E-01
7.577E-01

SUBLAYER 3

MOISTURE 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 4.230E-01 7.763E-01
1.284E+00
%SOLUBILITY 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 8.041E-02 1.476E-01
2.440E-01
SOIL AIR 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 1.131E-01 2.079E-01
3.487E-01

POL DEP CM 2.854E+02 2.914E+02 2.978E+02 3.017E+02 3.028E+02 3.076E+02 3.127E+02 3.265E+02 3.414E+02 3.519E+02 3.585E+02
3.693E+02
1 YEAR - 1 ANNUAL SUMMARY REPORT
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-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	4.518E+08
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	4.518E+08

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.835
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.835
TOTAL PRECIPITATION (CM)	73.404
TOTAL INFILTRATION (CM)	73.398
TOTAL EVAPOTRANSPIRATION (CM)	68.967
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.326
TOTAL MOISTURE RETENTION (CM)	0.105
TOTAL YIELD (CM)	4.332

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 4.998E+08

SUBLAYER 2

TOTAL DIFFUSED (UP) 5.922E+08

SUBLAYER 3

TOTAL DIFFUSED (UP) 7.396E+08

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 9.238E+08

SUBLAYER 2

TOTAL DIFFUSED (UP) 5.000E+08

SUBLAYER 3

TOTAL DIFFUSED (UP) 5.031E+08

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 5.054E+08

SUBLAYER 2

TOTAL DIFFUSED (UP) 1.079E+07

SUBLAYER 3

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.050E+00
ADSORBED SOIL (UG/G)	2.892E+00
SOIL AIR (UG/ML)	2.955E-01

SUBLAYER 2

SOIL MOISTURE (UG/ML)	2.293E+00
ADSORBED SOIL (UG/G)	6.317E+00
SOIL AIR (UG/ML)	6.477E-01

SUBLAYER 3

SOIL MOISTURE (UG/ML)	3.847E+00
ADSORBED SOIL (UG/G)	1.060E+01
SOIL AIR (UG/ML)	1.089E+00

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	6.007E+00
SOIL AIR (UG/ML)	1.697E+00

SUBLAYER 2

SOIL MOISTURE (UG/ML)	7.179E+00
SOIL AIR (UG/ML)	2.028E+00

SUBLAYER 3

SOIL MOISTURE (UG/ML)	8.369E+00
SOIL AIR (UG/ML)	2.363E+00

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	9.567E+00
SOIL AIR (UG/ML)	2.699E+00

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.815E+00
SOIL AIR (UG/ML)	4.973E-01

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.069E-01
SOIL AIR (UG/ML)	5.581E-02

MAX. POLL. DEPTH (M)	3.693E+00

**** WARNING (MONTH 3) - PROBLEM IN HYDRO CYCLE: W EQUALS OR EXCEEDS EP
W SET TO EP

1

YEAR - 2 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

PA/MPA (GZ) 0.997 1.001 0.992 1.002 1.009 0.998 1.002 0.999 1.004 1.005 1.005 1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED	3.292E+07	2.990E+07	2.657E+07	2.577E+07	2.863E+07	2.344E+07	2.144E+07	1.667E+07	1.489E+07	1.431E+07	1.398E+07	1.204E+07
IN SOIL MOI	1.375E+06	1.306E+06	1.252E+06	1.125E+06	8.972E+05	8.563E+05	7.517E+05	7.335E+05	6.645E+05	5.886E+05	5.225E+05	5.035E+05
ADS ON SOIL	5.897E+07	5.459E+07	5.059E+07	4.661E+07	4.205E+07	3.794E+07	3.424E+07	3.091E+07	2.808E+07	2.577E+07	2.373E+07	2.178E+07
IN SOIL AIR	7.397E+05	6.957E+05	6.459E+05	6.047E+05	5.763E+05	5.019E+05	4.450E+05	3.792E+05	3.386E+05	3.133E+05	2.941E+05	2.674E+05

SUBLAYER 2

DIFFUSED UP	2.933E+07	2.627E+07	2.297E+07	2.201E+07	2.438E+07	2.002E+07	1.850E+07	1.462E+07	1.332E+07	1.292E+07	1.262E+07	1.086E+07
IN SOIL MOI	2.595E+06	2.446E+06	2.328E+06	2.082E+06	1.660E+06	1.591E+06	1.403E+06	1.384E+06	1.263E+06	1.121E+06	9.932E+05	9.580E+05
ADS ON SOIL	1.113E+08	1.022E+08	9.404E+07	8.624E+07	7.780E+07	7.050E+07	6.392E+07	5.831E+07	5.340E+07	4.908E+07	4.510E+07	4.145E+07
IN SOIL AIR	1.396E+06	1.302E+06	1.201E+06	1.119E+06	1.066E+06	9.326E+05	8.308E+05	7.154E+05	6.437E+05	5.966E+05	5.591E+05	5.088E+05

SUBLAYER 3

DIFFUSED UP	1.997E+07	1.756E+07	1.498E+07	1.416E+07	1.585E+07	1.303E+07	1.224E+07	9.810E+06	9.176E+06	9.132E+06	9.007E+06	7.680E+06
IN SOIL MOI	3.421E+06	3.200E+06	3.022E+06	2.695E+06	2.157E+06	2.071E+06	1.838E+06	1.825E+06	1.682E+06	1.500E+06	1.329E+06	1.279E+06
ADS ON SOIL	1.467E+08	1.337E+08	1.221E+08	1.117E+08	1.011E+08	9.177E+07	8.373E+07	7.691E+07	7.107E+07	6.565E+07	6.033E+07	5.533E+07
IN SOIL AIR	1.840E+06	1.704E+06	1.559E+06	1.449E+06	1.386E+06	1.214E+06	1.088E+06	9.435E+05	8.567E+05	7.982E+05	7.479E+05	6.792E+05

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP	5.859E+06	4.454E+06	3.246E+06	3.452E+06	4.839E+06	3.635E+06	4.085E+06	3.227E+06	3.536E+06	3.783E+06	3.676E+06	2.798E+06
IN SOIL MOI	4.157E+06	3.841E+06	3.594E+06	3.224E+06	2.605E+06	2.511E+06	2.251E+06	2.253E+06	2.101E+06	1.881E+06	1.661E+06	1.591E+06
IN SOIL AIR	2.236E+06	2.046E+06	1.854E+06	1.732E+06	1.674E+06	1.472E+06	1.332E+06	1.165E+06	1.070E+06	1.001E+06	9.351E+05	8.451E+05

SUBLAYER 2

DIFFUSED UP	4.980E+06	3.772E+06	2.731E+06	2.922E+06	4.097E+06	3.138E+06	3.522E+06	2.848E+06	3.144E+06	3.379E+06	3.277E+06	2.510E+06
IN SOIL MOI	4.416E+06	4.043E+06	3.757E+06	3.387E+06	2.759E+06	2.666E+06	2.410E+06	2.430E+06	2.288E+06	2.055E+06	1.810E+06	1.727E+06
IN SOIL AIR	2.376E+06	2.153E+06	1.938E+06	1.820E+06	1.773E+06	1.563E+06	1.427E+06	1.256E+06	1.166E+06	1.094E+06	1.019E+06	9.173E+05

SUBLAYER 3

DIFFUSED UP	3.922E+06	2.958E+06	2.140E+06	2.377E+06	3.321E+06	2.584E+06	2.898E+06	2.390E+06	2.657E+06	2.866E+06	2.773E+06	2.133E+06
IN SOIL MOI	4.619E+06	4.199E+06	3.888E+06	3.520E+06	2.886E+06	2.794E+06	2.542E+06	2.579E+06	2.448E+06	2.203E+06	1.935E+06	1.842E+06
IN SOIL AIR	2.485E+06	2.236E+06	2.006E+06	1.892E+06	1.854E+06	1.638E+06	1.505E+06	1.333E+06	1.247E+06	1.173E+06	1.089E+06	9.782E+05

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP	2.713E+06	2.037E+06	1.504E+06	1.819E+06	2.517E+06	1.982E+06	2.222E+06	1.864E+06	2.085E+06	2.254E+06	2.174E+06
1.678E+06											
IN SOIL MOI	4.760E+06	4.305E+06	3.992E+06	3.621E+06	2.984E+06	2.892E+06	2.645E+06	2.695E+06	2.574E+06	2.320E+06	2.034E+06
1.932E+06											
IN SOIL AIR	2.560E+06	2.292E+06	2.059E+06	1.946E+06	1.917E+06	1.695E+06	1.566E+06	1.393E+06	1.312E+06	1.235E+06	1.145E+06
1.026E+06											

SUBLAYER 2

DIFFUSED UP	1.390E+06	1.039E+06	8.605E+05	1.240E+06	1.702E+06	1.344E+06	1.512E+06	1.281E+06	1.441E+06	1.558E+06	1.499E+06
1.159E+06											
IN SOIL MOI	4.831E+06	4.359E+06	4.072E+06	3.689E+06	3.050E+06	2.958E+06	2.715E+06	2.774E+06	2.662E+06	2.401E+06	2.102E+06
1.994E+06											
IN SOIL AIR	2.599E+06	2.321E+06	2.101E+06	1.983E+06	1.959E+06	1.734E+06	1.607E+06	1.434E+06	1.356E+06	1.278E+06	1.183E+06
1.059E+06											

SUBLAYER 3

DIFFUSED UP	0.000E+00	0.000E+00	2.567E+05	6.313E+05	8.581E+05	6.788E+05	7.652E+05	6.545E+05	7.400E+05	7.984E+05	7.651E+05
5.930E+05											
IN SOIL MOI	3.170E+06	3.712E+06	4.121E+06	3.724E+06	3.083E+06	2.991E+06	2.75[illegible]+06	2.815E+06	2.707E+06	2.442E+06	2.136E+06
2.026E+06											
IN SOIL AIR	1.705E+06	1.977E+06	2.126E+06	2.001E+06	1.980E+06	1.753E+06	1.628E+06	1.456E+06	1.379E+06	1.300E+06	1.203E+06
1.076E+06											
GWR. RUNOFF	0.000E+00	0.000E+00	2.302E+04	3.558E+05	0.000E+00	0.000E+00	0.000E+00	4.929E+05	5.244E+05	2.113E+05	0.000E+00
2.206E+05											

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

---

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE	7.991E-01	7.398E-01	6.855E-01	6.316E-01	5.698E-01	5.142E-01	4.640E-01	4.189E-01	3.806E-01	3.492E-01	3.215E-01
2.952E-01											
%SOLUBILITY	1.519E-01	1.406E-01	1.303E-01	1.201E-01	1.083E-01	9.776E-02	8.822E-02	7.965E-02	7.236E-02	6.639E-02	6.113E-02
5.612E-02											
ADSORBED	2.202E+00	2.038E+00	1.889E+00	1.740E+00	1.570E+00	1.417E+00	1.278E+00	1.154E+00	1.049E+00	9.621E-01	8.859E-01
8.133E-01											
SOIL AIR	2.228E-01	2.125E-01	2.010E-01	1.855E-01	1.663E-01	1.487E-01	1.301E-01	1.153E-01	1.028E-01	9.339E-02	8.612E-02
8.019E-02											

SUBLAYER 2

MOISTURE	1.508E+00	1.385E+00	1.274E+00	1.169E+00	1.054E+00	9.554E-01	8.663E-01	7.903E-01	7.237E-01	6.651E-01	6.112E-01
5.617E-01											
%SOLUBILITY	2.867E-01	2.633E-01	2.423E-01	2.222E-01	2.005E-01	1.816E-01	1.647E-01	1.502E-01	1.376E-01	1.264E-01	1.162E-01
1.068E-01											
ADSORBED	4.154E+00	3.816E+00	3.511E+00	3.220E+00	2.905E+00	2.632E+00	2.387E+00	2.177E+00	1.994E+00	1.832E+00	1.684E+00
1.548E+00											
SOIL AIR	4.205E-01	3.978E-01	3.737E-01	3.433E-01	3.077E-01	2.764E-01	2.429E-01	2.175E-01	1.954E-01	1.779E-01	1.637E-01
1.526E-01											

SUBLAYER 3

MOISTURE	1.988E+00	1.812E+00	1.655E+00	1.513E+00	1.370E+00	1.244E+00	1.135E+00	1.042E+00	9.632E-01	8.897E-01	8.176E-01
7.498E-01											
%SOLUBILITY	3.780E-01	3.445E-01	3.146E-01	2.877E-01	2.605E-01	2.365E-01	2.157E-01	1.981E-01	1.831E-01	1.692E-01	1.554E-01
1.426E-01											
ADSORBED	5.477E+00	4.992E+00	4.558E+00	4.169E+00	3.775E+00	3.426E+00	3.126E+00	2.871E+00	2.654E+00	2.451E+00	2.253E+00
2.066E+00											
SOIL AIR	5.544E-01	5.204E-01	4.851E-01	4.445E-01	3.999E-01	3.597E-01	3.182E-01	2.869E-01	2.601E-01	2.379E-01	2.190E-01
2.037E-01											

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	2.147E+00	1.934E+00	1.749E+00	1.609E+00	1.471E+00	1.340E+00	1.235E+00	1.144E+00	1.070E+00	9.920E-01	9.087E-01
8.294E-01											
%SOLUBILITY	4.082E-01	3.676E-01	3.325E-01	3.058E-01	2.796E-01	2.548E-01	2.348E-01	2.175E-01	2.033E-01	1.886E-01	1.728E-01
1.577E-01											
SOIL AIR	5.987E-01	5.554E-01	5.129E-01	4.726E-01	4.293E-01	3.876E-01	3.463E-01	3.149E-01	2.888E-01	2.653E-01	2.434E-01
2.253E-01											

SUBLAYER 2

MOISTURE	2.281E+00	2.035E+00	1.828E+00	1.690E+00	1.558E+00	1.423E+00	1.322E+00	1.234E+00	1.165E+00	1.084E+00	9.900E-01
9.001E-01											
%SOLUBILITY	4.337E-01	3.868E-01	3.476E-01	3.213E-01	2.962E-01	2.706E-01	2.514E-01	2.345E-01	2.215E-01	2.061E-01	1.882E-01
1.711E-01											
SOIL AIR	6.362E-01	5.845E-01	5.361E-01	4.965E-01	4.547E-01	4.116E-01	3.708E-01	3.396E-01	3.146E-01	2.899E-01	2.652E-01
2.445E-01											

SUBLAYER 3

MOISTURE 2.386E+00 2.113E+00 1.892E+00 1.756E+00 1.629E+00 1.491E+00 1.395E+00 1.309E+00 1.246E+00 1.162E+00 1.059E+00 9.600E-01
%SOLUBILITY 4.537E-01 4.018E-01 3.598E-01 3.339E-01 3.098E-01 2.835E-01 2.652E-01 2.489E-01 2.370E-01 2.209E-01 2.013E-01 1.825E-01
SOIL AIR 6.654E-01 6.070E-01 5.549E-01 5.160E-01 4.756E-01 4.314E-01 3.912E-01 3.603E-01 3.366E-01 3.108E-01 2.836E-01 2.608E-01

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 2.459E+00 2.167E+00 1.943E+00 1.807E+00 1.684E+00 1.544E+00 1.451E+00 1.368E+00 1.311E+00 1.224E+00 1.113E+00 1.007E+00
%SOLUBILITY 4.674E-01 4.120E-01 3.693E-01 3.435E-01 3.202E-01 2.934E-01 2.759E-01 2.601E-01 2.492E-01 2.326E-01 2.115E-01 1.914E-01
SOIL AIR 6.856E-01 6.224E-01 5.696E-01 5.308E-01 4.916E-01 4.465E-01 4.070E-01 3.765E-01 3.539E-01 3.272E-01 2.980E-01 2.735E-01

SUBLAYER 2

MOISTURE 2.496E+00 2.194E+00 1.982E+00 1.841E+00 1.722E+00 1.579E+00 1.490E+00 1.408E+00 1.355E+00 1.266E+00 1.150E+00 1.039E+00
%SOLUBILITY 4.745E-01 4.171E-01 3.767E-01 3.500E-01 3.273E-01 3.002E-01 2.832E-01 2.678E-01 2.576E-01 2.407E-01 2.186E-01 1.976E-01
SOIL AIR 6.959E-01 6.302E-01 5.810E-01 5.408E-01 5.025E-01 4.567E-01 4.177E-01 3.876E-01 3.659E-01 3.386E-01 3.079E-01 2.823E-01

SUBLAYER 3

MOISTURE 1.638E+00 1.868E+00 2.006E+00 1.858E+00 1.740E+00 1.597E+00 1.509E+00 1.429E+00 1.378E+00 1.288E+00 1.169E+00 1.056E+00
%SOLUBILITY 3.113E-01 3.552E-01 3.813E-01 3.533E-01 3.309E-01 3.036E-01 2.869E-01 2.717E-01 2.620E-01 2.449E-01 2.222E-01 2.007E-01
SOIL AIR 4.567E-01 5.367E-01 5.881E-01 5.459E-01 5.080E-01 4.619E-01 4.231E-01 3.934E-01 3.721E-01 3.445E-01 3.130E-01 2.868E-01

POL DEP CM 3.776E+02 3.838E+02 3.902E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
1 YEAR - 2 ANNUAL SUMMARY REPORT
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-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 2.605E+08

SUBLAYER 2

TOTAL DIFFUSED (UP) 2.278E+08

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.526E+08

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 4.659E+07

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        SUBLAYER  2

            TOTAL DIFFUSED (UP)                 4.032E+07

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                 3.302E+07

    SOIL ZONE 3:

        SUBLAYER  1

        SUBLAYER  2

        SUBLAYER  3

    LOWER SOIL ZONE:

        SUBLAYER  1

            TOTAL DIFFUSED (UP)                 2.485E+07

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                 1.603E+07

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                 6.741E+06
            TOTAL IN GROUNDWATER RUNOFF         1.828E+06
1                   -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                    ---------------------------------------------------------------------------------

    UPPER SOIL ZONE:

        SUBLAYER  1

                                SOIL MOISTURE (UG/ML)  5.141E-01
                                ADSORBED SOIL (UG/G)   1.416E+00
                                SOIL AIR (UG/ML)       1.454E-01

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)  9.637E-01
                                ADSORBED SOIL (UG/G)   2.655E+00
                                SOIL AIR (UG/ML)       2.724E-01

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)  1.265E+00
                                ADSORBED SOIL (UG/G)   3.485E+00
                                SOIL AIR (UG/ML)       3.575E-01

    SOIL ZONE 2:

        SUBLAYER  1

                                SOIL MOISTURE (UG/ML)  1.369E+00
                                SOIL AIR (UG/ML)       3.867E-01

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)  1.459E+00
                                SOIL AIR (UG/ML)       4.120E-01

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)  1.533E+00
                                SOIL AIR (UG/ML)       4.328E-01

    SOIL ZONE 3:

    LOWER SOIL ZONE:

        SUBLAYER  1

                                SOIL MOISTURE (UG/ML)  1.590E+00
                                SOIL AIR (UG/ML)       4.486E-01

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)  1.627E+00
                                SOIL AIR (UG/ML)       4.589E-01

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)  1.545E+00
                                SOIL AIR (UG/ML)       4.358E-01

                                MAX. POLL. DEPTH (M)   3.900E+00
1
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YEAR - 3 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	1.121E+07	1.023E+07	9.128E+06	8.892E+06	9.923E+06	8.156E+06	7.476E+06	5.822E+06	5.204E+06	5.004E+06	4.892E+06	4.212E+06
IN SOIL MOI	4.692E+05	4.478E+05	4.311E+05	3.891E+05	3.117E+05	2.983E+05	2.624E+05	2.563E+05	2.323E+05	2.059E+05	1.828E+05	1.762E+05
ADS ON SOIL	2.012E+07	1.871E+07	1.742E+07	1.612E+07	1.461E+07	1.322E+07	1.195E+07	1.080E+07	9.819E+06	9.014E+06	8.302E+06	7.622E+06
IN SOIL AIR	2.524E+05	2.384E+05	2.224E+05	2.091E+05	2.002E+05	1.749E+05	1.553E+05	1.325E+05	1.184E+05	1.096E+05	1.029E+05	9.357E+04

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.008E+07	9.077E+06	7.977E+06	7.676E+06	8.523E+06	7.008E+06	6.477E+06	5.118E+06	4.662E+06	4.524E+06	4.419E+06	3.800E+06
IN SOIL MOI	8.895E+05	8.425E+05	8.054E+05	7.232E+05	5.787E+05	5.556E+05	4.905E+05	4.839E+05	4.420E+05	3.922E+05	3.476E+05	3.353E+05
ADS ON SOIL	3.814E+07	3.520E+07	3.254E+07	2.996E+07	2.712E+07	2.462E+07	2.234E+07	2.040E+07	1.868E+07	1.717E+07	1.578E+07	1.451E+07
IN SOIL AIR	4.785E+05	4.486E+05	4.155E+05	3.887E+05	3.717E+05	3.256E+05	2.904E+05	2.502E+05	2.252E+05	2.088E+05	1.957E+05	1.781E+05

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	7.072E+06	6.266E+06	5.373E+06	5.084E+06	5.651E+06	4.616E+06	4.318E+06	3.450E+06	3.222E+06	3.203E+06	3.157E+06	2.691E+06
IN SOIL MOI	1.183E+06	1.112E+06	1.055E+06	9.430E+05	7.553E+05	7.252E+05	6.436E+05	6.390E+05	5.887E+05	5.250E+05	4.651E+05	4.477E+05
ADS ON SOIL	5.074E+07	4.648E+07	4.262E+07	3.906E+07	3.540E+07	3.213E+07	2.932E+07	2.693E+07	2.488E+07	2.298E+07	2.112E+07	1.937E+07
IN SOIL AIR	6.364E+05	5.923E+05	5.442E+05	5.068E+05	4.852E+05	4.251E+05	3.811E+05	3.304E+05	3.000E+05	2.794E+05	2.618E+05	2.378E+05

SOIL ZONE 2:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	2.511E+06	1.975E+06	1.474E+06	1.429E+06	1.824E+06	1.327E+06	1.459E+06	1.142E+06	1.245E+06	1.329E+06	1.290E+06	9.816E+05

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 IN SOIL MOI 1.463E+06 1.358E+06 1.273E+06 1.136E+06 9.158E+05 8.810E+05 7.890E+05 7.895E+05 7.359E+05 6.587E+05 5.817E+05
5.572E+05
 IN SOIL AIR 7.872E+05 7.232E+05 6.569E+05 6.108E+05 5.883E+05 5.164E+05 4.671E+05 4.082E+05 3.749E+05 3.506E+05 3.274E+05
2.959E+05

          SUBLAYER  2

 DIFFUSED UP 2.236E+06 1.753E+06 1.299E+06 1.230E+06 1.557E+06 1.151E+06 1.260E+06 1.009E+06 1.108E+06 1.188E+06 1.151E+06
8.805E+05
 IN SOIL MOI 1.580E+06 1.452E+06 1.348E+06 1.202E+06 9.731E+05 9.372E+05 8.456E+05 8.520E+05 8.019E+05 7.199E+05 6.338E+05
6.048E+05
 IN SOIL AIR 8.501E+05 7.730E+05 6.956E+05 6.459E+05 6.251E+05 5.494E+05 5.007E+05 4.405E+05 4.085E+05 3.832E+05 3.568E+05
3.212E+05

          SUBLAYER  3

 DIFFUSED UP 1.890E+06 1.477E+06 1.088E+06 1.012E+06 1.271E+06 9.506E+05 1.039E+06 8.479E+05 9.367E+05 1.008E+06 9.736E+05
7.486E+05
 IN SOIL MOI 1.679E+06 1.530E+06 1.411E+06 1.256E+06 1.021E+06 9.835E+05 8.928E+05 9.045E+05 8.581E+05 7.720E+05 6.779E+05
6.451E+05
 IN SOIL AIR 9.031E+05 8.145E+05 7.277E+05 6.748E+05 6.556E+05 5.765E+05 5.286E+05 4.676E+05 4.372E+05 4.109E+05 3.816E+05
3.426E+05

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

 DIFFUSED UP 1.481E+06 1.153E+06 8.454E+05 7.756E+05 9.688E+05 7.309E+05 7.976E+05 6.617E+05 7.353E+05 7.926E+05 7.633E+05
5.890E+05
 IN SOIL MOI 1.756E+06 1.590E+06 1.458E+06 1.297E+06 1.057E+06 1.019E+06 9.293E+05 9.455E+05 9.025E+05 8.130E+05 7.125E+05
6.766E+05
 IN SOIL AIR 9.443E+05 8.466E+05 7.523E+05 6.971E+05 6.790E+05 5.973E+05 5.502E+05 4.888E+05 4.598E+05 4.327E+05 4.011E+05
3.593E+05

          SUBLAYER  2

 DIFFUSED UP 1.019E+06 7.906E+05 5.781E+05 5.257E+05 6.574E+05 4.964E+05 5.430E+05 4.549E+05 5.084E+05 5.479E+05 5.263E+05
4.068E+05
 IN SOIL MOI 1.808E+06 1.631E+06 1.491E+06 1.325E+06 1.082E+06 1.043E+06 9.542E+05 9.737E+05 9.333E+05 8.414E+05 7.363E+05
6.984E+05
 IN SOIL AIR 9.727E+05 8.685E+05 7.691E+05 7.121E+05 6.949E+05 6.114E+05 5.649E+05 5.034E+05 4.755E+05 4.479E+05 4.145E+05
3.709E+05

          SUBLAYER  3

 DIFFUSED UP 5.203E+05 4.021E+05 2.936E+05 2.657E+05 3.319E+05 2.508E+05 2.750E+05 2.325E+05 2.611E+05 2.808E+05 2.687E+05
2.081E+05
 IN SOIL MOI 1.835E+06 1.652E+06 1.508E+06 1.339E+06 1.094E+06 1.055E+06 9.668E+05 9.882E+05 9.492E+05 8.560E+05 7.484E+05
7.095E+05
 IN SOIL AIR 9.871E+05 8.796E+05 7.777E+05 7.197E+05 7.029E+05 6.186E+05 5.724E+05 5.109E+05 4.836E+05 4.556E+05 4.213E+05
3.768E+05
 GWR. RUNOFF 1.714E+05 1.930E+05 2.652E+05 1.291E+05 0.000E+00 0.000E+00 0.000E+00 1.731E+05 1.840E+05 7.406E+04 0.000E+00
7.728E+04


     -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
     ----------------------------------------------------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

 MOISTURE     2.727E-01 2.536E-01 2.360E-01 2.184E-01 1.979E-01 1.791E-01 1.620E-01 1.464E-01 1.331E-01 1.222E-01 1.125E-01
1.033E-01
 %SOLUBILITY 5.184E-02 4.821E-02 4.487E-02 4.153E-02 3.763E-02 3.406E-02 3.079E-02 2.783E-02 2.530E-02 2.322E-02 2.139E-02
1.964E-02
 ADSORBED     7.513E-01 6.986E-01 6.502E-01 6.018E-01 5.453E-01 4.935E-01 4.462E-01 4.033E-01 3.666E-01 3.365E-01 3.099E-01
2.846E-01
 SOIL AIR     7.604E-02 7.283E-02 6.920E-02 6.417E-02 5.777E-02 5.182E-02 4.542E-02 4.029E-02 3.593E-02 3.267E-02 3.013E-02
2.806E-02

          SUBLAYER  2

 MOISTURE     5.169E-01 4.771E-01 4.410E-01 4.060E-01 3.675E-01 3.336E-01 3.028E-01 2.764E-01 2.532E-01 2.327E-01 2.139E-01
1.966E-01
 %SOLUBILITY 9.827E-02 9.069E-02 8.383E-02 7.719E-02 6.987E-02 6.342E-02 5.757E-02 5.255E-02 4.813E-02 4.425E-02 4.067E-02
3.738E-02
 ADSORBED     1.424E+00 1.314E+00 1.215E+00 1.119E+00 1.013E+00 9.191E-01 8.342E-01 7.615E-01 6.975E-01 6.412E-01 5.893E-01
5.416E-01
 SOIL AIR     1.441E-01 1.370E-01 1.293E-01 1.193E-01 1.073E-01 9.650E-02 8.491E-02 7.607E-02 6.837E-02 6.224E-02 5.729E-02
5.340E-02

          SUBLAYER  3
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MOISTURE      6.876E-01 6.298E-01 5.775E-01 5.294E-01 4.797E-01 4.355E-01 3.973E-01 3.649E-01 3.372E-01 3.115E-01 2.862E-01
2.625E-01
%SOLUBILITY 1.307E-01 1.197E-01 1.098E-01 1.006E-01 9.120E-02 8.279E-02 7.554E-02 6.938E-02 6.411E-02 5.922E-02 5.442E-02
4.990E-02
ADSORBED      1.894E+00 1.735E+00 1.591E+00 1.458E+00 1.322E+00 1.200E+00 1.095E+00 1.005E+00 9.290E-01 8.582E-01 7.886E-01
7.232E-01
SOIL AIR      1.917E-01 1.809E-01 1.693E-01 1.555E-01 1.400E-01 1.260E-01 1.114E-01 1.004E-01 9.106E-02 8.330E-02 7.667E-02
7.130E-02

      SOIL ZONE 2:

            SUBLAYER  1

MOISTURE      7.560E-01 6.836E-01 6.197E-01 5.671E-01 5.170E-01 4.702E-01 4.329E-01 4.008E-01 3.747E-01 3.474E-01 3.182E-01
2.904E-01
%SOLUBILITY 1.437E-01 1.300E-01 1.178E-01 1.078E-01 9.829E-02 8.940E-02 8.231E-02 7.620E-02 7.123E-02 6.605E-02 6.049E-02
5.520E-02
SOIL AIR      2.108E-01 1.964E-01 1.817E-01 1.666E-01 1.509E-01 1.360E-01 1.214E-01 1.103E-01 1.012E-01 9.291E-02 8.523E-02
7.888E-02

            SUBLAYER  2

MOISTURE      8.164E-01 7.307E-01 6.562E-01 5.998E-01 5.494E-01 5.003E-01 4.640E-01 4.325E-01 4.083E-01 3.797E-01 3.467E-01
3.152E-01
%SOLUBILITY 1.552E-01 1.389E-01 1.248E-01 1.140E-01 1.044E-01 9.511E-02 8.822E-02 8.223E-02 7.762E-02 7.218E-02 6.591E-02
5.992E-02
SOIL AIR      2.277E-01 2.099E-01 1.924E-01 1.762E-01 1.603E-01 1.447E-01 1.301E-01 1.190E-01 1.102E-01 1.015E-01 9.286E-02
8.562E-02

            SUBLAYER  3

MOISTURE      8.672E-01 7.699E-01 6.865E-01 6.266E-01 5.761E-01 5.250E-01 4.899E-01 4.592E-01 4.369E-01 4.071E-01 3.708E-01
3.362E-01
%SOLUBILITY 1.649E-01 1.464E-01 1.305E-01 1.191E-01 1.095E-01 9.980E-02 9.314E-02 8.729E-02 8.306E-02 7.740E-02 7.050E-02
6.391E-02
SOIL AIR      2.418E-01 2.211E-01 2.013E-01 1.841E-01 1.682E-01 1.518E-01 1.374E-01 1.264E-01 1.180E-01 1.089E-01 9.933E-02
9.132E-02

      SOIL ZONE 3:

      LOWER SOIL ZONE:

            SUBLAYER  1

MOISTURE      9.069E-01 8.002E-01 7.098E-01 6.472E-01 5.967E-01 5.439E-01 5.100E-01 4.800E-01 4.595E-01 4.288E-01 3.898E-01
3.526E-01
%SOLUBILITY 1.724E-01 1.521E-01 1.349E-01 1.231E-01 1.134E-01 1.034E-01 9.695E-02 9.125E-02 8.736E-02 8.152E-02 7.410E-02
6.704E-02
SOIL AIR      2.529E-01 2.298E-01 2.081E-01 1.901E-01 1.742E-01 1.573E-01 1.430E-01 1.321E-01 1.241E-01 1.147E-01 1.044E-01
9.579E-02

            SUBLAYER  2

MOISTURE      9.341E-01 8.209E-01 7.256E-01 6.612E-01 6.107E-01 5.568E-01 5.236E-01 4.943E-01 4.752E-01 4.438E-01 4.028E-01
3.640E-01
%SOLUBILITY 1.776E-01 1.561E-01 1.379E-01 1.257E-01 1.161E-01 1.059E-01 9.955E-02 9.398E-02 9.034E-02 8.437E-02 7.657E-02
6.920E-02
SOIL AIR      2.605E-01 2.358E-01 2.128E-01 1.942E-01 1.782E-01 1.610E-01 1.468E-01 1.360E-01 1.283E-01 1.187E-01 1.079E-01
9.887E-02

            SUBLAYER  3

MOISTURE      9.480E-01 8.314E-01 7.336E-01 6.683E-01 6.177E-01 5.633E-01 5.305E-01 5.017E-01 4.833E-01 4.514E-01 4.094E-01
3.698E-01
%SOLUBILITY 1.802E-01 1.581E-01 1.395E-01 1.271E-01 1.174E-01 1.071E-01 1.009E-01 9.537E-02 9.187E-02 8.583E-02 7.783E-02
7.030E-02
SOIL AIR      2.643E-01 2.388E-01 2.151E-01 1.963E-01 1.803E-01 1.629E-01 1.488E-01 1.381E-01 1.305E-01 1.207E-01 1.097E-01
1.004E-01

POL DEP CM    3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                                YEAR -   3 ANNUAL SUMMARY REPORT
                                 ==========================

        -- TOTAL INPUTS (UG) --

UPPER SOIL ZONE              0.000E+00
SOIL ZONE 2                  0.000E+00
SOIL ZONE 3                  0.000E+00
LOWER SOIL ZONE              0.000E+00

        -- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)          11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)    11.844
TOTAL PRECIPITATION (CM)                  73.466
TOTAL INFILTRATION (CM)                   73.460
TOTAL EVAPOTRANSPIRATION (CM)             69.004
TOTAL SURFACE RUNOFF (CM)                  0.000
TOTAL GRW RUNOFF (CM)                      4.453
TOTAL MOISTURE RETENTION (CM)              0.003
TOTAL YIELD (CM)                           4.460
```

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 9.015E+07

SUBLAYER 2

TOTAL DIFFUSED (UP) 7.934E+07

SUBLAYER 3

TOTAL DIFFUSED (UP) 5.410E+07

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 1.799E+07

SUBLAYER 2

TOTAL DIFFUSED (UP) 1.582E+07

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.324E+07

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 1.029E+07

SUBLAYER 2

TOTAL DIFFUSED (UP) 7.055E+06

SUBLAYER 3

TOTAL DIFFUSED (UP) 3.591E+06
TOTAL IN GROUNDWATER RUNOFF 1.267E+06

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.781E-01
ADSORBED SOIL (UG/G) 4.907E-01
SOIL AIR (UG/ML) 5.036E-02

SUBLAYER 2

SOIL MOISTURE (UG/ML) 3.348E-01
ADSORBED SOIL (UG/G) 9.224E-01
SOIL AIR (UG/ML) 9.465E-02

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.416E-01
ADSORBED SOIL (UG/G) 1.217E+00
SOIL AIR (UG/ML) 1.248E-01

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.815E-01
SOIL AIR (UG/ML) 1.360E-01

SUBLAYER 2

SOIL MOISTURE (UG/ML) 5.166E-01

SOIL AIR (UG/ML) 1.459E-01

SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.460E-01
SOIL AIR (UG/ML) 1.541E-01

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 5.688E-01
SOIL AIR (UG/ML) 1.605E-01

SUBLAYER 2

SOIL MOISTURE (UG/ML) 5.844E-01
SOIL AIR (UG/ML) 1.649E-01

SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.924E-01
SOIL AIR (UG/ML) 1.672E-01

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR - 4 MONTHLY RESULTS (OUTPUT)
======== ==========

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	3.923E+06	3.579E+06	3.195E+06	3.112E+06	3.473E+06	2.854E+06	2.617E+06	2.038E+06	1.821E+06	1.751E+06	1.712E+06	1.474E+06
IN SOIL MOI	1.642E+05	1.567E+05	1.509E+05	1.362E+05	1.091E+05	1.044E+05	9.182E+04	8.970E+04	8.131E+04	7.205E+04	6.398E+04	6.166E+04
ADS ON SOIL	7.042E+06	6.549E+06	6.096E+06	5.642E+06	5.112E+06	4.627E+06	4.183E+06	3.780E+06	3.436E+06	3.155E+06	2.905E+06	2.668E+06
IN SOIL AIR	8.834E+04	8.346E+04	7.784E+04	7.319E+04	7.007E+04	6.120E+04	5.436E+04	4.637E+04	4.142E+04	3.835E+04	3.601E+04	

3.274E+04

SUBLAYER 2

DIFFUSED UP 3.527E+06 3.177E+06 2.792E+06 2.686E+06 2.983E+06 2.452E+06 2.266E+06 1.791E+06 1.631E+06 1.583E+06 1.546E+06
1.330E+06
IN SOIL MOI 3.113E+05 2.949E+05 2.819E+05 2.531E+05 2.025E+05 1.944E+05 1.717E+05 1.693E+05 1.547E+05 1.373E+05 1.216E+05
1.173E+05
ADS ON SOIL 1.335E+07 1.232E+07 1.139E+07 1.049E+07 9.491E+06 8.615E+06 7.819E+06 7.137E+06 6.538E+06 6.009E+06 5.523E+06
5.076E+06
IN SOIL AIR 1.675E+05 1.570E+05 1.454E+05 1.360E+05 1.301E+05 1.140E+05 1.016E+05 8.755E+04 7.881E+04 7.306E+04 6.847E+04
6.231E+04

SUBLAYER 3

DIFFUSED UP 2.477E+06 2.194E+06 1.881E+06 1.780E+06 1.978E+06 1.615E+06 1.511E+06 1.207E+06 1.127E+06 1.120E+06 1.104E+06
9.410E+05
IN SOIL MOI 4.142E+05 3.893E+05 3.692E+05 3.300E+05 2.643E+05 2.538E+05 2.252E+05 2.236E+05 2.060E+05 1.837E+05 1.627E+05
1.566E+05
ADS ON SOIL 1.776E+07 1.627E+07 1.492E+07 1.367E+07 1.239E+07 1.125E+07 1.026E+07 9.423E+06 8.707E+06 8.042E+06 7.390E+06
6.777E+06
IN SOIL AIR 2.228E+05 2.073E+05 1.905E+05 1.774E+05 1.698E+05 1.488E+05 1.333E+05 1.156E+05 1.050E+05 9.777E+04 9.160E+04
8.319E+04

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP 8.801E+05 6.922E+05 5.163E+05 5.002E+05 6.385E+05 4.646E+05 5.105E+05 3.998E+05 4.357E+05 4.650E+05 4.514E+05
3.432E+05
IN SOIL MOI 5.123E+05 4.754E+05 4.457E+05 3.978E+05 3.205E+05 3.083E+05 2.761E+05 2.763E+05 2.575E+05 2.305E+05 2.035E+05
1.949E+05
IN SOIL AIR 2.756E+05 2.532E+05 2.299E+05 2.138E+05 2.059E+05 1.807E+05 1.635E+05 1.428E+05 1.312E+05 1.227E+05 1.146E+05
1.035E+05

SUBLAYER 2

DIFFUSED UP 7.840E+05 6.143E+05 4.551E+05 4.308E+05 5.452E+05 4.027E+05 4.411E+05 3.532E+05 3.876E+05 4.155E+05 4.025E+05
3.079E+05
IN SOIL MOI 5.533E+05 5.082E+05 4.720E+05 4.206E+05 3.406E+05 3.280E+05 2.959E+05 2.981E+05 2.806E+05 2.519E+05 2.217E+05
2.116E+05
IN SOIL AIR 2.976E+05 2.706E+05 2.435E+05 2.261E+05 2.188E+05 1.923E+05 1.752E+05 1.541E+05 1.429E+05 1.341E+05 1.248E+05
1.124E+05

SUBLAYER 3

DIFFUSED UP 6.628E+05 5.174E+05 3.811E+05 3.543E+05 4.451E+05 3.327E+05 3.635E+05 2.967E+05 3.277E+05 3.525E+05 3.406E+05
2.618E+05
IN SOIL MOI 5.878E+05 5.355E+05 4.938E+05 4.395E+05 3.572E+05 3.442E+05 3.124E+05 3.165E+05 3.002E+05 2.701E+05 2.372E+05
2.257E+05
IN SOIL AIR 3.162E+05 2.851E+05 2.547E+05 2.362E+05 2.294E+05 2.017E+05 1.850E+05 1.636E+05 1.530E+05 1.438E+05 1.335E+05
1.198E+05

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 5.194E+05 4.039E+05 2.962E+05 2.716E+05 3.392E+05 2.558E+05 2.791E+05 2.315E+05 2.573E+05 2.773E+05 2.670E+05
2.060E+05
IN SOIL MOI 6.147E+05 5.566E+05 5.105E+05 4.540E+05 3.699E+05 3.566E+05 3.252E+05 3.308E+05 3.158E+05 2.844E+05 2.493E+05
2.367E+05
IN SOIL AIR 3.307E+05 2.964E+05 2.634E+05 2.440E+05 2.376E+05 2.090E+05 1.925E+05 1.710E+05 1.609E+05 1.514E+05 1.403E+05
1.257E+05

SUBLAYER 2

DIFFUSED UP 3.576E+05 2.771E+05 2.025E+05 1.841E+05 2.302E+05 1.737E+05 1.900E+05 1.592E+05 1.779E+05 1.917E+05 1.841E+05
1.423E+05
IN SOIL MOI 6.332E+05 5.710E+05 5.219E+05 4.638E+05 3.786E+05 3.650E+05 3.339E+05 3.407E+05 3.265E+05 2.944E+05 2.576E+05
2.443E+05
IN SOIL AIR 3.406E+05 3.041E+05 2.692E+05 2.493E+05 2.432E+05 2.140E+05 1.977E+05 1.761E+05 1.664E+05 1.567E+05 1.450E+05
1.297E+05

SUBLAYER 3

DIFFUSED UP 1.825E+05 1.409E+05 1.029E+05 9.305E+04 1.162E+05 8.779E+04 9.624E+04 8.134E+04 9.137E+04 9.824E+04 9.398E+04
7.278E+04
IN SOIL MOI 6.426E+05 5.783E+05 5.277E+05 4.687E+05 3.829E+05 3.693E+05 3.383E+05 3.458E+05 3.321E+05 2.995E+05 2.618E+05
2.482E+05
IN SOIL AIR 3.457E+05 3.080E+05 2.722E+05 2.519E+05 2.460E+05 2.165E+05 2.003E+05 1.788E+05 1.692E+05 1.594E+05 1.474E+05
1.318E+05
GWR. RUNOFF 6.002E+04 6.757E+04 9.283E+04 4.518E+04 0.000E+00 0.000E+00 0.000E+00 6.058E+04 6.436E+04 2.591E+04 0.000E+00
2.704E+04

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE	9.544E-02	8.875E-02	8.261E-02	7.646E-02	6.928E-02	6.270E-02	5.668E-02	5.123E-02	4.657E-02	4.275E-02	3.937E-02
3.615E-02											
%SOLUBILITY	1.814E-02	1.687E-02	1.571E-02	1.454E-02	1.317E-02	1.192E-02	1.078E-02	9.739E-03	8.854E-03	8.127E-03	7.485E-03
6.873E-03											
ADSORBED	2.629E-01	2.445E-01	2.276E-01	2.106E-01	1.909E-01	1.727E-01	1.562E-01	1.411E-01	1.283E-01	1.178E-01	1.085E-01
9.959E-02											
SOIL AIR	2.661E-02	2.549E-02	2.422E-02	2.246E-02	2.022E-02	1.814E-02	1.590E-02	1.410E-02	1.258E-02	1.143E-02	1.055E-02
9.820E-03											

SUBLAYER 2

MOISTURE	1.809E-01	1.670E-01	1.543E-01	1.421E-01	1.286E-01	1.168E-01	1.060E-01	9.672E-02	8.860E-02	8.144E-02	7.485E-02
6.879E-02											
%SOLUBILITY	3.440E-02	3.174E-02	2.934E-02	2.702E-02	2.445E-02	2.220E-02	2.015E-02	1.839E-02	1.684E-02	1.548E-02	1.423E-02
1.308E-02											
ADSORBED	4.984E-01	4.600E-01	4.252E-01	3.915E-01	3.544E-01	3.216E-01	2.919E-01	2.665E-01	2.441E-01	2.244E-01	2.062E-01
1.895E-01											
SOIL AIR	5.045E-02	4.796E-02	4.525E-02	4.174E-02	3.754E-02	3.377E-02	2.971E-02	2.662E-02	2.392E-02	2.178E-02	2.005E-02
1.869E-02											

SUBLAYER 3

MOISTURE	2.407E-01	2.205E-01	2.021E-01	1.853E-01	1.679E-01	1.524E-01	1.390E-01	1.277E-01	1.180E-01	1.090E-01	1.001E-01
9.184E-02											
%SOLUBILITY	4.576E-02	4.191E-02	3.843E-02	3.523E-02	3.192E-02	2.897E-02	2.643E-02	2.428E-02	2.243E-02	2.072E-02	1.904E-02
1.746E-02											
ADSORBED	6.631E-01	6.074E-01	5.569E-01	5.105E-01	4.625E-01	4.199E-01	3.831E-01	3.518E-01	3.251E-01	3.003E-01	2.759E-01
2.530E-01											
SOIL AIR	6.712E-02	6.332E-02	5.927E-02	5.443E-02	4.900E-02	4.408E-02	3.899E-02	3.515E-02	3.186E-02	2.914E-02	2.682E-02
2.495E-02											

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	2.647E-01	2.393E-01	2.169E-01	1.985E-01	1.809E-01	1.646E-01	1.515E-01	1.403E-01	1.311E-01	1.216E-01	1.113E-01
1.016E-01											
%SOLUBILITY	5.031E-02	4.549E-02	4.124E-02	3.774E-02	3.440E-02	3.129E-02	2.880E-02	2.666E-02	2.492E-02	2.311E-02	2.116E-02
1.931E-02											
SOIL AIR	7.380E-02	6.874E-02	6.360E-02	5.831E-02	5.281E-02	4.760E-02	4.248E-02	3.860E-02	3.540E-02	3.251E-02	2.982E-02
2.760E-02											

SUBLAYER 2

MOISTURE	2.858E-01	2.558E-01	2.297E-01	2.099E-01	1.923E-01	1.751E-01	1.624E-01	1.513E-01	1.428E-01	1.328E-01	1.213E-01
1.103E-01											
%SOLUBILITY	5.434E-02	4.863E-02	4.367E-02	3.991E-02	3.655E-02	3.328E-02	3.087E-02	2.877E-02	2.716E-02	2.525E-02	2.306E-02
2.096E-02											
SOIL AIR	7.971E-02	7.347E-02	6.735E-02	6.167E-02	5.612E-02	5.064E-02	4.553E-02	4.165E-02	3.857E-02	3.552E-02	3.249E-02
2.995E-02											

SUBLAYER 3

MOISTURE	3.037E-01	2.695E-01	2.403E-01	2.193E-01	2.016E-01	1.837E-01	1.714E-01	1.607E-01	1.529E-01	1.424E-01	1.297E-01
1.176E-01											
%SOLUBILITY	5.773E-02	5.124E-02	4.568E-02	4.170E-02	3.833E-02	3.493E-02	3.259E-02	3.054E-02	2.906E-02	2.708E-02	2.466E-02
2.236E-02											
SOIL AIR	8.467E-02	7.741E-02	7.046E-02	6.443E-02	5.885E-02	5.314E-02	4.807E-02	4.422E-02	4.128E-02	3.809E-02	3.475E-02
3.195E-02											

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	3.175E-01	2.802E-01	2.485E-01	2.265E-01	2.088E-01	1.904E-01	1.784E-01	1.679E-01	1.608E-01	1.500E-01	1.364E-01
1.234E-01											
%SOLUBILITY	6.037E-02	5.326E-02	4.724E-02	4.307E-02	3.970E-02	3.619E-02	3.393E-02	3.193E-02	3.056E-02	2.852E-02	2.592E-02
2.345E-02											
SOIL AIR	8.855E-02	8.047E-02	7.285E-02	6.655E-02	6.095E-02	5.506E-02	5.004E-02	4.622E-02	4.341E-02	4.012E-02	3.652E-02
3.351E-02											

SUBLAYER 2

MOISTURE	3.271E-01	2.874E-01	2.540E-01	2.314E-01	2.137E-01	1.949E-01	1.832E-01	1.730E-01	1.663E-01	1.553E-01	1.409E-01
1.273E-01											
%SOLUBILITY	6.218E-02	5.464E-02	4.829E-02	4.400E-02	4.063E-02	3.704E-02	3.483E-02	3.288E-02	3.161E-02	2.952E-02	2.679E-02
2.421E-02											
SOIL AIR	9.121E-02	8.255E-02	7.448E-02	6.799E-02	6.238E-02	5.636E-02	5.138E-02	4.760E-02	4.489E-02	4.152E-02	3.774E-02
3.459E-02											

SUBLAYER 3

MOISTURE	3.319E-01	2.911E-01	2.568E-01	2.339E-01	2.162E-01	1.971E-01	1.857E-01	1.755E-01	1.691E-01	1.579E-01	1.432E-01
1.294E-01											
%SOLUBILITY	6.311E-02	5.534E-02	4.883E-02	4.447E-02	4.110E-02	3.748E-02	3.529E-02	3.337E-02	3.214E-02	3.003E-02	2.723E-02
2.459E-02											

```
 SOIL AIR      9.256E-02 8.361E-02 7.530E-02 6.871E-02 6.310E-02 5.702E-02 5.206E-02 4.831E-02 4.566E-02 4.224E-02 3.836E-02
3.514E-02

 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                              YEAR -   4 ANNUAL SUMMARY REPORT
                               ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


           -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)                11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)          11.844
 TOTAL PRECIPITATION (CM)                        73.466
 TOTAL INFILTRATION (CM)                         73.460
 TOTAL EVAPOTRANSPIRATION (CM)                   69.004
 TOTAL SURFACE RUNOFF (CM)                        0.000
 TOTAL GRW RUNOFF (CM)                            4.453
 TOTAL MOISTURE RETENTION (CM)                    0.003
 TOTAL YIELD (CM)                                 4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
-------------------------------------------------------------------------------------------------------------------------------
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      UPPER SOIL ZONE:

          SUBLAYER  1

               TOTAL VOLATILIZED                 3.155E+07

          SUBLAYER  2

               TOTAL DIFFUSED (UP)               2.776E+07

          SUBLAYER  3

               TOTAL DIFFUSED (UP)               1.893E+07

      SOIL ZONE 2:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)               6.297E+06

          SUBLAYER  2

               TOTAL DIFFUSED (UP)               5.540E+06

          SUBLAYER  3

               TOTAL DIFFUSED (UP)               4.636E+06

      SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

      LOWER SOIL ZONE:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)               3.604E+06

          SUBLAYER  2

               TOTAL DIFFUSED (UP)               2.470E+06

          SUBLAYER  3

               TOTAL DIFFUSED (UP)               1.257E+06
               TOTAL IN GROUNDWATER RUNOFF       4.435E+05
1                        -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                         ---------------------------------------------------------------------------------
```

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	6.233E-02
ADSORBED SOIL (UG/G)	1.717E-01
SOIL AIR (UG/ML)	1.763E-02

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.172E-01
ADSORBED SOIL (UG/G)	3.228E-01
SOIL AIR (UG/ML)	3.312E-02

SUBLAYER 3

SOIL MOISTURE (UG/ML)	1.545E-01
ADSORBED SOIL (UG/G)	4.258E-01
SOIL AIR (UG/ML)	4.368E-02

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.685E-01
SOIL AIR (UG/ML)	4.760E-02

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.808E-01
SOIL AIR (UG/ML)	5.106E-02

SUBLAYER 3

SOIL MOISTURE (UG/ML)	1.911E-01
SOIL AIR (UG/ML)	5.394E-02

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.991E-01
SOIL AIR (UG/ML)	5.619E-02

SUBLAYER 2

SOIL MOISTURE (UG/ML)	2.045E-01
SOIL AIR (UG/ML)	5.772E-02

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.073E-01
SOIL AIR (UG/ML)	5.851E-02

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR - 5 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG

```
SEP

 PRECIP.       0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD UPPER    0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 2   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 3   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD LOWER    0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00

 TOTAL INPUT   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------------


      UPPER SOIL ZONE:

            SUBLAYER  1

 VOLATILIZED 1.373E+06 1.252E+06 1.118E+06 1.089E+06 1.215E+06 9.989E+05 9.157E+05 7.131E+05 6.374E+05 6.129E+05 5.992E+05
5.160E+05
 IN SOIL MOI 5.747E+04 5.485E+04 5.280E+04 4.765E+04 3.817E+04 3.654E+04 3.214E+04 3.139E+04 2.846E+04 2.522E+04 2.239E+04
2.158E+04
 ADS ON SOIL 2.464E+06 2.292E+06 2.133E+06 1.974E+06 1.789E+06 1.619E+06 1.464E+06 1.323E+06 1.203E+06 1.104E+06 1.017E+06
9.337E+05
 IN SOIL AIR 3.091E+04 2.920E+04 2.724E+04 2.561E+04 2.452E+04 2.142E+04 1.903E+04 1.623E+04 1.450E+04 1.342E+04 1.261E+04
1.146E+04

            SUBLAYER  2

 DIFFUSED UP 1.234E+06 1.112E+06 9.770E+05 9.402E+05 1.044E+06 8.583E+05 7.933E+05 6.269E+05 5.710E+05 5.541E+05 5.412E+05
4.655E+05
 IN SOIL MOI 1.089E+05 1.032E+05 9.865E+04 8.858E+04 7.088E+04 6.805E+04 6.008E+04 5.928E+04 5.414E+04 4.805E+04 4.258E+04
4.107E+04
 ADS ON SOIL 4.672E+06 4.311E+06 3.985E+06 3.669E+06 3.322E+06 3.015E+06 2.737E+06 2.498E+06 2.288E+06 2.104E+06 1.933E+06
1.777E+06
 IN SOIL AIR 5.860E+04 5.495E+04 5.089E+04 4.761E+04 4.553E+04 3.989E+04 3.557E+04 3.065E+04 2.758E+04 2.557E+04 2.397E+04
2.181E+04

            SUBLAYER  3

 DIFFUSED UP 8.664E+05 7.675E+05 6.582E+05 6.227E+05 6.921E+05 5.654E+05 5.289E+05 4.226E+05 3.946E+05 3.923E+05 3.866E+05
3.296E+05
 IN SOIL MOI 1.449E+05 1.362E+05 1.292E+05 1.155E+05 9.251E+04 8.882E+04 7.884E+04 7.826E+04 7.211E+04 6.431E+04 5.697E+04
5.484E+04
 ADS ON SOIL 6.215E+06 5.692E+06 5.220E+06 4.785E+06 4.336E+06 3.936E+06 3.591E+06 3.298E+06 3.048E+06 2.815E+06 2.587E+06
2.373E+06
 IN SOIL AIR 7.795E+04 7.254E+04 6.665E+04 6.207E+04 5.943E+04 5.207E+04 4.667E+04 4.046E+04 3.674E+04 3.423E+04 3.207E+04
2.912E+04

      SOIL ZONE 2:

            SUBLAYER  1

 DIFFUSED UP 3.077E+05 2.420E+05 1.805E+05 1.750E+05 2.234E+05 1.626E+05 1.787E+05 1.399E+05 1.525E+05 1.628E+05 1.581E+05
1.202E+05
 IN SOIL MOI 1.792E+05 1.664E+05 1.560E+05 1.392E+05 1.122E+05 1.079E+05 9.663E+04 9.671E+04 9.013E+04 8.069E+04 7.125E+04
6.825E+04
 IN SOIL AIR 9.642E+04 8.858E+04 8.045E+04 7.481E+04 7.205E+04 6.325E+04 5.721E+04 5.000E+04 4.592E+04 4.295E+04 4.011E+04
3.624E+04

            SUBLAYER  2

 DIFFUSED UP 2.741E+05 2.148E+05 1.591E+05 1.507E+05 1.908E+05 1.409E+05 1.544E+05 1.236E+05 1.357E+05 1.455E+05 1.409E+05
1.079E+05
 IN SOIL MOI 1.936E+05 1.778E+05 1.652E+05 1.472E+05 1.192E+05 1.148E+05 1.036E+05 1.044E+05 9.822E+04 8.818E+04 7.763E+04
7.408E+04
 IN SOIL AIR 1.041E+05 9.468E+04 8.520E+04 7.911E+04 7.657E+04 6.729E+04 6.132E+04 5.395E+04 5.004E+04 4.693E+04 4.370E+04
3.934E+04

            SUBLAYER  3

 DIFFUSED UP 2.317E+05 1.809E+05 1.332E+05 1.239E+05 1.557E+05 1.164E+05 1.272E+05 1.039E+05 1.147E+05 1.234E+05 1.193E+05
9.169E+04
 IN SOIL MOI 2.056E+05 1.873E+05 1.728E+05 1.538E+05 1.250E+05 1.205E+05 1.094E+05 1.108E+05 1.051E+05 9.456E+04 8.304E+04
7.901E+04
 IN SOIL AIR 1.106E+05 9.976E+04 8.912E+04 8.266E+04 8.029E+04 7.061E+04 6.474E+04 5.728E+04 5.355E+04 5.033E+04 4.674E+04
4.196E+04

      SOIL ZONE 3:

            SUBLAYER  1

            SUBLAYER  2

            SUBLAYER  3

      LOWER SOIL ZONE:
```

SUBLAYER 1

DIFFUSED UP 1.816E+05 1.412E+05 1.035E+05 9.500E+04 1.187E+05 8.952E+04 9.770E+04 8.105E+04 9.007E+04 9.708E+04 9.349E+04
7.215E+04
IN SOIL MOI 2.150E+05 1.947E+05 1.786E+05 1.589E+05 1.295E+05 1.248E+05 1.138E+05 1.158E+05 1.105E+05 9.959E+04 8.727E+04
8.288E+04
IN SOIL AIR 1.157E+05 1.037E+05 9.215E+04 8.538E+04 8.316E+04 7.316E+04 6.739E+04 5.987E+04 5.632E+04 5.301E+04 4.913E+04
4.401E+04

SUBLAYER 2

DIFFUSED UP 1.250E+05 9.684E+04 7.080E+04 6.439E+04 8.052E+04 6.080E+04 6.651E+04 5.572E+04 6.227E+04 6.711E+04 6.446E+04
4.983E+04
IN SOIL MOI 2.215E+05 1.998E+05 1.826E+05 1.623E+05 1.325E+05 1.278E+05 1.169E+05 1.193E+05 1.143E+05 1.031E+05 9.019E+04
8.554E+04
IN SOIL AIR 1.191E+05 1.064E+05 9.420E+04 8.722E+04 8.511E+04 7.489E+04 6.920E+04 6.166E+04 5.824E+04 5.486E+04 5.077E+04
4.543E+04

SUBLAYER 3

DIFFUSED UP 6.382E+04 4.926E+04 3.595E+04 3.254E+04 4.065E+04 3.072E+04 3.369E+04 2.848E+04 3.199E+04 3.440E+04 3.291E+04
2.549E+04
IN SOIL MOI 2.248E+05 2.023E+05 1.846E+05 1.640E+05 1.340E+05 1.293E+05 1.184E+05 1.210E+05 1.163E+05 1.048E+05 9.167E+04
8.691E+04
IN SOIL AIR 1.209E+05 1.077E+05 9.525E+04 8.815E+04 8.609E+04 7.577E+04 7.011E+04 6.258E+04 5.923E+04 5.581E+04 5.160E+04
4.615E+04
GWR. RUNOFF 2.100E+04 2.364E+04 3.248E+04 1.581E+04 0.000E+00 0.000E+00 0.000E+00 2.121E+04 2.253E+04 9.072E+03 0.000E+00
9.466E+03

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
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UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 3.340E-02 3.106E-02 2.891E-02 2.675E-02 2.424E-02 2.194E-02 1.984E-02 1.793E-02 1.630E-02 1.496E-02 1.378E-02
1.265E-02
%SOLUBILITY 6.349E-03 5.904E-03 5.496E-03 5.086E-03 4.609E-03 4.172E-03 3.772E-03 3.409E-03 3.099E-03 2.845E-03 2.620E-03
2.406E-03
ADSORBED 9.201E-02 8.556E-02 7.964E-02 7.371E-02 6.679E-02 6.045E-02 5.465E-02 4.940E-02 4.491E-02 4.122E-02 3.797E-02
3.486E-02
SOIL AIR 9.313E-03 8.920E-03 8.476E-03 7.859E-03 7.076E-03 6.347E-03 5.563E-03 4.935E-03 4.401E-03 4.001E-03 3.691E-03
3.437E-03

SUBLAYER 2

MOISTURE 6.331E-02 5.843E-02 5.401E-02 4.973E-02 4.501E-02 4.086E-02 3.709E-02 3.385E-02 3.101E-02 2.851E-02 2.620E-02
2.408E-02
%SOLUBILITY 1.204E-02 1.111E-02 1.027E-02 9.454E-03 8.558E-03 7.768E-03 7.051E-03 6.436E-03 5.896E-03 5.420E-03 4.981E-03
4.578E-03
ADSORBED 1.744E-01 1.610E-01 1.488E-01 1.370E-01 1.240E-01 1.126E-01 1.022E-01 9.327E-02 8.544E-02 7.854E-02 7.218E-02
6.634E-02
SOIL AIR 1.765E-02 1.678E-02 1.584E-02 1.461E-02 1.314E-02 1.182E-02 1.040E-02 9.318E-03 8.374E-03 7.623E-03 7.018E-03
6.542E-03

SUBLAYER 3

MOISTURE 8.422E-02 7.714E-02 7.074E-02 6.484E-02 5.876E-02 5.334E-02 4.867E-02 4.470E-02 4.130E-02 3.815E-02 3.506E-02
3.215E-02
%SOLUBILITY 1.601E-02 1.467E-02 1.345E-02 1.233E-02 1.117E-02 1.014E-02 9.252E-03 8.498E-03 7.853E-03 7.254E-03 6.666E-03
6.113E-03
ADSORBED 2.320E-01 2.125E-01 1.949E-01 1.786E-01 1.619E-01 1.469E-01 1.341E-01 1.231E-01 1.138E-01 1.051E-01 9.659E-02
8.858E-02
SOIL AIR 2.348E-02 2.216E-02 2.074E-02 1.905E-02 1.715E-02 1.543E-02 1.365E-02 1.230E-02 1.115E-02 1.020E-02 9.391E-03
8.734E-03

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 9.260E-02 8.373E-02 7.590E-02 6.946E-02 6.332E-02 5.760E-02 5.303E-02 4.910E-02 4.589E-02 4.255E-02 3.898E-02
3.557E-02
%SOLUBILITY 1.760E-02 1.592E-02 1.443E-02 1.321E-02 1.204E-02 1.095E-02 1.008E-02 9.334E-03 8.724E-03 8.090E-03 7.410E-03
6.762E-03
SOIL AIR 2.582E-02 2.405E-02 2.225E-02 2.041E-02 1.848E-02 1.666E-02 1.487E-02 1.351E-02 1.239E-02 1.138E-02 1.044E-02
9.662E-03

SUBLAYER 2

MOISTURE 1.000E-01 8.949E-02 8.038E-02 7.346E-02 6.729E-02 6.127E-02 5.684E-02 5.298E-02 5.001E-02 4.651E-02 4.247E-02
3.861E-02
%SOLUBILITY 1.901E-02 1.701E-02 1.528E-02 1.397E-02 1.279E-02 1.165E-02 1.081E-02 1.007E-02 9.507E-03 8.842E-03 8.074E-03
7.340E-03
SOIL AIR 2.789E-02 2.571E-02 2.357E-02 2.158E-02 1.964E-02 1.772E-02 1.594E-02 1.458E-02 1.350E-02 1.244E-02 1.137E-02
1.049E-02

SUBLAYER 3

MOISTURE 1.062E-01 9.429E-02 8.408E-02 7.675E-02 7.057E-02 6.430E-02 6.001E-02 5.624E-02 5.351E-02 4.987E-02 4.542E-02
4.118E-02
%SOLUBILITY 2.020E-02 1.793E-02 1.598E-02 1.459E-02 1.342E-02 1.222E-02 1.141E-02 1.069E-02 1.017E-02 9.481E-03 8.636E-03
7.829E-03

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 SOIL AIR      2.962E-02 2.708E-02 2.465E-02 2.255E-02 2.060E-02 1.860E-02 1.683E-02 1.548E-02 1.445E-02 1.334E-02 1.217E-02
1.119E-02

      SOIL ZONE 3:

      LOWER SOIL ZONE:

            SUBLAYER  1

 MOISTURE      1.111E-01 9.801E-02 8.693E-02 7.928E-02 7.309E-02 6.662E-02 6.246E-02 5.879E-02 5.628E-02 5.252E-02 4.774E-02
4.319E-02
 %SOLUBILITY 2.112E-02 1.863E-02 1.653E-02 1.507E-02 1.389E-02 1.267E-02 1.187E-02 1.118E-02 1.070E-02 9.985E-03 9.076E-03
8.212E-03
 SOIL AIR      3.098E-02 2.815E-02 2.549E-02 2.329E-02 2.133E-02 1.927E-02 1.751E-02 1.618E-02 1.520E-02 1.405E-02 1.279E-02
1.173E-02

            SUBLAYER  2

 MOISTURE      1.144E-01 1.005E-01 8.887E-02 8.099E-02 7.479E-02 6.820E-02 6.413E-02 6.055E-02 5.820E-02 5.436E-02 4.933E-02
4.458E-02
 %SOLUBILITY 2.175E-02 1.911E-02 1.690E-02 1.540E-02 1.422E-02 1.297E-02 1.219E-02 1.151E-02 1.107E-02 1.033E-02 9.379E-03
8.476E-03
 SOIL AIR      3.191E-02 2.888E-02 2.606E-02 2.379E-02 2.183E-02 1.973E-02 1.798E-02 1.666E-02 1.572E-02 1.454E-02 1.321E-02
1.211E-02

            SUBLAYER  3

 MOISTURE      1.161E-01 1.018E-01 8.986E-02 8.185E-02 7.566E-02 6.899E-02 6.498E-02 6.145E-02 5.919E-02 5.530E-02 5.015E-02
4.529E-02
 %SOLUBILITY 2.208E-02 1.936E-02 1.708E-02 1.556E-02 1.438E-02 1.312E-02 1.235E-02 1.168E-02 1.125E-02 1.051E-02 9.534E-03
8.611E-03
 SOIL AIR      3.238E-02 2.925E-02 2.635E-02 2.404E-02 2.208E-02 1.996E-02 1.822E-02 1.691E-02 1.598E-02 1.479E-02 1.343E-02
1.230E-02


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                              YEAR -   5 ANNUAL SUMMARY REPORT
                               ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE                0.000E+00
 SOIL ZONE 2                    0.000E+00
 SOIL ZONE 3                    0.000E+00
 LOWER SOIL ZONE                0.000E+00


            -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)                11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)          11.844
 TOTAL PRECIPITATION (CM)                        73.466
 TOTAL INFILTRATION (CM)                         73.460
 TOTAL EVAPOTRANSPIRATION (CM)                   69.004
 TOTAL SURFACE RUNOFF (CM)                        0.000
 TOTAL GRW RUNOFF (CM)                            4.453
 TOTAL MOISTURE RETENTION (CM)                    0.003
 TOTAL YIELD (CM)                                 4.460
0           -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
            ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)

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      UPPER SOIL ZONE:

            SUBLAYER  1

                  TOTAL VOLATILIZED                 1.104E+07

            SUBLAYER  2

                  TOTAL DIFFUSED (UP)               9.717E+06

            SUBLAYER  3

                  TOTAL DIFFUSED (UP)               6.627E+06

      SOIL ZONE 2:

            SUBLAYER  1

                  TOTAL DIFFUSED (UP)               2.203E+06

            SUBLAYER  2

                  TOTAL DIFFUSED (UP)               1.938E+06

            SUBLAYER  3
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            TOTAL DIFFUSED (UP)                1.622E+06

SOIL ZONE 3:

     SUBLAYER  1

     SUBLAYER  2

     SUBLAYER  3

LOWER SOIL ZONE:

     SUBLAYER  1

            TOTAL DIFFUSED (UP)                1.261E+06

     SUBLAYER  2

            TOTAL DIFFUSED (UP)                8.643E+05

     SUBLAYER  3

            TOTAL DIFFUSED (UP)                4.399E+05
            TOTAL IN GROUNDWATER RUNOFF        1.552E+05
1                    -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                     ---------------------------------------------------------------------------------

UPPER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  2.181E-02
                                   ADSORBED SOIL (UG/G)   6.010E-02
                                   SOIL AIR (UG/ML)       6.168E-03

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  4.101E-02
                                   ADSORBED SOIL (UG/G)   1.130E-01
                                   SOIL AIR (UG/ML)       1.159E-02

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  5.409E-02
                                   ADSORBED SOIL (UG/G)   1.490E-01
                                   SOIL AIR (UG/ML)       1.529E-02

SOIL ZONE 2:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  5.898E-02
                                   SOIL AIR (UG/ML)       1.666E-02

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  6.327E-02
                                   SOIL AIR (UG/ML)       1.787E-02

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  6.687E-02
                                   SOIL AIR (UG/ML)       1.888E-02

SOIL ZONE 3:

LOWER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  6.967E-02
                                   SOIL AIR (UG/ML)       1.966E-02

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  7.158E-02
                                   SOIL AIR (UG/ML)       2.020E-02

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  7.256E-02
                                   SOIL AIR (UG/ML)       2.047E-02

                                   MAX. POLL. DEPTH (M)   3.900E+00
1
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YEAR - 6 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	4.806E+05	4.384E+05	3.913E+05	3.812E+05	4.254E+05	3.497E+05	3.205E+05	2.496E+05	2.231E+05	2.145E+05	2.097E+05	1.806E+05
IN SOIL MOI	2.011E+04	1.920E+04	1.848E+04	1.668E+04	1.336E+04	1.279E+04	1.125E+04	1.099E+04	9.960E+03	8.826E+03	7.837E+03	7.553E+03
ADS ON SOIL	8.626E+05	8.021E+05	7.466E+05	6.910E+05	6.262E+05	5.667E+05	5.124E+05	4.631E+05	4.210E+05	3.864E+05	3.559E+05	3.268E+05
IN SOIL AIR	1.082E+04	1.022E+04	9.533E+03	8.965E+03	8.583E+03	7.497E+03	6.659E+03	5.681E+03	5.074E+03	4.698E+03	4.411E+03	4.011E+03

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	4.321E+05	3.892E+05	3.420E+05	3.291E+05	3.654E+05	3.004E+05	2.776E+05	2.194E+05	1.998E+05	1.939E+05	1.894E+05	1.629E+05
IN SOIL MOI	3.813E+04	3.612E+04	3.453E+04	3.100E+04	2.481E+04	2.382E+04	2.103E+04	2.074E+04	1.895E+04	1.681E+04	1.490E+04	1.437E+04
ADS ON SOIL	1.635E+06	1.509E+06	1.395E+06	1.284E+06	1.163E+06	1.055E+06	9.578E+05	8.742E+05	8.008E+05	7.361E+05	6.766E+05	6.218E+05
IN SOIL AIR	2.051E+04	1.923E+04	1.781E+04	1.666E+04	1.594E+04	1.396E+04	1.245E+04	1.073E+04	9.653E+03	8.949E+03	8.387E+03	7.633E+03

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	3.034E+05	2.687E+05	2.304E+05	2.180E+05	2.423E+05	1.979E+05	1.851E+05	1.479E+05	1.381E+05	1.373E+05	1.353E+05	1.153E+05
IN SOIL MOI	5.073E+04	4.769E+04	4.523E+04	4.043E+04	3.238E+04	3.109E+04	2.759E+04	2.739E+04	2.524E+04	2.250E+04	1.993E+04	1.919E+04
ADS ON SOIL	2.176E+06	1.993E+06	1.827E+06	1.675E+06	1.518E+06	1.378E+06	1.257E+06	1.154E+06	1.067E+06	9.852E+05	9.052E+05	8.301E+05
IN SOIL AIR	2.729E+04	2.540E+04	2.333E+04	2.173E+04	2.080E+04	1.822E+04	1.634E+04	1.416E+04	1.286E+04	1.198E+04	1.122E+04	1.019E+04

SOIL ZONE 2:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.078E+05	8.478E+04	6.324E+04	6.128E+04	7.822E+04	5.691E+04	6.254E+04	4.897E+04	5.338E+04	5.697E+04	5.530E+04	4.206E+04
IN SOIL MOI	6.275E+04	5.824E+04	5.460E+04	4.872E+04	3.926E+04	3.777E+04	3.382E+04	3.384E+04	3.154E+04	2.823E+04	2.493E+04	2.388E+04
IN SOIL AIR	3.376E+04	3.101E+04	2.816E+04	2.619E+04	2.522E+04	2.214E+04	2.002E+04	1.750E+04	1.607E+04	1.503E+04	1.403E+04	1.268E+04

SUBLAYER 2

DIFFUSED UP 9.603E+04 7.525E+04 5.574E+04 5.277E+04 6.679E+04 4.933E+04 5.404E+04 4.326E+04 4.748E+04 5.091E+04 4.931E+04 3.773E+04
IN SOIL MOI 6.778E+04 6.225E+04 5.782E+04 5.153E+04 4.172E+04 4.018E+04 3.625E+04 3.652E+04 3.437E+04 3.086E+04 2.716E+04 2.592E+04
IN SOIL AIR 3.646E+04 3.315E+04 2.983E+04 2.769E+04 2.680E+04 2.355E+04 2.146E+04 1.888E+04 1.751E+04 1.642E+04 1.529E+04 1.376E+04

SUBLAYER 3

DIFFUSED UP 8.118E+04 6.338E+04 4.668E+04 4.339E+04 5.452E+04 4.076E+04 4.453E+04 3.635E+04 4.015E+04 4.319E+04 4.173E+04 3.208E+04
IN SOIL MOI 7.200E+04 6.559E+04 6.049E+04 5.384E+04 4.375E+04 4.216E+04 3.827E+04 3.877E+04 3.678E+04 3.309E+04 2.905E+04 2.764E+04
IN SOIL AIR 3.873E+04 3.493E+04 3.120E+04 2.893E+04 2.811E+04 2.471E+04 2.266E+04 2.004E+04 1.874E+04 1.761E+04 1.635E+04 1.468E+04

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 6.362E+04 4.948E+04 3.628E+04 3.327E+04 4.155E+04 3.134E+04 3.420E+04 2.836E+04 3.152E+04 3.397E+04 3.271E+04 2.524E+04
IN SOIL MOI 7.530E+04 6.818E+04 6.254E+04 5.561E+04 4.532E+04 4.368E+04 3.984E+04 4.053E+04 3.868E+04 3.485E+04 3.054E+04 2.900E+04
IN SOIL AIR 4.050E+04 3.630E+04 3.226E+04 2.989E+04 2.911E+04 2.561E+04 2.359E+04 2.095E+04 1.971E+04 1.855E+04 1.719E+04 1.540E+04

SUBLAYER 2

DIFFUSED UP 4.380E+04 3.394E+04 2.481E+04 2.255E+04 2.820E+04 2.128E+04 2.328E+04 1.950E+04 2.179E+04 2.348E+04 2.255E+04 1.743E+04
IN SOIL MOI 7.756E+04 6.995E+04 6.394E+04 5.681E+04 4.638E+04 4.472E+04 4.090E+04 4.174E+04 4.000E+04 3.606E+04 3.155E+04 2.993E+04
IN SOIL AIR 4.172E+04 3.725E+04 3.298E+04 3.053E+04 2.979E+04 2.621E+04 2.422E+04 2.158E+04 2.038E+04 1.920E+04 1.776E+04 1.589E+04

SUBLAYER 3

DIFFUSED UP 2.236E+04 1.726E+04 1.260E+04 1.140E+04 1.423E+04 1.075E+04 1.179E+04 9.965E+03 1.119E+04 1.204E+04 1.151E+04 8.917E+03
IN SOIL MOI 7.871E+04 7.084E+04 6.464E+04 5.742E+04 4.691E+04 4.524E+04 4.145E+04 4.236E+04 4.068E+04 3.669E+04 3.207E+04 3.041E+04
IN SOIL AIR 4.234E+04 3.772E+04 3.335E+04 3.086E+04 3.013E+04 2.652E+04 2.454E+04 2.190E+04 2.073E+04 1.953E+04 1.806E+04 1.615E+04
GWR. RUNOFF 7.352E+03 8.277E+03 1.137E+04 5.534E+03 0.000E+00 0.000E+00 0.000E+00 7.421E+03 7.885E+03 3.174E+03 0.000E+00 3.312E+03

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 1.169E-02 1.087E-02 1.012E-02 9.365E-03 8.486E-03 7.680E-03 6.944E-03 6.275E-03 5.705E-03 5.237E-03 4.823E-03 4.428E-03
%SOLUBILITY 2.222E-03 2.067E-03 1.924E-03 1.780E-03 1.613E-03 1.460E-03 1.320E-03 1.193E-03 1.085E-03 9.956E-04 9.169E-04 8.419E-04
ADSORBED 3.221E-02 2.995E-02 2.787E-02 2.580E-02 2.338E-02 2.116E-02 1.913E-02 1.729E-02 1.572E-02 1.443E-02 1.329E-02 1.220E-02
SOIL AIR 3.260E-03 3.122E-03 2.967E-03 2.751E-03 2.477E-03 2.221E-03 1.947E-03 1.727E-03 1.540E-03 1.400E-03 1.292E-03 1.203E-03

SUBLAYER 2

MOISTURE 2.216E-02 2.045E-02 1.891E-02 1.741E-02 1.576E-02 1.430E-02 1.298E-02 1.185E-02 1.085E-02 9.975E-03 9.169E-03 8.427E-03
%SOLUBILITY 4.213E-03 3.888E-03 3.594E-03 3.309E-03 2.995E-03 2.719E-03 2.468E-03 2.252E-03 2.063E-03 1.896E-03 1.743E-03 1.602E-03
ADSORBED 6.106E-02 5.635E-02 5.208E-02 4.795E-02 4.341E-02 3.940E-02 3.576E-02 3.264E-02 2.990E-02 2.748E-02 2.526E-02 2.322E-02
SOIL AIR 6.180E-03 5.875E-03 5.543E-03 5.113E-03 4.598E-03 4.137E-03 3.640E-03 3.261E-03 2.930E-03 2.668E-03 2.456E-03 2.289E-03

SUBLAYER 3

MOISTURE 2.948E-02 2.701E-02 2.476E-02 2.270E-02 2.057E-02 1.867E-02 1.703E-02 1.564E-02 1.445E-02 1.335E-02 1.227E-02 1.125E-02
%SOLUBILITY 5.605E-03 5.134E-03 4.708E-03 4.315E-03 3.910E-03 3.549E-03 3.238E-03 2.974E-03 2.748E-03 2.538E-03 2.332E-03 2.139E-03

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 ADSORBED      8.123E-02 7.440E-02 6.822E-02 6.253E-02 5.666E-02 5.143E-02 4.693E-02 4.310E-02 3.982E-02 3.678E-02 3.380E-02
3.099E-02
 SOIL AIR      8.221E-03 7.757E-03 7.260E-03 6.667E-03 6.002E-03 5.400E-03 4.776E-03 4.305E-03 3.903E-03 3.570E-03 3.286E-03
3.056E-03

      SOIL ZONE 2:

            SUBLAYER  1

 MOISTURE      3.242E-02 2.931E-02 2.657E-02 2.432E-02 2.216E-02 2.016E-02 1.856E-02 1.718E-02 1.606E-02 1.489E-02 1.364E-02
1.244E-02
 %SOLUBILITY 6.163E-03 5.573E-03 5.051E-03 4.623E-03 4.214E-03 3.833E-03 3.528E-03 3.266E-03 3.053E-03 2.831E-03 2.593E-03
2.366E-03
 SOIL AIR      9.040E-03 8.420E-03 7.791E-03 7.143E-03 6.469E-03 5.831E-03 5.204E-03 4.729E-03 4.336E-03 3.982E-03 3.653E-03
3.381E-03

            SUBLAYER  2

 MOISTURE      3.501E-02 3.133E-02 2.814E-02 2.571E-02 2.355E-02 2.145E-02 1.989E-02 1.854E-02 1.750E-02 1.627E-02 1.486E-02
1.351E-02
 %SOLUBILITY 6.657E-03 5.957E-03 5.349E-03 4.889E-03 4.478E-03 4.077E-03 3.782E-03 3.525E-03 3.327E-03 3.094E-03 2.825E-03
2.568E-03
 SOIL AIR      9.764E-03 9.000E-03 8.250E-03 7.554E-03 6.874E-03 6.203E-03 5.578E-03 5.103E-03 4.725E-03 4.352E-03 3.980E-03
3.669E-03

            SUBLAYER  3

 MOISTURE      3.720E-02 3.301E-02 2.944E-02 2.687E-02 2.470E-02 2.251E-02 2.100E-02 1.968E-02 1.873E-02 1.745E-02 1.589E-02
1.441E-02
 %SOLUBILITY 7.071E-03 6.276E-03 5.596E-03 5.108E-03 4.696E-03 4.279E-03 3.993E-03 3.742E-03 3.560E-03 3.318E-03 3.022E-03
2.739E-03
 SOIL AIR      1.037E-02 9.483E-03 8.631E-03 7.892E-03 7.209E-03 6.509E-03 5.889E-03 5.417E-03 5.057E-03 4.667E-03 4.257E-03
3.914E-03

      SOIL ZONE 3:

      LOWER SOIL ZONE:

            SUBLAYER  1

 MOISTURE      3.890E-02 3.432E-02 3.043E-02 2.775E-02 2.558E-02 2.332E-02 2.186E-02 2.057E-02 1.970E-02 1.838E-02 1.670E-02
1.511E-02
 %SOLUBILITY 7.395E-03 6.524E-03 5.786E-03 5.276E-03 4.864E-03 4.433E-03 4.156E-03 3.911E-03 3.744E-03 3.494E-03 3.176E-03
2.873E-03
 SOIL AIR      1.085E-02 9.857E-03 8.924E-03 8.152E-03 7.467E-03 6.745E-03 6.130E-03 5.663E-03 5.318E-03 4.915E-03 4.474E-03
4.105E-03

            SUBLAYER  2

 MOISTURE      4.007E-02 3.521E-02 3.111E-02 2.835E-02 2.618E-02 2.387E-02 2.245E-02 2.119E-02 2.037E-02 1.902E-02 1.726E-02
1.560E-02
 %SOLUBILITY 7.617E-03 6.693E-03 5.915E-03 5.390E-03 4.977E-03 4.538E-03 4.267E-03 4.028E-03 3.872E-03 3.616E-03 3.282E-03
2.965E-03
 SOIL AIR      1.117E-02 1.011E-02 9.123E-03 8.328E-03 7.641E-03 6.904E-03 6.294E-03 5.832E-03 5.500E-03 5.086E-03 4.623E-03
4.237E-03

            SUBLAYER  3

 MOISTURE      4.066E-02 3.566E-02 3.146E-02 2.865E-02 2.648E-02 2.415E-02 2.274E-02 2.150E-02 2.071E-02 1.935E-02 1.755E-02
1.585E-02
 %SOLUBILITY 7.730E-03 6.779E-03 5.981E-03 5.448E-03 5.035E-03 4.591E-03 4.324E-03 4.088E-03 3.938E-03 3.678E-03 3.336E-03
3.013E-03
 SOIL AIR      1.134E-02 1.024E-02 9.224E-03 8.417E-03 7.729E-03 6.985E-03 6.377E-03 5.918E-03 5.593E-03 5.174E-03 4.699E-03
4.305E-03


 POL DEP CM    3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                              YEAR -   6 ANNUAL SUMMARY REPORT
                               ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


            -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)              11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)        11.844
 TOTAL PRECIPITATION (CM)                      73.466
 TOTAL INFILTRATION (CM)                       73.460
 TOTAL EVAPOTRANSPIRATION (CM)                 69.004
 TOTAL SURFACE RUNOFF (CM)                      0.000
 TOTAL GRW RUNOFF (CM)                          4.453
 TOTAL MOISTURE RETENTION (CM)                  0.003
 TOTAL YIELD (CM)                               4.460
0           -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
            ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
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     UPPER SOIL ZONE:

          SUBLAYER  1

               TOTAL VOLATILIZED                    3.865E+06

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  3.401E+06

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  2.320E+06

     SOIL ZONE 2:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                  7.715E+05

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  6.786E+05

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  5.679E+05

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                  4.415E+05

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  3.026E+05

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  1.540E+05
               TOTAL IN GROUNDWATER RUNOFF          5.433E+04
1                       -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                        ---------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  7.635E-03
                                   ADSORBED SOIL (UG/G)   2.103E-02
                                   SOIL AIR (UG/ML)       2.159E-03

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  1.435E-02
                                   ADSORBED SOIL (UG/G)   3.954E-02
                                   SOIL AIR (UG/ML)       4.057E-03

          SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  1.893E-02
                                   ADSORBED SOIL (UG/G)   5.216E-02
                                   SOIL AIR (UG/ML)       5.350E-03

     SOIL ZONE 2:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  2.064E-02
                                   SOIL AIR (UG/ML)       5.831E-03

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  2.215E-02
                                   SOIL AIR (UG/ML)       6.254E-03

          SUBLAYER  3
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SOIL MOISTURE (UG/ML) 2.341E-02
SOIL AIR (UG/ML) 6.608E-03

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 2.439E-02
SOIL AIR (UG/ML) 6.883E-03

SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.506E-02
SOIL AIR (UG/ML) 7.071E-03

SUBLAYER 3

SOIL MOISTURE (UG/ML) 2.540E-02
SOIL AIR (UG/ML) 7.167E-03

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR - 7 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	1.682E+05	1.534E+05	1.369E+05	1.334E+05	1.489E+05	1.224E+05	1.122E+05	8.735E+04	7.807E+04	7.507E+04	7.339E+04	6.320E+04
IN SOIL MOI	7.039E+03	6.718E+03	6.468E+03	5.837E+03	4.676E+03	4.476E+03	3.936E+03	3.845E+03	3.486E+03	3.089E+03	2.743E+03	2.644E+03
ADS ON SOIL	3.019E+05	2.807E+05	2.613E+05	2.418E+05	2.191E+05	1.983E+05	1.793E+05	1.621E+05	1.473E+05	1.352E+05	1.246E+05	1.144E+05
IN SOIL AIR	3.787E+03	3.577E+03	3.336E+03	3.137E+03	3.004E+03	2.624E+03	2.330E+03	1.988E+03	1.776E+03	1.644E+03	1.544E+03	1.404E+03

SUBLAYER 2

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 DIFFUSED UP 1.512E+05 1.362E+05 1.197E+05 1.152E+05 1.279E+05 1.051E+05 9.717E+04 7.678E+04 6.995E+04 6.787E+04 6.630E+04
5.702E+04
 IN SOIL MOI 1.334E+04 1.264E+04 1.208E+04 1.085E+04 8.681E+03 8.335E+03 7.359E+03 7.261E+03 6.632E+03 5.885E+03 5.215E+03
5.031E+03
 ADS ON SOIL 5.722E+05 5.281E+05 4.882E+05 4.495E+05 4.069E+05 3.693E+05 3.352E+05 3.060E+05 2.803E+05 2.577E+05 2.368E+05
2.177E+05
 IN SOIL AIR 7.178E+03 6.730E+03 6.233E+03 5.831E+03 5.577E+03 4.886E+03 4.357E+03 3.754E+03 3.379E+03 3.132E+03 2.936E+03
2.672E+03

          SUBLAYER  3

 DIFFUSED UP 1.061E+05 9.399E+04 8.060E+04 7.626E+04 8.477E+04 6.924E+04 6.477E+04 5.176E+04 4.834E+04 4.805E+04 4.736E+04
4.037E+04
 IN SOIL MOI 1.775E+04 1.669E+04 1.583E+04 1.415E+04 1.133E+04 1.088E+04 9.656E+03 9.586E+03 8.833E+03 7.877E+03 6.979E+03
6.717E+03
 ADS ON SOIL 7.612E+05 6.972E+05 6.393E+05 5.860E+05 5.310E+05 4.821E+05 4.399E+05 4.040E+05 3.733E+05 3.449E+05 3.169E+05
2.906E+05
 IN SOIL AIR 9.548E+03 8.885E+03 8.163E+03 7.603E+03 7.279E+03 6.377E+03 5.717E+03 4.956E+03 4.500E+03 4.192E+03 3.928E+03
3.567E+03

     SOIL ZONE 2:

          SUBLAYER  1

 DIFFUSED UP 3.771E+04 2.965E+04 2.211E+04 2.142E+04 2.735E+04 1.991E+04 2.188E+04 1.714E+04 1.868E+04 1.994E+04 1.936E+04
1.473E+04
 IN SOIL MOI 2.196E+04 2.038E+04 1.910E+04 1.705E+04 1.374E+04 1.322E+04 1.184E+04 1.185E+04 1.104E+04 9.883E+03 8.727E+03
8.360E+03
 IN SOIL AIR 1.181E+04 1.085E+04 9.854E+03 9.163E+03 8.825E+03 7.747E+03 7.008E+03 6.124E+03 5.625E+03 5.261E+03 4.913E+03
4.440E+03

          SUBLAYER  2

 DIFFUSED UP 3.359E+04 2.632E+04 1.948E+04 1.845E+04 2.335E+04 1.726E+04 1.891E+04 1.514E+04 1.662E+04 1.782E+04 1.726E+04
1.321E+04
 IN SOIL MOI 2.371E+04 2.178E+04 2.023E+04 1.803E+04 1.460E+04 1.406E+04 1.269E+04 1.278E+04 1.203E+04 1.080E+04 9.510E+03
9.074E+03
 IN SOIL AIR 1.276E+04 1.160E+04 1.044E+04 9.689E+03 9.378E+03 8.241E+03 7.511E+03 6.609E+03 6.130E+03 5.749E+03 5.353E+03
4.819E+03

          SUBLAYER  3

 DIFFUSED UP 2.840E+04 2.217E+04 1.632E+04 1.517E+04 1.906E+04 1.426E+04 1.558E+04 1.272E+04 1.405E+04 1.512E+04 1.461E+04
1.123E+04
 IN SOIL MOI 2.519E+04 2.295E+04 2.116E+04 1.884E+04 1.531E+04 1.475E+04 1.339E+04 1.357E+04 1.287E+04 1.158E+04 1.017E+04
9.679E+03
 IN SOIL AIR 1.355E+04 1.222E+04 1.092E+04 1.012E+04 9.834E+03 8.648E+03 7.930E+03 7.016E+03 6.559E+03 6.165E+03 5.726E+03
5.140E+03

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

 DIFFUSED UP 2.225E+04 1.730E+04 1.268E+04 1.163E+04 1.452E+04 1.096E+04 1.196E+04 9.927E+03 1.103E+04 1.189E+04 1.145E+04
8.838E+03
 IN SOIL MOI 2.634E+04 2.385E+04 2.188E+04 1.945E+04 1.586E+04 1.529E+04 1.394E+04 1.418E+04 1.354E+04 1.220E+04 1.069E+04
1.015E+04
 IN SOIL AIR 1.417E+04 1.270E+04 1.129E+04 1.046E+04 1.019E+04 8.961E+03 8.254E+03 7.333E+03 6.899E+03 6.493E+03 6.018E+03
5.391E+03

          SUBLAYER  2

 DIFFUSED UP 1.532E+04 1.187E+04 8.672E+03 7.879E+03 9.855E+03 7.445E+03 8.145E+03 6.824E+03 7.627E+03 8.220E+03 7.896E+03
6.104E+03
 IN SOIL MOI 2.713E+04 2.447E+04 2.237E+04 1.987E+04 1.623E+04 1.565E+04 1.432E+04 1.461E+04 1.400E+04 1.262E+04 1.105E+04
1.048E+04
 IN SOIL AIR 1.460E+04 1.303E+04 1.154E+04 1.068E+04 1.042E+04 9.173E+03 8.475E+03 7.553E+03 7.134E+03 6.719E+03 6.219E+03
5.565E+03

          SUBLAYER  3

 DIFFUSED UP 7.822E+03 6.038E+03 4.403E+03 3.983E+03 4.975E+03 3.762E+03 4.125E+03 3.488E+03 3.918E+03 4.213E+03 4.031E+03
3.122E+03
 IN SOIL MOI 2.754E+04 2.478E+04 2.261E+04 2.009E+04 1.641E+04 1.583E+04 1.450E+04 1.483E+04 1.424E+04 1.284E+04 1.123E+04
1.065E+04
 IN SOIL AIR 1.481E+04 1.320E+04 1.167E+04 1.080E+04 1.054E+04 9.280E+03 8.588E+03 7.665E+03 7.255E+03 6.836E+03 6.321E+03
5.654E+03
 GWR. RUNOFF 2.572E+03 2.896E+03 3.978E+03 1.936E+03 0.000E+00 0.000E+00 0.000E+00 2.597E+03 2.760E+03 1.111E+03 0.000E+00
1.160E+03

     -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
     ----------------------------------------------------------------------------------------------------------------------
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UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE	4.091E-03	3.804E-03	3.541E-03	3.277E-03	2.970E-03	2.688E-03	2.430E-03	2.196E-03	1.997E-03	1.833E-03	1.688E-03
1.550E-03											
%SOLUBILITY	7.778E-04	7.232E-04	6.732E-04	6.230E-04	5.646E-04	5.110E-04	4.620E-04	4.175E-04	3.796E-04	3.484E-04	3.209E-04
2.947E-04											
ADSORBED	1.127E-02	1.048E-02	9.755E-03	9.029E-03	8.182E-03	7.405E-03	6.695E-03	6.050E-03	5.501E-03	5.049E-03	4.651E-03
4.270E-03											
SOIL AIR	1.141E-03	1.093E-03	1.038E-03	9.627E-04	8.667E-04	7.774E-04	6.814E-04	6.045E-04	5.391E-04	4.901E-04	4.521E-04
4.210E-04											

SUBLAYER 2

MOISTURE	7.755E-03	7.157E-03	6.615E-03	6.091E-03	5.514E-03	5.005E-03	4.543E-03	4.147E-03	3.799E-03	3.492E-03	3.209E-03
2.950E-03											
%SOLUBILITY	1.474E-03	1.361E-03	1.258E-03	1.158E-03	1.048E-03	9.515E-04	8.637E-04	7.884E-04	7.222E-04	6.638E-04	6.102E-04
5.608E-04											
ADSORBED	2.136E-02	1.972E-02	1.823E-02	1.678E-02	1.519E-02	1.379E-02	1.252E-02	1.142E-02	1.047E-02	9.620E-03	8.842E-03
8.127E-03											
SOIL AIR	2.162E-03	2.056E-03	1.940E-03	1.789E-03	1.609E-03	1.448E-03	1.274E-03	1.141E-03	1.026E-03	9.338E-04	8.596E-04
8.013E-04											

SUBLAYER 3

MOISTURE	1.032E-02	9.449E-03	8.664E-03	7.942E-03	7.197E-03	6.533E-03	5.961E-03	5.475E-03	5.059E-03	4.673E-03	4.295E-03
3.938E-03											
%SOLUBILITY	1.961E-03	1.796E-03	1.647E-03	1.510E-03	1.368E-03	1.242E-03	1.133E-03	1.041E-03	9.619E-04	8.885E-04	8.165E-04
7.488E-04											
ADSORBED	2.842E-02	2.603E-02	2.387E-02	2.188E-02	1.983E-02	1.800E-02	1.642E-02	1.508E-02	1.394E-02	1.288E-02	1.183E-02
1.085E-02											
SOIL AIR	2.877E-03	2.714E-03	2.540E-03	2.333E-03	2.100E-03	1.890E-03	1.672E-03	1.507E-03	1.366E-03	1.250E-03	1.150E-03
1.070E-03											

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	1.134E-02	1.026E-02	9.296E-03	8.508E-03	7.756E-03	7.055E-03	6.495E-03	6.014E-03	5.621E-03	5.213E-03	4.774E-03
4.357E-03											
%SOLUBILITY	2.156E-03	1.950E-03	1.767E-03	1.618E-03	1.475E-03	1.341E-03	1.235E-03	1.143E-03	1.069E-03	9.910E-04	9.076E-04
8.283E-04											
SOIL AIR	3.163E-03	2.946E-03	2.726E-03	2.499E-03	2.264E-03	2.041E-03	1.821E-03	1.655E-03	1.518E-03	1.394E-03	1.279E-03
1.184E-03											

SUBLAYER 2

MOISTURE	1.225E-02	1.096E-02	9.845E-03	8.997E-03	8.241E-03	7.505E-03	6.962E-03	6.489E-03	6.125E-03	5.697E-03	5.202E-03
4.729E-03											
%SOLUBILITY	2.329E-03	2.084E-03	1.872E-03	1.710E-03	1.567E-03	1.427E-03	1.324E-03	1.234E-03	1.164E-03	1.083E-03	9.890E-04
8.991E-04											
SOIL AIR	3.416E-03	3.149E-03	2.886E-03	2.643E-03	2.405E-03	2.171E-03	1.952E-03	1.786E-03	1.654E-03	1.523E-03	1.393E-03
1.285E-03											

SUBLAYER 3

MOISTURE	1.301E-02	1.155E-02	1.030E-02	9.400E-03	8.643E-03	7.875E-03	7.350E-03	6.889E-03	6.555E-03	6.109E-03	5.564E-03
5.044E-03											
%SOLUBILITY	2.474E-03	2.196E-03	1.958E-03	1.787E-03	1.643E-03	1.497E-03	1.397E-03	1.310E-03	1.246E-03	1.161E-03	1.058E-03
9.590E-04											
SOIL AIR	3.629E-03	3.317E-03	3.019E-03	2.761E-03	2.522E-03	2.278E-03	2.061E-03	1.896E-03	1.770E-03	1.634E-03	1.490E-03
1.370E-03											

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	1.361E-02	1.201E-02	1.065E-02	9.709E-03	8.951E-03	8.160E-03	7.650E-03	7.201E-03	6.894E-03	6.433E-03	5.848E-03
5.291E-03											
%SOLUBILITY	2.587E-03	2.282E-03	2.024E-03	1.846E-03	1.702E-03	1.551E-03	1.454E-03	1.369E-03	1.311E-03	1.223E-03	1.112E-03
1.006E-03											
SOIL AIR	3.795E-03	3.448E-03	3.122E-03	2.852E-03	2.613E-03	2.360E-03	2.145E-03	1.982E-03	1.862E-03	1.720E-03	1.566E-03
1.437E-03											

SUBLAYER 2

MOISTURE	1.402E-02	1.232E-02	1.088E-02	9.918E-03	9.160E-03	8.353E-03	7.855E-03	7.416E-03	7.129E-03	6.658E-03	6.043E-03
5.461E-03											
%SOLUBILITY	2.665E-03	2.341E-03	2.069E-03	1.886E-03	1.742E-03	1.588E-03	1.493E-03	1.410E-03	1.355E-03	1.266E-03	1.149E-03
1.038E-03											
SOIL AIR	3.909E-03	3.538E-03	3.191E-03	2.914E-03	2.674E-03	2.416E-03	2.203E-03	2.041E-03	1.925E-03	1.780E-03	1.619E-03
1.483E-03											

SUBLAYER 3

MOISTURE	1.423E-02	1.247E-02	1.101E-02	1.002E-02	9.266E-03	8.450E-03	7.959E-03	7.526E-03	7.250E-03	6.773E-03	6.143E-03
5.548E-03											
%SOLUBILITY	2.704E-03	2.371E-03	2.092E-03	1.906E-03	1.762E-03	1.607E-03	1.513E-03	1.431E-03	1.378E-03	1.288E-03	1.168E-03
1.055E-03											
SOIL AIR	3.967E-03	3.583E-03	3.227E-03	2.945E-03	2.704E-03	2.444E-03	2.232E-03	2.071E-03	1.958E-03	1.811E-03	1.645E-03
1.507E-03											

```
 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                                YEAR -    7 ANNUAL SUMMARY REPORT
                                 ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE                0.000E+00
 SOIL ZONE 2                    0.000E+00
 SOIL ZONE 3                    0.000E+00
 LOWER SOIL ZONE                0.000E+00


           -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)              11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)        11.844
 TOTAL PRECIPITATION (CM)                      73.466
 TOTAL INFILTRATION (CM)                       73.460
 TOTAL EVAPOTRANSPIRATION (CM)                 69.004
 TOTAL SURFACE RUNOFF (CM)                      0.000
 TOTAL GRW RUNOFF (CM)                          4.453
 TOTAL MOISTURE RETENTION (CM)                  0.003
 TOTAL YIELD (CM)                               4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
-----------------------------------------------------------------------------------------------------------------------------
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      UPPER SOIL ZONE:

           SUBLAYER  1

                TOTAL VOLATILIZED                1.352E+06

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              1.190E+06

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              8.116E+05

      SOIL ZONE 2:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)              2.699E+05

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              2.374E+05

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              1.987E+05

      SOIL ZONE 3:

           SUBLAYER  1

           SUBLAYER  2

           SUBLAYER  3

      LOWER SOIL ZONE:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)              1.545E+05

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              1.059E+05

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              5.388E+04
                TOTAL IN GROUNDWATER RUNOFF      1.901E+04
1                        -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                         ---------------------------------------------------------------------------------


      UPPER SOIL ZONE:

           SUBLAYER  1
```

SOIL MOISTURE (UG/ML) 2.672E-03
ADSORBED SOIL (UG/G) 7.361E-03
SOIL AIR (UG/ML) 7.556E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 5.023E-03
ADSORBED SOIL (UG/G) 1.384E-02
SOIL AIR (UG/ML) 1.420E-03

SUBLAYER 3

SOIL MOISTURE (UG/ML) 6.625E-03
ADSORBED SOIL (UG/G) 1.825E-02
SOIL AIR (UG/ML) 1.872E-03

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 7.224E-03
SOIL AIR (UG/ML) 2.041E-03

SUBLAYER 2

SOIL MOISTURE (UG/ML) 7.750E-03
SOIL AIR (UG/ML) 2.189E-03

SUBLAYER 3

SOIL MOISTURE (UG/ML) 8.191E-03
SOIL AIR (UG/ML) 2.312E-03

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 8.533E-03
SOIL AIR (UG/ML) 2.409E-03

SUBLAYER 2

SOIL MOISTURE (UG/ML) 8.768E-03
SOIL AIR (UG/ML) 2.474E-03

SUBLAYER 3

SOIL MOISTURE (UG/ML) 8.887E-03
SOIL AIR (UG/ML) 2.508E-03

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR - 8 MONTHLY RESULTS (OUTPUT)
======== ==========

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

```
 LOAD UPPER   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 2 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 3 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD LOWER   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00

 TOTAL INPUT 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------------


      UPPER SOIL ZONE:

            SUBLAYER  1

 VOLATILIZED 5.887E+04 5.370E+04 4.793E+04 4.670E+04 5.211E+04 4.283E+04 3.926E+04 3.058E+04 2.733E+04 2.628E+04 2.569E+04
2.212E+04
 IN SOIL MOI 2.464E+03 2.352E+03 2.264E+03 2.043E+03 1.637E+03 1.567E+03 1.378E+03 1.346E+03 1.220E+03 1.081E+03 9.600E+02
9.252E+02
 ADS ON SOIL 1.057E+05 9.825E+04 9.146E+04 8.465E+04 7.670E+04 6.942E+04 6.277E+04 5.673E+04 5.157E+04 4.734E+04 4.360E+04
4.003E+04
 IN SOIL AIR 1.325E+03 1.252E+03 1.168E+03 1.098E+03 1.051E+03 9.183E+02 8.158E+02 6.959E+02 6.216E+02 5.755E+02 5.404E+02
4.914E+02

            SUBLAYER  2

 DIFFUSED UP 5.293E+04 4.767E+04 4.190E+04 4.032E+04 4.476E+04 3.680E+04 3.401E+04 2.687E+04 2.448E+04 2.375E+04 2.320E+04
1.995E+04
 IN SOIL MOI 4.671E+03 4.425E+03 4.230E+03 3.798E+03 3.039E+03 2.917E+03 2.576E+03 2.541E+03 2.321E+03 2.060E+03 1.825E+03
1.761E+03
 ADS ON SOIL 2.003E+05 1.849E+05 1.709E+05 1.573E+05 1.424E+05 1.293E+05 1.173E+05 1.071E+05 9.810E+04 9.018E+04 8.288E+04
7.617E+04
 IN SOIL AIR 2.513E+03 2.356E+03 2.182E+03 2.041E+03 1.952E+03 1.710E+03 1.525E+03 1.314E+03 1.183E+03 1.096E+03 1.027E+03
9.350E+02

            SUBLAYER  3

 DIFFUSED UP 3.716E+04 3.292E+04 2.823E+04 2.670E+04 2.968E+04 2.424E+04 2.268E+04 1.812E+04 1.692E+04 1.682E+04 1.657E+04
1.413E+04
 IN SOIL MOI 6.214E+03 5.842E+03 5.540E+03 4.952E+03 3.967E+03 3.808E+03 3.380E+03 3.355E+03 3.092E+03 2.757E+03 2.442E+03
2.351E+03
 ADS ON SOIL 2.665E+05 2.441E+05 2.238E+05 2.052E+05 1.859E+05 1.688E+05 1.540E+05 1.414E+05 1.307E+05 1.207E+05 1.109E+05
1.017E+05
 IN SOIL AIR 3.343E+03 3.111E+03 2.858E+03 2.662E+03 2.548E+03 2.232E+03 2.001E+03 1.735E+03 1.575E+03 1.467E+03 1.375E+03
1.248E+03

      SOIL ZONE 2:

            SUBLAYER  1

 DIFFUSED UP 1.321E+04 1.039E+04 7.748E+03 7.507E+03 9.582E+03 6.972E+03 7.662E+03 6.000E+03 6.540E+03 6.981E+03 6.776E+03
5.154E+03
 IN SOIL MOI 7.687E+03 7.134E+03 6.688E+03 5.969E+03 4.810E+03 4.627E+03 4.143E+03 4.146E+03 3.864E+03 3.459E+03 3.054E+03
2.925E+03
 IN SOIL AIR 4.135E+03 3.799E+03 3.450E+03 3.208E+03 3.090E+03 2.712E+03 2.453E+03 2.144E+03 1.969E+03 1.841E+03 1.719E+03
1.554E+03

            SUBLAYER  2

 DIFFUSED UP 1.176E+04 9.218E+03 6.829E+03 6.465E+03 8.182E+03 6.044E+03 6.620E+03 5.301E+03 5.818E+03 6.238E+03 6.042E+03
4.623E+03
 IN SOIL MOI 8.303E+03 7.626E+03 7.083E+03 6.312E+03 5.111E+03 4.922E+03 4.441E+03 4.474E+03 4.211E+03 3.780E+03 3.328E+03
3.175E+03
 IN SOIL AIR 4.466E+03 4.060E+03 3.654E+03 3.392E+03 3.283E+03 2.885E+03 2.629E+03 2.313E+03 2.145E+03 2.012E+03 1.873E+03
1.686E+03

            SUBLAYER  3

 DIFFUSED UP 9.945E+03 7.764E+03 5.719E+03 5.316E+03 6.679E+03 4.993E+03 5.456E+03 4.453E+03 4.919E+03 5.292E+03 5.112E+03
3.931E+03
 IN SOIL MOI 8.820E+03 8.035E+03 7.409E+03 6.595E+03 5.360E+03 5.165E+03 4.689E+03 4.750E+03 4.506E+03 4.054E+03 3.560E+03
3.387E+03
 IN SOIL AIR 4.744E+03 4.278E+03 3.822E+03 3.544E+03 3.443E+03 3.028E+03 2.776E+03 2.456E+03 2.296E+03 2.158E+03 2.004E+03
1.799E+03

      SOIL ZONE 3:

            SUBLAYER  1

            SUBLAYER  2

            SUBLAYER  3

      LOWER SOIL ZONE:

            SUBLAYER  1

 DIFFUSED UP 7.793E+03 6.061E+03 4.444E+03 4.076E+03 5.090E+03 3.839E+03 4.189E+03 3.475E+03 3.862E+03 4.162E+03 4.008E+03
3.093E+03
```

IN SOIL MOI 9.223E+03 8.352E+03 7.661E+03 6.812E+03 5.551E+03 5.352E+03 4.880E+03 4.965E+03 4.739E+03 4.269E+03 3.741E+03
3.553E+03
IN SOIL AIR 4.961E+03 4.447E+03 3.952E+03 3.661E+03 3.566E+03 3.137E+03 2.889E+03 2.567E+03 2.415E+03 2.272E+03 2.106E+03
1.887E+03

SUBLAYER 2

DIFFUSED UP 5.366E+03 4.158E+03 3.039E+03 2.763E+03 3.454E+03 2.608E+03 2.852E+03 2.389E+03 2.670E+03 2.877E+03 2.764E+03
2.136E+03
IN SOIL MOI 9.501E+03 8.568E+03 7.832E+03 6.959E+03 5.681E+03 5.478E+03 5.011E+03 5.113E+03 4.901E+03 4.418E+03 3.866E+03
3.667E+03
IN SOIL AIR 5.110E+03 4.562E+03 4.040E+03 3.740E+03 3.649E+03 3.211E+03 2.967E+03 2.644E+03 2.497E+03 2.352E+03 2.176E+03
1.947E+03

SUBLAYER 3

DIFFUSED UP 2.739E+03 2.115E+03 1.543E+03 1.396E+03 1.744E+03 1.318E+03 1.445E+03 1.221E+03 1.371E+03 1.475E+03 1.411E+03
1.093E+03
IN SOIL MOI 9.642E+03 8.678E+03 7.919E+03 7.034E+03 5.747E+03 5.542E+03 5.077E+03 5.189E+03 4.984E+03 4.495E+03 3.930E+03
3.725E+03
IN SOIL AIR 5.186E+03 4.621E+03 4.085E+03 3.780E+03 3.692E+03 3.249E+03 3.006E+03 2.683E+03 2.539E+03 2.392E+03 2.212E+03
1.978E+03
GWR. RUNOFF 9.006E+02 1.014E+03 1.393E+03 6.779E+02 0.000E+00 0.000E+00 0.000E+00 9.092E+02 9.660E+02 3.889E+02 0.000E+00
4.058E+02

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

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UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 1.432E-03 1.332E-03 1.239E-03 1.147E-03 1.039E-03 9.408E-04 8.506E-04 7.687E-04 6.989E-04 6.415E-04 5.908E-04
5.425E-04
%SOLUBILITY 2.722E-04 2.531E-04 2.356E-04 2.181E-04 1.976E-04 1.789E-04 1.617E-04 1.461E-04 1.329E-04 1.220E-04 1.123E-04
1.031E-04
ADSORBED 3.945E-03 3.668E-03 3.415E-03 3.160E-03 2.864E-03 2.592E-03 2.343E-03 2.118E-03 1.925E-03 1.767E-03 1.628E-03
1.494E-03
SOIL AIR 3.993E-04 3.825E-04 3.634E-04 3.370E-04 3.034E-04 2.721E-04 2.385E-04 2.116E-04 1.887E-04 1.716E-04 1.582E-04
1.474E-04

SUBLAYER 2

MOISTURE 2.715E-03 2.505E-03 2.316E-03 2.132E-03 1.930E-03 1.752E-03 1.590E-03 1.451E-03 1.329E-03 1.222E-03 1.123E-03
1.032E-03
%SOLUBILITY 5.161E-04 4.763E-04 4.403E-04 4.054E-04 3.669E-04 3.331E-04 3.023E-04 2.759E-04 2.527E-04 2.323E-04 2.135E-04
1.962E-04
ADSORBED 7.479E-03 6.902E-03 6.380E-03 5.874E-03 5.317E-03 4.827E-03 4.381E-03 3.999E-03 3.663E-03 3.367E-03 3.094E-03
2.844E-03
SOIL AIR 7.570E-04 7.196E-04 6.790E-04 6.264E-04 5.633E-04 5.067E-04 4.459E-04 3.995E-04 3.590E-04 3.268E-04 3.008E-04
2.804E-04

SUBLAYER 3

MOISTURE 3.612E-03 3.308E-03 3.033E-03 2.780E-03 2.519E-03 2.287E-03 2.087E-03 1.916E-03 1.771E-03 1.636E-03 1.503E-03
1.378E-03
%SOLUBILITY 6.866E-04 6.289E-04 5.767E-04 5.286E-04 4.790E-04 4.348E-04 3.967E-04 3.643E-04 3.366E-04 3.110E-04 2.857E-04
2.620E-04
ADSORBED 9.950E-03 9.114E-03 8.357E-03 7.660E-03 6.941E-03 6.301E-03 5.748E-03 5.280E-03 4.878E-03 4.506E-03 4.141E-03
3.797E-03
SOIL AIR 1.007E-03 9.502E-04 8.894E-04 8.168E-04 7.353E-04 6.615E-04 5.851E-04 5.274E-04 4.782E-04 4.374E-04 4.026E-04
3.744E-04

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 3.971E-03 3.591E-03 3.255E-03 2.979E-03 2.715E-03 2.470E-03 2.273E-03 2.105E-03 1.967E-03 1.824E-03 1.671E-03
1.525E-03
%SOLUBILITY 7.550E-04 6.827E-04 6.188E-04 5.663E-04 5.162E-04 4.695E-04 4.322E-04 4.002E-04 3.740E-04 3.468E-04 3.176E-04
2.899E-04
SOIL AIR 1.107E-03 1.031E-03 9.543E-04 8.750E-04 7.925E-04 7.143E-04 6.375E-04 5.793E-04 5.312E-04 4.878E-04 4.475E-04
4.142E-04

SUBLAYER 2

MOISTURE 4.289E-03 3.838E-03 3.447E-03 3.150E-03 2.885E-03 2.627E-03 2.437E-03 2.271E-03 2.144E-03 1.994E-03 1.820E-03
1.655E-03
%SOLUBILITY 8.154E-04 7.297E-04 6.553E-04 5.989E-04 5.485E-04 4.995E-04 4.633E-04 4.318E-04 4.076E-04 3.790E-04 3.461E-04
3.146E-04
SOIL AIR 1.196E-03 1.102E-03 1.011E-03 9.253E-04 8.421E-04 7.599E-04 6.833E-04 6.251E-04 5.789E-04 5.332E-04 4.876E-04
4.496E-04

SUBLAYER 3

MOISTURE 4.556E-03 4.044E-03 3.606E-03 3.291E-03 3.026E-03 2.757E-03 2.573E-03 2.411E-03 2.294E-03 2.138E-03 1.947E-03
1.765E-03
%SOLUBILITY 8.662E-04 7.688E-04 6.855E-04 6.257E-04 5.753E-04 5.241E-04 4.891E-04 4.584E-04 4.362E-04 4.064E-04 3.702E-04
3.356E-04
SOIL AIR 1.271E-03 1.162E-03 1.057E-03 9.668E-04 8.831E-04 7.974E-04 7.215E-04 6.636E-04 6.195E-04 5.717E-04 5.215E-04
4.795E-04

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	4.765E-03	4.204E-03	3.728E-03	3.400E-03	3.134E-03	2.857E-03	2.678E-03	2.521E-03	2.413E-03	2.252E-03	2.046E-03
1.852E-03											
%SOLUBILITY	9.058E-04	7.992E-04	7.088E-04	6.463E-04	5.958E-04	5.431E-04	5.091E-04	4.792E-04	4.587E-04	4.281E-04	3.891E-04
3.520E-04											
SOIL AIR	1.329E-03	1.207E-03	1.093E-03	9.986E-04	9.147E-04	8.263E-04	7.510E-04	6.937E-04	6.515E-04	6.021E-04	5.481E-04
5.030E-04											

SUBLAYER 2

MOISTURE	4.908E-03	4.313E-03	3.812E-03	3.473E-03	3.207E-03	2.924E-03	2.750E-03	2.596E-03	2.495E-03	2.330E-03	2.115E-03
1.911E-03											
%SOLUBILITY	9.331E-04	8.199E-04	7.246E-04	6.603E-04	6.097E-04	5.559E-04	5.228E-04	4.935E-04	4.744E-04	4.430E-04	4.021E-04
3.633E-04											
SOIL AIR	1.369E-03	1.239E-03	1.118E-03	1.020E-03	9.361E-04	8.458E-04	7.711E-04	7.144E-04	6.738E-04	6.231E-04	5.664E-04
5.191E-04											

SUBLAYER 3

MOISTURE	4.981E-03	4.368E-03	3.854E-03	3.510E-03	3.244E-03	2.958E-03	2.786E-03	2.634E-03	2.538E-03	2.371E-03	2.150E-03
1.942E-03											
%SOLUBILITY	9.469E-04	8.304E-04	7.327E-04	6.673E-04	6.168E-04	5.624E-04	5.297E-04	5.008E-04	4.824E-04	4.507E-04	4.087E-04
3.691E-04											
SOIL AIR	1.389E-03	1.255E-03	1.130E-03	1.031E-03	9.469E-04	8.557E-04	7.813E-04	7.251E-04	6.852E-04	6.339E-04	5.758E-04
5.274E-04											

POL DEP CM	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02
3.900E+02											

1 YEAR - 8 ANNUAL SUMMARY REPORT

-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 4.734E+05

SUBLAYER 2

TOTAL DIFFUSED (UP) 4.166E+05

SUBLAYER 3

TOTAL DIFFUSED (UP) 2.842E+05

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 9.451E+04

SUBLAYER 2

TOTAL DIFFUSED (UP) 8.314E+04

SUBLAYER 3

TOTAL DIFFUSED (UP) 6.958E+04

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 5.409E+04

SUBLAYER 2

TOTAL DIFFUSED (UP) 3.708E+04

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.887E+04
TOTAL IN GROUNDWATER RUNOFF 6.655E+03

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	9.353E-04
ADSORBED SOIL (UG/G)	2.577E-03
SOIL AIR (UG/ML)	2.645E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.758E-03
ADSORBED SOIL (UG/G)	4.844E-03
SOIL AIR (UG/ML)	4.970E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.319E-03
ADSORBED SOIL (UG/G)	6.389E-03
SOIL AIR (UG/ML)	6.554E-04

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	2.529E-03
SOIL AIR (UG/ML)	7.144E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML)	2.713E-03
SOIL AIR (UG/ML)	7.662E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.867E-03
SOIL AIR (UG/ML)	8.095E-04

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	2.987E-03
SOIL AIR (UG/ML)	8.432E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML)	3.069E-03
SOIL AIR (UG/ML)	8.662E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML)	3.111E-03
SOIL AIR (UG/ML)	8.780E-04

1 MAX. POLL. DEPTH (M) 3.900E+00

YEAR - 9 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	2.060E+04	1.879E+04	1.677E+04	1.634E+04	1.824E+04	1.499E+04	1.374E+04	1.070E+04	9.563E+03	9.196E+03	8.990E+03	7.742E+03
IN SOIL MOI	8.623E+02	8.230E+02	7.923E+02	7.150E+02	5.728E+02	5.482E+02	4.822E+02	4.710E+02	4.270E+02	3.784E+02	3.360E+02	3.238E+02
ADS ON SOIL	3.698E+04	3.439E+04	3.201E+04	2.962E+04	2.684E+04	2.429E+04	2.196E+04	1.985E+04	1.805E+04	1.657E+04	1.526E+04	1.401E+04
IN SOIL AIR	4.639E+02	4.382E+02	4.087E+02	3.843E+02	3.679E+02	3.214E+02	2.855E+02	2.435E+02	2.175E+02	2.014E+02	1.891E+02	1.720E+02

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.852E+04	1.668E+04	1.466E+04	1.411E+04	1.566E+04	1.288E+04	1.190E+04	9.405E+03	8.567E+03	8.313E+03	8.120E+03	6.984E+03
IN SOIL MOI	1.635E+03	1.548E+03	1.480E+03	1.329E+03	1.063E+03	1.021E+03	9.014E+02	8.893E+02	8.123E+02	7.209E+02	6.388E+02	6.163E+02
ADS ON SOIL	7.010E+04	6.469E+04	5.980E+04	5.505E+04	4.983E+04	4.524E+04	4.106E+04	3.748E+04	3.433E+04	3.156E+04	2.901E+04	2.666E+04
IN SOIL AIR	8.793E+02	8.245E+02	7.635E+02	7.142E+02	6.831E+02	5.984E+02	5.337E+02	4.598E+02	4.139E+02	3.837E+02	3.596E+02	3.273E+02

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.300E+04	1.151E+04	9.871E+03	9.337E+03	1.038E+04	8.480E+03	7.933E+03	6.340E+03	5.920E+03	5.885E+03	5.801E+03	4.945E+03
IN SOIL MOI	2.174E+03	2.044E+03	1.938E+03	1.733E+03	1.388E+03	1.333E+03	1.183E+03	1.174E+03	1.082E+03	9.648E+02	8.548E+02	8.228E+02
ADS ON SOIL	9.325E+04	8.541E+04	7.831E+04	7.178E+04	6.504E+04	5.905E+04	5.388E+04	4.948E+04	4.573E+04	4.224E+04	3.882E+04	3.560E+04
IN SOIL AIR	1.170E+03	1.088E+03	9.999E+02	9.312E+02	8.916E+02	7.811E+02	7.002E+02	6.071E+02	5.512E+02	5.135E+02	4.812E+02	4.370E+02

SOIL ZONE 2:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	4.621E+03	3.634E+03	2.710E+03	2.626E+03	3.351E+03	2.438E+03	2.679E+03	2.099E+03	2.288E+03	2.443E+03	2.371E+03	1.804E+03
IN SOIL MOI	2.690E+03	2.496E+03	2.340E+03	2.088E+03	1.683E+03	1.619E+03	1.450E+03	1.451E+03	1.352E+03	1.211E+03	1.069E+03	1.024E+03
IN SOIL AIR	1.447E+03	1.329E+03	1.207E+03	1.122E+03	1.081E+03	9.489E+02	8.583E+02	7.501E+02	6.890E+02	6.443E+02	6.018E+02	5.438E+02

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	4.116E+03	3.225E+03	2.389E+03	2.261E+03	2.861E+03	2.113E+03	2.315E+03	1.854E+03	2.035E+03	2.183E+03	2.115E+03	1.618E+03
IN SOIL MOI	2.905E+03	2.668E+03	2.478E+03	2.208E+03	1.788E+03	1.722E+03	1.554E+03	1.566E+03	1.474E+03	1.323E+03	1.165E+03	1.112E+03
IN SOIL AIR	1.563E+03	1.421E+03	1.278E+03	1.187E+03	1.149E+03	1.009E+03	9.200E+02	8.094E+02	7.508E+02	7.042E+02	6.557E+02	

5.903E+02

SUBLAYER 3

DIFFUSED UP 3.480E+03 2.717E+03 2.001E+03 1.860E+03 2.335E+03 1.745E+03 1.908E+03 1.558E+03 1.721E+03 1.852E+03 1.789E+03
1.376E+03
IN SOIL MOI 3.086E+03 2.811E+03 2.592E+03 2.307E+03 1.875E+03 1.807E+03 1.640E+03 1.662E+03 1.577E+03 1.419E+03 1.246E+03
1.185E+03
IN SOIL AIR 1.660E+03 1.497E+03 1.337E+03 1.240E+03 1.204E+03 1.059E+03 9.712E+02 8.593E+02 8.034E+02 7.551E+02 7.013E+02
6.296E+02

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 2.727E+03 2.121E+03 1.555E+03 1.426E+03 1.780E+03 1.342E+03 1.465E+03 1.215E+03 1.351E+03 1.456E+03 1.403E+03
1.083E+03
IN SOIL MOI 3.227E+03 2.922E+03 2.680E+03 2.383E+03 1.942E+03 1.872E+03 1.708E+03 1.737E+03 1.658E+03 1.494E+03 1.309E+03
1.244E+03
IN SOIL AIR 1.736E+03 1.556E+03 1.383E+03 1.281E+03 1.247E+03 1.097E+03 1.011E+03 8.982E+02 8.449E+02 7.952E+02 7.371E+02
6.604E+02

SUBLAYER 2

DIFFUSED UP 1.878E+03 1.455E+03 1.063E+03 9.664E+02 1.208E+03 9.115E+02 9.968E+02 8.355E+02 9.340E+02 1.007E+03 9.671E+02
7.477E+02
IN SOIL MOI 3.324E+03 2.998E+03 2.740E+03 2.435E+03 1.987E+03 1.916E+03 1.753E+03 1.789E+03 1.715E+03 1.546E+03 1.353E+03
1.284E+03
IN SOIL AIR 1.788E+03 1.596E+03 1.413E+03 1.308E+03 1.277E+03 1.123E+03 1.038E+03 9.250E+02 8.738E+02 8.230E+02 7.617E+02
6.816E+02

SUBLAYER 3

DIFFUSED UP 9.586E+02 7.400E+02 5.400E+02 4.885E+02 6.098E+02 4.605E+02 5.049E+02 4.270E+02 4.798E+02 5.160E+02 4.937E+02
3.825E+02
IN SOIL MOI 3.374E+03 3.036E+03 2.770E+03 2.461E+03 2.010E+03 1.939E+03 1.776E+03 1.816E+03 1.744E+03 1.573E+03 1.375E+03
1.304E+03
IN SOIL AIR 1.815E+03 1.617E+03 1.429E+03 1.322E+03 1.291E+03 1.136E+03 1.052E+03 9.388E+02 8.886E+02 8.372E+02 7.742E+02
6.925E+02
GWR. RUNOFF 3.152E+02 3.548E+02 4.874E+02 2.372E+02 0.000E+00 0.000E+00 0.000E+00 3.181E+02 3.380E+02 1.361E+02 0.000E+00
1.420E+02

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 5.011E-04 4.660E-04 4.338E-04 4.014E-04 3.638E-04 3.292E-04 2.976E-04 2.690E-04 2.446E-04 2.245E-04 2.068E-04
1.899E-04
%SOLUBILITY 9.527E-05 8.859E-05 8.247E-05 7.632E-05 6.916E-05 6.259E-05 5.659E-05 5.114E-05 4.649E-05 4.268E-05 3.931E-05
3.610E-05
ADSORBED 1.381E-03 1.284E-03 1.195E-03 1.106E-03 1.002E-03 9.070E-04 8.200E-04 7.411E-04 6.738E-04 6.185E-04 5.696E-04
5.231E-04
SOIL AIR 1.397E-04 1.339E-04 1.272E-04 1.179E-04 1.062E-04 9.522E-05 8.346E-05 7.404E-05 6.604E-05 6.004E-05 5.538E-05
5.157E-05

SUBLAYER 2

MOISTURE 9.500E-04 8.767E-04 8.104E-04 7.461E-04 6.754E-04 6.131E-04 5.565E-04 5.079E-04 4.653E-04 4.277E-04 3.931E-04
3.613E-04
%SOLUBILITY 1.806E-04 1.667E-04 1.541E-04 1.418E-04 1.284E-04 1.165E-04 1.058E-04 9.656E-05 8.845E-05 8.131E-05 7.474E-05
6.869E-05
ADSORBED 2.617E-03 2.415E-03 2.233E-03 2.056E-03 1.861E-03 1.689E-03 1.533E-03 1.399E-03 1.282E-03 1.178E-03 1.083E-03
9.954E-04
SOIL AIR 2.649E-04 2.518E-04 2.376E-04 2.192E-04 1.971E-04 1.773E-04 1.560E-04 1.398E-04 1.256E-04 1.144E-04 1.053E-04
9.815E-05

SUBLAYER 3

MOISTURE 1.264E-03 1.157E-03 1.061E-03 9.727E-04 8.815E-04 8.002E-04 7.301E-04 6.706E-04 6.197E-04 5.724E-04 5.260E-04
4.824E-04
%SOLUBILITY 2.403E-04 2.200E-04 2.018E-04 1.849E-04 1.676E-04 1.521E-04 1.388E-04 1.275E-04 1.178E-04 1.088E-04 1.000E-04
9.171E-05
ADSORBED 3.482E-03 3.189E-03 2.924E-03 2.680E-03 2.428E-03 2.205E-03 2.012E-03 1.848E-03 1.707E-03 1.577E-03 1.449E-03
1.329E-03
SOIL AIR 3.524E-04 3.325E-04 3.112E-04 2.857E-04 2.573E-04 2.315E-04 2.047E-04 1.846E-04 1.673E-04 1.531E-04 1.409E-04
1.310E-04

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 1.390E-03 1.256E-03 1.139E-03 1.042E-03 9.500E-04 8.641E-04 7.955E-04 7.366E-04 6.885E-04 6.385E-04 5.848E-04
5.337E-04
%SOLUBILITY 2.642E-04 2.389E-04 2.165E-04 1.981E-04 1.806E-04 1.643E-04 1.512E-04 1.400E-04 1.309E-04 1.214E-04 1.112E-04
1.015E-04
SOIL AIR 3.875E-04 3.609E-04 3.339E-04 3.061E-04 2.773E-04 2.499E-04 2.231E-04 2.027E-04 1.859E-04 1.707E-04 1.566E-04
1.450E-04

SUBLAYER 2

MOISTURE 1.501E-03 1.343E-03 1.206E-03 1.102E-03 1.009E-03 9.192E-04 8.527E-04 7.948E-04 7.502E-04 6.977E-04 6.372E-04
5.793E-04
%SOLUBILITY 2.853E-04 2.553E-04 2.293E-04 2.095E-04 1.919E-04 1.747E-04 1.621E-04 1.511E-04 1.426E-04 1.327E-04 1.211E-04
1.101E-04
SOIL AIR 4.185E-04 3.857E-04 3.536E-04 3.237E-04 2.946E-04 2.659E-04 2.391E-04 2.187E-04 2.026E-04 1.866E-04 1.707E-04
1.574E-04

SUBLAYER 3

MOISTURE 1.594E-03 1.415E-03 1.262E-03 1.151E-03 1.059E-03 9.646E-04 9.002E-04 8.437E-04 8.028E-04 7.482E-04 6.815E-04
6.178E-04
%SOLUBILITY 3.031E-04 2.690E-04 2.398E-04 2.189E-04 2.012E-04 1.834E-04 1.711E-04 1.604E-04 1.526E-04 1.422E-04 1.296E-04
1.175E-04
SOIL AIR 4.446E-04 4.064E-04 3.699E-04 3.382E-04 3.090E-04 2.790E-04 2.524E-04 2.322E-04 2.168E-04 2.001E-04 1.825E-04
1.678E-04

SOIL ZONE 3.

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 1.667E-03 1.471E-03 1.304E-03 1.189E-03 1.096E-03 9.994E-04 9.370E-04 8.820E-04 8.444E-04 7.880E-04 7.163E-04
6.481E-04
%SOLUBILITY 3.170E-04 2.796E-04 2.480E-04 2.261E-04 2.084E-04 1.900E-04 1.781E-04 1.677E-04 1.605E-04 1.498E-04 1.362E-04
1.232E-04
SOIL AIR 4.649E-04 4.225E-04 3.825E-04 3.494E-04 3.200E-04 2.891E-04 2.627E-04 2.427E-04 2.280E-04 2.107E-04 1.918E-04
1.760E-04

SUBLAYER 2

MOISTURE 1.717E-03 1.509E-03 1.333E-03 1.215E-03 1.122E-03 1.023E-03 9.621E-04 9.083E-04 8.732E-04 8.155E-04 7.402E-04
6.689E-04
%SOLUBILITY 3.265E-04 2.869E-04 2.535E-04 2.310E-04 2.133E-04 1.945E-04 1.829E-04 1.727E-04 1.660E-04 1.550E-04 1.407E-04
1.272E-04
SOIL AIR 4.789E-04 4.334E-04 3.910E-04 3.569E-04 3.275E-04 2.959E-04 2.698E-04 2.500E-04 2.358E-04 2.181E-04 1.983E-04
1.817E-04

SUBLAYER 3

MOISTURE 1.743E-03 1.528E-03 1.348E-03 1.228E-03 1.135E-03 1.035E-03 9.748E-04 9.218E-04 8.880E-04 8.296E-04 7.524E-04
6.796E-04
%SOLUBILITY 3.313E-04 2.905E-04 2.563E-04 2.335E-04 2.158E-04 1.968E-04 1.853E-04 1.752E-04 1.688E-04 1.577E-04 1.430E-04
1.292E-04
SOIL AIR 4.860E-04 4.390E-04 3.953E-04 3.607E-04 3.312E-04 2.993E-04 2.733E-04 2.537E-04 2.398E-04 2.219E-04 2.015E-04
1.846E-04

POL DEP CM 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1 YEAR - 9 ANNUAL SUMMARY REPORT
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-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

```
        SUBLAYER  1

            TOTAL VOLATILIZED                    1.657E+05

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                  1.458E+05

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                  9.941E+04

    SOIL ZONE 2:

        SUBLAYER  1

            TOTAL DIFFUSED (UP)                  3.306E+04

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                  2.909E+04

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                  2.434E+04

    SOIL ZONE 3:

        SUBLAYER  1

        SUBLAYER  2

        SUBLAYER  3

    LOWER SOIL ZONE:

        SUBLAYER  1

            TOTAL DIFFUSED (UP)                  1.892E+04

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                  1.297E+04

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                  6.601E+03
            TOTAL IN GROUNDWATER RUNOFF          2.329E+03
1                   -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                    ----------------------------------------------------------------------------------

    UPPER SOIL ZONE:

        SUBLAYER  1

                                    SOIL MOISTURE (UG/ML)  3.273E-04
                                    ADSORBED SOIL (UG/G)   9.017E-04
                                    SOIL AIR (UG/ML)       9.255E-05

        SUBLAYER  2

                                    SOIL MOISTURE (UG/ML)  6.153E-04
                                    ADSORBED SOIL (UG/G)   1.695E-03
                                    SOIL AIR (UG/ML)       1.739E-04

        SUBLAYER  3

                                    SOIL MOISTURE (UG/ML)  8.115E-04
                                    ADSORBED SOIL (UG/G)   2.236E-03
                                    SOIL AIR (UG/ML)       2.293E-04

    SOIL ZONE 2:

        SUBLAYER  1

                                    SOIL MOISTURE (UG/ML)  8.848E-04
                                    SOIL AIR (UG/ML)       2.500E-04

        SUBLAYER  2

                                    SOIL MOISTURE (UG/ML)  9.493E-04
                                    SOIL AIR (UG/ML)       2.681E-04

        SUBLAYER  3

                                    SOIL MOISTURE (UG/ML)  1.003E-03
                                    SOIL AIR (UG/ML)       2.832E-04

    SOIL ZONE 3:

    LOWER SOIL ZONE:
```

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.045E-03
SOIL AIR (UG/ML) 2.950E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.074E-03
SOIL AIR (UG/ML) 3.031E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.089E-03
SOIL AIR (UG/ML) 3.072E-04

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -10 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	7.211E+03	6.578E+03	5.872E+03	5.720E+03	6.384E+03	5.247E+03	4.810E+03	3.745E+03	3.348E+03	3.219E+03	3.147E+03	2.710E+03
IN SOIL MOI	3.018E+02	2.881E+02	2.773E+02	2.503E+02	2.005E+02	1.919E+02	1.688E+02	1.649E+02	1.495E+02	1.325E+02	1.176E+02	1.134E+02
ADS ON SOIL	1.294E+04	1.204E+04	1.120E+04	1.037E+04	9.396E+03	8.504E+03	7.688E+03	6.949E+03	6.317E+03	5.799E+03	5.341E+03	4.904E+03
IN SOIL AIR	1.624E+02	1.534E+02	1.431E+02	1.345E+02	1.288E+02	1.125E+02	9.992E+01	8.525E+01	7.615E+01	7.050E+01	6.621E+01	6.020E+01

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	6.483E+03	5.840E+03	5.132E+03	4.938E+03	5.483E+03	4.508E+03	4.167E+03	3.292E+03	2.999E+03	2.910E+03	2.842E+03	2.444E+03
IN SOIL MOI	5.722E+02	5.420E+02	5.181E+02	4.652E+02	3.723E+02	3.574E+02	3.156E+02	3.113E+02	2.844E+02	2.523E+02	2.236E+02	2.157E+02
ADS ON SOIL	2.454E+04	2.265E+04	2.093E+04	1.927E+04	1.745E+04	1.584E+04	1.437E+04	1.312E+04	1.202E+04	1.105E+04	1.015E+04	9.332E+03
IN SOIL AIR	3.078E+02	2.886E+02	2.673E+02	2.500E+02	2.391E+02	2.095E+02	1.868E+02	1.610E+02	1.449E+02	1.343E+02	1.259E+02	

1.146E+02

SUBLAYER 3

DIFFUSED UP 4.552E+03 4.032E+03 3.458E+03 3.271E+03 3.636E+03 2.970E+03 2.778E+03 2.220E+03 2.073E+03 2.060E+03 2.031E+03
1.731E+03
IN SOIL MOI 7.612E+02 7.156E+02 6.787E+02 6.066E+02 4.859E+02 4.665E+02 4.141E+02 4.111E+02 3.787E+02 3.377E+02 2.992E+02
2.880E+02
ADS ON SOIL 3.264E+04 2.990E+04 2.742E+04 2.513E+04 2.277E+04 2.067E+04 1.886E+04 1.732E+04 1.601E+04 1.479E+04 1.359E+04
1.246E+04
IN SOIL AIR 4.095E+02 3.811E+02 3.501E+02 3.260E+02 3.122E+02 2.735E+02 2.452E+02 2.125E+02 1.930E+02 1.798E+02 1.684E+02
1.529E+02

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP 1.618E+03 1.272E+03 9.490E+02 9.196E+02 1.174E+03 8.542E+02 9.386E+02 7.351E+02 8.013E+02 8.552E+02 8.302E+02
6.315E+02
IN SOIL MOI 9.416E+02 8.739E+02 8.193E+02 7.312E+02 5.892E+02 5.668E+02 5.076E+02 5.079E+02 4.734E+02 4.238E+02 3.742E+02
3.584E+02
IN SOIL AIR 5.065E+02 4.653E+02 4.226E+02 3.930E+02 3.785E+02 3.322E+02 3.005E+02 2.626E+02 2.412E+02 2.256E+02 2.106E+02
1.903E+02

SUBLAYER 2

DIFFUSED UP 1.441E+03 1.129E+03 8.365E+02 7.919E+02 1.002E+03 7.404E+02 8.110E+02 6.494E+02 7.128E+02 7.642E+02 7.403E+02
5.665E+02
IN SOIL MOI 1.017E+03 9.341E+02 8.676E+02 7.732E+02 6.261E+02 6.029E+02 5.440E+02 5.481E+02 5.159E+02 4.631E+02 4.077E+02
3.891E+02
IN SOIL AIR 5.471E+02 4.974E+02 4.476E+02 4.156E+02 4.022E+02 3.534E+02 3.221E+02 2.834E+02 2.628E+02 2.465E+02 2.295E+02
2.066E+02

SUBLAYER 3

DIFFUSED UP 1.218E+03 9.510E+02 7.005E+02 6.512E+02 8.182E+02 6.117E+02 6.684E+02 5.456E+02 6.027E+02 6.483E+02 6.264E+02
4.816E+02
IN SOIL MOI 1.080E+03 9.842E+02 9.076E+02 8.079E+02 6.566E+02 6.327E+02 5.744E+02 5.819E+02 5.520E+02 4.966E+02 4.361E+02
4.150E+02
IN SOIL AIR 5.811E+02 5.241E+02 4.682E+02 4.342E+02 4.218E+02 3.709E+02 3.401E+02 3.008E+02 2.813E+02 2.643E+02 2.455E+02
2.204E+02

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 9.545E+02 7.424E+02 5.444E+02 4.993E+02 6.235E+02 4.703E+02 5.133E+02 4.257E+02 4.731E+02 5.099E+02 4.910E+02
3.790E+02
IN SOIL MOI 1.130E+03 1.023E+03 9.384E+02 8.345E+02 6.800E+02 6.556E+02 5.979E+02 6.082E+02 5.806E+02 5.230E+02 4.583E+02
4.353E+02
IN SOIL AIR 6.077E+02 5.447E+02 4.841E+02 4.485E+02 4.368E+02 3.843E+02 3.540E+02 3.145E+02 2.958E+02 2.784E+02 2.580E+02
2.312E+02

SUBLAYER 2

DIFFUSED UP 6.572E+02 5.093E+02 3.723E+02 3.384E+02 4.231E+02 3.194E+02 3.494E+02 2.927E+02 3.271E+02 3.525E+02 3.386E+02
2.617E+02
IN SOIL MOI 1.164E+03 1.050E+03 9.594E+02 8.525E+02 6.959E+02 6.711E+02 6.139E+02 6.264E+02 6.004E+02 5.413E+02 4.736E+02
4.493E+02
IN SOIL AIR 6.260E+02 5.589E+02 4.949E+02 4.582E+02 4.471E+02 3.934E+02 3.635E+02 3.239E+02 3.059E+02 2.881E+02 2.666E+02
2.386E+02

SUBLAYER 3

DIFFUSED UP 3.355E+02 2.590E+02 1.890E+02 1.710E+02 2.136E+02 1.614E+02 1.769E+02 1.496E+02 1.680E+02 1.807E+02 1.728E+02
1.339E+02
IN SOIL MOI 1.181E+03 1.063E+03 9.700E+02 8.616E+02 7.040E+02 6.789E+02 6.220E+02 6.357E+02 6.106E+02 5.507E+02 4.814E+02
4.564E+02
IN SOIL AIR 6.353E+02 5.660E+02 5.004E+02 4.631E+02 4.522E+02 3.980E+02 3.683E+02 3.287E+02 3.111E+02 2.931E+02 2.710E+02
2.424E+02
GWR. RUNOFF 1.103E+02 1.242E+02 1.706E+02 8.304E+01 0.000E+00 0.000E+00 0.000E+00 1.114E+02 1.183E+02 4.765E+01 0.000E+00
4.972E+01

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

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UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 1.754E-04 1.631E-04 1.518E-04 1.405E-04 1.273E-04 1.152E-04 1.042E-04 9.417E-05 8.561E-05 7.859E-05 7.238E-05
6.646E-05

```
 %SOLUBILITY 3.335E-05 3.101E-05 2.886E-05 2.672E-05 2.421E-05 2.191E-05 1.981E-05 1.790E-05 1.628E-05 1.494E-05 1.376E-05
1.263E-05
 ADSORBED     4.832E-04 4.494E-04 4.183E-04 3.871E-04 3.508E-04 3.175E-04 2.870E-04 2.594E-04 2.359E-04 2.165E-04 1.994E-04
1.831E-04
 SOIL AIR     4.891E-05 4.685E-05 4.452E-05 4.128E-05 3.717E-05 3.333E-05 2.922E-05 2.592E-05 2.312E-05 2.102E-05 1.939E-05
1.805E-05

          SUBLAYER  2

 MOISTURE     3.325E-04 3.069E-04 2.837E-04 2.612E-04 2.364E-04 2.146E-04 1.948E-04 1.778E-04 1.629E-04 1.497E-04 1.376E-04
1.265E-04
 %SOLUBILITY 6.322E-05 5.834E-05 5.393E-05 4.966E-05 4.495E-05 4.080E-05 3.703E-05 3.380E-05 3.096E-05 2.846E-05 2.616E-05
2.404E-05
 ADSORBED     9.161E-04 8.455E-04 7.815E-04 7.196E-04 6.514E-04 5.913E-04 5.367E-04 4.899E-04 4.487E-04 4.125E-04 3.791E-04
3.484E-04
 SOIL AIR     9.272E-05 8.815E-05 8.318E-05 7.673E-05 6.901E-05 6.208E-05 5.463E-05 4.894E-05 4.398E-05 4.004E-05 3.686E-05
3.435E-05

          SUBLAYER  3

 MOISTURE     4.424E-04 4.052E-04 3.716E-04 3.406E-04 3.086E-04 2.802E-04 2.556E-04 2.348E-04 2.169E-04 2.004E-04 1.841E-04
1.689E-04
 %SOLUBILITY 8.410E-05 7.704E-05 7.064E-05 6.475E-05 5.867E-05 5.326E-05 4.860E-05 4.463E-05 4.124E-05 3.810E-05 3.501E-05
3.210E-05
 ADSORBED     1.219E-03 1.116E-03 1.024E-03 9.383E-04 8.502E-04 7.718E-04 7.042E-04 6.468E-04 5.976E-04 5.521E-04 5.073E-04
4.652E-04
 SOIL AIR     1.234E-04 1.164E-04 1.089E-04 1.001E-04 9.008E-05 8.104E-05 7.168E-05 6.461E-05 5.858E-05 5.359E-05 4.932E-05
4.587E-05

     SOIL ZONE 2:

          SUBLAYER  1

 MOISTURE     4.864E-04 4.398E-04 3.987E-04 3.649E-04 3.326E-04 3.025E-04 2.785E-04 2.579E-04 2.410E-04 2.235E-04 2.047E-04
1.868E-04
 %SOLUBILITY 9.247E-05 8.362E-05 7.580E-05 6.937E-05 6.323E-05 5.752E-05 5.295E-05 4.902E-05 4.582E-05 4.249E-05 3.891E-05
3.551E-05
 SOIL AIR     1.356E-04 1.263E-04 1.169E-04 1.072E-04 9.708E-05 8.751E-05 7.810E-05 7.097E-05 6.508E-05 5.977E-05 5.482E-05
5.074E-05

          SUBLAYER  2

 MOISTURE     5.254E-04 4.701E-04 4.222E-04 3.859E-04 3.534E-04 3.218E-04 2.985E-04 2.783E-04 2.626E-04 2.443E-04 2.230E-04
2.028E-04
 %SOLUBILITY 9.988E-05 8.938E-05 8.027E-05 7.336E-05 6.719E-05 6.119E-05 5.676E-05 5.290E-05 4.993E-05 4.644E-05 4.240E-05
3.855E-05
 SOIL AIR     1.465E-04 1.350E-04 1.238E-04 1.134E-04 1.032E-04 9.309E-05 8.371E-05 7.658E-05 7.092E-05 6.532E-05 5.974E-05
5.508E-05

          SUBLAYER  3

 MOISTURE     5.581E-04 4.954E-04 4.417E-04 4.032E-04 3.707E-04 3.377E-04 3.152E-04 2.954E-04 2.811E-04 2.619E-04 2.386E-04
2.163E-04
 %SOLUBILITY 1.061E-04 9.418E-05 8.397E-05 7.665E-05 7.047E-05 6.421E-05 5.992E-05 5.616E-05 5.343E-05 4.980E-05 4.535E-05
4.111E-05
 SOIL AIR     1.556E-04 1.423E-04 1.295E-04 1.184E-04 1.082E-04 9.769E-05 8.838E-05 8.130E-05 7.589E-05 7.004E-05 6.390E-05
5.875E-05

     SOIL ZONE 3:

     LOWER SOIL ZONE:

          SUBLAYER  1

 MOISTURE     5.836E-04 5.149E-04 4.567E-04 4.164E-04 3.839E-04 3.499E-04 3.281E-04 3.088E-04 2.956E-04 2.758E-04 2.507E-04
2.268E-04
 %SOLUBILITY 1.110E-04 9.789E-05 8.682E-05 7.917E-05 7.299E-05 6.653E-05 6.237E-05 5.870E-05 5.620E-05 5.244E-05 4.767E-05
4.313E-05
 SOIL AIR     1.627E-04 1.479E-04 1.339E-04 1.223E-04 1.120E-04 1.012E-04 9.200E-05 8.499E-05 7.982E-05 7.377E-05 6.716E-05
6.162E-05

          SUBLAYER  2

 MOISTURE     6.012E-04 5.283E-04 4.669E-04 4.254E-04 3.929E-04 3.582E-04 3.369E-04 3.180E-04 3.057E-04 2.855E-04 2.591E-04
2.341E-04
 %SOLUBILITY 1.143E-04 1.004E-04 8.876E-05 8.088E-05 7.469E-05 6.810E-05 6.404E-05 6.046E-05 5.812E-05 5.427E-05 4.926E-05
4.451E-05
 SOIL AIR     1.676E-04 1.517E-04 1.369E-04 1.250E-04 1.147E-04 1.036E-04 9.446E-05 8.753E-05 8.255E-05 7.634E-05 6.940E-05
6.360E-05

          SUBLAYER  3

 MOISTURE     6.101E-04 5.350E-04 4.721E-04 4.300E-04 3.974E-04 3.624E-04 3.413E-04 3.227E-04 3.109E-04 2.904E-04 2.634E-04
2.379E-04
 %SOLUBILITY 1.160E-04 1.017E-04 8.975E-05 8.175E-05 7.556E-05 6.890E-05 6.489E-05 6.136E-05 5.910E-05 5.521E-05 5.007E-05
4.522E-05
 SOIL AIR     1.701E-04 1.537E-04 1.384E-04 1.263E-04 1.160E-04 1.048E-04 9.571E-05 8.883E-05 8.395E-05 7.766E-05 7.054E-05
6.462E-05


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                         YEAR -  10 ANNUAL SUMMARY REPORT
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-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 5.799E+04

SUBLAYER 2

TOTAL DIFFUSED (UP) 5.104E+04

SUBLAYER 3

TOTAL DIFFUSED (UP) 3.481E+04

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 1.158E+04

SUBLAYER 2

TOTAL DIFFUSED (UP) 1.019E+04

SUBLAYER 3

TOTAL DIFFUSED (UP) 8.524E+03

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 6.626E+03

SUBLAYER 2

TOTAL DIFFUSED (UP) 4.542E+03

SUBLAYER 3

TOTAL DIFFUSED (UP) 2.312E+03
TOTAL IN GROUNDWATER RUNOFF 8.153E+02

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.146E-04
ADSORBED SOIL (UG/G)	3.156E-04
SOIL AIR (UG/ML)	3.240E-05

SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.154E-04
ADSORBED SOIL (UG/G) 5.934E-04
SOIL AIR (UG/ML) 6.089E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML) 2.841E-04
ADSORBED SOIL (UG/G) 7.827E-04
SOIL AIR (UG/ML) 8.029E-05

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 3.098E-04
SOIL AIR (UG/ML) 8.751E-05

SUBLAYER 2

SOIL MOISTURE (UG/ML) 3.324E-04
SOIL AIR (UG/ML) 9.386E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML) 3.513E-04
SOIL AIR (UG/ML) 9.917E-05

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 3.660E-04
SOIL AIR (UG/ML) 1.033E-04

SUBLAYER 2

SOIL MOISTURE (UG/ML) 3.760E-04
SOIL AIR (UG/ML) 1.061E-04

SUBLAYER 3

SOIL MOISTURE (UG/ML) 3.811E-04
SOIL AIR (UG/ML) 1.076E-04

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -11 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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 LOAD LOWER   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00

 TOTAL INPUT 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------------

      UPPER SOIL ZONE:

            SUBLAYER  1

 VOLATILIZED 2.524E+03 2.303E+03 2.055E+03 2.002E+03 2.234E+03 1.836E+03 1.683E+03 1.311E+03 1.172E+03 1.127E+03 1.102E+03
9.487E+02
 IN SOIL MOI 1.056E+02 1.008E+02 9.707E+01 8.760E+01 7.018E+01 6.717E+01 5.908E+01 5.771E+01 5.232E+01 4.636E+01 4.117E+01
3.968E+01
 ADS ON SOIL 4.531E+03 4.213E+03 3.921E+03 3.629E+03 3.289E+03 2.976E+03 2.691E+03 2.432E+03 2.211E+03 2.030E+03 1.870E+03
1.717E+03
 IN SOIL AIR 5.683E+01 5.369E+01 5.007E+01 4.708E+01 4.508E+01 3.937E+01 3.498E+01 2.984E+01 2.665E+01 2.468E+01 2.317E+01
2.107E+01

            SUBLAYER  2

 DIFFUSED UP 2.269E+03 2.043E+03 1.796E+03 1.728E+03 1.919E+03 1.578E+03 1.458E+03 1.152E+03 1.050E+03 1.019E+03 9.949E+02
8.557E+02
 IN SOIL MOI 2.003E+02 1.897E+02 1.813E+02 1.628E+02 1.303E+02 1.251E+02 1.104E+02 1.090E+02 9.953E+01 8.832E+01 7.827E+01
7.551E+01
 ADS ON SOIL 8.588E+03 7.925E+03 7.326E+03 6.745E+03 6.106E+03 5.542E+03 5.031E+03 4.592E+03 4.207E+03 3.867E+03 3.554E+03
3.267E+03
 IN SOIL AIR 1.077E+02 1.010E+02 9.354E+01 8.751E+01 8.369E+01 7.332E+01 6.539E+01 5.634E+01 5.071E+01 4.701E+01 4.406E+01
4.010E+01

            SUBLAYER  3

 DIFFUSED UP 1.593E+03 1.411E+03 1.210E+03 1.144E+03 1.272E+03 1.039E+03 9.719E+02 7.767E+02 7.253E+02 7.209E+02 7.106E+02
6.057E+02
 IN SOIL MOI 2.664E+02 2.504E+02 2.375E+02 2.123E+02 1.700E+02 1.633E+02 1.449E+02 1.439E+02 1.326E+02 1.182E+02 1.047E+02
1.008E+02
 ADS ON SOIL 1.142E+04 1.046E+04 9.595E+03 8.795E+03 7.969E+03 7.234E+03 6.601E+03 6.063E+03 5.603E+03 5.175E+03 4.756E+03
4.362E+03
 IN SOIL AIR 1.433E+02 1.334E+02 1.225E+02 1.141E+02 1.092E+02 9.570E+01 8.579E+01 7.438E+01 6.754E+01 6.292E+01 5.895E+01
5.354E+01

      SOIL ZONE 2:

            SUBLAYER  1

 DIFFUSED UP 5.662E+02 4.453E+02 3.322E+02 3.218E+02 4.108E+02 2.989E+02 3.283E+02 2.571E+02 2.802E+02 2.991E+02 2.903E+02
2.208E+02
 IN SOIL MOI 3.296E+02 3.058E+02 2.867E+02 2.559E+02 2.062E+02 1.983E+02 1.776E+02 1.778E+02 1.657E+02 1.483E+02 1.310E+02
1.255E+02
 IN SOIL AIR 1.773E+02 1.629E+02 1.479E+02 1.375E+02 1.324E+02 1.163E+02 1.052E+02 9.190E+01 8.441E+01 7.894E+01 7.372E+01
6.662E+01

            SUBLAYER  2

 DIFFUSED UP 5.044E+02 3.953E+02 2.928E+02 2.772E+02 3.507E+02 2.591E+02 2.837E+02 2.271E+02 2.493E+02 2.673E+02 2.589E+02
1.981E+02
 IN SOIL MOI 3.559E+02 3.269E+02 3.036E+02 2.706E+02 2.191E+02 2.110E+02 1.904E+02 1.918E+02 1.805E+02 1.621E+02 1.427E+02
1.362E+02
 IN SOIL AIR 1.915E+02 1.741E+02 1.566E+02 1.454E+02 1.407E+02 1.237E+02 1.127E+02 9.916E+01 9.198E+01 8.627E+01 8.033E+01
7.231E+01

            SUBLAYER  3

 DIFFUSED UP 4.264E+02 3.329E+02 2.452E+02 2.279E+02 2.863E+02 2.140E+02 2.338E+02 1.908E+02 2.108E+02 2.268E+02 2.191E+02
1.684E+02
 IN SOIL MOI 3.781E+02 3.445E+02 3.176E+02 2.827E+02 2.298E+02 2.214E+02 2.010E+02 2.036E+02 1.932E+02 1.738E+02 1.526E+02
1.452E+02
 IN SOIL AIR 2.034E+02 1.834E+02 1.638E+02 1.519E+02 1.476E+02 1.298E+02 1.190E+02 1.053E+02 9.842E+01 9.250E+01 8.591E+01
7.713E+01

      SOIL ZONE 3:

            SUBLAYER  1

            SUBLAYER  2

            SUBLAYER  3

      LOWER SOIL ZONE:

            SUBLAYER  1

 DIFFUSED UP 3.341E+02 2.599E+02 1.905E+02 1.747E+02 2.182E+02 1.646E+02 1.795E+02 1.489E+02 1.655E+02 1.783E+02 1.717E+02
1.325E+02
 IN SOIL MOI 3.954E+02 3.581E+02 3.284E+02 2.920E+02 2.380E+02 2.294E+02 2.092E+02 2.128E+02 2.032E+02 1.830E+02 1.604E+02
1.523E+02
 IN SOIL AIR 2.127E+02 1.907E+02 1.694E+02 1.569E+02 1.529E+02 1.345E+02 1.239E+02 1.100E+02 1.035E+02 9.742E+01 9.029E+01
8.090E+01

            SUBLAYER  2
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 DIFFUSED UP 2.301E+02 1.783E+02 1.303E+02 1.184E+02 1.481E+02 1.118E+02 1.222E+02 1.024E+02 1.144E+02 1.233E+02 1.184E+02
9.152E+01
 IN SOIL MOI 4.073E+02 3.673E+02 3.358E+02 2.983E+02 2.435E+02 2.348E+02 2.148E+02 2.192E+02 2.101E+02 1.894E+02 1.657E+02
1.572E+02
 IN SOIL AIR 2.191E+02 1.956E+02 1.732E+02 1.603E+02 1.564E+02 1.376E+02 1.272E+02 1.133E+02 1.070E+02 1.008E+02 9.330E+01
8.350E+01

          SUBLAYER  3

 DIFFUSED UP 1.174E+02 9.068E+01 6.616E+01 5.987E+01 7.476E+01 5.649E+01 6.190E+01 5.231E+01 5.877E+01 6.318E+01 6.044E+01
4.681E+01
 IN SOIL MOI 4.134E+02 3.720E+02 3.395E+02 3.015E+02 2.463E+02 2.376E+02 2.177E+02 2.225E+02 2.137E+02 1.927E+02 1.685E+02
1.597E+02
 IN SOIL AIR 2.224E+02 1.981E+02 1.751E+02 1.621E+02 1.582E+02 1.393E+02 1.289E+02 1.150E+02 1.089E+02 1.026E+02 9.484E+01
8.483E+01
 GWR. RUNOFF 3.861E+01 4.347E+01 5.972E+01 2.906E+01 0.000E+00 0.000E+00 0.000E+00 3.897E+01 4.141E+01 1.667E+01 0.000E+00
1.740E+01


     -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
     ----------------------------------------------------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

 MOISTURE     6.140E-05 5.709E-05 5.314E-05 4.918E-05 4.457E-05 4.034E-05 3.647E-05 3.296E-05 2.997E-05 2.751E-05 2.534E-05
2.326E-05
 %SOLUBILITY 1.167E-05 1.085E-05 1.010E-05 9.351E-06 8.473E-06 7.669E-06 6.933E-06 6.266E-06 5.697E-06 5.230E-06 4.817E-06
4.423E-06
 ADSORBED     1.692E-04 1.573E-04 1.464E-04 1.355E-04 1.228E-04 1.111E-04 1.005E-04 9.081E-05 8.256E-05 7.579E-05 6.980E-05
6.409E-05
 SOIL AIR     1.712E-05 1.640E-05 1.558E-05 1.445E-05 1.301E-05 1.167E-05 1.023E-05 9.072E-06 8.092E-06 7.356E-06 6.786E-06
6.320E-06

          SUBLAYER  2

 MOISTURE     1.164E-04 1.074E-04 9.928E-05 9.141E-05 8.275E-05 7.511E-05 6.818E-05 6.223E-05 5.701E-05 5.241E-05 4.817E-05
4.427E-05
 %SOLUBILITY 2.213E-05 2.042E-05 1.887E-05 1.738E-05 1.573E-05 1.428E-05 1.296E-05 1.183E-05 1.084E-05 9.963E-06 9.158E-06
8.417E-06
 ADSORBED     3.206E-04 2.959E-04 2.735E-04 2.518E-04 2.280E-04 2.069E-04 1.878E-04 1.714E-04 1.571E-04 1.444E-04 1.327E-04
1.220E-04
 SOIL AIR     3.245E-05 3.085E-05 2.911E-05 2.685E-05 2.415E-05 2.173E-05 1.912E-05 1.713E-05 1.539E-05 1.401E-05 1.290E-05
1.203E-05

          SUBLAYER  3

 MOISTURE     1.548E-04 1.418E-04 1.300E-04 1.192E-04 1.080E-04 9.804E-05 8.946E-05 8.216E-05 7.593E-05 7.014E-05 6.445E-05
5.911E-05
 %SOLUBILITY 2.944E-05 2.696E-05 2.472E-05 2.266E-05 2.053E-05 1.864E-05 1.701E-05 1.562E-05 1.443E-05 1.333E-05 1.225E-05
1.124E-05
 ADSORBED     4.266E-04 3.907E-04 3.582E-04 3.284E-04 2.975E-04 2.701E-04 2.464E-04 2.264E-04 2.092E-04 1.932E-04 1.776E-04
1.628E-04
 SOIL AIR     4.317E-05 4.073E-05 3.813E-05 3.501E-05 3.152E-05 2.836E-05 2.508E-05 2.261E-05 2.050E-05 1.876E-05 1.726E-05
1.606E-05

     SOIL ZONE 2:

          SUBLAYER  1

 MOISTURE     1.702E-04 1.539E-04 1.395E-04 1.277E-04 1.164E-04 1.059E-04 9.746E-05 9.024E-05 8.435E-05 7.822E-05 7.164E-05
6.538E-05
 %SOLUBILITY 3.237E-05 2.927E-05 2.653E-05 2.428E-05 2.213E-05 2.013E-05 1.853E-05 1.716E-05 1.604E-05 1.487E-05 1.362E-05
1.243E-05
 SOIL AIR     4.747E-05 4.422E-05 4.091E-05 3.751E-05 3.397E-05 3.062E-05 2.733E-05 2.484E-05 2.278E-05 2.092E-05 1.919E-05
1.776E-05

          SUBLAYER  2

 MOISTURE     1.839E-04 1.645E-04 1.478E-04 1.350E-04 1.237E-04 1.126E-04 1.045E-04 9.737E-05 9.191E-05 8.548E-05 7.806E-05
7.097E-05
 %SOLUBILITY 3.496E-05 3.128E-05 2.809E-05 2.567E-05 2.351E-05 2.141E-05 1.986E-05 1.851E-05 1.747E-05 1.625E-05 1.484E-05
1.349E-05
 SOIL AIR     5.127E-05 4.726E-05 4.332E-05 3.967E-05 3.610E-05 3.257E-05 2.929E-05 2.680E-05 2.482E-05 2.286E-05 2.091E-05
1.928E-05

          SUBLAYER  3

 MOISTURE     1.953E-04 1.734E-04 1.546E-04 1.411E-04 1.297E-04 1.182E-04 1.103E-04 1.034E-04 9.835E-05 9.166E-05 8.349E-05
7.569E-05
 %SOLUBILITY 3.714E-05 3.296E-05 2.939E-05 2.682E-05 2.466E-05 2.247E-05 2.097E-05 1.965E-05 1.870E-05 1.743E-05 1.587E-05
1.439E-05
 SOIL AIR     5.447E-05 4.980E-05 4.532E-05 4.144E-05 3.786E-05 3.418E-05 3.093E-05 2.845E-05 2.656E-05 2.451E-05 2.236E-05
2.056E-05

     SOIL ZONE 3:

     LOWER SOIL ZONE:

          SUBLAYER  1

 MOISTURE     2.043E-04 1.802E-04 1.598E-04 1.457E-04 1.343E-04 1.225E-04 1.148E-04 1.081E-04 1.034E-04 9.653E-05 8.774E-05
7.939E-05
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 %SOLUBILITY 3.884E-05 3.426E-05 3.038E-05 2.771E-05 2.554E-05 2.328E-05 2.183E-05 2.054E-05 1.967E-05 1.835E-05 1.668E-05
1.509E-05
 SOIL AIR     5.696E-05 5.176E-05 4.686E-05 4.281E-05 3.921E-05 3.542E-05 3.219E-05 2.974E-05 2.793E-05 2.581E-05 2.350E-05
2.157E-05

          SUBLAYER  2

 MOISTURE     2.104E-04 1.849E-04 1.634E-04 1.489E-04 1.375E-04 1.253E-04 1.179E-04 1.113E-04 1.070E-04 9.990E-05 9.067E-05
8.194E-05
 %SOLUBILITY 4.000E-05 3.515E-05 3.106E-05 2.830E-05 2.614E-05 2.383E-05 2.241E-05 2.116E-05 2.034E-05 1.899E-05 1.724E-05
1.558E-05
 SOIL AIR     5.867E-05 5.310E-05 4.791E-05 4.373E-05 4.013E-05 3.626E-05 3.305E-05 3.063E-05 2.889E-05 2.672E-05 2.429E-05
2.226E-05

          SUBLAYER  3

 MOISTURE     2.135E-04 1.873E-04 1.652E-04 1.505E-04 1.391E-04 1.268E-04 1.194E-04 1.129E-04 1.088E-04 1.016E-04 9.216E-05
8.325E-05
 %SOLUBILITY 4.060E-05 3.560E-05 3.141E-05 2.861E-05 2.644E-05 2.411E-05 2.271E-05 2.147E-05 2.068E-05 1.932E-05 1.752E-05
1.583E-05
 SOIL AIR     5.955E-05 5.379E-05 4.844E-05 4.420E-05 4.059E-05 3.668E-05 3.349E-05 3.108E-05 2.938E-05 2.718E-05 2.468E-05
2.261E-05


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                          YEAR -  11 ANNUAL SUMMARY REPORT
                           ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


          -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)              11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)        11.844
 TOTAL PRECIPITATION (CM)                      73.466
 TOTAL INFILTRATION (CM)                       73.460
 TOTAL EVAPOTRANSPIRATION (CM)                 69.004
 TOTAL SURFACE RUNOFF (CM)                      0.000
 TOTAL GRW RUNOFF (CM)                          4.453
 TOTAL MOISTURE RETENTION (CM)                  0.003
 TOTAL YIELD (CM)                               4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
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      UPPER SOIL ZONE:

           SUBLAYER  1

                TOTAL VOLATILIZED                2.030E+04

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              1.786E+04

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              1.218E+04

      SOIL ZONE 2:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)              4.051E+03

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              3.564E+03

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              2.982E+03

      SOIL ZONE 3:

           SUBLAYER  1

           SUBLAYER  2

           SUBLAYER  3
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LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 2.319E+03

SUBLAYER 2

TOTAL DIFFUSED (UP) 1.589E+03

SUBLAYER 3

TOTAL DIFFUSED (UP) 8.088E+02
TOTAL IN GROUNDWATER RUNOFF 2.853E+02

-- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	4.010E-05
ADSORBED SOIL (UG/G)	1.105E-04
SOIL AIR (UG/ML)	1.134E-05

SUBLAYER 2

SOIL MOISTURE (UG/ML)	7.538E-05
ADSORBED SOIL (UG/G)	2.077E-04
SOIL AIR (UG/ML)	2.131E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML)	9.943E-05
ADSORBED SOIL (UG/G)	2.739E-04
SOIL AIR (UG/ML)	2.810E-05

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.084E-04
SOIL AIR (UG/ML)	3.063E-05

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.163E-04
SOIL AIR (UG/ML)	3.285E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML)	1.229E-04
SOIL AIR (UG/ML)	3.470E-05

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.281E-04
SOIL AIR (UG/ML)	3.615E-05

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.316E-04
SOIL AIR (UG/ML)	3.714E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML)	1.334E-04
SOIL AIR (UG/ML)	3.764E-05

MAX. POLL. DEPTH (M) 3.900E+00

YEAR -12 MONTHLY RESULTS (OUTPUT)
======== ==========

-- HYDROLOGIC CYCLE COMPONENTS --

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED	8.836E+02	8.061E+02	7.195E+02	7.010E+02	7.823E+02	6.430E+02	5.894E+02	4.590E+02	4.103E+02	3.945E+02	3.857E+02	3.321E+02
IN SOIL MOI	3.698E+01	3.530E+01	3.398E+01	3.067E+01	2.457E+01	2.352E+01	2.068E+01	2.021E+01	1.832E+01	1.623E+01	1.441E+01	1.389E+01
ADS ON SOIL	1.586E+03	1.475E+03	1.373E+03	1.271E+03	1.151E+03	1.042E+03	9.422E+02	8.516E+02	7.742E+02	7.107E+02	6.545E+02	6.010E+02
IN SOIL AIR	1.989E+01	1.880E+01	1.753E+01	1.649E+01	1.578E+01	1.379E+01	1.225E+01	1.045E+01	9.332E+00	8.640E+00	8.113E+00	7.377E+00

SUBLAYER 2

DIFFUSED UP	7.943E+02	7.155E+02	6.288E+02	6.051E+02	6.719E+02	5.524E+02	5.106E+02	4.034E+02	3.675E+02	3.566E+02	3.483E+02	2.996E+02
IN SOIL MOI	7.011E+01	6.641E+01	6.349E+01	5.701E+01	4.562E+01	4.380E+01	3.867E+01	3.815E+01	3.485E+01	3.092E+01	2.740E+01	2.643E+01
ADS ON SOIL	3.007E+03	2.775E+03	2.565E+03	2.362E+03	2.138E+03	1.941E+03	1.761E+03	1.608E+03	1.473E+03	1.354E+03	1.244E+03	1.144E+03
IN SOIL AIR	3.771E+01	3.536E+01	3.275E+01	3.064E+01	2.930E+01	2.567E+01	2.289E+01	1.972E+01	1.775E+01	1.646E+01	1.542E+01	1.404E+01

SUBLAYER 3

DIFFUSED UP	5.576E+02	4.940E+02	4.236E+02	4.007E+02	4.454E+02	3.638E+02	3.403E+02	2.719E+02	2.539E+02	2.524E+02	2.487E+02	2.120E+02
IN SOIL MOI	9.327E+01	8.768E+01	8.315E+01	7.433E+01	5.954E+01	5.716E+01	5.074E+01	5.037E+01	4.641E+01	4.138E+01	3.666E+01	3.529E+01
ADS ON SOIL	4.000E+03	3.664E+03	3.359E+03	3.079E+03	2.790E+03	2.533E+03	2.311E+03	2.123E+03	1.961E+03	1.812E+03	1.665E+03	1.527E+03
IN SOIL AIR	5.017E+01	4.669E+01	4.289E+01	3.995E+01	3.825E+01	3.351E+01	3.004E+01	2.604E+01	2.364E+01	2.203E+01	2.064E+01	1.874E+01

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP	1.980E+02	1.557E+02	1.161E+02	1.125E+02	1.436E+02	1.045E+02	1.148E+02	8.991E+01	9.800E+01	1.046E+02	1.015E+02	7.720E+01
IN SOIL MOI	1.154E+02	1.071E+02	1.004E+02	8.958E+01	7.218E+01	6.944E+01	6.218E+01	6.223E+01	5.800E+01	5.192E+01	4.584E+01	4.391E+01
IN SOIL AIR	6.205E+01	5.701E+01	5.178E+01	4.814E+01	4.637E+01	4.070E+01	3.682E+01	3.217E+01	2.955E+01	2.763E+01	2.581E+01	2.332E+01

SUBLAYER 2

DIFFUSED UP	1.764E+02	1.382E+02	1.023E+02	9.687E+01	1.226E+02	9.055E+01	9.920E+01	7.943E+01	8.716E+01	9.346E+01	9.052E+01	6.926E+01
IN SOIL MOI	1.246E+02	1.144E+02	1.063E+02	9.472E+01	7.670E+01	7.386E+01	6.664E+01	6.714E+01	6.319E+01	5.673E+01	4.994E+01	4.766E+01
IN SOIL AIR	6.702E+01	6.093E+01	5.483E+01	5.091E+01	4.927E+01	4.330E+01	3.946E+01	3.471E+01	3.219E+01	3.020E+01	2.811E+01	2.531E+01

SUBLAYER 3

DIFFUSED UP	1.491E+02	1.164E+02	8.570E+01	7.966E+01	1.001E+02	7.482E+01	8.176E+01	6.673E+01	7.369E+01	7.928E+01	7.659E+01	5.888E+01

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 IN SOIL MOI 1.323E+02 1.206E+02 1.112E+02 9.896E+01 8.043E+01 7.750E+01 7.036E+01 7.127E+01 6.761E+01 6.083E+01 5.341E+01
5.082E+01
 IN SOIL AIR 7.119E+01 6.420E+01 5.735E+01 5.319E+01 5.166E+01 4.543E+01 4.166E+01 3.685E+01 3.445E+01 3.238E+01 3.007E+01
2.699E+01

      SOIL ZONE 3:

            SUBLAYER  1


            SUBLAYER  2


            SUBLAYER  3


      LOWER SOIL ZONE:

            SUBLAYER  1

 DIFFUSED UP 1.168E+02 9.087E+01 6.660E+01 6.108E+01 7.629E+01 5.754E+01 6.278E+01 5.207E+01 5.786E+01 6.235E+01 6.004E+01
4.634E+01
 IN SOIL MOI 1.384E+02 1.253E+02 1.149E+02 1.022E+02 8.330E+01 8.030E+01 7.323E+01 7.450E+01 7.111E+01 6.405E+01 5.613E+01
5.331E+01
 IN SOIL AIR 7.445E+01 6.673E+01 5.930E+01 5.494E+01 5.351E+01 4.707E+01 4.336E+01 3.852E+01 3.623E+01 3.409E+01 3.160E+01
2.831E+01

            SUBLAYER  2

 DIFFUSED UP 8.046E+01 6.234E+01 4.555E+01 4.141E+01 5.177E+01 3.909E+01 4.274E+01 3.579E+01 4.000E+01 4.310E+01 4.140E+01
3.201E+01
 IN SOIL MOI 1.426E+02 1.286E+02 1.175E+02 1.044E+02 8.524E+01 8.220E+01 7.519E+01 7.672E+01 7.353E+01 6.629E+01 5.800E+01
5.502E+01
 IN SOIL AIR 7.668E+01 6.845E+01 6.062E+01 5.612E+01 5.476E+01 4.818E+01 4.452E+01 3.966E+01 3.746E+01 3.528E+01 3.265E+01
2.922E+01

            SUBLAYER  3

 DIFFUSED UP 4.107E+01 3.171E+01 2.314E+01 2.093E+01 2.613E+01 1.975E+01 2.165E+01 1.829E+01 2.055E+01 2.209E+01 2.113E+01
1.637E+01
 IN SOIL MOI 1.447E+02 1.302E+02 1.188E+02 1.055E+02 8.622E+01 8.315E+01 7.618E+01 7.786E+01 7.478E+01 6.743E+01 5.896E+01
5.590E+01
 IN SOIL AIR 7.782E+01 6.933E+01 6.129E+01 5.672E+01 5.539E+01 4.874E+01 4.510E+01 4.025E+01 3.810E+01 3.589E+01 3.319E+01
2.968E+01
 GWR. RUNOFF 1.351E+01 1.521E+01 2.090E+01 1.017E+01 0.000E+00 0.000E+00 0.000E+00 1.364E+01 1.449E+01 5.835E+00 0.000E+00
6.088E+00


      -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
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      UPPER SOIL ZONE:

            SUBLAYER  1

 MOISTURE     2.149E-05 1.999E-05 1.861E-05 1.722E-05 1.560E-05 1.412E-05 1.277E-05 1.154E-05 1.049E-05 9.631E-06 8.870E-06
8.145E-06
 %SOLUBILITY 4.086E-06 3.800E-06 3.537E-06 3.274E-06 2.967E-06 2.685E-06 2.428E-06 2.194E-06 1.995E-06 1.831E-06 1.686E-06
1.548E-06
 ADSORBED     5.922E-05 5.507E-05 5.126E-05 4.744E-05 4.299E-05 3.891E-05 3.518E-05 3.179E-05 2.890E-05 2.653E-05 2.444E-05
2.244E-05
 SOIL AIR     5.994E-06 5.741E-06 5.455E-06 5.059E-06 4.555E-06 4.085E-06 3.581E-06 3.176E-06 2.833E-06 2.576E-06 2.376E-06
2.212E-06

            SUBLAYER  2

 MOISTURE     4.075E-05 3.760E-05 3.476E-05 3.201E-05 2.897E-05 2.630E-05 2.387E-05 2.179E-05 1.996E-05 1.835E-05 1.686E-05
1.550E-05
 %SOLUBILITY 7.746E-06 7.149E-06 6.609E-06 6.085E-06 5.508E-06 5.000E-06 4.538E-06 4.142E-06 3.795E-06 3.488E-06 3.206E-06
2.947E-06
 ADSORBED     1.123E-04 1.036E-04 9.577E-05 8.818E-05 7.982E-05 7.245E-05 6.577E-05 6.003E-05 5.499E-05 5.055E-05 4.646E-05
4.270E-05
 SOIL AIR     1.136E-05 1.080E-05 1.019E-05 9.402E-06 8.456E-06 7.607E-06 6.694E-06 5.997E-06 5.390E-06 4.906E-06 4.517E-06
4.210E-06

            SUBLAYER  3

 MOISTURE     5.420E-05 4.965E-05 4.553E-05 4.173E-05 3.781E-05 3.433E-05 3.132E-05 2.877E-05 2.658E-05 2.455E-05 2.256E-05
2.069E-05
 %SOLUBILITY 1.030E-05 9.439E-06 8.655E-06 7.934E-06 7.189E-06 6.526E-06 5.955E-06 5.469E-06 5.054E-06 4.668E-06 4.290E-06
3.934E-06
 ADSORBED     1.493E-04 1.368E-04 1.254E-04 1.150E-04 1.042E-04 9.457E-05 8.629E-05 7.925E-05 7.323E-05 6.765E-05 6.216E-05
5.700E-05
 SOIL AIR     1.511E-05 1.426E-05 1.335E-05 1.226E-05 1.104E-05 9.929E-06 8.783E-06 7.917E-06 7.178E-06 6.566E-06 6.043E-06
5.621E-06

      SOIL ZONE 2:

            SUBLAYER  1

 MOISTURE     5.959E-05 5.389E-05 4.885E-05 4.470E-05 4.075E-05 3.706E-05 3.412E-05 3.159E-05 2.953E-05 2.738E-05 2.508E-05
2.288E-05
 %SOLUBILITY 1.133E-05 1.024E-05 9.286E-06 8.499E-06 7.747E-06 7.046E-06 6.487E-06 6.006E-06 5.614E-06 5.206E-06 4.767E-06
4.351E-06
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 SOIL AIR      1.662E-05 1.548E-05 1.432E-05 1.313E-05 1.189E-05 1.072E-05 9.568E-06 8.695E-06 7.973E-06 7.322E-06 6.717E-06
6.216E-06

            SUBLAYER  2

 MOISTURE      6.436E-05 5.760E-05 5.172E-05 4.727E-05 4.330E-05 3.943E-05 3.657E-05 3.409E-05 3.217E-05 2.992E-05 2.732E-05
2.484E-05
 %SOLUBILITY 1.224E-05 1.095E-05 9.833E-06 8.987E-06 8.232E-06 7.495E-06 6.952E-06 6.480E-06 6.116E-06 5.688E-06 5.194E-06
4.722E-06
 SOIL AIR      1.795E-05 1.654E-05 1.517E-05 1.389E-05 1.264E-05 1.140E-05 1.025E-05 9.382E-06 8.687E-06 8.001E-06 7.317E-06
6.747E-06

            SUBLAYER  3

 MOISTURE      6.837E-05 6.068E-05 5.410E-05 4.939E-05 4.540E-05 4.137E-05 3.861E-05 3.618E-05 3.442E-05 3.208E-05 2.922E-05
2.649E-05
 %SOLUBILITY 1.300E-05 1.154E-05 1.029E-05 9.389E-06 8.632E-06 7.865E-06 7.340E-06 6.879E-06 6.544E-06 6.099E-06 5.555E-06
5.036E-06
 SOIL AIR      1.906E-05 1.743E-05 1.586E-05 1.451E-05 1.325E-05 1.197E-05 1.083E-05 9.959E-06 9.295E-06 8.579E-06 7.826E-06
7.195E-06

      SOIL ZONE 3:

      LOWER SOIL ZONE:

            SUBLAYER  1

 MOISTURE      7.149E-05 6.307E-05 5.594E-05 5.101E-05 4.702E-05 4.286E-05 4.018E-05 3.782E-05 3.620E-05 3.378E-05 3.071E-05
2.778E-05
 %SOLUBILITY 1.359E-05 1.199E-05 1.063E-05 9.698E-06 8.940E-06 8.149E-06 7.640E-06 7.190E-06 6.883E-06 6.422E-06 5.838E-06
5.282E-06
 SOIL AIR      1.994E-05 1.812E-05 1.640E-05 1.498E-05 1.372E-05 1.240E-05 1.127E-05 1.041E-05 9.776E-06 9.034E-06 8.224E-06
7.547E-06

            SUBLAYER  2

 MOISTURE      7.364E-05 6.471E-05 5.719E-05 5.211E-05 4.812E-05 4.388E-05 4.126E-05 3.895E-05 3.744E-05 3.496E-05 3.173E-05
2.867E-05
 %SOLUBILITY 1.400E-05 1.230E-05 1.087E-05 9.907E-06 9.149E-06 8.341E-06 7.844E-06 7.405E-06 7.117E-06 6.646E-06 6.032E-06
5.451E-06
 SOIL AIR      2.053E-05 1.859E-05 1.677E-05 1.531E-05 1.405E-05 1.269E-05 1.157E-05 1.072E-05 1.011E-05 9.349E-06 8.499E-06
7.789E-06

            SUBLAYER  3

 MOISTURE      7.473E-05 6.553E-05 5.782E-05 5.267E-05 4.868E-05 4.439E-05 4.180E-05 3.953E-05 3.807E-05 3.556E-05 3.225E-05
2.913E-05
 %SOLUBILITY 1.421E-05 1.246E-05 1.099E-05 1.001E-05 9.254E-06 8.439E-06 7.948E-06 7.514E-06 7.238E-06 6.761E-06 6.132E-06
5.538E-06
 SOIL AIR      2.084E-05 1.882E-05 1.695E-05 1.547E-05 1.421E-05 1.284E-05 1.172E-05 1.088E-05 1.028E-05 9.510E-06 8.638E-06
7.913E-06


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                              YEAR -  12 ANNUAL SUMMARY REPORT
                               ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE                0.000E+00
 SOIL ZONE 2                    0.000E+00
 SOIL ZONE 3                    0.000E+00
 LOWER SOIL ZONE                0.000E+00


            -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)              11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)        11.844
 TOTAL PRECIPITATION (CM)                      73.466
 TOTAL INFILTRATION (CM)                       73.460
 TOTAL EVAPOTRANSPIRATION (CM)                 69.004
 TOTAL SURFACE RUNOFF (CM)                      0.000
 TOTAL GRW RUNOFF (CM)                          4.453
 TOTAL MOISTURE RETENTION (CM)                  0.003
 TOTAL YIELD (CM)                               4.460
0           -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
            ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)

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      UPPER SOIL ZONE:

            SUBLAYER  1

                 TOTAL VOLATILIZED                 7.106E+03

            SUBLAYER  2
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            TOTAL DIFFUSED (UP)                6.254E+03

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                4.264E+03

    SOIL ZONE 2:

        SUBLAYER  1

            TOTAL DIFFUSED (UP)                1.416E+03

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                1.246E+03

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                1.043E+03

    SOIL ZONE 3:

        SUBLAYER  1

        SUBLAYER  2

        SUBLAYER  3

    LOWER SOIL ZONE:

        SUBLAYER  1

            TOTAL DIFFUSED (UP)                8.107E+02

        SUBLAYER  2

            TOTAL DIFFUSED (UP)                5.556E+02

        SUBLAYER  3

            TOTAL DIFFUSED (UP)                2.828E+02
            TOTAL IN GROUNDWATER RUNOFF        9.986E+01
1                   -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                    ----------------------------------------------------------------------------------

    UPPER SOIL ZONE:

        SUBLAYER  1

                                    SOIL MOISTURE (UG/ML)  1.404E-05
                                    ADSORBED SOIL (UG/G)   3.868E-05
                                    SOIL AIR (UG/ML)       3.970E-06

        SUBLAYER  2

                                    SOIL MOISTURE (UG/ML)  2.639E-05
                                    ADSORBED SOIL (UG/G)   7.271E-05
                                    SOIL AIR (UG/ML)       7.461E-06

        SUBLAYER  3

                                    SOIL MOISTURE (UG/ML)  3.481E-05
                                    ADSORBED SOIL (UG/G)   9.590E-05
                                    SOIL AIR (UG/ML)       9.838E-06

    SOIL ZONE 2:

        SUBLAYER  1

                                    SOIL MOISTURE (UG/ML)  3.795E-05
                                    SOIL AIR (UG/ML)       1.072E-05

        SUBLAYER  2

                                    SOIL MOISTURE (UG/ML)  4.072E-05
                                    SOIL AIR (UG/ML)       1.150E-05

        SUBLAYER  3

                                    SOIL MOISTURE (UG/ML)  4.303E-05
                                    SOIL AIR (UG/ML)       1.215E-05

    SOIL ZONE 3:

    LOWER SOIL ZONE:

        SUBLAYER  1

                                    SOIL MOISTURE (UG/ML)  4.482E-05
                                    SOIL AIR (UG/ML)       1.265E-05

        SUBLAYER  2
```

SOIL MOISTURE (UG/ML) 4.605E-05
SOIL AIR (UG/ML) 1.300E-05

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.668E-05
SOIL AIR (UG/ML) 1.317E-05

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -13 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	3.093E+02	2.822E+02	2.519E+02	2.454E+02	2.738E+02	2.250E+02	2.063E+02	1.606E+02	1.436E+02	1.380E+02	1.349E+02	1.162E+02
IN SOIL MOI	1.295E+01	1.236E+01	1.190E+01	1.074E+01	8.600E+00	8.231E+00	7.239E+00	7.071E+00	6.410E+00	5.679E+00	5.043E+00	4.859E+00
ADS ON SOIL	5.552E+02	5.163E+02	4.806E+02	4.448E+02	4.030E+02	3.647E+02	3.297E+02	2.980E+02	2.709E+02	2.487E+02	2.290E+02	2.102E+02
IN SOIL AIR	6.965E+00	6.580E+00	6.137E+00	5.770E+00	5.524E+00	4.825E+00	4.286E+00	3.656E+00	3.266E+00	3.023E+00	2.839E+00	2.581E+00

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	2.781E+02	2.505E+02	2.201E+02	2.118E+02	2.351E+02	1.933E+02	1.787E+02	1.412E+02	1.286E+02	1.248E+02	1.218E+02	1.048E+02
IN SOIL MOI	2.454E+01	2.325E+01	2.222E+01	1.995E+01	1.597E+01	1.533E+01	1.353E+01	1.335E+01	1.219E+01	1.082E+01	9.586E+00	9.246E+00
ADS ON SOIL	1.052E+03	9.713E+02	8.978E+02	8.267E+02	7.482E+02	6.792E+02	6.164E+02	5.626E+02	5.153E+02	4.737E+02	4.353E+02	4.000E+02
IN SOIL AIR	1.320E+01	1.238E+01	1.146E+01	1.072E+01	1.026E+01	8.984E+00	8.012E+00	6.902E+00	6.212E+00	5.758E+00	5.396E+00	4.910E+00

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.952E+02	1.729E+02	1.482E+02	1.402E+02	1.558E+02	1.273E+02	1.190E+02	9.510E+01	8.878E+01	8.823E+01	8.696E+01	7.410E+01
IN SOIL MOI	3.265E+01	3.069E+01	2.910E+01	2.601E+01	2.084E+01	2.000E+01	1.775E+01	1.762E+01	1.624E+01	1.448E+01	1.282E+01	

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1.234E+01
 ADS ON SOIL 1.400E+03 1.282E+03 1.176E+03 1.078E+03 9.765E+02 8.864E+02 8.087E+02 7.427E+02 6.862E+02 6.338E+02 5.823E+02
5.339E+02
 IN SOIL AIR 1.756E+01 1.634E+01 1.501E+01 1.398E+01 1.339E+01 1.173E+01 1.051E+01 9.111E+00 8.272E+00 7.705E+00 7.218E+00
6.554E+00

      SOIL ZONE 2:

            SUBLAYER  1

 DIFFUSED UP 6.922E+01 5.440E+01 4.053E+01 3.927E+01 5.016E+01 3.646E+01 4.005E+01 3.135E+01 3.418E+01 3.647E+01 3.539E+01
2.687E+01
 IN SOIL MOI 4.037E+01 3.747E+01 3.512E+01 3.135E+01 2.526E+01 2.429E+01 2.175E+01 2.177E+01 2.028E+01 1.816E+01 1.603E+01
1.535E+01
 IN SOIL AIR 2.172E+01 1.995E+01 1.812E+01 1.685E+01 1.622E+01 1.424E+01 1.288E+01 1.125E+01 1.033E+01 9.663E+00 9.022E+00
8.152E+00

            SUBLAYER  2

 DIFFUSED UP 6.164E+01 4.829E+01 3.573E+01 3.383E+01 4.282E+01 3.161E+01 3.461E+01 2.771E+01 3.039E+01 3.259E+01 3.156E+01
2.411E+01
 IN SOIL MOI 4.360E+01 4.004E+01 3.719E+01 3.314E+01 2.683E+01 2.584E+01 2.331E+01 2.348E+01 2.209E+01 1.983E+01 1.746E+01
1.665E+01
 IN SOIL AIR 2.345E+01 2.132E+01 1.918E+01 1.781E+01 1.724E+01 1.515E+01 1.380E+01 1.214E+01 1.126E+01 1.056E+01 9.826E+00
8.845E+00

            SUBLAYER  3

 DIFFUSED UP 5.212E+01 4.068E+01 2.993E+01 2.782E+01 3.495E+01 2.610E+01 2.853E+01 2.328E+01 2.571E+01 2.764E+01 2.671E+01
2.049E+01
 IN SOIL MOI 4.631E+01 4.219E+01 3.890E+01 3.462E+01 2.813E+01 2.711E+01 2.460E+01 2.492E+01 2.363E+01 2.126E+01 1.866E+01
1.775E+01
 IN SOIL AIR 2.491E+01 2.246E+01 2.007E+01 1.861E+01 1.807E+01 1.589E+01 1.457E+01 1.288E+01 1.204E+01 1.132E+01 1.051E+01
9.429E+00

      SOIL ZONE 3:

            SUBLAYER  1

            SUBLAYER  2

            SUBLAYER  3

      LOWER SOIL ZONE:

            SUBLAYER  1

 DIFFUSED UP 4.084E+01 3.177E+01 2.325E+01 2.134E+01 2.664E+01 2.008E+01 2.190E+01 1.816E+01 2.019E+01 2.175E+01 2.093E+01
1.613E+01
 IN SOIL MOI 4.843E+01 4.384E+01 4.021E+01 3.576E+01 2.914E+01 2.808E+01 2.560E+01 2.605E+01 2.485E+01 2.239E+01 1.961E+01
1.862E+01
 IN SOIL AIR 2.605E+01 2.335E+01 2.074E+01 1.922E+01 1.872E+01 1.646E+01 1.516E+01 1.347E+01 1.266E+01 1.192E+01 1.104E+01
9.887E+00

            SUBLAYER  2

 DIFFUSED UP 2.812E+01 2.179E+01 1.591E+01 1.446E+01 1.808E+01 1.365E+01 1.491E+01 1.247E+01 1.396E+01 1.504E+01 1.443E+01
1.116E+01
 IN SOIL MOI 4.988E+01 4.498E+01 4.111E+01 3.653E+01 2.982E+01 2.875E+01 2.629E+01 2.682E+01 2.570E+01 2.317E+01 2.026E+01
1.921E+01
 IN SOIL AIR 2.683E+01 2.395E+01 2.121E+01 1.963E+01 1.915E+01 1.685E+01 1.556E+01 1.387E+01 1.309E+01 1.233E+01 1.141E+01
1.020E+01

            SUBLAYER  3

 DIFFUSED UP 1.436E+01 1.109E+01 8.086E+00 7.320E+00 9.119E+00 6.895E+00 7.556E+00 6.370E+00 7.166E+00 7.704E+00 7.369E+00
5.703E+00
 IN SOIL MOI 5.062E+01 4.555E+01 4.156E+01 3.692E+01 3.016E+01 2.908E+01 2.664E+01 2.722E+01 2.613E+01 2.356E+01 2.060E+01
1.952E+01
 IN SOIL AIR 2.723E+01 2.426E+01 2.144E+01 1.984E+01 1.937E+01 1.705E+01 1.577E+01 1.407E+01 1.332E+01 1.254E+01 1.159E+01
1.037E+01
 GWR. RUNOFF 4.728E+00 5.323E+00 7.312E+00 3.558E+00 0.000E+00 0.000E+00 0.000E+00 4.769E+00 5.066E+00 2.039E+00 0.000E+00
2.126E+00


      -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
      ---------------------------------------------------------------------------------------------------------------------------

      UPPER SOIL ZONE:

            SUBLAYER  1

 MOISTURE      7.524E-06 6.997E-06 6.513E-06 6.028E-06 5.462E-06 4.943E-06 4.469E-06 4.039E-06 3.671E-06 3.370E-06 3.103E-06
2.849E-06
 %SOLUBILITY 1.431E-06 1.330E-06 1.238E-06 1.146E-06 1.038E-06 9.397E-07 8.496E-07 7.678E-07 6.980E-07 6.406E-07 5.900E-07
5.417E-07
 ADSORBED      2.073E-05 1.928E-05 1.794E-05 1.661E-05 1.505E-05 1.362E-05 1.231E-05 1.113E-05 1.011E-05 9.284E-06 8.550E-06
7.849E-06
 SOIL AIR      2.098E-06 2.010E-06 1.910E-06 1.771E-06 1.594E-06 1.430E-06 1.253E-06 1.112E-06 9.914E-07 9.011E-07 8.312E-07
7.739E-07
```

SUBLAYER 2

MOISTURE 1.426E-05 1.316E-05 1.217E-05 1.120E-05 1.014E-05 9.204E-06 8.354E-06 7.625E-06 6.984E-06 6.419E-06 5.899E-06
5.421E-06
%SOLUBILITY 2.712E-06 2.503E-06 2.313E-06 2.130E-06 1.928E-06 1.750E-06 1.588E-06 1.450E-06 1.328E-06 1.220E-06 1.122E-06
1.031E-06
ADSORBED 3.930E-05 3.627E-05 3.352E-05 3.086E-05 2.794E-05 2.536E-05 2.301E-05 2.101E-05 1.924E-05 1.768E-05 1.625E-05
1.494E-05
SOIL AIR 3.977E-06 3.781E-06 3.568E-06 3.291E-06 2.960E-06 2.662E-06 2.343E-06 2.099E-06 1.886E-06 1.717E-06 1.580E-06
1.473E-06

SUBLAYER 3

MOISTURE 1.897E-05 1.738E-05 1.593E-05 1.461E-05 1.323E-05 1.201E-05 1.096E-05 1.006E-05 9.300E-06 8.589E-06 7.891E-06
7.236E-06
%SOLUBILITY 3.607E-06 3.304E-06 3.029E-06 2.777E-06 2.516E-06 2.284E-06 2.083E-06 1.913E-06 1.768E-06 1.633E-06 1.500E-06
1.376E-06
ADSORBED 5.227E-05 4.788E-05 4.390E-05 4.024E-05 3.646E-05 3.309E-05 3.019E-05 2.773E-05 2.562E-05 2.366E-05 2.174E-05
1.993E-05
SOIL AIR 5.291E-06 4.992E-06 4.672E-06 4.290E-06 3.862E-06 3.475E-06 3.073E-06 2.770E-06 2.511E-06 2.297E-06 2.114E-06
1.966E-06

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 2.086E-05 1.886E-05 1.709E-05 1.564E-05 1.426E-05 1.297E-05 1.194E-05 1.105E-05 1.033E-05 9.575E-06 8.767E-06
8.000E-06
%SOLUBILITY 3.965E-06 3.585E-06 3.250E-06 2.974E-06 2.711E-06 2.465E-06 2.269E-06 2.101E-06 1.963E-06 1.820E-06 1.667E-06
1.521E-06
SOIL AIR 5.816E-06 5.417E-06 5.012E-06 4.595E-06 4.162E-06 3.751E-06 3.347E-06 3.041E-06 2.789E-06 2.561E-06 2.348E-06
2.173E-06

SUBLAYER 2

MOISTURE 2.252E-05 2.015E-05 1.810E-05 1.654E-05 1.515E-05 1.379E-05 1.279E-05 1.192E-05 1.125E-05 1.046E-05 9.549E-06
8.680E-06
%SOLUBILITY 4.282E-06 3.831E-06 3.441E-06 3.144E-06 2.880E-06 2.622E-06 2.432E-06 2.266E-06 2.138E-06 1.989E-06 1.815E-06
1.650E-06
SOIL AIR 6.281E-06 5.789E-06 5.306E-06 4.859E-06 4.421E-06 3.989E-06 3.587E-06 3.281E-06 3.037E-06 2.797E-06 2.558E-06
2.358E-06

SUBLAYER 3

MOISTURE 2.392E-05 2.123E-05 1.893E-05 1.728E-05 1.588E-05 1.447E-05 1.350E-05 1.265E-05 1.203E-05 1.121E-05 1.021E-05
9.253E-06
%SOLUBILITY 4.548E-06 4.037E-06 3.599E-06 3.285E-06 3.020E-06 2.751E-06 2.567E-06 2.405E-06 2.288E-06 2.132E-06 1.941E-06
1.759E-06
SOIL AIR 6.671E-06 6.099E-06 5.550E-06 5.076E-06 4.636E-06 4.186E-06 3.786E-06 3.482E-06 3.249E-06 2.999E-06 2.735E-06
2.514E-06

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 2.502E-05 2.207E-05 1.957E-05 1.785E-05 1.645E-05 1.499E-05 1.405E-05 1.322E-05 1.265E-05 1.181E-05 1.073E-05
9.703E-06
%SOLUBILITY 4.756E-06 4.195E-06 3.721E-06 3.393E-06 3.127E-06 2.850E-06 2.671E-06 2.514E-06 2.406E-06 2.245E-06 2.040E-06
1.845E-06
SOIL AIR 6.976E-06 6.339E-06 5.738E-06 5.242E-06 4.801E-06 4.336E-06 3.940E-06 3.639E-06 3.417E-06 3.158E-06 2.873E-06
2.636E-06

SUBLAYER 2

MOISTURE 2.577E-05 2.264E-05 2.001E-05 1.823E-05 1.683E-05 1.534E-05 1.443E-05 1.362E-05 1.308E-05 1.222E-05 1.108E-05
1.001E-05
%SOLUBILITY 4.899E-06 4.304E-06 3.803E-06 3.466E-06 3.200E-06 2.917E-06 2.742E-06 2.589E-06 2.487E-06 2.323E-06 2.107E-06
1.904E-06
SOIL AIR 7.185E-06 6.502E-06 5.866E-06 5.355E-06 4.913E-06 4.438E-06 4.045E-06 3.748E-06 3.533E-06 3.267E-06 2.969E-06
2.720E-06

SUBLAYER 3

MOISTURE 2.615E-05 2.293E-05 2.023E-05 1.842E-05 1.703E-05 1.552E-05 1.462E-05 1.382E-05 1.331E-05 1.243E-05 1.127E-05
1.017E-05
%SOLUBILITY 4.971E-06 4.359E-06 3.845E-06 3.503E-06 3.237E-06 2.951E-06 2.779E-06 2.627E-06 2.530E-06 2.363E-06 2.142E-06
1.934E-06
SOIL AIR 7.292E-06 6.586E-06 5.931E-06 5.412E-06 4.969E-06 4.490E-06 4.099E-06 3.803E-06 3.593E-06 3.323E-06 3.018E-06
2.763E-06

POL DEP CM 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1

YEAR - 13 ANNUAL SUMMARY REPORT

-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

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          -- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)                11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)          11.844
TOTAL PRECIPITATION (CM)                        73.466
TOTAL INFILTRATION (CM)                         73.460
TOTAL EVAPOTRANSPIRATION (CM)                   69.004
TOTAL SURFACE RUNOFF (CM)                        0.000
TOTAL GRW RUNOFF (CM)                            4.453
TOTAL MOISTURE RETENTION (CM)                    0.003
TOTAL YIELD (CM)                                 4.460
0         -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
          ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
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     UPPER SOIL ZONE:

          SUBLAYER  1

               TOTAL VOLATILIZED                2.487E+03

          SUBLAYER  2

               TOTAL DIFFUSED (UP)              2.189E+03

          SUBLAYER  3

               TOTAL DIFFUSED (UP)              1.492E+03

     SOIL ZONE 2:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)              4.943E+02

          SUBLAYER  2

               TOTAL DIFFUSED (UP)              4.349E+02

          SUBLAYER  3

               TOTAL DIFFUSED (UP)              3.640E+02

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)              2.830E+02

          SUBLAYER  2

               TOTAL DIFFUSED (UP)              1.940E+02

          SUBLAYER  3

               TOTAL DIFFUSED (UP)              9.874E+01
               TOTAL IN GROUNDWATER RUNOFF      3.492E+01
1                    -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                     ---------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  4.914E-06
                                   ADSORBED SOIL (UG/G)   1.354E-05
                                   SOIL AIR (UG/ML)       1.390E-06

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  9.237E-06
                                   ADSORBED SOIL (UG/G)   2.545E-05
                                   SOIL AIR (UG/ML)       2.611E-06

          SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  1.218E-05
                                   ADSORBED SOIL (UG/G)   3.356E-05
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SOIL AIR (UG/ML) 3.443E-06

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.328E-05
SOIL AIR (UG/ML) 3.751E-06

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.424E-05
SOIL AIR (UG/ML) 4.022E-06

SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.505E-05
SOIL AIR (UG/ML) 4.248E-06

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.568E-05
SOIL AIR (UG/ML) 4.425E-06

SUBLAYER 2

SOIL MOISTURE (UG/ML) 1.611E-05
SOIL AIR (UG/ML) 4.545E-06

SUBLAYER 3

SOIL MOISTURE (UG/ML) 1.632E-05
SOIL AIR (UG/ML) 4.607E-06

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -14 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0

-- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED 1.082E+02 9.870E+01 8.808E+01 8.580E+01 9.573E+01 7.866E+01 7.209E+01 5.613E+01 5.015E+01 4.821E+01 4.712E+01
4.056E+01
IN SOIL MOI 4.529E+00 4.321E+00 4.160E+00 3.754E+00 3.006E+00 2.877E+00 2.530E+00 2.471E+00 2.239E+00 1.983E+00 1.761E+00
1.696E+00
ADS ON SOIL 1.942E+02 1.806E+02 1.681E+02 1.555E+02 1.409E+02 1.275E+02 1.152E+02 1.041E+02 9.463E+01 8.684E+01 7.996E+01
7.338E+01
IN SOIL AIR 2.436E+00 2.301E+00 2.146E+00 2.018E+00 1.931E+00 1.686E+00 1.498E+00 1.277E+00 1.141E+00 1.056E+00 9.912E-01
9.007E-01

SUBLAYER 2

DIFFUSED UP 9.724E+01 8.757E+01 7.695E+01 7.403E+01 8.218E+01 6.756E+01 6.242E+01 4.931E+01 4.490E+01 4.355E+01 4.252E+01
3.655E+01
IN SOIL MOI 8.583E+00 8.129E+00 7.771E+00 6.976E+00 5.581E+00 5.357E+00 4.728E+00 4.664E+00 4.258E+00 3.777E+00 3.346E+00
3.226E+00
ADS ON SOIL 3.681E+02 3.397E+02 3.139E+02 2.890E+02 2.615E+02 2.374E+02 2.154E+02 1.965E+02 1.800E+02 1.654E+02 1.519E+02
1.396E+02
IN SOIL AIR 4.617E+00 4.329E+00 4.008E+00 3.749E+00 3.585E+00 3.140E+00 2.799E+00 2.411E+00 2.170E+00 2.011E+00 1.883E+00
1.713E+00

SUBLAYER 3

DIFFUSED UP 6.821E+01 6.041E+01 5.177E+01 4.896E+01 5.441E+01 4.442E+01 4.154E+01 3.317E+01 3.096E+01 3.076E+01 3.030E+01
2.581E+01
IN SOIL MOI 1.142E+01 1.073E+01 1.017E+01 9.092E+00 7.281E+00 6.989E+00 6.201E+00 6.154E+00 5.668E+00 5.052E+00 4.474E+00
4.304E+00
ADS ON SOIL 4.895E+02 4.483E+02 4.110E+02 3.767E+02 3.412E+02 3.097E+02 2.825E+02 2.593E+02 2.396E+02 2.212E+02 2.032E+02
1.862E+02
IN SOIL AIR 6.141E+00 5.714E+00 5.248E+00 4.887E+00 4.677E+00 4.097E+00 3.671E+00 3.182E+00 2.888E+00 2.689E+00 2.518E+00
2.286E+00

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP 2.409E+01 1.891E+01 1.406E+01 1.363E+01 1.740E+01 1.263E+01 1.387E+01 1.085E+01 1.182E+01 1.260E+01 1.222E+01
9.268E+00
IN SOIL MOI 1.411E+01 1.309E+01 1.227E+01 1.095E+01 8.821E+00 8.481E+00 7.592E+00 7.596E+00 7.073E+00 6.329E+00 5.585E+00
5.348E+00
IN SOIL AIR 7.591E+00 6.972E+00 6.330E+00 5.885E+00 5.667E+00 4.971E+00 4.495E+00 3.927E+00 3.604E+00 3.369E+00 3.144E+00
2.840E+00

SUBLAYER 2

DIFFUSED UP 2.146E+01 1.679E+01 1.240E+01 1.173E+01 1.485E+01 1.095E+01 1.199E+01 9.582E+00 1.050E+01 1.127E+01 1.090E+01
8.321E+00
IN SOIL MOI 1.523E+01 1.399E+01 1.299E+01 1.157E+01 9.369E+00 9.015E+00 8.131E+00 8.186E+00 7.699E+00 6.909E+00 6.078E+00
5.799E+00
IN SOIL AIR 8.195E+00 7.448E+00 6.700E+00 6.219E+00 6.018E+00 5.284E+00 4.814E+00 4.232E+00 3.923E+00 3.678E+00 3.422E+00
3.079E+00

SUBLAYER 3

DIFFUSED UP 1.814E+01 1.413E+01 1.040E+01 9.649E+00 1.212E+01 9.045E+00 9.872E+00 8.055E+00 8.883E+00 9.542E+00 9.228E+00
7.068E+00
IN SOIL MOI 1.618E+01 1.473E+01 1.358E+01 1.209E+01 9.819E+00 9.453E+00 8.580E+00 8.683E+00 8.232E+00 7.402E+00 6.497E+00
6.178E+00
IN SOIL AIR 8.703E+00 7.845E+00 7.007E+00 6.495E+00 6.307E+00 5.541E+00 5.080E+00 4.489E+00 4.194E+00 3.940E+00 3.657E+00
3.281E+00

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 1.423E+01 1.103E+01 8.084E+00 7.404E+00 9.239E+00 6.950E+00 7.571E+00 6.272E+00 6.981E+00 7.515E+00 7.247E+00
5.574E+00
IN SOIL MOI 1.691E+01 1.531E+01 1.404E+01 1.248E+01 1.017E+01 9.790E+00 8.926E+00 9.073E+00 8.652E+00 7.793E+00 6.826E+00
6.476E+00
IN SOIL AIR 9.099E+00 8.151E+00 7.241E+00 6.707E+00 6.530E+00 5.739E+00 5.285E+00 4.691E+00 4.408E+00 4.148E+00 3.842E+00
3.439E+00

SUBLAYER 2

DIFFUSED UP 9.799E+00 7.572E+00 5.526E+00 5.012E+00 6.271E+00 4.725E+00 5.160E+00 4.311E+00 4.826E+00 5.195E+00 4.993E+00
3.859E+00
IN SOIL MOI 1.742E+01 1.570E+01 1.435E+01 1.275E+01 1.040E+01 1.002E+01 9.163E+00 9.341E+00 8.945E+00 8.062E+00 7.051E+00
6.681E+00
IN SOIL AIR 9.372E+00 8.361E+00 7.401E+00 6.851E+00 6.682E+00 5.873E+00 5.425E+00 4.829E+00 4.557E+00 4.291E+00 3.969E+00
3.548E+00

SUBLAYER 3

DIFFUSED UP 4.984E+00 3.846E+00 2.806E+00 2.544E+00 3.162E+00 2.395E+00 2.613E+00 2.200E+00 2.486E+00 2.657E+00 2.548E+00
1.981E+00
IN SOIL MOI 1.768E+01 1.590E+01 1.451E+01 1.288E+01 1.052E+01 1.014E+01 9.283E+00 9.479E+00 9.096E+00 8.199E+00 7.166E+00
6.787E+00
IN SOIL AIR 9.509E+00 8.468E+00 7.484E+00 6.925E+00 6.757E+00 5.941E+00 5.496E+00 4.901E+00 4.634E+00 4.364E+00 4.034E+00
3.604E+00
GWR. RUNOFF 1.651E+00 1.858E+00 2.552E+00 1.242E+00 0.000E+00 0.000E+00 0.000E+00 1.661E+00 1.764E+00 7.095E-01 0.000E+00
7.396E-01

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 2.632E-06 2.447E-06 2.277E-06 2.108E-06 1.909E-06 1.728E-06 1.562E-06 1.411E-06 1.282E-06 1.177E-06 1.084E-06
9.944E-07
%SOLUBILITY 5.004E-07 4.652E-07 4.330E-07 4.007E-07 3.630E-07 3.285E-07 2.969E-07 2.683E-07 2.438E-07 2.237E-07 2.060E-07
1.890E-07
ADSORBED 7.251E-06 6.741E-06 6.275E-06 5.807E-06 5.260E-06 4.760E-06 4.302E-06 3.887E-06 3.533E-06 3.242E-06 2.985E-06
2.740E-06
SOIL AIR 7.339E-07 7.028E-07 6.678E-07 6.192E-07 5.573E-07 4.997E-07 4.379E-07 3.883E-07 3.463E-07 3.147E-07 2.902E-07
2.701E-07

SUBLAYER 2

MOISTURE 4.988E-06 4.603E-06 4.254E-06 3.916E-06 3.544E-06 3.217E-06 2.919E-06 2.663E-06 2.439E-06 2.241E-06 2.059E-06
1.892E-06
%SOLUBILITY 9.483E-07 8.751E-07 8.088E-07 7.446E-07 6.738E-07 6.115E-07 5.549E-07 5.064E-07 4.637E-07 4.261E-07 3.915E-07
3.596E-07
ADSORBED 1.374E-05 1.268E-05 1.172E-05 1.079E-05 9.765E-06 8.862E-06 8.042E-06 7.338E-06 6.719E-06 6.175E-06 5.673E-06
5.211E-06
SOIL AIR 1.391E-06 1.322E-06 1.247E-06 1.150E-06 1.034E-06 9.304E-07 8.185E-07 7.331E-07 6.586E-07 5.993E-07 5.515E-07
5.138E-07

SUBLAYER 3

MOISTURE 6.634E-06 6.076E-06 5.570E-06 5.105E-06 4.624E-06 4.197E-06 3.828E-06 3.515E-06 3.246E-06 2.997E-06 2.753E-06
2.523E-06
%SOLUBILITY 1.261E-06 1.155E-06 1.059E-06 9.705E-07 8.791E-07 7.979E-07 7.277E-07 6.682E-07 6.172E-07 5.698E-07 5.234E-07
4.797E-07
ADSORBED 1.828E-05 1.674E-05 1.534E-05 1.406E-05 1.274E-05 1.156E-05 1.055E-05 9.683E-06 8.944E-06 8.258E-06 7.585E-06
6.952E-06
SOIL AIR 1.850E-06 1.745E-06 1.633E-06 1.500E-06 1.350E-06 1.214E-06 1.073E-06 9.673E-07 8.766E-07 8.016E-07 7.374E-07
6.854E-07

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 7.290E-06 6.590E-06 5.972E-06 5.464E-06 4.980E-06 4.527E-06 4.166E-06 3.856E-06 3.601E-06 3.338E-06 3.055E-06
2.787E-06
%SOLUBILITY 1.386E-06 1.253E-06 1.135E-06 1.039E-06 9.468E-07 8.606E-07 7.920E-07 7.331E-07 6.846E-07 6.346E-07 5.808E-07
5.298E-07
SOIL AIR 2.033E-06 1.893E-06 1.751E-06 1.605E-06 1.453E-06 1.309E-06 1.168E-06 1.061E-06 9.724E-07 8.926E-07 8.183E-07
7.571E-07

SUBLAYER 2

MOISTURE 7.870E-06 7.040E-06 6.321E-06 5.775E-06 5.289E-06 4.812E-06 4.462E-06 4.156E-06 3.920E-06 3.644E-06 3.325E-06
3.022E-06
%SOLUBILITY 1.496E-06 1.338E-06 1.202E-06 1.098E-06 1.006E-06 9.148E-07 8.483E-07 7.901E-07 7.452E-07 6.928E-07 6.321E-07
5.745E-07
SOIL AIR 2.195E-06 2.022E-06 1.853E-06 1.696E-06 1.544E-06 1.392E-06 1.251E-06 1.144E-06 1.059E-06 9.745E-07 8.906E-07
8.209E-07

SUBLAYER 3

MOISTURE 8.358E-06 7.415E-06 6.610E-06 6.031E-06 5.543E-06 5.046E-06 4.708E-06 4.408E-06 4.191E-06 3.904E-06 3.554E-06
3.220E-06
%SOLUBILITY 1.589E-06 1.410E-06 1.257E-06 1.147E-06 1.054E-06 9.593E-07 8.951E-07 8.380E-07 7.968E-07 7.422E-07 6.757E-07
6.122E-07
SOIL AIR 2.331E-06 2.130E-06 1.938E-06 1.772E-06 1.618E-06 1.460E-06 1.320E-06 1.213E-06 1.132E-06 1.044E-06 9.519E-07
8.747E-07

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 8.738E-06 7.705E-06 6.831E-06 6.228E-06 5.739E-06 5.226E-06 4.898E-06 4.606E-06 4.405E-06 4.110E-06 3.734E-06
3.375E-06
%SOLUBILITY 1.661E-06 1.465E-06 1.299E-06 1.184E-06 1.091E-06 9.935E-07 9.312E-07 8.757E-07 8.375E-07 7.814E-07 7.099E-07
6.416E-07
SOIL AIR 2.437E-06 2.213E-06 2.003E-06 1.830E-06 1.675E-06 1.512E-06 1.373E-06 1.268E-06 1.189E-06 1.099E-06 1.000E-06
9.168E-07

SUBLAYER 2

MOISTURE 9.000E-06 7.903E-06 6.982E-06 6.361E-06 5.872E-06 5.348E-06 5.028E-06 4.742E-06 4.554E-06 4.252E-06 3.857E-06
3.482E-06

%SOLUBILITY 1.711E-06 1.502E-06 1.327E-06 1.209E-06 1.116E-06 1.017E-06 9.559E-07 9.015E-07 8.658E-07 8.084E-07 7.333E-07 6.620E-07
SOIL AIR 2.510E-06 2.270E-06 2.047E-06 1.869E-06 1.714E-06 1.547E-06 1.410E-06 1.305E-06 1.230E-06 1.137E-06 1.033E-06 9.459E-07

SUBLAYER 3

MOISTURE 9.132E-06 8.004E-06 7.060E-06 6.430E-06 5.938E-06 5.410E-06 5.094E-06 4.812E-06 4.631E-06 4.324E-06 3.920E-06 3.537E-06
%SOLUBILITY 1.736E-06 1.522E-06 1.342E-06 1.222E-06 1.129E-06 1.029E-06 9.684E-07 9.148E-07 8.804E-07 8.221E-07 7.452E-07 6.724E-07
SOIL AIR 2.546E-06 2.299E-06 2.070E-06 1.889E-06 1.733E-06 1.565E-06 1.428E-06 1.324E-06 1.251E-06 1.156E-06 1.050E-06 9.608E-07

POL DEP CM 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
1

YEAR - 14 ANNUAL SUMMARY REPORT
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-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 8.695E+02

SUBLAYER 2

TOTAL DIFFUSED (UP) 7.648E+02

SUBLAYER 3

TOTAL DIFFUSED (UP) 5.207E+02

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 1.713E+02

SUBLAYER 2

TOTAL DIFFUSED (UP) 1.507E+02

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.261E+02

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 9.810E+01

SUBLAYER 2

TOTAL DIFFUSED (UP) 6.725E+01

SUBLAYER 3

TOTAL DIFFUSED (UP) 3.422E+01
TOTAL IN GROUNDWATER RUNOFF 1.218E+01

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 1.718E-06
ADSORBED SOIL (UG/G) 4.732E-06
SOIL AIR (UG/ML) 4.857E-07

SUBLAYER 2

SOIL MOISTURE (UG/ML) 3.228E-06
ADSORBED SOIL (UG/G) 8.893E-06
SOIL AIR (UG/ML) 9.126E-07

SUBLAYER 3

SOIL MOISTURE (UG/ML) 4.256E-06
ADSORBED SOIL (UG/G) 1.172E-05
SOIL AIR (UG/ML) 1.203E-06

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 4.635E-06
SOIL AIR (UG/ML) 1.310E-06

SUBLAYER 2

SOIL MOISTURE (UG/ML) 4.970E-06
SOIL AIR (UG/ML) 1.403E-06

SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.249E-06
SOIL AIR (UG/ML) 1.482E-06

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 5.466E-06
SOIL AIR (UG/ML) 1.543E-06

SUBLAYER 2

SOIL MOISTURE (UG/ML) 5.615E-06
SOIL AIR (UG/ML) 1.585E-06

SUBLAYER 3

SOIL MOISTURE (UG/ML) 5.691E-06
SOIL AIR (UG/ML) 1.606E-06

MAX. POLL. DEPTH (M) 3.900E+00

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YEAR -15 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560

YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED	3.777E+01	3.444E+01	3.071E+01	2.989E+01	3.336E+01	2.741E+01	2.511E+01	1.953E+01	1.745E+01	1.676E+01	1.637E+01	1.407E+01
IN SOIL MOI	1.581E+00	1.507E+00	1.449E+00	1.308E+00	1.048E+00	1.002E+00	8.807E-01	8.597E-01	7.787E-01	6.895E-01	6.110E-01	5.886E-01
ADS ON SOIL	6.779E+01	6.298E+01	5.855E+01	5.418E+01	4.910E+01	4.441E+01	4.012E+01	3.623E+01	3.291E+01	3.019E+01	2.775E+01	2.546E+01
IN SOIL AIR	8.503E-01	8.026E-01	7.476E-01	7.029E-01	6.730E-01	5.875E-01	5.214E-01	4.445E-01	3.967E-01	3.670E-01	3.439E-01	3.126E-01

SUBLAYER 2

DIFFUSED UP	3.390E+01	3.053E+01	2.683E+01	2.582E+01	2.863E+01	2.352E+01	2.172E+01	1.714E+01	1.560E+01	1.512E+01	1.475E+01	1.267E+01
IN SOIL MOI	2.994E+00	2.835E+00	2.709E+00	2.431E+00	1.944E+00	1.865E+00	1.645E+00	1.622E+00	1.480E+00	1.312E+00	1.161E+00	1.118E+00
ADS ON SOIL	1.284E+02	1.184E+02	1.094E+02	1.007E+02	9.110E+01	8.264E+01	7.495E+01	6.834E+01	6.254E+01	5.745E+01	5.272E+01	4.838E+01
IN SOIL AIR	1.611E+00	1.510E+00	1.397E+00	1.306E+00	1.249E+00	1.093E+00	9.741E-01	8.384E-01	7.539E-01	6.984E-01	6.535E-01	5.939E-01

SUBLAYER 3

DIFFUSED UP	2.374E+01	2.101E+01	1.802E+01	1.704E+01	1.891E+01	1.542E+01	1.439E+01	1.149E+01	1.072E+01	1.063E+01	1.045E+01	8.898E+00
IN SOIL MOI	3.979E+00	3.740E+00	3.545E+00	3.167E+00	2.535E+00	2.431E+00	2.155E+00	2.138E+00	1.968E+00	1.752E+00	1.550E+00	1.489E+00
ADS ON SOIL	1.707E+02	1.563E+02	1.432E+02	1.312E+02	1.188E+02	1.077E+02	9.818E+01	9.008E+01	8.317E+01	7.671E+01	7.039E+01	6.444E+01
IN SOIL AIR	2.141E+00	1.991E+00	1.829E+00	1.702E+00	1.628E+00	1.425E+00	1.276E+00	1.105E+00	1.003E+00	9.326E-01	8.725E-01	7.910E-01

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP	8.300E+00	6.529E+00	4.829E+00	4.673E+00	5.956E+00	4.284E+00	4.676E+00	3.673E+00	4.010E+00	4.259E+00	4.111E+00	3.083E+00
IN SOIL MOI	4.917E+00	4.560E+00	4.274E+00	3.809E+00	3.066E+00	2.941E+00	2.633E+00	2.632E+00	2.451E+00	2.188E+00	1.929E+00	1.844E+00
IN SOIL AIR	2.645E+00	2.428E+00	2.205E+00	2.047E+00	1.970E+00	1.724E+00	1.559E+00	1.361E+00	1.249E+00	1.165E+00	1.086E+00	9.793E-01

SUBLAYER 2

DIFFUSED UP	7.416E+00	5.792E+00	4.268E+00	4.016E+00	5.100E+00	3.702E+00	4.042E+00	3.238E+00	3.563E+00	3.800E+00	3.678E+00	2.778E+00
IN SOIL MOI	5.304E+00	4.868E+00	4.521E+00	4.022E+00	3.254E+00	3.121E+00	2.816E+00	2.833E+00	2.663E+00	2.383E+00	2.095E+00	1.996E+00
IN SOIL AIR	2.853E+00	2.592E+00	2.332E+00	2.161E+00	2.090E+00	1.829E+00	1.667E+00	1.464E+00	1.357E+00	1.269E+00	1.179E+00	1.060E+00

SUBLAYER 3

DIFFUSED UP	6.283E+00	4.887E+00	3.554E+00	3.291E+00	4.166E+00	3.060E+00	3.345E+00	2.731E+00	3.012E+00	3.220E+00	3.105E+00	2.384E+00
IN SOIL MOI	5.629E+00	5.124E+00	4.722E+00	4.196E+00	3.408E+00	3.269E+00	2.969E+00	3.000E+00	2.844E+00	2.552E+00	2.236E+00	2.124E+00
IN SOIL AIR	3.028E+00	2.728E+00	2.436E+00	2.255E+00	2.189E+00	1.916E+00	1.758E+00	1.551E+00	1.449E+00	1.358E+00	1.259E+00	1.128E+00

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 4.946E+00 3.813E+00 2.768E+00 2.523E+00 3.181E+00 2.361E+00 2.586E+00 2.148E+00 2.352E+00 2.524E+00 2.428E+00 1.896E+00
IN SOIL MOI 5.887E+00 5.323E+00 4.878E+00 4.332E+00 3.527E+00 3.383E+00 3.089E+00 3.132E+00 2.985E+00 2.683E+00 2.345E+00 2.226E+00
IN SOIL AIR 3.167E+00 2.834E+00 2.516E+00 2.328E+00 2.266E+00 1.983E+00 1.829E+00 1.619E+00 1.521E+00 1.428E+00 1.320E+00 1.182E+00

SUBLAYER 2

DIFFUSED UP 3.420E+00 2.623E+00 1.897E+00 1.715E+00 2.172E+00 1.593E+00 1.758E+00 1.472E+00 1.621E+00 1.736E+00 1.686E+00 1.316E+00
IN SOIL MOI 6.063E+00 5.458E+00 4.985E+00 4.422E+00 3.608E+00 3.460E+00 3.171E+00 3.223E+00 3.084E+00 2.772E+00 2.422E+00 2.295E+00
IN SOIL AIR 3.261E+00 2.906E+00 2.572E+00 2.377E+00 2.318E+00 2.028E+00 1.877E+00 1.666E+00 1.571E+00 1.475E+00 1.363E+00 1.219E+00

SUBLAYER 3

DIFFUSED UP 1.760E+00 1.339E+00 9.557E-01 8.744E-01 1.099E+00 8.145E-01 8.816E-01 7.461E-01 8.409E-01 9.011E-01 8.627E-01 6.711E-01
IN SOIL MOI 6.156E+00 5.525E+00 5.038E+00 4.469E+00 3.651E+00 3.500E+00 3.213E+00 3.270E+00 3.133E+00 2.818E+00 2.461E+00 2.331E+00
IN SOIL AIR 3.311E+00 2.942E+00 2.599E+00 2.402E+00 2.345E+00 2.051E+00 1.902E+00 1.691E+00 1.596E+00 1.500E+00 1.385E+00 1.238E+00
GWR. RUNOFF 5.748E-01 6.464E-01 8.864E-01 4.309E-01 0.000E+00 0.000E+00 0.000E+00 5.739E-01 6.080E-01 2.440E-01 0.000E+00 2.540E-01

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

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UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 9.187E-07 8.535E-07 7.935E-07 7.343E-07 6.654E-07 6.019E-07 5.437E-07 4.910E-07 4.460E-07 4.091E-07 3.760E-07 3.451E-07
%SOLUBILITY 1.747E-07 1.623E-07 1.509E-07 1.396E-07 1.265E-07 1.144E-07 1.034E-07 9.335E-08 8.479E-08 7.778E-08 7.148E-08 6.561E-08
ADSORBED 2.531E-06 2.351E-06 2.186E-06 2.023E-06 1.833E-06 1.658E-06 1.498E-06 1.353E-06 1.229E-06 1.127E-06 1.036E-06 9.508E-07
SOIL AIR 2.562E-07 2.452E-07 2.327E-07 2.157E-07 1.942E-07 1.741E-07 1.525E-07 1.351E-07 1.204E-07 1.094E-07 1.007E-07 9.374E-08

SUBLAYER 2

MOISTURE 1.740E-06 1.605E-06 1.483E-06 1.365E-06 1.235E-06 1.120E-06 1.016E-06 9.262E-07 8.476E-07 7.785E-07 7.144E-07 6.557E-07
%SOLUBILITY 3.308E-07 3.052E-07 2.819E-07 2.594E-07 2.347E-07 2.129E-07 1.931E-07 1.761E-07 1.611E-07 1.480E-07 1.358E-07 1.247E-07
ADSORBED 4.794E-06 4.422E-06 4.086E-06 3.760E-06 3.401E-06 3.086E-06 2.798E-06 2.552E-06 2.335E-06 2.145E-06 1.968E-06 1.806E-06
SOIL AIR 4.852E-07 4.611E-07 4.348E-07 4.009E-07 3.603E-07 3.240E-07 2.848E-07 2.549E-07 2.289E-07 2.082E-07 1.913E-07 1.781E-07

SUBLAYER 3

MOISTURE 2.313E-06 2.118E-06 1.941E-06 1.778E-06 1.610E-06 1.460E-06 1.331E-06 1.221E-06 1.127E-06 1.040E-06 9.539E-07 8.733E-07
%SOLUBILITY 4.397E-07 4.026E-07 3.690E-07 3.380E-07 3.060E-07 2.775E-07 2.529E-07 2.321E-07 2.143E-07 1.976E-07 1.813E-07 1.660E-07
ADSORBED 6.371E-06 5.834E-06 5.347E-06 4.899E-06 4.435E-06 4.022E-06 3.666E-06 3.363E-06 3.105E-06 2.864E-06 2.628E-06 2.406E-06
SOIL AIR 6.449E-07 6.083E-07 5.691E-07 5.223E-07 4.698E-07 4.223E-07 3.731E-07 3.360E-07 3.044E-07 2.780E-07 2.555E-07 2.372E-07

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 2.540E-06 2.295E-06 2.080E-06 1.901E-06 1.731E-06 1.570E-06 1.445E-06 1.336E-06 1.248E-06 1.154E-06 1.055E-06 9.610E-07
%SOLUBILITY 4.829E-07 4.363E-07 3.954E-07 3.614E-07 3.291E-07 2.985E-07 2.747E-07 2.540E-07 2.373E-07 2.194E-07 2.006E-07 1.827E-07
SOIL AIR 7.083E-07 6.592E-07 6.099E-07 5.584E-07 5.052E-07 4.541E-07 4.052E-07 3.677E-07 3.370E-07 3.086E-07 2.826E-07 2.611E-07

SUBLAYER 2

MOISTURE 2.740E-06 2.450E-06 2.200E-06 2.007E-06 1.837E-06 1.666E-06 1.545E-06 1.438E-06 1.356E-06 1.257E-06 1.146E-06 1.040E-06
%SOLUBILITY 5.209E-07 4.658E-07 4.183E-07 3.816E-07 3.492E-07 3.167E-07 2.937E-07 2.734E-07 2.578E-07 2.390E-07 2.179E-07 1.977E-07

SOIL AIR 7.640E-07 7.037E-07 6.451E-07 5.896E-07 5.362E-07 4.819E-07 4.332E-07 3.958E-07 3.662E-07 3.361E-07 3.069E-07
2.825E-07

SUBLAYER 3

MOISTURE 2.908E-06 2.579E-06 2.298E-06 2.094E-06 1.924E-06 1.745E-06 1.629E-06 1.523E-06 1.448E-06 1.346E-06 1.223E-06
1.107E-06
%SOLUBILITY 5.529E-07 4.903E-07 4.369E-07 3.981E-07 3.658E-07 3.317E-07 3.097E-07 2.895E-07 2.753E-07 2.559E-07 2.325E-07
2.105E-07
SOIL AIR 8.109E-07 7.408E-07 6.738E-07 6.151E-07 5.615E-07 5.047E-07 4.568E-07 4.192E-07 3.910E-07 3.599E-07 3.276E-07
3.007E-07

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE 3.041E-06 2.679E-06 2.374E-06 2.162E-06 1.991E-06 1.806E-06 1.695E-06 1.590E-06 1.520E-06 1.415E-06 1.283E-06
1.160E-06
%SOLUBILITY 5.781E-07 5.093E-07 4.513E-07 4.110E-07 3.785E-07 3.433E-07 3.222E-07 3.023E-07 2.890E-07 2.690E-07 2.439E-07
2.205E-07
SOIL AIR 8.480E-07 7.695E-07 6.961E-07 6.351E-07 5.811E-07 5.224E-07 4.753E-07 4.376E-07 4.104E-07 3.784E-07 3.436E-07
3.151E-07

SUBLAYER 2

MOISTURE 3.132E-06 2.747E-06 2.426E-06 2.207E-06 2.037E-06 1.847E-06 1.740E-06 1.636E-06 1.570E-06 1.462E-06 1.325E-06
1.196E-06
%SOLUBILITY 5.954E-07 5.222E-07 4.612E-07 4.196E-07 3.873E-07 3.511E-07 3.308E-07 3.110E-07 2.985E-07 2.779E-07 2.519E-07
2.274E-07
SOIL AIR 8.734E-07 7.890E-07 7.113E-07 6.483E-07 5.945E-07 5.342E-07 4.879E-07 4.503E-07 4.239E-07 3.910E-07 3.549E-07
3.249E-07

SUBLAYER 3

MOISTURE 3.180E-06 2.781E-06 2.452E-06 2.230E-06 2.061E-06 1.868E-06 1.763E-06 1.660E-06 1.595E-06 1.486E-06 1.346E-06
1.215E-06
%SOLUBILITY 6.046E-07 5.287E-07 4.662E-07 4.240E-07 3.918E-07 3.551E-07 3.352E-07 3.156E-07 3.032E-07 2.825E-07 2.559E-07
2.310E-07
SOIL AIR 8.867E-07 7.988E-07 7.189E-07 6.551E-07 6.015E-07 5.403E-07 4.944E-07 4.569E-07 4.307E-07 3.974E-07 3.605E-07
3.300E-07

POL DEP CM 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1

YEAR - 15 ANNUAL SUMMARY REPORT

-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 3.029E+02

SUBLAYER 2

TOTAL DIFFUSED (UP) 2.662E+02

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.807E+02

SOIL ZONE 2:

SUBLAYER 1

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          TOTAL DIFFUSED (UP)                5.838E+01

     SUBLAYER  2

          TOTAL DIFFUSED (UP)                5.139E+01

     SUBLAYER  3

          TOTAL DIFFUSED (UP)                4.304E+01

SOIL ZONE 3:

     SUBLAYER  1

     SUBLAYER  2

     SUBLAYER  3

LOWER SOIL ZONE:

     SUBLAYER  1

          TOTAL DIFFUSED (UP)                3.353E+01

     SUBLAYER  2

          TOTAL DIFFUSED (UP)                2.301E+01

     SUBLAYER  3

          TOTAL DIFFUSED (UP)                1.175E+01
          TOTAL IN GROUNDWATER RUNOFF        4.218E+00
1                    -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                     ---------------------------------------------------------------------------------

UPPER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  5.982E-07
                                   ADSORBED SOIL (UG/G)   1.648E-06
                                   SOIL AIR (UG/ML)       1.692E-07

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  1.124E-06
                                   ADSORBED SOIL (UG/G)   3.096E-06
                                   SOIL AIR (UG/ML)       3.177E-07

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  1.480E-06
                                   ADSORBED SOIL (UG/G)   4.078E-06
                                   SOIL AIR (UG/ML)       4.184E-07

SOIL ZONE 2:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  1.610E-06
                                   SOIL AIR (UG/ML)       4.548E-07

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  1.723E-06
                                   SOIL AIR (UG/ML)       4.868E-07

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  1.819E-06
                                   SOIL AIR (UG/ML)       5.135E-07

SOIL ZONE 3:

LOWER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  1.893E-06
                                   SOIL AIR (UG/ML)       5.344E-07

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  1.944E-06
                                   SOIL AIR (UG/ML)       5.486E-07

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  1.970E-06
                                   SOIL AIR (UG/ML)       5.559E-07
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MAX. POLL. DEPTH (M) 3.900E+00

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YEAR -16 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

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-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	1.309E+01	1.192E+01	1.062E+01	1.032E+01	1.150E+01	9.438E+00	8.646E+00	6.718E+00	5.990E+00	5.761E+00	5.618E+00	4.807E+00
IN SOIL MOI	5.470E-01	5.217E-01	5.012E-01	4.512E-01	3.607E-01	3.454E-01	3.032E-01	2.952E-01	2.673E-01	2.373E-01	2.091E-01	2.009E-01
ADS ON SOIL	2.346E+01	2.180E+01	2.025E+01	1.869E+01	1.691E+01	1.530E+01	1.381E+01	1.244E+01	1.130E+01	1.039E+01	9.497E+00	8.692E+00
IN SOIL AIR	2.943E-01	2.778E-01	2.585E-01	2.425E-01	2.317E-01	2.024E-01	1.795E-01	1.526E-01	1.362E-01	1.263E-01	1.177E-01	1.067E-01

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	1.174E+01	1.056E+01	9.287E+00	8.930E+00	9.881E+00	8.093E+00	7.451E+00	5.869E+00	5.336E+00	5.151E+00	5.027E+00	4.329E+00
IN SOIL MOI	1.037E+00	9.809E-01	9.370E-01	8.391E-01	6.698E-01	6.416E-01	5.650E-01	5.563E-01	5.067E-01	4.487E-01	3.975E-01	3.810E-01
ADS ON SOIL	4.447E+01	4.098E+01	3.785E+01	3.476E+01	3.139E+01	2.843E+01	2.574E+01	2.344E+01	2.141E+01	1.964E+01	1.805E+01	1.648E+01
IN SOIL AIR	5.579E-01	5.223E-01	4.834E-01	4.510E-01	4.303E-01	3.761E-01	3.345E-01	2.876E-01	2.581E-01	2.388E-01	2.237E-01	2.024E-01

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	8.174E+00	7.218E+00	6.154E+00	5.819E+00	6.469E+00	5.269E+00	4.889E+00	3.887E+00	3.621E+00	3.592E+00	3.518E+00	2.971E+00
IN SOIL MOI	1.376E+00	1.291E+00	1.222E+00	1.091E+00	8.718E-01	8.346E-01	7.380E-01	7.305E-01	6.713E-01	5.976E-01	5.273E-01	5.054E-01
ADS ON SOIL	5.900E+01	5.393E+01	4.938E+01	4.520E+01	4.086E+01	3.698E+01	3.362E+01	3.079E+01	2.837E+01	2.617E+01	2.394E+01	2.186E+01
IN SOIL AIR	7.401E-01	6.872E-01	6.305E-01	5.863E-01	5.600E-01	4.892E-01	4.369E-01	3.777E-01	3.420E-01	3.181E-01	2.968E-01	2.684E-01

SOIL ZONE 2:

SUBLAYER 1

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 DIFFUSED UP 2.762E+00 2.124E+00 1.554E+00 1.502E+00 1.928E+00 1.372E+00 1.458E+00 1.139E+00 1.272E+00 1.346E+00 1.241E+00
9.250E-01
 IN SOIL MOI 1.692E+00 1.566E+00 1.467E+00 1.306E+00 1.050E+00 1.004E+00 8.948E-01 8.943E-01 8.308E-01 7.414E-01 6.490E-01
6.198E-01
 IN SOIL AIR 9.101E-01 8.337E-01 7.568E-01 7.022E-01 6.748E-01 5.886E-01 5.298E-01 4.624E-01 4.233E-01 3.946E-01 3.653E-01
3.291E-01

          SUBLAYER  2

 DIFFUSED UP 2.482E+00 1.900E+00 1.367E+00 1.284E+00 1.643E+00 1.199E+00 1.260E+00 9.896E-01 1.129E+00 1.188E+00 1.090E+00
8.288E-01
 IN SOIL MOI 1.822E+00 1.665E+00 1.545E+00 1.375E+00 1.111E+00 1.060E+00 9.495E-01 9.573E-01 8.996E-01 8.001E-01 6.965E-01
6.658E-01
 IN SOIL AIR 9.799E-01 8.866E-01 7.971E-01 7.388E-01 7.134E-01 6.215E-01 5.621E-01 4.949E-01 4.583E-01 4.259E-01 3.921E-01
3.536E-01

          SUBLAYER  3

 DIFFUSED UP 2.091E+00 1.620E+00 1.161E+00 1.065E+00 1.357E+00 9.635E-01 1.022E+00 8.303E-01 9.449E-01 9.978E-01 9.295E-01
6.735E-01
 IN SOIL MOI 1.932E+00 1.750E+00 1.611E+00 1.431E+00 1.162E+00 1.105E+00 9.950E-01 1.009E+00 9.565E-01 8.494E-01 7.367E-01
7.023E-01
 IN SOIL AIR 1.039E+00 9.320E-01 8.310E-01 7.689E-01 7.464E-01 6.479E-01 5.891E-01 5.214E-01 4.873E-01 4.521E-01 4.147E-01
3.730E-01

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

 DIFFUSED UP 1.629E+00 1.260E+00 9.170E-01 8.338E-01 1.024E+00 7.297E-01 7.605E-01 6.407E-01 7.480E-01 7.835E-01 7.178E-01
5.297E-01
 IN SOIL MOI 2.017E+00 1.816E+00 1.664E+00 1.473E+00 1.201E+00 1.139E+00 1.028E+00 1.050E+00 1.002E+00 8.874E-01 7.678E-01
7.311E-01
 IN SOIL AIR 1.085E+00 9.670E-01 8.586E-01 7.916E-01 7.715E-01 6.677E-01 6.085E-01 5.428E-01 5.104E-01 4.723E-01 4.322E-01
3.882E-01

          SUBLAYER  2

 DIFFUSED UP 1.120E+00 8.648E-01 6.460E-01 5.864E-01 6.897E-01 4.766E-01 4.766E-01 4.555E-01 5.178E-01 5.402E-01 5.025E-01
3.814E-01
 IN SOIL MOI 2.075E+00 1.860E+00 1.699E+00 1.503E+00 1.228E+00 1.162E+00 1.050E+00 1.081E+00 1.033E+00 9.139E-01 7.897E-01
7.522E-01
 IN SOIL AIR 1.116E+00 9.902E-01 8.766E-01 8.077E-01 7.885E-01 6.808E-01 6.215E-01 5.591E-01 5.264E-01 4.864E-01 4.445E-01
3.994E-01

          SUBLAYER  3

 DIFFUSED UP 5.731E-01 4.474E-01 3.318E-01 3.019E-01 3.441E-01 2.364E-01 2.357E-01 2.177E-01 2.689E-01 2.655E-01 2.698E-01
1.947E-01
 IN SOIL MOI 2.104E+00 1.882E+00 1.720E+00 1.519E+00 1.242E+00 1.173E+00 1.061E+00 1.097E+00 1.049E+00 9.291E-01 8.007E-01
7.637E-01
 IN SOIL AIR 1.132E+00 1.002E+00 8.872E-01 8.163E-01 7.977E-01 6.874E-01 6.279E-01 5.672E-01 5.344E-01 4.945E-01 4.507E-01
4.056E-01
 GWR. RUNOFF 1.966E-01 2.207E-01 3.024E-01 1.469E-01 0.000E+00 0.000E+00 0.000E+00 1.911E-01 2.034E-01 8.105E-02 0.000E+00
8.289E-02


     -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
     ----------------------------------------------------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

 MOISTURE      3.179E-07 2.954E-07 2.744E-07 2.533E-07 2.291E-07 2.074E-07 1.872E-07 1.686E-07 1.531E-07 1.408E-07 1.287E-07
1.178E-07
 %SOLUBILITY 6.044E-08 5.616E-08 5.217E-08 4.816E-08 4.356E-08 3.943E-08 3.559E-08 3.205E-08 2.911E-08 2.677E-08 2.447E-08
2.240E-08
 ADSORBED      8.758E-07 8.138E-07 7.560E-07 6.978E-07 6.312E-07 5.714E-07 5.157E-07 4.645E-07 4.218E-07 3.879E-07 3.546E-07
3.245E-07
 SOIL AIR      8.865E-08 8.485E-08 8.046E-08 7.441E-08 6.687E-08 5.999E-08 5.249E-08 4.640E-08 4.134E-08 3.765E-08 3.447E-08
3.200E-08

          SUBLAYER  2

 MOISTURE      6.027E-07 5.554E-07 5.130E-07 4.711E-07 4.254E-07 3.853E-07 3.488E-07 3.177E-07 2.902E-07 2.662E-07 2.446E-07
2.234E-07
 %SOLUBILITY 1.146E-07 1.056E-07 9.753E-08 8.956E-08 8.087E-08 7.325E-08 6.631E-08 6.040E-08 5.517E-08 5.061E-08 4.650E-08
4.247E-08
 ADSORBED      1.660E-06 1.530E-06 1.413E-06 1.298E-06 1.172E-06 1.062E-06 9.610E-07 8.753E-07 7.995E-07 7.334E-07 6.739E-07
6.155E-07
 SOIL AIR      1.681E-07 1.595E-07 1.504E-07 1.384E-07 1.242E-07 1.114E-07 9.781E-08 8.744E-08 7.836E-08 7.119E-08 6.551E-08
6.069E-08
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SUBLAYER 3

MOISTURE	7.996E-07	7.308E-07	6.692E-07	6.125E-07	5.537E-07	5.012E-07	4.556E-07	4.172E-07	3.845E-07	3.546E-07	3.245E-07	2.963E-07
%SOLUBILITY	1.520E-07	1.389E-07	1.272E-07	1.164E-07	1.053E-07	9.529E-08	8.662E-08	7.932E-08	7.310E-08	6.741E-08	6.169E-08	5.633E-08
ADSORBED	2.203E-06	2.013E-06	1.844E-06	1.687E-06	1.525E-06	1.381E-06	1.255E-06	1.149E-06	1.059E-06	9.769E-07	8.940E-07	8.163E-07
SOIL AIR	2.230E-07	2.099E-07	1.962E-07	1.799E-07	1.616E-07	1.450E-07	1.278E-07	1.148E-07	1.038E-07	9.483E-08	8.691E-08	8.049E-08

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	8.740E-07	7.880E-07	7.140E-07	6.520E-07	5.930E-07	5.360E-07	4.910E-07	4.540E-07	4.230E-07	3.910E-07	3.550E-07	3.230E-07
%SOLUBILITY	1.662E-07	1.498E-07	1.357E-07	1.240E-07	1.127E-07	1.019E-07	9.335E-08	8.631E-08	8.042E-08	7.433E-08	6.749E-08	6.141E-08
SOIL AIR	2.437E-07	2.263E-07	2.093E-07	1.915E-07	1.731E-07	1.550E-07	1.377E-07	1.250E-07	1.142E-07	1.046E-07	9.508E-08	8.774E-08

SUBLAYER 2

MOISTURE	9.410E-07	8.380E-07	7.520E-07	6.860E-07	6.270E-07	5.660E-07	5.210E-07	4.860E-07	4.580E-07	4.220E-07	3.810E-07	3.470E-07
%SOLUBILITY	1.789E-07	1.593E-07	1.430E-07	1.304E-07	1.192E-07	1.076E-07	9.905E-08	9.240E-08	8.707E-08	8.023E-08	7.243E-08	6.597E-08
SOIL AIR	2.624E-07	2.407E-07	2.205E-07	2.015E-07	1.830E-07	1.637E-07	1.461E-07	1.338E-07	1.237E-07	1.129E-07	1.020E-07	9.426E-08

SUBLAYER 3

MOISTURE	9.980E-07	8.810E-07	7.840E-07	7.140E-07	6.560E-07	5.900E-07	5.460E-07	5.120E-07	4.870E-07	4.480E-07	4.030E-07	3.660E-07
%SOLUBILITY	1.897E-07	1.675E-07	1.490E-07	1.357E-07	1.247E-07	1.122E-07	1.038E-07	9.734E-08	9.259E-08	8.517E-08	7.662E-08	6.958E-08
SOIL AIR	2.783E-07	2.531E-07	2.299E-07	2.097E-07	1.915E-07	1.707E-07	1.531E-07	1.409E-07	1.315E-07	1.198E-07	1.079E-07	9.942E-08

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	1.042E-06	9.140E-07	8.100E-07	7.350E-07	6.780E-07	6.080E-07	5.640E-07	5.330E-07	5.100E-07	4.680E-07	4.200E-07	3.810E-07
%SOLUBILITY	1.981E-07	1.738E-07	1.540E-07	1.397E-07	1.289E-07	1.156E-07	1.072E-07	1.013E-07	9.696E-08	8.897E-08	7.985E-08	7.243E-08
SOIL AIR	2.906E-07	2.625E-07	2.375E-07	2.159E-07	1.979E-07	1.759E-07	1.582E-07	1.467E-07	1.377E-07	1.252E-07	1.125E-07	1.035E-07

SUBLAYER 2

MOISTURE	1.072E-06	9.360E-07	8.270E-07	7.500E-07	6.930E-07	6.200E-07	5.760E-07	5.490E-07	5.260E-07	4.820E-07	4.320E-07	3.920E-07
%SOLUBILITY	2.038E-07	1.779E-07	1.572E-07	1.426E-07	1.317E-07	1.179E-07	1.095E-07	1.044E-07	1.000E-07	9.163E-08	8.213E-08	7.452E-08
SOIL AIR	2.989E-07	2.689E-07	2.425E-07	2.203E-07	2.023E-07	1.793E-07	1.615E-07	1.511E-07	1.420E-07	1.289E-07	1.157E-07	1.065E-07

SUBLAYER 3

MOISTURE	1.087E-06	9.470E-07	8.370E-07	7.580E-07	7.010E-07	6.260E-07	5.820E-07	5.570E-07	5.340E-07	4.900E-07	4.380E-07	3.980E-07
%SOLUBILITY	2.067E-07	1.800E-07	1.591E-07	1.441E-07	1.333E-07	1.190E-07	1.106E-07	1.059E-07	1.015E-07	9.316E-08	8.327E-08	7.567E-08
SOIL AIR	3.031E-07	2.720E-07	2.454E-07	2.227E-07	2.046E-07	1.811E-07	1.632E-07	1.533E-07	1.442E-07	1.310E-07	1.173E-07	1.081E-07

POL DEP CM	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02	3.900E+02

1 YEAR - 16 ANNUAL SUMMARY REPORT

-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453

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 TOTAL MOISTURE RETENTION (CM)                    0.003
 TOTAL YIELD (CM)                                 4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)

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     UPPER SOIL ZONE:

          SUBLAYER  1

               TOTAL VOLATILIZED                   1.044E+02

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                 9.166E+01

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                 6.158E+01

     SOIL ZONE 2:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                 1.862E+01

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                 1.636E+01

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                 1.366E+01

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                 1.057E+01

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                 7.258E+00

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                 3.687E+00
               TOTAL IN GROUNDWATER RUNOFF         1.425E+00
1                        -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                         ---------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  2.061E-07
                                   ADSORBED SOIL (UG/G)   5.679E-07
                                   SOIL AIR (UG/ML)       5.830E-08

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  3.870E-07
                                   ADSORBED SOIL (UG/G)   1.066E-06
                                   SOIL AIR (UG/ML)       1.094E-07

          SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  5.083E-07
                                   ADSORBED SOIL (UG/G)   1.400E-06
                                   SOIL AIR (UG/ML)       1.437E-07

     SOIL ZONE 2:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  5.495E-07
                                   SOIL AIR (UG/ML)       1.553E-07

          SUBLAYER  2
```

SOIL MOISTURE (UG/ML) 5.854E-07
SOIL AIR (UG/ML) 1.654E-07

SUBLAYER 3

SOIL MOISTURE (UG/ML) 6.154E-07
SOIL AIR (UG/ML) 1.738E-07

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 6.386E-07
SOIL AIR (UG/ML) 1.803E-07

SUBLAYER 2

SOIL MOISTURE (UG/ML) 6.546E-07
SOIL AIR (UG/ML) 1.848E-07

SUBLAYER 3

SOIL MOISTURE (UG/ML) 6.629E-07
SOIL AIR (UG/ML) 1.872E-07

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -17 MONTHLY RESULTS (OUTPUT)
======== ==========

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

VOLATILIZED	4.472E+00	4.055E+00	3.617E+00	3.509E+00	3.883E+00	3.179E+00	2.928E+00	2.288E+00	2.031E+00	1.938E+00	1.911E+00	1.672E+00
IN SOIL MOI	1.870E-01	1.771E-01	1.706E-01	1.530E-01	1.217E-01	1.166E-01	1.032E-01	1.007E-01	8.991E-02	7.989E-02	7.198E-02	7.044E-02
ADS ON SOIL	8.021E+00	7.401E+00	6.893E+00	6.339E+00	5.705E+00	5.165E+00	4.700E+00	4.243E+00	3.800E+00	3.498E+00	3.269E+00	3.048E+00

IN SOIL AIR 1.006E-01 9.432E-02 8.801E-02 8.224E-02 7.819E-02 6.833E-02 6.109E-02 5.205E-02 4.581E-02 4.252E-02 4.052E-02
3.741E-02

SUBLAYER 2

DIFFUSED UP 3.989E+00 3.588E+00 3.135E+00 2.991E+00 3.331E+00 2.722E+00 2.491E+00 1.947E+00 1.798E+00 1.739E+00 1.694E+00
1.465E+00
IN SOIL MOI 3.531E-01 3.333E-01 3.171E-01 2.827E-01 2.263E-01 2.158E-01 1.903E-01 1.877E-01 1.714E-01 1.510E-01 1.355E-01
1.318E-01
ADS ON SOIL 1.514E+01 1.392E+01 1.281E+01 1.171E+01 1.060E+01 9.563E+00 8.670E+00 7.910E+00 7.246E+00 6.612E+00 6.154E+00
5.704E+00
IN SOIL AIR 1.899E-01 1.775E-01 1.636E-01 1.519E-01 1.453E-01 1.265E-01 1.127E-01 9.704E-02 8.735E-02 8.038E-02 7.629E-02
7.002E-02

SUBLAYER 3

DIFFUSED UP 2.726E+00 2.410E+00 2.053E+00 1.934E+00 2.122E+00 1.730E+00 1.600E+00 1.273E+00 1.176E+00 1.210E+00 1.204E+00
9.960E-01
IN SOIL MOI 4.663E-01 4.362E-01 4.122E-01 3.666E-01 2.919E-01 2.789E-01 2.469E-01 2.443E-01 2.261E-01 2.019E-01 1.797E-01
1.728E-01
ADS ON SOIL 2.000E+01 1.823E+01 1.665E+01 1.519E+01 1.368E+01 1.236E+01 1.125E+01 1.029E+01 9.556E+00 8.840E+00 8.162E+00
7.475E+00
IN SOIL AIR 2.508E-01 2.323E-01 2.127E-01 1.970E-01 1.875E-01 1.635E-01 1.462E-01 1.263E-01 1.152E-01 1.075E-01 1.012E-01
9.176E-02

SOIL ZONE 2:

SUBLAYER 1

DIFFUSED UP 8.255E-01 6.375E-01 4.584E-01 4.438E-01 5.837E-01 4.133E-01 4.200E-01 3.283E-01 4.411E-01 4.681E-01 4.751E-01
3.062E-01
IN SOIL MOI 5.672E-01 5.245E-01 4.911E-01 4.368E-01 3.507E-01 3.335E-01 2.952E-01 2.955E-01 2.809E-01 2.522E-01 2.212E-01
2.130E-01
IN SOIL AIR 3.051E-01 2.793E-01 2.533E-01 2.348E-01 2.253E-01 1.955E-01 1.748E-01 1.528E-01 1.431E-01 1.342E-01 1.245E-01
1.131E-01

SUBLAYER 2

DIFFUSED UP 7.524E-01 5.812E-01 4.126E-01 4.006E-01 5.211E-01 3.610E-01 3.659E-01 2.884E-01 4.050E-01 4.343E-01 4.493E-01
2.956E-01
IN SOIL MOI 6.078E-01 5.563E-01 5.137E-01 4.569E-01 3.702E-01 3.503E-01 3.116E-01 3.152E-01 3.044E-01 2.787E-01 2.395E-01
2.303E-01
IN SOIL AIR 3.270E-01 2.962E-01 2.650E-01 2.455E-01 2.378E-01 2.054E-01 1.845E-01 1.629E-01 1.551E-01 1.484E-01 1.348E-01
1.223E-01

SUBLAYER 3

DIFFUSED UP 6.282E-01 5.177E-01 3.617E-01 3.240E-01 4.390E-01 2.916E-01 2.943E-01 2.614E-01 3.308E-01 3.795E-01 3.849E-01
2.585E-01
IN SOIL MOI 6.407E-01 5.841E-01 5.343E-01 4.729E-01 3.862E-01 3.634E-01 3.262E-01 3.349E-01 3.241E-01 3.034E-01 2.559E-01
2.418E-01
IN SOIL AIR 3.447E-01 3.110E-01 2.756E-01 2.542E-01 2.481E-01 2.130E-01 1.931E-01 1.731E-01 1.651E-01 1.615E-01 1.441E-01
1.284E-01

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 5.251E-01 4.209E-01 2.909E-01 2.357E-01 3.356E-01 2.364E-01 2.318E-01 1.907E-01 2.069E-01 3.353E-01 2.946E-01
1.936E-01
IN SOIL MOI 6.698E-01 6.080E-01 5.486E-01 4.849E-01 3.986E-01 3.747E-01 3.353E-01 3.467E-01 3.398E-01 3.223E-01 2.669E-01
2.514E-01
IN SOIL AIR 3.603E-01 3.237E-01 2.830E-01 2.606E-01 2.560E-01 2.196E-01 1.985E-01 1.792E-01 1.731E-01 1.716E-01 1.502E-01
1.335E-01

SUBLAYER 2

DIFFUSED UP 3.528E-01 2.814E-01 2.046E-01 1.800E-01 2.507E-01 1.670E-01 1.667E-01 1.346E-01 1.427E-01 2.107E-01 2.079E-01
1.495E-01
IN SOIL MOI 6.891E-01 6.239E-01 5.610E-01 4.949E-01 4.092E-01 3.803E-01 3.408E-01 3.546E-01 3.535E-01 3.337E-01 2.742E-01
2.610E-01
IN SOIL AIR 3.707E-01 3.322E-01 2.894E-01 2.660E-01 2.628E-01 2.229E-01 2.018E-01 1.833E-01 1.801E-01 1.776E-01 1.544E-01
1.386E-01

SUBLAYER 3

DIFFUSED UP 1.770E-01 1.430E-01 1.051E-01 9.987E-02 1.275E-01 1.053E-01 1.094E-01 6.732E-02 6.639E-02 1.316E-01 1.287E-01
5.216E-02
IN SOIL MOI 6.988E-01 6.318E-01 5.671E-01 5.010E-01 4.145E-01 3.840E-01 3.463E-01 3.585E-01 3.575E-01 3.413E-01 2.797E-01
2.686E-01
IN SOIL AIR 3.759E-01 3.364E-01 2.926E-01 2.692E-01 2.663E-01 2.251E-01 2.050E-01 1.853E-01 1.821E-01 1.817E-01 1.574E-01
1.427E-01
GWR. RUNOFF 6.491E-02 7.342E-02 1.002E-01 4.839E-02 0.000E+00 0.000E+00 0.000E+00 6.229E-02 6.766E-02 2.837E-02 0.000E+00
2.858E-02

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE	1.087E-07	1.003E-07	9.341E-08	8.591E-08	7.731E-08	7.000E-08	6.370E-08	5.750E-08	5.150E-08	4.740E-08	4.430E-08
4.130E-08											
%SOLUBILITY	2.067E-08	1.907E-08	1.776E-08	1.633E-08	1.470E-08	1.331E-08	1.211E-08	1.093E-08	9.791E-09	9.011E-09	8.422E-09
7.852E-09											
ADSORBED	2.995E-07	2.763E-07	2.573E-07	2.367E-07	2.130E-07	1.928E-07	1.755E-07	1.584E-07	1.419E-07	1.306E-07	1.220E-07
1.138E-07											
SOIL AIR	3.031E-08	2.881E-08	2.739E-08	2.524E-08	2.256E-08	2.025E-08	1.786E-08	1.583E-08	1.391E-08	1.268E-08	1.187E-08
1.122E-08											

SUBLAYER 2

MOISTURE	2.052E-07	1.887E-07	1.736E-07	1.587E-07	1.437E-07	1.296E-07	1.175E-07	1.072E-07	9.820E-08	8.960E-08	8.340E-08
7.730E-08											
%SOLUBILITY	3.901E-08	3.587E-08	3.300E-08	3.017E-08	2.732E-08	2.464E-08	2.234E-08	2.038E-08	1.867E-08	1.703E-08	1.586E-08
1.470E-08											
ADSORBED	5.653E-07	5.199E-07	4.783E-07	4.372E-07	3.959E-07	3.570E-07	3.237E-07	2.953E-07	2.705E-07	2.468E-07	2.298E-07
2.130E-07											
SOIL AIR	5.722E-08	5.420E-08	5.090E-08	4.662E-08	4.194E-08	3.749E-08	3.295E-08	2.950E-08	2.652E-08	2.396E-08	2.234E-08
2.100E-08											

SUBLAYER 3

MOISTURE	2.710E-07	2.470E-07	2.257E-07	2.058E-07	1.854E-07	1.675E-07	1.524E-07	1.395E-07	1.295E-07	1.198E-07	1.106E-07
1.013E-07											
%SOLUBILITY	5.152E-08	4.696E-08	4.291E-08	3.913E-08	3.525E-08	3.184E-08	2.897E-08	2.652E-08	2.462E-08	2.278E-08	2.103E-08
1.926E-08											
ADSORBED	7.466E-07	6.805E-07	6.218E-07	5.670E-07	5.108E-07	4.615E-07	4.199E-07	3.843E-07	3.568E-07	3.300E-07	3.047E-07
2.791E-07											
SOIL AIR	7.557E-08	7.095E-08	6.618E-08	6.045E-08	5.411E-08	4.845E-08	4.274E-08	3.839E-08	3.497E-08	3.204E-08	2.963E-08
2.752E-08											

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	2.930E-07	2.640E-07	2.390E-07	2.180E-07	1.980E-07	1.780E-07	1.620E-07	1.500E-07	1.430E-07	1.330E-07	1.210E-07
1.110E-07											
%SOLUBILITY	5.570E-08	5.019E-08	4.544E-08	4.144E-08	3.764E-08	3.384E-08	3.080E-08	2.852E-08	2.719E-08	2.529E-08	2.300E-08
2.110E-08											
SOIL AIR	8.170E-08	7.583E-08	7.008E-08	6.404E-08	5.779E-08	5.149E-08	4.543E-08	4.128E-08	3.861E-08	3.557E-08	3.241E-08
3.015E-08											

SUBLAYER 2

MOISTURE	3.140E-07	2.800E-07	2.500E-07	2.280E-07	2.090E-07	1.870E-07	1.710E-07	1.600E-07	1.550E-07	1.470E-07	1.310E-07
1.200E-07											
%SOLUBILITY	5.970E-08	5.323E-08	4.753E-08	4.335E-08	3.973E-08	3.555E-08	3.251E-08	3.042E-08	2.947E-08	2.795E-08	2.490E-08
2.281E-08											
SOIL AIR	8.756E-08	8.043E-08	7.330E-08	6.698E-08	6.100E-08	5.409E-08	4.795E-08	4.404E-08	4.185E-08	3.931E-08	3.509E-08
3.260E-08											

SUBLAYER 3

MOISTURE	3.310E-07	2.940E-07	2.600E-07	2.360E-07	2.180E-07	1.940E-07	1.790E-07	1.700E-07	1.650E-07	1.600E-07	1.400E-07
1.260E-07											
%SOLUBILITY	6.293E-08	5.589E-08	4.943E-08	4.487E-08	4.144E-08	3.688E-08	3.403E-08	3.232E-08	3.137E-08	3.042E-08	2.662E-08
2.395E-08											
SOIL AIR	9.230E-08	8.445E-08	7.623E-08	6.933E-08	6.363E-08	5.611E-08	5.019E-08	4.679E-08	4.455E-08	4.279E-08	3.750E-08
3.423E-08											

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	3.460E-07	3.060E-07	2.670E-07	2.420E-07	2.250E-07	2.000E-07	1.840E-07	1.760E-07	1.730E-07	1.700E-07	1.460E-07
1.310E-07											
%SOLUBILITY	6.578E-08	5.817E-08	5.076E-08	4.601E-08	4.278E-08	3.802E-08	3.498E-08	3.346E-08	3.289E-08	3.232E-08	2.776E-08
2.490E-08											
SOIL AIR	9.648E-08	8.789E-08	7.829E-08	7.109E-08	6.567E-08	5.785E-08	5.160E-08	4.844E-08	4.672E-08	4.546E-08	3.910E-08
3.559E-08											

SUBLAYER 2

MOISTURE	3.560E-07	3.140E-07	2.730E-07	2.470E-07	2.310E-07	2.030E-07	1.870E-07	1.800E-07	1.800E-07	1.760E-07	1.500E-07
1.360E-07											
%SOLUBILITY	6.768E-08	5.970E-08	5.190E-08	4.696E-08	4.392E-08	3.859E-08	3.555E-08	3.422E-08	3.422E-08	3.346E-08	2.852E-08
2.586E-08											
SOIL AIR	9.927E-08	9.019E-08	8.005E-08	7.256E-08	6.742E-08	5.872E-08	5.244E-08	4.954E-08	4.861E-08	4.707E-08	4.018E-08
3.694E-08											

SUBLAYER 3

MOISTURE	3.610E-07	3.180E-07	2.760E-07	2.500E-07	2.340E-07	2.050E-07	1.900E-07	1.820E-07	1.820E-07	1.800E-07	1.530E-07
1.400E-07											
%SOLUBILITY	6.863E-08	6.046E-08	5.247E-08	4.753E-08	4.449E-08	3.897E-08	3.612E-08	3.460E-08	3.460E-08	3.422E-08	2.909E-08

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2.662E-08
 SOIL AIR     1.007E-07 9.134E-08 8.093E-08 7.344E-08 6.830E-08 5.929E-08 5.328E-08 5.009E-08 4.915E-08 4.814E-08 4.098E-08
3.803E-08


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                              YEAR -  17 ANNUAL SUMMARY REPORT
                               ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


           -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)                11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)          11.844
 TOTAL PRECIPITATION (CM)                        73.466
 TOTAL INFILTRATION (CM)                         73.460
 TOTAL EVAPOTRANSPIRATION (CM)                   69.004
 TOTAL SURFACE RUNOFF (CM)                        0.000
 TOTAL GRN RUNOFF (CM)                            4.453
 TOTAL MOISTURE RETENTION (CM)                    0.003
 TOTAL YIELD (CM)                                 4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)

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      UPPER SOIL ZONE:

           SUBLAYER  1

                TOTAL VOLATILIZED                 3.548E+01

           SUBLAYER  2

                TOTAL DIFFUSED (UP)               3.089E+01

           SUBLAYER  3

                TOTAL DIFFUSED (UP)               2.044E+01

      SOIL ZONE 2:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)               5.801E+00

           SUBLAYER  2

                TOTAL DIFFUSED (UP)               5.267E+00

           SUBLAYER  3

                TOTAL DIFFUSED (UP)               4.472E+00

      SOIL ZONE 3:

           SUBLAYER  1


           SUBLAYER  2


           SUBLAYER  3


      LOWER SOIL ZONE:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)               3.497E+00

           SUBLAYER  2

                TOTAL DIFFUSED (UP)               2.449E+00

           SUBLAYER  3

                TOTAL DIFFUSED (UP)               1.313E+00
                TOTAL IN GROUNDWATER RUNOFF       4.738E-01
1                        -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                         ---------------------------------------------------------------------------------
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UPPER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	7.011E-08
ADSORBED SOIL (UG/G)	1.932E-07
SOIL AIR (UG/ML)	1.983E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.311E-07
ADSORBED SOIL (UG/G)	3.611E-07
SOIL AIR (UG/ML)	3.705E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML)	1.713E-07
ADSORBED SOIL (UG/G)	4.719E-07
SOIL AIR (UG/ML)	4.842E-08

SOIL ZONE 2:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	1.842E-07
SOIL AIR (UG/ML)	5.203E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML)	1.960E-07
SOIL AIR (UG/ML)	5.535E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.061E-07
SOIL AIR (UG/ML)	5.817E-08

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML)	2.138E-07
SOIL AIR (UG/ML)	6.035E-08

SUBLAYER 2

SOIL MOISTURE (UG/ML)	2.194E-07
SOIL AIR (UG/ML)	6.191E-08

SUBLAYER 3

SOIL MOISTURE (UG/ML)	2.226E-07
SOIL AIR (UG/ML)	6.280E-08

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -18 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG

```
SEP

 PRECIP.       0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD UPPER    0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 2   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD ZONE 3   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
 LOAD LOWER    0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00

 TOTAL INPUT   0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
             ---------------------------------------------------------------------------------------------------------------

      UPPER SOIL ZONE:

            SUBLAYER  1

 VOLATILIZED 1.568E+00 1.426E+00 1.256E+00 1.201E+00 1.322E+00 1.069E+00 9.518E-01 7.306E-01 6.630E-01 6.408E-01 6.226E-01
5.321E-01
 IN SOIL MOI 6.573E-02 6.216E-02 5.881E-02 5.201E-02 4.125E-02 3.863E-02 3.288E-02 3.241E-02 2.970E-02 2.631E-02 2.307E-02
2.236E-02
 ADS ON SOIL 2.819E+00 2.597E+00 2.376E+00 2.155E+00 1.933E+00 1.712E+00 1.498E+00 1.366E+00 1.255E+00 1.152E+00 1.048E+00
9.674E-01
 IN SOIL AIR 3.536E-02 3.310E-02 3.034E-02 2.795E-02 2.650E-02 2.265E-02 1.947E-02 1.676E-02 1.513E-02 1.400E-02 1.299E-02
1.187E-02

            SUBLAYER  2

 DIFFUSED UP 1.363E+00 1.220E+00 1.058E+00 1.006E+00 1.116E+00 9.040E-01 8.418E-01 6.724E-01 6.085E-01 5.793E-01 5.491E-01
4.626E-01
 IN SOIL MOI 1.225E-01 1.150E-01 1.079E-01 9.620E-02 7.574E-02 7.196E-02 6.254E-02 6.233E-02 5.692E-02 4.989E-02 4.322E-02
4.179E-02
 ADS ON SOIL 5.254E+00 4.804E+00 4.361E+00 3.985E+00 3.549E+00 3.188E+00 2.849E+00 2.627E+00 2.406E+00 2.184E+00 1.963E+00
1.808E+00
 IN SOIL AIR 6.590E-02 6.122E-02 5.568E-02 5.170E-02 4.865E-02 4.218E-02 3.703E-02 3.223E-02 2.900E-02 2.655E-02 2.433E-02
2.219E-02

            SUBLAYER  3

 DIFFUSED UP 8.924E-01 7.706E-01 6.609E-01 6.611E-01 7.407E-01 5.794E-01 5.225E-01 3.988E-01 3.884E-01 4.063E-01 4.116E-01
3.648E-01
 IN SOIL MOI 1.590E-01 1.482E-01 1.395E-01 1.250E-01 9.858E-02 9.292E-02 8.067E-02 8.054E-02 7.507E-02 6.710E-02 5.915E-02
5.680E-02
 ADS ON SOIL 6.819E+00 6.191E+00 5.638E+00 5.180E+00 4.620E+00 4.117E+00 3.675E+00 3.394E+00 3.173E+00 2.938E+00 2.686E+00
2.457E+00
 IN SOIL AIR 8.553E-02 7.890E-02 7.198E-02 6.720E-02 6.333E-02 5.447E-02 4.776E-02 4.164E-02 3.825E-02 3.571E-02 3.330E-02
3.016E-02

      SOIL ZONE 2:

            SUBLAYER  1

 DIFFUSED UP 2.850E-01 1.810E-01 9.507E-02 1.363E-01 1.729E-01 5.956E-02 1.068E-01 9.264E-02 1.311E-01 1.098E-01 1.051E-01
8.750E-02
 IN SOIL MOI 1.936E-01 1.768E-01 1.644E-01 1.503E-01 1.151E-01 1.087E-01 9.659E-02 9.849E-02 9.035E-02 7.964E-02 7.312E-02
6.908E-02
 IN SOIL AIR 1.041E-01 9.416E-02 8.480E-02 8.077E-02 7.396E-02 6.369E-02 5.718E-02 5.092E-02 4.603E-02 4.239E-02 4.116E-02
3.668E-02

            SUBLAYER  2

 DIFFUSED UP 2.602E-01 1.591E-01 9.292E-02 1.208E-01 1.459E-01 2.441E-02 1.068E-01 6.732E-02 8.520E-02 1.094E-01 9.778E-02
9.389E-02
 IN SOIL MOI 2.071E-01 1.808E-01 1.685E-01 1.603E-01 1.187E-01 1.124E-01 1.002E-01 1.024E-01 9.821E-02 8.343E-02 7.678E-02
7.483E-02
 IN SOIL AIR 1.114E-01 9.627E-02 8.692E-02 8.616E-02 7.624E-02 6.589E-02 5.934E-02 5.296E-02 5.003E-02 4.441E-02 4.322E-02
3.974E-02

            SUBLAYER  3

 DIFFUSED UP 2.192E-01 1.349E-01 9.181E-02 7.896E-02 1.204E-01 6.423E-03 6.511E-02 6.732E-02 6.639E-02 8.150E-02 1.003E-01
1.855E-02
 IN SOIL MOI 2.187E-01 1.868E-01 1.726E-01 1.643E-01 1.240E-01 1.124E-01 1.039E-01 1.064E-01 1.021E-01 8.912E-02 8.043E-02
7.675E-02
 IN SOIL AIR 1.177E-01 9.945E-02 8.904E-02 8.831E-02 7.965E-02 6.589E-02 6.150E-02 5.499E-02 5.204E-02 4.743E-02 4.528E-02
4.076E-02

      SOIL ZONE 3:

            SUBLAYER  1

            SUBLAYER  2

            SUBLAYER  3

      LOWER SOIL ZONE:
```

SUBLAYER 1

DIFFUSED UP 1.781E-01 9.340E-02 6.858E-02 8.245E-02 9.063E-02 0.000E+00 7.813E-03 6.732E-02 6.639E-02 2.678E-02 1.089E-01
1.391E-02
IN SOIL MOI 2.284E-01 1.927E-01 1.788E-01 1.683E-01 1.240E-01 1.124E-01 1.093E-01 1.103E-01 1.061E-01 9.480E-02 8.592E-02
7.675E-02
IN SOIL AIR 1.229E-01 1.026E-01 9.222E-02 9.046E-02 7.965E-02 6.589E-02 6.474E-02 5.703E-02 5.404E-02 5.046E-02 4.836E-02
4.076E-02

SUBLAYER 2

DIFFUSED UP 9.962E-02 7.034E-02 2.434E-02 1.010E-01 7.789E-02 0.000E+00 0.000E+00 3.366E-02 5.090E-02 9.314E-03 3.713E-02
1.043E-02
IN SOIL MOI 2.323E-01 1.987E-01 1.849E-01 1.743E-01 1.240E-01 1.124E-01 1.093E-01 1.123E-01 1.100E-01 9.480E-02 9.140E-02
7.675E-02
IN SOIL AIR 1.250E-01 1.058E-01 9.540E-02 9.370E-02 7.965E-02 6.589E-02 6.474E-02 5.805E-02 5.604E-02 5.046E-02 5.145E-02
4.076E-02

SUBLAYER 3

DIFFUSED UP 5.508E-02 4.036E-02 0.000E+00 6.619E-02 5.098E-02 0.000E+00 0.000E+00 2.244E-02 3.319E-02 5.821E-03 0.000E+00
0.000E+00
IN SOIL MOI 2.342E-01 1.987E-01 1.849E-01 1.803E-01 1.240E-01 1.124E-01 1.093E-01 1.142E-01 1.120E-01 9.480E-02 9.140E-02
7.675E-02
IN SOIL AIR 1.260E-01 1.058E-01 9.540E-02 9.693E-02 7.965E-02 6.589E-02 6.474E-02 5.907E-02 5.704E-02 5.046E-02 5.145E-02
4.076E-02
GWR. RUNOFF 2.210E-02 2.369E-02 3.131E-02 1.653E-02 0.000E+00 0.000E+00 0.000E+00 1.972E-02 2.137E-02 8.046E-03 0.000E+00
8.307E-03

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 3.820E-08 3.520E-08 3.220E-08 2.920E-08 2.620E-08 2.320E-08 2.030E-08 1.851E-08 1.701E-08 1.561E-08 1.420E-08
1.311E-08
%SOLUBILITY 7.262E-09 6.692E-09 6.122E-09 5.551E-09 4.981E-09 4.411E-09 3.859E-09 3.519E-09 3.234E-09 2.968E-09 2.700E-09
2.492E-09
ADSORBED 1.052E-07 9.698E-08 8.871E-08 8.045E-08 7.218E-08 6.392E-08 5.593E-08 5.100E-08 4.686E-08 4.301E-08 3.912E-08
3.612E-08
SOIL AIR 1.065E-08 1.011E-08 9.441E-09 8.578E-09 7.647E-09 6.710E-09 5.692E-09 5.094E-09 4.593E-09 4.174E-09 3.803E-09
3.561E-09

SUBLAYER 2

MOISTURE 7.120E-08 6.510E-08 5.910E-08 5.401E-08 4.810E-08 4.321E-08 3.861E-08 3.560E-08 3.260E-08 2.960E-08 2.660E-08
2.450E-08
%SOLUBILITY 1.354E-08 1.238E-08 1.124E-08 1.027E-08 9.144E-09 8.215E-09 7.340E-09 6.768E-09 6.198E-09 5.627E-09 5.057E-09
4.658E-09
ADSORBED 1.962E-07 1.794E-07 1.628E-07 1.488E-07 1.325E-07 1.190E-07 1.064E-07 9.808E-08 8.981E-08 8.155E-08 7.328E-08
6.750E-08
SOIL AIR 1.985E-08 1.870E-08 1.733E-08 1.587E-08 1.404E-08 1.250E-08 1.083E-08 9.798E-09 8.803E-09 7.916E-09 7.125E-09
6.655E-09

SUBLAYER 3

MOISTURE 9.241E-08 8.390E-08 7.640E-08 7.020E-08 6.261E-08 5.580E-08 4.980E-08 4.600E-08 4.300E-08 3.981E-08 3.640E-08
3.330E-08
%SOLUBILITY 1.757E-08 1.595E-08 1.452E-08 1.335E-08 1.190E-08 1.061E-08 9.468E-09 8.745E-09 8.175E-09 7.568E-09 6.920E-09
6.331E-09
ADSORBED 2.546E-07 2.311E-07 2.105E-07 1.934E-07 1.725E-07 1.537E-07 1.372E-07 1.267E-07 1.185E-07 1.097E-07 1.003E-07
9.174E-08
SOIL AIR 2.577E-08 2.410E-08 2.240E-08 2.062E-08 1.827E-08 1.614E-08 1.396E-08 1.266E-08 1.161E-08 1.065E-08 9.749E-09
9.046E-09

SOIL ZONE 2:

SUBLAYER 1

MOISTURE 1.000E-07 8.900E-08 8.000E-08 7.500E-08 6.500E-08 5.800E-08 5.300E-08 5.000E-08 4.600E-08 4.200E-08 4.000E-08
3.600E-08
%SOLUBILITY 1.901E-08 1.692E-08 1.521E-08 1.426E-08 1.236E-08 1.103E-08 1.008E-08 9.506E-09 8.745E-09 7.985E-09 7.605E-09
6.844E-09
SOIL AIR 2.788E-08 2.556E-08 2.346E-08 2.203E-08 1.897E-08 1.678E-08 1.486E-08 1.376E-08 1.242E-08 1.123E-08 1.071E-08
9.779E-09

SUBLAYER 2

MOISTURE 1.070E-07 9.100E-08 8.200E-08 8.000E-08 6.700E-08 6.000E-08 5.500E-08 5.200E-08 5.000E-08 4.400E-08 4.200E-08
3.900E-08
%SOLUBILITY 2.034E-08 1.730E-08 1.559E-08 1.521E-08 1.274E-08 1.141E-08 1.046E-08 9.886E-09 9.506E-09 8.365E-09 7.985E-09
7.414E-09
SOIL AIR 2.984E-08 2.614E-08 2.404E-08 2.350E-08 1.955E-08 1.735E-08 1.542E-08 1.431E-08 1.350E-08 1.177E-08 1.125E-08
1.059E-08

SUBLAYER 3

MOISTURE 1.130E-07 9.400E-08 8.400E-08 8.200E-08 7.000E-08 6.000E-08 5.700E-08 5.400E-08 5.200E-08 4.700E-08 4.400E-08
4.000E-08
%SOLUBILITY 2.148E-08 1.787E-08 1.597E-08 1.559E-08 1.331E-08 1.141E-08 1.084E-08 1.027E-08 9.886E-09 8.935E-09 8.365E-09
7.605E-09

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 SOIL AIR      3.151E-08 2.700E-08 2.463E-08 2.409E-08 2.043E-08 1.735E-08 1.598E-08 1.486E-08 1.404E-08 1.257E-08 1.179E-08
1.087E-08

      SOIL ZONE 3:

      LOWER SOIL ZONE:

           SUBLAYER  1

 MOISTURE      1.180E-07 9.700E-08 8.700E-08 8.400E-08 7.000E-08 6.000E-08 6.000E-08 5.600E-08 5.400E-08 5.000E-08 4.700E-08
4.000E-08
 %SOLUBILITY 2.243E-08 1.844E-08 1.654E-08 1.597E-08 1.331E-08 1.141E-08 1.141E-08 1.065E-08 1.027E-08 9.506E-09 8.935E-09
7.605E-09
 SOIL AIR      3.290E-08 2.786E-08 2.551E-08 2.468E-08 2.043E-08 1.735E-08 1.682E-08 1.541E-08 1.458E-08 1.337E-08 1.259E-08
1.087E-08

           SUBLAYER  2

 MOISTURE      1.200E-07 1.000E-07 9.000E-08 8.700E-08 7.000E-08 6.000E-08 6.000E-08 5.700E-08 5.600E-08 5.000E-08 5.000E-08
4.000E-08
 %SOLUBILITY 2.281E-08 1.901E-08 1.711E-08 1.654E-08 1.331E-08 1.141E-08 1.141E-08 1.084E-08 1.065E-08 9.506E-09 9.506E-09
7.605E-09
 SOIL AIR      3.346E-08 2.872E-08 2.639E-08 2.556E-08 2.043E-08 1.735E-08 1.682E-08 1.569E-08 1.512E-08 1.337E-08 1.339E-08
1.087E-08

           SUBLAYER  3

 MOISTURE      1.210E-07 1.000E-07 9.000E-08 9.000E-08 7.000E-08 6.000E-08 6.000E-08 5.800E-08 5.700E-08 5.000E-08 5.000E-08
4.000E-08
 %SOLUBILITY 2.300E-08 1.901E-08 1.711E-08 1.711E-08 1.331E-08 1.141E-08 1.141E-08 1.103E-08 1.084E-08 9.506E-09 9.506E-09
7.605E-09
 SOIL AIR      3.374E-08 2.872E-08 2.639E-08 2.644E-08 2.043E-08 1.735E-08 1.682E-08 1.596E-08 1.539E-08 1.337E-08 1.339E-08
1.087E-08


 POL DEP CM  3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                          YEAR -  18 ANNUAL SUMMARY REPORT
                           ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


           -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)                11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)          11.844
 TOTAL PRECIPITATION (CM)                        73.466
 TOTAL INFILTRATION (CM)                         73.460
 TOTAL EVAPOTRANSPIRATION (CM)                   69.004
 TOTAL SURFACE RUNOFF (CM)                        0.000
 TOTAL GRW RUNOFF (CM)                            4.453
 TOTAL MOISTURE RETENTION (CM)                    0.003
 TOTAL YIELD (CM)                                 4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)

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      UPPER SOIL ZONE:

           SUBLAYER  1

                TOTAL VOLATILIZED                1.198E+01

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              1.038E+01

           SUBLAYER  3

                TOTAL DIFFUSED (UP)              6.797E+00

      SOIL ZONE 2:

           SUBLAYER  1

                TOTAL DIFFUSED (UP)              1.563E+00

           SUBLAYER  2

                TOTAL DIFFUSED (UP)              1.364E+00

           SUBLAYER  3
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          TOTAL DIFFUSED (UP)                1.051E+00

SOIL ZONE 3:

     SUBLAYER  1

     SUBLAYER  2

     SUBLAYER  3

LOWER SOIL ZONE:

     SUBLAYER  1

          TOTAL DIFFUSED (UP)                8.043E-01

     SUBLAYER  2

          TOTAL DIFFUSED (UP)                5.146E-01

     SUBLAYER  3

          TOTAL DIFFUSED (UP)                2.741E-01
          TOTAL IN GROUNDWATER RUNOFF        1.511E-01
1                    -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                     ---------------------------------------------------------------------------------

UPPER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  2.358E-08
                                   ADSORBED SOIL (UG/G)   6.496E-08
                                   SOIL AIR (UG/ML)       6.672E-09

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  4.402E-08
                                   ADSORBED SOIL (UG/G)   1.213E-07
                                   SOIL AIR (UG/ML)       1.245E-08

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  5.747E-08
                                   ADSORBED SOIL (UG/G)   1.583E-07
                                   SOIL AIR (UG/ML)       1.625E-08

SOIL ZONE 2:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  6.117E-08
                                   SOIL AIR (UG/ML)       1.729E-08

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  6.408E-08
                                   SOIL AIR (UG/ML)       1.811E-08

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  6.642E-08
                                   SOIL AIR (UG/ML)       1.876E-08

SOIL ZONE 3:

LOWER SOIL ZONE:

     SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  6.858E-08
                                   SOIL AIR (UG/ML)       1.937E-08

     SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  7.000E-08
                                   SOIL AIR (UG/ML)       1.976E-08

     SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  7.050E-08
                                   SOIL AIR (UG/ML)       1.991E-08

                                   MAX. POLL. DEPTH (M)   3.900E+00
1
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YEAR -19 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1 -- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	5.057E-01	4.689E-01	4.219E-01	4.063E-01	4.420E-01	3.636E-01	3.563E-01	3.067E-01	3.025E-01	3.183E-01	3.342E-01	3.130E-01
IN SOIL MOI	2.118E-02	2.050E-02	1.991E-02	1.781E-02	1.371E-02	1.366E-02	1.312E-02	1.418E-02	1.414E-02	1.365E-02	1.300E-02	1.364E-02
ADS ON SOIL	9.084E-01	8.567E-01	8.043E-01	7.379E-01	6.427E-01	6.051E-01	5.977E-01	5.977E-01	5.977E-01	5.977E-01	5.903E-01	5.903E-01
IN SOIL AIR	1.139E-02	1.092E-02	1.027E-02	9.573E-03	8.810E-03	8.004E-03	7.768E-03	7.332E-03	7.205E-03	7.266E-03	7.318E-03	7.246E-03

SUBLAYER 2

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	4.271E-01	3.795E-01	3.252E-01	3.077E-01	3.398E-01	2.740E-01	2.684E-01	2.272E-01	2.241E-01	2.358E-01	2.508E-01	2.308E-01
IN SOIL MOI	3.906E-02	3.691E-02	3.490E-02	3.117E-02	2.425E-02	2.398E-02	2.300E-02	2.469E-02	2.462E-02	2.376E-02	2.275E-02	2.371E-02
ADS ON SOIL	1.675E+00	1.542E+00	1.410E+00	1.291E+00	1.136E+00	1.063E+00	1.048E+00	1.040E+00	1.040E+00	1.040E+00	1.033E+00	1.026E+00
IN SOIL AIR	2.101E-02	1.965E-02	1.801E-02	1.675E-02	1.558E-02	1.406E-02	1.362E-02	1.276E-02	1.254E-02	1.265E-02	1.281E-02	1.259E-02

SUBLAYER 3

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	3.230E-01	2.704E-01	2.141E-01	1.940E-01	2.199E-01	1.715E-01	1.715E-01	1.409E-01	1.382E-01	1.454E-01	1.586E-01	1.487E-01
IN SOIL MOI	5.214E-02	4.821E-02	4.438E-02	3.974E-02	3.102E-02	3.047E-02	2.932E-02	3.117E-02	3.108E-02	3.000E-02	2.892E-02	3.019E-02
ADS ON SOIL	2.236E+00	2.014E+00	1.793E+00	1.646E+00	1.454E+00	1.350E+00	1.336E+00	1.313E+00	1.313E+00	1.313E+00	1.313E+00	1.306E+00
IN SOIL AIR	2.805E-02	2.567E-02	2.290E-02	2.136E-02	1.993E-02	1.786E-02	1.736E-02	1.611E-02	1.583E-02	1.597E-02	1.628E-02	1.603E-02

SOIL ZONE 2:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
DIFFUSED UP	4.395E-02	5.247E-02	3.816E-02	7.427E-02	8.110E-02	5.685E-02	7.355E-02	3.969E-02	3.983E-02	7.684E-02	8.169E-02	4.519E-02
IN SOIL MOI	6.194E-02	5.960E-02	5.343E-02	4.809E-02	3.897E-02	3.747E-02	3.645E-02	3.743E-02	3.732E-02	3.792E-02	3.656E-02	3.646E-02
IN SOIL AIR	3.332E-02	3.174E-02	2.756E-02	2.585E-02	2.503E-02	2.196E-02	2.158E-02	1.935E-02	1.901E-02	2.018E-02	2.058E-02	1.936E-02

SUBLAYER 2

DIFFUSED UP 4.922E-02 1.153E-02 4.646E-02 7.200E-02 8.639E-02 1.542E-02 0.000E+00 3.366E-02 3.319E-02 0.000E+00 0.000E+00
3.477E-02
IN SOIL MOI 6.582E-02 5.960E-02 5.754E-02 5.410E-02 4.251E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
3.838E-02
IN SOIL AIR 3.540E-02 3.174E-02 2.968E-02 2.908E-02 2.731E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
2.038E-02

SUBLAYER 3

DIFFUSED UP 5.977E-02 9.225E-03 5.641E-02 9.174E-02 8.497E-02 1.285E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
IN SOIL MOI 6.969E-02 5.960E-02 6.165E-02 6.011E-02 4.606E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
3.838E-02
IN SOIL AIR 3.749E-02 3.174E-02 3.180E-02 3.231E-02 2.958E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
2.038E-02

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

DIFFUSED UP 6.798E-02 6.919E-03 0.000E+00 0.000E+00 7.789E-02 1.028E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
IN SOIL MOI 7.356E-02 5.960E-02 6.165E-02 6.011E-02 4.960E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
3.838E-02
IN SOIL AIR 3.957E-02 3.174E-02 3.180E-02 3.231E-02 3.186E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
2.038E-02

SUBLAYER 2

DIFFUSED UP 6.915E-02 4.612E-03 0.000E+00 0.000E+00 5.523E-02 7.708E-03 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
IN SOIL MOI 7.743E-02 5.960E-02 6.165E-02 6.011E-02 5.314E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
3.838E-02
IN SOIL AIR 4.165E-02 3.174E-02 3.180E-02 3.231E-02 3.414E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
2.038E-02

SUBLAYER 3

DIFFUSED UP 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 6.423E-03 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0.000E+00
IN SOIL MOI 7.743E-02 5.960E-02 6.165E-02 6.011E-02 5.314E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
3.838E-02
IN SOIL AIR 4.165E-02 3.174E-02 3.180E-02 3.231E-02 3.414E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
2.038E-02
GWR. RUNOFF 6.913E-03 6.879E-03 1.033E-02 5.509E-03 0.000E+00 0.000E+00 0.000E+00 6.800E-03 7.434E-03 3.143E-03 0.000E+00
4.033E-03

-- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE 1.231E-08 1.161E-08 1.090E-08 1.000E-08 8.710E-09 8.200E-09 8.100E-09 8.100E-09 8.100E-09 8.100E-09 8.000E-09
8.000E-09
%SOLUBILITY 2.340E-09 2.207E-09 2.072E-09 1.901E-09 1.656E-09 1.559E-09 1.540E-09 1.540E-09 1.540E-09 1.540E-09 1.521E-09
1.521E-09
ADSORBED 3.391E-08 3.199E-08 3.003E-08 2.755E-08 2.400E-08 2.259E-08 2.232E-08 2.232E-08 2.232E-08 2.232E-08 2.204E-08
2.204E-08
SOIL AIR 3.433E-09 3.335E-09 3.196E-09 2.938E-09 2.542E-09 2.372E-09 2.271E-09 2.229E-09 2.187E-09 2.166E-09 2.143E-09
2.173E-09

SUBLAYER 2

MOISTURE 2.270E-08 2.090E-08 1.911E-08 1.750E-08 1.540E-08 1.440E-08 1.420E-08 1.410E-08 1.410E-08 1.410E-08 1.400E-08
1.390E-08
%SOLUBILITY 4.316E-09 3.973E-09 3.633E-09 3.327E-09 2.928E-09 2.738E-09 2.700E-09 2.681E-09 2.681E-09 2.681E-09 2.662E-09
2.643E-09
ADSORBED 6.254E-08 5.758E-08 5.265E-08 4.821E-08 4.243E-08 3.967E-08 3.912E-08 3.885E-08 3.885E-08 3.885E-08 3.857E-08
3.829E-08
SOIL AIR 6.330E-09 6.003E-09 5.603E-09 5.141E-09 4.495E-09 4.165E-09 3.982E-09 3.881E-09 3.807E-09 3.771E-09 3.750E-09
3.776E-09

SUBLAYER 3

MOISTURE 3.030E-08 2.730E-08 2.430E-08 2.231E-08 1.970E-08 1.830E-08 1.810E-08 1.780E-08 1.780E-08 1.780E-08 1.780E-08
1.770E-08
%SOLUBILITY 5.760E-09 5.190E-09 4.620E-09 4.241E-09 3.745E-09 3.479E-09 3.441E-09 3.384E-09 3.384E-09 3.384E-09 3.384E-09
3.365E-09

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 ADSORBED      8.348E-08 7.521E-08 6.695E-08 6.146E-08 5.427E-08 5.042E-08 4.987E-08 4.904E-08 4.904E-08 4.904E-08 4.904E-08
4.876E-08
 SOIL AIR      8.449E-09 7.841E-09 7.125E-09 6.554E-09 5.750E-09 5.293E-09 5.076E-09 4.899E-09 4.807E-09 4.760E-09 4.768E-09
4.808E-09

      SOIL ZONE 2:

            SUBLAYER  1

 MOISTURE      3.200E-08 3.000E-08 2.600E-08 2.400E-08 2.200E-08 2.000E-08 2.000E-08 1.900E-08 1.900E-08 2.000E-08 2.000E-08
1.900E-08
 %SOLUBILITY 6.084E-09 5.703E-09 4.943E-09 4.563E-09 4.183E-09 3.802E-09 3.802E-09 3.612E-09 3.612E-09 3.802E-09 3.802E-09
3.612E-09
 SOIL AIR      8.923E-09 8.617E-09 7.623E-09 7.050E-09 6.421E-09 5.785E-09 5.608E-09 5.229E-09 5.131E-09 5.348E-09 5.357E-09
5.161E-09

            SUBLAYER  2

 MOISTURE      3.400E-08 3.000E-08 2.800E-08 2.700E-08 2.400E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08
2.000E-08
 %SOLUBILITY 6.464E-09 5.703E-09 5.323E-09 5.133E-09 4.563E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09
3.802E-09
 SOIL AIR      9.481E-09 8.617E-09 8.210E-09 7.931E-09 7.005E-09 5.785E-09 5.608E-09 5.505E-09 5.401E-09 5.348E-09 5.357E-09
5.433E-09

            SUBLAYER  3

 MOISTURE      3.600E-08 3.000E-08 3.000E-08 3.000E-08 2.600E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08
2.000E-08
 %SOLUBILITY 6.844E-09 5.703E-09 5.703E-09 5.703E-09 4.943E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09
3.802E-09
 SOIL AIR      1.004E-08 8.617E-09 8.796E-09 8.813E-09 7.588E-09 5.785E-09 5.608E-09 5.505E-09 5.401E-09 5.348E-09 5.357E-09
5.433E-09

      SOIL ZONE 3:

      LOWER SOIL ZONE:

            SUBLAYER  1

 MOISTURE      3.800E-08 3.000E-08 3.000E-08 3.000E-08 2.800E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08
2.000E-08
 %SOLUBILITY 7.224E-09 5.703E-09 5.703E-09 5.703E-09 5.323E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09
3.802E-09
 SOIL AIR      1.060E-08 8.617E-09 8.796E-09 8.813E-09 8.172E-09 5.785E-09 5.608E-09 5.505E-09 5.401E-09 5.348E-09 5.357E-09
5.433E-09

            SUBLAYER  2

 MOISTURE      4.000E-08 3.000E-08 3.000E-08 3.000E-08 3.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08
2.000E-08
 %SOLUBILITY 7.605E-09 5.703E-09 5.703E-09 5.703E-09 5.703E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09
3.802E-09
 SOIL AIR      1.115E-08 8.617E-09 8.796E-09 8.813E-09 8.756E-09 5.785E-09 5.608E-09 5.505E-09 5.401E-09 5.348E-09 5.357E-09
5.433E-09

            SUBLAYER  3

 MOISTURE      4.000E-08 3.000E-08 3.000E-08 3.000E-08 3.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08 2.000E-08
2.000E-08
 %SOLUBILITY 7.605E-09 5.703E-09 5.703E-09 5.703E-09 5.703E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09 3.802E-09
3.802E-09
 SOIL AIR      1.115E-08 8.617E-09 8.796E-09 8.813E-09 8.756E-09 5.785E-09 5.608E-09 5.505E-09 5.401E-09 5.348E-09 5.357E-09
5.433E-09


 POL DEP CM   3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1                          YEAR -  19 ANNUAL SUMMARY REPORT
                           ================================


        -- TOTAL INPUTS (UG) --


 UPPER SOIL ZONE              0.000E+00
 SOIL ZONE 2                  0.000E+00
 SOIL ZONE 3                  0.000E+00
 LOWER SOIL ZONE              0.000E+00


           -- HYDROLOGIC CYCLE COMPONENTS --

 AVERAGE SOIL MOISTURE ZONE 1 (%)              11.844
 AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)        11.844
 TOTAL PRECIPITATION (CM)                      73.466
 TOTAL INFILTRATION (CM)                       73.460
 TOTAL EVAPOTRANSPIRATION (CM)                 69.004
 TOTAL SURFACE RUNOFF (CM)                      0.000
 TOTAL GRW RUNOFF (CM)                          4.453
 TOTAL MOISTURE RETENTION (CM)                  0.003
 TOTAL YIELD (CM)                               4.460
0          -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED
           ---------------------------------------------------------------------------------------------------------
 FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH
SEP)
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     UPPER SOIL ZONE:

          SUBLAYER  1

               TOTAL VOLATILIZED                    4.539E+00

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  3.490E+00

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  2.296E+00

     SOIL ZONE 2:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                  7.036E-01

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  3.826E-01

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  3.150E-01

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

               TOTAL DIFFUSED (UP)                  1.631E-01

          SUBLAYER  2

               TOTAL DIFFUSED (UP)                  1.367E-01

          SUBLAYER  3

               TOTAL DIFFUSED (UP)                  6.423E-03
               TOTAL IN GROUNDWATER RUNOFF          5.104E-02
1                    -- AVERAGE POLLUTANT CONCENTRATIONS --  NOTE: ONLY NON-ZERO VALUES ARE PRINTED --
                     ---------------------------------------------------------------------------------

     UPPER SOIL ZONE:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  9.178E-09
                                   ADSORBED SOIL (UG/G)   2.528E-08
                                   SOIL AIR (UG/ML)       2.582E-09

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  1.620E-08
                                   ADSORBED SOIL (UG/G)   4.463E-08
                                   SOIL AIR (UG/ML)       4.559E-09

          SUBLAYER  3

                                   SOIL MOISTURE (UG/ML)  2.077E-08
                                   ADSORBED SOIL (UG/G)   5.721E-08
                                   SOIL AIR (UG/ML)       5.844E-09

     SOIL ZONE 2:

          SUBLAYER  1

                                   SOIL MOISTURE (UG/ML)  2.258E-08
                                   SOIL AIR (UG/ML)       6.355E-09

          SUBLAYER  2

                                   SOIL MOISTURE (UG/ML)  2.358E-08
                                   SOIL AIR (UG/ML)       6.640E-09

          SUBLAYER  3
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SOIL MOISTURE (UG/ML) 2.433E-08
SOIL AIR (UG/ML) 6.857E-09

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

SOIL MOISTURE (UG/ML) 2.467E-08
SOIL AIR (UG/ML) 6.953E-09

SUBLAYER 2

SOIL MOISTURE (UG/ML) 2.500E-08
SOIL AIR (UG/ML) 7.048E-09

SUBLAYER 3

SOIL MOISTURE (UG/ML) 2.500E-08
SOIL AIR (UG/ML) 7.048E-09

MAX. POLL. DEPTH (M) 3.900E+00

1

YEAR -20 MONTHLY RESULTS (OUTPUT)

-- HYDROLOGIC CYCLE COMPONENTS --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MOIS. IN L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
MOIS. BELOW L1 (%)	11.949	12.264	12.684	12.369	10.934	11.564	11.249	12.159	12.124	11.704	11.284	11.844
PRECIPATION (CM)	6.492	3.795	2.549	1.924	2.059	5.239	5.884	10.277	10.811	8.803	7.034	8.600
NET INFILT. (CM)	6.491	3.794	2.549	1.924	2.059	5.239	5.884	10.276	10.810	8.801	7.034	8.599
EVAPOTRANS. (CM)	5.977	3.080	1.456	1.516	3.057	5.124	6.293	9.035	9.788	8.500	7.320	7.857
MOIS. RETEN (CM)	0.034	0.102	0.136	-0.102	-0.466	0.205	-0.102	0.296	-0.011	-0.136	-0.136	0.182
SUR. RUNOFF (CM)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GRW. RUNOFF (CM)	0.480	0.612	0.956	0.510	-0.532	-0.090	-0.307	0.944	1.032	0.437	-0.150	0.560
YIELD (CM)	0.480	0.613	0.956	0.510	-0.532	-0.090	-0.307	0.945	1.034	0.439	-0.149	0.561
PAU/MPA (GZU)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001
PA/MPA (GZ)	0.997	1.001	0.992	1.002	1.009	0.998	1.002	0.999	1.004	1.005	1.005	1.001

1

-- POLLUTANT MASS INPUT TO COLUMN (UG) --

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRECIP.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD UPPER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD ZONE 3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LOAD LOWER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL INPUT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

UPPER SOIL ZONE:

SUBLAYER 1

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
VOLATILIZED	3.125E-01	3.074E-01	2.949E-01	3.096E-01	3.576E-01	3.174E-01	3.167E-01	2.726E-01	2.689E-01	2.829E-01	2.966E-01	2.778E-01
IN SOIL MOI	1.359E-02	1.395E-02	1.443E-02	1.407E-02	1.165E-02	1.216E-02	1.166E-02	1.261E-02	1.257E-02	1.213E-02	1.154E-02	1.211E-02
ADS ON SOIL	5.829E-01	5.829E-01	5.829E-01	5.829E-01	5.460E-01	5.387E-01	5.313E-01	5.313E-01	5.313E-01	5.313E-01	5.239E-01	5.239E-01
IN SOIL AIR	7.312E-03	7.429E-03	7.443E-03	7.563E-03	7.485E-03	7.126E-03	6.905E-03	6.518E-03	6.404E-03	6.459E-03	6.494E-03	6.431E-03

SUBLAYER 2

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 DIFFUSED UP 2.304E-01 2.218E-01 2.091E-01 2.195E-01 2.568E-01 2.261E-01 2.244E-01 1.931E-01 1.904E-01 1.967E-01 2.090E-01
1.917E-01
 IN SOIL MOI 2.357E-02 2.402E-02 2.466E-02 2.405E-02 2.000E-02 2.082E-02 1.992E-02 2.154E-02 2.147E-02 2.056E-02 1.966E-02
2.047E-02
 ADS ON SOIL 1.011E+00 1.004E+00 9.962E-01 9.962E-01 9.371E-01 9.224E-01 9.076E-01 9.076E-01 9.076E-01 9.002E-01 8.929E-01
8.855E-01
 IN SOIL AIR 1.268E-02 1.279E-02 1.272E-02 1.292E-02 1.285E-02 1.220E-02 1.180E-02 1.113E-02 1.094E-02 1.094E-02 1.107E-02
1.087E-02

          SUBLAYER  3

 DIFFUSED UP 1.359E-01 1.323E-01 1.169E-01 1.177E-01 1.506E-01 1.268E-01 1.314E-01 1.028E-01 1.008E-01 1.060E-01 1.128E-01
1.018E-01
 IN SOIL MOI 2.942E-02 3.002E-02 3.032E-02 2.939E-02 2.504E-02 2.564E-02 2.478E-02 2.626E-02 2.619E-02 2.511E-02 2.405E-02
2.490E-02
 ADS ON SOIL 1.262E+00 1.254E+00 1.225E+00 1.218E+00 1.173E+00 1.136E+00 1.129E+00 1.107E+00 1.107E+00 1.099E+00 1.092E+00
1.077E+00
 IN SOIL AIR 1.583E-02 1.599E-02 1.564E-02 1.580E-02 1.608E-02 1.503E-02 1.467E-02 1.358E-02 1.334E-02 1.337E-02 1.354E-02
1.322E-02

     SOIL ZONE 2:

          SUBLAYER  1

 DIFFUSED UP 2.950E-02 3.459E-02 1.225E-02 1.729E-02 4.227E-02 2.089E-02 2.720E-02 0.000E+00 0.000E+00 3.365E-03 7.290E-03
0.000E+00
 IN SOIL MOI 3.484E-02 3.576E-02 3.493E-02 3.406E-02 3.011E-02 2.997E-02 2.916E-02 2.955E-02 2.946E-02 2.844E-02 2.742E-02
1.919E-02
 IN SOIL AIR 1.874E-02 1.904E-02 1.802E-02 1.831E-02 1.934E-02 1.757E-02 1.726E-02 1.528E-02 1.501E-02 1.514E-02 1.544E-02
1.019E-02

          SUBLAYER  2

 DIFFUSED UP 7.032E-02 3.459E-02 3.318E-02 3.484E-02 4.248E-02 3.854E-02 3.906E-02 3.366E-02 3.319E-02 3.493E-02 3.713E-02
5.796E-03
 IN SOIL MOI 3.872E-02 3.775E-02 3.699E-02 3.607E-02 3.188E-02 3.185E-02 3.098E-02 3.152E-02 3.143E-02 3.034E-02 2.925E-02
1.919E-02
 IN SOIL AIR 2.083E-02 2.010E-02 1.908E-02 1.939E-02 2.048E-02 1.867E-02 1.834E-02 1.629E-02 1.601E-02 1.615E-02 1.646E-02
1.019E-02

          SUBLAYER  3

 DIFFUSED UP 0.000E+00 3.459E-02 3.318E-02 3.484E-02 8.497E-02 3.854E-02 3.906E-02 3.366E-02 3.319E-02 3.493E-02 3.713E-02
4.637E-03
 IN SOIL MOI 3.872E-02 3.974E-02 3.904E-02 3.807E-02 3.543E-02 3.372E-02 3.280E-02 3.349E-02 3.339E-02 3.223E-02 3.108E-02
1.919E-02
 IN SOIL AIR 2.083E-02 2.116E-02 2.014E-02 2.046E-02 2.276E-02 1.977E-02 1.942E-02 1.731E-02 1.701E-02 1.716E-02 1.749E-02
1.019E-02

     SOIL ZONE 3:

          SUBLAYER  1

          SUBLAYER  2

          SUBLAYER  3

     LOWER SOIL ZONE:

          SUBLAYER  1

 DIFFUSED UP 0.000E+00 0.000E+00 3.318E-02 3.484E-02 0.000E+00 3.854E-02 7.813E-02 3.366E-02 3.319E-02 3.493E-02 3.713E-02
3.477E-03
 IN SOIL MOI 3.872E-02 3.974E-02 4.110E-02 4.008E-02 3.543E-02 3.559E-02 3.645E-02 3.546E-02 3.535E-02 3.413E-02 3.290E-02
1.919E-02
 IN SOIL AIR 2.083E-02 2.116E-02 2.120E-02 2.154E-02 2.276E-02 2.086E-02 2.158E-02 1.833E-02 1.801E-02 1.817E-02 1.852E-02
1.019E-02

          SUBLAYER  2

 DIFFUSED UP 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 3.854E-02 0.000E+00 3.366E-02 6.639E-02 6.986E-02 7.426E-02
2.318E-03
 IN SOIL MOI 3.872E-02 3.974E-02 4.110E-02 4.008E-02 3.543E-02 3.747E-02 3.645E-02 3.743E-02 3.928E-02 3.792E-02 3.656E-02
1.919E-02
 IN SOIL AIR 2.083E-02 2.116E-02 2.120E-02 2.154E-02 2.276E-02 2.196E-02 2.158E-02 1.935E-02 2.001E-02 2.018E-02 2.058E-02
1.019E-02

          SUBLAYER  3

 DIFFUSED UP 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 3.366E-02 0.000E+00 0.000E+00 0.000E+00
1.159E-03
 IN SOIL MOI 3.872E-02 3.974E-02 4.110E-02 4.008E-02 3.543E-02 3.747E-02 3.645E-02 3.940E-02 3.928E-02 3.792E-02 3.656E-02
1.919E-02
 IN SOIL AIR 2.083E-02 2.116E-02 2.120E-02 2.154E-02 2.276E-02 2.196E-02 2.158E-02 2.037E-02 2.001E-02 2.018E-02 2.058E-02
1.019E-02
 GWR. RUNOFF 3.457E-03 4.410E-03 6.886E-03 3.673E-03 0.000E+00 0.000E+00 0.000E+00 6.800E-03 7.434E-03 3.143E-03 0.000E+00
2.319E-03

     -- POLLUTANT CONCENTRATIONS (UG/ML) OR (UG/G) -- NOTE: IF CONCENTRATIONS ARE ZERO FOR EACH MONTH, THEY ARE NOT PRINTED --
```

UPPER SOIL ZONE:

SUBLAYER 1

MOISTURE	7.900E-09	7.900E-09	7.900E-09	7.900E-09	7.400E-09	7.300E-09	7.200E-09	7.200E-09	7.200E-09	7.200E-09	7.100E-09
7.100E-09											
%SOLUBILITY	1.502E-09	1.502E-09	1.502E-09	1.502E-09	1.407E-09	1.388E-09	1.369E-09	1.369E-09	1.369E-09	1.369E-09	1.350E-09
1.350E-09											
ADSORBED	2.176E-08	2.176E-08	2.176E-08	2.176E-08	2.039E-08	2.011E-08	1.984E-08	1.984E-08	1.984E-08	1.984E-08	1.956E-08
1.956E-08											
SOIL AIR	2.203E-09	2.269E-09	2.316E-09	2.321E-09	2.160E-09	2.111E-09	2.019E-09	1.982E-09	1.944E-09	1.925E-09	1.902E-09
1.929E-09											

SUBLAYER 2

MOISTURE	1.370E-08	1.360E-08	1.350E-08	1.350E-08	1.270E-08	1.250E-08	1.230E-08	1.230E-08	1.230E-08	1.220E-08	1.210E-08
1.200E-08											
%SOLUBILITY	2.605E-09	2.586E-09	2.567E-09	2.567E-09	2.414E-09	2.376E-09	2.338E-09	2.338E-09	2.338E-09	2.319E-09	2.300E-09
2.281E-09											
ADSORBED	3.774E-08	3.747E-08	3.719E-08	3.719E-08	3.499E-08	3.444E-08	3.389E-08	3.389E-08	3.389E-08	3.361E-08	3.334E-08
3.306E-08											
SOIL AIR	3.820E-09	3.906E-09	3.958E-09	3.966E-09	3.707E-09	3.616E-09	3.449E-09	3.385E-09	3.321E-09	3.262E-09	3.241E-09
3.260E-09											

SUBLAYER 3

MOISTURE	1.710E-08	1.700E-08	1.660E-08	1.650E-08	1.590E-08	1.540E-08	1.530E-08	1.500E-08	1.500E-08	1.490E-08	1.480E-08
1.460E-08											
%SOLUBILITY	3.251E-09	3.232E-09	3.156E-09	3.137E-09	3.023E-09	2.928E-09	2.909E-09	2.852E-09	2.852E-09	2.833E-09	2.814E-09
2.776E-09											
ADSORBED	4.711E-08	4.684E-08	4.573E-08	4.546E-08	4.380E-08	4.243E-08	4.215E-08	4.132E-08	4.132E-08	4.105E-08	4.077E-08
4.022E-08											
SOIL AIR	4.768E-09	4.883E-09	4.867E-09	4.847E-09	4.641E-09	4.454E-09	4.290E-09	4.128E-09	4.050E-09	3.985E-09	3.964E-09
3.966E-09											

SOIL ZONE 2:

SUBLAYER 1

MOISTURE	1.800E-08	1.800E-08	1.700E-08	1.700E-08	1.700E-08	1.600E-08	1.600E-08	1.500E-08	1.500E-08	1.500E-08	1.500E-08
1.000E-08											
%SOLUBILITY	3.422E-09	3.422E-09	3.232E-09	3.232E-09	3.232E-09	3.042E-09	3.042E-09	2.852E-09	2.852E-09	2.852E-09	2.852E-09
1.901E-09											
SOIL AIR	5.019E-09	5.170E-09	4.985E-09	4.994E-09	4.962E-09	4.628E-09	4.487E-09	4.128E-09	4.050E-09	4.011E-09	4.018E-09
2.716E-09											

SUBLAYER 2

MOISTURE	2.000E-08	1.900E-08	1.800E-08	1.800E-08	1.800E-08	1.700E-08	1.700E-08	1.600E-08	1.600E-08	1.600E-08	1.600E-08
1.000E-08											
%SOLUBILITY	3.802E-09	3.612E-09	3.422E-09	3.422E-09	3.422E-09	3.232E-09	3.232E-09	3.042E-09	3.042E-09	3.042E-09	3.042E-09
1.901E-09											
SOIL AIR	5.577E-09	5.457E-09	5.278E-09	5.288E-09	5.254E-09	4.917E-09	4.767E-09	4.404E-09	4.320E-09	4.279E-09	4.285E-09
2.716E-09											

SUBLAYER 3

MOISTURE	2.000E-08	2.000E-08	1.900E-08	1.900E-08	2.000E-08	1.800E-08	1.800E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08
1.000E-08											
%SOLUBILITY	3.802E-09	3.802E-09	3.612E-09	3.612E-09	3.802E-09	3.422E-09	3.422E-09	3.232E-09	3.232E-09	3.232E-09	3.232E-09
1.901E-09											
SOIL AIR	5.577E-09	5.745E-09	5.571E-09	5.581E-09	5.837E-09	5.206E-09	5.047E-09	4.679E-09	4.591E-09	4.546E-09	4.553E-09
2.716E-09											

SOIL ZONE 3:

LOWER SOIL ZONE:

SUBLAYER 1

MOISTURE	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	1.900E-08	2.000E-08	1.800E-08	1.800E-08	1.800E-08	1.800E-08
1.000E-08											
%SOLUBILITY	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.612E-09	3.802E-09	3.422E-09	3.422E-09	3.422E-09	3.422E-09
1.901E-09											
SOIL AIR	5.577E-09	5.745E-09	5.864E-09	5.875E-09	5.837E-09	5.496E-09	5.608E-09	4.954E-09	4.861E-09	4.814E-09	4.821E-09
2.716E-09											

SUBLAYER 2

MOISTURE	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	1.900E-08	2.000E-08	2.000E-08	2.000E-08
1.000E-08											
%SOLUBILITY	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.612E-09	3.802E-09	3.802E-09	3.802E-09
1.901E-09											
SOIL AIR	5.577E-09	5.745E-09	5.864E-09	5.875E-09	5.837E-09	5.785E-09	5.608E-09	5.229E-09	5.401E-09	5.348E-09	5.357E-09
2.716E-09											

SUBLAYER 3

MOISTURE	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08	2.000E-08
1.000E-08											
%SOLUBILITY	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09	3.802E-09
1.901E-09											
SOIL AIR	5.577E-09	5.745E-09	5.864E-09	5.875E-09	5.837E-09	5.785E-09	5.608E-09	5.505E-09	5.401E-09	5.348E-09	5.357E-09
2.716E-09											

POL DEP CM 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02 3.900E+02
3.900E+02
1 YEAR - 20 ANNUAL SUMMARY REPORT

-- TOTAL INPUTS (UG) --

UPPER SOIL ZONE	0.000E+00
SOIL ZONE 2	0.000E+00
SOIL ZONE 3	0.000E+00
LOWER SOIL ZONE	0.000E+00

-- HYDROLOGIC CYCLE COMPONENTS --

AVERAGE SOIL MOISTURE ZONE 1 (%)	11.844
AVERAGE SOIL MOISTURE BELOW ZONE 1 (%)	11.844
TOTAL PRECIPITATION (CM)	73.466
TOTAL INFILTRATION (CM)	73.460
TOTAL EVAPOTRANSPIRATION (CM)	69.004
TOTAL SURFACE RUNOFF (CM)	0.000
TOTAL GRW RUNOFF (CM)	4.453
TOTAL MOISTURE RETENTION (CM)	0.003
TOTAL YIELD (CM)	4.460

0 -- POLLUTANT MASS DISTRIBUTION IN COLUMN (UG) -- NOTE: IF COMPONENT IS ZERO EACH MONTH, IT IS NOT PRINTED

FOR FINAL MASS IN SOIL MOI., ADS. ON SOIL, SOIL AIR, IMMOBIL CEC, COMPLEXED, AND PURE PHASE FOR EACH SUBLAYER, SEE ABOVE (MONTH SEP)

UPPER SOIL ZONE:

SUBLAYER 1

TOTAL VOLATILIZED 3.615E+00

SUBLAYER 2

TOTAL DIFFUSED (UP) 2.569E+00

SUBLAYER 3

TOTAL DIFFUSED (UP) 1.436E+00

SOIL ZONE 2:

SUBLAYER 1

TOTAL DIFFUSED (UP) 1.946E-01

SUBLAYER 2

TOTAL DIFFUSED (UP) 4.377E-01

SUBLAYER 3

TOTAL DIFFUSED (UP) 4.087E-01

SOIL ZONE 3:

SUBLAYER 1

SUBLAYER 2

SUBLAYER 3

LOWER SOIL ZONE:

SUBLAYER 1

TOTAL DIFFUSED (UP) 3.271E-01

SUBLAYER 2

TOTAL DIFFUSED (UP) 2.850E-01

SUBLAYER 3

TOTAL DIFFUSED (UP) 3.482E-02
TOTAL IN GROUNDWATER RUNOFF 3.812E-02

1 -- AVERAGE POLLUTANT CONCENTRATIONS -- NOTE: ONLY NON-ZERO VALUES ARE PRINTED --

UPPER SOIL ZONE:

SUBLAYER 1

```
                                SOIL MOISTURE (UG/ML)   7.442E-09
                                ADSORBED SOIL (UG/G)    2.050E-08
                                SOIL AIR (UG/ML)        2.090E-09

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)   1.272E-08
                                ADSORBED SOIL (UG/G)    3.506E-08
                                SOIL AIR (UG/ML)        3.574E-09

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)   1.567E-08
                                ADSORBED SOIL (UG/G)    4.318E-08
                                SOIL AIR (UG/ML)        4.404E-09

    SOIL ZONE 2:

        SUBLAYER  1

                                SOIL MOISTURE (UG/ML)   1.575E-08
                                SOIL AIR (UG/ML)        4.431E-09

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)   1.675E-08
                                SOIL AIR (UG/ML)        4.712E-09

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)   1.767E-08
                                SOIL AIR (UG/ML)        4.971E-09

    SOIL ZONE 3:

    LOWER SOIL ZONE:

        SUBLAYER  1

                                SOIL MOISTURE (UG/ML)   1.842E-08
                                SOIL AIR (UG/ML)        5.181E-09

        SUBLAYER  2

                                SOIL MOISTURE (UG/ML)   1.908E-08
                                SOIL AIR (UG/ML)        5.362E-09

        SUBLAYER  3

                                SOIL MOISTURE (UG/ML)   1.917E-08
                                SOIL AIR (UG/ML)        5.385E-09

                                MAX. POLL. DEPTH (M)    3.900E+00

*****************************************EXECUTION COMPLETED*****************************************
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Appendix B

MODEL INPUT AND OUTPUT

NO. OF POINTS IN X-DIRECTION	6
NO. OF POINTS IN Y-DIRECTION	5
NO. OF POINTS IN Z-DIRECTION	5
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	13
NO. OF ENDING TIME STEP	181
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	180
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ...	0.0000E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ...	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.3000E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.3000E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.3000E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.3000E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00

POROSITY	0.3000E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.9530E+01
HYDRAULIC GRADIENT	0.9630E-03
LONGITIDUNAL DESPERSIVITY (METER)	0.3000E+02
LATERAL DISPERSIVITY (METER)	0.1000E+02
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.0000E+00
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)..	0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY TOROSITY (M**2/HR)	0.0000E+00
DECAY CONSTANT (PER HOUR)	0.0000E+00
BULK DENSITY OF THE SOIL (KG/M**3)	0.1860E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-01
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) ..	0.7300E+03
DISCHARGE TIME (HR)	0.1314E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) .	0.0000E+00

LIST OF TRANSIENT SOURCE RELEASE RATE

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.599E-05
0.000E+00	0.951E-04	0.856E-04	0.106E-03	0.150E-03	0.769E-04	0.000E+00	0.000E+00	0.000E+00	0.147E-03
0.160E-03	0.689E-04	0.000E+00	0.857E-04	0.698E-04	0.809E-04	0.110E-03	0.546E-04	0.000E+00	0.000E+00
0.000E+00	0.958E-04	0.102E-03	0.432E-04	0.000E+00	0.527E-04	0.426E-04	0.490E-04	0.665E-04	0.328E-04
0.000E+00	0.000E+00	0.000E+00	0.569E-04	0.605E-04	0.255E-04	0.000E+00	0.310E-04	0.250E-04	0.288E-04
0.390E-04	0.192E-04	0.000E+00	0.000E+00	0.000E+00	0.333E-04	0.354E-04	0.149E-04	0.000E+00	0.181E-04
0.146E-04	0.168E-04	0.228E-04	0.112E-04	0.000E+00	0.000E+00	0.000E+00	0.195E-04	0.206E-04	0.871E-05
0.000E+00	0.106E-04	0.852E-05	0.981E-05	0.133E-04	0.654E-05	0.000E+00	0.000E+00	0.000E+00	0.113E-04
0.120E-04	0.507E-05	0.000E+00	0.616E-05	0.497E-05	0.572E-05	0.775E-05	0.381E-05	0.000E+00	0.000E+00
0.000E+00	0.661E-05	0.701E-05	0.296E-05	0.000E+00	0.359E-05	0.290E-05	0.333E-05	0.452E-05	0.222E-05
0.000E+00	0.000E+00	0.000E+00	0.385E-05	0.409E-05	0.172E-05	0.000E+00	0.209E-05	0.169E-05	0.194E-05
0.263E-05	0.130E-05	0.000E+00	0.000E+00	0.000E+00	0.224E-05	0.238E-05	0.100E-05	0.000E+00	0.122E-05
0.984E-06	0.113E-05	0.154E-05	0.756E-06	0.000E+00	0.000E+00	0.000E+00	0.131E-05	0.139E-05	0.586E-06
0.000E+00	0.711E-06	0.574E-06	0.660E-06	0.895E-06	0.440E-06	0.000E+00	0.000E+00	0.000E+00	0.763E-06
0.810E-06	0.341E-06	0.000E+00	0.414E-06	0.334E-06	0.385E-06	0.521E-06	0.256E-06	0.000E+00	0.000E+00
0.000E+00	0.444E-06	0.472E-06	0.199E-06	0.000E+00	0.242E-06	0.195E-06	0.224E-06	0.304E-06	0.150E-06
0.000E+00	0.000E+00	0.000E+00	0.259E-06	0.275E-06	0.116E-06	0.000E+00	0.141E-06	0.114E-06	0.131E-06
0.177E-06	0.872E-07	0.000E+00	0.000E+00	0.000E+00	0.151E-06	0.160E-06	0.676E-07	0.000E+00	0.821E-07

RETARDATION FACTOR	0.1000E+01
RETARDED DARCY VELOCITY (M/HR)	0.3059E-01
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) ..	0.9177E+00
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) .	0.3059E+00
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR).	0.3059E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Z = 5.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Z = 10.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Z = 15.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Z = 20.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-50.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-100.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.136E-05	0.195E-05	0.246E-06	0.260E-08	0.350E-11	0.000E+00
50.	0.410E-03	0.812E-04	0.402E-05	0.425E-07	0.572E-10	0.000E+00
0.	0.632E-02	0.879E-03	0.102E-04	0.108E-06	0.145E-09	0.000E+00
-50.	0.410E-03	0.812E-04	0.402E-05	0.425E-07	0.572E-10	0.000E+00
-100.	0.136E-05	0.195E-05	0.246E-06	0.260E-08	0.350E-11	0.000E+00

Z = 5.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.123E-05	0.177E-05	0.224E-06	0.237E-08	0.319E-11	0.000E+00
50.	0.313E-03	0.662E-04	0.366E-05	0.387E-07	0.521E-10	0.000E+00
0.	0.479E-02	0.677E-03	0.932E-05	0.981E-07	0.132E-09	0.000E+00
-50.	0.313E-03	0.662E-04	0.366E-05	0.387E-07	0.521E-10	0.000E+00
-100.	0.123E-05	0.177E-05	0.224E-06	0.237E-08	0.319E-11	0.000E+00

Z = 10.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.904E-06	0.134E-05	0.169E-06	0.179E-08	0.241E-11	0.000E+00
50.	0.141E-03	0.379E-04	0.277E-05	0.292E-07	0.394E-10	0.000E+00
0.	0.208E-02	0.316E-03	0.703E-05	0.742E-07	0.998E-10	0.000E+00
-50.	0.141E-03	0.379E-04	0.277E-05	0.292E-07	0.394E-10	0.000E+00
-100.	0.904E-06	0.134E-05	0.169E-06	0.179E-08	0.241E-11	0.000E+00

Z = 15.00

Y	0.	100.	200.	300.	400.	500.
					X	
100.	0.556E-06	0.837E-06	0.106E-06	0.112E-08	0.151E-11	0.000E+00
50.	0.403E-04	0.176E-04	0.173E-05	0.183E-07	0.247E-10	0.000E+00
0.	0.528E-03	0.990E-04	0.440E-05	0.465E-07	0.626E-10	0.000E+00
-50.	0.403E-04	0.176E-04	0.173E-05	0.183E-07	0.247E-10	0.000E+00
-100.	0.556E-06	0.837E-06	0.106E-06	0.112E-08	0.151E-11	0.000E+00

Z = 20.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.286E-06	0.435E-06	0.553E-07	0.585E-09	0.787E-12	0.000E+00
50.	0.907E-05	0.767E-05	0.903E-06	0.955E-08	0.128E-10	0.000E+00
0.	0.830E-04	0.271E-04	0.229E-05	0.242E-07	0.326E-10	0.000E+00
-50.	0.907E-05	0.767E-05	0.903E-06	0.955E-08	0.128E-10	0.000E+00
-100.	0.286E-06	0.435E-06	0.553E-07	0.585E-09	0.787E-12	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.124E-03	0.338E-03	0.369E-03	0.281E-03	0.140E-03	0.419E-04
50.	0.111E-02	0.174E-02	0.114E-02	0.636E-03	0.294E-03	0.848E-04
0.	0.717E-02	0.393E-02	0.179E-02	0.849E-03	0.378E-03	0.108E-03
-50.	0.111E-02	0.174E-02	0.114E-02	0.636E-03	0.294E-03	0.848E-04
-100.	0.124E-03	0.338E-03	0.369E-03	0.281E-03	0.140E-03	0.419E-04

Z = 5.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.118E-03	0.323E-03	0.357E-03	0.273E-03	0.137E-03	0.409E-04
50.	0.973E-03	0.163E-02	0.110E-02	0.619E-03	0.287E-03	0.828E-04
0.	0.569E-02	0.355E-02	0.171E-02	0.824E-03	0.368E-03	0.105E-03
-50.	0.973E-03	0.163E-02	0.110E-02	0.619E-03	0.287E-03	0.828E-04
-100.	0.118E-03	0.323E-03	0.357E-03	0.273E-03	0.137E-03	0.409E-04

Z = 10.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.101E-03	0.282E-03	0.323E-03	0.253E-03	0.127E-03	0.381E-04
50.	0.695E-03	0.135E-02	0.967E-03	0.569E-03	0.266E-03	0.772E-04
0.	0.299E-02	0.271E-02	0.149E-02	0.755E-03	0.342E-03	0.978E-04
-50.	0.695E-03	0.135E-02	0.967E-03	0.569E-03	0.266E-03	0.772E-04
-100.	0.101E-03	0.282E-03	0.323E-03	0.253E-03	0.127E-03	0.381E-04

Z = 15.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.786E-04	0.226E-03	0.275E-03	0.222E-03	0.112E-03	0.339E-04
50.	0.449E-03	0.100E-02	0.791E-03	0.495E-03	0.235E-03	0.686E-04
0.	0.126E-02	0.186E-02	0.119E-02	0.655E-03	0.302E-03	0.868E-04
-50.	0.449E-03	0.100E-02	0.791E-03	0.495E-03	0.235E-03	0.686E-04
-100.	0.786E-04	0.226E-03	0.275E-03	0.222E-03	0.112E-03	0.339E-04

Z = 20.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.565E-04	0.169E-03	0.221E-03	0.185E-03	0.947E-04	0.288E-04
50.	0.277E-03	0.681E-03	0.605E-03	0.408E-03	0.198E-03	0.581E-04
0.	0.573E-03	0.119E-02	0.891E-03	0.538E-03	0.253E-03	0.736E-04
-50.	0.277E-03	0.681E-03	0.605E-03	0.408E-03	0.198E-03	0.581E-04
-100.	0.565E-04	0.169E-03	0.221E-03	0.185E-03	0.947E-04	0.288E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.966E-04	0.286E-03	0.411E-03	0.469E-03	0.428E-03	0.325E-03
50.	0.730E-03	0.124E-02	0.104E-02	0.889E-03	0.731E-03	0.515E-03
0.	0.448E-02	0.264E-02	0.151E-02	0.112E-02	0.879E-03	0.603E-03
-50.	0.730E-03	0.124E-02	0.104E-02	0.889E-03	0.731E-03	0.515E-03
-100.	0.966E-04	0.286E-03	0.411E-03	0.469E-03	0.428E-03	0.325E-03

Z = 5.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.921E-04	0.275E-03	0.400E-03	0.459E-03	0.421E-03	0.320E-03
50.	0.645E-03	0.117E-02	0.999E-03	0.870E-03	0.718E-03	0.507E-03
0.	0.356E-02	0.240E-02	0.145E-02	0.109E-02	0.863E-03	0.593E-03
-50.	0.645E-03	0.117E-02	0.999E-03	0.870E-03	0.718E-03	0.507E-03
-100.	0.921E-04	0.275E-03	0.400E-03	0.459E-03	0.421E-03	0.320E-03

Z = 10.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.803E-04	0.244E-03	0.369E-03	0.432E-03	0.400E-03	0.306E-03
50.	0.469E-03	0.978E-03	0.901E-03	0.814E-03	0.680E-03	0.484E-03
0.	0.190E-02	0.186E-02	0.129E-02	0.102E-02	0.816E-03	0.566E-03
-50.	0.469E-03	0.978E-03	0.901E-03	0.814E-03	0.680E-03	0.484E-03
-100.	0.803E-04	0.244E-03	0.369E-03	0.432E-03	0.400E-03	0.306E-03

Z = 15.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.646E-04	0.203E-03	0.324E-03	0.390E-03	0.367E-03	0.283E-03
50.	0.312E-03	0.746E-03	0.762E-03	0.729E-03	0.621E-03	0.448E-03
0.	0.828E-03	0.132E-02	0.107E-02	0.909E-03	0.745E-03	0.523E-03
-50.	0.312E-03	0.746E-03	0.762E-03	0.729E-03	0.621E-03	0.448E-03
-100.	0.646E-04	0.203E-03	0.324E-03	0.390E-03	0.367E-03	0.283E-03

Z = 20.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.486E-04	0.159E-03	0.272E-03	0.339E-03	0.325E-03	0.255E-03
50.	0.199E-03	0.526E-03	0.612E-03	0.628E-03	0.548E-03	0.402E-03
0.	0.392E-03	0.875E-03	0.841E-03	0.779E-03	0.656E-03	0.469E-03
-50.	0.199E-03	0.526E-03	0.612E-03	0.628E-03	0.548E-03	0.402E-03
-100.	0.486E-04	0.159E-03	0.272E-03	0.339E-03	0.325E-03	0.255E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.593E-04	0.178E-03	0.270E-03	0.339E-03	0.366E-03	0.363E-03
50.	0.435E-03	0.748E-03	0.654E-03	0.615E-03	0.590E-03	0.537E-03
0.	0.264E-02	0.158E-02	0.942E-03	0.761E-03	0.695E-03	0.614E-03
-50.	0.435E-03	0.748E-03	0.654E-03	0.615E-03	0.590E-03	0.537E-03
-100.	0.593E-04	0.178E-03	0.270E-03	0.339E-03	0.366E-03	0.363E-03

Z = 5.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.566E-04	0.172E-03	0.263E-03	0.332E-03	0.361E-03	0.359E-03
50.	0.385E-03	0.704E-03	0.632E-03	0.602E-03	0.580E-03	0.530E-03
0.	0.210E-02	0.144E-02	0.907E-03	0.745E-03	0.684E-03	0.606E-03
-50.	0.385E-03	0.704E-03	0.632E-03	0.602E-03	0.580E-03	0.530E-03
-100.	0.566E-04	0.172E-03	0.263E-03	0.332E-03	0.361E-03	0.359E-03

Z = 10.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.495E-04	0.153E-03	0.244E-03	0.314E-03	0.345E-03	0.345E-03
50.	0.281E-03	0.593E-03	0.572E-03	0.566E-03	0.552E-03	0.509E-03
0.	0.112E-02	0.112E-02	0.810E-03	0.698E-03	0.651E-03	0.582E-03
-50.	0.281E-03	0.593E-03	0.572E-03	0.566E-03	0.552E-03	0.509E-03
-100.	0.495E-04	0.153E-03	0.244E-03	0.314E-03	0.345E-03	0.345E-03

Z = 15.00

Y	0.	100.	200.	300.	X 400.	500.
100.	0.401E-04	0.128E-03	0.216E-03	0.286E-03	0.319E-03	0.324E-03
50.	0.187E-03	0.454E-03	0.487E-03	0.511E-03	0.510E-03	0.477E-03
0.	0.493E-03	0.794E-03	0.677E-03	0.628E-03	0.599E-03	0.544E-03
-50.	0.187E-03	0.454E-03	0.487E-03	0.511E-03	0.510E-03	0.477E-03
-100.	0.401E-04	0.128E-03	0.216E-03	0.286E-03	0.319E-03	0.324E-03

Z = 20.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.304E-04	0.101E-03	0.183E-03	0.252E-03	0.287E-03	0.297E-03
50.	0.121E-03	0.323E-03	0.395E-03	0.444E-03	0.456E-03	0.435E-03
0.	0.235E-03	0.531E-03	0.536E-03	0.543E-03	0.535E-03	0.496E-03
-50.	0.121E-03	0.323E-03	0.395E-03	0.444E-03	0.456E-03	0.435E-03
-100.	0.304E-04	0.101E-03	0.183E-03	0.252E-03	0.287E-03	0.297E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.349E-04	0.105E-03	0.161E-03	0.207E-03	0.235E-03	0.253E-03
50.	0.255E-03	0.439E-03	0.388E-03	0.372E-03	0.372E-03	0.366E-03
0.	0.155E-02	0.926E-03	0.557E-03	0.459E-03	0.436E-03	0.415E-03
-50.	0.255E-03	0.439E-03	0.388E-03	0.372E-03	0.372E-03	0.366E-03
-100.	0.349E-04	0.105E-03	0.161E-03	0.207E-03	0.235E-03	0.253E-03

Z = 5.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.334E-04	0.101E-03	0.157E-03	0.203E-03	0.231E-03	0.250E-03
50.	0.225E-03	0.414E-03	0.375E-03	0.364E-03	0.366E-03	0.361E-03
0.	0.123E-02	0.843E-03	0.536E-03	0.449E-03	0.429E-03	0.410E-03
-50.	0.225E-03	0.414E-03	0.375E-03	0.364E-03	0.366E-03	0.361E-03
-100.	0.334E-04	0.101E-03	0.157E-03	0.203E-03	0.231E-03	0.250E-03

Z = 10.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.292E-04	0.906E-04	0.146E-03	0.193E-03	0.221E-03	0.241E-03
50.	0.165E-03	0.348E-03	0.339E-03	0.343E-03	0.349E-03	0.348E-03
0.	0.657E-03	0.657E-03	0.479E-03	0.422E-03	0.409E-03	0.394E-03
-50.	0.165E-03	0.348E-03	0.339E-03	0.343E-03	0.349E-03	0.348E-03
-100.	0.292E-04	0.906E-04	0.146E-03	0.193E-03	0.221E-03	0.241E-03

Z = 15.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.236E-04	0.759E-04	0.129E-03	0.176E-03	0.206E-03	0.227E-03
50.	0.110E-03	0.267E-03	0.290E-03	0.310E-03	0.323E-03	0.327E-03
0.	0.289E-03	0.466E-03	0.401E-03	0.380E-03	0.378E-03	0.370E-03
-50.	0.110E-03	0.267E-03	0.290E-03	0.310E-03	0.323E-03	0.327E-03
-100.	0.236E-04	0.759E-04	0.129E-03	0.176E-03	0.206E-03	0.227E-03

Z = 20.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.180E-04	0.601E-04	0.110E-03	0.155E-03	0.186E-03	0.209E-03
50.	0.709E-04	0.190E-03	0.235E-03	0.270E-03	0.290E-03	0.300E-03
0.	0.138E-03	0.312E-03	0.318E-03	0.329E-03	0.338E-03	0.339E-03
-50.	0.709E-04	0.190E-03	0.235E-03	0.270E-03	0.290E-03	0.300E-03
-100.	0.180E-04	0.601E-04	0.110E-03	0.155E-03	0.186E-03	0.209E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X = 0.	100.	200.	300.	400.	500.
100.	0.204E-04	0.616E-04	0.946E-04	0.122E-03	0.140E-03	0.155E-03
50.	0.149E-03	0.256E-03	0.227E-03	0.219E-03	0.221E-03	0.222E-03
0.	0.902E-03	0.541E-03	0.326E-03	0.270E-03	0.259E-03	0.251E-03
-50.	0.149E-03	0.256E-03	0.227E-03	0.219E-03	0.221E-03	0.222E-03
-100.	0.204E-04	0.616E-04	0.946E-04	0.122E-03	0.140E-03	0.155E-03

Z = 5.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.195E-04	0.593E-04	0.923E-04	0.120E-03	0.138E-03	0.153E-03
50.	0.132E-03	0.242E-03	0.219E-03	0.214E-03	0.217E-03	0.219E-03
0.	0.718E-03	0.492E-03	0.314E-03	0.264E-03	0.255E-03	0.248E-03
-50.	0.132E-03	0.242E-03	0.219E-03	0.214E-03	0.217E-03	0.219E-03
-100.	0.195E-04	0.593E-04	0.923E-04	0.120E-03	0.138E-03	0.153E-03

Z = 10.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.171E-04	0.530E-04	0.857E-04	0.114E-03	0.132E-03	0.148E-03
50.	0.961E-04	0.203E-03	0.199E-03	0.202E-03	0.207E-03	0.211E-03
0.	0.383E-03	0.383E-03	0.280E-03	0.248E-03	0.243E-03	0.239E-03
-50.	0.961E-04	0.203E-03	0.199E-03	0.202E-03	0.207E-03	0.211E-03
-100.	0.171E-04	0.530E-04	0.857E-04	0.114E-03	0.132E-03	0.148E-03

Z = 15.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.138E-04	0.444E-04	0.759E-04	0.104E-03	0.123E-03	0.139E-03
50.	0.642E-04	0.156E-03	0.170E-03	0.182E-03	0.192E-03	0.199E-03
0.	0.168E-03	0.272E-03	0.235E-03	0.223E-03	0.224E-03	0.225E-03
-50.	0.642E-04	0.156E-03	0.170E-03	0.182E-03	0.192E-03	0.199E-03
-100.	0.138E-04	0.444E-04	0.759E-04	0.104E-03	0.123E-03	0.139E-03

Z = 20.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.105E-04	0.352E-04	0.645E-04	0.916E-04	0.111E-03	0.128E-03
50.	0.414E-04	0.111E-03	0.138E-03	0.159E-03	0.173E-03	0.183E-03
0.	0.804E-04	0.182E-03	0.186E-03	0.194E-03	0.201E-03	0.206E-03
-50.	0.414E-04	0.111E-03	0.138E-03	0.159E-03	0.173E-03	0.183E-03
-100.	0.105E-04	0.352E-04	0.645E-04	0.916E-04	0.111E-03	0.128E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.119E-04	0.360E-04	0.552E-04	0.714E-04	0.822E-04	0.913E-04
50.	0.866E-04	0.150E-03	0.132E-03	0.128E-03	0.129E-03	0.131E-03
0.	0.526E-03	0.315E-03	0.190E-03	0.158E-03	0.151E-03	0.148E-03
-50.	0.866E-04	0.150E-03	0.132E-03	0.128E-03	0.129E-03	0.131E-03
-100.	0.119E-04	0.360E-04	0.552E-04	0.714E-04	0.822E-04	0.913E-04

Z = 5.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.114E-04	0.346E-04	0.539E-04	0.701E-04	0.810E-04	0.902E-04
50.	0.767E-04	0.141E-03	0.128E-03	0.125E-03	0.127E-03	0.129E-03
0.	0.418E-03	0.287E-03	0.183E-03	0.154E-03	0.149E-03	0.146E-03
-50.	0.767E-04	0.141E-03	0.128E-03	0.125E-03	0.127E-03	0.129E-03
-100.	0.114E-04	0.346E-04	0.539E-04	0.701E-04	0.810E-04	0.902E-04

Z = 10.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.996E-05	0.309E-04	0.500E-04	0.664E-04	0.775E-04	0.871E-04
50.	0.560E-04	0.119E-03	0.116E-03	0.118E-03	0.121E-03	0.124E-03
0.	0.224E-03	0.224E-03	0.164E-03	0.145E-03	0.142E-03	0.141E-03
-50.	0.560E-04	0.119E-03	0.116E-03	0.118E-03	0.121E-03	0.124E-03
-100.	0.996E-05	0.309E-04	0.500E-04	0.664E-04	0.775E-04	0.871E-04

Z = 15.00

Y \ X	0.	100.	200.	300.	400.	500.
100.	0.807E-05	0.259E-04	0.443E-04	0.606E-04	0.721E-04	0.822E-04
50.	0.374E-04	0.910E-04	0.989E-04	0.107E-03	0.112E-03	0.117E-03
0.	0.982E-04	0.159E-03	0.137E-03	0.130E-03	0.131E-03	0.132E-03
-50.	0.374E-04	0.910E-04	0.989E-04	0.107E-03	0.112E-03	0.117E-03
-100.	0.807E-05	0.259E-04	0.443E-04	0.606E-04	0.721E-04	0.822E-04

Z = 20.00

X

100.	200.	300.	400.	500.
0.205E-04	0.377E-04	0.535E-04	0.653E-04	0.759E-04
0.648E-04	0.804E-04	0.930E-04	0.101E-03	0.108E-03
0.106E-03	0.109E-03	0.113E-03	0.118E-03	0.121E-03
0.648E-04	0.804E-04	0.930E-04	0.101E-03	0.108E-03
0.205E-04	0.377E-04	0.535E-04	0.653E-04	0.759E-04

DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
MICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

100.	200.	300.	400.	500.
0.210E-04	0.322E-04	0.417E-04	0.480E-04	0.534E-04
0.871E-04	0.772E-04	0.745E-04	0.754E-04	0.764E-04
0.184E-03	0.111E-03	0.919E-04	0.884E-04	0.864E-04
0.871E-04	0.772E-04	0.745E-04	0.754E-04	0.764E-04
0.210E-04	0.322E-04	0.417E-04	0.480E-04	0.534E-04

Z = 5.00

X

100.	200.	300.	400.	500.
0.202E-04	0.314E-04	0.409E-04	0.473E-04	0.527E-04
0.821E-04	0.746E-04	0.730E-04	0.743E-04	0.754E-04
0.167E-03	0.107E-03	0.899E-04	0.870E-04	0.853E-04
0.821E-04	0.746E-04	0.730E-04	0.743E-04	0.754E-04
0.202E-04	0.314E-04	0.409E-04	0.473E-04	0.527E-04

Z = 10.00

X

100.	200.	300.	400.	500.
0.180E-04	0.292E-04	0.387E-04	0.453E-04	0.509E-04
0.691E-04	0.675E-04	0.687E-04	0.709E-04	0.727E-04
0.130E-03	0.953E-04	0.844E-04	0.829E-04	0.822E-04
0.691E-04	0.675E-04	0.687E-04	0.709E-04	0.727E-04
0.180E-04	0.292E-04	0.387E-04	0.453E-04	0.509E-04

Z = 15.00

X

100.	200.	300.	400.	500.
0.151E-04	0.258E-04	0.354E-04	0.421E-04	0.481E-04
0.530E-04	0.577E-04	0.622E-04	0.656E-04	0.685E-04
0.925E-04	0.798E-04	0.760E-04	0.766E-04	0.773E-04
0.530E-04	0.577E-04	0.622E-04	0.656E-04	0.685E-04
0.151E-04	0.258E-04	0.354E-04	0.421E-04	0.481E-04

Z = 20.00

X

100.	200.	300.	400.	500.
0.120E-04	0.220E-04	0.312E-04	0.381E-04	0.444E-04
0.378E-04	0.469E-04	0.542E-04	0.590E-04	0.629E-04
0.620E-04	0.633E-04	0.660E-04	0.687E-04	0.710E-04
0.378E-04	0.469E-04	0.542E-04	0.590E-04	0.629E-04
0.120E-04	0.220E-04	0.312E-04	0.381E-04	0.444E-04

DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
ICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

X

100.	200.	300.	400.	500.
0.122E-04	0.188E-04	0.243E-04	0.280E-04	0.311E-04
.508E-04	0.450E-04	0.434E-04	0.440E-04	0.445E-04
0.107E-03	0.646E-04	0.535E-04	0.515E-04	0.504E-04
0.508E-04	0.450E-04	0.434E-04	0.440E-04	0.445E-04
0.122E-04	0.188E-04	0.243E-04	0.280E-04	0.311E-04

Z = 5.00

Z = 20.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.122E-05	0.407E-05	0.746E-05	0.106E-04	0.130E-04	0.151E-04
0.	0.478E-05	0.128E-04	0.159E-04	0.184E-04	0.201E-04	0.214E-04
0.	0.929E-05	0.211E-04	0.215E-04	0.224E-04	0.234E-04	0.241E-04
0.	0.478E-05	0.128E-04	0.159E-04	0.184E-04	0.201E-04	0.214E-04
0.	0.122E-05	0.407E-05	0.746E-05	0.106E-04	0.130E-04	0.151E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.137E-05	0.415E-05	0.638E-05	0.825E-05	0.950E-05	0.106E-04
0.	0.100E-04	0.173E-04	0.153E-04	0.148E-04	0.149E-04	0.151E-04
0.	0.607E-04	0.364E-04	0.219E-04	0.182E-04	0.175E-04	0.171E-04
0.	0.100E-04	0.173E-04	0.153E-04	0.148E-04	0.149E-04	0.151E-04
0.	0.137E-05	0.415E-05	0.638E-05	0.825E-05	0.950E-05	0.106E-04

Z = 5.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.131E-05	0.400E-05	0.622E-05	0.810E-05	0.936E-05	0.105E-04
0.	0.886E-05	0.163E-04	0.148E-04	0.145E-04	0.147E-04	0.149E-04
0.	0.483E-04	0.331E-04	0.211E-04	0.178E-04	0.172E-04	0.169E-04
0.	0.886E-05	0.163E-04	0.148E-04	0.145E-04	0.147E-04	0.149E-04
0.	0.131E-05	0.400E-05	0.622E-05	0.810E-05	0.936E-05	0.105E-04

Z = 10.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.115E-05	0.357E-05	0.577E-05	0.767E-05	0.897E-05	0.101E-04
0.	0.647E-05	0.137E-04	0.134E-04	0.136E-04	0.140E-04	0.144E-04
0.	0.258E-04	0.258E-04	0.189E-04	0.167E-04	0.164E-04	0.163E-04
0.	0.647E-05	0.137E-04	0.134E-04	0.136E-04	0.140E-04	0.144E-04
0.	0.115E-05	0.357E-05	0.577E-05	0.767E-05	0.897E-05	0.101E-04

Z = 15.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.931E-06	0.299E-05	0.512E-05	0.701E-05	0.834E-05	0.953E-05
0.	0.432E-05	0.105E-04	0.114E-04	0.123E-04	0.130E-04	0.136E-04
0.	0.113E-04	0.183E-04	0.158E-04	0.151E-04	0.152E-04	0.153E-04
0.	0.432E-05	0.105E-04	0.114E-04	0.123E-04	0.130E-04	0.136E-04
0.	0.931E-06	0.299E-05	0.512E-05	0.701E-05	0.834E-05	0.953E-05

Z = 20.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.709E-06	0.237E-05	0.435E-05	0.619E-05	0.755E-05	0.879E-05
0.	0.279E-05	0.749E-05	0.929E-05	0.107E-04	0.117E-04	0.125E-04
0.	0.541E-05	0.123E-04	0.125E-04	0.131E-04	0.136E-04	0.141E-04
0.	0.279E-05	0.749E-05	0.929E-05	0.107E-04	0.117E-04	0.125E-04
0.	0.709E-06	0.237E-05	0.435E-05	0.619E-05	0.755E-05	0.879E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	100.	200.	300.	X 400.	500.
0.	0.801E-06	0.242E-05	0.372E-05	0.481E-05	0.554E-05	0.616E-05
0.	0.583E-05	0.101E-04	0.891E-05	0.860E-05	0.871E-05	0.882E-05
0.	0.354E-04	0.212E-04	0.128E-04	0.106E-04	0.102E-04	0.998E-05
0.	0.583E-05	0.101E-04	0.891E-05	0.860E-05	0.871E-05	0.882E-05
0.	0.801E-06	0.242E-05	0.372E-05	0.481E-05	0.554E-05	0.616E-05

Z = 5.00

Z = 20.00

	X = 0.	100.	200.	300.	400.	500.
	E-06	0.806E-06	0.148E-05	0.210E-05	0.257E-05	0.299E-05
	E-06	0.254E-05	0.315E-05	0.365E-05	0.397E-05	0.424E-05
	84E-05	0.417E-05	0.426E-05	0.444E-05	0.463E-05	0.478E-05
	47E-06	0.254E-05	0.315E-05	0.365E-05	0.397E-05	0.424E-05
	E-06	0.806E-06	0.148E-05	0.210E-05	0.257E-05	0.299E-05

ION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
RBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X = 0.	100.	200.	300.	400.	500.
	72E-06	0.822E-06	0.126E-05	0.163E-05	0.188E-05	0.209E-05
	E-05	0.342E-05	0.303E-05	0.292E-05	0.296E-05	0.300E-05
	E-04	0.720E-05	0.434E-05	0.360E-05	0.347E-05	0.339E-05
	E-05	0.342E-05	0.303E-05	0.292E-05	0.296E-05	0.300E-05
	72E-06	0.822E-06	0.126E-05	0.163E-05	0.188E-05	0.209E-05

Z = 5.00

	X = 0.	100.	200.	300.	400.	500.
	60E-06	0.791E-06	0.123E-05	0.160E-05	0.185E-05	0.207E-05
	E-05	0.322E-05	0.293E-05	0.286E-05	0.291E-05	0.296E-05
	E-05	0.656E-05	0.418E-05	0.353E-05	0.341E-05	0.335E-05
	E-05	0.322E-05	0.293E-05	0.286E-05	0.291E-05	0.296E-05
	E-06	0.791E-06	0.123E-05	0.160E-05	0.185E-05	0.207E-05

Z = 10.00

	X = 0.	100.	200.	300.	400.	500.
	28E-06	0.707E-06	0.114E-05	0.152E-05	0.178E-05	0.200E-05
	28E-05	0.271E-05	0.265E-05	0.269E-05	0.278E-05	0.285E-05
	E-05	0.511E-05	0.374E-05	0.331E-05	0.325E-05	0.323E-05
	E-05	0.271E-05	0.265E-05	0.269E-05	0.278E-05	0.285E-05
	E-06	0.707E-06	0.114E-05	0.152E-05	0.178E-05	0.200E-05

Z = 15.00

	X = 0.	100.	200.	300.	400.	500.
	84E-06	0.592E-06	0.101E-05	0.139E-05	0.165E-05	0.189E-05
	56E-06	0.208E-05	0.226E-05	0.244E-05	0.257E-05	0.269E-05
	E-05	0.363E-05	0.313E-05	0.298E-05	0.301E-05	0.303E-05
	E-06	0.208E-05	0.226E-05	0.244E-05	0.257E-05	0.269E-05
	E-06	0.592E-06	0.101E-05	0.139E-05	0.165E-05	0.189E-05

Z = 20.00

	X = 0.	100.	200.	300.	400.	500.
	40E-06	0.470E-06	0.861E-06	0.122E-05	0.150E-05	0.174E-05
	52E-06	0.148E-05	0.184E-05	0.213E-05	0.232E-05	0.247E-05
	E-05	0.243E-05	0.248E-05	0.259E-05	0.270E-05	0.279E-05
	E-06	0.148E-05	0.184E-05	0.213E-05	0.232E-05	0.247E-05
	E-06	0.470E-06	0.861E-06	0.122E-05	0.150E-05	0.174E-05

E SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

UTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
RBED CHEMICAL CONC. = 0.0000E+00 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X = 0.	100.	200.	300.	400.	500.
	58E-06	0.479E-06	0.736E-06	0.952E-06	0.110E-05	0.122E-05
	15E-05	0.199E-05	0.176E-05	0.170E-05	0.173E-05	0.175E-05
	0E-05	0.420E-05	0.253E-05	0.210E-05	0.202E-05	0.198E-05
	15E-05	0.199E-05	0.176E-05	0.170E-05	0.173E-05	0.175E-05

APPENDIX G

ESTIMATION OF HYPOTHETICAL INDOOR AIR CONCENTRATIONS

APPENDIX G

Estimation of Hypothetical Indoor Air Concentrations

Introduction

Indoor air concentrations were estimated for hypothetical future residences that might be built on the site if the industrial area were re-zoned, permitting residential development. These hypothetical estimates are based on the modeled emission rates of the chemicals of concern detected in the soil at the site. The surface flux measurements predicted by the model were used as input to a simple steady-state, single-compartment mixing model representing a hypothetical structure which can assumed to be typical of home construction. These homes are assumed to be built with ventilated crawl spaces.

Estimation of Hypothetical Indoor Air Concentration

The soil vapor emission rates predicted by the modeling were used to calculate estimates of the indoor air concentration using a steady-state, single compartment model, where complete, instantaneous mixing of the vapors within the structure is assumed. The model was developed for studies of radon gas entry into homes. The major difference in its application here is the assumption that there is no degradation of the chemicals occurs during the time of transport from the surface through the crawl space and into the structure.

The entry rate of the vapors per unit volume was estimated using the following equation (Nazaroff and Doyle, 1985):

$$\sigma = f \times \frac{F}{h} \qquad (1)$$

where:

s = entry rate per unit volume (kg/m^3-sec)

f = fraction of crawl space vapors transmitted to the living space

h = ratio of the interior volume to floor area of the crawl space

The fraction of soil vapors transmitted to the living space was assumed to be 0.65 as a maximum plausible case based on studies of radon transport into homes with ventilated crawl spaces.

The indoor vapor concentration was estimated using (Nazaroff and Doyle, 1985):

$$I = \frac{\sigma}{\lambda} + I_v \qquad (2)$$

where:

I = indoor air concentration (kg/m^3)

λ = ventilation rate (hr^{-1})

I_v = outdoor air concentration (kg/m^3)

The ratio of the interior volume to floor area of crawl space was assumed to be 2.45 meters, and the ventilation rate was assumed to be 1 volume per hour.

As with the modeling of the volatilization of chemicals from on-site soil into ambient outdoor air, the composition of the mineral spirits remaining in the soil was assumed to be 50% cyclohexane, and 50% nonane. This likely results in an overestimation of emission rates, as nonane and cyclohexane represent the most volatile compounds expected to be present in mineral spirits.

Hypothetical indoor air concentrations are based on a soil concentration of 75 mg/kg mineral spirits (37.5 mg/kg cyclohexane, 37.5 mg/kg nonane). The hypothetical indoor air concentrations are first calculated using the flux rates determined by the box model described in Appendix D. A linear relationship between these higher air concentrations and the concentrations expected to result from the lower soil levels following remediation is then assumed. The actual soil levels used to estimate the hypothetical indoor air concentration for each chemical are listed in Table 6. The estimates of the hypothetical indoor air concentrations are summarized in Table F-1. It should be noted that due to the simplistic nature of the model and the conservative assumptions made (i.e., the representation of cyclohexane as comprising 50% of the mineral spirits in soil), the hypothetical indoor air concentrations presented here are likely to be considerably overestimated.

References

Nazaroff, W.W.; Doyle, S.M. 1985. Radon Entry Into Houses Having a Crawl Space. Health Physics. 48(3):265–281

TABLE G-1
ESTIMATED INDOOR AIR CONCENTRATIONS OF ON-SITE CHEMICALS VOLATILIZED FROM SOIL

Chemical	Flux (mg/m^2-sec)	Fraction assumed transmitted to the living space f (unitless)	Ratio of interior volume to floor area of crawl-space h (m)	Calculated entry rate per unit volume σ (kg/m3/sec)	Assumed ventilation rate λ (1/hr)	Hypothetical indoor air concentration I (mg/m^3)
Cyclohexane	1.36×10^{-2}	0.65	2.45	3.61×10^{-9}	1	2.02959
Ethylbenzene	4.78×10^{-5}	0.65	2.45	1.27×10^{-11}	1	0.00713
Naphthalene	2.76×10^{-7}	0.65	2.45	7.32×10^{-14}	1	0.00004
Nonane	4.90×10^{-3}	0.65	2.45	1.30×10^{-9}	1	0.731
Toluene	4.11×10^{-5}	0.65	2.45	1.09×10^{-11}	1	0.00613
Xylene	1.63×10^{-5}	0.65	2.45	4.32×10^{-12}	1	0.00243