APPENDIX E-1

FINAL RISK ASSESSMENT

MotivePower
A Wabtec company

Groundwater Standards Revisions

Prepared for:

Wabtec-MotivePower Facility
4600 Apple Street
Boise, Idaho 83705

Prepared by:

The Mahfood Group LLC
1061 Waterdam Plaza Drive
Suite 201
McMurray, Pennsylvania 15317

Project No. 11027-002

December 2011

TABLE OF CONTENTS

1 Introduction 1-1
1.1 Objectives of the Groundwater Standards Revisions 1-1
2 Groundwater Standards Revisions 2-1
2.1 Maximum Contaminant Levels 2-1
2.2 Source Concentrations 2-2
2.3 Toxicity Criteria 2-3
2.4 Methodology for the Inhalation Route of Exposure 2-5
2.5 Vapor Intrusion Modeling 2-7
2.6 Revisions to the RBTLs 2-7
3 Summary 3-1
4 References 4-1

LIST OF TABLES

Table 1 Constituent Analyte List and Associated Standards
Table 2 Source Concentrations in the Areas of Concern
Table 3 Toxicity Values
Table 4 Summary of Exposure Assumptions for on On-Site Industrial Worker in Area 1
Table 5 Summary of Exposure Assumptions for on On-Site Commercial Worker in Area 2
Table 6 Summary of Exposure Assumptions for an Adult Resident in Area 3
Table 7 Summary of Exposure Assumptions for a Child Resident in Area 3
Table 8 Summary of Exposure Assumptions for a Construction Worker in Area 4
Table 9 Summary of Exposure Assumptions for an Adult Resident in Area 4
Table 10 Summary of Exposure Assumptions for a Child Resident in Area 4
Table 11 Summary of Exposure Assumptions for a Child Recreational User in the Lakewood Pond Water in Area 4
Table 12 Calculation of Permeability Constants for a Construction Worker in Area 4
Table 13 Calculation of Permeability Constants for a Child Recreational User in the Lakewood Pond Water in Area 4
Table 14 Calculation of Exposed Groundwater Volatilization Transfer Factors for a Construction Worker in Area 4
Table 15 Calculation of Risks and Hazard Indices for an On-Site Industrial Worker in Area 1
Table 16 Calculation of Risks and Hazard Indices for an On-Site Commercial Worker in Area 2
Table 17 Calculation of Risks and Hazard Indices for an Adult Resident in Area 3
Table 18 Calculation of Risks and Hazard Indices for a Child Resident in Area 3
Table 19 Calculation of Risks and Hazard Indices for a Construction Worker in Area 4
Table 20 Calculation of Risks and Hazard Indices for an Adult Resident in Area 4
Table 21 Calculation of Risks and Hazard Indices for a Child Resident in Area 4
Table 22 Calculation of Risks and Hazard Indices for a Child Recreational User in the Lakewood Pond Water in Area 4
Table 23 Risk-Based Trigger Levels in Area 1 (Derived from an On-Site Industrial Worker Exposure)
Table 24 Risk-Based Trigger Levels in Area 2 (Derived from an On-Site Commercial Worker Exposure)
Table 25 Risk-Based Trigger Levels in Area 3 (Derived from a Child Resident Exposure)
Table 26 Risk-Based Trigger Levels in Area 4 (Derived from a Construction Worker Exposure)
Table 27 Risk-Based Trigger Levels in Area 4 (Derived from a Child Resident Exposure)
Table 28 Risk-Based Trigger Levels in Area 4 (Derived from a Child Recreational User in the Lakewood Pond Water Exposure)

APPENDICES

Appendix A Calculations for the Determination of Source Concentrations
Appendix B Johnson and Etttinger Vapor Intrusion Modeling

1 Introduction

The Wabtec-MotivePower facility (Site) is located at 4600 Apple Street in Boise, Idaho. The Site currently operates under a RCRA Post-Closure Part B Permit (Permit) which is up for renewal (Permit No. IDD980976831; effective August 7, 2002). A Risk Assessment report was prepared in 2001 [RAM Group 2001] to establish groundwater standards for the Site and for downgradient areas. Since 2001, much advancement has occurred in the risk assessment process which needs to be incorporated into the groundwater standards as part of the permit renewal. This report summarizes the revisions to the groundwater standards to reflect current methodologies and accepted values.

1.1 Objectives of the Groundwater Standards Revisions

The objective of this analysis is to revise and update the groundwater standards according to updated methodologies and accepted values since 2001. The revisions include:

- Updating maximum contaminant levels (MCLs) to reflect the current accepted values;
- Updating the data sets used in the quantitative assessment (i.e., source concentrations) to reflect the most current data available;
- Revising toxicity criteria to reflect the current accepted values, which includes the addition of the mutagenic mode of action of trichloroethene (TCE);
- Updating the risk calculations for the inhalation route of exposure to reflect the revised methodology presented in RAGS Part F [2009]; and
- Updating the vapor intrusion modeling to reflect the revised parameters and algorithms contained in the Johnson and Ettinger (J&E) model [USEPA 2004a].

Other than the parameters listed above, the remaining elements of the Risk Assessment [RAM Group 2001] have been preserved including the most sensitive exposure routes and receptors for each area as well as their respective exposure parameters.

2 Groundwater Standards Revisions

There are four categories of standards that have been calculated in the risk assessement [RAM Group 2001] or presented in the Permit. The Groundwater Protection Standard (GPS) is equal to the MCL of the constituent. The Remedial Action Criteria (RAC) is a multiple of the MCL and is only presented for the areas of active remediation (Areas 1 and 3). The Contingency Criteria (CC) is also a multiple of the MCL and is only applied at monitoring well MW-38A in Area 4. Finally, the Risk-Based Threshold Limit (RBTL) is dependent on risk criteria and is most affected by the revisions outlined in the objectives. The updated standards are presented in Table 1.

2.1 Maximum Contaminant Levels

MCLs are the primary standards used to protect public health by limiting the levels of contaminants in drinking water and are legally enforceable standards. The MCLs are used as the GPSs across the Site. When an MCL is not available, which was the case for 1,1,2,2-tetrachloroethane, 1,1-dichloroethane, and chloroethane, a risk-based screening value was obtained from the Oak Ridge National Laboratory (ORNL) database which is widely accepted. The GPS is to be established at 1 x 10^{-5} for carcinogenic chemicals (Permit III.G.12) and 1.0 for noncarcinogenic chemicals as established in the risk assessment [RAM Group 2001]. Therefore, the carcinogenic screening values obtained from ORNL were adjusted by a factor of ten. The following changes were made to update the GPSs in the summary table (Table 1).

- 1,1,2,2-Tetrachloroethane was changed from 5.0 ug/L to reflect the new ORNL value of 0.66 ug/L.
- 1,1-Dichloroethane was changed from 810 ug/L to reflect the new ORNL value of 24 ug/L.
- Chloroethane was changed from 46 ug/L to reflect the new ORNL value of 21,000 ug/L.
- Chloroform was changed from 2 ug/L to reflect the new MCL of 80 ug/L.

- Xylenes were changed from 1,000 ug/L to reflect the new MCL of 10,000 ug/L.

The RACs in Areas 1 and 3 and the CCs for MW-38A in Area 4 were calculated based on the GPSs. Therefore, if the GPS value changed, the RACs and CCs were updated to reflect the change. The RACs in Area 1 were calculated to be five times the GPS except for 1,1,1-trichloroethane which was calculated to be three times the GPS as specified in the Permit (IV.E.1.b). The RACs in Area 3 were also calculated to be five times the GPS except for 1,1,1-trichloroethane. The RAC for 1,1,1-trichloroethane in Area 3 was calculated to be two times the GPS as specified in the Permit (IV.E.1.c). The CCs only apply at monitoring well MW-38A and were calculated to be two times the GPS as specified in the Permit (IV.L.5).

2.2 Updated Data Sets (Source Concentrations)

Data sets were created for Areas 1 through 4 based on the well locations presented in Table III-3 in the Permit. Only the eight most recent sampling events per well location were used in the data sets to derive the source concentrations. Using the eight most recent monitoring events represents current site conditions. For the Lakewood Pond Area, monitoring well MW-44A, which is closest to the pond area, was used to estimate concentrations at the pond. The data sets are shown in Appendix A.

The intent of determining source concentrations in groundwater in the various areas is to represent the average constituent concentrations. To account for uncertainty in the data, an upper confidence limit for the mean (UCL) is generally used for Superfund risk assessments [USEPA 1992].

Source concentrations were determined for the groundwater data sets in Areas 1 through 4 and the Lakewood Pond Area following the procedures presented in the United States Environmental Protection Agency (USEPA) ProUCL 4.1 User Guide [USEPA 2010]:

- The distribution of each constituent in each dataset was determined by running the goodness-of-fit test in ProUCL. If a constituent could be represented by a normal distribution, it was classified as following a normal distribution. If a constituent could not be represented by a normal distribution, but could be represented by a

gamma distribution, it was classified as following a gamma distribution. If a constituent could not be represented by a normal distribution or gamma distribution, but could be represented by a lognormal distribution, it was classified as following a lognormal distribution. If a constituent could not be represented by a normal distribution, gamma distribution or lognormal distribution, it was classified as nonparametric (i.e., not following any particular distribution).

- Depending on the distribution that a constituent was determined to follow, a reliable and stable UCL of the mean was calculated using ProUCL.
- The source concentrations were determined to be the lesser of the recommended UCL or the maximum detected concentration.

This procedure is appropriate in determining source concentrations in Areas 1 through 4 and at the Lakewood Pond Area. In general terms, most maximum concentrations of constituents occurred during the first half of the sampling data with decreasing or stable concentrations during the second half (most recent four rounds of groundwater sampling events). Since most trends are decreasing or stable over the last four events, the minimum of the UCL or the maximum detected concentration is a conservative representation of the source concentrations in the various areas.

Appendix A presents the calculations for the determination of the source concentrations. Table 2 presents the source concentrations by area for each constituent.

2.3 Toxicity Criteria

Toxicity criteria are revised over time as new information and scientific studies are made available. Carcinogenic effects are described by cancer slope factors (*CSFs*) and unit risk factors (*URFs*). Noncarcinogenic effects are described by Reference doses (*RfDs*) and reference concentrations (*RfCs*). The toxicity criteria for each constituent are presented in Table 3. These values were obtained utilizing USEPA's hierarchy:

- Tier 1: Integrated Risk Information System (IRIS), available through the USEPA website (http://www.epa.gov/IRIS/).

- Tier 2: Provisional Peer Reviewed Toxicity Values (PPRTVs). Information regarding the PPRTVs is available through the Risk Assessment Information System (RAIS) website (http://rais.ornl.gov).

- Tier 3: Other Toxicity Values

Tier 3 of the hierarchy includes several sources of toxicity values that are commonly consulted by the USEPA when a relevant toxicity value is not available from either IRIS or the PPRTV database. They include:

- The Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), available at http://www.atsdr.cdc.gov/mrls/index.html.

- The California Environmental Protection Agency (Cal EPA) toxicity values, available at http://www.oehha.ca.gov/risk/chemicalDB/index.asp.

- Provisional Peer Reviewed Toxicity Values (PPRTV) Screening Values from certain PPRTV assessment appendices. Information regarding the PPRTV Screening Values is available through the Risk Assessment Information System (RAIS) website (http://rais.ornl.gov).

- The EPA Superfund Health Effects Assessment Summary Tables (HEAST).

Reference doses and inhalation reference concentrations for subchronic effects are also provided in Table 3 for each constituent. These values were obtained from IRIS, PPRTV, HEAST, and the ATSDR MRLs website. If values were not available from these sources, then the reference doses and reference concentrations for chronic effects were used.

In accordance with USEPA Risk Assessment Guidance for Superfund (RAGS) Part E [USEPA 2004b], oral-to-dermal conversion factors were used to convert oral slope factors and reference doses to dermal slope factors and reference doses. Conservatively, the conversion factor used is 1.0 for each constituent.

The toxicity criteria used to calculate the groundwater standards for the Site have been revised to reflect the current accepted values from the sources listed above. The most substantial change was in the toxicity criteria of TCE. The previous values for TCE were an RfDo of 0.006 mg/kg/day, an RfCi of 0.5 mg/m^3, and a CSFo of 0.011 $(mg/kg/day)^{-1}$. The new values for TCE are an RfDo of 0.0005 mg/kg/day, an RfCi of 0.002 mg/m^3, a CSFo of 0.046 $(mg/kg/day)^{-1}$, and an inhalation unit risk (IUR) of 4.1 x 10^{-6} $(ug/m^3)^{-1}$ [ORNL 2011]. In addition, an inhalation assessment of the toxicity of cis-1,2-dichloroethene has not been established, therefore, the RBTLs that rely on the inhalation routes cannot be calculated for this constituent [ORNL 2011].

Another change in the toxicity of this assessment is that TCE is now classified as carcinogenic by a mutagenic mode of action for the induction of kidney tumors. For those exposed to TCE, it is assumed to have increased early-life susceptibility. The adjustment only applies to the kidney cancer component of the total cancer risk estimate and not to the non-Hodgkin's lymphoma (NHL) and liver cancer risks. The IUR for TCE is calculated from the IUR estimate for kidney cancer (1 x 10^{-6} $(ug/m^3)^{-1}$) with a factor of 4 applied to include NHL and liver cancer risks (4 x 10^{-6} $(ug/m^3)^{-1}$). The risks are calculated and discussed further in Section 2.6.

2.4 Methodology for the Inhalation Route of Exposure

Calculations for the inhalation route of exposure were updated to reflect current methodology presented in the Risk Assessment Guidance for Superfund (RAGS) Part F, Supplemental Guidance for Inhalation Risk Assessment published in January 2009 [USEPA 2009]. It is now compatible with the Inhalation Dosimetry Methodology [USEPA 2009] which represents the current method to derive inhalation toxicity values. RAGS Part F recommends that the concentration of the constituents in air (e.g., mg/m^3) be used as the exposure metric instead of using an inhalation intake of a constituent in air based on inhalation rate and body weight (e.g., mg/kg-day). This current methodology was used to revise the risk calculations for the inhalation pathway in the relevant areas associated with the Site.

Based on Equation 6 of RAGS Part F [USEPA 2009], the exposure concentration for estimating inhalation of volatiles is estimated using the following equation:

$$EC = \frac{CA_a * ET * EF * ED}{AT}$$

where:

EC	=	exposure concentration (ug/m^3)
CA_a	=	constituent concentration in air (ug/m^3)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (hours)

The constituent concentration in indoor air is calculated using the results of the J&E model (see Section 2.5). The constituent concentration in outdoor air for a construction worker in Area 4 is calculated using the following equation:

$$CA_a = C_{src} * TF_a$$

where:

C_{src}	=	constituent source concentration in groundwater (ug/L)
TF_a	=	transfer factor that translates the source concentration in groundwater to an air concentration (L/m^3)

Some parameters are discussed further in Sections 2.5 and 2.6. The remaining parameters were held constant from the initial risk assessment [RAM Group 2001].

2.5 Vapor Intrusion Modeling

The J&E Vapor Intrusion Model (Version 3.1) [USEPA 2004a] for vapor intrusion to indoor air has been revised in 2004. The algorithms in the model have been updated to be consistent with the Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, dated November 25, 2002. Some of the major changes incorporated in the current version include:

- Chemical property data – This information was updated to reflect the most currently accepted values.
- Assumptions and limitations – Since it is a screening model, several simplifying assumptions were updated regarding contaminant distribution and occurrence, subsurface characteristics, transport mechanisms and building construction.
- Soil parameters – A list of conservative model input parameters for selected soil types are now provided. A soil type still needs to be input based on site-specific information.

Source concentrations for the vapor intrusion constituents in groundwater were the UCLs by area discussed in Section 2.2. The selected source concentrations were used in the J&E Model to estimate the indoor air concentrations of the current buildings. The remaining parameters in the model were held constant from the previous modeling done in the risk assessment [RAM Group 2001].

The J&E modeling was revised to reflect the new source concentrations in each area and to incorporate the revisions to the parameters and algorithms contained in the model. Appendix B presents the J&E model outputs for each of the source concentrations and input parameters. It also contains the estimated indoor air concentrations.

2.6 Revisions to the RBTLs

The RBTLs are calculated based on the source concentrations, the estimated risks and hazard quotients, and the target risks and hazard quotients. The source concentrations

were discussed previously in Section 2.2 and are presented on Table 2. The target risk and hazard quotient are 1.0 x 10^{-5} and 1.0, respectively, based on Permit specifications. The individually calculated risks and hazards are discussed below.

Risks and hazard quotients were calculated in each area for the most sensitive pathways which were previously determined in the risk assessment [RAM Group 2001]. They are:

- Area 1 – inhalation of emissions from groundwater for an on-site industrial worker;
- Area 2 – inhalation of emissions from groundwater for an on-site commercial worker;
- Area 3 – inhalation of emissions from groundwater for an adult and child resident; and
- Area 4 – inhalation of emissions from groundwater for an adult and child resident, inhalation of emissions from groundwater for a construction worker, dermal contact with groundwater for a construction worker, accidental ingestion of groundwater for a construction worker, dermal contact with pond water for a child resident, and accidental ingestion of pond water for a child resident.

The accidental ingestion of groundwater for a construction worker in Area 4 was considered negligible and was not reevaluated for this analysis.

The parameters that have been updated since the initial evaluation in 2001 have been discussed in the previous sections. All other exposure parameters and receptor-specific parameters have remained constant from the initial risk assessment [RAM Group 2001].

The exposure parameters for Areas 1 through 4 are shown in Tables 4 through 11, respectively. The calculations for the permeability constants for the dermal exposure to groundwater and surface water are shown in Tables 12 and 13, respectively. The calculation of the exposed groundwater volatilization transfer factor for a construction worker in Area 4 is shown in Table 14. The risks and hazard indices calculated for Areas

1 through 4 are shown in Tables 15 through 22, respectively. The calculation of the TCE risk for a child resident in Area 3 which accounts for the mutagenic mode of action for the induction of kidney tumors is included in Table 18.

The RBTL equations use the calculated risks and hazard quotients, as well as the source concentrations, and the target risks and hazard quotients. The equation to calculate an RBTL for a noncarcinogen is as follows:

$$RBTL = \frac{C_{src} \times HQ_{target}}{HQ_{estimated}}$$

where:

C_{src}	=	constituent source concentration in groundwater derived for each area (ug/L)
HQ_{target}	=	target hazard quotient set equal to 1.0 (unitless)
$HQ_{estimated}$	=	estimated hazard quotient by area, receptor and constituent (shown on Tables 23 through 28) (unitless)

The equation to calculate an RBTL for a carcinogen is as follows:

$$RBTL = \frac{C_{src} \times Risk_{target}}{Risk_{estimated}}$$

where:

C_{src}	=	constituent source concentration in groundwater derived for each area (ug/L)
$Risk_{target}$	=	target risk set equal to 1×10^{-5} (unitless)
$Risk_{estimated}$	=	estimated risk by area, receptor and constituent (shown on Tables 23 through 28) (unitless)

The calculated RBTLs for Areas 1 through 4 are shown on Tables 23 through 28, respectively. The minimum calculated RBTL by constituent was chosen when multiple sensitive pathways exist.

3 Summary

The groundwater standards for the Site in Boise, Idaho, have been revised to reflect current risk assessment methodologies, accepted toxicological values, and current site-specific data. The revisions include the following list.

- The GPSs were revised to reflect updated MCL values. When an MCL was not available, a risk-based screening value was obtained from ORNL.
- The RACs and CCs were updated to reflect a multiple of the revised MCL / ORNL values, as specified in the Permit.
- The RBTLs were updated based on the following:
    1. The data sets used in the quantitative assessment (i.e., source concentrations) were revised to reflect the UCL of the eight most recent sampling events across each area;
    2. The toxicity criteria have been revised to reflect the current accepted values, which includes the addition of the mutagenic mode of action of TCE;
    3. The methodology for calculating the inhalation route of exposure has been revised; and
    4. The J&E vapor intrusion model has been revised and indoor air concentrations have been updated.

Other than the parameters listed above, the remaining elements of the risk assessment [RAM Group 2001] have remained constant. A summary of the revised groundwater standards is shown in Table 1.

4 References

ORNL 2011. The Risk Assessment Information System. Oak Ridge National Laboratory. http://rais.ornl.gov. Accessed November 2011.

RAM Group 2001. Risk Assessment for MotivePower Apple Street Facility (MP) in Boise, Idaho. Prepared by Risk Assessment & Management Group, Inc. December 2001.

USEPA 1989. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A). U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, EPA/540/1-89/002, December 1989.

USEPA 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. Office of Solid Waste and Emergency Response. Washington, DC. OSWER Directive No. 9285.7-081.

USEPA 1997. Exposure Factors Handbook Volume I. U.S. Environmental Protection Agency, National Center for Environmental Assessment, Office of Research and Development, August 1997.

USEPA 2004a. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. February 22, 2004.

USEPA 2004b. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July 2004.

USEPA 2009. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment). U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, EPA/540/R-070/002, OSWER 9285.7-82, January 2009.

USEPA 2010. ProUCL Version 4.1 User Guide (Draft). U.S. Environmental Protection Agency, Office of Research and Development, EPA/600/R-07/041, May 2010.

Tables

Appendices

Appendix A
Calculations for the Determination of Source Concentrations

Area 1

Area 2

Area 3

Area 4

Lakewood Pond in Area 4
(Represented by MW-44A)

Appendix B
Johnson and Ettinger Vapor Intrusion Modeling

Area 1

Area 2

Area 3

Area 4

Appendix B
Johnson and Ettinger Vapor Intrusion Modeling

Area 1

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71556	1.17E+02	1,1,1-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,874	8.91E-03	3.82E-01	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.01E-04	1.07E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	4.47E+04	0.10	9.95E+01	1.26E-02	4.00E+02	1.28E+257	6.49E-05	2.90E+00	NA	2.2E+00

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79345	1.30E+00	1,1,2,2-Tetrachloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	10,530	1.43E-04	6.15E-03	1.76E-04	1.15E-02	0.00E+00	0.00E+00	5.49E-04	1.00E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	7.99E+00	0.10	9.95E+01	1.15E-02	4.00E+02	2.78E+282	6.09E-05	4.86E-04	5.8E-05	2.1E-01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79005	1.73E+00	1,1,2-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	9,561	4.11E-04	1.76E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.36E-04	1.09E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	3.05E+01	0.10	9.95E+01	1.26E-02	4.00E+02	1.27E+257	6.56E-05	2.00E-03	1.6E-05	1.4E-02

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75343	2.96E+02	1,1-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,439	3.02E-03	1.30E-01	1.76E-04	1.20E-02	0.00E+00	0.00E+00	4.81E-04	1.02E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	3.83E+04	0.10	9.95E+01	1.20E-02	4.00E+02	1.89E+270	6.20E-05	2.38E+00	NA	5.0E-01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75354	6.39E+01	1,1-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	6,386	1.53E-02	6.57E-01	1.76E-04	1.45E-02	0.00E+00	0.00E+00	5.78E-04	1.24E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	4.20E+04	0.10	9.95E+01	1.45E-02	4.00E+02	6.72E+222	7.44E-05	3.12E+00	NA	2.0E-01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
107062	2.17E+00	1,2-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,511	4.81E-04	2.06E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	7.01E-04	1.44E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	4.48E+01	0.10	9.95E+01	1.68E-02	4.00E+02	6.75E+192	8.59E-05	3.85E-03	2.6E-05	NA

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
78875	2.18E+00	1,2-Dichloropropane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,621	1.36E-03	5.85E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.12E-04	1.08E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.27E+02	0.10	9.95E+01	1.26E-02	4.00E+02	2.82E+256	6.53E-05	8.32E-03	1.9E-05	4.0E-03

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432	1.85E+03	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,112	2.82E-03	1.21E-01	1.76E-04	1.42E-02	0.00E+00	0.00E+00	5.70E-04	1.21E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.24E+05	0.10	9.95E+01	1.42E-02	4.00E+02	7.79E+227	7.29E-05	1.63E+01	7.8E-06	3.0E-02

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75003	5.33E+00	Chloroethane (ethyl chloride)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	5,893	5.39E-03	2.31E-01	1.76E-04	4.38E-02	0.00E+00	0.00E+00	1.74E-03	3.73E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.23E+03	0.10	9.95E+01	4.38E-02	4.00E+02	1.00E+74	2.04E-04	2.51E-01	8.3E-07	1.0E+01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
67663	1.28E+00	Chloroform

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,544	1.95E-03	8.38E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	6.75E-04	1.43E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.07E+02	0.10	9.95E+01	1.68E-02	4.00E+02	6.78E+192	8.55E-05	9.17E-03	2.3E-05	NA

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156592	1.97E+01	cis-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,724	2.14E-03	9.18E-02	1.76E-04	1.19E-02	0.00E+00	0.00E+00	4.80E-04	1.02E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.81E+03	0.10	9.95E+01	1.19E-02	4.00E+02	3.01E+272	6.16E-05	1.11E-01	NA	3.5E-02

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79016	1.13E+01	Trichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,544	5.05E-03	2.17E-01	1.76E-04	1.28E-02	0.00E+00	0.00E+00	5.09E-04	1.09E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.45E+03	0.10	9.95E+01	1.28E-02	4.00E+02	7.15E+253	6.58E-05	1.61E-01	1.1E-04	4.0E-02

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
127184	1.28E+01	Tetrachloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	9,543	8.30E-03	3.56E-01	1.76E-04	1.16E-02	0.00E+00	0.00E+00	4.63E-04	9.92E-03	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	4.56E+03	0.10	9.95E+01	1.16E-02	4.00E+02	3.42E+278	6.01E-05	2.74E-01	5.9E-06	6.0E-01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156605	3.08E+01	trans-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,126	5.17E-03	2.22E-01	1.76E-04	1.14E-02	0.00E+00	0.00E+00	4.57E-04	9.75E-03	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.83E+03	0.10	9.95E+01	1.14E-02	4.00E+02	4.53E+283	5.91E-05	4.04E-01	NA	7.0E-02

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75014	3.86E+00	Vinyl chloride (chloroethene)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	4,989	1.78E-02	7.63E-01	1.76E-04	1.71E-02	0.00E+00	0.00E+00	6.80E-04	1.46E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.94E+03	0.10	9.95E+01	1.71E-02	4.00E+02	1.56E+189	8.69E-05	2.56E-01	8.8E-06	1.0E-01

END

Area 1

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
1330207	3.51E+02	Xylenes, Total

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2389.6	2389.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.38	0.25	0.23	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 1

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2374.6	0.321	0.020	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	10,480	2.17E-03	9.29E-02	1.76E-04	1.37E-02	0.00E+00	0.00E+00	5.50E-04	1.17E-02	2374.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	3.26E+04	0.10	9.95E+01	1.37E-02	4.00E+02	5.89E+236	7.04E-05	2.29E+00	NA	NA

END

Area 2

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71556	5.69E+01	1,1,1-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,874	8.91E-03	3.82E-01	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.01E-04	1.07E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.17E+04	0.10	9.95E+01	1.26E-02	4.00E+02	1.28E+257	6.62E-05	1.44E+00	NA	2.2E+00

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79345	5.00E-01	1,1,2,2-Tetrachloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	10,530	1.43E-04	6.15E-03	1.76E-04	1.15E-02	0.00E+00	0.00E+00	5.49E-04	1.00E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	3.07E+00	0.10	9.95E+01	1.15E-02	4.00E+02	2.78E+282	6.21E-05	1.91E-04	5.8E-05	2.1E-01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79005	1.30E+00	1,1,2-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	9,561	4.11E-04	1.76E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.36E-04	1.08E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.30E+01	0.10	9.95E+01	1.26E-02	4.00E+02	1.27E+257	6.68E-05	1.54E-03	1.6E-05	1.4E-02

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75343	2.22E+02	1,1-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,439	3.02E-03	1.30E-01	1.76E-04	1.20E-02	0.00E+00	0.00E+00	4.81E-04	1.02E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.88E+04	0.10	9.95E+01	1.20E-02	4.00E+02	1.89E+270	6.32E-05	1.82E+00	NA	5.0E-01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75354	9.86E+01	1,1-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	6,386	1.53E-02	6.57E-01	1.76E-04	1.45E-02	0.00E+00	0.00E+00	5.78E-04	1.24E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.47E+04	0.10	9.95E+01	1.45E-02	4.00E+02	6.72E+222	7.58E-05	4.91E+00	NA	2.0E-01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
107062	1.96E+00	1,2-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,511	4.81E-04	2.06E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	7.01E-04	1.44E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	4.04E+01	0.10	9.95E+01	1.68E-02	4.00E+02	6.75E+192	8.76E-05	3.54E-03	2.6E-05	NA

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
78875	1.10E+00	1,2-Dichloropropane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,621	1.36E-03	5.85E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.12E-04	1.08E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.43E+01	0.10	9.95E+01	1.26E-02	4.00E+02	2.82E+256	6.65E-05	4.28E-03	1.9E-05	4.0E-03

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432	5.00E-01	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,112	2.82E-03	1.21E-01	1.76E-04	1.42E-02	0.00E+00	0.00E+00	5.70E-04	1.21E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.05E+01	0.10	9.95E+01	1.42E-02	4.00E+02	7.79E+227	7.43E-05	4.49E-03	7.8E-06	3.0E-02

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75003	5.72E+00	Chloroethane (ethyl chloride)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	5,893	5.39E-03	2.31E-01	1.76E-04	4.38E-02	0.00E+00	0.00E+00	1.74E-03	3.72E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.32E+03	0.10	9.95E+01	4.38E-02	4.00E+02	1.00E+74	2.07E-04	2.74E-01	8.3E-07	1.0E+01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
67663	1.20E+00	Chloroform

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,544	1.95E-03	8.38E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	6.75E-04	1.43E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.01E+02	0.10	9.95E+01	1.68E-02	4.00E+02	6.78E+192	8.71E-05	8.76E-03	2.3E-05	NA

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156592	1.78E+00	cis-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,724	2.14E-03	9.18E-02	1.76E-04	1.19E-02	0.00E+00	0.00E+00	4.80E-04	1.01E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.63E+02	0.10	9.95E+01	1.19E-02	4.00E+02	3.01E+272	6.27E-05	1.03E-02	NA	3.5E-02

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79016	8.84E+00	Trichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	8,544	5.05E-03	2.17E-01	1.76E-04	1.28E-02	0.00E+00	0.00E+00	5.09E-04	1.09E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.91E+03	0.10	9.95E+01	1.28E-02	4.00E+02	7.15E+253	6.70E-05	1.28E-01	1.1E-04	4.0E-02

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
127184	7.35E+00	Tetrachloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	9,543	8.30E-03	3.56E-01	1.76E-04	1.16E-02	0.00E+00	0.00E+00	4.63E-04	9.89E-03	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.62E+03	0.10	9.95E+01	1.16E-02	4.00E+02	3.42E+278	6.13E-05	1.60E-01	5.9E-06	6.0E-01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156605	5.00E-01	trans-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	7,126	5.17E-03	2.22E-01	1.76E-04	1.14E-02	0.00E+00	0.00E+00	4.57E-04	9.71E-03	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.11E+02	0.10	9.95E+01	1.14E-02	4.00E+02	4.53E+283	6.03E-05	6.69E-03	NA	7.0E-02

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75014	3.26E+00	Vinyl chloride (chloroethene)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	4,989	1.78E-02	7.63E-01	1.76E-04	1.71E-02	0.00E+00	0.00E+00	6.80E-04	1.45E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	2.49E+03	0.10	9.95E+01	1.71E-02	4.00E+02	1.56E+189	8.85E-05	2.20E-01	8.8E-06	1.0E-01

END

Area 2

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
1330207	1.36E+00	Xylenes, Total

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	15	2334.7	2334.7	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
30	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	9	9	250	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 2

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
2.84E+08	2319.7	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.00E+06	4.00E-04	15	10,480	2.17E-03	9.29E-02	1.76E-04	1.37E-02	0.00E+00	0.00E+00	5.50E-04	1.16E-02	2319.7

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	1.26E+02	0.10	9.95E+01	1.37E-02	4.00E+02	5.89E+236	7.17E-05	9.06E-03	NA	NA

END

Area 3

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71556	1.69E+01	1,1,1-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,874	8.91E-03	3.82E-01	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.01E-04	9.01E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	6.46E+03	0.10	6.84E+01	1.26E-02	4.00E+02	2.21E+147	1.92E-04	1.24E+00	NA	2.2E+00

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79345	5.00E-01	1,1,2,2-Tetrachloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	10,530	1.43E-04	6.15E-03	1.76E-04	1.15E-02	0.00E+00	0.00E+00	5.49E-04	8.64E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	3.07E+00	0.10	6.84E+01	1.15E-02	4.00E+02	7.30E+161	1.85E-04	5.70E-04	5.8E-05	2.1E-01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79005	5.00E-01	1,1,2-Trichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	9,561	4.11E-04	1.76E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.36E-04	9.19E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	8.82E+00	0.10	6.84E+01	1.26E-02	4.00E+02	2.19E+147	1.95E-04	1.72E-03	1.6E-05	1.4E-02

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75343	5.29E+01	1,1-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,439	3.02E-03	1.30E-01	1.76E-04	1.20E-02	0.00E+00	0.00E+00	4.81E-04	8.60E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	6.85E+03	0.10	6.84E+01	1.20E-02	4.00E+02	7.75E+154	1.85E-04	1.26E+00	NA	5.0E-01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75354	3.36E+01	1,1-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	6,386	1.53E-02	6.57E-01	1.76E-04	1.45E-02	0.00E+00	0.00E+00	5.78E-04	1.04E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	2.21E+04	0.10	6.84E+01	1.45E-02	4.00E+02	4.99E+127	2.15E-04	4.74E+00	NA	2.0E-01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
107062	1.16E+00	1,2-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	8,511	4.81E-04	2.06E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	7.01E-04	1.22E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	2.39E+01	0.10	6.84E+01	1.68E-02	4.00E+02	3.21E+110	2.43E-04	5.83E-03	2.6E-05	NA

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
78875	5.00E-01	1,2-Dichloropropane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	8,621	1.36E-03	5.85E-02	1.76E-04	1.26E-02	0.00E+00	0.00E+00	5.12E-04	9.08E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	2.92E+01	0.10	6.84E+01	1.26E-02	4.00E+02	9.25E+146	1.93E-04	5.65E-03	1.9E-05	4.0E-03

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432	2.77E+00	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	8,112	2.82E-03	1.21E-01	1.76E-04	1.42E-02	0.00E+00	0.00E+00	5.70E-04	1.02E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	3.35E+02	0.10	6.84E+01	1.42E-02	4.00E+02	3.98E+130	2.12E-04	7.09E-02	7.8E-06	3.0E-02

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75003	3.56E+01	Chloroethane (ethyl chloride)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	5,893	5.39E-03	2.31E-01	1.76E-04	4.38E-02	0.00E+00	0.00E+00	1.74E-03	3.13E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	8.23E+03	0.10	6.84E+01	4.38E-02	4.00E+02	2.56E+42	4.56E-04	3.75E+00	8.3E-07	1.0E+01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
67663	1.83E+00	Chloroform

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,544	1.95E-03	8.38E-02	1.76E-04	1.68E-02	0.00E+00	0.00E+00	6.75E-04	1.20E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	1.53E+02	0.10	6.84E+01	1.68E-02	4.00E+02	3.22E+110	2.41E-04	3.70E-02	2.3E-05	NA

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156592	2.80E+00	cis-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,724	2.14E-03	9.18E-02	1.76E-04	1.19E-02	0.00E+00	0.00E+00	4.80E-04	8.54E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	2.57E+02	0.10	6.84E+01	1.19E-02	4.00E+02	1.42E+156	1.84E-04	4.72E-02	NA	3.5E-02

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79016	4.27E+00	Trichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	8,544	5.05E-03	2.17E-01	1.76E-04	1.28E-02	0.00E+00	0.00E+00	5.09E-04	9.13E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	9.25E+02	0.10	6.84E+01	1.28E-02	4.00E+02	3.01E+145	1.94E-04	1.79E-01	1.1E-04	4.0E-02

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
127184	4.05E+00	Tetrachloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	9,543	8.30E-03	3.56E-01	1.76E-04	1.16E-02	0.00E+00	0.00E+00	4.63E-04	8.32E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	1.44E+03	0.10	6.84E+01	1.16E-02	4.00E+02	4.19E+159	1.80E-04	2.59E-01	5.9E-06	6.0E-01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
156605	5.00E-01	trans-1,2-Dichloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,126	5.17E-03	2.22E-01	1.76E-04	1.14E-02	0.00E+00	0.00E+00	4.57E-04	8.18E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	1.11E+02	0.10	6.84E+01	1.14E-02	4.00E+02	3.61E+162	1.77E-04	1.97E-02	NA	7.0E-02

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75014	6.36E+00	Vinyl chloride (chloroethene)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	4,989	1.78E-02	7.63E-01	1.76E-04	1.71E-02	0.00E+00	0.00E+00	6.80E-04	1.22E-02	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	4.85E+03	0.10	6.84E+01	1.71E-02	4.00E+02	2.65E+108	2.44E-04	1.18E+00	8.8E-06	1.0E-01

END

Area 3

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
1330207	1.70E+00	Xylenes, Total

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	1231.4	1231.4	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 3

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	1031.4	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	10,480	2.17E-03	9.29E-02	1.76E-04	1.37E-02	0.00E+00	0.00E+00	5.50E-04	9.82E-03	1031.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	1.58E+02	0.10	6.84E+01	1.37E-02	4.00E+02	4.88E+135	2.06E-04	3.25E-02	NA	NA

END

Area 4

Area 4

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79345	5.00E-01	1,1,2,2-Tetrachloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	410.6	410.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 4

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	210.6	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	10,530	1.43E-04	6.15E-03	1.76E-04	1.15E-02	0.00E+00	0.00E+00	5.49E-04	4.40E-03	210.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	3.07E+00	0.10	6.84E+01	1.15E-02	4.00E+02	7.30E+161	3.64E-04	1.12E-03	5.8E-05	2.1E-01

END

Area 4

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75343	2.68E+00	1,1-Dichloroethane

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	410.6	410.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 4

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	210.6	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	7,439	3.02E-03	1.30E-01	1.76E-04	1.20E-02	0.00E+00	0.00E+00	4.81E-04	4.08E-03	210.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	3.46E+02	0.10	6.84E+01	1.20E-02	4.00E+02	7.75E+154	3.47E-04	1.20E-01	NA	5.0E-01

END

Area 4

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75003	5.00E-01	Chloroethane (ethyl chloride)

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
11	200	410.6	410.6	0	0	A	S	S		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
25	40	1000	1000	300	0.1	0.8	

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-05	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Area 4

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	210.6	0.321	0.321	0.244	0.003	9.94E-08	0.998	9.92E-08	17.05	0.375	0.122	0.253	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.67E+04	1.80E+06	2.22E-04	200	5,893	5.39E-03	2.31E-01	1.76E-04	4.38E-02	0.00E+00	0.00E+00	1.74E-03	1.48E-02	210.6

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
200	1.16E+02	0.10	6.84E+01	4.38E-02	4.00E+02	2.56E+42	6.66E-04	7.70E-02	8.3E-07	1.0E+01

END

Appendix A
Calculations for the Determination of Source Concentrations

Area 1

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1,2-Trichloroethane	d_1,1,2-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	1,2-Dichloroethane	d_1,2-Dichloroethane
306	1	3.14	1	351	1	95.7	1	1.96	1
290	1	3.76	1	358	1	81.4	1	1.7	1
238	1	3.65	1	338	1	82.6	1	2.13	1
166	1	2.94	1	247	1	62.8	1	1.32	1
167	1	2.48	1	258	1	63.6	1	1	0
194	1	2.79	1	304	1	69.2	1	1.67	1
129	1	2.67	1	249	1	58.3	1	1.74	1
137	1	2.61	1	248	1	60.6	1	1.41	1
291	1	1.73	1	350	1	145	1	4.2	1
225	1	2.37	1	396	1	135	1	5.26	1
238	1	1.38	1	531	1	145	1	5.95	1
297	1	1.54	1	417	1	52.4	1	4.31	1
256	1	1.24	1	380	1	83.8	1	1	0
220	1	1.46	1	453	1	117	1	3.77	1
158	1	1.59	1	573	1	120	1	3.64	1
195	1	1.94	1	537	1	117	1	4.05	1
358	1	3.89	1	988	1	370	1	11.9	1
422	1	3.85	1	1090	1	368	1	10.4	1
288	1	10	0	975	1	238	1	10	0
217	1	2.2	1	870	1	165	1	1	0
315	1	2.65	1	898	1	58.9	1	7.38	1
510	1	2.87	1	1020	1	52.5	1	7.01	1
396	1	3.35	1	1100	1	17.6	1	7.45	1
324	1	10	0	940	1	10	0	10	0
17	1	1	0	8.34	1	26.8	1	1	0
14.6	1	1	0	6.95	1	17.7	1	1	0
18.9	1	1	0	7.95	1	28.4	1	1	0
16.4	1	1	0	6.56	1	18.8	1	1	0
4.28	1	1	0	4.38	1	6.28	1	1	0
5.77	1	1	0	9.85	1	11.6	1	1	0
21.5	1	1	0	9.81	1	15	1	1	0
43.2	1	1	0	20.1	1	24	1	1	0
44.4	1	1	0	28.4	1	47.7	1	1	0
40.8	1	1	0	28	1	42.6	1	1	0
37	1	1	0	22.4	1	38.3	1	1	0
46.4	1	1	0	29.4	1	44.2	1	1	0
46.5	1	1	0	29.6	1	40.4	1	1	0
32.5	1	1	0	22.4	1	36.9	1	1	0
32.8	1	1	0	22.2	1	29.3	1	1	0
58	1	1	0	43.5	1	45.2	1	1	0
2.23	1	1	0	1.24	1	1	0	1	0

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1,2-Trichloroethane	d_1,1,2-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	1,2-Dichloroethane	d_1,2-Dichloroethane
12	1	1	0	3.47	1	11.1	1	1	0
12.3	1	1	0	5.23	1	7.49	1	1	0
8.07	1	1	0	13	1	9.61	1	1	0
41	1	1	0	9.87	1	24.5	1	1	0
44.6	1	1	0	9.91	1	25.4	1	1	0
45.1	1	1	0	17.2	1	21.4	1	1	0
83.6	1	1	0	19	1	27.1	1	1	0
1	0	1	0	1	0	1	0	2.21	1
1	0	1	0	1	0	1	0	1	0
1.2	1	1	0	1	0	1.67	1	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1.16	1	1	0
1	0	1	0	1	0	1.36	1	1	0
8.46	1	1	0	5.8	1	23.8	1	1	0
13.4	1	1	0	9.45	1	26.4	1	1	0
16.2	1	1	0	8.96	1	33.4	1	1	0
57.5	1	1	0	21.8	1	41.4	1	1	0
58.2	1	1	0	18.8	1	47.1	1	1	0
72.5	1	1	0	28	1	47.9	1	1	0
77.2	1	1	0	32.2	1	42.2	1	1	0
131	1	1	0	77	1	51.1	1	1	0
5.58	1	1	0	42.7	1	19.9	1	1	0
5.59	1	1	0	43.4	1	19.4	1	1	0
6.46	1	1	0	45.6	1	20.1	1	1	0
5.9	1	1	0	41.2	1	19.6	1	1	0
5.67	1	1	0	39.4	1	21.2	1	1	0
5.06	1	1	0	44.7	1	19.5	1	1	0
5.35	1	1	0	48.6	1	24.7	1	1	0
4.08	1	1	0	39	1	15.1	1	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1,2-Trichloroethane	d_1,1,2-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	1,2-Dichloroethane	d_1,2-Dichloroethane
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
11.6	1	1	0	12.7	1	18.7	1	1	0
11.9	1	1	0	9.52	1	18	1	1	0
12.3	1	1	0	11.2	1	20.1	1	1	0
11.5	1	1	0	12.2	1	18.2	1	1	0
13.5	1	1	0	8.77	1	19.4	1	1	0
14.5	1	1	0	11.3	1	21.6	1	1	0
13.3	1	1	0	8.77	1	18.8	1	1	0
14.8	1	1	0	15.8	1	28.9	1	1	0
35.2	1	1	0	59.9	1	60.2	1	1	0
1	0	1	0	11.6	1	3.78	1	1	0
1	0	1	0	51.9	1	23.7	1	1	0
1	0	1	0	12.1	1	16.8	1	1	0
1	0	1	0	5.01	1	1	0	1	0
1	0	1	0	2.53	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	6.57	1	1	0	1	0
26.9	1	1	0	21.6	1	33.6	1	1	0
26.6	1	1	0	16.3	1	36.1	1	1	0
21.9	1	1	0	21.7	1	34.4	1	1	0
17.4	1	1	0	14.2	1	29.4	1	1	0
17.2	1	1	0	14.7	1	25	1	1	0
15.8	1	1	0	12.8	1	31.3	1	1	0
15	1	1	0	16.8	1	34.5	1	1	0
14.6	1	1	0	14.2	1	30.4	1	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0

1,2-Dichloropropane	d_1,2-Dichloropropane	Chloroethane	d_Chloroethan	Chloroform	d_Chloroforn	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene	Tetrachloroethene	d_Tetrachloroethene
2.02	1	1	0	1	0	42.4	1	30.9	1
2.4	1	1	0	1	0	44.1	1	22.7	1
2.75	1	1	0	1	0	51.1	1	20.1	1
1.66	1	1	0	1	0	35.8	1	17.9	1
1	0	1	0	1	0	32.6	1	17.2	1
2.17	1	1	0	1	0	40.3	1	19.7	1
1.95	1	1	0	1	0	30.4	1	16.4	1
1.96	1	1	0	1	0	31.8	1	16.3	1
1.55	1	1	0	1	0	28.5	1	28.8	1
2.16	1	27.2	1	1	0	15.2	1	19	1
2.18	1	8.95	1	1	0	11.4	1	23.3	1
1	0	1	0	1	0	8.89	1	25.6	1
1	0	1	0	1	0	9.78	1	18.4	1
2.03	1	1	0	1	0	14.6	1	25.7	1
2.4	1	1	0	1	0	20.9	1	20.9	1
2.85	1	1	0	1	0	24.1	1	26.8	1
5.42	1	1.98	1	1.27	1	21.3	1	25.9	1
5.62	1	2.4	1	1.57	1	20.6	1	22.4	1
10	0	35	1	10	0	23.9	1	10	0
4.34	1	1	0	1	0	22.9	1	5.21	1
1	0	1	0	1	0	13	1	10.5	1
5.93	1	4.48	1	1.33	1	10.9	1	22	1
6.3	1	2.96	1	1.22	1	5.5	1	23.5	1
10	0	10	0	10	0	10	0	27.2	1
1	0	1	0	1	0	1	0	6.02	1
1	0	1	0	1	0	1	0	4.16	1
1	0	1	0	1	0	1	0	5.47	1
1	0	1	0	1	0	1	0	4.12	1
1	0	1	0	1	0	1	0	2.15	1
1	0	1	0	1	0	1	0	6.54	1
1	0	1	0	1	0	1	0	5.63	1
1	0	1	0	1	0	1	0	11.9	1
1	0	1	0	1	0	1	0	15.5	1
1	0	1	0	1	0	1	0	13	1
1	0	1	0	1	0	1	0	14.8	1
1	0	1	0	1	0	1.02	1	16.8	1
1	0	1	0	1	0	1.38	1	15.9	1
1	0	1	0	1	0	1	0	13.5	1
1	0	1	0	1.32	1	1.51	1	14.5	1
1	0	1	0	1	0	4.52	1	27.1	1
1	0	1	0	1	0	1	0	1	0

1,2-Dichloropropane	d_1,2-Dichloropropane	Chloroethane	d_Chloroethan	Chloroform	d_Chloroforn	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene	Tetrachloroethene	d_Tetrachloroethene
1	0	1	0	1	0	1	0	1.77	1
1	0	1	0	1	0	1	0	1.85	1
1	0	1	0	1	0	1	0	2.59	1
1	0	1	0	1	0	1	0	4.11	1
1	0	1	0	1	0	1	0	5.84	1
1	0	1	0	1	0	1	0	5.12	1
1	0	1	0	1	0	1	0	7.52	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	6.15	1
1	0	1	0	1	0	1	0	7.13	1
1	0	1	0	1	0	1	0	8.52	1
1	0	1	0	1	0	1	0	12.2	1
1	0	1	0	1	0	1	0	15.6	1
1	0	1	0	1	0	1.15	1	24.8	1
1	0	1	0	1	0	1.84	1	26.5	1
1	0	1	0	1.01	1	7.02	1	43.7	1
1	0	1	0	1	0	75.4	1	29.3	1
1	0	1	0	1	0	74.8	1	23.8	1
1	0	1	0	1	0	79.8	1	24.3	1
1	0	1	0	1	0	74.6	1	24.8	1
1	0	1	0	1	0	70.4	1	23.4	1
1	0	1	0	1	0	77.1	1	23	1
1	0	1	0	1	0	71.9	1	24.2	1
1	0	1	0	1	0	64.7	1	23.2	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0

1,2-Dichloropropane	d_1,2-Dichloropropane	Chloroethane	d_Chloroethan	Chloroform	d_Chloroforn	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene	Tetrachloroethene	d_Tetrachloroethene
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1.46	1	3.99	1
1	0	1	0	1	0	1.39	1	3.83	1
1	0	1	0	1	0	1.77	1	4.23	1
1	0	1	0	1	0	1.67	1	3.47	1
1	0	1	0	1	0	1.55	1	4.42	1
1	0	1	0	1	0	1.79	1	5.01	1
1	0	1	0	1	0	1.51	1	5.01	1
1	0	1	0	1	0	1.99	1	6.06	1
1	0	1	0	1	0	1.88	1	12.7	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1.35	1	1	0
1	0	34.2	1	1	0	1	0	2.4	1
1	0	20.9	1	1	0	1	0	1.55	1
1	0	18.4	1	1	0	1	0	1.22	1
1	0	16.3	1	1	0	1	0	1	0
1	0	33.4	1	1	0	1	0	1.32	1
1	0	1	0	1	0	2.01	1	14.5	1
1	0	1	0	1	0	1.33	1	13.5	1
1	0	1	0	1	0	1.85	1	18.6	1
1	0	1	0	1	0	1.09	1	11.3	1
1	0	1	0	1	0	1.08	1	10.7	1
1	0	1	0	1	0	1	0	14	1
1	0	1	0	1	0	1.02	1	12.3	1
1	0	1	0	1	0	1	0	13.2	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0

trans-1,2-Dichloroethene	d_trans-1,2-Dichloroethene	Trichloroethene	d_Trichloroethene	Vinyl Chloride	d_Vinyl Chloride
1	0	28.3	1	1	0
1	0	23	1	1	0
1	0	30.4	1	1	0
1	0	19	1	1	0
1	0	19.3	1	1	0
1	0	21.6	1	1	0
1	0	18.4	1	1	0
1	0	17	1	1.2	1
1	0	17.9	1	1	0
1	0	16.2	1	1	0
1	0	22.2	1	1.2	1
1	0	19.9	1	1	0
1	0	18.9	1	1	0
30.8	1	24.1	1	1	0
1	0	24.1	1	1	0
1	0	27.3	1	3.24	1
1	0	44.3	1	1	0
1	0	43.4	1	1	0
10	0	35.2	1	10	0
1	0	35.8	1	16.9	1
1	0	28.7	1	41.2	1
1	0	24.3	1	42.8	1
1	0	15.3	1	51.2	1
10	0	10	0	10	0
1	0	1.36	1	1	0
1	0	1	0	1	0
1	0	1.12	1	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.88	1	1	0
1	0	3.35	1	1.38	1
1	0	4.9	1	1	0
1	0	3.79	1	1	0
1	0	4.43	1	1	0
1	0	5.49	1	1	0
1	0	6.02	1	1	0
1	0	4.06	1	1	0
1	0	4.92	1	1	0
1	0	9.51	1	1	0
1	0	1	0	1	0

trans-1,2-Dichloroethene	d_trans-1,2-Dichloroethene	Trichloroethene	d_Trichloroethen	Vinyl Chloride	d_Vinyl Chloride
1	0	1	0	1.06	1
1	0	1	0	1.02	1
1	0	1	0	1	0
1	0	1	0	1.95	1
1	0	2.18	1	1	0
1	0	1	0	2.45	1
1	0	1	0	3.28	1
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.32	1	1	0
1	0	1.92	1	1	0
1	0	3.92	1	1	0
1	0	4.43	1	1	0
1	0	7.51	1	1	0
1	0	9.44	1	1	0
1	0	17.5	1	1	0
1	0	6.84	1	1	0
1	0	5.99	1	1	0
1	0	7.66	1	1	0
1	0	6.53	1	1	0
1	0	6.94	1	1	0
1	0	6.73	1	1	0
1	0	6.86	1	1	0
1	0	7.38	1	1	0
1	0	1	0	1	0
1	0	1	0	1	0

trans-1,2-Dichloroethene	d_trans-1,2-Dichloroethene	Trichloroethene	d_Trichloroethene	Vinyl Chloride	d_Vinyl Chloride
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.52	1	1	0
1	0	1.61	1	1	0
1	0	2.12	1	1	0
1	0	1.43	1	1	0
1	0	2.18	1	1	0
1	0	2.27	1	1	0
1	0	2.31	1	1	0
1	0	2.83	1	1	0
1	0	2.5	1	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.58	1	2.66	1
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.26	1	1	0
1	0	1.31	1	1	0
1	0	1.48	1	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1.01	1	1	0
1	0	1.01	1	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0
1	0	1	0	1	0

Area 1 Groundwater Raw Statistics
MP Facility
Boise, Idaho

From File: Area 1 - 8 events.wst

Summary Statistics for Raw Data Sets with NDs using Detected Data Only

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum (ug/l)	Mean	Median	SD	MAD/0.675	Skewness	CV
1,1,1-Trichloroethane	82	30	26.79%	1.2	510	95.6	34	121.8	38.15	1.448	1.274
1,1,2-Trichloroethane	22	90	80.36%	1.24	3.89	2.55	2.63	0.843	1.045	0.0565	0.33
1,1-Dichloroethane	87	25	22.32%	1.24	1100	174.4	22.4	297.7	23.48	1.978	1.707
1,1-Dichloroethene	85	27	24.11%	1.16	370	51.28	29.4	64.1	18.68	3.409	1.25
1,2-Dichloroethane	20	92	82.14%	1.32	11.9	4.473	3.91	3.057	3.121	1.072	0.683
1,2-Dichloropropane	18	94	83.93%	1.55	6.3	3.094	2.29	1.621	0.593	1.107	0.524
Chloroethane	12	100	89.29%	1.98	35	17.18	17.35	13.03	20.21	0.182	0.758
Chloroform	6	106	94.64%	1.01	1.57	1.287	1.295	0.181	0.0815	0.0696	0.141
cis-1,2-Dichloroethene	54	58	51.79%	1.02	79.8	22.07	11.15	25.48	14.54	1.145	1.154
Tetrachloroethene	83	29	25.89%	1.22	43.7	14.41	14	9.248	12.9	0.403	0.642
trans-1,2-Dichloroethene	1	111	99.11%	30.8	30.8	30.8	30.8	N/A	0	N/A	N/A
Trichloroethene	66	46	41.07%	1.01	44.3	11.44	6.63	11.37	7.606	1.147	0.994
Vinyl Chloride	14	98	87.50%	1.02	51.2	12.25	2.555	18.35	2.009	1.462	1.498

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 1 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	0.95

1,1,1-Trichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	82	30	26.79%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	30	1	1	1	1	0
Statistics (Detects Only)	82	1.2	510	95.6	34	121.8
Statistics (All: NDs treated as DL value)	112	1	510	70.26	14.7	112.2
Statistics (All: NDs treated as DL/2 value)	112	0.5	510	70.13	14.7	112.3
Statistics (Normal ROS Estimated Data)	112	-365.8	510	23.28	14.7	163.4
Statistics (Gamma ROS Estimated Data)	112	0.000001	510	69.99	14.7	112.4
Statistics (Lognormal ROS Estimated Data)	112	0.115	510	70.46	14.7	112.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.654	0.643	146.1	3.628	1.475	0.406
Statistics (NDs = DL)	0.411	0.406	171.1	2.656	2.047	0.771
Statistics (NDs = DL/2)	0.374	0.37	187.6	2.47	2.298	0.93
Statistics (Gamma ROS Estimates)	0.146	0.148	480	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.72	2.022	0.743

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.868	0.816	0.817	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.279	0.0978	Data Not Normal
Lilliefors (NDs = DL)	0.307	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.307	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.178	0.0837	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.968	0.965	0.895

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.809	0.803	
Kolmogorov-Smirnov (Detects Only)	0.157	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.019	0.841	
Kolmogorov-Smirnov (NDs = DL)	0.143	0.0924	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.277	0.85	
Kolmogorov-Smirnov (NDs = DL/2)	0.145	0.0928	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.948	0.976	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.248	0.0979	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.955	0.951	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.114	0.0978	Data Not Lognormal
Lilliefors (NDs = DL)	0.171	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.184	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0783	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,1,2-Trichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	22	90	80.36%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	90	1	10	1.2	1	1.334
Statistics (Detects Only)	22	1.24	3.89	2.55	2.63	0.843
Statistics (All: NDs treated as DL value)	112	1	10	1.465	1	1.361
Statistics (All: NDs treated as DL/2 value)	112	0.5	5	0.983	0.5	1.047
Statistics (Normal ROS Estimated Data)	112	-4.766	3.89	-0.137	-0.146	1.892
Statistics (Gamma ROS Estimated Data)	112	0.000001	3.89	0.528	0.000001	1.077
Statistics (Lognormal ROS Estimated Data)	112	0.127	3.89	1.085	0.814	0.879

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.901	8.669	0.286	0.879	0.356	0.405
Statistics (NDs = DL)	3.129	3.051	0.468	0.214	0.476	2.226
Statistics (NDs = DL/2)	1.68	1.641	0.585	-0.343	0.697	-2.03
Statistics (Gamma ROS Estimates)	0.0862	0.0898	6.128	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.202	0.762	-3.777

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.982	0.61	0.728	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.947	0.911	Data Appear Normal
Lilliefors (Detects Only)	0.108	0.189	Data Appear Normal
Lilliefors (NDs = DL)	0.419	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.463	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0339	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.971	0.758	0.889	0.797

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.423	0.744	
Kolmogorov-Smirnov (Detects Only)	0.117	0.185	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	24.77	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.456	0.0869	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	25.72	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.483	0.0878	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	23.79	1.387	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.478	0.109	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.718	0.74	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.936	0.911	Data Appear Lognormal
Lilliefors (Detects Only)	0.135	0.189	Data Appear Lognormal
Lilliefors (NDs = DL)	0.459	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.478	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0438	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,1-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	87	25	22.32%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	1	1	1	1	0
Statistics (Detects Only)	87	1.24	1100	174.4	22.4	297.7
Statistics (All: NDs treated as DL value)	112	1	1100	135.7	14.45	271.9
Statistics (All: NDs treated as DL/2 value)	112	0.5	1100	135.5	14.45	271.9
Statistics (Normal ROS Estimated Data)	112	-798.6	1100	41.17	14.45	368.6
Statistics (Gamma ROS Estimated Data)	112	0.000001	1100	135.4	14.45	272
Statistics (Lognormal ROS Estimated Data)	112	0.065	1100	135.7	14.45	271.9

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.442	0.436	394.9	3.694	1.738	0.47
Statistics (NDs = DL)	0.332	0.329	408.2	2.869	2.174	0.758
Statistics (NDs = DL/2)	0.312	0.31	434.2	2.715	2.389	0.88
Statistics (Gamma ROS Estimates)	0.15	0.152	902.7	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.814	2.296	0.816

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.786	0.741	0.741	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.362	0.095	Data Not Normal
Lilliefors (NDs = DL)	0.389	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.389	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.257	0.0837	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.951	0.952	0.951	0.916

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	6.674	0.833	
Kolmogorov-Smirnov (Detects Only)	0.258	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.989	0.86	
Kolmogorov-Smirnov (NDs = DL)	0.224	0.0933	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.831	0.865	
Kolmogorov-Smirnov (NDs = DL/2)	0.211	0.0936	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.129	0.971	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.232	0.0977	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.956	0.962	0.962	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.149	0.095	Data Not Lognormal
Lilliefors (NDs = DL)	0.13	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.146	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.094	0.0837	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,1-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	85	27	24.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	27	1	10	1.333	1	1.732
Statistics (Detects Only)	85	1.16	370	51.28	29.4	64.1
Statistics (All: NDs treated as DL value)	112	1	370	39.24	22.65	59.75
Statistics (All: NDs treated as DL/2 value)	112	0.5	370	39.08	22.65	59.85
Statistics (Normal ROS Estimated Data)	112	-154.9	370	21.37	22.65	78.69
Statistics (Gamma ROS Estimated Data)	112	0.000001	370	38.92	22.65	59.95
Statistics (Lognormal ROS Estimated Data)	112	0.791	370	39.87	22.65	59.36

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.173	1.148	43.7	3.454	1.025	0.297
Statistics (NDs = DL)	0.601	0.591	65.29	2.642	1.714	0.649
Statistics (NDs = DL/2)	0.529	0.521	73.9	2.475	1.972	0.797
Statistics (Gamma ROS Estimates)	0.172	0.174	225.9	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.919	1.335	0.457

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.771	0.766	0.768	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.247	0.0961	Data Not Normal
Lilliefors (NDs = DL)	0.261	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.26	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.162	0.0837	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.934	0.962	0.966	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.364	0.778	
Kolmogorov-Smirnov (Detects Only)	0.123	0.0995	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.885	0.809	
Kolmogorov-Smirnov (NDs = DL)	0.142	0.0907	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.183	0.816	
Kolmogorov-Smirnov (NDs = DL/2)	0.152	0.0912	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	17.02	0.945	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.349	0.0968	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.967	0.935	0.923	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.143	0.0961	Data Not Lognormal
Lilliefors (NDs = DL)	0.204	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.231	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.136	0.0837	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,2-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	20	92	82.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	92	1	10	1.196	1	1.32
Statistics (Detects Only)	20	1.32	11.9	4.473	3.91	3.057
Statistics (All: NDs treated as DL value)	112	1	11.9	1.781	1	2.149
Statistics (All: NDs treated as DL/2 value)	112	0.5	11.9	1.29	0.5	2.044
Statistics (Normal ROS Estimated Data)	112	-22.34	11.9	-5.643	-5.686	6.847
Statistics (Gamma ROS Estimated Data)	112	0.000001	11.9	0.799	0.000001	2.136
Statistics (Lognormal ROS Estimated Data)	112	0.0114	11.9	1.147	0.407	2.037

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.431	2.372	1.84	1.279	0.687	0.537
Statistics (NDs = DL)	1.773	1.732	1.004	0.269	0.631	2.34
Statistics (NDs = DL/2)	1.037	1.015	1.244	-0.3	0.849	-2.83
Statistics (Gamma ROS Estimates)	0.0769	0.0808	10.39	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.89	1.471	-1.652

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.94	0.646	0.669	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.877	0.905	Data Not Normal
Lilliefors (Detects Only)	0.171	0.198	Data Appear Normal
Lilliefors (NDs = DL)	0.445	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.454	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.024	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.831	0.893	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.49	0.75	
Kolmogorov-Smirnov (Detects Only)	0.176	0.196	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	28.17	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.473	0.0877	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	27.09	0.782	
Kolmogorov-Smirnov (NDs = DL/2)	0.49	0.0889	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	29.13	1.627	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.521	0.114	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.698	0.721	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.16	0.198	Data Appear Lognormal
Lilliefors (NDs = DL)	0.469	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.482	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0382	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,2-Dichloropropane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	18	94	83.93%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	94	1	10	1.191	1	1.306
Statistics (Detects Only)	18	1.55	6.3	3.094	2.29	1.621
Statistics (All: NDs treated as DL value)	112	1	10	1.497	1	1.524
Statistics (All: NDs treated as DL/2 value)	112	0.5	6.3	0.997	0.5	1.268
Statistics (Normal ROS Estimated Data)	112	-12.19	6.3	-2.787	-2.804	3.844
Statistics (Gamma ROS Estimated Data)	112	0.000001	6.3	0.499	0.000001	1.305
Statistics (Lognormal ROS Estimated Data)	112	0.033	6.3	0.919	0.502	1.197

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.674	4.555	0.662	1.019	0.464	0.456
Statistics (NDs = DL)	2.67	2.605	0.561	0.205	0.504	2.463
Statistics (NDs = DL/2)	1.481	1.447	0.673	-0.377	0.709	-1.881
Statistics (Gamma ROS Estimates)	0.0786	0.0825	6.345	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.685	1.113	-1.626

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.886	0.605	0.67	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.773	0.897	Data Not Normal
Lilliefors (Detects Only)	0.282	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.449	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.474	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0339	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.932	0.768	0.858	0.907

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.474	0.743	
Kolmogorov-Smirnov (Detects Only)	0.255	0.204	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	27.71	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.479	0.0871	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	28.18	0.77	
Kolmogorov-Smirnov (NDs = DL/2)	0.5	0.088	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	30.1	1.582	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.527	0.113	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.684	0.704	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.849	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.232	0.209	Data Not Lognormal
Lilliefors (NDs = DL)	0.479	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.494	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0307	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	12	100	89.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	100	1	10	1.09	1	0.9
Statistics (Detects Only)	12	1.98	35	17.18	17.35	13.03
Statistics (All: NDs treated as DL value)	112	1	35	2.814	1	6.522
Statistics (All: NDs treated as DL/2 value)	112	0.5	35	2.327	0.5	6.612
Statistics (Normal ROS Estimated Data)	112	-125.7	35	-42.27	-42.81	34.2
Statistics (Gamma ROS Estimated Data)	112	0.000001	35	1.841	0.000001	6.732
Statistics (Lognormal ROS Estimated Data)	112	0.000166	35	2.136	0.105	6.673

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.307	1.278	13.14	2.415	1.101	0.456
Statistics (NDs = DL)	0.787	0.772	3.574	0.279	0.848	3.037
Statistics (NDs = DL/2)	0.531	0.523	4.38	-0.34	1.042	-3.069
Statistics (Gamma ROS Estimates)	0.067	0.0712	27.46	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.212	2.665	-1.205

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.955	0.549	0.547	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.881	0.859	Data Appear Normal
Lilliefors (Detects Only)	0.168	0.256	Data Appear Normal
Lilliefors (NDs = DL)	0.493	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.493	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0191	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.904	0.811	0.844	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.583	0.75	
Kolmogorov-Smirnov (Detects Only)	0.177	0.251	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	35.51	0.793	
Kolmogorov-Smirnov (NDs = DL)	0.533	0.0896	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	35.45	0.816	
Kolmogorov-Smirnov (NDs = DL/2)	0.542	0.0911	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	36.34	1.883	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.564	0.121	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.943	0.603	0.613	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.863	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.217	0.256	Data Appear Lognormal
Lilliefors (NDs = DL)	0.513	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.517	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0323	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chloroform

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	6	106	94.64%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	106	1	10	1.17	1	1.23
Statistics (Detects Only)	6	1.01	1.57	1.287	1.295	0.181
Statistics (All: NDs treated as DL value)	112	1	10	1.176	1	1.198
Statistics (All: NDs treated as DL/2 value)	112	0.5	5	0.623	0.5	0.62
Statistics (Normal ROS Estimated Data)	112	-1.402	1.57	0.064	0.062	0.599
Statistics (Gamma ROS Estimated Data)	112	0.000001	1.57	0.103	0.000001	0.318
Statistics (Lognormal ROS Estimated Data)	112	0.16	1.57	0.551	0.495	0.267

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	59.43	57.84	0.0217	0.244	0.143	0.588
Statistics (NDs = DL)	4.79	4.667	0.246	0.0542	0.311	5.741
Statistics (NDs = DL/2)	4.071	3.967	0.153	-0.602	0.368	-0.612
Statistics (Gamma ROS Estimates)	0.0841	0.0878	1.22	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.701	0.463	-0.66

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.961	0.346	0.433	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.239	0.362	Data Appear Normal
Lilliefors (NDs = DL)	0.493	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.507	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0179	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.963	0.455	0.562	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.316	0.697	
Kolmogorov-Smirnov (Detects Only)	0.215	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	39.36	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.505	0.0865	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	36.55	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.53	0.0867	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	34.42	1.442	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.554	0.11	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.959	0.395	0.51	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.219	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.498	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.527	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0187	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

cis-1,2-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	54	58	51.79%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	58	1	10	1.155	1	1.182
Statistics (Detects Only)	54	1.02	79.8	22.07	11.15	25.48
Statistics (All: NDs treated as DL value)	112	1	79.8	11.24	1	20.52
Statistics (All: NDs treated as DL/2 value)	112	0.5	79.8	10.94	0.5	20.65
Statistics (Normal ROS Estimated Data)	112	-115.1	79.8	-12.91	-13.77	42.15
Statistics (Gamma ROS Estimated Data)	112	0.000001	79.8	10.64	0.000001	20.8
Statistics (Lognormal ROS Estimated Data)	112	0.00238	79.8	10.8	1	20.72

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.646	0.634	34.17	2.148	1.564	0.728
Statistics (NDs = DL)	0.47	0.464	23.9	1.056	1.528	1.447
Statistics (NDs = DL/2)	0.39	0.385	28.07	0.697	1.786	2.562
Statistics (Gamma ROS Estimates)	0.0962	0.0996	110.6	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.0596	2.528	42.43

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.893	0.753	0.756	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.204	0.121	Data Not Normal
Lilliefors (NDs = DL)	0.37	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.364	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.112	0.0837	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.937	0.95	0.951	0.847

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.071	0.802	
Kolmogorov-Smirnov (Detects Only)	0.215	0.127	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	16.66	0.826	
Kolmogorov-Smirnov (NDs = DL)	0.353	0.0917	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	13.77	0.846	
Kolmogorov-Smirnov (NDs = DL/2)	0.301	0.0927	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	11.49	1.128	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.341	0.102	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.944	0.84	0.873	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.212	0.121	Data Not Lognormal
Lilliefors (NDs = DL)	0.289	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.291	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.106	0.0837	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Tetrachloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	83	29	25.89%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	29	1	10	1.31	1	1.671
Statistics (Detects Only)	83	1.22	43.7	14.41	14	9.248
Statistics (All: NDs treated as DL value)	112	1	43.7	11.02	7.325	9.855
Statistics (All: NDs treated as DL/2 value)	112	0.5	43.7	10.85	6.835	10
Statistics (Normal ROS Estimated Data)	112	-21.61	43.7	8.932	6.835	12.59
Statistics (Gamma ROS Estimated Data)	112	0.000001	43.7	10.68	6.835	10.17
Statistics (Lognormal ROS Estimated Data)	112	0.479	43.7	11.18	6.835	9.672

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.864	1.82	7.731	2.377	0.868	0.365
Statistics (NDs = DL)	0.941	0.922	11.71	1.782	1.274	0.715
Statistics (NDs = DL/2)	0.764	0.749	14.21	1.602	1.528	0.953
Statistics (Gamma ROS Estimates)	0.179	0.18	59.7	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.903	1.126	0.592

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.938	0.94	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.128	0.0973	Data Not Normal
Lilliefors (NDs = DL)	0.172	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.172	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0785	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.956	0.941	0.927	0.749

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.709	0.766	
Kolmogorov-Smirnov (Detects Only)	0.102	0.0995	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.11	0.786	
Kolmogorov-Smirnov (NDs = DL)	0.153	0.0891	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.101	0.795	
Kolmogorov-Smirnov (NDs = DL/2)	0.167	0.0897	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	19.29	0.937	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.316	0.0965	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.932	0.923	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.148	0.0973	Data Not Lognormal
Lilliefors (NDs = DL)	0.169	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.184	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.141	0.0837	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

trans-1,2-Dichloroethene								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	112	0	112	1	111	99.11%		
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable trans-1,2-Dichloroethene was not processed!								

Trichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	66	46	41.07%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	46	1	10	1.196	1	1.327
Statistics (Detects Only)	66	1.01	44.3	11.44	6.63	11.37
Statistics (All: NDs treated as DL value)	112	1	44.3	7.232	1.595	10.1
Statistics (All: NDs treated as DL/2 value)	112	0.5	44.3	6.987	1.595	10.22
Statistics (Normal ROS Estimated Data)	112	-42.14	44.3	-0.0232	1.55	17.36
Statistics (Gamma ROS Estimated Data)	112	0.000001	44.3	6.741	1.55	10.37
Statistics (Lognormal ROS Estimated Data)	112	0.0321	44.3	6.973	1.55	10.23

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.011	0.99	11.31	1.867	1.145	0.613
Statistics (NDs = DL)	0.704	0.691	10.27	1.121	1.273	1.136
Statistics (NDs = DL/2)	0.563	0.554	12.41	0.836	1.534	1.835
Statistics (Gamma ROS Estimates)	0.122	0.125	55.23	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.732	1.727	2.359

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.914	0.824	0.83	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.236	0.109	Data Not Normal
Lilliefors (NDs = DL)	0.269	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.263	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.113	0.0837	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.974	0.975	0.864

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.635	0.78	
Kolmogorov-Smirnov (Detects Only)	0.12	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	9.77	0.8	
Kolmogorov-Smirnov (NDs = DL)	0.229	0.09	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.271	0.813	
Kolmogorov-Smirnov (NDs = DL/2)	0.22	0.0909	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	12.19	1.004	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.29	0.0988	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.972	0.903	0.924	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.138	0.109	Data Not Lognormal
Lilliefors (NDs = DL)	0.228	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.242	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0904	0.0837	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vinyl Chloride

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	112	0	112	14	98	87.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	98	1	10	1.184	1	1.279
Statistics (Detects Only)	14	1.02	51.2	12.25	2.555	18.35
Statistics (All: NDs treated as DL value)	112	1	51.2	2.567	1	7.376
Statistics (All: NDs treated as DL/2 value)	112	0.5	51.2	2.049	0.5	7.404
Statistics (Normal ROS Estimated Data)	112	-162.3	51.2	-58.59	-58.81	42.57
Statistics (Gamma ROS Estimated Data)	112	0.000001	51.2	1.532	0.000001	7.485
Statistics (Lognormal ROS Estimated Data)	112	1.618E-06	51.2	1.579	0.0102	7.476

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.574	0.564	21.35	1.422	1.475	1.037
Statistics (NDs = DL)	0.817	0.801	3.141	0.219	0.746	3.41
Statistics (NDs = DL/2)	0.564	0.555	3.632	-0.388	0.906	-2.337
Statistics (Gamma ROS Estimates)	0.0688	0.0729	22.28	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.568	3.596	-0.787

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.808	0.459	0.452	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.646	0.874	Data Not Normal
Lilliefors (Detects Only)	0.402	0.237	Data Not Normal
Lilliefors (NDs = DL)	0.466	0.0837	Data Not Normal
Lilliefors (NDs = DL/2)	0.44	0.0837	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0443	0.0837	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.931	0.723	0.751	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.622	0.787	
Kolmogorov-Smirnov (Detects Only)	0.352	0.24	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	36.32	0.792	
Kolmogorov-Smirnov (NDs = DL)	0.496	0.0895	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	34.27	0.813	
Kolmogorov-Smirnov (NDs = DL/2)	0.508	0.0909	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	34.36	1.839	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.551	0.12	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.909	0.568	0.619	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.806	0.874	Data Not Lognormal
Lilliefors (Detects Only)	0.277	0.237	Data Not Lognormal
Lilliefors (NDs = DL)	0.472	0.0837	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.489	0.0837	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.024	0.0837	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 1 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1,1,1-Trichloroethane

General Statistics			
Number of Valid Data	112	Number of Detected Data	82
Number of Distinct Detected Data	79	Number of Non-Detect Data	30
		Percent Non-Detects	26.79%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	510	Maximum Detected	6.234
Mean of Detected	95.6	Mean of Detected	3.628
SD of Detected	121.8	SD of Detected	1.475
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.279	Lilliefors Test Statistic	0.114
5% Lilliefors Critical Value	0.0978	5% Lilliefors Critical Value	0.0978
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	70.13	Mean	2.47
SD	112.3	SD	2.298
95% DL/2 (t) UCL	87.73	95% H-Stat (DL/2) UCL	371.1
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	44.26	Mean in Log Scale	2.72
SD	139.7	SD in Log Scale	2.022
95% MLE (t) UCL	66.14	Mean in Original Scale	70.46
95% MLE (Tiku) UCL	66.68	SD in Original Scale	112.1
		95% t UCL	88.03
		95% Percentile Bootstrap UCL	88.04
		95% BCA Bootstrap UCL	90.55
		95% H UCL	222.8
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.639	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	149.7		
nu star	104.7		
A-D Test Statistic	2.809	**Nonparametric Statistics**	
5% A-D Critical Value	0.803	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.803	Mean	70.32
5% K-S Critical Value	0.103	SD	111.7
Data not Gamma Distributed at 5% Significance Level		SE of Mean	10.62
		95% KM (t) UCL	87.93
Assuming Gamma Distribution		95% KM (z) UCL	87.78
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	87.65
Minimum	0.000001	95% KM (bootstrap t) UCL	89.83
Maximum	510	95% KM (BCA) UCL	90.35
Mean	69.99	95% KM (Percentile Bootstrap) UCL	88.87
Median	14.7	95% KM (Chebyshev) UCL	116.6
SD	112.4	97.5% KM (Chebyshev) UCL	136.6
k star	0.148	99% KM (Chebyshev) UCL	175.9
Theta star	473.4		
Nu star	33.12	**Potential UCLs to Use**	
AppChi2	20.96	95% KM (Chebyshev) UCL	116.6
95% Gamma Approximate UCL (Use when n >= 40)	110.6		
95% Adjusted Gamma UCL (Use when n < 40)	111.3		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1,2-Trichloroethane

General Statistics			
Number of Valid Data	112	Number of Detected Data	22
Number of Distinct Detected Data	22	Number of Non-Detect Data	90
		Percent Non-Detects	80.36%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.24	Minimum Detected	0.215
Maximum Detected	3.89	Maximum Detected	1.358
Mean of Detected	2.55	Mean of Detected	0.879
SD of Detected	0.843	SD of Detected	0.356
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	112
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.911	5% Shapiro Wilk Critical Value	0.911
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.983	Mean	-0.343
SD	1.047	SD	0.697
95% DL/2 (t) UCL	1.147	95% H-Stat (DL/2) UCL	1.03
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.202
		SD in Log Scale	0.762
		Mean in Original Scale	1.085
		SD in Original Scale	0.879
		95% t UCL	1.223
		95% Percentile Bootstrap UCL	1.225
		95% BCA Bootstrap UCL	1.242
		95% H-UCL	1.264
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	7.718	**Data appear Normal at 5% Significance Level**	
Theta Star	0.33		
nu star	339.6		
A-D Test Statistic	0.423	**Nonparametric Statistics**	
5% A-D Critical Value	0.744	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.744	Mean	1.502
5% K-S Critical Value	0.185	SD	0.64
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0625
		95% KM (t) UCL	1.606
Assuming Gamma Distribution		95% KM (z) UCL	1.605
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.605
Minimum	0.000001	95% KM (bootstrap t) UCL	1.616
Maximum	3.89	95% KM (BCA) UCL	1.816
Mean	0.528	95% KM (Percentile Bootstrap) UCL	1.727
Median	0.000001	95% KM (Chebyshev) UCL	1.774
SD	1.077	97.5% KM (Chebyshev) UCL	1.892
k star	0.0898	99% KM (Chebyshev) UCL	2.124
Theta star	5.879		
Nu star	20.12	**Potential UCLs to Use**	
AppChi2	10.94	95% KM (t) UCL	1.606
95% Gamma Approximate UCL (Use when n >= 40)	0.971	95% KM (Percentile Bootstrap) UCL	1.727
95% Adjusted Gamma UCL (Use when n < 40)	0.979		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics			
Number of Valid Data	112	Number of Detected Data	87
Number of Distinct Detected Data	83	Number of Non-Detect Data	25
		Percent Non-Detects	22.32%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.24	Minimum Detected	0.215
Maximum Detected	1100	Maximum Detected	7.003
Mean of Detected	174.4	Mean of Detected	3.694
SD of Detected	297.7	SD of Detected	1.738
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.362	Lilliefors Test Statistic	0.149
5% Lilliefors Critical Value	0.095	5% Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	135.5	Mean	2.715
SD	271.9	SD	2.389
95% DL/2 (t) UCL	178.2	95% H-Stat (DL/2) UCL	621.2
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	84.75	Mean in Log Scale	2.814
SD	321.1	SD in Log Scale	2.296
95% MLE (t) UCL	135.1	Mean in Original Scale	135.7
95% MLE (Tiku) UCL	134.7	SD in Original Scale	271.9
		95% t UCL	178.3
		95% Percentile Bootstrap UCL	182.8
		95% BCA Bootstrap UCL	185.1
		95% H UCL	520.4
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.434	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	401.8		
nu star	75.51		
A-D Test Statistic	6.674	**Nonparametric Statistics**	
5% A-D Critical Value	0.833	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.833	Mean	135.7
5% K-S Critical Value	0.102	SD	270.6
Data not Gamma Distributed at 5% Significance Level		SE of Mean	25.72
		95% KM (t) UCL	178.4
Assuming Gamma Distribution		95% KM (z) UCL	178
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	178.1
Minimum	0.000001	95% KM (bootstrap t) UCL	187.5
Maximum	1100	95% KM (BCA) UCL	180.8
Mean	135.4	95% KM (Percentile Bootstrap) UCL	180.9
Median	14.45	95% KM (Chebyshev) UCL	247.8
SD	272	97.5% KM (Chebyshev) UCL	296.3
k star	0.152	99% KM (Chebyshev) UCL	391.6
Theta star	891.2		
Nu star	34.04	**Potential UCLs to Use**	
AppChi2	21.7	97.5% KM (Chebyshev) UCL	296.3
95% Gamma Approximate UCL (Use when n >= 40)	212.5		
95% Adjusted Gamma UCL (Use when n < 40)	213.8		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics			
Number of Valid Data	112	Number of Detected Data	85
Number of Distinct Detected Data	80	Number of Non-Detect Data	27
		Percent Non-Detects	24.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.16	Minimum Detected	0.148
Maximum Detected	370	Maximum Detected	5.914
Mean of Detected	51.28	Mean of Detected	3.454
SD of Detected	64.1	SD of Detected	1.025
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	78
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	30.36%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.247	Lilliefors Test Statistic	0.143
5% Lilliefors Critical Value	0.0961	5% Lilliefors Critical Value	0.0961
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	39.08	Mean	2.475
SD	59.85	SD	1.972
95% DL/2 (t) UCL	48.46	95% H-Stat (DL/2) UCL	153.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	25.14	Mean in Log Scale	2.919
SD	74.76	SD in Log Scale	1.335
95% MLE (t) UCL	36.86	Mean in Original Scale	39.87
95% MLE (Tiku) UCL	37.38	SD in Original Scale	59.36
		95% t UCL	49.17
		95% Percentile Bootstrap UCL	49.88
		95% BCA Bootstrap UCL	52.35
		95% H UCL	62.37
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.14	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	44.99		
nu star	193.8		
A-D Test Statistic	2.364	**Nonparametric Statistics**	
5% A-D Critical Value	0.778	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.778	Mean	39.21
5% K-S Critical Value	0.0995	SD	59.5
Data not Gamma Distributed at 5% Significance Level		SE of Mean	5.656
		95% KM (t) UCL	48.59
Assuming Gamma Distribution		95% KM (z) UCL	48.51
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	48.53
Minimum	0.000001	95% KM (bootstrap t) UCL	51.37
Maximum	370	95% KM (BCA) UCL	48.27
Mean	38.92	95% KM (Percentile Bootstrap) UCL	49.17
Median	22.65	95% KM (Chebyshev) UCL	63.86
SD	59.95	97.5% KM (Chebyshev) UCL	74.53
k star	0.174	99% KM (Chebyshev) UCL	95.48
Theta star	224.2		
Nu star	38.89	**Potential UCLs to Use**	
AppChi2	25.61	95% KM (Chebyshev) UCL	63.86
95% Gamma Approximate UCL (Use when n >= 40)	59.11		
95% Adjusted Gamma UCL (Use when n < 40)	59.44		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics			
Number of Valid Data	112	Number of Detected Data	20
Number of Distinct Detected Data	20	Number of Non-Detect Data	92
		Percent Non-Detects	82.14%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.32	Minimum Detected	0.278
Maximum Detected	11.9	Maximum Detected	2.477
Mean of Detected	4.473	Mean of Detected	1.279
SD of Detected	3.057	SD of Detected	0.687
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	110
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	98.21%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.939
5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.29	Mean	-0.3
SD	2.044	SD	0.849
95% DL/2 (t) UCL	1.61	95% H-Stat (DL/2) UCL	1.256
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.89
		SD in Log Scale	1.471
		Mean in Original Scale	1.147
		SD in Original Scale	2.037
		95% t UCL	1.466
		95% Percentile Bootstrap UCL	1.5
		95% BCA Bootstrap UCL	1.555
		95% H-UCL	1.764

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.1	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	2.13		
nu star	84		
A-D Test Statistic	0.49	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	1.89
5% K-S Critical Value	0.196	SD	1.751
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.171
		95% KM (t) UCL	2.173
Assuming Gamma Distribution		95% KM (z) UCL	2.171
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.123
Minimum	0.000001	95% KM (bootstrap t) UCL	2.236
Maximum	11.9	95% KM (BCA) UCL	2.465
Mean	0.799	95% KM (Percentile Bootstrap) UCL	2.32
Median	0.000001	95% KM (Chebyshev) UCL	2.633
SD	2.136	97.5% KM (Chebyshev) UCL	2.955
k star	0.0808	99% KM (Chebyshev) UCL	3.587
Theta star	9.886		
Nu star	18.1	**Potential UCLs to Use**	
AppChi2	9.462	95% KM (t) UCL	2.173
95% Gamma Approximate UCL (Use when n >= 40)	1.528		
95% Adjusted Gamma UCL (Use when n < 40)	1.541		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloropropane

General Statistics			
Number of Valid Data	112	Number of Detected Data	18
Number of Distinct Detected Data	17	Number of Non-Detect Data	94
		Percent Non-Detects	83.93%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.55	Minimum Detected	0.438
Maximum Detected	6.3	Maximum Detected	1.841
Mean of Detected	3.094	Mean of Detected	1.019
SD of Detected	1.621	SD of Detected	0.464
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	112
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.773	Shapiro Wilk Test Statistic	0.849
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.997	Mean	-0.377
SD	1.268	SD	0.709
95% DL/2 (t) UCL	1.196	95% H-Stat (DL/2) UCL	1.007
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.685
		SD in Log Scale	1.113
		Mean in Original Scale	0.919
		SD in Original Scale	1.197
		95% t UCL	1.106
		95% Percentile Bootstrap UCL	1.104
		95% BCA Bootstrap UCL	1.142
		95% H-UCL	1.198
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.932	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.787		
nu star	141.6		
A-D Test Statistic	1.474	**Nonparametric Statistics**	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.743	Mean	1.803
5% K-S Critical Value	0.204	SD	0.856
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.084
		95% KM (t) UCL	1.942
Assuming Gamma Distribution		95% KM (z) UCL	1.941
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.918
Minimum	0.000001	95% KM (bootstrap t) UCL	1.969
Maximum	6.3	95% KM (BCA) UCL	2.258
Mean	0.499	95% KM (Percentile Bootstrap) UCL	2.178
Median	0.000001	95% KM (Chebyshev) UCL	2.169
SD	1.305	97.5% KM (Chebyshev) UCL	2.327
k star	0.0825	99% KM (Chebyshev) UCL	2.638
Theta star	6.049		
Nu star	18.48	**Potential UCLs to Use**	
AppChi2	9.737	95% KM (t) UCL	1.942
95% Gamma Approximate UCL (Use when n >= 40)	0.947	95% KM (% Bootstrap) UCL	2.178
95% Adjusted Gamma UCL (Use when n < 40)	0.955		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroethane

General Statistics			
Number of Valid Data	112	Number of Detected Data	12
Number of Distinct Detected Data	12	Number of Non-Detect Data	100
		Percent Non-Detects	89.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.98	Minimum Detected	0.683
Maximum Detected	35	Maximum Detected	3.555
Mean of Detected	17.18	Mean of Detected	2.415
SD of Detected	13.03	SD of Detected	1.101
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	105
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.75%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Test Statistic	0.863
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.327	Mean	-0.34
SD	6.612	SD	1.042
95% DL/2 (t) UCL	3.364	95% H-Stat (DL/2) UCL	1.532
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.212
		SD in Log Scale	2.665
		Mean in Original Scale	2.136
		SD in Original Scale	6.673
		95% t UCL	3.181
		95% Percentile Bootstrap UCL	3.185
		95% BCA Bootstrap UCL	3.503
		95% H-UCL	10.96
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.036	**Data appear Normal at 5% Significance Level**	
Theta Star	16.59		
nu star	24.86		
A-D Test Statistic	0.583	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	3.61
5% K-S Critical Value	0.251	SD	6.227
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.615
		95% KM (t) UCL	4.629
Assuming Gamma Distribution		95% KM (z) UCL	4.621
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	4.409
Minimum	0.000001	95% KM (bootstrap t) UCL	4.874
Maximum	35	95% KM (BCA) UCL	7.407
Mean	1.841	95% KM (Percentile Bootstrap) UCL	5.329
Median	0.000001	95% KM (Chebyshev) UCL	6.289
SD	6.732	97.5% KM (Chebyshev) UCL	7.448
k star	0.0712	99% KM (Chebyshev) UCL	9.725
Theta star	25.86		
Nu star	15.95	**Potential UCLs to Use**	
AppChi2	7.925	95% KM (t) UCL	4.629
95% Gamma Approximate UCL (Use when n >= 40)	3.704	95% KM (Percentile Bootstrap) UCL	5.329
95% Adjusted Gamma UCL (Use when n < 40)	3.739		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics			
Number of Valid Data	112	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	106
		Percent Non-Detects	94.64%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.01	Minimum Detected	0.00995
Maximum Detected	1.57	Maximum Detected	0.451
Mean of Detected	1.287	Mean of Detected	0.244
SD of Detected	0.181	SD of Detected	0.143
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	112
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.623	Mean	-0.602
SD	0.62	SD	0.368
95% DL/2 (t) UCL	0.72	95% H-Stat (DL/2) UCL	0.623
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.701
		SD in Log Scale	0.463
		Mean in Original Scale	0.551
		SD in Original Scale	0.267
		95% t UCL	0.593
		95% Percentile Bootstrap UCL	0.595
		95% BCA Bootstrap UCL	0.594
		95% H-UCL	0.598

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	29.82	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0431		
nu star	357.9		
A-D Test Statistic	0.316	**Nonparametric Statistics**	
5% A-D Critical Value	0.697	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.697	Mean	1.025
5% K-S Critical Value	0.332	SD	0.0738
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00771
		95% KM (t) UCL	1.038
Assuming Gamma Distribution		95% KM (z) UCL	1.038
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.156
Minimum	0.000001	95% KM (bootstrap t) UCL	1.036
Maximum	1.57	95% KM (BCA) UCL	1.322
Mean	0.103	95% KM (Percentile Bootstrap) UCL	1.282
Median	0.000001	95% KM (Chebyshev) UCL	1.059
SD	0.318	97.5% KM (Chebyshev) UCL	1.073
k star	0.0878	99% KM (Chebyshev) UCL	1.102
Theta star	1.169		
Nu star	19.66	**Potential UCLs to Use**	
AppChi2	10.6	95% KM (t) UCL	1.038
95% Gamma Approximate UCL (Use when n >= 40)	0.19	95% KM (Percentile Bootstrap) UCL	1.282
95% Adjusted Gamma UCL (Use when n < 40)	0.192		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics			
Number of Valid Data	112	Number of Detected Data	54
Number of Distinct Detected Data	52	Number of Non-Detect Data	58
		Percent Non-Detects	51.79%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.02	Minimum Detected	0.0198
Maximum Detected	79.8	Maximum Detected	4.38
Mean of Detected	22.07	Mean of Detected	2.148
SD of Detected	25.48	SD of Detected	1.564
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	84
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	28
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	75.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.204	Lilliefors Test Statistic	0.212
5% Lilliefors Critical Value	0.121	5% Lilliefors Critical Value	0.121
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.94	Mean	0.697
SD	20.65	SD	1.786
95% DL/2 (t) UCL	14.18	95% H-Stat (DL/2) UCL	16.64
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.0596
		SD in Log Scale	2.528
		Mean in Original Scale	10.8
		SD in Original Scale	20.72
		95% t UCL	14.05
		95% Percentile Bootstrap UCL	13.93
		95% BCA Bootstrap UCL	14.69
		95% H-UCL	67.58

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.622	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	35.47		
nu star	67.21		
A-D Test Statistic	2.071	**Nonparametric Statistics**	
5% A-D Critical Value	0.802	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.802	Mean	11.17
5% K-S Critical Value	0.127	SD	20.44
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.95
		95% KM (t) UCL	14.41
Assuming Gamma Distribution		95% KM (z) UCL	14.38
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	14.39
Minimum	0.000001	95% KM (bootstrap t) UCL	14.84
Maximum	79.8	95% KM (BCA) UCL	14.53
Mean	10.64	95% KM (Percentile Bootstrap) UCL	14.64
Median	0.000001	95% KM (Chebyshev) UCL	19.67
SD	20.8	97.5% KM (Chebyshev) UCL	23.35
k star	0.0996	99% KM (Chebyshev) UCL	30.57
Theta star	106.9		
Nu star	22.3	**Potential UCLs to Use**	
AppChi2	12.57	95% KM (Chebyshev) UCL	19.67
95% Gamma Approximate UCL (Use when n >= 40)	18.89		
95% Adjusted Gamma UCL (Use when n < 40)	19.03		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics			
Number of Valid Data	112	Number of Detected Data	83
Number of Distinct Detected Data	79	Number of Non-Detect Data	29
		Percent Non-Detects	25.89%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.22	Minimum Detected	0.199
Maximum Detected	43.7	Maximum Detected	3.777
Mean of Detected	14.41	Mean of Detected	2.377
SD of Detected	9.248	SD of Detected	0.868
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	59
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	53
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	52.68%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.128	Lilliefors Test Statistic	0.148
5% Lilliefors Critical Value	0.0973	5% Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.85	Mean	1.602
SD	10	SD	1.528
95% DL/2 (t) UCL	12.42	95% H-Stat (DL/2) UCL	23.79
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.585	Mean in Log Scale	1.903
SD	12.14	SD in Log Scale	1.126
95% MLE (t) UCL	11.49	Mean in Original Scale	11.18
95% MLE (Tiku) UCL	12	SD in Original Scale	9.672
		95% t UCL	12.69
		95% Percentile Bootstrap UCL	12.79
		95% BCA Bootstrap UCL	12.79
		95% H UCL	16.22
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.805	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	7.985		
nu star	299.6		
A-D Test Statistic	1.709	**Nonparametric Statistics**	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.766	Mean	11.01
5% K-S Critical Value	0.0995	SD	9.787
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.931
		95% KM (t) UCL	12.55
Assuming Gamma Distribution		95% KM (z) UCL	12.54
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	12.53
Minimum	0.000001	95% KM (bootstrap t) UCL	12.63
Maximum	43.7	95% KM (BCA) UCL	12.8
Mean	10.68	95% KM (Percentile Bootstrap) UCL	12.55
Median	6.835	95% KM (Chebyshev) UCL	15.07
SD	10.17	97.5% KM (Chebyshev) UCL	16.82
k star	0.18	99% KM (Chebyshev) UCL	20.27
Theta star	59.31		
Nu star	40.34	**Potential UCLs to Use**	
AppChi2	26.78	95% KM (BCA) UCL	12.8
95% Gamma Approximate UCL (Use when n >= 40)	16.08		
95% Adjusted Gamma UCL (Use when n < 40)	16.17		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

trans-1,2-Dichloroethene			
General Statistics			
Number of Valid Data	112	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	111
		Percent Non-Detects	99.11%
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!			
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).			
The data set for variable trans-1,2-Dichloroethene was not processed!			

Trichloroethene

General Statistics			
Number of Valid Data	112	Number of Detected Data	66
Number of Distinct Detected Data	62	Number of Non-Detect Data	46
		Percent Non-Detects	41.07%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.01	Minimum Detected	0.00995
Maximum Detected	44.3	Maximum Detected	3.791
Mean of Detected	11.44	Mean of Detected	1.867
SD of Detected	11.37	SD of Detected	1.145
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	88
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	24
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	78.57%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.236	Lilliefors Test Statistic	0.138
5% Lilliefors Critical Value	0.109	5% Lilliefors Critical Value	0.109
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.987	Mean	0.836
SD	10.22	SD	1.534
95% DL/2 (t) UCL	8.589	95% H-Stat (DL/2) UCL	11.2
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	25.6	Mean in Log Scale	0.732
SD	7.987	SD in Log Scale	1.727
95% MLE (t) UCL	26.85	Mean in Original Scale	6.973
95% MLE (Tiku) UCL	28.27	SD in Original Scale	10.23
		95% t UCL	8.576
		95% Percentile Bootstrap UCL	8.584
		95% BCA Bootstrap UCL	8.747
		95% H UCL	15.08

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.975	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	11.73		
nu star	128.8		
A-D Test Statistic	1.635	**Nonparametric Statistics**	
5% A-D Critical Value	0.78	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.78	Mean	7.168
5% K-S Critical Value	0.113	SD	10.06
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.958
		95% KM (t) UCL	8.757
Assuming Gamma Distribution		95% KM (z) UCL	8.744
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.752
Minimum	0.000001	95% KM (bootstrap t) UCL	9.01
Maximum	44.3	95% KM (BCA) UCL	8.805
Mean	6.741	95% KM (Percentile Bootstrap) UCL	8.786
Median	1.55	95% KM (Chebyshev) UCL	11.34
SD	10.37	97.5% KM (Chebyshev) UCL	13.15
k star	0.125	99% KM (Chebyshev) UCL	16.7
Theta star	54.04		
Nu star	27.94	**Potential UCLs to Use**	
AppChi2	16.88	95% KM (Chebyshev) UCL	11.34
95% Gamma Approximate UCL (Use when n >= 40)	11.16		
95% Adjusted Gamma UCL (Use when n < 40)	11.23		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Vinyl Chloride

General Statistics			
Number of Valid Data	112	Number of Detected Data	14
Number of Distinct Detected Data	13	Number of Non-Detect Data	98
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.02	Minimum Detected	0.0198
Maximum Detected	51.2	Maximum Detected	3.936
Mean of Detected	12.25	Mean of Detected	1.422
SD of Detected	18.35	SD of Detected	1.475
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	108
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	96.43%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.646	Shapiro Wilk Test Statistic	0.806
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.049	Mean	-0.388
SD	7.404	SD	0.906
95% DL/2 (t) UCL	3.21	95% H-Stat (DL/2) UCL	1.229
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.568
		SD in Log Scale	3.596
		Mean in Original Scale	1.579
		SD in Original Scale	7.476
		95% t UCL	2.751
		95% Percentile Bootstrap UCL	2.852
		95% BCA Bootstrap UCL	3.351
		95% H-UCL	42.21
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.499	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	24.58		
nu star	13.96		
A-D Test Statistic	1.622	**Nonparametric Statistics**	
5% A-D Critical Value	0.787	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.787	Mean	2.426
5% K-S Critical Value	0.24	SD	7.273
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.713
		95% KM (t) UCL	3.609
Assuming Gamma Distribution		95% KM (z) UCL	3.599
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.538
Minimum	0.000001	95% KM (bootstrap t) UCL	4.336
Maximum	51.2	95% KM (BCA) UCL	3.864
Mean	1.532	95% KM (Percentile Bootstrap) UCL	3.706
Median	0.000001	95% KM (Chebyshev) UCL	5.535
SD	7.485	97.5% KM (Chebyshev) UCL	6.88
k star	0.0729	99% KM (Chebyshev) UCL	9.522
Theta star	21.02		
Nu star	16.32	**Potential UCLs to Use**	
AppChi2	8.189	95% KM (BCA) UCL	3.864
95% Gamma Approximate UCL (Use when n >= 40)	3.052		
95% Adjusted Gamma UCL (Use when n < 40)	3.081		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Area 2

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1,2-Trichloroethane	d_1,1,2-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene
57	1	1	0	50.1	1	54.5	1
93.8	1	1	0	82.4	1	82	1
86.1	1	1	0	81.6	1	74.5	1
45.5	1	1	0	60	1	53.9	1
37.3	1	1	0	49.7	1	51.5	1
66.8	1	1	0	81.6	1	76.6	1
35.6	1	1	0	50.6	1	51.8	1
45.6	1	1	0	53.9	1	46.2	1
8.85	1	1	0	4.34	1	13.4	1
9.54	1	1	0	5.38	1	13.4	1
7.43	1	1	0	2.66	1	9.84	1
6.02	1	1	0	2.42	1	8.42	1
5.7	1	1	0	2.32	1	10.3	1
5.44	1	1	0	2.66	1	9.33	1
5.48	1	1	0	3.14	1	7.61	1
10.5	1	1	0	5.29	1	9.48	1
147	1	1	0	223	1	121	1
84.3	1	1	0	131	1	76	1
91.7	1	1	0	144	1	76.8	1
23.8	1	1	0	118	1	58.6	1
79.8	1	1	0	158	1	78.9	1
29.1	1	1	0	50.8	1	33.7	1
45.2	1	1	0	124	1	56.3	1
26.1	1	1	0	183	1	71.7	1
166	1	1.96	1	366	1	283	1
108	1	1.22	1	182	1	183	1
50	0	50	0	50	0	50	0
1	0	1	0	21.1	1	2.52	1
1	0	1	0	61.1	1	18.3	1
1	0	1	0	104	1	38.3	1
1	0	1	0	84.9	1	31.6	1
10	0	10	0	74.9	1	34.9	1

1,2-Dichloroethane	d_1,2-Dichloroethane	Chloroethane	d_Chloroethane	Chloroform	d_Chloroform	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene
1	0	1	0	1	0	1.55	1
1	0	1	0	1	0	3.25	1
1	0	1	0	1	0	3.24	1
1	0	1	0	1	0	1.93	1
1	0	1	0	1	0	1.96	1
1	0	1	0	1	0	2.92	1
1	0	1.6	1	1	0	2.46	1
1	0	1	0	1	0	1.93	1
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
1	0	1	0	1.2	1	1	0
1.9	1	1	0	1	0	1.68	1
1.32	1	1	0	1	0	1	0
1.3	1	1	0	1	0	1.39	1
1	0	1	0	1	0	1.08	1
1	0	1	0	1	0	1.35	1
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1.08	1
1.49	1	1	0	1	0	2.17	1
6.54	1	1	0	1	0	1.34	1
2.71	1	1	0	1	0	1	0
50	0	50	0	50	0	50	0
1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0
2.14	1	1.84	1	1	0	1	0
2.83	1	29	1	1	0	1	0
10	0	28.7	1	10	0	10	0

Tetrachloroethene	d_Tetrachloroethene	Trichloroethene	d_Trichloroethene	Vinyl Chloride	d_Vinyl Chloride
9.6	1	4.26	1	1	0
13.8	1	8.89	1	1	0
12.3	1	7.45	1	1	0
16.8	1	6.78	1	1	0
9.75	1	5.56	1	1	0
15.2	1	8.49	1	1	0
8.47	1	4.54	1	1.81	1
11.4	1	5.4	1	2.07	1
4.06	1	1	0	1	0
4.13	1	1	0	1	0
3.13	1	1	0	1	0
3.08	1	1	0	1	0
2.86	1	1	0	1	0
3.13	1	1	0	1	0
2.89	1	1	0	1	0
5.5	1	1.2	1	1	0
8.42	1	23.4	1	1	0
5.13	1	15.1	1	1	0
5.03	1	14.2	1	1	0
1	0	3.82	1	2.83	1
1	0	14.2	1	7.59	1
1.14	1	6.59	1	1	0
2.51	1	11.8	1	3.24	1
4.78	1	15.8	1	5.28	1
12.9	1	21.4	1	1	0
7.76	1	12.9	1	1	0
50	0	50	0	50	0
1	0	1	0	1	0
1	0	1	0	1	0
1.07	1	2.27	1	1	0
1	0	1.92	1	1	0
10	0	10	0	10	0

Area 2 Groundwater Raw Statistics
MP Facility
Boise, Idaho

From File: Area 2 - 8 events.wst

Summary Statistics for Raw Data Sets with NDs using Detected Data Only

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum (ug/l)	Mean	Median	SD	MAD/0.675	Skewness	CV
1,1,1-Trichloroethane	26	6	18.75%	5.44	166	51.06	41.25	44.83	49.09	1.017	0.878
1,1,2-Trichloroethane	2	30	93.75%	1.22	1.96	1.59	1.59	0.523	0.549	N/A	0.329
1,1-Dichloroethane	31	1	3.13%	2.32	366	82.71	61.1	80.64	82.74	1.63	0.975
1,1-Dichloroethene	31	1	3.13%	2.52	283	56.05	51.5	57.16	37.51	2.491	1.02
1,2-Dichloroethane	8	24	75.00%	1.3	6.54	2.529	2.02	1.724	1.03	2.212	0.682
Chloroethane	4	28	87.50%	1.6	29	15.29	15.27	15.66	20.09	0.0001144	1.025
Chloroform	1	31	96.88%	1.2	1.2	1.2	1.2	N/A	0	N/A	N/A
cis-1,2-Dichloroethene	15	17	53.13%	1.08	3.25	1.955	1.93	0.727	0.801	0.7	0.372
Tetrachloroethene	25	7	21.88%	1.07	16.8	6.994	5.13	4.616	3.899	0.648	0.66
Trichloroethene	21	11	34.38%	1.2	23.4	9.332	7.45	6.257	6.449	0.774	0.671
Vinyl Chloride	6	26	81.25%	1.81	7.59	3.803	3.035	2.225	1.623	1.178	0.585

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 2 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	0.95

1,1,1-Trichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	26	6	18.75%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	1	50	10.67	1	19.6
Statistics (Detects Only)	26	5.44	166	51.06	41.25	44.83
Statistics (All: NDs treated as DL value)	32	1	166	43.49	32.35	44.04
Statistics (All: NDs treated as DL/2 value)	32	0.5	166	42.49	27.6	44.33
Statistics (Normal ROS Estimated Data)	32	-72.06	166	35.2	27.6	53.78
Statistics (Gamma ROS Estimated Data)	32	0.000001	166	41.83	27.6	44.79
Statistics (Lognormal ROS Estimated Data)	32	1.47	166	42.4	27.6	44.26

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.159	1.071	44.06	3.443	1.122	0.326
Statistics (NDs = DL)	0.765	0.714	56.86	2.992	1.544	0.516
Statistics (NDs = DL/2)	0.683	0.64	62.18	2.862	1.727	0.604
Statistics (Gamma ROS Estimates)	0.237	0.236	176.4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.049	1.341	0.44

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.944	0.929	0.925	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.882	0.92	Data Not Normal
Lilliefors (Detects Only)	0.164	0.174	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.856	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.179	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.849	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.172	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.97	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.134	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.983	0.979	0.976	0.902

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.551	0.77	
Kolmogorov-Smirnov (Detects Only)	0.152	0.176	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.51	0.787	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.162	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.479	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.1	0.162	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.15	0.882	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.323	0.171	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.958	0.947	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.907	0.92	Data Not Lognormal
Lilliefors (Detects Only)	0.143	0.174	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.9	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.147	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.881	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.164	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.938	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.121	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

1,1,2-Trichloroethane						
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	2	30	93.75%
	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	30	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	32	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	32	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	32	N/A	N/A	N/A	N/A	N/A
Normal Distribution Test Results						
	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	N/A	N/A	N/A	N/A		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilks (Detects Only)	N/A	N/A				
Lilliefors (Detects Only)	N/A	N/A				
Shapiro-Wilks (NDs = DL)	N/A	N/A				
Lilliefors (NDs = DL)	N/A	N/A				
Shapiro-Wilks (NDs = DL/2)	N/A	N/A				
Lilliefors (NDs = DL/2)	N/A	N/A				
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A				
Lilliefors (Normal ROS Estimates)	N/A	N/A				
Gamma Distribution Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	N/A	N/A	N/A	N/A		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	N/A	N/A				
Kolmogorov-Smirnov (Detects Only)	N/A	N/A				
Anderson-Darling (NDs = DL)	N/A	N/A				
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A				
Anderson-Darling (NDs = DL/2)	N/A	N/A				
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A				
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A				
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A				
Note: Substitution methods such as DL or DL/2 are not recommended.						

1,1-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	31	1	3.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	31	2.32	366	82.71	61.1	80.64
Statistics (All: NDs treated as DL value)	32	2.32	366	81.68	60.55	79.53
Statistics (All: NDs treated as DL/2 value)	32	2.32	366	80.9	60.55	79.98
Statistics (Normal ROS Estimated Data)	32	2.32	366	80.29	60.55	80.5
Statistics (Gamma ROS Estimated Data)	32	0.000001	366	80.12	60.55	80.66
Statistics (Lognormal ROS Estimated Data)	32	2.32	366	80.38	60.55	80.41

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.786	0.733	105.3	3.658	1.576	0.431
Statistics (NDs = DL)	0.805	0.75	101.5	3.666	1.551	0.423
Statistics (NDs = DL/2)	0.793	0.74	102	3.644	1.552	0.426
Statistics (Gamma ROS Estimates)	0.5	0.474	160.4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.609	1.574	0.436

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.919	0.916	0.917	0.915

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.852	0.929	Data Not Normal
Lilliefors (Detects Only)	0.167	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.848	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.171	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.848	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.168	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.846	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.166	0.157	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.986	0.987	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.05	0.786	
Kolmogorov-Smirnov (Detects Only)	0.2	0.164	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.057	0.785	
Kolmogorov-Smirnov (NDs = DL)	0.209	0.161	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.902	0.786	
Kolmogorov-Smirnov (NDs = DL/2)	0.183	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.449	0.81	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.257	0.164	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.927	0.934	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.843	0.929	Data Not Lognormal
Lilliefors (Detects Only)	0.272	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.843	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.28	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.856	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.254	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.857	0.93	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.262	0.157	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,1-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	31	1	3.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	31	2.52	283	56.05	51.5	57.16
Statistics (All: NDs treated as DL value)	32	2.52	283	55.86	50.75	56.24
Statistics (All: NDs treated as DL/2 value)	32	2.52	283	55.08	48.85	56.49
Statistics (Normal ROS Estimated Data)	32	2.52	283	54.92	48.85	56.59
Statistics (Gamma ROS Estimated Data)	32	2.52	283	54.8	48.85	56.67
Statistics (Lognormal ROS Estimated Data)	32	2.52	283	54.8	48.85	56.67

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.206	1.114	46.47	3.557	1.07	0.301
Statistics (NDs = DL)	1.241	1.145	45.02	3.568	1.054	0.295
Statistics (NDs = DL/2)	1.222	1.129	45.06	3.547	1.054	0.297
Statistics (Gamma ROS Estimates)	1.202	1.11	45.58	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.533	1.061	0.3

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.852	0.851	0.85	0.85

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.746	0.929	Data Not Normal
Lilliefors (Detects Only)	0.228	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.743	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.227	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.742	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.223	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.742	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.222	0.157	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.962	0.959	0.961	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.61	0.771	
Kolmogorov-Smirnov (Detects Only)	0.132	0.162	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.649	0.77	
Kolmogorov-Smirnov (NDs = DL)	0.133	0.159	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.537	0.771	
Kolmogorov-Smirnov (NDs = DL/2)	0.128	0.159	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.584	0.771	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.126	0.159	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.969	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.929	Data Appear Lognormal
Lilliefors (Detects Only)	0.156	0.159	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.943	0.93	Data Appear Lognormal
Lilliefors (NDs = DL)	0.162	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.953	0.93	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.146	0.157	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.952	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.15	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

1,2-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	8	24	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	1	50	3.417	1	10.09
Statistics (Detects Only)	8	1.3	6.54	2.529	2.02	1.724
Statistics (All: NDs treated as DL value)	32	1	50	3.195	1	8.739
Statistics (All: NDs treated as DL/2 value)	32	0.5	25	1.913	0.5	4.437
Statistics (Normal ROS Estimated Data)	32	-9.412	6.54	-2.108	-2.127	3.575
Statistics (Gamma ROS Estimated Data)	32	0.000001	6.54	0.632	0.000001	1.382
Statistics (Lognormal ROS Estimated Data)	32	0.0404	6.54	0.907	0.461	1.274

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.591	3.275	0.704	0.782	0.535	0.684
Statistics (NDs = DL)	0.773	0.721	4.135	0.39	0.855	2.193
Statistics (NDs = DL/2)	0.766	0.715	2.497	-0.13	0.982	-7.544
Statistics (Gamma ROS Estimates)	0.0853	0.0981	7.412	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.768	1.191	-1.551

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.838	0.494	0.57	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.722	0.818	Data Not Normal
Lilliefors (Detects Only)	0.306	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.278	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.423	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.359	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.375	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.99	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0798	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.927	0.753	0.823	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.567	0.72	
Kolmogorov-Smirnov (Detects Only)	0.222	0.296	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.513	0.787	
Kolmogorov-Smirnov (NDs = DL)	0.362	0.161	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.594	0.787	
Kolmogorov-Smirnov (NDs = DL/2)	0.397	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.879	1.062	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.479	0.183	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.937	0.723	0.802	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.882	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.19	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.542	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.363	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.65	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.404	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.992	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0565	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

Chloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	4	28	87.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	28	1	50	2.75	1	9.26
Statistics (Detects Only)	4	1.6	29	15.29	15.27	15.66
Statistics (All: NDs treated as DL value)	32	1	50	4.317	1	10.78
Statistics (All: NDs treated as DL/2 value)	32	0.5	29	3.114	0.5	8.016
Statistics (Normal ROS Estimated Data)	32	-144.3	29	-57.22	-57.69	43.06
Statistics (Gamma ROS Estimated Data)	32	0.000001	29	1.911	0.000001	7.08
Statistics (Lognormal ROS Estimated Data)	32	4.009E-07	29	1.944	0.00343	7.071

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.769	0.718	19.88	1.951	1.63	0.836
Statistics (NDs = DL)	0.568	0.536	7.598	0.366	1.051	2.869
Statistics (NDs = DL/2)	0.467	0.444	6.674	-0.24	1.201	-4.995
Statistics (Gamma ROS Estimates)	0.068	0.0824	28.11	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.627	4.5	-0.8

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.879	0.576	0.587	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.74	0.748	Data Not Normal
Lilliefors (Detects Only)	0.305	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.355	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.497	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.356	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.472	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0395	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.76	0.857	0.851	0.907

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.677	0.67	
Kolmogorov-Smirnov (Detects Only)	0.337	0.405	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	10.2	0.804	
Kolmogorov-Smirnov (NDs = DL)	0.505	0.164	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.811	0.818	
Kolmogorov-Smirnov (NDs = DL/2)	0.515	0.165	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.853	1.193	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.552	0.191	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.886	0.616	0.643	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.754	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.306	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.391	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.48	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.421	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.491	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.987	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0396	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

Chloroform

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	1	31	96.88%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Chloroform was not processed!

cis-1,2-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	15	17	53.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	1	50	4.412	1	11.95
Statistics (Detects Only)	15	1.08	3.25	1.955	1.93	0.727
Statistics (All: NDs treated as DL value)	32	1	50	3.26	1.08	8.687
Statistics (All: NDs treated as DL/2 value)	32	0.5	25	2.088	1.08	4.321
Statistics (Normal ROS Estimated Data)	32	-1.612	3.25	0.917	0.917	1.231
Statistics (Gamma ROS Estimated Data)	32	0.000001	3.25	0.972	0.602	1.069
Statistics (Lognormal ROS Estimated Data)	32	0.311	3.25	1.309	1.08	0.807

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.17	7.425	0.239	0.608	0.364	0.599
Statistics (NDs = DL)	0.839	0.782	3.884	0.479	0.816	1.703
Statistics (NDs = DL/2)	0.931	0.864	2.243	0.111	0.936	8.432
Statistics (Gamma ROS Estimates)	0.143	0.15	6.8	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.0911	0.613	6.732

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.96	0.491	0.575	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.905	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.164	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.275	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.438	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.367	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.357	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.984	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0449	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.735	0.79	0.76

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.345	0.738	
Kolmogorov-Smirnov (Detects Only)	0.122	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	6.155	0.783	
Kolmogorov-Smirnov (NDs = DL)	0.303	0.161	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.91	0.779	
Kolmogorov-Smirnov (NDs = DL/2)	0.24	0.16	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.862	0.928	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.293	0.174	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.786	0.898	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.111	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.637	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.809	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.274	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.979	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0938	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

Tetrachloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	25	7	21.88%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	1	50	9.286	1	18.26
Statistics (Detects Only)	25	1.07	16.8	6.994	5.13	4.616
Statistics (All: NDs treated as DL value)	32	1	50	7.495	4.905	9.054
Statistics (All: NDs treated as DL/2 value)	32	0.5	25	6.479	4.89	5.797
Statistics (Normal ROS Estimated Data)	32	-6.354	16.8	5.198	4.455	5.64
Statistics (Gamma ROS Estimated Data)	32	0.000001	16.8	5.766	4.455	4.815
Statistics (Lognormal ROS Estimated Data)	32	0.65	16.8	5.86	4.115	4.644

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.193	2.008	3.189	1.7	0.762	0.448
Statistics (NDs = DL)	1.155	1.067	6.491	1.522	1.026	0.674
Statistics (NDs = DL/2)	1.142	1.056	5.674	1.371	1.156	0.843
Statistics (Gamma ROS Estimates)	0.281	0.275	20.56	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.413	0.917	0.649

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.963	0.78	0.934	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.914	0.918	Data Not Normal
Lilliefors (Detects Only)	0.187	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.639	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.237	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.874	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.192	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.974	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.135	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.977	0.918	0.992	0.86

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.398	0.755	
Kolmogorov-Smirnov (Detects Only)	0.111	0.177	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.595	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.105	0.16	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.419	0.772	
Kolmogorov-Smirnov (NDs = DL/2)	0.101	0.16	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.788	0.863	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.381	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.972	0.962	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.116	0.177	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.935	0.93	Data Appear Lognormal
Lilliefors (NDs = DL)	0.131	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.908	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.141	0.157	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.947	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0997	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

Trichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	21	11	34.38%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	1	50	6.273	1	14.75
Statistics (Detects Only)	21	1.2	23.4	9.332	7.45	6.257
Statistics (All: NDs treated as DL value)	32	1	50	8.28	5.48	9.881
Statistics (All: NDs treated as DL/2 value)	32	0.5	25	7.202	5.2	7.194
Statistics (Normal ROS Estimated Data)	32	-12.9	23.4	4.72	4.612	8.685
Statistics (Gamma ROS Estimated Data)	32	0.000001	23.4	6.295	4.74	6.644
Statistics (Lognormal ROS Estimated Data)	32	0.492	23.4	6.703	4.4	6.263

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.1	1.924	4.444	1.977	0.796	0.403
Statistics (NDs = DL)	0.935	0.868	8.857	1.491	1.193	0.8
Statistics (NDs = DL/2)	0.82	0.764	8.78	1.253	1.411	1.126
Statistics (Gamma ROS Estimates)	0.171	0.176	36.74	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.42	1.068	0.752

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.837	0.929	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.928	0.908	Data Appear Normal
Lilliefors (Detects Only)	0.147	0.193	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.72	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.231	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.849	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.176	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.986	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0656	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.971	0.971	0.842

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.195	0.753	
Kolmogorov-Smirnov (Detects Only)	0.1	0.192	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.912	0.779	
Kolmogorov-Smirnov (NDs = DL)	0.164	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.972	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.182	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.028	0.913	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.315	0.173	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.955	0.94	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.908	Data Appear Lognormal
Lilliefors (Detects Only)	0.112	0.193	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.893	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.176	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.857	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.197	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.96	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0878	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 2 Groundwater
MP Facility, Boise, Idaho

Vinyl Chloride

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	6	26	81.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	1	50	3.231	1	9.701
Statistics (Detects Only)	6	1.81	7.59	3.803	3.035	2.225
Statistics (All: NDs treated as DL value)	32	1	50	3.338	1	8.76
Statistics (All: NDs treated as DL/2 value)	32	0.5	25	2.026	0.5	4.53
Statistics (Normal ROS Estimated Data)	32	-16.06	7.59	-4.516	-4.553	5.634
Statistics (Gamma ROS Estimated Data)	32	0.000001	7.59	0.713	0.000001	1.753
Statistics (Lognormal ROS Estimated Data)	32	0.0232	7.59	1.037	0.413	1.648

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.967	3.616	0.959	1.205	0.551	0.457
Statistics (NDs = DL)	0.761	0.71	4.388	0.42	0.901	2.146
Statistics (NDs = DL/2)	0.71	0.665	2.851	-0.143	1.048	-7.323
Statistics (Gamma ROS Estimates)	0.0784	0.0919	9.094	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.875	1.408	-1.609

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.514	0.597	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.875	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.267	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.299	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.395	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.39	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.382	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.992	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0568	0.157	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.774	0.858	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.311	0.7	
Kolmogorov-Smirnov (Detects Only)	0.223	0.334	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.224	0.787	
Kolmogorov-Smirnov (NDs = DL)	0.43	0.162	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.425	0.791	
Kolmogorov-Smirnov (NDs = DL/2)	0.453	0.162	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	8.169	1.114	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.516	0.186	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.734	0.769	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.188	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.554	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.429	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.596	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.45	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.99	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0519	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 2 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1,1,1-Trichloroethane

General Statistics			
Number of Valid Data	32	Number of Detected Data	26
Number of Distinct Detected Data	26	Number of Non-Detect Data	6
		Percent Non-Detects	18.75%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.44	Minimum Detected	1.694
Maximum Detected	166	Maximum Detected	5.112
Mean of Detected	51.06	Mean of Detected	3.443
SD of Detected	44.83	SD of Detected	1.122
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	22
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	68.75%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.92	5% Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	42.49	Mean	2.862
SD	44.33	SD	1.727
95% DL/2 (t) UCL	55.78	95% H-Stat (DL/2) UCL	224.6
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	16.89	Mean in Log Scale	3.049
SD	70.35	SD in Log Scale	1.341
95% MLE (t) UCL	37.98	Mean in Original Scale	42.4
95% MLE (Tiku) UCL	52.22	SD in Original Scale	44.26
		95% t UCL	55.67
		95% Percentile Bootstrap UCL	55.2
		95% BCA Bootstrap UCL	57.05
		95% H UCL	103.5
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.051	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	48.59		
nu star	54.65		
A-D Test Statistic	0.551	**Nonparametric Statistics**	
5% A-D Critical Value	0.77	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.77	Mean	42.93
5% K-S Critical Value	0.176	SD	43.22
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	7.808
		95% KM (t) UCL	56.17
Assuming Gamma Distribution		95% KM (z) UCL	55.77
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	56.12
Minimum	0.000001	95% KM (bootstrap t) UCL	59.02
Maximum	166	95% KM (BCA) UCL	56.87
Mean	41.83	95% KM (Percentile Bootstrap) UCL	56.15
Median	27.6	95% KM (Chebyshev) UCL	76.96
SD	44.79	97.5% KM (Chebyshev) UCL	91.69
k star	0.236	99% KM (Chebyshev) UCL	120.6
Theta star	177.4		
Nu star	15.09	**Potential UCLs to Use**	
AppChi2	7.324	95% KM (BCA) UCL	56.87
95% Gamma Approximate UCL (Use when n >= 40)	86.18		
95% Adjusted Gamma UCL (Use when n < 40)	89.72		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1,2-Trichloroethane

General Statistics			
Number of Valid Data	32	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	30
		Percent Non-Detects	93.75%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.22	Minimum Detected	0.199
Maximum Detected	1.96	Maximum Detected	0.673
Mean of Detected	1.59	Mean of Detected	0.436
SD of Detected	0.523	SD of Detected	0.335
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.474	Mean	-0.428
SD	4.373	SD	0.824
95% DL/2 (t) UCL	2.785	95% H-Stat (DL/2) UCL	1.273
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.245
5% K-S Critical Value	N/A	SD	0.133
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0343
		95% KM (t) UCL	1.303
Assuming Gamma Distribution		95% KM (z) UCL	1.301
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.728
Minimum	N/A	95% KM (bootstrap t) UCL	1.247
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	1.394
SD	N/A	97.5% KM (Chebyshev) UCL	1.459
k star	N/A	99% KM (Chebyshev) UCL	1.586
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.303
95% Gamma Approximate UCL (Use when n >= 40)	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL (Use when n < 40)	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics			
Number of Valid Data	32	Number of Detected Data	31
Number of Distinct Detected Data	29	Number of Non-Detect Data	1
		Percent Non-Detects	3.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.32	Minimum Detected	0.842
Maximum Detected	366	Maximum Detected	5.903
Mean of Detected	82.71	Mean of Detected	3.658
SD of Detected	80.64	SD of Detected	1.576
Minimum Non-Detect	50	Minimum Non-Detect	3.912
Maximum Non-Detect	50	Maximum Non-Detect	3.912

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.852	Shapiro Wilk Test Statistic	0.843
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	80.9	Mean	3.644
SD	79.98	SD	1.552
95% DL/2 (t) UCL	104.9	95% H-Stat (DL/2) UCL	308.1
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	71.31	Mean in Log Scale	3.609
SD	92.57	SD in Log Scale	1.574
95% MLE (t) UCL	99.06	Mean in Original Scale	80.38
95% MLE (Tiku) UCL	101.2	SD in Original Scale	80.41
		95% t UCL	104.5
		95% Percentile Bootstrap UCL	103.3
		95% BCA Bootstrap UCL	105.9
		95% H UCL	314.8
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.731	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	113.1		
nu star	45.32		
A-D Test Statistic	1.05	**Nonparametric Statistics**	
5% A-D Critical Value	0.786	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.786	Mean	80.43
5% K-S Critical Value	0.164	SD	79.14
Data not Gamma Distributed at 5% Significance Level		SE of Mean	14.23
		95% KM (t) UCL	104.6
Assuming Gamma Distribution		95% KM (z) UCL	103.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	104.5
Minimum	0.000001	95% KM (bootstrap t) UCL	109.8
Maximum	366	95% KM (BCA) UCL	105.9
Mean	80.12	95% KM (Percentile Bootstrap) UCL	104.4
Median	60.55	95% KM (Chebyshev) UCL	142.5
SD	80.66	97.5% KM (Chebyshev) UCL	169.3
k star	0.474	99% KM (Chebyshev) UCL	222
Theta star	169.2		
Nu star	30.31	**Potential UCLs to Use**	
AppChi2	18.74	99% KM (Chebyshev) UCL	222
95% Gamma Approximate UCL (Use when n >= 40)	129.6		
95% Adjusted Gamma UCL (Use when n < 40)	133.1		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics			
Number of Valid Data	32	Number of Detected Data	31
Number of Distinct Detected Data	30	Number of Non-Detect Data	1
		Percent Non-Detects	3.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.52	Minimum Detected	0.924
Maximum Detected	283	Maximum Detected	5.645
Mean of Detected	56.05	Mean of Detected	3.557
SD of Detected	57.16	SD of Detected	1.07
Minimum Non-Detect	50	Minimum Non-Detect	3.912
Maximum Non-Detect	50	Maximum Non-Detect	3.912

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.746	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	55.08	Mean	3.547
SD	56.49	SD	1.054
95% DL/2 (t) UCL	72.01	95% H-Stat (DL/2) UCL	96.99
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	38.15	Mean in Log Scale	3.533
SD	74.96	SD in Log Scale	1.061
95% MLE (t) UCL	60.62	Mean in Original Scale	54.8
95% MLE (Tiku) UCL	66.14	SD in Original Scale	56.67
		95% t UCL	71.78
		95% Percentile Bootstrap UCL	72.51
		95% BCA Bootstrap UCL	76.51
		95% H UCL	96.88

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.111	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	50.45		
nu star	68.87		
A-D Test Statistic	0.61	**Nonparametric Statistics**	
5% A-D Critical Value	0.771	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.771	Mean	54.89
5% K-S Critical Value	0.162	SD	55.76
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	10.03
		95% KM (t) UCL	71.9
Assuming Gamma Distribution		95% KM (z) UCL	71.39
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	71.89
Minimum	2.52	95% KM (bootstrap t) UCL	83.31
Maximum	283	95% KM (BCA) UCL	71.43
Mean	54.8	95% KM (Percentile Bootstrap) UCL	71.93
Median	48.85	95% KM (Chebyshev) UCL	98.61
SD	56.67	97.5% KM (Chebyshev) UCL	117.5
k star	1.11	99% KM (Chebyshev) UCL	154.7
Theta star	49.35		
Nu star	71.07	**Potential UCLs to Use**	
AppChi2	52.66	95% KM (Chebyshev) UCL	98.61
95% Gamma Approximate UCL (Use when n >= 40)	73.96		
95% Adjusted Gamma UCL (Use when n < 40)	75.17		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics			
Number of Valid Data	32	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	24
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.3	Minimum Detected	0.262
Maximum Detected	6.54	Maximum Detected	1.878
Mean of Detected	2.529	Mean of Detected	0.782
SD of Detected	1.724	SD of Detected	0.535
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.722	Shapiro Wilk Test Statistic	0.882
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.913	Mean	-0.13
SD	4.437	SD	0.982
95% DL/2 (t) UCL	3.243	95% H-Stat (DL/2) UCL	2.174
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.768
		SD in Log Scale	1.191
		Mean in Original Scale	0.907
		SD in Original Scale	1.274
		95% t UCL	1.289
		95% Percentile Bootstrap UCL	1.3
		95% BCA Bootstrap UCL	1.42
		95% H-UCL	1.668

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.328	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	1.086		
nu star	37.24		
A-D Test Statistic	0.567	**Nonparametric Statistics**	
5% A-D Critical Value	0.72	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.72	Mean	1.628
5% K-S Critical Value	0.296	SD	0.994
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.194
		95% KM (t) UCL	1.957
Assuming Gamma Distribution		95% KM (z) UCL	1.947
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.929
Minimum	0.000001	95% KM (bootstrap t) UCL	2.423
Maximum	6.54	95% KM (BCA) UCL	2.255
Mean	0.632	95% KM (Percentile Bootstrap) UCL	2.072
Median	0.000001	95% KM (Chebyshev) UCL	2.474
SD	1.382	97.5% KM (Chebyshev) UCL	2.84
k star	0.0981	99% KM (Chebyshev) UCL	3.559
Theta star	6.442		
Nu star	6.28	**Potential UCLs to Use**	
AppChi2	1.785	95% KM (t) UCL	1.957
95% Gamma Approximate UCL (Use when n >= 40)	2.225		
95% Adjusted Gamma UCL (Use when n < 40)	2.392		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroethane

General Statistics			
Number of Valid Data	32	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	28
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.6	Minimum Detected	0.47
Maximum Detected	29	Maximum Detected	3.367
Mean of Detected	15.29	Mean of Detected	1.951
SD of Detected	15.66	SD of Detected	1.63
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.74	Shapiro Wilk Test Statistic	0.754
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.114	Mean	-0.24
SD	8.016	SD	1.201
95% DL/2 (t) UCL	5.516	95% H-Stat (DL/2) UCL	2.882
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-5.627
		SD in Log Scale	4.5
		Mean in Original Scale	1.944
		SD in Original Scale	7.071
		95% t UCL	4.064
		95% Percentile Bootstrap UCL	3.887
		95% BCA Bootstrap UCL	5.539
		95% H-UCL	53231
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.359	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	42.59		
nu star	2.871		
A-D Test Statistic	0.677	**Nonparametric Statistics**	
5% A-D Critical Value	0.67	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.67	Mean	3.366
5% K-S Critical Value	0.405	SD	6.693
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	1.388
		95% KM (t) UCL	5.719
Assuming Gamma Distribution		95% KM (z) UCL	5.649
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.276
Minimum	0.000001	95% KM (bootstrap t) UCL	4.713
Maximum	29	95% KM (BCA) UCL	29
Mean	1.911	95% KM (Percentile Bootstrap) UCL	28.72
Median	0.000001	95% KM (Chebyshev) UCL	9.416
SD	7.08	97.5% KM (Chebyshev) UCL	12.03
k star	0.0824	99% KM (Chebyshev) UCL	17.18
Theta star	23.18		
Nu star	5.276	**Potential UCLs to Use**	
AppChi2	1.282	95% KM (t) UCL	5.719
95% Gamma Approximate UCL (Use when n >= 40)	7.864		
95% Adjusted Gamma UCL (Use when n < 40)	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroform			
General Statistics			
Number of Valid Data	32	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	31
		Percent Non-Detects	96.88%
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!			
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)			
The data set for variable Chloroform was not processed!			

cis-1,2-Dichloroethene

General Statistics			
Number of Valid Data	32	Number of Detected Data	15
Number of Distinct Detected Data	13	Number of Non-Detect Data	17
		Percent Non-Detects	53.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.08	Minimum Detected	0.077
Maximum Detected	3.25	Maximum Detected	1.179
Mean of Detected	1.955	Mean of Detected	0.608
SD of Detected	0.727	SD of Detected	0.364
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.088	Mean	0.111
SD	4.321	SD	0.936
95% DL/2 (t) UCL	3.384	95% H-Stat (DL/2) UCL	2.575
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.0911
		SD in Log Scale	0.613
		Mean in Original Scale	1.309
		SD in Original Scale	0.807
		95% t UCL	1.55
		95% Percentile Bootstrap UCL	1.542
		95% BCA Bootstrap UCL	1.591
		95% H-UCL	1.652
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	6.581	**Data appear Normal at 5% Significance Level**	
Theta Star	0.297		
nu star	197.4		
A-D Test Statistic	0.345	**Nonparametric Statistics**	
5% A-D Critical Value	0.738	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.738	Mean	1.518
5% K-S Critical Value	0.222	SD	0.662
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.125
		95% KM (t) UCL	1.73
Assuming Gamma Distribution		95% KM (z) UCL	1.723
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.726
Minimum	0.000001	95% KM (bootstrap t) UCL	1.797
Maximum	3.25	95% KM (BCA) UCL	1.805
Mean	0.972	95% KM (Percentile Bootstrap) UCL	1.779
Median	0.602	95% KM (Chebyshev) UCL	2.063
SD	1.069	97.5% KM (Chebyshev) UCL	2.299
k star	0.15	99% KM (Chebyshev) UCL	2.762
Theta star	6.464		
Nu star	9.625	**Potential UCLs to Use**	
AppChi2	3.709	95% KM (t) UCL	1.73
95% Gamma Approximate UCL (Use when n >= 40)	2.523	95% KM (Percentile Bootstrap) UCL	1.779
95% Adjusted Gamma UCL (Use when n < 40)	2.663		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics			
Number of Valid Data	32	Number of Detected Data	25
Number of Distinct Detected Data	24	Number of Non-Detect Data	7
		Percent Non-Detects	21.88%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.07	Minimum Detected	0.0677
Maximum Detected	16.8	Maximum Detected	2.821
Mean of Detected	6.994	Mean of Detected	1.7
SD of Detected	4.616	SD of Detected	0.762
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.479	Mean	1.371
SD	5.797	SD	1.156
95% DL/2 (t) UCL	8.217	95% H-Stat (DL/2) UCL	13.24
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	1.413
		SD in Log Scale	0.917
		Mean in Original Scale	5.86
		SD in Original Scale	4.644
		95% t UCL	7.252
		95% Percentile Bootstrap UCL	7.243
		95% BCA Bootstrap UCL	7.326
		95% H-UCL	9.19
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.957	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	3.574		
nu star	97.83		
A-D Test Statistic	0.398	**Nonparametric Statistics**	
5% A-D Critical Value	0.755	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.755	Mean	5.944
5% K-S Critical Value	0.177	SD	4.646
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.857
		95% KM (t) UCL	7.397
Assuming Gamma Distribution		95% KM (z) UCL	7.353
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.385
Minimum	0.000001	95% KM (bootstrap t) UCL	7.503
Maximum	16.8	95% KM (BCA) UCL	7.354
Mean	5.766	95% KM (Percentile Bootstrap) UCL	7.405
Median	4.455	95% KM (Chebyshev) UCL	9.679
SD	4.815	97.5% KM (Chebyshev) UCL	11.29
k star	0.275	99% KM (Chebyshev) UCL	14.47
Theta star	20.96		
Nu star	17.6	**Potential UCLs to Use**	
AppChi2	9.105	95% KM (BCA) UCL	7.354
95% Gamma Approximate UCL (Use when n >= 40)	11.15		
95% Adjusted Gamma UCL (Use when n < 40)	11.56		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics			
Number of Valid Data	32	Number of Detected Data	21
Number of Distinct Detected Data	20	Number of Non-Detect Data	11
		Percent Non-Detects	34.38%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	23.4	Maximum Detected	3.153
Mean of Detected	9.332	Mean of Detected	1.977
SD of Detected	6.257	SD of Detected	0.796
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.959
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.202	Mean	1.253
SD	7.194	SD	1.411
95% DL/2 (t) UCL	9.358	95% H-Stat (DL/2) UCL	20.1
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	1.42
		SD in Log Scale	1.068
		Mean in Original Scale	6.703
		SD in Original Scale	6.263
		95% t UCL	8.581
		95% Percentile Bootstrap UCL	8.594
		95% BCA Bootstrap UCL	8.871
		95% H-UCL	11.85
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.832	**Data appear Normal at 5% Significance Level**	
Theta Star	5.095		
nu star	76.93		
A-D Test Statistic	0.195	**Nonparametric Statistics**	
5% A-D Critical Value	0.753	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.753	Mean	6.784
5% K-S Critical Value	0.192	SD	6.267
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.157
		95% KM (t) UCL	8.746
Assuming Gamma Distribution		95% KM (z) UCL	8.687
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.607
Minimum	0.000001	95% KM (bootstrap t) UCL	9.07
Maximum	23.4	95% KM (BCA) UCL	9.134
Mean	6.295	95% KM (Percentile Bootstrap) UCL	8.843
Median	4.74	95% KM (Chebyshev) UCL	11.83
SD	6.644	97.5% KM (Chebyshev) UCL	14.01
k star	0.176	99% KM (Chebyshev) UCL	18.3
Theta star	35.74		
Nu star	11.27	**Potential UCLs to Use**	
AppChi2	4.752	95% KM (t) UCL	8.746
95% Gamma Approximate UCL (Use when n >= 40)	14.93	95% KM (Percentile Bootstrap) UCL	8.843
95% Adjusted Gamma UCL (Use when n < 40)	15.68		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Vinyl Chloride

General Statistics			
Number of Valid Data	32	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	26
		Percent Non-Detects	81.25%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.81	Minimum Detected	0.593
Maximum Detected	7.59	Maximum Detected	2.027
Mean of Detected	3.803	Mean of Detected	1.205
SD of Detected	2.225	SD of Detected	0.551
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	50	Maximum Non-Detect	3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.026	Mean	-0.143
SD	4.53	SD	1.048
95% DL/2 (t) UCL	3.384	95% H-Stat (DL/2) UCL	2.397
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.875
		SD in Log Scale	1.408
		Mean in Original Scale	1.037
		SD in Original Scale	1.648
		95% t UCL	1.531
		95% Percentile Bootstrap UCL	1.565
		95% BCA Bootstrap UCL	1.702
		95% H-UCL	2.375

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.095	**Data appear Normal at 5% Significance Level**	
Theta Star	1.816		
nu star	25.14		
A-D Test Statistic	0.311	**Nonparametric Statistics**	
5% A-D Critical Value	0.7	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.7	Mean	2.209
5% K-S Critical Value	0.334	SD	1.209
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.242
		95% KM (t) UCL	2.619
Assuming Gamma Distribution		95% KM (z) UCL	2.606
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.536
Minimum	0.000001	95% KM (bootstrap t) UCL	3.033
Maximum	7.59	95% KM (BCA) UCL	5.28
Mean	0.713	95% KM (Percentile Bootstrap) UCL	3.258
Median	0.000001	95% KM (Chebyshev) UCL	3.262
SD	1.753	97.5% KM (Chebyshev) UCL	3.718
k star	0.0919	99% KM (Chebyshev) UCL	4.614
Theta star	7.76		
Nu star	5.882	**Potential UCLs to Use**	
AppChi2	1.58	95% KM (t) UCL	2.619
95% Gamma Approximate UCL (Use when n >= 40)	2.655	95% KM (Percentile Bootstrap) UCL	3.258
95% Adjusted Gamma UCL (Use when n < 40)	2.865		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Area 3

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	1,2-Dichloroethane	d_1,2-Dichloroethane	Chloroethane	d_Chloroethane
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
39.4	1	70.3	1	38.6	1	1	0	1	0
41.9	1	75.5	1	44.7	1	1	0	1	0
46.8	1	86.8	1	50	1	1	0	1	0
49.4	1	95.6	1	51.9	1	1	0	1	0
40.3	1	75.2	1	50.6	1	1	0	1	0
39.6	1	79	1	39.9	1	1	0	1	0
41.9	1	77.7	1	48.7	1	1	0	1	0
52.8	1	80.9	1	44.2	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
14	1	93.3	1	75.2	1	1.16	1	27.1	1
7.67	1	58.3	1	81.1	1	1.08	1	42.3	1
1.18	1	25.8	1	22.1	1	1	0	15.8	1
1	0	45.4	1	38.5	1	1	0	80	1
2.54	1	51.2	1	73.1	1	1	0	59.6	1
12.4	1	88.3	1	75.7	1	1.11	1	32.6	1
7.89	1	51.9	1	20.8	1	1	0	44.1	1
10.5	1	59.1	1	20.3	1	1	0	43.8	1

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	1,2-Dichloroethane	d_1,2-Dichloroethane	Chloroethane	d_Chloroethane
1.77	1	<1	0	2.34	1	1	0	1	0
2.28	1	1.11	1	2.31	1	1	0	1	0
2.92	1	1.23	1	3.64	1	1	0	1	0
3.04	1	1.16	1	3.51	1	1	0	1	0
4.02	1	1.53	1	5.42	1	1	0	1	0
3.26	1	1.49	1	4.01	1	1	0	1	0
3.12	1	1.59	1	4.69	1	1	0	1	0
3.41	1	1.52	1	4.05	1	1	0	1	0
33.2	1	81.2	1	39.1	1	1	0	1	0
32.2	1	79.3	1	42	1	1	0	1	0
25.8	1	65.5	1	32.1	1	1	0	1	0
20.7	1	61.2	1	27.1	1	1	0	1	0
22.3	1	61.1	1	36.2	1	1	0	1	0
24.9	1	72.5	1	35.1	1	1	0	1	0
16.1	1	54.7	1	25.8	1	1	0	1	0
18.4	1	51.9	1	23	1	1	0	1	0
9.42	1	18	1	8.49	1	1	0	1	0
11.8	1	23.3	1	12.8	1	1	0	1	0
2.97	1	5.29	1	3.44	1	1	0	1	0
17.3	1	34.2	1	21.5	1	1	0	1	0
11.5	1	23.1	1	14.6	1	1	0	1	0
6.22	1	15.6	1	6.09	1	1	0	1	0
17	1	39.9	1	24	1	1	0	1	0
13	1	28.8	1	14.2	1	1	0	1	0
33.2	1	68	1	37	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
21.1	1	44.6	1	24.9	1	1	0	1	0
26.8	1	59.5	1	35.8	1	1	0	1	0
26.3	1	63.2	1	32.3	1	1	0	1	0
19.2	1	51.6	1	30.2	1	1	0	1	0
18.4	1	45.3	1	21.5	1	1	0	1	0

Chloroform	d_Chloroform	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene	Tetrachloroethene	d_Tetrachloroethene	Trichloroethene	d_Trichloroethene	Vinyl Chloride	d_Vinyl Chloride
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.07	1	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.26	1	1.72	1	4.56	1	7.23	1	1	0
1.11	1	2.27	1	5.43	1	7.2	1	1	0
1	0	2.67	1	6.48	1	8.45	1	1	0
1	0	3.14	1	6.18	1	8.43	1	1	0
1	0	3.07	1	6.36	1	7.29	1	1	0
1.02	1	2.79	1	5.76	1	7.52	1	1	0
1.01	1	3.38	1	6.14	1	7.9	1	1	0
1	1	4.18	1	7.75	1	8.57	1	1	0
9.24	1	1	0	1	0	1	0	1	0
2.56	1	1	0	1	0	1	0	1	0
3.52	1	1	0	1	0	1	0	1	0
3.22	1	1	0	1	0	1	0	1	0
3.43	1	1	0	1	0	1	0	1	0
3.27	1	1	0	1	0	1	0	1	0
3.15	1	1	0	1	0	1	0	1	0
6.21	1	1	0	1	0	1	0	1	0
1	0	9.14	1	8.68	1	7.13	1	1	0
1	0	8.71	1	4.84	1	8.6	1	1.72	1
1	0	3.79	1	2.07	1	1.06	1	1	0
1	0	10.7	1	1	0	1	0	2.25	1
1	0	11	1	4.16	1	5.8	1	1	0
1	0	5.96	1	8.93	1	8.4	1	6.27	1
1	0	1.37	1	5.68	1	3.03	1	7.11	1
1	0	1.84	1	7.1	1	3.12	1	8.31	1

Chloroform	d_Chloroform	cis-1,2-Dichloroethene	d_cis-1,2-Dichloroethene	Tetrachloroethene	d_Tetrachloroethene	Trichloroethene	d_Trichloroethene	Vinyl Chloride	d_Vinyl Chloride
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.01	1	1	0	1	0	1	0	1	0
1.13	1	1	0	1	0	1	0	1	0
1.52	1	2.33	1	6.9	1	6.46	1	1	0
1.62	1	2.53	1	6.5	1	6.19	1	1	0
1.2	1	2.04	1	5.86	1	5.5	1	1	0
1.08	1	1.84	1	4.71	1	4.35	1	1	0
1	0	2.38	1	5.67	1	4.92	1	1	0
1	0	2.48	1	6.14	1	5.63	1	1	0
1	0	1.97	1	4.51	1	4.11	1	1	0
1.54	1	1.78	1	5.98	1	4.07	1	1	0
1.62	1	1	0	1.59	1	2.01	1	1	0
1.82	1	1	0	2.33	1	2.81	1	1	0
1	0	1	0	1	0	1	0	1	0
1	1	1	0	2.72	1	3.6	1	1	0
1	0	1	0	2.35	1	2.65	1	1	0
1.51	1	1	0	1.34	1	1.76	1	1	0
1.5	1	1.13	1	3.28	1	4.2	1	1	0
1.83	1	1	0	3.11	1	3.27	1	1	0
1.3	1	1.69	1	5.05	1	6.15	1	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.36	1	1.34	1	3.14	1	3.97	1	1	0
1	0	2.18	1	5.48	1	5.32	1	1	0
1.39	1	2.07	1	5.41	1	5.51	1	1	0
1.31	1	1.88	1	4.55	1	4.57	1	1	0
2.31	1	1.75	1	4.67	1	3.93	1	1	0

Area 3 Groundwater Raw Statistics
MP Facility
Boise, Idaho

From File: Area 3 - 8 events.wst

Summary Statistics for Raw Data Sets with NDs using Detected Data Only

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum (ug/l)	Mean	Median	SD	MAD/0.675	Skewness	CV
1,1,1-Trichloroethane	45	19	29.69%	1.18	52.8	19.11	17	14.83	15.98	0.657	0.776
1,1-Dichloroethane	45	18	28.57%	1.11	95.6	48.26	51.9	29.45	34.99	-0.33	0.61
1,1-Dichloroethene	46	18	28.13%	2.31	81.1	29.4	26.45	21	20.09	0.696	0.714
1,2-Dichloroethane	3	61	95.31%	1.08	1.16	1.117	1.11	0.0404	0.0445	0.722	0.0362
Chloroethane	8	56	87.50%	15.8	80	43.16	43.05	19.81	19.57	0.701	0.459
Chloroform	32	32	50.00%	1	9.24	2.098	1.505	1.717	0.608	2.914	0.819
cis-1,2-Dichloroethene	31	33	51.56%	1.13	11	3.391	2.33	2.736	0.86	1.942	0.807
Tetrachloroethene	36	28	43.75%	1.34	8.93	5.039	5.42	1.875	1.371	-0.151	0.372
Trichloroethene	36	28	43.75%	1.06	8.6	5.298	5.41	2.147	2.669	-0.0404	0.405
Vinyl Chloride	5	59	92.19%	1.72	8.31	5.132	6.27	2.969	3.024	-0.356	0.578

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 3 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	0.95

1,1,1-Trichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	45	19	29.69%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	19	1	1	1	1	0
Statistics (Detects Only)	45	1.18	52.8	19.11	17	14.83
Statistics (All: NDs treated as DL value)	64	1	52.8	13.73	7.78	14.94
Statistics (All: NDs treated as DL/2 value)	64	0.5	52.8	13.58	7.78	15.07
Statistics (Normal ROS Estimated Data)	64	-39.46	52.8	8.511	7.78	21.27
Statistics (Gamma ROS Estimated Data)	64	0.000001	52.8	13.44	7.78	15.2
Statistics (Lognormal ROS Estimated Data)	64	0.27	52.8	13.86	7.78	14.84

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.343	1.29	14.23	2.534	1.044	0.412
Statistics (NDs = DL)	0.718	0.695	19.12	1.782	1.457	0.818
Statistics (NDs = DL/2)	0.598	0.581	22.71	1.576	1.723	1.094
Statistics (Gamma ROS Estimates)	0.155	0.159	86.42	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.838	1.431	0.779

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.962	0.91	0.914	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.904	0.945	Data Not Normal
Lilliefors (Detects Only)	0.113	0.132	Data Appear Normal
Lilliefors (NDs = DL)	0.211	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.206	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0683	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.966	0.957	0.947	0.798

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.645	0.771	
Kolmogorov-Smirnov (Detects Only)	0.115	0.135	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.603	0.795	
Kolmogorov-Smirnov (NDs = DL)	0.168	0.116	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.3	0.807	
Kolmogorov-Smirnov (NDs = DL/2)	0.184	0.117	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.055	0.944	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.28	0.125	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.966	0.935	0.932	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.916	0.945	Data Not Lognormal
Lilliefors (Detects Only)	0.126	0.132	Data Appear Lognormal
Lilliefors (NDs = DL)	0.186	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.203	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.12	0.111	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 3 Groundwater
MP Facility, Boise, Idaho

1,1-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	1	63	45	18	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	1	1	1	1	0
Statistics (Detects Only)	45	1.11	95.6	48.26	51.9	29.45
Statistics (All: NDs treated as DL value)	63	1	95.6	34.76	28.8	32.84
Statistics (All: NDs treated as DL/2 value)	63	0.5	95.6	34.61	28.8	32.99
Statistics (Normal ROS Estimated Data)	63	-61.28	95.6	28.95	28.8	40.7
Statistics (Gamma ROS Estimated Data)	63	0.000001	95.6	34.47	28.8	33.14
Statistics (Lognormal ROS Estimated Data)	63	0.398	95.6	35.19	28.8	32.4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.092	1.051	44.18	3.353	1.431	0.427
Statistics (NDs = DL)	0.544	0.528	63.92	2.395	1.945	0.812
Statistics (NDs = DL/2)	0.475	0.463	72.83	2.197	2.202	1.002
Statistics (Gamma ROS Estimates)	0.151	0.154	228.6	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.6	1.743	0.671

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.97	0.925	0.926	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.915	0.945	Data Not Normal
Lilliefors (Detects Only)	0.118	0.132	Data Appear Normal
Lilliefors (NDs = DL)	0.241	0.112	Data Not Normal
Lilliefors (NDs = DL/2)	0.238	0.112	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.132	0.112	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.85	0.836	0.819	0.636

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.756	0.775	
Kolmogorov-Smirnov (Detects Only)	0.241	0.135	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.533	0.812	
Kolmogorov-Smirnov (NDs = DL)	0.247	0.118	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.244	0.822	
Kolmogorov-Smirnov (NDs = DL/2)	0.215	0.119	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.2	0.948	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.305	0.126	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.85	0.876	0.883	0.926

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.707	0.945	Data Not Lognormal
Lilliefors (Detects Only)	0.266	0.132	Data Not Lognormal
Lilliefors (NDs = DL)	0.236	0.112	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.227	0.112	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.214	0.112	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 3 Groundwater
MP Facility, Boise, Idaho

1,1-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	46	18	28.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	1	1	1	1	0
Statistics (Detects Only)	46	2.31	81.1	29.4	26.45	21
Statistics (All: NDs treated as DL value)	64	1	81.1	21.42	17.45	21.93
Statistics (All: NDs treated as DL/2 value)	64	0.5	81.1	21.27	17.45	22.06
Statistics (Normal ROS Estimated Data)	64	-51.34	81.1	15.36	17.45	29.61
Statistics (Gamma ROS Estimated Data)	64	0.000001	81.1	21.13	17.45	22.2
Statistics (Lognormal ROS Estimated Data)	64	0.589	81.1	21.87	17.45	21.51

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.484	1.424	19.82	3.008	1.014	0.337
Statistics (NDs = DL)	0.673	0.652	31.8	2.162	1.61	0.745
Statistics (NDs = DL/2)	0.571	0.554	37.28	1.967	1.883	0.958
Statistics (Gamma ROS Estimates)	0.16	0.162	132.5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.393	1.346	0.563

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.926	0.928	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.918	0.945	Data Not Normal
Lilliefors (Detects Only)	0.0985	0.131	Data Appear Normal
Lilliefors (NDs = DL)	0.195	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.192	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0662	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.95	0.939	0.798

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.083	0.768	
Kolmogorov-Smirnov (Detects Only)	0.139	0.133	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.756	0.8	
Kolmogorov-Smirnov (NDs = DL)	0.175	0.116	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.786	0.809	
Kolmogorov-Smirnov (NDs = DL/2)	0.186	0.117	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.21	0.941	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.286	0.125	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.926	0.917	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.879	0.945	Data Not Lognormal
Lilliefors (Detects Only)	0.197	0.131	Data Not Lognormal
Lilliefors (NDs = DL)	0.201	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.21	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.177	0.111	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 3 Groundwater
MP Facility, Boise, Idaho

1,2-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	3	61	95.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	61	1	1	1	1	0
Statistics (Detects Only)	3	1.08	1.16	1.117	1.11	0.0404
Statistics (All: NDs treated as DL value)	64	1	1.16	1.005	1	0.0259
Statistics (All: NDs treated as DL/2 value)	64	0.5	1.16	0.529	0.5	0.132
Statistics (Normal ROS Estimated Data)	64	0.382	1.16	0.762	0.761	0.169
Statistics (Gamma ROS Estimated Data)	64	0.000001	1.16	0.0523	0.000001	0.238
Statistics (Lognormal ROS Estimated Data)	64	0.58	1.16	0.823	0.813	0.125

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1151	1097	0.00097	0.11	0.0361	0.328
Statistics (NDs = DL)	1658	1580	0.0006065	0.00515	0.0243	4.713
Statistics (NDs = DL/2)	27.11	25.85	0.0195	-0.656	0.171	-0.261
Statistics (Gamma ROS Estimates)	0.0815	0.0881	0.642	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.206	0.151	-0.732

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.99	0.454	0.459	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.98	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.232	0.512	Data Appear Normal
Lilliefors (NDs = DL)	0.537	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.54	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0167	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.465	0.512	0.878

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	22.81	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.541	0.111	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	23.21	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.542	0.111	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	25.25	1.274	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.603	0.138	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.991	0.455	0.458	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.982	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.228	0.512	Data Appear Lognormal
Lilliefors (NDs = DL)	0.537	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.54	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0166	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	8	56	87.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	56	1	1	1	1	0
Statistics (Detects Only)	8	15.8	80	43.16	43.05	19.81
Statistics (All: NDs treated as DL value)	64	1	80	6.27	1	15.53
Statistics (All: NDs treated as DL/2 value)	64	0.5	80	5.833	0.5	15.68
Statistics (Normal ROS Estimated Data)	64	-175.9	80	-49.92	-50.3	56.01
Statistics (Gamma ROS Estimated Data)	64	0.000001	80	5.395	0.000001	15.83
Statistics (Lognormal ROS Estimated Data)	64	0.223	80	9.891	4.314	14.96

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.19	4.957	8.316	3.666	0.495	0.135
Statistics (NDs = DL)	0.466	0.455	13.45	0.458	1.233	2.691
Statistics (NDs = DL/2)	0.351	0.345	16.59	-0.148	1.462	-9.859
Statistics (Gamma ROS Estimates)	0.0642	0.0716	84.09	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.471	1.322	0.899

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.972	0.618	0.619	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.955	0.818	Data Appear Normal
Lilliefors (Detects Only)	0.231	0.313	Data Appear Normal
Lilliefors (NDs = DL)	0.508	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.508	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0283	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.91	0.929	0.928

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.212	0.719	
Kolmogorov-Smirnov (Detects Only)	0.172	0.295	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	19.74	0.824	
Kolmogorov-Smirnov (NDs = DL)	0.547	0.118	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	19.8	0.852	
Kolmogorov-Smirnov (NDs = DL/2)	0.55	0.12	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	19.74	1.543	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.554	0.148	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.633	0.632	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.965	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.189	0.313	Data Appear Lognormal
Lilliefors (NDs = DL)	0.52	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.52	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0354	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 3 Groundwater
MP Facility, Boise, Idaho

Chloroform

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	32	32	50.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	32	1	1	1	1	0
Statistics (Detects Only)	32	1	9.24	2.098	1.505	1.717
Statistics (All: NDs treated as DL value)	64	1	9.24	1.549	1	1.326
Statistics (All: NDs treated as DL/2 value)	64	0.5	9.24	1.299	0.75	1.449
Statistics (Normal ROS Estimated Data)	64	-5.791	9.24	0.0114	0.455	2.64
Statistics (Gamma ROS Estimated Data)	64	0.000001	9.24	1.049	0.5	1.603
Statistics (Lognormal ROS Estimated Data)	64	0.0967	9.24	1.263	0.89	1.476

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.798	2.677	0.75	0.552	0.559	1.013
Statistics (NDs = DL)	3.25	3.108	0.477	0.276	0.48	1.742
Statistics (NDs = DL/2)	1.652	1.585	0.786	-0.0708	0.74	-10.45
Statistics (Gamma ROS Estimates)	0.119	0.124	8.822	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.212	0.945	-4.454

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.786	0.673	0.755	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.637	0.93	Data Not Normal
Lilliefors (Detects Only)	0.281	0.157	Data Not Normal
Lilliefors (NDs = DL)	0.339	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.291	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.146	0.111	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.907	0.815	0.915	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.208	0.754	
Kolmogorov-Smirnov (Detects Only)	0.239	0.157	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	9.83	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.294	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.121	0.767	
Kolmogorov-Smirnov (NDs = DL/2)	0.283	0.113	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.639	0.973	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.342	0.126	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.923	0.802	0.901	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.85	0.93	Data Not Lognormal
Lilliefors (Detects Only)	0.205	0.157	Data Not Lognormal
Lilliefors (NDs = DL)	0.283	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.3	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0888	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

cis-1,2-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	31	33	51.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	33	1	1	1	1	0
Statistics (Detects Only)	31	1.13	11	3.391	2.33	2.736
Statistics (All: NDs treated as DL value)	64	1	11	2.158	1	2.24
Statistics (All: NDs treated as DL/2 value)	64	0.5	11	1.9	0.5	2.384
Statistics (Normal ROS Estimated Data)	64	-10.02	11	-0.237	-0.318	4.408
Statistics (Gamma ROS Estimated Data)	64	0.000001	11	1.643	0.000001	2.546
Statistics (Lognormal ROS Estimated Data)	64	0.112	11	1.95	1.119	2.365

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.496	2.389	1.359	1.008	0.607	0.602
Statistics (NDs = DL)	1.928	1.848	1.119	0.488	0.658	1.348
Statistics (NDs = DL/2)	1.115	1.073	1.704	0.131	0.953	7.298
Statistics (Gamma ROS Estimates)	0.112	0.117	14.64	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.143	1.038	7.264

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.826	0.747	0.786	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.682	0.929	Data Not Normal
Lilliefors (Detects Only)	0.278	0.159	Data Not Normal
Lilliefors (NDs = DL)	0.303	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.279	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.108	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.927	0.898	0.947	0.901

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.33	0.756	
Kolmogorov-Smirnov (Detects Only)	0.21	0.159	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.735	0.764	
Kolmogorov-Smirnov (NDs = DL)	0.271	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.382	0.777	
Kolmogorov-Smirnov (NDs = DL/2)	0.308	0.114	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.499	0.978	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.35	0.127	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.938	0.874	0.898	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.873	0.929	Data Not Lognormal
Lilliefors (Detects Only)	0.165	0.159	Data Not Lognormal
Lilliefors (NDs = DL)	0.287	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.322	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0811	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 3 Groundwater
MP Facility, Boise, Idaho

Tetrachloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	36	28	43.75%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	28	1	1	1	1	0
Statistics (Detects Only)	36	1.34	8.93	5.039	5.42	1.875
Statistics (All: NDs treated as DL value)	64	1	8.93	3.272	2.34	2.456
Statistics (All: NDs treated as DL/2 value)	64	0.5	8.93	3.053	2.34	2.665
Statistics (Normal ROS Estimated Data)	64	-3.629	8.93	2.96	2.359	2.948
Statistics (Gamma ROS Estimated Data)	64	0.000001	8.93	2.89	2.34	2.833
Statistics (Lognormal ROS Estimated Data)	64	0.683	8.93	3.583	2.53	2.201

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.921	5.654	0.851	1.53	0.458	0.299
Statistics (NDs = DL)	1.688	1.619	1.938	0.861	0.838	0.973
Statistics (NDs = DL/2)	1.03	0.992	2.965	0.558	1.163	2.086
Statistics (Gamma ROS Estimates)	0.148	0.151	19.54	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.072	0.666	0.622

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.987	0.913	0.916	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.966	0.935	Data Appear Normal
Lilliefors (Detects Only)	0.111	0.148	Data Appear Normal
Lilliefors (NDs = DL)	0.26	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.268	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.107	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.965	0.937	0.912	0.665

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.018	0.75	
Kolmogorov-Smirnov (Detects Only)	0.172	0.147	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.278	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.282	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.57	0.779	
Kolmogorov-Smirnov (NDs = DL/2)	0.292	0.115	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.84	0.95	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.289	0.125	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.948	0.896	0.884	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.895	0.935	Data Not Lognormal
Lilliefors (Detects Only)	0.201	0.148	Data Not Lognormal
Lilliefors (NDs = DL)	0.285	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.296	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.149	0.111	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Trichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	36	28	43.75%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	28	1	1	1	1	0
Statistics (Detects Only)	36	1.06	8.6	5.298	5.41	2.147
Statistics (All: NDs treated as DL value)	64	1	8.6	3.417	2.73	2.679
Statistics (All: NDs treated as DL/2 value)	64	0.5	8.6	3.199	2.73	2.884
Statistics (Normal ROS Estimated Data)	64	-4.726	8.6	2.894	2.73	3.401
Statistics (Gamma ROS Estimated Data)	64	0.000001	8.6	3.007	2.73	3.071
Statistics (Lognormal ROS Estimated Data)	64	0.586	8.6	3.687	2.73	2.465

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.105	4.876	1.038	1.566	0.494	0.315
Statistics (NDs = DL)	1.583	1.519	2.159	0.881	0.865	0.982
Statistics (NDs = DL/2)	0.988	0.952	3.237	0.578	1.188	2.057
Statistics (Gamma ROS Estimates)	0.138	0.142	21.83	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.062	0.729	0.686

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.986	0.911	0.916	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.935	Data Appear Normal
Lilliefors (Detects Only)	0.109	0.148	Data Appear Normal
Lilliefors (NDs = DL)	0.264	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.263	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0654	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.957	0.936	0.912	0.649

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.479	0.75	
Kolmogorov-Smirnov (Detects Only)	0.108	0.147	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.861	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.282	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.12	0.78	
Kolmogorov-Smirnov (NDs = DL/2)	0.29	0.115	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.67	0.958	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.302	0.126	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.899	0.888	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.915	0.935	Data Not Lognormal
Lilliefors (Detects Only)	0.118	0.148	Data Appear Lognormal
Lilliefors (NDs = DL)	0.283	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.295	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0953	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vinyl Chloride

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	64	0	64	5	59	92.19%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	59	1	1	1	1	0
Statistics (Detects Only)	5	1.72	8.31	5.132	6.27	2.969
Statistics (All: NDs treated as DL value)	64	1	8.31	1.323	1	1.345
Statistics (All: NDs treated as DL/2 value)	64	0.5	8.31	0.862	0.5	1.459
Statistics (Normal ROS Estimated Data)	64	-33.67	8.31	-12.53	-12.59	9.399
Statistics (Gamma ROS Estimated Data)	64	0.000001	8.31	0.401	0.000001	1.577
Statistics (Lognormal ROS Estimated Data)	64	0.0005209	8.31	0.572	0.0698	1.559

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.905	2.779	1.767	1.454	0.723	0.497
Statistics (NDs = DL)	3.165	3.027	0.418	0.114	0.433	3.815
Statistics (NDs = DL/2)	1.471	1.413	0.586	-0.525	0.609	-1.158
Statistics (Gamma ROS Estimates)	0.0721	0.0791	5.563	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.65	2.184	-0.824

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.948	0.494	0.506	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.249	0.396	Data Appear Normal
Lilliefors (NDs = DL)	0.517	0.111	Data Not Normal
Lilliefors (NDs = DL/2)	0.52	0.111	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0241	0.111	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.895	0.642	0.711	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.513	0.683	
Kolmogorov-Smirnov (Detects Only)	0.308	0.36	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	21.44	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.533	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	21.63	0.77	
Kolmogorov-Smirnov (NDs = DL/2)	0.547	0.114	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	22.8	1.421	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.583	0.143	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.523	0.539	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.84	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.302	0.396	Data Appear Lognormal
Lilliefors (NDs = DL)	0.525	0.111	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.53	0.111	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0269	0.111	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

	General UCL Statistics for Data Sets with Non-Detects		
User Selected Options			
From File	Area 3 - 8 events.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
1,1,1-Trichloroethane			
General Statistics			
Number of Valid Data	64	Number of Detected Data	45
Number of Distinct Detected Data	42	Number of Non-Detect Data	19
		Percent Non-Detects	29.69%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.18	Minimum Detected	0.166
Maximum Detected	52.8	Maximum Detected	3.967
Mean of Detected	19.11	Mean of Detected	2.534
SD of Detected	14.83	SD of Detected	1.044
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.916
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.58	Mean	1.576
SD	15.07	SD	1.723
95% DL/2 (t) UCL	16.73	95% H-Stat (DL/2) UCL	38.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.953	Mean in Log Scale	1.838
SD	19.52	SD in Log Scale	1.431
95% MLE (t) UCL	14.03	Mean in Original Scale	13.86
95% MLE (Tiku) UCL	14.26	SD in Original Scale	14.84
		95% t UCL	16.96
		95% Percentile Bootstrap UCL	16.94
		95% BCA Bootstrap UCL	17.22
		95% H UCL	26.79
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.268	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	15.07		
nu star	114.1		
A-D Test Statistic	0.645	**Nonparametric Statistics**	
5% A-D Critical Value	0.771	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.771	Mean	13.79
5% K-S Critical Value	0.135	SD	14.78
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.868
		95% KM (t) UCL	16.91
Assuming Gamma Distribution		95% KM (z) UCL	16.86
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.76
Minimum	0.000001	95% KM (bootstrap t) UCL	17.18
Maximum	52.8	95% KM (BCA) UCL	17.19
Mean	13.44	95% KM (Percentile Bootstrap) UCL	16.91
Median	7.78	95% KM (Chebyshev) UCL	21.93
SD	15.2	97.5% KM (Chebyshev) UCL	25.45
k star	0.159	99% KM (Chebyshev) UCL	32.37
Theta star	84.72		
Nu star	20.3	**Potential UCLs to Use**	
AppChi2	11.07	95% KM (Percentile Bootstrap) UCL	16.91
95% Gamma Approximate UCL (Use when n >= 40)	24.63		
95% Adjusted Gamma UCL (Use when n < 40)	24.99		
Note: DL/2 is not a recommended method.			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
For additional insight, the user may want to consult a statistician.			

1,1-Dichloroethane

General Statistics			
Number of Valid Data	63	Number of Detected Data	45
Number of Distinct Detected Data	44	Number of Non-Detect Data	18
Number of Missing Values	1	Percent Non-Detects	28.57%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.11	Minimum Detected	0.104
Maximum Detected	95.6	Maximum Detected	4.56
Mean of Detected	48.26	Mean of Detected	3.353
SD of Detected	29.45	SD of Detected	1.431
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.707
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	34.61	Mean	2.197
SD	32.99	SD	2.202
95% DL/2 (t) UCL	41.56	95% H-Stat (DL/2) UCL	251.7
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	27.26	Mean in Log Scale	2.6
SD	42.9	SD in Log Scale	1.743
95% MLE (t) UCL	36.28	Mean in Original Scale	35.19
95% MLE (Tiku) UCL	36.87	SD in Original Scale	32.4
		95% t UCL	42
		95% Percentile Bootstrap UCL	41.59
		95% BCA Bootstrap UCL	41.87
		95% H UCL	113.5
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.034	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	46.66		
nu star	93.08		
A-D Test Statistic	3.756	**Nonparametric Statistics**	
5% A-D Critical Value	0.775	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.775	Mean	34.79
5% K-S Critical Value	0.135	SD	32.55
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.147
		95% KM (t) UCL	41.71
Assuming Gamma Distribution		95% KM (z) UCL	41.61
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	41.68
Minimum	0.000001	95% KM (bootstrap t) UCL	42.01
Maximum	95.6	95% KM (BCA) UCL	41.73
Mean	34.47	95% KM (Percentile Bootstrap) UCL	41.72
Median	28.8	95% KM (Chebyshev) UCL	52.86
SD	33.14	97.5% KM (Chebyshev) UCL	60.69
k star	0.154	99% KM (Chebyshev) UCL	76.05
Theta star	223.5		
Nu star	19.43	**Potential UCLs to Use**	
AppChi2	10.43	95% KM (Chebyshev) UCL	52.86
95% Gamma Approximate UCL (Use when n >= 40)	64.2		
95% Adjusted Gamma UCL (Use when n < 40)	65.17		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics			
Number of Valid Data	64	Number of Detected Data	46
Number of Distinct Detected Data	45	Number of Non-Detect Data	18
		Percent Non-Detects	28.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.31	Minimum Detected	0.837
Maximum Detected	81.1	Maximum Detected	4.396
Mean of Detected	29.4	Mean of Detected	3.008
SD of Detected	21	SD of Detected	1.014
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Test Statistic	0.879
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.27	Mean	1.967
SD	22.06	SD	1.883
95% DL/2 (t) UCL	25.88	95% H-Stat (DL/2) UCL	84.01
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	16.41	Mean in Log Scale	2.393
SD	28.3	SD in Log Scale	1.346
95% MLE (t) UCL	22.31	Mean in Original Scale	21.87
95% MLE (Tiku) UCL	22.64	SD in Original Scale	21.51
		95% t UCL	26.36
		95% Percentile Bootstrap UCL	26.57
		95% BCA Bootstrap UCL	26.53
		95% H UCL	39.78
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.401	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	20.98		
nu star	128.9		
A-D Test Statistic	1.083	**Nonparametric Statistics**	
5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.768	Mean	21.78
5% K-S Critical Value	0.133	SD	21.41
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.706
		95% KM (t) UCL	26.3
Assuming Gamma Distribution		95% KM (z) UCL	26.24
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.28
Minimum	0.000001	95% KM (bootstrap t) UCL	26.79
Maximum	81.1	95% KM (BCA) UCL	26.13
Mean	21.13	95% KM (Percentile Bootstrap) UCL	26.51
Median	17.45	95% KM (Chebyshev) UCL	33.58
SD	22.2	97.5% KM (Chebyshev) UCL	38.68
k star	0.162	99% KM (Chebyshev) UCL	48.71
Theta star	130.1		
Nu star	20.8	**Potential UCLs to Use**	
AppChi2	11.44	95% KM (Chebyshev) UCL	33.58
95% Gamma Approximate UCL (Use when n >= 40)	38.42		
95% Adjusted Gamma UCL (Use when n < 40)	38.97		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics			
Number of Valid Data	64	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	61
		Percent Non-Detects	95.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.08	Minimum Detected	0.077
Maximum Detected	1.16	Maximum Detected	0.148
Mean of Detected	1.117	Mean of Detected	0.11
SD of Detected	0.0404	SD of Detected	0.0361
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.98	Shapiro Wilk Test Statistic	0.982
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.529	Mean	-0.656
SD	0.132	SD	0.171
95% DL/2 (t) UCL	0.556	95% H-Stat (DL/2) UCL	0.547
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.579	Mean in Log Scale	-0.206
SD	0.253	SD in Log Scale	0.151
95% MLE (t) UCL	0.632	Mean in Original Scale	0.823
95% MLE (Tiku) UCL	0.974	SD in Original Scale	0.125
		95% t UCL	0.849
		95% Percentile Bootstrap UCL	0.849
		95% BCA Bootstrap UCL	0.851
		95% H UCL	0.85

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.082
5% K-S Critical Value	N/A	SD	0.0105
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00161
		95% KM (t) UCL	1.084
Assuming Gamma Distribution		95% KM (z) UCL	1.084
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.101
Minimum	N/A	95% KM (bootstrap t) UCL	1.083
Maximum	N/A	95% KM (BCA) UCL	1.16
Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.16
Median	N/A	95% KM (Chebyshev) UCL	1.089
SD	N/A	97.5% KM (Chebyshev) UCL	1.092
k star	N/A	99% KM (Chebyshev) UCL	1.098
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.084
95% Gamma Approximate UCL (Use when n >= 40)	N/A	95% KM (Percentile Bootstrap) UCL	1.16
95% Adjusted Gamma UCL (Use when n < 40)	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroethane

General Statistics			
Number of Valid Data	64	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	56
		Percent Non-Detects	87.50%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	15.8	Minimum Detected	2.76
Maximum Detected	80	Maximum Detected	4.382
Mean of Detected	43.16	Mean of Detected	3.666
SD of Detected	19.81	SD of Detected	0.495
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.955	Shapiro Wilk Test Statistic	0.965
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.833	Mean	-0.148
SD	15.68	SD	1.462
95% DL/2 (t) UCL	9.105	95% H-Stat (DL/2) UCL	3.911
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.471
		SD in Log Scale	1.322
		Mean in Original Scale	9.891
		SD in Original Scale	14.96
		95% t UCL	13.01
		95% Percentile Bootstrap UCL	13.23
		95% BCA Bootstrap UCL	13.75
		95% H-UCL	15.16

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.327	**Data appear Normal at 5% Significance Level**	
Theta Star	12.97		
nu star	53.23		
A-D Test Statistic	0.212	**Nonparametric Statistics**	
5% A-D Critical Value	0.719	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.719	Mean	19.22
5% K-S Critical Value	0.295	SD	11.17
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.493
		95% KM (t) UCL	21.71
Assuming Gamma Distribution		95% KM (z) UCL	21.68
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.09
Minimum	0.000001	95% KM (bootstrap t) UCL	22.03
Maximum	80	95% KM (BCA) UCL	43.25
Mean	5.395	95% KM (Percentile Bootstrap) UCL	35.59
Median	0.000001	95% KM (Chebyshev) UCL	25.73
SD	15.83	97.5% KM (Chebyshev) UCL	28.54
k star	0.0716	99% KM (Chebyshev) UCL	34.08
Theta star	75.39		
Nu star	9.161	**Potential UCLs to Use**	
AppChi2	3.424	95% KM (t) UCL	21.71
95% Gamma Approximate UCL (Use when n >= 40)	14.43	95% KM (Percentile Bootstrap) UCL	35.59
95% Adjusted Gamma UCL (Use when n < 40)	14.78		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics			
Number of Valid Data	64	Number of Detected Data	32
Number of Distinct Detected Data	29	Number of Non-Detect Data	32
		Percent Non-Detects	50.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	9.24	Maximum Detected	2.224
Mean of Detected	2.098	Mean of Detected	0.552
SD of Detected	1.717	SD of Detected	0.559
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.637	Shapiro Wilk Test Statistic	0.85
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.299	Mean	-0.0708
SD	1.449	SD	0.74
95% DL/2 (t) UCL	1.601	95% H-Stat (DL/2) UCL	1.481
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.637	Mean in Log Scale	-0.212
SD	2.112	SD in Log Scale	0.945
95% MLE (t) UCL	1.077	Mean in Original Scale	1.263
95% MLE (Tiku) UCL	1.187	SD in Original Scale	1.476
		95% t UCL	1.57
		95% Percentile Bootstrap UCL	1.592
		95% BCA Bootstrap UCL	1.696
		95% H UCL	1.646

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.557	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.82		
nu star	163.6		
A-D Test Statistic	2.208	**Nonparametric Statistics**	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.754	Mean	1.549
5% K-S Critical Value	0.157	SD	1.315
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.167
		95% KM (t) UCL	1.828
Assuming Gamma Distribution		95% KM (z) UCL	1.823
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.825
Minimum	0.000001	95% KM (bootstrap t) UCL	2.079
Maximum	9.24	95% KM (BCA) UCL	1.851
Mean	1.049	95% KM (Percentile Bootstrap) UCL	1.829
Median	0.5	95% KM (Chebyshev) UCL	2.277
SD	1.603	97.5% KM (Chebyshev) UCL	2.592
k star	0.124	99% KM (Chebyshev) UCL	3.211
Theta star	8.477		
Nu star	15.84	**Potential UCLs to Use**	
AppChi2	7.847	95% KM (t) UCL	1.828
95% Gamma Approximate UCL (Use when n >= 40)	2.117	95% KM (% Bootstrap) UCL	1.829
95% Adjusted Gamma UCL (Use when n < 40)	2.152		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics			
Number of Valid Data	64	Number of Detected Data	31
Number of Distinct Detected Data	30	Number of Non-Detect Data	33
		Percent Non-Detects	51.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.13	Minimum Detected	0.122
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	3.391	Mean of Detected	1.008
SD of Detected	2.736	SD of Detected	0.607
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.682	Shapiro Wilk Test Statistic	0.873
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.9	Mean	0.131
SD	2.384	SD	0.953
95% DL/2 (t) UCL	2.398	95% H-Stat (DL/2) UCL	2.345
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.519	Mean in Log Scale	0.143
SD	3.757	SD in Log Scale	1.038
95% MLE (t) UCL	1.303	Mean in Original Scale	1.95
95% MLE (Tiku) UCL	1.508	SD in Original Scale	2.365
		95% t UCL	2.444
		95% Percentile Bootstrap UCL	2.483
		95% BCA Bootstrap UCL	2.596
		95% H UCL	2.657

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.276	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1.49		
nu star	141.1		
A-D Test Statistic	2.33	**Nonparametric Statistics**	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.756	Mean	2.225
5% K-S Critical Value	0.159	SD	2.188
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.278
		95% KM (t) UCL	2.689
Assuming Gamma Distribution		95% KM (z) UCL	2.682
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.622
Minimum	0.000001	95% KM (bootstrap t) UCL	2.811
Maximum	11	95% KM (BCA) UCL	2.892
Mean	1.643	95% KM (Percentile Bootstrap) UCL	2.798
Median	0.000001	95% KM (Chebyshev) UCL	3.437
SD	2.546	97.5% KM (Chebyshev) UCL	3.961
k star	0.117	99% KM (Chebyshev) UCL	4.991
Theta star	14		
Nu star	15.02	**Potential UCLs to Use**	
AppChi2	7.276	95% KM (t) UCL	2.689
95% Gamma Approximate UCL (Use when n >= 40)	3.391	95% KM (% Bootstrap) UCL	2.798
95% Adjusted Gamma UCL (Use when n < 40)	3.45		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Tetrachloroethene			
General Statistics			
Number of Valid Data	64	Number of Detected Data	36
Number of Distinct Detected Data	35	Number of Non-Detect Data	28
		Percent Non-Detects	43.75%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.34	Minimum Detected	0.293
Maximum Detected	8.93	Maximum Detected	2.189
Mean of Detected	5.039	Mean of Detected	1.53
SD of Detected	1.875	SD of Detected	0.458
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Test Statistic	0.895
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.053	Mean	0.558
SD	2.665	SD	1.163
95% DL/2 (t) UCL	3.609	95% H-Stat (DL/2) UCL	4.78
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.053	Mean in Log Scale	1.072
SD	3.934	SD in Log Scale	0.666
95% MLE (t) UCL	2.874	Mean in Original Scale	3.583
95% MLE (Tiku) UCL	3.011	SD in Original Scale	2.201
		95% t UCL	4.042
		95% Percentile Bootstrap UCL	4.045
		95% BCA Bootstrap UCL	4.074
		95% H UCL	4.308
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	5.446	**Data appear Normal at 5% Significance Level**	
Theta Star	0.925		
nu star	392.1		
A-D Test Statistic	1.018	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	3.421
5% K-S Critical Value	0.147	SD	2.3
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.292
		95% KM (t) UCL	3.908
Assuming Gamma Distribution		95% KM (z) UCL	3.9
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.848
Minimum	0.000001	95% KM (bootstrap t) UCL	3.875
Maximum	8.93	95% KM (BCA) UCL	4.264
Mean	2.89	95% KM (Percentile Bootstrap) UCL	4.049
Median	2.34	95% KM (Chebyshev) UCL	4.692
SD	2.833	97.5% KM (Chebyshev) UCL	5.242
k star	0.151	99% KM (Chebyshev) UCL	6.322
Theta star	19.09		
Nu star	19.38	**Potential UCLs to Use**	
AppChi2	10.4	95% KM (t) UCL	3.908
95% Gamma Approximate UCL (Use when n >= 40)	5.388	95% KM (Percentile Bootstrap) UCL	4.049
95% Adjusted Gamma UCL (Use when n < 40)	5.468		
Note: DL/2 is not a recommended method.			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
For additional insight, the user may want to consult a statistician.			

Trichloroethene			
General Statistics			
Number of Valid Data	64	Number of Detected Data	36
Number of Distinct Detected Data	36	Number of Non-Detect Data	28
		Percent Non-Detects	43.75%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.06	Minimum Detected	0.0583
Maximum Detected	8.6	Maximum Detected	2.152
Mean of Detected	5.298	Mean of Detected	1.566
SD of Detected	2.147	SD of Detected	0.494
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.199	Mean	0.578
SD	2.884	SD	1.188
95% DL/2 (t) UCL	3.8	95% H-Stat (DL/2) UCL	5.051
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.084	Mean in Log Scale	1.062
SD	4.277	SD in Log Scale	0.729
95% MLE (t) UCL	2.977	Mean in Original Scale	3.687
95% MLE (Tiku) UCL	3.124	SD in Original Scale	2.465
		95% t UCL	4.201
		95% Percentile Bootstrap UCL	4.201
		95% BCA Bootstrap UCL	4.227
		95% H UCL	4.547
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	4.698	**Data appear Normal at 5% Significance Level**	
Theta Star	1.128		
nu star	338.3		
A-D Test Statistic	0.479	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	3.444
5% K-S Critical Value	0.147	SD	2.635
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.334
		95% KM (t) UCL	4.001
Assuming Gamma Distribution		95% KM (z) UCL	3.993
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.933
Minimum	0.000001	95% KM (bootstrap t) UCL	3.986
Maximum	8.6	95% KM (BCA) UCL	4.486
Mean	3.007	95% KM (Percentile Bootstrap) UCL	4.273
Median	2.73	95% KM (Chebyshev) UCL	4.899
SD	3.071	97.5% KM (Chebyshev) UCL	5.529
k star	0.142	99% KM (Chebyshev) UCL	6.767
Theta star	21.22		
Nu star	18.14	**Potential UCLs to Use**	
AppChi2	9.495	95% KM (t) UCL	4.001
95% Gamma Approximate UCL (Use when n >= 40)	5.747	95% KM (Percentile Bootstrap) UCL	4.273
95% Adjusted Gamma UCL (Use when n < 40)	5.835		
Note: DL/2 is not a recommended method.			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
For additional insight, the user may want to consult a statistician.			

Vinyl Chloride

General Statistics			
Number of Valid Data	64	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	59
		Percent Non-Detects	92.19%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.72	Minimum Detected	0.542
Maximum Detected	8.31	Maximum Detected	2.117
Mean of Detected	5.132	Mean of Detected	1.454
SD of Detected	2.969	SD of Detected	0.723
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.84
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.862	Mean	-0.525
SD	1.459	SD	0.609
95% DL/2 (t) UCL	1.166	95% H-Stat (DL/2) UCL	0.826
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.801	Mean in Log Scale	-2.65
SD	2.655	SD in Log Scale	2.184
95% MLE (t) UCL	6.355	Mean in Original Scale	0.572
95% MLE (Tiku) UCL	7.753	SD in Original Scale	1.559
		95% t UCL	0.897
		95% Percentile Bootstrap UCL	0.919
		95% BCA Bootstrap UCL	0.988
		95% H UCL	1.851

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.295	**Data appear Normal at 5% Significance Level**	
Theta Star	3.962		
nu star	12.95		
A-D Test Statistic	0.513	**Nonparametric Statistics**	
5% A-D Critical Value	0.683	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.683	Mean	1.987
5% K-S Critical Value	0.36	SD	1.179
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.165
		95% KM (t) UCL	2.262
Assuming Gamma Distribution		95% KM (z) UCL	2.258
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.357
Minimum	0.000001	95% KM (bootstrap t) UCL	2.268
Maximum	8.31	95% KM (BCA) UCL	7.129
Mean	0.401	95% KM (Percentile Bootstrap) UCL	6.36
Median	0.000001	95% KM (Chebyshev) UCL	2.705
SD	1.577	97.5% KM (Chebyshev) UCL	3.015
k star	0.0791	99% KM (Chebyshev) UCL	3.626
Theta star	5.068		
Nu star	10.13	**Potential UCLs to Use**	
AppChi2	4.021	95% KM (t) UCL	2.262
95% Gamma Approximate UCL (Use when n >= 40)	1.01	95% KM (Percentile Bootstrap) UCL	6.36
95% Adjusted Gamma UCL (Use when n < 40)	1.032		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Area 4

Area 4 Groundwater Input
MP Facility, Boise, Idaho

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	Chloroform	d_Chloroform	Tetrachloroethene	d_Tetrachloroethene
2.17	1	1.98	1	3.12	1	1	0	1.24	1
1.16	1	1.13	1	1.72	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.4	1	1.52	1	1.78	1	1	0	1	0
1	0	1	0	1.52	1	1	0	1	0
1	0	1	0	1	0	1.03	1	1	0
1	0	1.05	1	1.53	1	1	0	1	0
2.56	1	3.63	1	2.83	1	1	0	1	0
5.12	1	5.75	1	7.79	1	1	0	1.84	1
3.88	1	3.99	1	5.7	1	1	0	1.55	1
5.11	1	7.1	1	8.33	1	1	0	1.5	1
2.44	1	3.75	1	2.75	1	1	0	1	0
3.57	1	4.8	1	5.67	1	1	0	1.43	1
2.72	1	3.53	1	5.22	1	1	0	1.24	1
2.88	1	4.04	1	5.05	1	1	0	1.26	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.24	1	1.6	1	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1.75	1	1	0	1	0	1	0
1.01	1	1.77	1	1	0	1	0	1	0
1	0	1	0	1.28	1	1	0	1	0
2.49	1	3.31	1	2.18	1	1	0	1	0
1.44	1	1.85	1	1.94	1	1	0	1	0
2.63	1	3.77	1	3.9	1	1	0	1	0
1.48	1	2.03	1	1.93	1	1	0	1	0
1.59	1	2.63	1	2.5	1	1	0	1	0
1	0	1.46	1	1.04	1	1	0	1	0
3.24	1	6.05	1	4.8	1	1	0	1.06	1

1,1,1-Trichloroethane	d_1,1,1-Trichloroethane	1,1-Dichloroethane	d_1,1-Dichloroethane	1,1-Dichloroethene	d_1,1-Dichloroethene	Chloroform	d_Chloroform	Tetrachloroethene	d_Tetrachloroethene
1	0	1	0	1	0	10.6	1	1	0
1	0	1	0	1	0	4.77	1	1	0
1	0	1	0	1	0	1.88	1	1	0
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	1	0	1.78	1
1	0	1	0	1	0	1	0	1	0
1	0	1	0	1	0	3.35	1	1	0
4.17	1	4.39	1	5.52	1	1	0	1.66	1
1	0	1	0	1	0	1	0	1	0
3.29	1	3.55	1	4.05	1	1	0	1.46	1
1	0	1	0	1	0	1	0	1	0
2.23	1	2.5	1	2.44	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
1.72	1	3.23	1	3.29	1	1	0	1	0
1	0	1	0	1	0	1	0	1	0
2.64	1	2.51	1	2.8	1	1	0	1	0
2.35	1	2.78	1	1.85	1	1	0	1	0
2.93	1	3.27	1	3.09	1	1	0	1.24	1
2.35	1	2.74	1	2.47	1	1	0	1.15	1
2.58	1	3.25	1	3.12	1	1	0	1	1
1.98	1	2.62	1	2.59	1	1	0	1.04	1
1.78	1	3.17	1	3.06	1	1	0	1	0
1.4	1	1.63	1	1.39	1	1	0	1	0
						1	0		

Area 4 Groundwater Raw Statistics
MP Facility
Boise, Idaho

From File: Area 4 - 8 events.wst

Summary Statistics for Raw Data Sets with NDs using Detected Data Only

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum (ug/l)	Mean	Median	SD	MAD/0.675	Skewness	CV
1,1,1-Trichloroethane	31	24	43.64%	1.01	5.12	2.502	2.44	1.061	1.067	0.917	0.424
1,1-Dichloroethane	34	21	38.18%	1.05	7.1	3.063	2.975	1.416	1.438	0.951	0.462
1,1-Dichloroethene	33	22	40.00%	1.04	8.33	3.28	2.8	1.822	1.512	1.217	0.555
Chloroform	5	51	91.07%	1.03	10.6	4.326	3.35	3.787	2.179	1.501	0.875
Tetrachloroethene	15	40	72.73%	1	1.84	1.363	1.26	0.265	0.297	0.4	0.195

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 4 Groundwater
MP Facility, Boise, Idaho

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 4 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	0.95

1,1,1-Trichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	55	0	55	31	24	43.64%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	1	1	1	1	0
Statistics (Detects Only)	31	1.01	5.12	2.502	2.44	1.061
Statistics (All: NDs treated as DL value)	55	1	5.12	1.846	1.4	1.091
Statistics (All: NDs treated as DL/2 value)	55	0.5	5.12	1.628	1.4	1.276
Statistics (Normal ROS Estimated Data)	55	-2.492	5.12	1.284	1.4	1.716
Statistics (Gamma ROS Estimated Data)	55	0.000001	5.12	1.424	1.4	1.469
Statistics (Lognormal ROS Estimated Data)	55	0.33	5.12	1.769	1.4	1.167

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.077	5.758	0.412	0.832	0.42	0.505
Statistics (NDs = DL)	3.63	3.444	0.509	0.469	0.521	1.111
Statistics (NDs = DL/2)	1.707	1.626	0.954	0.167	0.825	4.951
Statistics (Gamma ROS Estimates)	0.147	0.151	9.685	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.359	0.67	1.868

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.965	0.889	0.917	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.923	0.929	Data Not Normal
Lilliefors (Detects Only)	0.128	0.159	Data Appear Normal
Lilliefors (NDs = DL)	0.233	0.119	Data Not Normal
Lilliefors (NDs = DL/2)	0.248	0.119	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0608	0.119	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.961	0.973	0.755

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.281	0.747	
Kolmogorov-Smirnov (Detects Only)	0.0787	0.158	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.896	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.26	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.523	0.766	
Kolmogorov-Smirnov (NDs = DL/2)	0.281	0.122	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	8.975	0.946	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.322	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.992	0.913	0.914	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.929	Data Appear Lognormal
Lilliefors (Detects Only)	0.102	0.159	Data Appear Lognormal
Lilliefors (NDs = DL)	0.265	0.119	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.288	0.119	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0975	0.119	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 4 Groundwater
MP Facility, Boise, Idaho

1,1-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	55	0	55	34	21	38.18%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	1	1	1	1	0
Statistics (Detects Only)	34	1.05	7.1	3.063	2.975	1.416
Statistics (All: NDs treated as DL value)	55	1	7.1	2.275	1.75	1.5
Statistics (All: NDs treated as DL/2 value)	55	0.5	7.1	2.084	1.75	1.675
Statistics (Normal ROS Estimated Data)	55	-3.106	7.1	1.697	1.75	2.183
Statistics (Gamma ROS Estimated Data)	55	0.000001	7.1	1.899	1.75	1.86
Statistics (Lognormal ROS Estimated Data)	55	0.377	7.1	2.245	1.75	1.536

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.012	4.75	0.611	1.016	0.468	0.461
Statistics (NDs = DL)	2.735	2.598	0.832	0.628	0.618	0.984
Statistics (NDs = DL/2)	1.493	1.424	1.396	0.364	0.915	2.516
Statistics (Gamma ROS Estimates)	0.157	0.161	12.09	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.575	0.709	1.233

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.966	0.91	0.931	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.931	0.933	Data Not Normal
Lilliefors (Detects Only)	0.103	0.152	Data Appear Normal
Lilliefors (NDs = DL)	0.198	0.119	Data Not Normal
Lilliefors (NDs = DL/2)	0.21	0.119	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0617	0.119	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.992	0.977	0.977	0.773

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.274	0.749	
Kolmogorov-Smirnov (Detects Only)	0.0897	0.151	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.957	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.221	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.843	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.25	0.122	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.488	0.939	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.342	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.992	0.931	0.924	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.976	0.933	Data Appear Lognormal
Lilliefors (Detects Only)	0.116	0.152	Data Appear Lognormal
Lilliefors (NDs = DL)	0.227	0.119	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.258	0.119	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.103	0.119	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 4 Groundwater
MP Facility, Boise, Idaho

1,1-Dichloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	55	0	55	33	22	40.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	1	1	1	1	0
Statistics (Detects Only)	33	1.04	8.33	3.28	2.8	1.822
Statistics (All: NDs treated as DL value)	55	1	8.33	2.368	1.72	1.799
Statistics (All: NDs treated as DL/2 value)	55	0.5	8.33	2.168	1.72	1.964
Statistics (Normal ROS Estimated Data)	55	-4.81	8.33	1.428	1.72	2.839
Statistics (Gamma ROS Estimated Data)	55	0.000001	8.33	1.968	1.72	2.144
Statistics (Lognormal ROS Estimated Data)	55	0.275	8.33	2.293	1.72	1.869

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.831	3.634	0.856	1.052	0.526	0.5
Statistics (NDs = DL)	2.317	2.203	1.022	0.631	0.659	1.044
Statistics (NDs = DL/2)	1.332	1.272	1.627	0.354	0.953	2.693
Statistics (Gamma ROS Estimates)	0.139	0.144	14.12	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.516	0.821	1.592

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.94	0.881	0.908	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.931	Data Not Normal
Lilliefors (Detects Only)	0.202	0.154	Data Not Normal
Lilliefors (NDs = DL)	0.224	0.119	Data Not Normal
Lilliefors (NDs = DL/2)	0.202	0.119	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0756	0.119	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.973	0.985	0.813

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.475	0.752	
Kolmogorov-Smirnov (Detects Only)	0.137	0.154	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.148	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.226	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.692	0.772	
Kolmogorov-Smirnov (NDs = DL/2)	0.253	0.123	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.329	0.951	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.338	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.992	0.929	0.929	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.975	0.931	Data Appear Lognormal
Lilliefors (Detects Only)	0.102	0.154	Data Appear Lognormal
Lilliefors (NDs = DL)	0.234	0.119	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.264	0.119	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0766	0.119	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 4 Groundwater
MP Facility, Boise, Idaho

Chloroform

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	56	0	56	5	51	91.07%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	51	1	1	1	1	0
Statistics (Detects Only)	5	1.03	10.6	4.326	3.35	3.787
Statistics (All: NDs treated as DL value)	56	1	10.6	1.297	1	1.4
Statistics (All: NDs treated as DL/2 value)	56	0.5	10.6	0.842	0.5	1.502
Statistics (Normal ROS Estimated Data)	56	-45.27	10.6	-18.13	-18.21	12.32
Statistics (Gamma ROS Estimated Data)	56	0.000001	10.6	0.386	0.000001	1.61
Statistics (Lognormal ROS Estimated Data)	56	2.447E-05	10.6	0.45	0.0151	1.6

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.782	1.699	2.427	1.159	0.889	0.768
Statistics (NDs = DL)	3.351	3.183	0.387	0.103	0.411	3.97
Statistics (NDs = DL/2)	1.553	1.481	0.542	-0.528	0.584	-1.107
Statistics (Gamma ROS Estimates)	0.0731	0.0811	5.284	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.172	2.925	-0.701

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.928	0.455	0.478	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.868	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.253	0.396	Data Appear Normal
Lilliefors (NDs = DL)	0.504	0.118	Data Not Normal
Lilliefors (NDs = DL/2)	0.501	0.118	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0293	0.118	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.995	0.601	0.685	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.204	0.685	
Kolmogorov-Smirnov (Detects Only)	0.162	0.361	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	18.57	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.517	0.12	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.14	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.535	0.121	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	19.21	1.345	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.576	0.15	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.998	0.513	0.553	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.995	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.125	0.396	Data Appear Lognormal
Lilliefors (NDs = DL)	0.51	0.118	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.522	0.118	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0211	0.118	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
Area 4 Groundwater
MP Facility, Boise, Idaho

Tetrachloroethene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	55	0	55	15	40	72.73%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	40	1	1	1	1	0
Statistics (Detects Only)	15	1	1.84	1.363	1.26	0.265
Statistics (All: NDs treated as DL value)	55	1	1.84	1.099	1	0.212
Statistics (All: NDs treated as DL/2 value)	55	0.5	1.84	0.735	0.5	0.411
Statistics (Normal ROS Estimated Data)	55	-0.632	1.84	0.645	0.638	0.581
Statistics (Gamma ROS Estimated Data)	55	0.000001	1.84	0.457	0.000001	0.609
Statistics (Lognormal ROS Estimated Data)	55	0.32	1.84	0.871	0.796	0.369

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	28.76	27.21	0.0474	0.292	0.193	0.661
Statistics (NDs = DL)	34.12	32.27	0.0322	0.0798	0.164	2.058
Statistics (NDs = DL/2)	4.43	4.201	0.166	-0.424	0.454	-1.069
Statistics (Gamma ROS Estimates)	0.119	0.125	3.837	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.223	0.417	-1.869

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.734	0.79	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.185	0.229	Data Appear Normal
Lilliefors (NDs = DL)	0.425	0.119	Data Not Normal
Lilliefors (NDs = DL/2)	0.444	0.119	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0472	0.119	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.778	0.875	0.721

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.309	0.735	
Kolmogorov-Smirnov (Detects Only)	0.172	0.221	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	11.53	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.432	0.12	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.73	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.453	0.12	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.633	0.966	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.353	0.136	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.745	0.786	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.954	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.158	0.229	Data Appear Lognormal
Lilliefors (NDs = DL)	0.432	0.119	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.45	0.119	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0533	0.119	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 4 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1,1,1-Trichloroethane

General Statistics			
Number of Valid Data	55	Number of Detected Data	31
Number of Distinct Detected Data	29	Number of Non-Detect Data	24
		Percent Non-Detects	43.64%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.01	Minimum Detected	0.00995
Maximum Detected	5.12	Maximum Detected	1.633
Mean of Detected	2.502	Mean of Detected	0.832
SD of Detected	1.061	SD of Detected	0.42
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.628	Mean	0.167
SD	1.276	SD	0.825
95% DL/2 (t) UCL	1.916	95% H-Stat (DL/2) UCL	2.113
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.299	Mean in Log Scale	0.359
SD	1.701	SD in Log Scale	0.67
95% MLE (t) UCL	1.683	Mean in Original Scale	1.769
95% MLE (Tiku) UCL	1.744	SD in Original Scale	1.167
		95% t UCL	2.032
		95% Percentile Bootstrap UCL	2.021
		95% BCA Bootstrap UCL	2.047
		95% H UCL	2.152
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	5.511	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.454		
nu star	341.7		
A-D Test Statistic	0.281	**Nonparametric Statistics**	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.747	Mean	1.851
5% K-S Critical Value	0.158	SD	1.077
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.148
		95% KM (t) UCL	2.098
Assuming Gamma Distribution		95% KM (z) UCL	2.094
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.064
Minimum	0.000001	95% KM (bootstrap t) UCL	2.118
Maximum	5.12	95% KM (BCA) UCL	2.214
Mean	1.424	95% KM (Percentile Bootstrap) UCL	2.144
Median	1.4	95% KM (Chebyshev) UCL	2.494
SD	1.469	97.5% KM (Chebyshev) UCL	2.773
k star	0.151	99% KM (Chebyshev) UCL	3.32
Theta star	9.422		
Nu star	16.63	**Potential UCLs to Use**	
AppChi2	8.405	95% KM (t) UCL	2.098
95% Gamma Approximate UCL (Use when n >= 40)	2.817		
95% Adjusted Gamma UCL (Use when n < 40)	2.871		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics			
Number of Valid Data	55	Number of Detected Data	34
Number of Distinct Detected Data	34	Number of Non-Detect Data	21
		Percent Non-Detects	38.18%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.05	Minimum Detected	0.0488
Maximum Detected	7.1	Maximum Detected	1.96
Mean of Detected	3.063	Mean of Detected	1.016
SD of Detected	1.416	SD of Detected	0.468
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.976
5% Shapiro Wilk Critical Value	0.933	5% Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.084	Mean	0.364
SD	1.675	SD	0.915
95% DL/2 (t) UCL	2.462	95% H-Stat (DL/2) UCL	2.885
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.699	Mean in Log Scale	0.575
SD	2.182	SD in Log Scale	0.709
95% MLE (t) UCL	2.191	Mean in Original Scale	2.245
95% MLE (Tiku) UCL	2.248	SD in Original Scale	1.536
		95% t UCL	2.592
		95% Percentile Bootstrap UCL	2.577
		95% BCA Bootstrap UCL	2.62
		95% H UCL	2.783

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.589	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.667		
nu star	312.1		
A-D Test Statistic	0.274	**Nonparametric Statistics**	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.749	Mean	2.294
5% K-S Critical Value	0.151	SD	1.47
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.201
		95% KM (t) UCL	2.631
Assuming Gamma Distribution		95% KM (z) UCL	2.625
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.608
Minimum	0.000001	95% KM (bootstrap t) UCL	2.63
Maximum	7.1	95% KM (BCA) UCL	2.777
Mean	1.899	95% KM (Percentile Bootstrap) UCL	2.675
Median	1.75	95% KM (Chebyshev) UCL	3.171
SD	1.86	97.5% KM (Chebyshev) UCL	3.55
k star	0.161	99% KM (Chebyshev) UCL	4.295
Theta star	11.82		
Nu star	17.67	**Potential UCLs to Use**	
AppChi2	9.155	95% KM (Percentile Bootstrap) UCL	2.675
95% Gamma Approximate UCL (Use when n >= 40)	3.667		
95% Adjusted Gamma UCL (Use when n < 40)	3.734		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics			
Number of Valid Data	55	Number of Detected Data	33
Number of Distinct Detected Data	32	Number of Non-Detect Data	22
		Percent Non-Detects	40.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.04	Minimum Detected	0.0392
Maximum Detected	8.33	Maximum Detected	2.12
Mean of Detected	3.28	Mean of Detected	1.052
SD of Detected	1.822	SD of Detected	0.526
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.975
5% Shapiro Wilk Critical Value	0.931	5% Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.168	Mean	0.354
SD	1.964	SD	0.953
95% DL/2 (t) UCL	2.611	95% H-Stat (DL/2) UCL	3.012
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.603	Mean in Log Scale	0.516
SD	2.654	SD in Log Scale	0.821
95% MLE (t) UCL	2.202	Mean in Original Scale	2.293
95% MLE (Tiku) UCL	2.278	SD in Original Scale	1.869
		95% t UCL	2.714
		95% Percentile Bootstrap UCL	2.73
		95% BCA Bootstrap UCL	2.736
		95% H UCL	2.981

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.503	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.936		
nu star	231.2		
A-D Test Statistic	0.475	**Nonparametric Statistics**	
5% A-D Critical Value	0.752	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.752	Mean	2.384
5% K-S Critical Value	0.154	SD	1.771
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.242
		95% KM (t) UCL	2.79
Assuming Gamma Distribution		95% KM (z) UCL	2.783
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.737
Minimum	0.000001	95% KM (bootstrap t) UCL	2.848
Maximum	8.33	95% KM (BCA) UCL	2.953
Mean	1.968	95% KM (Percentile Bootstrap) UCL	2.864
Median	1.72	95% KM (Chebyshev) UCL	3.441
SD	2.144	97.5% KM (Chebyshev) UCL	3.898
k star	0.144	99% KM (Chebyshev) UCL	4.797
Theta star	13.68		
Nu star	15.83	**Potential UCLs to Use**	
AppChi2	7.842	95% KM (t) UCL	2.79
95% Gamma Approximate UCL (Use when n >= 40)	3.973		
95% Adjusted Gamma UCL (Use when n < 40)	4.051		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Chloroform

General Statistics

Number of Valid Data	56	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	51
		Percent Non-Detects	91.07%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.03	Minimum Detected	0.0296
Maximum Detected	10.6	Maximum Detected	2.361
Mean of Detected	4.326	Mean of Detected	1.159
SD of Detected	3.787	SD of Detected	0.889
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.868	Shapiro Wilk Test Statistic	0.995
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.842	Mean	-0.528
SD	1.502	SD	0.584
95% DL/2 (t) UCL	1.177	95% H-Stat (DL/2) UCL	0.815
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.172
		SD in Log Scale	2.925
		Mean in Original Scale	0.45
		SD in Original Scale	1.6
		95% t UCL	0.808
		95% Percentile Bootstrap UCL	0.836
		95% BCA Bootstrap UCL	1.069
		95% H-UCL	8.832

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.846	**Data appear Normal at 5% Significance Level**	
Theta Star	5.112		
nu star	8.462		
A-D Test Statistic	0.204	**Nonparametric Statistics**	
5% A-D Critical Value	0.685	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.685	Mean	1.324
5% K-S Critical Value	0.361	SD	1.381
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.206
		95% KM (t) UCL	1.67
Assuming Gamma Distribution		95% KM (z) UCL	1.664
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.891
Minimum	0.000001	95% KM (bootstrap t) UCL	1.918
Maximum	10.6	95% KM (BCA) UCL	4.77
Mean	0.386	95% KM (Percentile Bootstrap) UCL	3.764
Median	0.000001	95% KM (Chebyshev) UCL	2.224
SD	1.61	97.5% KM (Chebyshev) UCL	2.613
k star	0.0811	99% KM (Chebyshev) UCL	3.377
Theta star	4.763		
Nu star	9.082	**Potential UCLs to Use**	
AppChi2	3.376	95% KM (t) UCL	1.67
95% Gamma Approximate UCL (Use when n >= 40)	1.039	95% KM (Percentile Bootstrap) UCL	3.764
95% Adjusted Gamma UCL (Use when n < 40)	1.068		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Tetrachloroethene

General Statistics			
Number of Valid Data	55	Number of Detected Data	15
Number of Distinct Detected Data	13	Number of Non-Detect Data	40
		Percent Non-Detects	72.73%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	1.84	Maximum Detected	0.61
Mean of Detected	1.363	Mean of Detected	0.292
SD of Detected	0.265	SD of Detected	0.193
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.954
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.735	Mean	-0.424
SD	0.411	SD	0.454
95% DL/2 (t) UCL	0.828	95% H-Stat (DL/2) UCL	0.813
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.666	Mean in Log Scale	-0.223
SD	0.565	SD in Log Scale	0.417
95% MLE (t) UCL	0.793	Mean in Original Scale	0.871
95% MLE (Tiku) UCL	0.903	SD in Original Scale	0.369
		95% t UCL	0.954
		95% Percentile Bootstrap UCL	0.95
		95% BCA Bootstrap UCL	0.962
		95% H UCL	0.968
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	23.05	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0591		
nu star	691.6		
A-D Test Statistic	0.309	**Nonparametric Statistics**	
5% A-D Critical Value	0.735	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.735	Mean	1.099
5% K-S Critical Value	0.221	SD	0.21
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0293
		95% KM (t) UCL	1.148
Assuming Gamma Distribution		95% KM (z) UCL	1.147
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.14
Minimum	0.000001	95% KM (bootstrap t) UCL	1.151
Maximum	1.84	95% KM (BCA) UCL	1.286
Mean	0.457	95% KM (Percentile Bootstrap) UCL	1.187
Median	0.000001	95% KM (Chebyshev) UCL	1.227
SD	0.609	97.5% KM (Chebyshev) UCL	1.282
k star	0.125	99% KM (Chebyshev) UCL	1.391
Theta star	3.664		
Nu star	13.73	**Potential UCLs to Use**	
AppChi2	6.386	95% KM (t) UCL	1.148
95% Gamma Approximate UCL (Use when n >= 40)	0.983	95% KM (Percentile Bootstrap) UCL	1.187
95% Adjusted Gamma UCL (Use when n < 40)	1.004		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Lakewood Pond in Area 4
(Represented by MW-44A)

1,1-Dichloroethane	d_1,1-Dichloroethane
2.51	1
2.78	1
3.27	1
2.74	1
3.25	1
2.62	1
3.17	1
1.63	1

MW-44A in Area 4 Groundwater Raw Statistics
MP Facility
Boise, Idaho

From File: Area 4 - 8 events.wst

Summary Statistics for Raw Dataset with NDs

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum (ug/L)	Mean	Median	SD	MAD/0.675	Skewness	CV
1,1-Dichloroethane	8	0	0.00%	1.63	3.27	2.746	2.76	0.538	0.489	-1.294	0.196

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
MW-44A in Area 4 Groundwater
MP Facility, Boise, Idaho

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 4 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	0.95

1,1-Dichloroethane

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	8	0	8	8	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	8	1.63	3.27	2.746	2.76	0.538

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	24.82	15.59	0.111	0.99	0.226	0.229

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.927	0.927	0.927	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.866	0.818	Data Appear Normal
Lilliefors (Full: no NDs)	0.205	0.313	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.9	0.9	0.9	0.9

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.599	0.716	
Kolmogorov-Smirnov (Full: no NDs)	0.229	0.294	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.889	0.889	0.889	0.889

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.804	0.818	Data Not Lognormal
Lilliefors (Full: no NDs)	0.254	0.313	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General UCL Statistics for Data Sets with Non-Detects
MW-44A in Area 4 Groundwater
MP Facility, Boise, Idaho

	General UCL Statistics for Data Sets with Non-Detects
User Selected Options	
From File	Area 4 - 8 events.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1,1-Dichloroethane

General Statistics

Number of Valid Observations	8	Number of Distinct Observations	8

Raw Statistics		**Log-transformed Statistics**	
Minimum	1.63	Minimum of Log Data	0.489
Maximum	3.27	Maximum of Log Data	1.185
Mean	2.746	Mean of log Data	0.99
Geometric Mean	2.691	SD of log Data	0.226
Median	2.76		
SD	0.538		
Std. Error of Mean	0.19		
Coefficient of Variation	0.196		
Skewness	-1.294		

Warning: There are only 8 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.804
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.107	95% H-UCL	3.268
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.714
95% Adjusted-CLT UCL (Chen-1995)	2.966	97.5% Chebyshev (MVUE) UCL	4.131
95% Modified-t UCL (Johnson-1978)	3.092	99% Chebyshev (MVUE) UCL	4.949

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	15.59	**Data appear Normal at 5% Significance Level**	
Theta Star	0.176		
MLE of Mean	2.746		
MLE of Standard Deviation	0.695		
nu star	249.5		
Approximate Chi Square Value (.05)	213.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	3.059
Adjusted Chi Square Value	205.6	95% Jackknife UCL	3.107
		95% Standard Bootstrap UCL	3.044
Anderson-Darling Test Statistic	0.599	95% Bootstrap-t UCL	3.021
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	2.992
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	3.015
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	2.973
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.575
		97.5% Chebyshev(Mean, Sd) UCL	3.934
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.639
95% Approximate Gamma UCL (Use when n >= 40)	3.203		
95% Adjusted Gamma UCL (Use when n < 40)	3.333		
Potential UCL to Use		Use 95% Student's-t UCL	3.107

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits
(e.g., Chen, Johnson, Lognormal, and Gamma) may not be
reliable. Chen's and Johnson's methods provide
adjustments for positvely skewed data sets.

Table 1
Constituent Analyte List and Associated Standards
MP Facility
Boise, Idaho

Constituents	A- and B-Zone	A-Zone Corrective Action Monitoring Program Areas						
		Area 1		Area 2	Area 3		Area 4	
	GPS	RAC[3]	RBTL[4]	RBTL	RAC	RBTL	CC[5]	RBTL
1,1,1-Trichloroethane	200	600	707,000	684,000	400	94,800	400	400
1,1,2,2-Tetrachloroethane	0.66	3	12,600	12,300	3	2,460	1.32	13
1,1,2-Trichloroethane	5	25	606	894	25	81	10	15
1,1-Dichloroethane	24	120	21,200	20,800	120	4,240	48	310
1,1-Dichloroethylene	7	35	14,300	14,100	35	1,970	14	21
1,2-Dichloroethane	5	25	5,910	5,800	25	1,240	10	15
1,2-Dichloropropane	5	25	3,670	3,600	25	493	10	15
Benzene	5	25	3,960	3,890	25	812	10	15
Chloroethane	21,000	105,000	744,000	732,000	105,000	132,000	42,000	1,500
Chloroform	80	400	1,650	1,620	400	349	160	240
cis-1,2-Dichloroethene	70	350	---	---	350	---	140	210
Tetrachloroethylene	5	25	2,160	2,160	25	430	10	15
trans-1,2-Dichloroethene	100	500	16,000	15,700	500	2,120	200	300
Trichloroethylene	5	25	492	481	25	66	10	15
Vinyl Chloride	2	10	935	921	10	198	4	6
Xylenes	10,000	50,000	53,700	52,600	50,000	7,280	20,000	30,000

Footnotes

[1]The constituent analyte list and associated standards as presented in the Wabtec Corporation - MotivePower Facility Permit Number IDD980976831.

All concentrations are presented in micrograms per liter (µg/l). The Estimated Quantitation Limit (EQL) for the analyte list is 1 µg/l.

[2]GPS - Groundwater Protection Standard.

[3]RAC - Remedial Action Criteria.

[4]RBTL - Risk-Based Threshold Limit.

[5]CC - Contingency Criteria (twice the MCL) only applied at monitoring well MW-38A as specified in Permit Condition IV.L.5.

--- No RBTL since inhalation toxicity criteria is not available for cis-1,2-Dichloroethene.

Table 2
Source Concentrations in the Areas of Concern
MP Facility
Boise, Idaho

CHEMICAL	ACRONYM	Exposure Point Concentration (ug/l)			
		Area 1	Area 2	Area 3	Area 4
1,1,1-Trichloroethane	1,1,1-TCA	117	56.9	16.9	2.10
1,1,2,2-Tetrachloroethane	1,1,2,2-TETRA	1.3[a]	0.5[c]	0.5[c]	0.5[c]
1,1,2-Trichloroethane	1,1,2-TCA	1.73	1.30	0.5[c]	0.5[c]
1,1-Dichloroethane	1,1-DCA	296	222	52.9	2.68; 3.11[d]
1,1-Dichloroethene	1,1-DCE	63.9	98.6	33.6	2.79
1,2-Dichloroethane	1,2-DCA	2.17	1.96	1.16	1.3[a]
1,2-Dichloropropane	1,2-DCPA	2.18	1.1[a]	0.5[c]	0.5[c]
Benzene	BZ	1,850[a]	0.5[c]	2.77[a]	0.5[c]
Chloroethane	CEA	5.33	5.72	35.6	0.5[c]
Chloroform	CF	1.28	1.2[b]	1.83	3.76
cis-1,2-Dichloroethene	cis-1,2-DCE	19.7	1.78	2.80	0.5[c]
Tetrachloroethene	TETRA	12.8	7.35	4.05	1.19
trans-1,2-Dichloroethene	trans-1,2-DCE	30.8[b]	0.5[c]	0.5[c]	0.5[c]
Trichloroethene	TCE	11.3	8.84	4.27	2.94[a]
Vinyl Chloride	VC	3.86	3.26	6.36	1.19[a]
Xylenes, Total	XL	351[a]	1.36[a]	1.7[a]	1.12[a]

Notes:
a - Since these constituents were non-detect over the most recent 8 sampling events per monitoring well, a 95% UCL cannot be calculated. Therefore, the maximum detected concentration over the entire sampling period was used.
b - Since these constituents were detected only once in their respective areas over the most recent 8 sampling events per monitoring well, a 95% UCL cannot be calculated. Therefore, the maximum detected concentration over the most recent 8 sampling events was used.
c - Since these constituents were never detected in the specified area, a 95% UCL cannot be calculated. Therefore, half of the average detection limit over the entire sampling period was used, excluding elevated detection limits.
d - The first value represents the 95% UCL for the most recent 8 sampling events for the entire Area 4. The second value represents the 95% UCL for the most recent 8 sampling events for MW-44A only.

Table 3
Toxicity Values
MP Facility
Boise, Idaho

Chemical	Cancer Slope Factors and Unit Risk Factors			Chronic Reference Doses			Subchronic Reference Doses		
	Oral CSF_O $(mg/kg\text{-}day)^{-1}$	Dermal CSF_D $(mg/kg\text{-}day)^{-1}$	Inhalation IUR $(ug/m^3)^{-1}$	Oral RfD_O (mg/kg-day)	Dermal RfD_D (mg/kg-day)	Inhalation RfC_I (mg/m^3)	Oral RfD_O (mg/kg-day)	Dermal RfD_D (mg/kg-day)	Inhalation RfC_I (mg/m^3)
Volatile Organic Compounds									
1,1,1-Trichloroethane	---	---	---	2.0E+00	2.0E+00	5.0E+00	7.0E+00	7.0E+00	5.0E+00
1,1,2,2-Tetrachloroethane	2.0E-01	2.0E-01	5.8E-05	2.0E-02	2.0E-02	---	5.0E-02	5.0E-02	---
1,1,2-Trichloroethane	5.7E-02	5.7E-02	1.6E-05	4.0E-03	4.0E-03	2.0E-04	4.0E-03	4.0E-03	2.0E-03
1,1-Dichloroethane	5.7E-03	5.7E-03	1.6E-06	2.0E-01	2.0E-01	---	2.0E+00	2.0E+00	---
1,1-Dichloroethene	---	---	---	5.0E-02	5.0E-02	2.0E-01	9.0E-03	9.0E-03	7.9E-02
1,2-Dichloroethane	9.1E-02	9.1E-02	2.6E-05	6.0E-03	6.0E-03	7.0E-03	2.0E-02	2.0E-02	7.0E-02
1,2-Dichloropropane	3.6E-02	3.6E-02	1.0E-05	9.0E-02	9.0E-02	4.0E-03	7.0E-02	7.0E-02	3.2E-02
Benzene	5.5E-02	5.5E-02	7.8E-06	4.0E-03	4.0E-03	3.0E-02	1.2E-02	1.2E-02	9.0E-02
Chloroethane (Ethyl Chloride)	---	---	---	---	---	1.0E+01	1.0E-01	1.0E-01	4.0E+00
Chloroform	3.1E-02	3.1E-02	2.3E-05	1.0E-02	1.0E-02	9.8E-02	1.0E-01	1.0E-01	2.4E-01
cis-1,2-Dichloroethene	---	---	---	2.0E-03	2.0E-03	---	2.0E-02	2.0E-02	---
Tetrachloroethene	5.4E-01	5.4E-01	5.9E-06	1.0E-02	1.0E-02	2.7E-01	1.0E-01	1.0E-01	---
trans-1,2-Dichloroethene	---	---	---	2.0E-02	2.0E-02	6.0E-02	2.0E-01	2.0E-01	7.9E-01
Trichloroethene	4.6E-02	4.6E-02	4.1E-06	5.0E-04	5.0E-04	2.0E-03	---	---	5.4E-01
Vinyl Chloride	7.2E-01	7.2E-01	4.4E-06	3.0E-03	3.0E-03	1.0E-01	---	---	7.7E-02
Xylenes, Total	---	---	---	2.0E-01	2.0E-01	1.0E-01	4.0E-01	4.0E-01	4.0E-01

-Referenced ORNL November 2011, IRIS, PPRTV (RAIS), Cal EPA, ATSDR, HEAST

Table 4
Summary of Exposure Assumptions for an On-Site Industrial Worker in Area 1
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	78,840	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	10	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	250	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
ED	Exposure Duration	=	9	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 5
Summary of Exposure Assumptions for an On-Site Commercial Worker in Area 2
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	78,840	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	10	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	250	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
ED	Exposure Duration	=	9	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 6
Summary of Exposure Assumptions for an Adult Resident in Area 3
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	262,800	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	18	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	350	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
ED	Exposure Duration	=	30	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 7
Summary of Exposure Assumptions for a Child Resident in Area 3
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	52,560	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	18	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	350	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
ED	Exposure Duration	=	6	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 8
Summary of Exposure Assumptions for a Construction Worker in Area 4
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Intake Equation
Averaging Times						
Ingestion/Dermal						
AT (c)	Carcinogenic Effects	=	25,550	days	based on lifetime of 70 years (USEPA 1991)	
AT (nc)	Noncarcinogenic Effects	=	250	days	averaging time for a noncarcinogen (ED x 365 days/year) (USEPA 1989)	
Inhalation						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	6,000	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Direct Contact with Groundwater						
Dermal Contact with Groundwater						
TBS	Total Body Surface Area	=	19,400	cm²	mean body surface area for adult male (USEPA 1997)	
FBE	Fraction of Body Exposed	=	0.111	unitless	mean body surface area exposed for adult male (corresponds to forearms and hands) (USEPA 1997)	
SA	Exposed Surface Area	=	2,153	cm²	calculated as TBS * FBE	
ET	Exposure Time	=	10	hrs/day	assumption for construction worker exposure (RAM Group, 2001)	
EF	Exposure Frequency	=	250	days/year	assumes 250 day construction period (RAM Group, 2001)	$I_{derm-w} = CW_{src} * TF_w * PC * IF_{derm-w}$
ED	Exposure Duration	=	1	years	construction occurs over a one year period (RAM Group, 2001)	
CF	Conversion Factor	=	1.0E-03	L/cm³	---	
BW	Body Weight	=	70	kg	recommended exposure assumption for a commercial/industrial exposure (PACODE 2011)	$IF_{derm-w} = \frac{SA * ET * EF * ED * CF}{BW * AT}$
IF_{derm-w} *(c)*	Absorbed Dose (Carcinogenic)	=	3.01E-03	L-hr/cm-kg-day	calculated	
IF_{derm-w} *(nc)*	Absorbed Dose (Noncarcinogenic)	=	3.08E-01	L-hr/cm-kg-day	calculated	
CW_{src}	Source Concentration in GW	=	chem-spec.	mg/L	measured value	
TF_w	Transfer Factor	=	1	unitless	conservative assumption	
PC	Permeability Constant	=	chem-spec.	cm/hr	chemical - specific	
Inhalation of Constituents Emitted from Groundwater to Outdoor Air						
ET	Exposure Time	=	10	hours/day	assumption for construction worker exposure (RAM Group, 2001)	
EF	Exposure Frequency	=	250	days/year	assumes 250 day construction period (RAM Group, 2001)	
ED	Exposure Duration	=	1	years	construction occurs over a one year period (IPCB 2007)	$EC = \frac{CA_a * ET * EF * ED}{AT}$
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated	
TF_{a-vol}	Transfer Factor	=	chem-spec.	L/m³	calculated using the groundwater volatilization model (VA DEQ 2008)	$CA_a = C_{src} * TF_a$
CA_a	Concentration in Outdoor Air	=	chem-spec.	ug/m³	calculated value	
C_{src}	Source Concentration in Groundwater	=	chem-spec.	ug/L	measured value	

Table 9
Summary of Exposure Assumptions for an Adult Resident in Area 4
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	262,800	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	18	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	350	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
ED	Exposure Duration	=	30	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 10
Summary of Exposure Assumptions for a Child Resident in Area 4
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Exposure Concentration Equation
Averaging Times						
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	
AT (nc)	Noncarcinogenic Effects	=	52,560	hours	averaging time for a noncarcinogen (ED in years x 365 days/year x 24 hours/day) (USEPA 2009)	
Exposure Assumptions Associated with Inhalation of Indoor Air via Vapor Intrusion						
ET	Exposure Time	=	18	hr/day	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
EF	Exposure Frequency	=	350	days/year	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	
ED	Exposure Duration	=	6	years	recommended exposure assumption for commercial/industrial indoor worker (USEPA 2002)	$EC = \frac{CA_{ia} * ET * EF * ED}{AT}$
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	ug/m³	calculated value	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	ug/m³	calculated value	
CA_{ia}	Concentration in Indoor Air	=	chem-spec.	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004a)	

Table 11
Summary of Exposure Assumptions for a Child Recreatonal User in the Lakewood Pond Water in Area 4
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	Intake Equation
Averaging Times						
Dermal						
AT (c)	Carcinogenic Effects	=	25,550	days	based on lifetime of 70 years (USEPA 1991)	
AT (nc)	Noncarcinogenic Effects	=	3,285	days	averaging time for a noncarcinogen (ED x 365 days/year) (USEPA 1989)	
Exposure Assumptions Associated with Direct Contact with Surface Water						
Dermal Contact with Surface Water						
TBS	Total Body Surface Area	=	19,400	cm²	mean skin surface area for males and females combined based on age range of 6 to 15 years (RAM Group, 2001)	
FBE	Fraction of Body Exposed	=	1	unitless	conservative assumption (RAM Group, 2001)	
SA	Exposed Surface Area	=	19,400	cm²	calculated as TBS * FBE	
ET	Exposure Time	=	0.5	hrs/day	professional judgment (RAM Group, 2001)	$I_{derm-w} = CW_{src} * TF_w * PC * IF_{derm-w}$
EF	Exposure Frequency	=	60	days/year	professional judgment (RAM Group, 2001)	
ED	Exposure Duration	=	9	years	based on age range of 6 to 15 years	
CF	Conversion Factor	=	1.0E-03	L/cm³	---	
BW	Body Weight	=	37.2	kg	mean body weight for males and females combined based on age range of 6 to 15 years (RAM Group, 2001)	$IF_{derm-w} = \frac{SA * ET * EF * ED * CF}{BW * AT}$
IF_{derm-w} *(c)*	Absorbed Dose (Carcinogenic)	=	5.51E-03	L-hr/cm-kg-day	calculated	
IF_{derm-w} *(nc)*	Absorbed Dose (Noncarcinogenic)	=	4.29E-02	L-hr/cm-kg-day	calculated	
CW_{src}	Source Concentration in Surface Water	=	chem-spec.	mg/L	measured value	
TF_w	Transfer Factor	=	1	unitless	conservative assumption	
PC	Permeability Constant	=	chem-spec.	cm/hr	chemical - specific	
Ingestion of Constituents from Surface Water						
ET	Exposure Time	=	0.5	hours/event	professional judgment (RAM Group, 2001)	
EF	Exposure Frequency	=	60	days/year	professional judgment (RAM Group, 2001)	$EC = \frac{C_{src} * IF_w}{AT}$
ED	Exposure Duration	=	9	years	based on age range of 6 to 15 years	
EV	Events	=	1	events/day	professional judgment (RAM Group, 2001)	
BW	Body Weight	=	37.2	kg	mean body weight for males and females combined based on age range of 6 to 15 years (RAM Group, 2001)	
IR_w	Ingestion Rate of Water	=	0.1	L/hour	professional judgment (RAM Group, 2001)	$IF_w = \frac{EV * ED * EF * ET * IR_w}{BW}$
IF_w	Ingestion Factor of Water	=	7.26E-01	L/kg	calculated	
EC_c	Exposure Concentration (Carcinogenic)	=	chem-spec.	mg/kg-day	calculated	
EC_{nc}	Exposure Concentration (Noncarcinogenic)	=	chem-spec.	mg/kg-day	calculated	
C_{src}	Source Concentration in Surface Water	=	chem-spec.	mg/L	measured value	

Table 12
Calculation of Permeability Constants for a Construction Worker in Area 4
MP Facility
Boise, Idaho

Expsoure Time per Event (ET) = 10 hrs/event

Chemical	Kp (cm/hr)	B (unitless)	Tau-ev (hr/event)	tstar (hr)	FA (unitless)	Organic? Enter "Y" or "N"	Permeability Constant ET <= tstar (cm/hr)	Permeability Constant ET > tstar (cm/hr)	Permeability Constant Selected (cm/hr)
Volatile Organic Compounds									
1,1,2,2-Tetrachloroethane	6.9E-03	0.0E+00	9.3E-01	2.2E+00	1.0E+00	Y	5.8E-03	8.2E-03	8.2E-03
1,1-Dichloroethane	6.7E-03	0.0E+00	3.8E-01	9.2E-01	1.0E+00	Y	3.6E-03	7.2E-03	7.2E-03
Chloroethane	6.1E-03	0.0E+00	2.4E-01	5.9E-01	1.0E+00	Y	2.6E-03	6.4E-03	6.4E-03

Table 13
Calculation of Permeability Constants for a Child Recreatinal User in Lakewood Pond in Area 4
MP Facility
Boise, Idaho

Expsoure Time per Event (ET) = 0.5 hrs/event

							Permeability Constant		
Chemical	**Kp (cm/hr)**	**B (unitless)**	**Tau-ev (hr/event)**	**tstar (hr)**	**FA (unitless)**	**Organic? Enter "Y" or "N"**	**ET <= tstar (cm/hr)**	**ET > tstar (cm/hr)**	**Selected (cm/hr)**
Volatile Organic Compounds									
1,1,2,2-Tetrachloroethane	6.9E-03	0.0E+00	9.3E-01	2.2E+00	1.0E+00	Y	2.6E-02	3.3E-02	2.6E-02
1,1-Dichloroethane	6.7E-03	0.0E+00	3.8E-01	9.2E-01	1.0E+00	Y	1.6E-02	1.7E-02	1.6E-02
Chloroethane	6.1E-03	0.0E+00	2.4E-01	5.9E-01	1.0E+00	Y	1.2E-02	1.2E-02	1.2E-02

Table 14
Calculation of Exposed Groundwater Volatilization Transfer Factors for a Construction Worker in Area 4
MP Facility
Boise, Idaho

System Parameters

Variable	Value	Units	Description
Mass Transfer Coefficient Parameters			
$k_{G,H2O}$	0.833	cm/sec	gas-phase mass transfer coefficient of water vapor at 25 ^oC
MW_{H2O}	18	g/mol	molecular weight of water
$k_{L,O2}$	0.002	cm/sec	liquid-phase mass transfer coefficient of oxygen at 25^oC
MW_{O2}	32	g/mol	molecular weight of oxygen
T	77	^oF	average system absolute temperature
	298	^oK	
R	8.21E-05	atm-m^3/mol-^oK	gas constant
Emission Flux and Concentration in Trench Parameters			
F	1	unitless	fraction of floor through which contaminant can enter
ACH	2	1/hr	air changes per hour
CF1	1.0E-03	L/cm^3	converson factor
CF2	1.0E+04	cm^2/m^2	converson factor
CF3	3600	sec/hr	converson factor
Trench Dimensions			
L	8	ft	length; VADEQ 2008 default assumption
	2.44	m	
W	6	ft	width; professional judgment
	1.83	m	
D	13.5	ft	depth; based on depth to groundwater in Area 4
	4.11	m	
W/D	0.44	unitless	
Volatilization Control			
Volatilization Control	2	0 indicates no limits on volatilization	
		1 indicates volat. occurs if Hen law const. > limit and mol. wt. < limit	
		2 indicates volat. occurs if boiling point < limit	
Henry's law limit	1.0E-05	atm-m^3/mol	
molecular weight limit	200	g/g-mol	
boiling point limit	200	^oC	

Table 14
Calculation of Exposed Groundwater Volatilization Transfer Factors for a Construction Worker in Area 4
MP Facility
Boise, Idaho

Chemical-Specific Variables

	Chemical Properties			Calculated Parameters				
Chemical	**Molecular Weight MW_i (g/mol)**	**Boiling Point BP_i**	**Henry's Law Constant H_i (atm-m³/mol)**	**Gas-Phase Mass Transfer Coefficient k_{iG} (cm/sec)**	**Liquid-Phase Mass Transfer Coefficient k_{iL} (cm/sec)**	**Overall Mass Transfer Coefficient K_i (cm/sec)**	**Volatilization Control**	**Volatilization Factor VF (L/m^3)**
Volatile Organic Compounds								
1,1,1-Trichloroethane	133	74	1.7E-02	4.26E-01	9.81E-04	9.78E-04	1	4.28E+00
1,1,2,2-Tetrachloroethane	168	147	3.7E-04	3.94E-01	8.73E-04	7.61E-04	1	3.33E+00
1,1,2-Trichloroethane	133	114	8.2E-04	4.26E-01	9.81E-04	9.18E-04	1	4.02E+00
1,1-Dichloroethane	99	57.4	5.6E-03	4.71E-01	1.14E-03	1.13E-03	1	4.92E+00
1,1-Dichloroethene	96.9	31.6	2.6E-02	4.74E-01	1.15E-03	1.15E-03	1	5.02E+00
1,2-Dichloroethane	99	83.5	1.2E-03	4.71E-01	1.14E-03	1.08E-03	1	4.74E+00
1,2-Dichloropropane	113	95.5	2.8E-03	4.50E-01	1.06E-03	1.04E-03	1	4.56E+00
Benzene	78.1	80	5.6E-03	5.09E-01	1.28E-03	1.27E-03	1	5.54E+00
Chloroethane	64.5	12.3	1.1E-02	5.43E-01	1.41E-03	1.40E-03	1	6.13E+00
Chloroform	119	61.1	3.7E-03	4.42E-01	1.04E-03	1.02E-03	1	4.47E+00
cis-1,2-Dichloroethene	96.9	55	4.1E-03	4.74E-01	1.15E-03	1.13E-03	1	4.96E+00
Tetrachloroethene	166	121	1.8E-02	3.96E-01	8.78E-04	8.75E-04	1	3.83E+00
trans-1,2-Dichloroethene	96.9	55	4.1E-03	4.74E-01	1.15E-03	1.13E-03	1	4.96E+00
Trichloroethene	131	87.2	9.9E-03	4.28E-01	9.88E-04	9.83E-04	1	4.30E+00
Vinyl Chloride	62.5	-13.3	2.8E-02	5.49E-01	1.43E-03	1.43E-03	1	6.25E+00
Xylenes, Total	106	139	5.2E-03	4.60E-01	1.10E-03	1.09E-03	1	4.75E+00

Table 15
Calculation of Risks and Hazard Indices for an On-Site Industrial Worker in Area 1
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,1-Trichloroethane	1.2E+02	2.9E+00	1.1E-01	---	---	8.3E-01	5.0E+00	1.7E-04
1,1,2,2-Tetrachloroethane	1.3E+00	4.9E-04	1.8E-05	5.8E-05	1.0E-09	1.4E-04	---	---
1,1,2-Trichloroethane	1.7E+00	2.0E-03	7.3E-05	1.6E-05	1.2E-09	5.7E-04	2.0E-04	2.9E-03
1,1-Dichloroethane	3.0E+02	2.4E+00	8.7E-02	1.6E-06	1.4E-07	6.8E-01	---	---
1,1-Dichloroethene	6.4E+01	3.1E+00	1.1E-01	---	---	8.9E-01	2.0E-01	4.5E-03
1,2-Dichloroethane	2.2E+00	3.8E-03	1.4E-04	2.6E-05	3.7E-09	1.1E-03	7.0E-03	1.6E-04
1,2-Dichloropropane	2.2E+00	8.3E-03	3.1E-04	1.0E-05	3.1E-09	2.4E-03	4.0E-03	5.9E-04
Benzene	1.9E+03	1.6E+01	6.0E-01	7.8E-06	4.7E-06	4.7E+00	3.0E-02	1.6E-01
Chloroethane	5.3E+00	2.5E-01	9.2E-03	---	---	7.2E-02	1.0E+01	7.2E-06
Chloroform	1.3E+00	9.2E-03	3.4E-04	2.3E-05	7.7E-09	2.6E-03	9.8E-02	2.7E-05
cis-1,2-Dichloroethene	2.0E+01	1.1E-01	4.1E-03	---	---	3.2E-02	---	---
Tetrachloroethene	1.3E+01	2.7E-01	1.0E-02	5.9E-06	5.9E-08	7.8E-02	2.7E-01	2.9E-04
trans-1,2-Dichloroethene	3.1E+01	4.0E-01	1.5E-02	---	---	1.2E-01	6.0E-02	1.9E-03
Trichloroethene	1.1E+01	1.6E-01	5.9E-03	4.1E-06	2.4E-08	4.6E-02	2.0E-03	2.3E-02
Vinyl Chloride	3.9E+00	2.6E-01	9.4E-03	4.4E-06	4.1E-08	7.3E-02	1.0E-01	7.3E-04
Xylenes, Total	3.5E+02	2.3E+00	8.4E-02	---	---	6.5E-01	1.0E-01	6.5E-03
					5.0E-06			**2.0E-01**

Table 16
Calculation of Risks and Hazard Indices for an On-Site Commercial Worker in Area 2
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,1-Trichloroethane	5.7E+01	1.4E+00	5.3E-02	---	---	4.1E-01	5.0E+00	8.2E-05
1,1,2,2-Tetrachloroethane	5.0E-01	1.9E-04	7.0E-06	5.8E-05	4.1E-10	5.4E-05	---	---
1,1,2-Trichloroethane	1.3E+00	1.5E-03	5.6E-05	1.6E-05	9.0E-10	4.4E-04	2.0E-04	2.2E-03
1,1-Dichloroethane	2.2E+02	1.8E+00	6.7E-02	1.6E-06	1.1E-07	5.2E-01	---	---
1,1-Dichloroethene	9.9E+01	4.9E+00	1.8E-01	---	---	1.4E+00	2.0E-01	7.0E-03
1,2-Dichloroethane	2.0E+00	3.5E-03	1.3E-04	2.6E-05	3.4E-09	1.0E-03	7.0E-03	1.4E-04
1,2-Dichloropropane	1.1E+00	4.3E-03	1.6E-04	1.0E-05	1.6E-09	1.2E-03	4.0E-03	3.1E-04
Benzene	5.0E-01	4.5E-03	1.6E-04	7.8E-06	1.3E-09	1.3E-03	3.0E-02	4.3E-05
Chloroethane	5.7E+00	2.7E-01	1.0E-02	---	---	7.8E-02	1.0E+01	7.8E-06
Chloroform	1.2E+00	8.8E-03	3.2E-04	2.3E-05	7.4E-09	2.5E-03	9.8E-02	2.6E-05
cis-1,2-Dichloroethene	1.8E+00	1.0E-02	3.8E-04	---	---	2.9E-03	---	---
Tetrachloroethene	7.4E+00	1.6E-01	5.9E-03	5.9E-06	3.5E-08	4.6E-02	2.7E-01	1.7E-04
trans-1,2-Dichloroethene	5.0E-01	6.7E-03	2.5E-04	---	---	1.9E-03	6.0E-02	3.2E-05
Trichloroethene	8.8E+00	1.3E-01	4.7E-03	4.1E-06	1.9E-08	3.7E-02	2.0E-03	1.8E-02
Vinyl Chloride	3.3E+00	2.2E-01	8.1E-03	4.4E-06	3.6E-08	6.3E-02	1.0E-01	6.3E-04
Xylenes, Total	1.4E+00	9.1E-03	3.3E-04	---	---	2.6E-03	1.0E-01	2.6E-05
					2.1E-07			**2.9E-02**

Table 17
Calculation of Risks and Hazard Indices for an Adult Resident in Area 3
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,1-Trichloroethane	1.7E+01	1.2E+00	3.8E-01	---	---	8.9E-01	5.0E+00	1.8E-04
1,1,2,2-Tetrachloroethane	5.0E-01	5.7E-04	1.8E-04	5.8E-05	1.0E-08	4.1E-04	---	---
1,1,2-Trichloroethane	5.0E-01	1.7E-03	5.3E-04	1.6E-05	8.5E-09	1.2E-03	2.0E-04	6.2E-03
1,1-Dichloroethane	5.3E+01	1.3E+00	3.9E-01	1.6E-06	6.2E-07	9.1E-01	---	---
1,1-Dichloroethene	3.4E+01	4.7E+00	1.5E+00	---	---	3.4E+00	2.0E-01	1.7E-02
1,2-Dichloroethane	1.2E+00	5.8E-03	1.8E-03	2.6E-05	4.7E-08	4.2E-03	7.0E-03	6.0E-04
1,2-Dichloropropane	5.0E-01	5.6E-03	1.7E-03	1.0E-05	1.7E-08	4.1E-03	4.0E-03	1.0E-03
Benzene	2.8E+00	7.1E-02	2.2E-02	7.8E-06	1.7E-07	5.1E-02	3.0E-02	1.7E-03
Chloroethane	3.6E+01	3.7E+00	1.2E+00	---	---	2.7E+00	1.0E+01	2.7E-04
Chloroform	1.8E+00	3.7E-02	1.1E-02	2.3E-05	2.6E-07	2.7E-02	9.8E-02	2.7E-04
cis-1,2-Dichloroethene	2.8E+00	4.7E-02	1.5E-02	---	---	3.4E-02	---	---
Tetrachloroethene	4.1E+00	2.6E-01	8.0E-02	5.9E-06	4.7E-07	1.9E-01	2.7E-01	6.9E-04
trans-1,2-Dichloroethene	5.0E-01	2.0E-02	6.1E-03	---	---	1.4E-02	6.0E-02	2.4E-04
Trichloroethene	4.3E+00	1.8E-01	5.5E-02	4.1E-06	2.3E-07	1.3E-01	2.0E-03	6.4E-02
Vinyl Chloride	6.4E+00	1.2E+00	3.7E-01	4.4E-06	1.6E-06	8.5E-01	1.0E-01	8.5E-03
Xylenes, Total	1.7E+00	3.2E-02	1.0E-02	---	---	2.3E-02	1.0E-01	2.3E-04
					3.4E-06			**1.0E-01**

Table 18
Calculation of Risks and Hazard Indices for a Child Resident in Area 3
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,1-Trichloroethane	1.7E+01	1.2E+00	7.6E-02	---	---	8.9E-01	5.0E+00	1.8E-04
1,1,2,2-Tetrachloroethane	5.0E-01	5.7E-04	3.5E-05	5.8E-05	2.0E-09	4.1E-04	---	---
1,1,2-Trichloroethane	5.0E-01	1.7E-03	1.1E-04	1.6E-05	1.7E-09	1.2E-03	2.0E-04	6.2E-03
1,1-Dichloroethane	5.3E+01	1.3E+00	7.8E-02	1.6E-06	1.2E-07	9.1E-01	---	---
1,1-Dichloroethene	3.4E+01	4.7E+00	2.9E-01	---	---	3.4E+00	2.0E-01	1.7E-02
1,2-Dichloroethane	1.2E+00	5.8E-03	3.6E-04	2.6E-05	9.3E-09	4.2E-03	7.0E-03	6.0E-04
1,2-Dichloropropane	5.0E-01	5.6E-03	3.5E-04	1.0E-05	3.5E-09	4.1E-03	4.0E-03	1.0E-03
Benzene	2.8E+00	7.1E-02	4.4E-03	7.8E-06	3.4E-08	5.1E-02	3.0E-02	1.7E-03
Chloroethane	3.6E+01	3.7E+00	2.3E-01	---	---	2.7E+00	1.0E+01	2.7E-04
Chloroform	1.8E+00	3.7E-02	2.3E-03	2.3E-05	5.2E-08	2.7E-02	9.8E-02	2.7E-04
cis-1,2-Dichloroethene	2.8E+00	4.7E-02	2.9E-03	---	---	3.4E-02	---	---
Tetrachloroethene	4.1E+00	2.6E-01	1.6E-02	5.9E-06	9.4E-08	1.9E-01	2.7E-01	6.9E-04
trans-1,2-Dichloroethene	5.0E-01	2.0E-02	1.2E-03	---	---	1.4E-02	6.0E-02	2.4E-04
Trichloroethene	4.3E+00	1.8E-01	mutagen[a]	4.1E-06	2.1E-07	1.3E-01	2.0E-03	6.4E-02
Vinyl Chloride	6.4E+00	1.2E+00	7.3E-02	4.4E-06	3.2E-07	8.5E-01	1.0E-01	8.5E-03
Xylenes, Total	1.7E+00	3.2E-02	2.0E-03	---	---	2.3E-02	1.0E-01	2.3E-04
					8.5E-07			**1.0E-01**

a - TCE is now classified as a mutagen. It's risk calculation is shown in the continuation of Table 18.

Table 18 continued
Calculation of Risks and Hazard Indices for a Child Resident in Area 3
(TCE)
MP Facility
Boise, Idaho

Parameter			Value	Units	Comments/References	
CA_{ia}	Concentration of **TCE** in Indoor Air	=	0.179	ug/m³	calculated using Johnson and Ettinger Model (USEPA 2004b)	
ET	Exposure Time	=	18	hr/day	exposure assumption for child resident (RAM Group, 2001)	
EF	Exposure Frequency	=	350	days/year	exposure assumption for child resident (RAM Group, 2001)	
AT (c)	Carcinogenic Effects	=	613,200	hours	averaging time for a carcinogen based on lifetime of 70 years (lifetime in years x 365 days/year x 24 hours/day) (USEPA 2009)	

Inhalation (concentration-equivalence across age groups)

Age group	Age group duration (yr)	Kidney unadjusted lifetime unit risk (µg/m3 air)-1	Kidney cancer default ADAF	**Kidney ADAF-adjusted partial risk [ED x IUR x ADAF] (yr * (ug/m3)-1)**	Kidney+NHL+ liver unadjusted lifetime unit risk (µg/m3 air)-1	NHL+ liver lifetime unit risk (µg/m3 air)-1	**NHL and liver partial risk [ED x IUR] (yr * (ug/m3)-1)**	**Total partial risk (yr * (ug/m3)-1)**
Birth to <2 years	2	1.0E-06	10	**2.0E-05**	4.1E-06	3.1E-06	**6.2E-06**	**2.6E-05**
2 to <16 years	14	1.0E-06	3	**4.2E-05**	4.1E-06	3.1E-06	**4.3E-05**	**8.5E-05**

Total Partial Risk: **1.1E-04**

R_{inhal}	**Risk from Inhalation of TCE**	=	2.1E-07	unitless

$$R_{inhal} = \frac{CA_{ia} * ET * EF * \{[(ED_{0-2} * IUR_K * ADAF) + (ED_{0-2} * IUR_{other})] + [(ED_{2-16} * IUR_K * ADAF) + (ED_{2-16} * IUR_{other})]\}}{AT}$$

Table 19
Calculation of Risks and Hazard Indices for a Construction Worker in Area 4
MP Facility
Boise, Idaho

Dermal Contact with Groundwater

Constituent of Concern	Source Concentration for Groundwater CW_{src} (mg/L)	Transfer Factor TF_w (unitless)	Exposure Point Concentration for Groundwater EPC_w (mg/L)	Solubility in Water S (mg/L)	Adjusted Exposure Point Concentration for Groundwater $EPC_{w\text{-}adj}$ (mg/L)	Permeability Constant PC (cm/hr)	Calculation of Risk			Calculation of Hazard Index		
							$IF_{derm\text{-}w}$ (c) =	3.01E-03	L-hr/cm-kg-day	$IF_{derm\text{-}w}$ (nc) =	3.08E-01	L-hr/cm-kg-day
							Dermal Absorbed Dose (Cancer) $I_{derm\text{-}w}$ (c) (mg/kg-day)	Dermal Cancer Slope Factor for Groundwater CSF_D $(mg/kg\text{-}day)^{-1}$	Risk from Dermal Contact with Groundwater $R_{derm\text{-}w}$ (unitless)	Dermal Absorbed Dose (Noncancer) $I_{derm\text{-}w}$ (nc) (mg/kg-day)	Dermal Reference Dose for Groundwater RfD_D (mg/kg-day)	Hazard Index from Dermal Contact with Groundwater $HI_{derm\text{-}w}$ (unitless)
1,1,2,2-Tetrachloroethane	5.0E-04	1	5.0E-04	2.8E+03	5.0E-04	8.2E-03	1.2E-08	2.0E-01	2.5E-09	1.3E-06	5.0E-02	2.5E-05
1,1-Dichloroethane	2.7E-03	1	2.7E-03	5.0E+03	2.7E-03	7.2E-03	5.8E-08	5.7E-03	3.3E-10	5.9E-06	2.0E+00	3.0E-06
Chloroethane	5.0E-04	1	5.0E-04	6.7E+03	5.0E-04	6.4E-03	9.6E-09	---	---	9.8E-07	1.0E-01	9.8E-06
									2.8E-09			**3.8E-05**

Table 19
Calculation of Risks and Hazard Indices for a Construction Worker in Area 4
MP Facility
Boise, Idaho

Inhalation of Chemicals Volatilized to Outdoor Air from Groundwater

Constituent of Concern	Source Concentration for Groundwater C_{src} (ug/L)	Transfer Factor TF_a (L/m^3)	Outdoor Air Concentration CA_a (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhal. of Chem. Vol. from Groundwater $R_{inhal\text{-}v}$ (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_I (mg/m^3)	Calculation of Hazard Index: Hazard Index from Inhal. of Chem. Vol. from Groundwater $HI_{inhal\text{-}v}$ (unitless)
1,1,2,2-Tetrachloroethane	5.0E-01	3.3E+00	1.7E+00	6.8E-03	5.8E-05	3.9E-07	6.9E-01	---	---
1,1-Dichloroethane	2.7E+00	4.9E+00	1.3E+01	5.4E-02	1.6E-06	8.6E-08	5.5E+00	---	---
Chloroethane	5.0E-01	6.1E+00	3.1E+00	1.2E-02	---	---	1.3E+00	4.0E+00	3.2E-04
						4.8E-07			**3.2E-04**

Table 20
Calculation of Risks and Hazard Indices for an Adult Resident in Area 4
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,1-Trichloroethane	2.1E+00	2.9E-01	8.8E-02	---	---	2.1E-01	5.0E+00	4.1E-05
1,1,2,2-Tetrachloroethane	5.0E-01	1.1E-03	3.4E-04	5.8E-05	2.0E-08	8.0E-04	---	---
1,1,2-Trichloroethane	1.3E+00	3.2E-03	1.0E-03	1.6E-05	1.6E-08	2.3E-03	2.0E-04	1.2E-02
1,1-Dichloroethane	2.7E+00	1.2E-01	3.7E-02	1.6E-06	5.9E-08	8.6E-02	---	---
1,1-Dichloroethene	2.8E+00	7.2E-01	2.2E-01	---	---	5.1E-01	2.0E-01	2.6E-03
1,2-Dichloroethane	5.0E-01	1.2E-02	3.6E-03	2.6E-05	9.3E-08	8.4E-03	7.0E-03	1.2E-03
1,2-Dichloropropane	5.0E-01	1.1E-02	3.2E-03	1.0E-05	3.2E-08	7.6E-03	4.0E-03	1.9E-03
Benzene	5.0E-01	2.3E-02	7.2E-03	7.8E-06	5.6E-08	1.7E-02	3.0E-02	5.6E-04
Chloroethane	5.0E-01	7.7E-02	2.4E-02	---	---	5.5E-02	1.0E+01	5.5E-06
Chloroform	3.8E+00	1.4E-01	4.2E-02	2.3E-05	9.6E-07	9.7E-02	9.8E-02	9.9E-04
cis-1,2-Dichloroethene	5.0E-01	1.6E-02	4.9E-03	---	---	1.1E-02	---	---
Tetrachloroethene	1.2E+00	1.4E-01	4.4E-02	5.9E-06	2.6E-07	1.0E-01	2.7E-01	3.8E-04
trans-1,2-Dichloroethene	5.0E-01	3.7E-02	1.1E-02	---	---	2.7E-02	6.0E-02	4.5E-04
Trichloroethene	2.9E+00	2.3E-01	7.1E-02	4.1E-06	2.9E-07	1.6E-01	2.0E-03	8.2E-02
Vinyl Chloride	1.2E+00	3.9E-01	1.2E-01	4.4E-06	5.3E-07	2.8E-01	1.0E-01	2.8E-03
Xylenes, Total	1.1E+00	3.9E-02	1.2E-02	---	---	2.8E-02	1.0E-01	2.8E-04
					2.3E-06			**1.1E-01**

Table 21
Calculation of Risks and Hazard Indices for a Child Resident in Area 4
MP Facility
Boise, Idaho

Indoor Air via Vapor Intrusion - Groundwater

Constituent of Concern	Source Concentration C_{src} (ug/L)	Indoor Air Concentration CA_{ia} (ug/m^3)	Calculation of Risk: Exposure Concentration (Cancer) EC_c (ug/m^3)	Calculation of Risk: Inhalation Unit Risk Factor IUR (ug/m^3)$^{-1}$	Calculation of Risk: Risk from Inhalation R_{inhal} (unitless)	Calculation of Hazard Index: Exposure Concentration (Noncancer) EC_{nc} (ug/m^3)	Calculation of Hazard Index: Reference Concentration RfC_i (mg/m^3)	Calculation of Hazard Index: Hazard Quotient from Inhalation HQ_{inhal} (unitless)
1,1,2,2-Tetrachloroethane	5.0E-01	1.1E-03	6.9E-05	5.8E-05	4.0E-09	8.0E-04	---	---
1,1-Dichloroethane	2.7E+00	1.2E-01	7.4E-03	1.6E-06	1.2E-08	8.6E-02	5.0E-01	1.7E-04
Chloroethane	5.0E-01	7.7E-02	4.7E-03	---	---	5.5E-02	1.0E+01	5.5E-06
					1.6E-08			**1.8E-04**

Table 22
Calculation of Risks and Hazard Indices for a Child Recreational User in Lakewood Pond in Area 4
MP Facility
Boise, Idaho

Dermal Contact with Surface Water

Constituent of Interest	Source Concentration for Surface Water CW_{src} (mg/L)	Transfer Factor TF_w (unitless)	Exposure Point Concentration for Surface Water EPC_w (mg/L)	Solubility in Water S (mg/L)	Adjusted Exposure Point Concentration for Surface Water $EPC_{w\text{-}adj}$ (mg/L)	Permeability Constant PC (cm/hr)	Calculation of Risk			Calculation of Hazard Index		
							$IF_{derm\text{-}w}$ (c) =	5.51E-03	L-hr/cm-kg-day	$IF_{derm\text{-}w}$ (nc) =	4.29E-02	L-hr/cm-kg-day
							Dermal Absorbed Dose (Cancer) $I_{derm\text{-}w}$ (c) (mg/kg-day)	Dermal Cancer Slope Factor CSF_D $(mg/kg\text{-}day)^{-1}$	Risk from Dermal Contact with Surface Water $R_{derm\text{-}w}$ (unitless)	Dermal Absorbed Dose (Noncancer) $I_{derm\text{-}w}$ (nc) (mg/kg-day)	Dermal Reference Dose RfD_D (mg/kg-day)	Hazard Index from Dermal Contact with Surface Water $HI_{derm\text{-}w}$ (unitless)
Volatile Organic Compounds												
1,1,2,2-Tetrachloroethane	5.0E-04	1	5.0E-04	2.8E+03	5.0E-04	2.6E-02	7.2E-08	2.0E-01	1.4E-08	5.6E-07	2.0E-02	2.8E-05
1,1-Dichloroethane	5.0E-04	1	5.0E-04	5.0E+03	5.0E-04	1.6E-02	4.4E-08	5.7E-03	2.5E-10	3.5E-07	2.0E-01	1.7E-06
Chloroethane	5.0E-04	1	5.0E-04	6.7E+03	5.0E-04	1.2E-02	3.2E-08	---	---	2.5E-07	---	---
									1.5E-08			**3.0E-05**

Table 22
Calculation of Risks and Hazard Indices for a Child Recreational User in Lakewood Pond in Area 4
MP Facility
Boise, Idaho

Accidental Ingestion of Surface Water

Constituent of Interest	Source Concentration for Surface Water CW_{src} (mg/L)	Transfer Factor TF_w (unitless)	Exposure Point Concentration for Surface Water EPC_w (mg/L)	Solubility in Water S (mg/L)	Adjusted Exposure Point Concentration for Surface Water $EPC_{w\text{-}adj}$ (mg/L)	Calculation of Risk			Calculation of Hazard Index		
						$IF_{ing\text{-}w}$ (c) =	7.26E-01	1/kg	$IF_{ing\text{-}w}$ (nc) =	7.26E-01	1/kg
						Oral Absorbed Dose (Cancer) $EC_{ing\text{-}w}$ (c) (mg/kg-day)	Oral Cancer Slope Factor CSF_O $(mg/kg\text{-}day)^{-1}$	Risk from Ingestion of Surface Water $R_{derm\text{-}w}$ (unitless)	Oral Absorbed Dose (Noncancer) $EC_{ing\text{-}w}$ (nc) (mg/kg-day)	Oral Reference Dose RfD_O (mg/kg-day)	Hazard Index from Ingestion of Surface Water $HI_{derm\text{-}w}$ (unitless)
Volatile Organic Compounds											
1,1,2,2-Tetrachloroethane	5.0E-04	1	5.0E-04	2.8E+03	5.0E-04	1.4E-08	2.0E-01	2.8E-09	1.1E-07	2.0E-02	5.5E-06
1,1-Dichloroethane	5.0E-04	1	5.0E-04	5.0E+03	5.0E-04	1.4E-08	5.7E-03	8.1E-11	1.1E-07	2.0E-01	5.5E-07
Chloroethane	5.0E-04	1	5.0E-04	6.7E+03	5.0E-04	1.4E-08	---	---	1.1E-07	---	---
								2.9E-09			**6.1E-06**

Table 23
Risk-Based Trigger Levels in Area 1
(Derived from an On-Site Industrial Worker Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: On-Site Industrial Worker
Receptor with Highest HI: On-Site Industrial Worker
Exposure Pathways / Routes: Inhalation of Volatile Emissions from Groundwater
Exposure Duration: 9 years
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration (ug/L)	Risk	Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1,1-Trichloroethane	1.2E+02	---	1.7E-04	---	7.1E+05	7.1E+05
1,1,2,2-Tetrachloroethane	1.3E+00	1.0E-09	---	1.3E+04	---	1.3E+04
1,1,2-Trichloroethane	1.7E+00	1.2E-09	2.9E-03	1.5E+04	6.1E+02	6.1E+02
1,1-Dichloroethane	3.0E+02	1.4E-07	---	2.1E+04	---	2.1E+04
1,1-Dichloroethene	6.4E+01	---	4.5E-03	---	1.4E+04	1.4E+04
1,2-Dichloroethane	2.2E+00	3.7E-09	1.6E-04	5.9E+03	1.4E+04	5.9E+03
1,2-Dichloropropane	2.2E+00	3.1E-09	5.9E-04	7.1E+03	3.7E+03	3.7E+03
Benzene	1.9E+03	4.7E-06	1.6E-01	4.0E+03	1.2E+04	4.0E+03
Chloroethane	5.3E+00	---	7.2E-06	---	7.4E+05	7.4E+05
Chloroform	1.3E+00	7.7E-09	2.7E-05	1.7E+03	4.8E+04	1.7E+03
cis-1,2-Dichloroethene	2.0E+01	---	---	---	---	---
Tetrachloroethene	1.3E+01	5.9E-08	2.9E-04	2.2E+03	4.4E+04	2.2E+03
trans-1,2-Dichloroethene	3.1E+01	---	1.9E-03	---	1.6E+04	1.6E+04
Trichloroethene	1.1E+01	2.4E-08	2.3E-02	4.7E+03	4.9E+02	4.9E+02
Vinyl Chloride	3.9E+00	4.1E-08	7.3E-04	9.3E+02	5.3E+03	9.3E+02
Xylenes, Total	3.5E+02	---	6.5E-03	---	5.4E+04	5.4E+04

Table 24
Risk-Based Trigger Levels in Area 2
(Derived from an On-Site Commercial Worker Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: Commercial Worker
Receptor with Highest HI: Commercial Worker
Exposure Pathways / Routes: Inhalation of Volatile Emissions from Groundwater
Exposure Duration: 9 years
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration (ug/L)	Risk	Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1,1-Trichloroethane	5.7E+01	---	8.2E-05	---	6.9E+05	6.9E+05
1,1,2,2-Tetrachloroethane	5.0E-01	4.1E-10	---	1.2E+04	---	1.2E+04
1,1,2-Trichloroethane	1.3E+00	9.0E-10	2.2E-03	1.4E+04	5.9E+02	5.9E+02
1,1-Dichloroethane	2.2E+02	1.1E-07	---	2.1E+04	---	2.1E+04
1,1-Dichloroethene	9.9E+01	---	7.0E-03	---	1.4E+04	1.4E+04
1,2-Dichloroethane	2.0E+00	3.4E-09	1.4E-04	5.8E+03	1.4E+04	5.8E+03
1,2-Dichloropropane	1.1E+00	1.6E-09	3.1E-04	7.0E+03	3.6E+03	3.6E+03
Benzene	5.0E-01	1.3E-09	4.3E-05	3.9E+03	1.2E+04	3.9E+03
Chloroethane	5.7E+00	---	7.8E-06	---	7.3E+05	7.3E+05
Chloroform	1.2E+00	7.4E-09	2.6E-05	1.6E+03	4.7E+04	1.6E+03
cis-1,2-Dichloroethene	1.8E+00	---	---	---	---	---
Tetrachloroethene	7.4E+00	3.5E-08	1.7E-04	2.1E+03	4.3E+04	2.1E+03
trans-1,2-Dichloroethene	5.0E-01	---	3.2E-05	---	1.6E+04	1.6E+04
Trichloroethene	8.8E+00	1.9E-08	1.8E-02	4.6E+03	4.8E+02	4.8E+02
Vinyl Chloride	3.3E+00	3.6E-08	6.3E-04	9.2E+02	5.2E+03	9.2E+02
Xylenes, Total	1.4E+00	---	2.6E-05	---	5.3E+04	5.3E+04

Table 25
Risk-Based Trigger Levels in Area 3
(Derived from a Child Resident Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: Child Resident
Receptor with Highest HI: Child Resident
Exposure Pathways / Routes: Inhalation of Volatile Emissions from Groundwater
Exposure Duration: 6 years
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration (ug/L)	Risk	Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1,1-Trichloroethane	1.7E+01	---	1.8E-04	---	9.5E+04	9.5E+04
1,1,2,2-Tetrachloroethane	5.0E-01	2.0E-09	---	2.5E+03	---	2.5E+03
1,1,2-Trichloroethane	5.0E-01	1.7E-09	6.2E-03	2.9E+03	8.1E+01	8.1E+01
1,1-Dichloroethane	5.3E+01	1.2E-07	---	4.2E+03	---	4.2E+03
1,1-Dichloroethene	3.4E+01	---	1.7E-02	---	2.0E+03	2.0E+03
1,2-Dichloroethane	1.2E+00	9.3E-09	6.0E-04	1.2E+03	1.9E+03	1.2E+03
1,2-Dichloropropane	5.0E-01	3.5E-09	1.0E-03	1.4E+03	4.9E+02	4.9E+02
Benzene	2.8E+00	3.4E-08	1.7E-03	8.1E+02	1.6E+03	8.1E+02
Chloroethane	3.6E+01	---	2.7E-04	---	1.3E+05	1.3E+05
Chloroform	1.8E+00	5.2E-08	2.7E-04	3.5E+02	6.7E+03	3.5E+02
cis-1,2-Dichloroethene	2.8E+00	---	---	---	---	---
Tetrachloroethene	4.1E+00	9.4E-08	6.9E-04	4.3E+02	5.9E+03	4.3E+02
trans-1,2-Dichloroethene	5.0E-01	---	2.4E-04	---	2.1E+03	2.1E+03
Trichloroethene	4.3E+00	2.1E-07	6.4E-02	2.0E+02	6.6E+01	6.6E+01
Vinyl Chloride	6.4E+00	3.2E-07	8.5E-03	2.0E+02	7.5E+02	2.0E+02
Xylenes, Total	1.7E+00	---	2.3E-04	---	7.3E+03	7.3E+03

Table 26
Risk-Based Trigger Levels in Area 4
(Derived from a Construction Worker Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: Construction Worker
Receptor with Highest HI: Construction Worker
Exposure Pathways / Routes: Inhalation of Volatile Emissions from Groundwater
Dermal Contact with Groundwater
Exposure Duration: 1 year
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration (ug/L)	Dermal Contact Risk	Inhalation of Volatiles Risk	Total Risk	Dermal Contact Hazard Quotient	Inhalation of Volatiles Hazard Quotient	Total Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1,2,2-Tetrachloroethane	5.0E-01	2.5E-09	3.9E-07	4.0E-07	2.5E-05	---	2.5E-05	1.3E+01	2.0E+04	1.3E+01
1,1-Dichloroethane	2.7E+00	3.3E-10	8.6E-08	8.6E-08	3.0E-06	---	3.0E-06	3.1E+02	9.0E+05	3.1E+02
Chloroethane	5.0E-01	---	---	---	9.8E-06	3.2E-04	3.3E-04	---	1.5E+03	1.5E+03

Table 27
Risk-Based Trigger Levels in Area 4
(Derived from a Child Resident Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: Child Resident
Receptor with Highest HI: Child Resident
Exposure Pathways / Routes: Inhalation of Volatile Emissions from Groundwater
Exposure Duration: 6 years
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration (ug/L)	Risk	Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1,2,2-Tetrachloroethane	5.0E-01	4.0E-09	---	1.3E+03	---	1.3E+03
1,1-Dichloroethane	2.7E+00	1.2E-08	1.7E-04	2.3E+03	1.5E+04	2.3E+03
Chloroethane	5.0E-01	---	5.5E-06	---	9.0E+04	9.0E+04

Table 28
Risk-Based Trigger Levels in Area 4
(Derived from a Child Recreational User in the Lakewood Pond Water Exposure)
MP Facility
Boise, Idaho

Receptor with Highest Risk: Resident Child
Receptor with Highest HI: Resident Child
Exposure Pathways / Routes: Dermal Contact with Groundwater
Accidental Ingestion of Groundwater
Exposure Duration: 9 years
Target Risk: 1.00E-05
Target Hazard Index: 1.0

Chemical	Source Concentration[a] (ug/L)	Dermal Contact Risk	Accidental Ingestion Risk	Total Risk	Dermal Contact Hazard Quotient	Accidental Ingestion Hazard Quotient	Total Hazard Quotient	RBTL carcinogenic (ug/L)	RBTL noncarcinogenic (ug/L)	RBTL conservative (ug/L)
1,1-Dichloroethane	5.0E-01	2.5E-10	8.1E-11	3.3E-10	1.7E-06	5.5E-07	2.3E-06	1.5E+04	2.2E+05	1.5E+04
Chloroethane	5.0E-01	---	---	---	---	---	---	---	---	---
1,1,2,2-Tetrachloroethane	5.0E-01	1.4E-08	2.8E-09	1.7E-08	2.8E-05	5.5E-06	3.3E-05	2.9E+02	1.5E+04	2.9E+02