

**OHIO VOLUNTARY ACTION PROGRAM
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM MANSFIELD STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

REVISED

JULY 2015

Prepared for:



RACER Trust
500 Woodward Avenue
Suite 1510
Detroit, MI 48226

Prepared by:



Tetra Tech, Inc.
250 West Court Street
Suite 200W
Cincinnati, Ohio 45202
513.241.0149

CONTENTS

<u>Section</u>	<u>Page</u>
ACRONYMS AND ABBREVIATIONS	v
EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1
1.1 SITE HISTORY	2
1.1.1 Subject Property Location and Description	2
1.1.2 Subject Property Operations and Ownership	3
1.2 RISK ASSESSMENT SCOPE AND TECHNICAL APPROACH	4
1.2.1 Risk Assessment Scope	4
1.2.2 Risk Assessment Technical Approach	7
1.3 RISK ASSESSMENT ORGANIZATION	8
2.0 DATA EVALUATION AND IDENTIFICATION OF COCs	10
2.1 DATA COLLECTION AND EVALUATION	10
2.1.1 Data Collection	10
2.1.2 Data Evaluation	13
2.2 COC IDENTIFICATION	13
3.0 EXPOSURE ASSESSMENT	15
3.1 EXPOSURE SETTING CHARACTERIZATION	15
3.2 CONCEPTUAL SITE MODEL	15
3.2.1 Potential Contaminant Sources and Release Mechanisms	16
3.2.2 Potential Receptors and Exposure Pathways	17
3.2.3 Exposure Scenarios	18
3.3 EXPOSURE QUANTIFICATION	20
3.3.1 EPC Calculations	21
3.3.2 Pathway-Specific Intake Equations and Exposure Parameters	24
3.3.3 Fate and Transport Modeling	25
3.3.4 Calculation of Total Exposures	25
4.0 TOXICITY ASSESSMENT	27
4.1 TOXICITY FACTORS FOR CARCINOGENIC COCs	27
4.2 TOXICITY FACTORS FOR NONCARCINOGENIC COCs	28
4.3 TOXICITY FACTORS FOR ECOLOGICAL RECEPTORS	29
5.0 RISK AND HAZARD CHARACTERIZATION	30
5.1 RISK AND HAZARD CHARACTERIZATION METHODOLOGIES	30
5.1.1 Carcinogenic Risks	30
5.1.2 Noncarcinogenic Hazards	32
5.1.3 Ecological Risks	33
5.2 ON-PROPERTY RISKS AND HAZARDS	34

5.2.1	Commercial/Industrial Workers	34
5.2.1.1	Risks	34
5.2.1.2	Hazards	36
5.2.2	Construction/Excavation Workers	38
5.2.2.1	Risks	38
5.2.2.2	Hazards	39
5.2.3	HAZARD SEGREGATION	41
5.3	POTENTIAL OFF-SITE EXPOSURES	41
5.4	ECOLOGICAL RISK CHARACTERIZATION	42
6.0	UNCERTAINTY ANALYSIS	43
7.0	SUMMARY AND CONCLUSIONS	45
7.1	RISK ASSESSMENT SUMMARY	45
7.1.1	Human Receptors	47
7.1.2	Ecological Receptors	49
7.2	RISK ASSESSMENT CONCLUSIONS	49
8.0	RECOMMENDATIONS	52
9.0	REFERENCES	53

CONTENTS (Continued)

APPENDICES

- A MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION CALCULATIONS
- B GROUNDWATER-TO-OUTDOOR AIR MODEL FOR CONSTRUCTION WORKER TRENCH SCENARIO
- C JOHNSON AND ETTINGER MODELING RESULTS
- D RECEPTOR-SPECIFIC EXPOSURE, RISK, AND HAZARD CALCULATIONS
- E MEDIUM-SPECIFIC ANALYTICAL SAMPLING RESULTS
- F OFF-PROPERTY MODELING RESULTS

LIST OF FIGURES

- 1 SITE LOCATION
- 2 SITE LAYOUT, WITH IDENTIFIED AREAS
- 3 CONCEPTUAL SITE MODEL
- 4A IAs AND SAMPLING LOCATIONS – NORTHEAST
- 4B IDENTIFIED AREAS 2, 5, 10, AND 13
- 4C IAs AND SAMPLING LOCATIONS – NORTHWEST
- 4D ADDITIONAL SEDIMENT & SURFACE WATER LOCATIONS
- 4E IA-4 SOIL BORING LOCATIONS
- 4F ADDITIONAL SOIL BORINGS – SOUTH TERRACE
- 4G MONITORING WELL LOCATIONS
- 5 IA-4 CORRECTIVE ACTION AREA

LIST OF TABLES

- 1 CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL – IA-2
- 2 CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL – IA-6
- 3 CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL – IA-10
- 4 CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL – IA-13
- 5 ECOLOGICAL RISK SUMMARY – OFFSITE SEDIMENT
- 6 CHEMICALS OF POTENTIAL CONCERN
- 7 EXPOSURE POINT CONCENTRATION SUMMARY
- 8 EXPOSURE PARAMETER VALUES
- 9 COC-SPECIFIC CHEMICAL FACTORS
- 10 TOXICITY FACTORS
- 11 HUMAN HEALTH RISK AND HAZARD SUMMARY
- 12 COMPARISON OF ESTIMATED INDOOR AIR CONCENTRATIONS FROM GROUNDWATER USING EPA’S GW-ADV-FEB04 AND VISL SPREADSHEET MODELS

ACRONYMS AND ABBREVIATIONS

µg/L	=	Micrograms per liter
ABS	=	Dermal Absorption factor
ACBM	=	Asbestos-containing building material
ADD	=	Average daily dose
AF	=	Adherence factor
AT	=	Averaging time
ATSDR	=	Agency for Toxic Substances and Disease Registry
bgs	=	Below ground surface
BCDC	=	Brownfield Communities Development Company
BUSTR	=	Bureau of Underground Storage Tank Regulations
BW	=	Body weight
C	=	Chemical concentration
Cal/EPA	=	California Environmental Protection Agency
CNS	=	Covenant Not to Sue
COC	=	Chemical of concern
CR	=	Contact rate
CSM	=	Conceptual site model
ED	=	Exposure duration
EF	=	Exposure frequency
ELCR	=	Excess lifetime cancer risk
EPA	=	U.S. Environmental Protection Agency
EPC	=	Exposure point concentration
ESA	=	Environmental Site Assessment
GM	=	General Motors
GNS	=	Generic numerical standard
HEAST	=	Health Effects Assessment Summary Tables
HI	=	Hazard index
HQ	=	Hazard quotient
I	=	Intake
IA	=	Identified area
IRIS	=	Integrated risk information system
J&E	=	Johnson and Ettinger
LADD	=	Lifetime average daily dose
LOAEL	=	Lowest observed adverse effect level
m	=	Meters
m ³ /hour	=	Cubic meters per hour
m ³ /kg	=	Cubic meters per kilogram
MCL	=	Maximum contaminant level
mg/kg-day	=	Milligrams per kilogram per day
msl	=	Mean sea level datum
NCEA	=	National Center for Environmental Assessment
NOAEL	=	No observed adverse effect level
NPDES	=	National Pollutant Discharge Elimination System
OAC	=	Ohio Administrative Code
OERR	=	Office of Emergency and Remedial Response
Ohio EPA	=	Ohio Environmental Protection Agency
ORD	=	Office of Research and Development
OSWER	=	Office of Solid Waste and Emergency Response

ACRONYMS AND ABBREVIATIONS (Continued)

PCB	=	Polychlorinated biphenyls
PEF	=	Particulate emission factor
PPRTV	=	Provisional Peer-Reviewed Toxicity Values
PSRA	=	Property-Specific Risk Assessment
PWS	=	Public Water Supply
RACER	=	Revitalizing Automotive Communities Environmental Response Trust
RAGS	=	Risk Assessment Guidance for Superfund
RAP	=	Remedial action plan
RfD	=	Reference dose
RME	=	Reasonable maximum exposure
RO	=	Remedial Objective
RSL	=	Regional Screening Level
SCDMTSC	=	Site Characterization and Monitoring Technical Support Center
sf	=	Square foot
SF	=	Slope factor
Tetra Tech	=	Tetra Tech Inc.
UAW	=	United Auto Workers
95 UCL	=	95 percent upper confidence limit
VAP	=	Voluntary Action Program
VDEQ	=	Virginia Department of Environmental Quality
VF	=	Volatilization factor
VI	=	Vapor intrusion
VISL	=	Vapor Intrusion Screening Level
VOC	=	Volatile organic chemical
WWTP	=	Wastewater Treatment Plant

EXECUTIVE SUMMARY

Introduction

The former General Motors (GM) Mansfield Stamping Plant (henceforth known as the Subject Property) in Ontario, Richland County, Ohio, is pursuing a (No Further Action Letter) NFA with a Covenant-not-to-sue (CNS) under the Ohio Voluntary Action Program (VAP) MOA track. On behalf of the Volunteer, Revitalizing Automotive Communities Environmental Response Trust (RACER), Tetra Tech, Inc. (Tetra Tech) completed a property-specific risk assessment (PSRA) to evaluate the potential human health risks and hazards posed by environmental impacts associated with surface and subsurface media in selected identified areas at the Subject Property. The specific purposes of the property-specific risk assessment presented in this document are to (1) assess and characterize potential human health exposures and risks, respectively, (2) determine whether identified risks exceed target levels, and (3) for target levels that are exceeded, assess the need for and extent of remedial actions, including determination of chemical- and medium-specific remedial objectives. The property-specific risk assessment was conducted in accordance with the procedures specified in the Ohio Administrative Code (OAC) 3745-300-09.

Background

The Subject Property is located in Ontario, several miles west of the city of Mansfield, in Richland County, Ohio. The Subject Property consists of approximately 266-acres made up of five parcels surrounded predominately by commercial/industrial and agricultural properties west of the Richland Mall, north of State Highway 309, and south of West Fourth Street (Lincoln Highway).

Manufacturing operations took place at the Subject Property from the time the Main Plant was constructed in 1955 through 2010. The RACER Trust was created in March 2011 by the U.S. Bankruptcy Court to facilitate the management of properties formerly owned by the bankrupted GM. Upon its creation, the RACER Trust owned a large amount of industrial space, including the Subject Property. In December 2012, RACER sold the Subject Property to Brownfield Communities Development Company (BCDC).

As presented in the 2015 revised VAP Phase II, 14 identified areas (IA) have been recognized within the Subject Property as follows:

IA No.	IA Description
1a, 1b, 1c	Snow Staging (IAs -1a and -1b)/Rack Wash Area (IA-1c) (west of the main plant building)
2	Former UST Farm (adjacent to the southwest corner of the main plant building)
3	Missing/Miss-Identified USTs (various locations)
4	Former Wastewater Treatment Plant (WWTP) (south of the Baler House and west of existing WWTP [see IA-9])
5	Artificial Fill/Slope Area (southern side of the main plant building)
6	Coal Storage Area (eastern side of the main plant building)
7	Original Switch House (east of northeast corner of main plant building)
8	Stained sumps, stains, and floor drains (various locations in the main plant building)
9	Existing WWTP (east side of main plant building)
10	Hazardous Waste Storage Area (southwest corner of the main plant building)
11	Asbestos Containing Building Materials (“out buildings” at the site)
12	Wood Block Flooring (various locations in the main plant building)
13	South Field Lower Terrace Fill (south of the main plant building)
14	Eastern Raw Material Storage Area

Risk Assessment Scope and Approach

The following five IAs were identified as having one or more chemicals in either or both soil (less than or equal to 10 feet bgs) and groundwater at concentrations above medium-specific generic numerical standard (GNS) values: IA-2, IA-4, IA-5, IA-10, and IA-14. Additional information for those IAs not addressed further in this property-specific risk assessment (IAs 1, 3, 6, 7, 8, 9, 11, 12, and 13) is presented below:

- IA-1 (IA-1a, -1b, and -1c) – The primary concern at IA-1 was a potential release from the snow melting system beneath the parking lot in that area (IAs -1a and -1b). Only one chemical of concern (COC), ethylene glycol, was identified for shallow soil in IA-1 in accordance with OAC 3745-300-06. Ethylene glycol was not detected in any soil sample collected at IA-1. The only exception was soil boring IA1-6 which was extended to address the potential impact of the Rack Wash building (IA-1c) located immediately upgradient of the boring location and thus sampled for VOCs. The sample from soil boring IA1-6 was collected from 15 feet bgs which is deeper than the range of subsurface soil (0 to 10 feet bgs) considered for potential direct contact for human receptors. It should be noted that all VOCs were detected at concentrations less than their respective medium-specific GNS values. Also, groundwater samples were not collected from IA-1. Therefore, IA-1 was not considered further.
- IA-3 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Therefore, IA-3 was not considered further.
- IA-6 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 2 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1.

Similar groundwater results were not added to the Table 2 soil results because the only chemicals detected in IA-6 groundwater (monitoring well MW6-1) were gasoline range organics (GRO) and the C20-C34 petroleum fraction. Therefore, IA-6 was not considered further.

- IA-7 – Wipe sampling for polychlorinated biphenyls (PCB) were all nondetect (see Table E6 in Appendix E). Therefore, IA-7 was not considered further.
- IA-8 – Information regarding IA-8 includes the results of a geophysical survey conducted within the Main Plant Building and analysis of samples from soil boring IA4-10 (Tetra Tech 2015), – the closest soil boring to the Main Plant Building. IA4-10 was installed to evaluate the horizon corresponding to the “marriage station” as an additional investigative tool to support the geophysical investigation of that feature. The sample depth was targeted to correspond with the elevation of the feature as described in the Site-Specific Work Plan and the Phase II ESA (Tetra Tech 2015). As a result, no soil samples were collected within 25 feet bgs. Therefore, no potential for direct contact with site-related chemicals in soil was identified. Further, all chemical concentrations in soil (sample collected 25 to 27.5 feet bgs) were less than commercial/industrial and construction/excavation GNS values – see Appendix E). Also, groundwater samples were not collected from IA-8. Therefore, IA-8 was not considered further.
- IA-9 – The waste water treatment system is a closed loop and no evidence of a release was identified in association with this feature. In addition, the IA was limited to the footprint of the building. As a result, no Phase II PA activities were conducted in this area. This IA is considered resolved. The raw materials storage area to the east that was formerly included in IA-9 has been separated from the WWTP and now represents IA-14.
- IA-11 – Information regarding IA-11 was requested by Ohio EPA to support cost estimation for demolition of the building. Asbestos-containing building material (ACBM) is outside the scope of the VAP and the abatement was conducted under Ohio EPA oversight. Therefore, IA-11 was not considered further.
- IA-12 – Wood block flooring at various locations in the Main Plant Building has been removed. Analytical results were collected at Ohio EPA’s request only to characterize the building materials for disposal purposes. Building materials (such as wood block flooring) are not eligible for inclusion under VAP. Therefore, IA-12 was not considered further.
- IA-13 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 4 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1. Also, groundwater samples were not collected from IA-13. Therefore, IA-13 was not considered further.

Similarly, as documented in Appendix E (see Table E-6), no chemical-specific exceedances of residential soil GNS values (see OAC 3745-300-08 (H) (2) (a)) were exceeded for the single sediment sample (SD12-LAN-0411) from Beer Road Ditch. Therefore, potential exposure by human receptors (recreationalists) to sediment in Beer Road Ditch was not considered further.

Therefore, the property-specific risk assessment includes evaluation of potential location-specific exposures, risks, and hazards only at IA-2, IA-4, IA-5, IA-10, and IA-14. In addition to evaluating potential human exposures to contaminants present in soil and groundwater at these IAs, the scope of the risk assessment also includes an evaluation of potential off-property, but potentially property-related human and ecological exposures. The conclusions of the property-specific risk assessment will be used to focus remediation of the remaining IAs and off-property locations (as required) and, to the extent necessary, design appropriate on-property work restrictions.

Risk assessment is typically conducted in four basic steps: (1) data evaluation and identification of COCs, (2) exposure assessment, (3) toxicity assessment, and (4) risk and hazard characterization. These four steps, as well as a risk assessment summary and recommendations for future remediation, are presented herein.

The property-specific risk assessment was completed in a manner consistent with the procedures specified in OAC 3745-300-09. In the future, the Subject Property will be used for commercial/industrial operations. Consistent with a future commercial/industrial land use, the risk assessment evaluated potential exposures to two groups of on-property receptors: commercial/industrial workers and construction/excavation workers. The risk assessment included evaluation of potential location-specific exposures, risks, and hazards at IA-2, IA-4, IA-5, IA-10, and IA-14. The property-specific risk assessment evaluated the potential indoor air pathway because the IAs listed above overlie volatile organic chemical (VOC) contamination in soil and groundwater. The vapor intrusion pathway (whether originating in soil or groundwater) is a pathway for which there are no generic standards (OAC 3745-300-09(A)(3)(a)). The mandatory requirement to conduct a property-specific risk assessment when important ecological resources or sediments are impacted by hazardous substances (OAC 3745-300-09 (A) (3)(e)) is limited for two primary reasons:

1. There are no complete exposure pathways to important ecological receptors other than surface water and sediment (see OAC 3745-300-09 (A) (3) (e)). The northern portion of the Subject Property is dominated by the former Main Plant Building and related paved parking and operational areas. The southern portion of the Subject Property is covered in grass and contains no unique ecological habitat or features, including natural surface water bodies.
2. Storm water collection in drainage features on the Subject Property, including the Storm Water Retention Pond and discharge to a ditch along the west side of the southern part of Beer Road (referred to in the revised PSRA as “the Beer Road Ditch”), is covered by NPDES permit 21S00045*GD. Surface water samples were collected for informational purposes only as part of the due diligence for the Subject Property and are not subject to VAP applicable standards.

Therefore, potential exposures to chemicals in surface water and on-property sediment and associated risks and hazards were not addressed in this revised PSRA.

However, potential ecological exposures to sediment in the Beer Road Ditch were evaluated. A single sediment sample (SD12-LAN-0411) was located in this ditch. Also, potential human exposures to off-property groundwater were evaluated qualitatively.

Results

All chemicals that were positively detected in at least one sample from a medium (soil, groundwater, and sediment [off-property only]) including chemicals with no qualifiers and chemicals with data qualifiers indicating known identities but uncertain concentrations (for example, J-qualified data) were retained as COCs for that medium. The soil (46 total, including those present at depths greater than 10 feet below ground surface [bgs] and therefore included for vapor intrusion only), groundwater (28 total), and sediment (21 total) COCs identified and carried through the risk assessment are identified in Table ES-1.

**TABLE ES-1
CHEMICALS OF CONCERN^a**

Chemical	Soil	Groundwater	Sediment
Acetone	X	X	X
Benzene	X		
Bromodichloromethane		X	
Bromomethane	X	X	
2-Butanone	X	X	X
Carbon disulfide	X	X	
Chloroethane	X	X	
Chloroform		X	
1,1-Dichloroethane	X	X	
1,2-Dichloroethane	X		
1,1-Dichloroethene		X	
cis-1,2-Dichloroethene		X	
trans-1,2-Dichloroethene		X	
Ethyl benzene	X		
2-Hexanone	X		
Isopropylbenzene	X		
Methylene chloride	X		X
4-Methyl-2-pentanone	X		
Tetrachloroethene		X	
Toluene	X	X	
1,2,4-Trichlorobenzene	X		
1,1,1-Trichloroethane		X	
Trichloroethene		X	
Vinyl chloride		X	
Xylenes (total)	X		
Acenaphthene	X	X	
Acenaphthylene	X		X
Anthracene	X		
Benzo(a)anthracene	X		X
Benzo(b)fluoranthene	X	X	X
Benzo(k)fluoranthene	X		X
Benzo(g,h,i)perylene	X		X
Benzo(a)pyrene	X		X
Chrysene	X	X	X
Dibenzo(a,h)anthracene	X		
Fluoranthene	X	X	X
Fluorene	X	X	X
Indeno(1,2,3-cd)pyrene	X		X
Isopropylbenzene	X		
1-Methylnaphthalene	X		
2-Methylnaphthalene	X		
Naphthalene	X	X	
Phenanthrene	X	X	X
Pyrene	X	X	X
Aroclors 1242, -1254, and -1260	X		
C6-C12	X		
C20-C34	X	X	
C10-C20	X	X	
Gasoline Range Organics (GRO)		X	
Arsenic	X		X
Cadmium	X		X
Chromium	X		X
Lead	X		X
Mercury	X	X	X
Selenium	X		X

Note: ^a The COCs represent those chemicals detected at least once in a particular medium.

Risks and hazards were evaluated separately for commercial/industrial and construction/excavation workers. These results are summarized below.

- Risks and hazards associated with the IA-2, IA-10, and IA-14 are less or equal to receptor-specific target cumulative risks and hazards. Therefore, remediation at these IAs is not required.
- Risks and hazards associated with IA-5 are less than or equal to receptor-specific target cumulative risks and hazards with one exception. The total HI for construction/excavation workers was calculated as 2, which exceeds the target hazard of 1. This total HI is driven by potential exposure to trichloroethene in trench air. However, trichloroethene was detected in only 1 of 4 monitoring wells at IA-5. The HI for trichloroethene (1.6) based on the maximum detected concentration of trichloroethene from monitoring well MW5-2S (11 µg/L) was reduced to 1.1 (and the total HI reduced from 1.6 to 1.2) when the trichloroethene concentration (7.7 µg/L) measured in a second sample collected two months later from MW5-2S is used. The revised total HI of 1.2 reduces to 1 at one significant figure.
- Risks and hazards at IA-4 exceed the target cumulative risk and hazard for commercial/industrial workers and for construction/excavation workers. These risks and hazards are driven by potential exposure to carcinogenic PAHs in soil. Excavation of PAH-contaminated soils at IA-4 will be required.

The conclusions drawn from this risk assessment are also summarized in the following tables and text:

Risk Assessment Outcome for Commercial/Industrial Worker Scenario

Area	Risk	Hazard	Recommended Action
IA-2	Pass	Pass	No Action Required
IA-4	Fail	Fail	Excavation of PAH-contaminated soil
IA-5	Pass	Pass	No Action Required
IA-10	Pass	Pass	No Action Required
IA-14	Pass	Pass	No Action Required

Risk Assessment Outcome for Construction/Excavation Worker Scenario

Area	Risk	Hazard	Recommended Action
IA-2	Pass	Pass	No Action Required
IA-4	Fail	Fail	Excavation of PAH-contaminated soil
IA-5	Pass	Pass	No Action Required*
IA-10	Pass	Pass	No Action Required
IA-14	Pass	Pass	No Action Required

* See text for more discussion.

Risk Assessment Outcome for Off-Property Exposure Scenarios

Area	Risk	Hazard	Recommended Action
Off-Property – General (inhalation of fugitive dust and vapors and potable groundwater use)	Pass	Pass	No Action Required

Risk Assessment Outcome for Off-Property Ecological Exposure Scenario

Area	Risk	Recommended Action
Beer Road Ditch	Fail	No Action Required* [1] Verified a documented historical release from an off-property source of PAHs to the Beer Road Ditch and portions of the site drainage network, [2] No known on site releases of hazardous substances or petroleum products to the drainage system on-property

* See text for more discussion.

Potential off-property human health risks related to COC exposures from the Subject Property are less than a target cumulative risk of 1E-05 and a target cumulative hazard of 1 (OAC 3745-300-09 (B)(1)(b)(ii)) based on (1) insubstantial exposures (inhalation of particulates and vapors from on-property soils) and (2) measured and modeled groundwater concentrations at the Subject Property boundaries less than 1E-05.

Potential off-property ecological exposures may be associated with elevated risks. The cumulative risk ratios based on potential exposure by ecological receptors to sediments in the Beer Road Ditch beyond the Property's NPDES-permitted discharge point exceed 1. These ecological risks are driven by potential exposure to PAHs (including acenaphthene, benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, and pyrene), and the VOC acetone. These ecological risks are expected to be overestimated based on the following criteria: (1) PAHs in Beer Road Ditch are likely the result (at least partially) of off-property sources such as the historical release at 815 Beer Road and traffic along Beer Road and upgradient commercial/industrial operations and (2) there are no reported releases of hazardous substances or petroleum products to the on-property drainage system from on-site sources. The PAH concentrations in Beer Road Ditch while exceeding threshold effects concentrations (TEC) are less than probably effects concentrations (PEC).

Based on the summary and conclusions and consistent with VAP response requirements specified in OAC 3745-300-09 for commercial/industrial properties, voluntary actions are recommended at IA-4.. At IA-4, excavation of PAH-contaminated soil is required. In Beer Road Ditch, the source of the PAHs and VOC are associated with a historical release of diesel fuel from the former Bender & Loudon Freight facility at 815 Beer Road. This incident marks the only known release to the stormwater drainage network at the site.

1.0 INTRODUCTION

On behalf of the Ohio Environmental Protection Agency (Ohio EPA) and the Revitalizing Automotive Communities Environmental Response Trust (RACER), Tetra Tech, Inc. (Tetra Tech), have completed a series of Phase I and Phase II reports for the former General Motors (GM) Mansfield Stamping Plant (henceforth known as the Subject Property) in Ontario, Richland County, Ohio (see Figure 1). The Subject Property sits on five parcels of land (0386015206000, 0386015205000, 0386015204000, 0386015202000, and 0386015203000) totaling 266 acres located between West Fourth Street and State Route 309 in Ontario. The Subject Property is bound by commercial properties to the north, additional commercial properties including the Richland Mall to the east, a rail yard and State Route 309 to the south, and Beer Road followed by light industry (Burner Systems, Invensys, Universal Refrigeration, Yellow Trucking, and Shearer Equipment) and farmland to the west (see Figure 2). The Subject Property was developed in 1955 as a GM metal stamping plant. GM ceased operations at the Subject Property in February 2010; the Subject Property is not currently in use. In December 2012, RACER sold the Subject Property to Brownfield Communities Development Company (BCDC). The Phase I and Phase II reports were prepared in accordance with Ohio EPA Voluntary Action Program (VAP) rules set forth in Ohio Administrative Code (OAC) 3745-300-06 and 3745-300-07, also known as VAP Rules 6 and 7 and include: a Phase I Environmental Site Assessment (ESA) (Tetra Tech 2011) and a Phase II ESA (Tetra Tech 2015).

The 2011 Phase I and 2015 Phase II reports identify potential adverse environmental impacts associated with surface and subsurface media in selected identified areas at the Subject Property (Tetra Tech 2011, Tetra Tech 2015). The overall purpose of the property-specific risk assessment (PSRA) is to support the no further action (NFA) letter with a covenant not to sue (CNS) from Ohio EPA sought by RACER. To this end, the specific purposes of the risk assessment are to (1) assess and characterize potential human health and ecological exposures and risks, (2) determine whether identified risks exceed target levels, and (3) for target levels that are exceeded, assess the need for and extent of remedial actions, including determination of chemical- and medium-specific remedial objectives (RO). The property-specific risk assessment was conducted in accordance with the procedures specified in Ohio Administrative Code (OAC) 3745-300-09.

The remainder of this section summarizes the site history (Section 1.1), presents the risk assessment scope and technical approach (Section 1.2), and discusses the risk assessment report organization (Section 1.3).

1.1 SITE HISTORY

This section describes the Subject Property location and layout (Section 1.1.1), summarizes Subject Property operations (Section 1.1.2), and summarizes major remedial actions (Section 1.1.3). The information is condensed from the Phase I and Phase II reports (Tetra Tech 2011, Tetra Tech 2015).

1.1.1 Subject Property Location and Description

The Subject Property is located in Ontario, several miles west of the city of Mansfield, in Richland County, Ohio. The Subject Property consists of approximately 266-acres made up of five parcels surrounded predominately by commercial-industrial and agricultural properties west of the Richland Mall, north of State Highway 309, and south of West Fourth Street (Lincoln Highway) (see Figures 1 and 2). The Subject Property and surrounding land are nearly level, with a surface elevation of approximately 1,400 feet mean sea level datum (msl). Surface water features on the Subject Property include a storm water pond and a series of drainage ditches comprising the surface drainage network. The surface drainage network eventually discharges to a ditch along Beer Road in the southwest corner of the site (see Figure 4D); this surface water feature is referred to in this revised PSRA as the Beer Road Ditch. Storm water discharge from the Subject Property is covered by an existing National Pollutant Discharge Elimination System (NPDES) permit 21S00045*GD. As a result, issues related to storm water discharge and the surface water and sediment in the surface drainage network upgradient of the discharge point fall under the purview of the NPDES permit. Issues that pertain to other regulatory programs such as NPDES are not eligible for inclusion in the VAP. Therefore, contaminant concentrations in surface water and on-property sediments were collected for informational purposes only as part of the due diligence for the Subject Property and are not subject to VAP applicable standards. However, potential human health and ecological exposures to potentially property-related chemical concentrations in a single off-property sediment sampled collected in the Beer Road Ditch were evaluated in this revised PSRA.

Primary features at the Subject Property included the following (see Figure 2):

- Main Plant Building
- Original Switch House
- New Switch House
- Electrical Substation
- Press Prep Building
- Powerhouse
- Former Wastewater Treatment Plant (WWTP)
- Existing WWTP
- Compressor Building

-
- Baler House
 - Former Coal Storage Area
 - Coil Steel Rack Building
 - Rack Wash Building
 - Oil Crib
 - Snow Staging Area
 - Storm water Retention Pond (and related drainage ditches)
 - Artificial Fill/Slope Area
 - Two water towers

Note: with the exception of the Press Prep Building, the Compressor Building, and the Rack Wash Building, all structures have been razed by the BCDC; only slabs remain.

The parcel was dominated by the Main Plant Area with its 2.9 million-square-foot (sf) footprint. Paved parking and operational areas are located west and east of the Main Plant Building. Grass and unpaved areas are located along the far northern and eastern boundaries of the Subject Property, and all land south of the Main Plant Building (see Figure 2). A chain-link fence completely surrounds the Subject Property. Access to the Subject Property is through a security gate along Stumbo Road on the east side of the Subject Property. Adjoining properties and respective orientations are the United Auto Workers (UAW) Hall, the ABC Warehouse, Red Lobster, and the Bookery north of the Subject Property along the north side of West Fourth Street; the Richland Mall to the east; the Ontario Police Department to the southeast; and Burner Systems, Invensys, Universal Refrigeration, Lucas Tool Grinding, Yellow Trucking, and Shearer Equipment to the west (see Figure 2).

1.1.2 Subject Property Operations and Ownership

Prior to GM purchasing the land in 1955, historical records and files reviewed indicate that the Subject Property was farmland. GM built the plant which began operations in 1955. The plant was built to produce automotive body components out of steel; the steel was “stamped” in various press machines. During the height of production at the plant, it contained 18 transfer presses, 21 major press lines with 134 conventional presses, 43 metal assembly lines, and 14 blanking presses. Presses were located in pits, with the hydraulic components below the machines. When production at the facility ceased in February 2010, several of the presses and various other machinery were removed; the remainder were auctioned off. The plant processed over 750 tons of steel per day; scrap metal from the presses was collected via a system of conveyors and sent to the baler house where it was baled for off-site removal. In 2002, the baler operation was terminated when a loose scrap system was instituted. The powerhouse was also built in 1955 to supply power and compressed air to the plant. When operational, the powerhouse burned up to 100 tons of coal per day and included three coal-fired boilers, one steam air compressor, and seven

electric air compressors. Coal entered the powerhouse through the basement, and an elevator was used to transport it to the top floor of the building where it entered a bunker; the coal was then weighed out and transferred to the boilers. Ash residue from the boilers was vacuumed out and collected in an adjoining silo, where it was periodically emptied into a cinder truck. The ash was re-used for salting the roads in winter or disposed of. A 42,000 square foot area south of the powerhouse, including the waste water treatment plant, was used to store the coal. The powerhouse was shut down in 2001 when gas-fired boilers were installed at the main plant.

The RACER Trust was created in March 2011 by the U.S. Bankruptcy Court. Upon its creation, the RACER Trust owned a large amount of industrial space, including the Subject Property. In December 2012, RACER sold the Subject Property to BCDC. After acquiring the property, BCDC has razed the majority of the buildings on site. Only the Prep Press, Rack Wash, and Compressor buildings remain. The slabs associated with the other structures remain in place.

1.2 RISK ASSESSMENT SCOPE AND TECHNICAL APPROACH

This section summarizes the scope (Section 1.2.1) and technical approach (Section 1.2.2) of the risk assessment.

1.2.1 Risk Assessment Scope

As presented in the revised 2015 Phase II ESA, releases of hazardous substances and petroleum have occurred on, underlying, and in the case of groundwater, are emanating from the Subject Property (Tetra Tech 2015). As presented in the revised 2015 Phase II ESA, 14 IAs have been recognized at the Property, as follows (see Figure 2):

IA No.	IA Description
1a, 1b, 1c	Snow Staging (IAs -1a and -1b)/Rack Wash Area (IA-1c) (west of the main plant building)
2	Former UST Farm (adjacent to the southwest corner of the main plant building)
3	Missing/Mis-Identified USTs (various locations)
4	Former Wastewater Treatment Plant (WWTP) (south of the Baler House and west of existing WWTP [see IA-9])
5	Artificial Fill/Slope Area (southern side of the main plant building)
6	Coal Storage Area (eastern side of the main plant building)
7	Original Switch House (east of northeast corner of main plant building)
8	Stained sumps, stains, and floor drains (various locations in the main plant building)
9	Existing WWTP (east side of main plant building)
10	Hazardous Waste Storage Area (southwest corner of the main plant building)
11	Asbestos Containing Building Materials (“out buildings” at the site)
12	Wood Block Flooring (various locations in the main plant building)
13	South Field Lower Terrace Fill (south of the main plant building)
14	Eastern Raw Material Storage Area

In addition to evaluating potential human exposures to contaminants present in soil and groundwater at these IAs, the scope of the revised PSRA also includes an evaluation of potential off-property, but potentially Property-related human health and ecological exposures. As noted in Section 1.1.1, storm water discharge from the Subject Property is covered by NPDES permit 21S00045*GD. Contaminant concentrations in surface water and on-property sediments were collected for informational purposes only as part of the due diligence for the Subject Property and are not subject to any VAP applicable standards. However, potential human health and ecological exposures to potentially Property-related chemical concentrations in a single off-property sediment sample (SD12-LAN-0411) collected in the Beer Road Ditch beyond the Property’s NPDES-permitted discharge point (see Figure 4D) were evaluated.

Figure 3 summarizes the exposure scenarios (human and ecological receptors, exposure routes, and exposure point combinations) considered in the risk assessment (these exposure scenarios are discussed in greater detail in Section 3.0). In order to focus the risk assessment, the maximum concentration of each chemical detected at each IA was compared to VAP generic numerical standards (OAC 3745-300-08). The proposed end use of the Subject Property is continued commercial and industrial operations. Therefore, for preliminary screening purposes, the appropriate soil direct contact generic numerical standards (GNS) are those associated with a commercial or industrial land use. With regard to groundwater, land use restrictions will be put into place prohibiting future use of Property groundwater. Also, the depth to groundwater is ≥ 12 feet below ground surface (bgs). Specifically, the Property is divided into two zones with regards depth to groundwater: (1) the upper terrace (where IAs 2, 4, 10, and 14 are located) – the depth to groundwater is about 25 feet bgs, and (2) the lower terrace (where IA-5 is located) – the depth to groundwater is about 12 feet bgs. Since construction/excavation trenches are typically ≤ 10 feet bgs in depth, the trenches are not expected to intersect the water table and groundwater

is not expected to accumulate in these trenches. Therefore, no direct contact exposure with groundwater is anticipated. However, receptors may be exposed to volatile chemicals that migrate from groundwater to air within buildings (indoor air) or construction/excavation trenches (trench air). For the purposes of the revised PSRA, the point of compliance (POC) for construction/excavation activities is 10 feet bgs.

The following five IAs were identified as having one or more chemicals in either or both soil (less than or equal to 10 feet bgs) and groundwater at concentrations above medium-specific GNS or VISL values: IA-2, IA-4, IA-5, IA-10, and IA-14. Additional information for those IAs not addressed further in this property-specific risk assessment (IAs 1, 3, 6, 7, 8, 9, 11, 12, and 13) is presented in Appendix E, Tables 2 and 4, and summarized below:

- IA-1 (IAs -1a, -1b, and -1c) – The primary concern at IA-1 was a potential release from the snow melting system beneath the parking lot in that area (IAs -1a and -1b). Only one chemical of concern (COC), ethylene glycol, was identified for shallow soil in IA-1 in accordance with OAC 3745-300-06. Ethylene glycol was not detected in any soil sample collected at IA-1. The only exception was soil boring IA1-6 which was extended to address the potential impact of the Rack Wash building (IA-1c) located immediately upgradient of the boring location and thus sampled for VOCs. The sample from soil boring IA1-6 was collected from 15 feet bgs which is deeper than the range of subsurface soil (0 to 10 feet bgs) considered for potential direct contact for human receptors. It should be noted that all VOCs were detected at concentrations less than their respective medium-specific GNS values. Also, groundwater samples were not collected from IA-1. Therefore, IA-1 was not considered further.
- IA-3 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Therefore, IA-3 was not considered further.
- IA-6 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 2 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1. Similar groundwater results were not added to the Table 2 soil results because the only chemicals detected in IA-6 groundwater (monitoring well MW6-1) were gasoline range organics (GRO) and the C20-C34 petroleum fraction. The Property was given a NFA by the Ohio BUSTR (ODC 2003). Therefore, IA-6 was not considered further.
- IA-7 – Wipe sampling for polychlorinated biphenyls (PCB) were all nondetect (see Table E6 in Appendix E). Therefore, IA-7 was not considered further.
- IA-8 – Information regarding IA-8 includes the results of a geophysical survey conducted within the Main Plant Building and analysis of samples from soil boring IA4-10 (Tetra Tech 2015), – the closest soil boring to the Main Plant Building. IA4-10 was installed to evaluate the horizon corresponding to the “marriage station” as an additional investigative tool to support the geophysical investigation of that feature. The sample depth was targeted to correspond with the elevation of the feature as described in the Site-Specific Work Plan and the Phase II ESA (Tetra Tech 2015). As a result, no soil samples were collected within 25 feet bgs. Therefore, no potential for direct contact with site-related chemicals in soil was identified. Further, all chemical

concentrations in soil (sample collected 25 to 27.5 feet bgs) were less than commercial/industrial and construction/excavation GNS values – see Appendix E). Also, groundwater samples were not collected from IA-8. Therefore, IA-8 was not considered further.

- IA-9 – The waste water treatment system is a closed loop and no evidence of a release was identified in association with this feature. In addition, the IA was limited to the footprint of the building. As a result, no Phase II PA activities were conducted in this area. This IA is considered resolved. The raw materials storage area to the east that was formerly included in IA-9 has been separated from the WWTP and now represents IA-14.
- IA-11 – Information regarding IA-11 was requested by Ohio EPA to support cost estimation for demolition of the building. Asbestos-containing building material (ACBM) is outside the scope of the VAP and the abatement was conducted under Ohio EPA oversight. Therefore, IA-11 was not considered further.
- IA-12 – Wood block flooring at various locations in the Main Plant Building has been removed. Analytical results were collected at Ohio EPA's request only to characterize the building materials for disposal purposes. Building materials (such as wood block flooring) are not eligible for inclusion under VAP. Therefore, IA-12 was not considered further.
- IA-13 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 4 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1. Also, groundwater samples were not collected from IA-13. Therefore, IA-13 was not considered further.

Similarly, as documented in Appendix E (see Table E-6), no chemical-specific exceedances of residential soil GNS values (see OAC 3745-300-08 (H) (2) (a)) were exceeded for the single sediment sample (SD12-LAN-0411) from Beer Road Ditch. Therefore, potential exposure by human receptors (recreationalists) to sediment in Beer Road Ditch was not considered further.

Therefore, the revised PSRA includes evaluation of potential location-specific exposures, risks, and hazards at IA-2, IA-4, IA-5, IA-10, and IA-14 (see Figure 2). The revised PSRA also includes an evaluation of potential off-property, but potentially property-related ecological exposures to sediment in the Beer Road Ditch (see Figure 4D).

1.2.2 Risk Assessment Technical Approach

The risk assessment was completed in accordance with Ohio EPA VAP property-specific risk assessment procedures (OAC 3745-300-09). A PSRA is also required at the Subject Property to evaluate the indoor air pathway in portions of the Subject Property that overlie or are located adjacent to groundwater containing volatile organic chemicals (VOC) at concentrations greater than Vapor Intrusion Screening Levels (VISL), a pathway for which there are no generic standards (OAC 3745-300-09(A)(3)(a)).

The risk assessment also addresses the requirement to evaluate the cumulative cancer risk to off-property human receptors under an industrial site remedy (OAC 3745-300-9(B) (1) (b) (i)) (see Section 5.3).

Finally, the revised PSRA includes a limited ecological risk assessment component for two primary reasons:

1. There are no complete exposure pathways to important ecological receptors other than surface water and sediment (see OAC 3745-300-9 (A)(3)(e)). The northern portion of the Subject Property is dominated by the former Main Plant Building and related paved parking and operational areas. The southern portion of the Subject Property is covered in grass and contains no unique ecological habitat or features, including natural surface water bodies.
2. As discussed in Section 1.1.1, storm water collection in drainage features on the Subject Property (including the Storm Water Retention Pond)) and discharge from the Subject Property is covered by NPDES permit 21S00045*GD. Surface water samples were collected for informational purposes only as part of the due diligence for the Subject Property and are not subject to any VAP applicable standards. Therefore, potential exposures to chemicals in surface water and on-property sediment and the associated risks and hazards are not addressed in this revised PSRA.

However, potential off-property ecological exposures to sediment in Beer Road Ditch were evaluated (see Section 5.4).

1.3 RISK ASSESSMENT ORGANIZATION

A risk assessment is typically conducted in four basic steps: (1) data evaluation and identification of chemicals of potential concern (COC), (2) exposure assessment, (3) toxicity assessment, and (4) risk and hazard characterization. These four steps as well as development of property-specific numerical standards and a risk assessment summary step are summarized below and are discussed in detail in Sections 2.0 through 7.0.

- **Section 2.0, Data Evaluation and Identification of Chemicals of Concern (COC)**, summarizes data collection and evaluation activities and identifies COCs.
- **Section 3.0, Exposure Assessment**, identifies potential human exposure pathways, estimates environmental concentrations of COCs at potential exposure points (exposure point concentrations [EPC]), and estimates potential human intakes or doses.
- **Section 4.0, Toxicity Assessment**, identifies and summarizes the basis for COC-specific toxicity criteria used in the risk assessment.
- **Section 5.0, Risk and Hazard Characterization**, presents estimates of carcinogenic risks and non-carcinogenic hazards, general conclusions regarding potential risks and hazards associated with exposures to COCs, and major uncertainties associated with the risk and hazard estimates.

-
- **Section 6.0, Uncertainty Analysis**, summarizes potentially significant sources of uncertainty associated with the risk assessment.
 - **Section 7.0, Summary and Conclusions**, summarizes the risk assessment process, major assumptions, significant conclusions, and uncertainties related to the risk assessment.
 - **Section 8.0, Recommendations**, makes recommendations relative to the ongoing remediation and identifies and documents chemical- and medium-specific COC remediation or target performance standards.

References cited in this report are listed in Section 9.0. Tables and figures for this report are provided after the list of references. Shorter tables are embedded in text. In addition, the report also includes six appendices. Appendix A documents the calculation of medium-specific EPCs used in the risk assessment. Appendix B presents trench air calculations. Appendix C presents the results of indoor air modeling. Appendix D presents receptor-specific exposure, risk, and hazard calculations. Appendix E presents medium-specific summary tables of Phase 2 ESA sampling results used as the basis for this Property-specific risk assessment. Finally, Appendix F presents an evaluation of off-property groundwater exposures.

2.0 DATA EVALUATION AND IDENTIFICATION OF COCS

The primary purpose of this section is to identify and discuss analytical results considered in the risk assessment and to discuss the basis for identifying site-specific COCs. COCs are chemicals carried through the entire risk assessment process for which carcinogenic risks and non-carcinogenic hazards are estimated. Section 2.1 discusses data collection and evaluation, and Section 2.2 summarizes the COC identification process.

2.1 DATA COLLECTION AND EVALUATION

As discussed in Section 1.2.1, the risk assessment focuses on potential exposure to contaminants in soil and groundwater based on analytical data sets for samples collected at the Subject Property. Section 2.1.1 discusses the sources of medium-specific analytical data considered in the risk assessment. Section 2.1.2 evaluates the analytical data in terms of its use in the risk assessment.

2.1.1 Data Collection

Analytical data considered for use in the risk assessment were reported in the following reports.

- Phase I ESA (Tetra Tech 2011)
- Phase II ESA (Tetra Tech 2015)

Each of these data sources is summarized below.

Phase I ESA (Tetra Tech 2011)

The Phase I ESA was performed in general accordance with the Ohio VAP guidelines specified in Ohio Administrative Code (OAC) 3745-300-06. The objective of the Phase I ESA was to identify recognized, obvious, and likely on-site or off-site potential sources of contamination. Subsurface investigations were not conducted as part of the Phase I ESA. In fact, no medium-specific sampling was conducted as part of the Phase I ESA.

The evaluation of the Subject Property and the information contained in the Phase I ESA was based on conditions existing on the date of the site reconnaissance. The evaluation was conducted only for the Subject Property with limited visual observations of the adjacent properties. To the extent feasible, the Phase I ESA included an evaluation of past and present land uses at the Subject Property. Tetra Tech has based its conclusions and recommendations on the limited information available during the study.

The Phase I ESA included five types of information or activities as listed below:

-
- Information regarding the owner, property manager, and occupant(s)
 - Summary of prior assessments. At the Subject Property, there were two:
 - Phase I ESA of Baler House (April 2008)
 - Phase I ESA of Subject Property (April 2011)
 - Records review
 - Site reconnaissance – conducted by Tetra Tech in January 2011
 - Interviews

Based on these five sources of information, Tetra Tech identified 14 IAs (numbered IA-1 through IA-14 as presented in Section 1.2.1. Recommendations led to the identification of additional IAs as discussed as part of the Phase II ESA (see below).

Phase II ESA Report (Tetra Tech 2015)

The Phase II ESA was conducted under the Ohio VAP as codified by Ohio Administrative Code (OAC) 3745-300-07. The investigation was based on the IAs identified in the Phase I ESA conducted in 2011 (see above). The purpose of the Phase II ESA was to conduct an investigation sufficient to determine whether all applicable standards were met or to determine that remedial activities conducted in accordance with rule OAC 3745-300-11 at the Subject Property meet or will achieve applicable standards.

Tetra Tech finished the first part of Phase II by June 2011. The second part of the Phase II investigation was conducted between October 2011 and November 2012. Following the transfer of the Subject Property to the BCDC, Tetra Tech returned to the Subject Property for additional Phase II activities in June 2013 (these additional activities focused on the South Field Lower Terrace area). The Phase II medium-specific sampling activities are summarized below by medium and type of investigation. The reader is directed to the full Phase II ESA for additional detail as required (Tetra Tech 2015).

Soil Borings

The distribution of chemical contamination throughout the Subject Property was determined by installing continuously sampled soil borings and test pits. The soil borings were initially distributed across 11 IAs (IAs 1a, 1b, 1c, 2, 3, 4, 5, 6, 10, 13, and 14), with locations and sampling depths biased toward areas in which the greatest chance for contamination may exist and/or in areas where hydrogeological data was necessary. Soil boring locations were selected to provide the most conservative representation of chemical contamination at the Subject Property.

-
- The initial subsurface investigation was conducted in April 2011 and included installation of shallow and deep soil borings in Ias 1, 2, 3, 4, 5, 6, 10, and 14
 - In April and May 2011, Tetra Tech installed four additional soil borings and excavated 17 seven-foot deep test pits at IA-5.
 - In May 2011, three additional borings were installed to delineate contamination detected at IA-4.
 - In December 2011, Tetra Tech installed 20 shallow borings at IA-4 to investigate the extent of polynuclear aromatic hydrocarbon (PAH) concentrations, specifically naphthalene, exceeding VAP soil direct contact standards for the commercial/industrial and construction/excavation scenarios.
 - In November 2012, Tetra Tech installed eight additional soil borings at IA-4 to further delineate the extent of PAH contamination.
 - In June 2013, Tetra Tech installed 32 additional shallow soil borings in the South Field Lower Terrace (IA-13).

Groundwater Monitoring Wells

Tetra Tech installed 12 groundwater monitoring wells at the Subject Property. The 12 locations and depth ranges were selected where soil sampling was not previously completed, and continuous samples of the subsurface materials were collected.

- Monitoring well locations MW2-1, MW2-2, MW4-7, MW5-1, MW5-2S, MW5-2D, MW5-4, MW10-1, and MW14-1 were sampled in April 2011. Monitoring wells MW1-6, MW6-1, and MW10-2 did not contain sufficient water for sampling.
- A second round of groundwater samples was collected in June 2011. Monitoring wells MW1-6, MW6-1, and MW14-1 did not contain sufficient water for sampling; however, a groundwater sample was collected from MW10-2. A sample was not collected from MW10-1; however, no exceedances were observed in the first round sample from that location.

Surface Water Sampling

Tetra Tech collected two surface water samples (one from the intake and one from the outfall of the Subject Property's storm water retention pond). These samples were collected for screening purposes only, as the storm water retention system at the Subject Property is regulated under an existing NPDES permit. As a result, issues related to storm water discharge and the sediments in the surface drainage network up gradient of the discharge point fall under the purview of the NPDES permit. Therefore, contaminant concentrations in surface water and on-property sediments were collected for informational purposes only as part of the due diligence for the Subject Property and are not subject to VAP applicable standards.

Sediment Sampling

Ten sediment samples were obtained throughout the Subject Property from the storm water collection and conveyance (retention) system. One sediment sample (SD12-LAN-0411) was collected in Beer Road Ditch on the downstream side of the Property's NPDES-permitted discharge point (see Figure 4D). The storm water collection system is under the purview of the Property's NPDES permit. Accordingly, the ten on-property sediment samples were not evaluated further. However, potential exposures to off-property sediment in Beer Road Ditch were evaluated for ecological receptors.

PCB Wipe Sampling

Ten wipe samples were collected from surfaces throughout the original Switch House (IA-7) in order to evaluate potential presence of PCBs related to past operations in this building.

Wood Block Floor Sampling

Seven composite wood block floor samples were collected from several areas of the Main Plant collectively referred to as IA-12.

Other Sampling

A standing water sample was collected from the basement of the original Switch House (IA-7) in order to screen the media for PCBs.

The results of all the medium-specific sampling conducted throughout the Subject Property were considered in the risk assessment for the specific purpose of identifying all COCs.

2.1.2 Data Evaluation

Medium-specific samples were collected using similar methodologies and were analyzed using the same or similar analytical methods. Therefore, it is appropriate to combine the samples collected as part of different investigations into a single data set in accordance with EPA's "Guidance for Data Usability in Risk Assessment (Part A) Final" (EPA 1992).

2.2 COC IDENTIFICATION

Consistent with Ohio EPA and U.S. EPA guidance, the first step in the COC identification process was to identify all chemicals that were positively detected in at least one sample, including chemicals with no data qualifiers and chemicals with data qualifiers indicating known identities but uncertain concentrations (for example, J-qualified data) (OAC 3745-300-09; EPA 1989). According to EPA's "Risk Assessment

Guidance for Superfund” (RAGS), this initial list of chemicals may be reduced based on the following factors:

- Comparison with appropriate background concentrations (including the East Ontario Lake Plain [EOLP] ecoregion [Ohio EPA 2008] for sediments)
- Evaluation of detection frequency
- Evaluation of essential nutrients
- Use of a concentration-toxicity screen

Because site-specific background samples have not been collected for the Subject Property, the PSRA did not consider the first of these factors. (Note: EOLP sediment values were not considered in the identification of sediment COCs, but were considered in the evaluation of sediment COCs). Similarly, in order to be health protective, the risk assessment did not consider the second of these factors. Medium-specific samples were not analyzed for essential human nutrients (for example, sodium); therefore, the risk assessment did not consider the third of these factors. Finally, VAP does not allow use of a concentration-toxicity screen as recommended by EPA. Therefore, the risk assessment considered as COCs for a particular medium all chemicals positively detected in at least one sample from that medium as described above.

Table 6 presents the soil (46 total, including those present at depths greater than 10 feet below ground surface [bgs] and therefore included for vapor intrusion only), groundwater (28 total), and sediment (21 total) COCs identified and carried through the risk assessment.

3.0 EXPOSURE ASSESSMENT

This section discusses the assumptions and methods used to estimate the types and magnitude of potential human exposure to COCs in soil and groundwater from beneath and near the Subject Property. Exposure is defined as human contact with a chemical or physical agent (EPA 1989). The exposure assessment consists of three fundamental steps: (1) exposure setting characterization, (2) exposure pathway identification through a conceptual site model (CSM), and (3) exposure quantification. These steps are discussed below in Sections 3.1, 3.2, and 3.3, respectively.

3.1 EXPOSURE SETTING CHARACTERIZATION

The exposure settings at and surrounding the Subject Property, as well as historical and intended future operations (commercial/industrial), are described in Section 1.1. In addition, this section presents some of the important assumptions regarding the exposure setting that directly influence the site-specific exposure assessment.

- Institutional controls will be put in place to limit the Subject Property to commercial/industrial use.
- Institutional controls will be put in place to prohibit potable groundwater use at the Subject Property.
- Groundwater at the Subject Property has been determined to be “Class B”. Therefore, potable groundwater use (ingestion and dermal contact, as well as inhalation of volatiles released from potable groundwater use [e.g., showering] on site is considered incomplete; hence, there are no receptors at or in the direction of groundwater flow (see 3745-300-07(F)(7)(d) and 3745-300-10(B)(2)(c)(i)).

3.2 CONCEPTUAL SITE MODEL

The CSM links potential or actual contaminant releases to potential human and ecological exposures. As discussed in Section 1.1.2, future land use is expected to be commercial/industrial. In addition to potential exposures by commercial/industrial workers, the risk assessment also considers potential exposures by workers involved in construction and excavation activities. Potential residential development of the Subject Property will be prohibited using institutional controls, therefore, the risk assessment does not quantitatively evaluate potential residential exposures. Members of the general public may also be exposed off-property to a limited extent via inhalation of ambient air, potable groundwater use, and inhalation of indoor air (from groundwater). In addition, members of the general public engaged in recreational activities (referred to as recreationalists) off-property in Beer Road Ditch may be exposed to sediment via incidental ingestion and dermal contact. As discussed in Section 1.2.1,

no exceedances of residential soil direct contact GNS values were observed in the single sediment sample from Beer Road Ditch; therefore, potential exposure by human receptors to sediment in Beer Road Ditch was not evaluated further.

Finally, ecological receptors (including, but not limited to, benthic invertebrates, amphibians, birds, and mammals) may be exposed to sediment in Beer Road Ditch.

Figure 3 shows the CSM, illustrating potential exposure pathways for future commercial/industrial and construction/excavation workers. Specifically, Figure 3 identifies (1) potential contaminant sources, (2) potential receptors and exposure pathways, and (3) exposure scenarios. These three elements are discussed below in Sections 3.2.1 through 3.2.3.

3.2.1 Potential Contaminant Sources and Release Mechanisms

Three primary release/transport mechanisms were identified at the Subject Property. Each of these properties and the related IAs are listed below:

- Surface disposal – IAs 1, 6, and 13
- Spills and leaks – IAs 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, and Beer Road Ditch
- Subsurface disposal – IA-5

These primary contaminant release and transport mechanisms resulted or potentially resulted in the contamination of surface and subsurface soil, as well as internal plant surfaces (including floors and walls), and sumps. Through mechanisms including the generation of fugitive dust, volatilization, leaching by percolation, and runoff/erosion, certain contaminants have migrated from the primary affected media into ambient air, groundwater, and the storm water system (including drainage ditches). Tertiary release and transport mechanisms including subsurface vapor transport have resulted or may in the future result in contamination of indoor air. It should be noted that the PSRA also considered potential preferential pathways (e.g., utilities and sumps). All sumps have been removed from the Subject Property as the result of demolition activities. The only utilities at the Subject Property are the process water sewer, sanitary sewer, and storm sewer lines. Samples were collected adjacent to the process water sewer and the effluent line from the Property's Waste Water Treatment Plant to the discharge into the Mansfield Municipal Waste Water System. Those sample locations are IA4-2, IA4-3, IA4-5, IA6-4, IA6-5, and IA6-6. Results from these sample locations were considered in the PSRA.

In addition to the exposure characterization assumptions described in Section 3.1, the risk assessment also assumes that potential human exposures to floors, walls, and other surfaces, as well as sumps at IAs 7, 8,

and 12 are insubstantial for the following reasons: (1) PCBs were not detected in the wipe samples collected at the Old Switch House (see Table E6 in Appendix E), (2) the stained flooring and sumps at IA-8 were determined to require no further evaluation (based on the result of a geophysical survey conducted within the Main Plant Building and soil boring IA4-10 [all chemical concentrations in soil less than commercial/industrial and construction/excavation GNS values – see Appendix E] [Tetra Tech 2015]), (3) the wood block flooring at IA-12 has been removed and disposed of (analytical results were collected only to characterize the building materials for disposal purposes; building materials [such as wood block flooring] are not eligible for inclusion under VAP), and (4) the main plant building has been demolished and the building materials disposed, mitigating risk from building material issues within the main plant.

Finally, property-related contaminants may have discharged off-property through the Subject Property's NPDES-permitted discharge point (see Figure 4D). Any contaminants in surface water are under the purview of the NPDES permit and are not subject to VAP regulation. However, this is the location impacted by a diesel fuel release from an off-site source in the 1990s. As a result, sediment contamination in a single sample (SD12-LAN-0414) was evaluated, but only in terms of potential exposure by ecological receptors.

3.2.2 Potential Receptors and Exposure Pathways

Identification and evaluation of potential human receptors at the Subject Property is based primarily on its intended future commercial/industrial use. Potential receptors and exposure pathways identified with this assumed future land use are discussed below.

Potential Receptors

Human exposures at the Subject Property are expected to occur almost exclusively as a result of work-related activities. Receptors are expected to include commercial/industrial workers employed at future commercial/industrial operations located at the Subject Property and construction/excavation workers hired as needed to perform construction/excavation activities such as utility installation and repair. Members of the general public and living off-property may also be exposed to Property-related contaminants released to groundwater, ambient air, and indoor air (from groundwater).

Exposure Pathways

Receptors are expected to be exposed to COCs in soil and groundwater at the Subject Property through a variety of exposure pathways as shown in the CSM (see Figure 3). The potentially complete exposure pathways evaluated in the risk assessment include the following:

- Incidental ingestion of, direct contact with, and inhalation of fugitive dusts and volatile contaminants from surface and subsurface soil (Note: commercial/industrial workers are expected to be exposed to subsurface soil only if intrusive construction/excavation activities result in subsurface soil [to a depth of 10 feet bgs] being brought to the surface and mixed with surface soil). As discussed in Section 1.2.1, the POC for construction/excavation activities is 10 feet bgs.
- Inhalation of VOCs from groundwater in a construction trench (construction/excavation workers only). (Note: as discussed in Section 1.2.1, the depth to groundwater at the Subject Property is $\geq$ 12 feet bgs. Since the POC for construction/excavation activities is 10 feet bgs, excavations are not expected to intersect the water table and therefore groundwater is not expected to directly enter excavated areas.. While there is potential for “leakage” from the confined layer in situations where an excavating operation overlies the confined unit, it is not expected that the excavation would be inundated and the volume of groundwater entering an excavation would be limited. Therefore, direct exposures [ingestion and dermal contact] will be negligible and was not evaluated).
- Inhalation of indoor air (commercial/industrial workers only). It should be noted that because ground water encountered in the glacial till unit at the Subject Property is classified as “Class B”, potable groundwater use (ingestion and dermal contact, as well as inhalation of volatiles released from potable groundwater use) onsite is not considered complete (see Section 3.1 above). Therefore, the only potential exposure to groundwater by commercial/industrial workers that was evaluated in the property-specific risk assessment is inhalation of indoor air impacted via the vapor intrusion pathway.

Medium-specific analytical results form the basis for soil exposures. COC concentrations in indoor and construction trench air were estimated using fate and transport modeling (see Section 3.3).

3.2.3 Exposure Scenarios

Exposure pathways and scenarios are considered complete when a point of contact exists or potentially exists between an affected medium and a receptor. At the Subject Property, potentially complete exposure scenarios are identified in the CSM (see Figure 3) and are associated with the following receptors:

- Adult commercial/industrial workers
- Adult construction/excavation workers
- Adult and child residential receptors.

Exposure scenarios for these receptors are discussed below.

Adult Commercial/Industrial Workers

Adult commercial/industrial workers are expected to be employed either helping to build or providing support services related to manufacturing. Specifically, in December 2012, RACER sold the Subject Property to BCDC. Adult commercial/industrial workers are expected to be potentially exposed through the inhalation of VOCs originating from groundwater and through incidental ingestion of, direct contact with, and inhalation of fugitive dusts and volatile contaminants from surface and subsurface soil near the current main plant building.

Adult Construction/Excavation Workers

Adult construction/excavation workers are expected to be hired on an as-needed basis to perform limited construction and utility work (for example, the installation and repair of utility lines). Adult construction/excavation workers are expected to be potentially exposed through the inhalation of VOCs originating from groundwater present in the air within a construction/excavation trench, or through incidental ingestion of, direct contact with, and inhalation of fugitive dusts and volatile contaminants from surface and subsurface soil.

Adult and Child Residents

A limited number of residences are located north of the site along or just north of West Fourth Street (Lincoln Highway). Off-site residents may potentially be exposed at their homes only via inhalation of fugitive dusts and volatile chemicals from surface soil and potable groundwater use; however, prevailing winds in the area of the site are predominantly from the west. IA-4 is the northernmost IA at which chemical concentrations in soil were found to be greater than industrial soil GNS values. IA-4 is about 1,000 feet south-southeast of the closest current residential location along the north side of West Fourth Street. As documented in EPA's Regional Screening Levels (RSL) User's Guide (EPA 2014b), the inhalation exposure pathway (inhalation of fugitive dusts and volatile chemicals from soil) contributes much less to total chemical exposure as compared to potential exposure via incidental ingestion and dermal contact. Therefore, chemicals present in soil on the Subject Property present insubstantial risks and hazards to off-site residents.

As noted in the Phase I ESA, one federal public water supply (PWS) system and 57 state registered wells are located within one mile of the Subject Property. The federal PWS is a well field located between one-half and one mile east-southeast and is owned by the City of Ontario. In order to assess the potential for

groundwater contamination measured in on-site wells to migrate off-site, chemical concentrations in the wells located closest to the perimeter of the Subject Property were evaluated in Section 5.4.

3.3 EXPOSURE QUANTIFICATION

Exposure is defined as the contact of an organism with a chemical or physical agent. Potential chemical exposure depends on the amount of a chemical available at human exchange boundaries (skin, lungs, and gut) during a specified time. The magnitude of exposure was quantitatively assessed for the human receptors discussed in Section 3.2.3.

Exposure dose equations that consider contact rate, receptor body weight, and frequency and duration of exposure were used to estimate the intake or dose of each COC for each receptor. Exposure doses were calculated for the reasonable maximum exposure (RME) case, which represents the highest exposure reasonably expected to occur.

An exposure can occur over a period of time. The total exposure can be divided by the time period to calculate an average exposure per unit of time. An average exposure can be expressed in terms of body weight. All exposures quantified in the risk assessment were normalized for time and body weight, are presented in units of milligrams of chemical per kilogram of body weight per day (mg/kg-day), and are termed “intakes.” Equations 3-1 and 3-2 are generic equations for calculating chemical intakes for the oral and dermal and inhalation exposure routes, respectively (EPA 1989, 2009).

$$I (\text{oral or dermal}) = (C \times CR \times EF \times ED) / (BW \times AT) \quad (3-1)$$

$$I (\text{inhalation}) = \frac{C \times ET \times EF \times ED}{AT} \quad (3-2)$$

where

I = Intake: the amount of chemical at the exchange boundary (mg/kg-day); to evaluate exposure to noncarcinogenic chemicals, the intake is referred to as the average daily dose (ADD); to evaluate exposure to carcinogenic chemicals, the intake is referred to as the lifetime average daily dose (LADD)

C = Chemical concentration: the average concentration (referred to as the EPC) contacted over the exposure period (for example, milligrams per kilogram [mg/kg] for soil)

CR = Contact rate: the amount of contaminated medium contaminated per unit of time of event (for example, milligram per day [mg/day] for soil)

EF	=	Exposure frequency: how often the exposure occurs (days/year)
ED	=	Exposure duration: how long the exposure occurs (years)
BW	=	Body weight: the average body weight of the receptor over the exposure period (kilograms [kg])
AT	=	Averaging time: the period over which exposure is averaged (days); for carcinogens, the averaging time is 25,550 days based on a lifetime exposure of 70 years; for noncarcinogens, the averaging time is calculated as ED (years) x 365 days/year

Variations of Equations 3-1 and 3-2 were used to calculate pathway-specific worker exposure to COCs. The equations and parameter values used for each exposure pathway are presented in Table 8. The EPC calculations are discussed in Section 3.3.1. Pathway-specific intake equations and exposure parameters used in the risk assessment are discussed in Section 3.3.2. Fate and transport modeling used to estimate receptor-specific exposure to potential VOCs in indoor air is discussed in Section 3.3.3. Finally, as discussed in Section 3.2, receptors are assumed to be exposed through various medium-specific exposure pathways (see Figure 3). Section 3.3.4 summarizes the medium-specific exposure scenarios that were summed in order to calculate total exposures for adult commercial/industrial and construction/excavation workers at each exposure point.

3.3.1 EPC Calculations

The EPC is defined as the concentration of a COC that a human receptor is exposed to at an exposure point. This section summarizes how EPCs were derived for surface soil, subsurface soil, groundwater, and indoor air. Medium-specific EPCs are discussed below.

Surface Soil EPCs

When the Subject Property is redeveloped in the future, buildings may be constructed as slab-on-grade construction with limited intrusive excavation or with basements requiring more extensive intrusive excavation. Assuming slab-on-grade construction, commercial/industrial workers are assumed to be exposed to surface soil (defined as 0 to 2 feet bgs). Separate surface soil EPCs were calculated for IAs 2, 4, 5, 10, and 14. Consistent with EPA guidance, surface soil EPCs for industrial workers were defined as the lesser of the maximum detected concentration and the 95 percent upper confidence limit (95 UCL) of the sample concentration mean. Location-specific 95 UCL values were calculated in a manner consistent with EPA guidance, including EPA's ProUCL Version 5.0 software package (EPA 2002b, 2013a). The

specific procedures used for evaluation of the Subject Property-specific ProUCL results may be summarized as follows:

- When preparing the input file to calculate the EPC from the ProUCL 5.0 program, there must be at least 6 detected results. When there were fewer than six detected results, the default EPC was identified as the maximum detected concentration. When there were six or more samples with detected results, the recommended EPC was selected. If multiple EPCs were recommended, the higher concentration was used. Once an EPC was selected from a sample size of six or more, it was then compared to the maximum detected concentration. The final EPC selected was the lesser of the maximum detected concentration and the suggested EPC.

IA-specific surface soil EPCs are presented in Table 7. ProUCL output supporting these EPCs is presented in Appendix A. The soil sample locations at which analytical results used to calculate the commercial/industrial worker surface soil EPCs are shown in Figures 4A, 4B, 4C, 4E, and 4F.

Subsurface Soil EPCs

Assuming basement construction during future redevelopment, the more extensive and intrusive excavation and associated site grading is assumed to bring soil from as deep as 10 feet bgs to the surface where it is assumed to become mixed with surface soil. Under these conditions, commercial/industrial workers are assumed to be exposed to soil from the entire 0 to 10 feet bgs soil column. Separate IA-specific subsurface soil EPCs were calculated for Ias 2, 4, 5, 10, and 14 and are presented in Table 7. ProUCL output supporting these EPCs is presented in Appendix A. The soil sample locations at which analytical results used to calculate the commercial/industrial worker surface soil EPCs are shown in Figure 4A, 4B, 4C, 4E, and 4F.

In contrast to commercial/industrial workers who are assumed to move freely throughout an exposure area, construction/excavation workers are assumed to be exposed in discrete locations in each exposure area (for example, in a construction trench). Also, construction/excavation workers are assumed to be exposed to subsurface soil only (0 to 10 feet bgs). Therefore, consistent with EPA and Ohio EPA guidance, subsurface soil EPCs for construction/excavation workers were set equal to the maximum concentration of each COC in subsurface at each IA. As noted for commercial/industrial workers, separate IA-specific subsurface soil construction/excavation worker EPCs were calculated for Ias 2, 4, 5, 10, and 14 and are presented in Table 7. ProUCL output supporting these EPCs is presented in Appendix A. The soil sample locations at which analytical results used to calculate the construction/excavation worker subsurface soil EPCs are shown in Figure 4A, 4B, 4C, 4E, and 4F.

Construction Trench Air EPCs

Chemical-specific volatilization factors (VF) were used to estimate construction trench air EPCs. The chemical-specific VFs relate concentrations of volatile chemicals in groundwater accumulated in a construction trench to airborne concentrations that may be inhaled by construction/excavation workers. COC-specific VFs and construction trench air EPCs were calculated for this scenario based on Virginia Department of Environmental Quality (VDEQ) guidance, which provides a combination of a vadose zone model to estimate volatilization of gaseous COCs from groundwater into a trench and a box model to estimate dispersion of the COCs from the air inside the trench into aboveground air (VDEQ 2014). VDEQ recommends the use of two separate models – the first model is for situations where the depth to groundwater is greater than 15 feet bgs (this applies to Ias 2, 4, 10, and 14 which are located in the Upper Terrace at the Subject Property where the depth to groundwater is about 25 feet bgs) and the second model is used for situations where the depth to groundwater is less than or equal to 15 feet (this applies to IA-5 which is located in the Lower Terrace at the Subject Property where the depth to groundwater is about 12 feet bgs). Appendix B further describes the modeling and presents the COC-specific construction trench air EPCs calculated using the VDEQ models. Area-specific construction trench air EPCs are presented in Table 7.

Groundwater- and Soil-to-Indoor Air EPCs

Commercial/industrial workers are assumed to not be directly exposed to contaminants in groundwater. Specifically, as discussed in Section 3.1, it was assumed that institutional controls will be put in place to prohibit potable groundwater use at the Subject Property until such time as contaminant concentrations in groundwater are at acceptable levels. However, commercial/industrial workers may be exposed to VOCs that potentially migrate from groundwater to soil gas and then to indoor air within work spaces, therefore, EPA's Johnson and Ettinger model was used to estimate the concentration of volatile COCs in indoor air due to potential vapor intrusion encroachment. As input to EPA's GW-ADV-Feb04.xls spreadsheet, the groundwater concentration was set equal to the maximum concentration of each volatile COC detected in groundwater at each IA. The monitoring wells from which groundwater analytical results used to identify the groundwater concentrations used to calculate the groundwater-based indoor air EPCs are shown in Figure 4G.

In addition to volatile chemicals migrating via vapor intrusion from groundwater to indoor air, volatile chemicals may also migrate from soil to indoor air via a similar mechanism. EPA's SL-ADV-Feb04.xls spreadsheet model was used to calculate soil-based indoor air EPCs. As input to this model, the maximum concentration of each volatile chemical detected in soil (from any depth) was identified for

each IA. The soil sample locations at which analytical results used to identify the soil concentrations used to calculate the soil-based indoor air EPCs are shown in Figures 4A, 4B, 4C, 4E, and 4F.

The assumptions and input parameter values used to model potential indoor air concentrations are discussed below under “Indoor Air EPCs.”

Indoor Air EPCs

As discussed above under “Groundwater- and Soil-to-Indoor Air EPCs,” indoor air EPCs were estimated from both groundwater and soil using EPA’s Johnson and Ettinger models specifically EPA’s GW-ADV-Feb04.xls and SL-ADV-Feb04.xls spreadsheets (EPA 2004a, 2004b). Model-specific inputs and results are presented in Appendix C. The model-specific indoor air concentrations were used as the indoor air EPCs for medium-specific (groundwater and soil) indoor air exposure scenarios for each IA. IA-specific groundwater- and soil-based indoor air concentrations were obtained from the “Intercalcs” page of the modeling results. For groundwater, the indoor air concentration is the “Infinite source building concentration”. For soil, the indoor air concentration is the “Final finite source building concentration”; the soil-based indoor air concentration is identified as finite because a lower depth of contamination was identified at each IA.

To the maximum extent possible, input parameter values required by the spreadsheet were based on site-specific conditions. Tables C-1 and C-2 in Appendix C present the Johnson and Ettinger input parameters used in EPA’s GW-ADV-Feb04.xls and SL-ADV-Feb04.xls spreadsheets, respectively. These input parameter values and calculated indoor air concentrations (see Tables C-3 through C-90 in Appendix C) were submitted as part of the Phase II ESA (Tetra Tech 2015). No comments were received on the indoor air EPCs. To be more specific, air modeling input parameters for Ias 2, 4, 5, 9, and 10 were based on expected future land use. However, because the future configuration of work spaces at these Ias are not known, the property-specific risk assessment employed default EPA- and Ohio EPA-recommended dimensions: length (10 meters [m]), width (10 m), and height (2.4 m) (EPA 2002a, Ohio EPA 2010). IA-specific groundwater- and soil-based indoor air concentrations are presented in Table 7.

3.3.2 Pathway-Specific Intake Equations and Exposure Parameters

Table 8 presents the pathway-specific intake equations and exposure parameter values used to estimate receptor-specific exposure under RME conditions for each exposure pathway. The intake equations and exposure parameter values used in the risk assessment were taken primarily from Ohio EPA’s “Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures” (Ohio EPA 2014) and EPA’s RSL User’s Guide (EPA 2014b).

Consistent with the intended future land use at the Subject Property (commercial/industrial), exposures were calculated for two receptor groups: adult commercial/industrial workers and adult construction/excavation workers. Table 8 summarizes the basis for each receptor-specific exposure parameter value for the potential exposure routes evaluated. Table 9 presents the COC-specific chemical factors used in the exposure calculations. Receptor-specific doses under RME conditions are presented in Tables D6.1 through D10.2 in Appendix D.

3.3.3 Fate and Transport Modeling

As discussed in Section 3.3.1, EPA's GW-ADV-Feb04.xls and SL-ADV-Feb04.xls spreadsheets (based on the Johnson and Ettinger models) were used to estimate indoor air EPCs from groundwater and soil, respectively.

EPA's Vapor Intrusion Screening Level (VISL) Calculator (EPA 2014c) was used to provide a second set of comparative indoor air EPCs, risks, and hazards based on the potential migration of volatile contaminants from groundwater to indoor air. (EPA's VISL Calculator does not address the soil to indoor air migration pathway). Inputs to EPA's VISL Calculator are more limited than the Johnson and Ettinger model-based spreadsheets discussed in Section 3.3.1. The only required inputs are: (1) receptor type (only commercial/industrial workers were evaluated via the off-property vapor intrusion pathway), (2) groundwater temperature (used the same temperature, 16° C as used in EPA's GW-ADV-Feb04.xls spreadsheet [see Table C-1 in Appendix C for documentation of this temperature]), and (3) groundwater concentration (used the same groundwater concentrations as used for inputs to EPA's GW-ADV-Feb04.xls [see Tables C-3 through C-29 in Appendix C]). It should be noted that some chemicals evaluated in EPA's GW-ADV-Feb04.xls spreadsheet are not included in EPA's VISL Calculator. Primarily, the absent chemicals are PAHs with limited volatility.

3.3.4 Calculation of Total Exposures

As discussed in Section 3.3, human receptors are expected to be exposed to COCs through various medium-specific exposure pathways. Exposures were evaluated for a series of five on-property exposure points – IAs 2, 4, 5, 10, and 14 (see Figure 2).

Commercial/industrial workers are assumed to be exposed through potential inhalation of VOCs in indoor air, as well as through incidental ingestion, dermal contact, and inhalation of fugitive dusts and volatile contaminants in soil at IAs 2, 4, 5, 10, and 14. The medium-specific exposure pathways that were

summed to calculate exposure point-specific total exposures for commercial/industrial workers located at each IA are summarized below.

- **IA-2** – inhalation of indoor air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contamination from soil. (The maximum detected concentration of each chemical detected in soil from 0 to 10 feet [the POC for construction/excavation activities] was used to prepare a multiple chemical adjustment)..
- **IA-4** – inhalation of indoor air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contaminants from surface and subsurface soil (two separate totals were prepared – one with indoor air and surface soil and a second with indoor air and subsurface soil).
- **IA-5** – inhalation of indoor air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contaminants (two separate totals were prepared – one with indoor air and surface soil and a second with indoor air and subsurface soil).
- **IA-10** – inhalation of indoor air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contamination from soil. (The maximum detected concentration of each chemical detected in soil from 0 to 10 feet [the POC for construction/excavation activities] was used to prepare a multiple chemical adjustment).
- **IA-14** – inhalation of indoor air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contamination from soil. (The maximum detected concentration of each chemical detected in soil from 0 to 10 feet [the POC for construction/excavation activities] was used to prepare a multiple chemical adjustment).

Construction/excavation workers are assumed to be exposed through potential inhalation of VOCs in trench air and incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile contaminants in subsurface soil at IAs 2, 4, 5, 10, and 14.

4.0 TOXICITY ASSESSMENT

This section identifies the toxicity values used to quantify potential adverse effects on human health associated with potential exposures to COCs in soil, groundwater, and air. These toxicity factors include slope factors (SF) for carcinogenic COCs and reference doses (RfD) for noncarcinogenic COCs. Sections 4.1 and 4.2 discuss the toxicity factors used to assess the carcinogenic and noncarcinogenic effects of COCs, respectively.

4.1 TOXICITY FACTORS FOR CARCINOGENIC COCS

For regulatory purposes, it is conservatively assumed that carcinogenic chemicals do not exhibit a response threshold (EPA 1986). However, recent scientific evidence clearly indicates that this assumption is an oversimplification of carcinogenic responses. A growing number of chemicals have been shown to elicit carcinogenic effects in experimental animals via mechanisms that are either not relevant to human biological processes or not expected to occur in humans at significantly lower, environmentally relevant doses (James and Saranko 2000). The EPA has revised the Guidelines for Carcinogen Risk Assessment (2005b), in which EPA recognizes these issues and provides alternative approaches for addressing them within the regulatory framework for cancer risk assessment.

The potential for exposure to a given chemical to result in carcinogenic effects is evaluated differently than for noncarcinogenic effects. The upper-bound excess lifetime cancer risk (ELCR) associated with a given dose is calculated by multiplying the dose from a given route of exposure (LADD) by an SF. An SF is an upper-bound estimate of the probability of a carcinogenic response per unit dose of a chemical over a lifetime. SFs are derived through use of mathematical models based on a high-to-low dose extrapolation and under the assumption that no threshold exists for initiation of cancer. Because of the use of the nonthreshold assumption and the 95 UCL of the slope of the dose-response curve, SFs provide a conservative, upper-bound estimate of potential cancer risks. The actual response to a given dose of a chemical is therefore probably less than the predicted response (EPA 1989).

SFs are specific to a chemical and a route of exposure and are generally available for both the oral (ingestion or gavage) and inhalation routes. Chemical-specific SFs were selected from Ohio EPA's VAP Chemical Information Database and Applicable Regulatory Standards (CIDARS) (Ohio EPA 2014b). Ohio EPA selected these SFs from the following sources of toxicity information (presented in order of decreasing preference):

- EPA's Integrated Risk Information System (IRIS)

-
- EPA National Center for Environmental Assessment (NCEA) Provisional Peer Reviewed Toxicity Values (PPRTV)
 - Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profiles
 - California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment, Toxicity Criteria Database
 - Health Effects and Assessment Summary Tables (HEAST) toxicity information
 - EPA criteria documents including, but not limited to, drinking water criteria documents, drinking water health advisory summaries, ambient water quality criteria documents, and air quality criteria documents.

In cases where SFs were not available from Ohio EPA-recommended sources (Ohio EPA 2014b), SFs were selected from EPA's RSL tables (EPA 2014a), as recommended by Ohio EPA (Tetra Tech 2014). Finally, in some instances, SFs were not available from either Ohio EPA or EPA sources. In these instances, appropriate surrogates were identified based on chemical-similarity.

Table 10 presents COC-specific oral and inhalation SF values used in the risk assessment.

4.2 TOXICITY FACTORS FOR NONCARCINOGENIC COCS

Standard risk assessment models are based on the assumption that noncarcinogenic effects, unlike carcinogenic effects, exhibit a threshold (that is, a level of exposure exists below which no adverse effects are observed). The potential for noncarcinogenic health effects resulting from exposure to a COC was assessed by comparing an exposure estimate for intake (ADD) to an RfD. The RfD represents an estimated daily intake rate for a noncarcinogenic COC that is believed to pose no appreciable risk of adverse effects on human health, including the health of sensitive populations, during a lifetime. RfDs also apply to the noncarcinogenic effects of potential carcinogens.

An RfD is specific to a chemical and a route of exposure, such as ingestion or inhalation. Chronic and subchronic RfDs are developed for different periods of exposure. Chronic RfDs are used to evaluate exposures occurring over periods of more than 7 years, and subchronic RfDs are used to evaluate exposures occurring over periods of less than 7 years. Therefore, chronic RfDs were used to characterize hazards associated with commercial/industrial worker exposures and subchronic RfDs were used to characterize hazards associated with construction/excavation worker exposures. These RfDs were identified for Table 2 of Ohio EPA's VAP CIDARS (Ohio EPA 2014b) as supplemented by EPA's RSL Table (EPA 2014a) as discussed in Section 4.1.

To derive an RfD, EPA workgroups review all human and animal studies relevant to a chemical and select the study or studies pertinent to the derivation of the RfD. RfDs are often derived from a measured

no-observed-adverse-effect-level (NOAEL). The NOAEL corresponds to the dose (in mg/kg-day) administered during the toxicity study without inducing observable adverse effects. If a NOAEL cannot be determined, the lowest observed adverse effect level (LOAEL) is used. The LOAEL corresponds to the lowest daily dose administered in the toxicity study that induces an observable adverse effect. The toxic effect characterized by the LOAEL is referred to as the “critical effect.”

To derive an RfD, the NOAEL or LOAEL is divided by uncertainty factors to ensure that the RfD will be protective of human health. Uncertainty factors usually occur in multiples of 10, and each factor represents a specific area of uncertainty inherent in extrapolation from available data. Uncertainty factors account for (1) variations in the general population to protect sensitive human populations such as child and elderly receptors, (2) extrapolation of data from animals to humans (interspecies extrapolation), (3) derivation of a chronic RfD based on a subchronic rather than a chronic study, and (4) derivation of an RfD based on a LOAEL instead of a NOAEL. Modifying factors may be applied to data in order to reflect additional uncertainties associated with the data. Modifying factors range from 0 to 10.

Table 10 presents COC-specific oral and inhalation chronic and subchronic RfD values used in the risk assessment.

4.3 TOXICITY FACTORS FOR ECOLOGICAL RECEPTORS

Potential exposures by ecological receptors to off-property sediment were evaluated by comparing sediment concentrations to ecological standards/benchmarks as per OAC 3745-300-08 (I) as discussed in Section 5.4.

5.0 RISK AND HAZARD CHARACTERIZATION

This section characterizes the carcinogenic risks and noncarcinogenic hazards associated with the exposure pathways identified in Section 3.0. Risks and hazards are characterized for individual COCs and for exposures attributable to multiple exposure pathways, as appropriate. Carcinogenic risk estimates were derived based on LADDs, and noncarcinogenic hazard estimates were derived based on ADDs.

Section 5.1 discusses the methodologies used to characterize carcinogenic risks and hazards. Section 5.2 discusses the receptor-specific risks and hazards estimated from these methodologies. Section 5.3 discusses the calculation of segregated hazards. Finally, Section 5.4 qualitatively evaluates the risks and hazards associated with potential off-site exposures to Subject Property-related chemicals by members of the general public (residents and recreationalists). This evaluation is intended to meet the requirements of OAC 3745-300-09 (B)(1)(b)(i).

5.1 RISK AND HAZARD CHARACTERIZATION METHODOLOGIES

The methodologies used to quantify carcinogenic risks and noncarcinogenic hazards are discussed in Sections 5.1.1 and 5.1.2, respectively. Section 5.1.3 presents the methodology used to evaluate risks to ecological receptors to sediment at an off-property location (Beer Road Ditch).

5.1.1 Carcinogenic Risks

For carcinogenic COCs, risk estimates represent the incremental probability that an individual will develop cancer over a lifetime as a result of exposure to the COC (EPA 1989). These ELCRs are calculated as shown in Equation 5-1 below:

$$\text{Upper-Bound ELCR (Risk)} = \text{LADD} \times \text{SF} \quad (5-1)$$

where

$$\text{LADD} = \text{Lifetime average daily dose (mg/kg-day)}$$

$$\text{SF} = \text{Slope factor (mg/kg-day)}^{-1}$$

Risk is expressed as a probability. For example, a risk of 1E-06 indicates one additional case of cancer in an exposed population of 1 million. The SF in almost all cases represents a 95 UCL of the probability of a carcinogenic response based on experimental data used in a multistage model. The resulting risk estimate therefore represents an upper-bound estimate of the carcinogenic risk. The actual risk probably does not exceed the estimate and is likely to be less.

Future land use at the Subject Property will be commercial/industrial. Therefore, a cumulative carcinogenic target risk level of 1E-05 for commercial/industrial and construction/excavation workers is applicable, per OAC 3745-300-09 (B) (1) (b) (i). The additional requirement that the cumulative cancer risk to off-property receptors, attributable to COCs, is less than 1E-05 (OAC 3745-300-09 (B) (1) (a)) is demonstrated in Section 5.4.

Within a given exposure pathway, receptors may be exposed to more than one chemical. The total upper-bound risk associated with exposure to multiple chemicals through a single pathway is estimated as shown in Equation 5-2.

$$\text{Risk}_{(\text{EP})} = \text{Risk}_1 + \text{Risk}_2 + \dots + \text{Risk}_i \quad (5-2)$$

where

$$\text{Risk}_{(\text{EP})} = \text{Total risk for a given exposure pathway}$$

$$\text{Risk}_i = \text{Risk estimate for the } i\text{th COC}$$

At particular exposure points, receptors may be exposed through a number of exposure pathways (see the CSM in Figure 3). At each exposure point, the total exposure for a receptor equals the sum of the exposures through the various exposure pathways to which the receptor is exposed. Under each exposure scenario, exposure pathway combinations were developed for each receptor (see Section 3.3.3). The total risk posed to a receptor through a combination of pathways is calculated as shown in Equation 5-3.

$$\text{Total Risk} = \text{Risk (EP}_1\text{)} + \text{Risk (EP}_2\text{)} + \dots + \text{Risk (EP}_j\text{)} \quad (5-3)$$

where

$$\text{Total Risk} = \text{Risk resulting from multiple exposure pathways}$$

$$\text{Risk (EP}_j\text{)} = \text{Risk resulting from the } j\text{th exposure pathway}$$

The approach described above is consistent with the widely held belief that the total carcinogenic risk associated with exposure to multiple carcinogenic COCs can be estimated as the sum of the carcinogenic risks posed by individual COCs (EPA 1986).

5.1.2 Noncarcinogenic Hazards

The potential for receptors to develop noncancerous health effects is characterized by comparing an intake for a specific exposure period (the ADD) to an RfD developed for a similar exposure period. When performed for a single chemical, this comparison yields a ratio known as the hazard quotient (HQ), which is calculated in Equation 5-4.

$$HQ = \text{ADD/RfD} \quad (5-4)$$

where

$$\text{ADD} = \text{Average daily dose (mg/kg-day)}$$

$$\text{RfD} = \text{Reference dose (mg/kg-day)}$$

Generally, an HQ of less than or equal to 1 is considered to be health-protective. An HQ exceeding 1 indicates a potential for adverse noncarcinogenic health effects (EPA 1989). Also, based on the intended future use of the Subject Property (commercial/industrial) a cumulative target hazard of 1 is applicable per OAC 3745-300-09 (B) (2). For the purposes of this risk assessment, chronic and subchronic RfDs were used to characterize noncarcinogenic hazards for industrial and construction/excavation worker, respectively.

As with carcinogenic COCs within a given exposure pathway, a receptor may be exposed to multiple substances with associated noncarcinogenic health effects. To estimate the total noncarcinogenic hazards for each exposure pathway, the risk assessment used the procedures outlined in “Guidelines for the Health Risk Assessment of Chemical Mixtures” and RAGS (EPA 1986, 1989). The total noncarcinogenic hazard attributable to exposure to multiple COCs through a single pathway was calculated as shown in Equation 5-5.

$$HI_{(EP)} = HQ_1 + HQ_2 + \dots + HQ_i \quad (5-5)$$

where

$$HI_{(EP)} = \text{Total hazard index (HI) for a given exposure pathway}$$

$$HQ_i = \text{Hazard quotient for the } i\text{th COC}$$

This summation methodology is based on the assumption that the effects of the various COCs to which a receptor is exposed are additive.

As discussed in Section 5.1.1 for carcinogenic COCs, exposure pathway combinations were developed for each receptor. The total noncarcinogenic hazard posed to a receptor through a combination of exposure pathways is calculated as shown in Equation 5-6.

$$\text{Total HI} = \text{HI (EP1)} + \text{HI (EP2)} + \dots + \text{HI (EPj)} \quad (5-6)$$

where

$$\text{HI (EPj)} = \text{Hazard index resulting from the jth exposure pathway}$$

Consistent with EPA guidance, all total HIs exceeding 1 were further evaluated (EPA 1989). The total HI for an exposure pathway can exceed 1 as a result of either (1) a single COC with an HQ exceeding 1 or (2) several COCs whose HQs sum (HI) exceeds 1, but whose individual HQs do not exceed 1. In the second case, a detailed analysis is required to determine whether the potential for noncarcinogenic health effects is accurately represented by the total HI because the toxicological effects associated with exposure to multiple COCs may not be additive; therefore, the total HI may overestimate the potential for noncarcinogenic health effects. To address this possibility, the primary contributors to the total HI are grouped according to target organ or effect, and the total segregated HI for each group is derived. This process is referred to as segregation of the HI. Section 5.3 provides further discussion of the impact of segregating HIs.

5.1.3 Ecological Risks

In accordance with OAC 3745-300-08 (I) (2), sediment sampling results were compared to the following reference values, when available, in the following hierarchy:

1. Ohio EPA's "Guidance for Conducting Ecological Risk Assessments," Attachment H (Ohio EPA 2008).
2. MacDonald, Ingersoll, and Berger. 2000. "Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems."
3. U.S. EPA Region 5 Ecological Screening Levels (EPA 2003).

One sediment sample, SD12-LAN-0411, was collected downgradient of the NPDES-permitted discharge point (see Figure 4D). Analytical results from this sample were compared to the reference values, and the results are included in Table 5. For one contaminant of concern, ethylene glycol, reference values were not available in any of the sources listed above. In this case, a reference value from the National Oceanic and Atmospheric Administration's (NOAA) Screening Quick Reference Tables (SQuiRT) was used (NOAA 2008).

5.2 ON-PROPERTY RISKS AND HAZARDS

This section discusses receptor-specific risks and hazards estimated using the methods described in Sections 5.1.1 and 5.1.2, respectively. Results are presented separately for commercial/industrial workers (Section 5.2.1) and construction/excavation workers (Section 5.2.2). Each section summarizes the exposure scenarios and receptors evaluated. For each receptor, risks are discussed first, followed by hazards.

COCs contributing significantly to potentially significant risks and hazards are identified. Risks equal to or greater than $1\text{E-}06$ are identified as contributing significantly to total risks. This approach is consistent with EPA policy that identifies a risk level of $1\text{E-}06$ as the low end of EPA's "acceptable" risk range (EPA 1990). Risks less than $1\text{E-}06$ are not considered further. Total risks are compared to a cumulative target risk of $1\text{E-}05$ for commercial/industrial and construction/excavation workers, based on the intended future commercial/industrial use of the Subject Property (OAC 3745-300-09 (B) (1) (a)). Similarly, HIs equal to or greater than 1 are identified as significant consistent with a cumulative target hazard of 1 based on the intended future commercial/industrial use of the Subject Property (OAC 3745-300-09 (B) (2)).

Table 11 summarizes the risks and hazards for each of the IAs and for the two worker exposure scenarios.

5.2.1 Commercial/Industrial Workers

This section discusses risks and hazards calculated for commercial/industrial workers for each of the IAs evaluated in the risk assessment: IA-2, IA-4, IA-5, IA-10, and IA-14. Risks are discussed in Section 5.2.1.1, and hazards are discussed in Section 5.2.1.2.

5.2.1.1 Risks

This section discusses risks calculated for commercial/industrial workers for IA-2, IA-4, IA-5, IA-10, and IA-14. It should be noted that risks specific to IAs 2, 10, and 14 are calculated and presented in two places – risks based on potential exposure through inhalation of indoor air are presented in Tables D1.1, D4.1, and D5.1 in Appendix D and risks associated with potential exposure through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile COCs in soil are presented in Tables 1 and 3 for IAs 2 and 10. No direct contact exposures were evaluated for IA-14 because all soil samples were collected deeper than 10 feet, the POC for construction/excavation activities. Risks specific to IAs 4 and 5 based on potential exposure through incidental ingestion of, dermal contact with, inhalation of fugitive dusts and volatile COCs associated with surface soil, and inhalation of indoor air are presented in Tables D2.1 and D3.1 in Appendix D.

IA-2

The IA-specific total risk for commercial/industrial workers based on inhalation of indoor air at IA-2 is 2E-09 (see Table D6.1 in Appendix D). The IA-specific total risk for commercial/industrial workers based on direct contact soil exposures is 2E-10 (see Table 1). The overall total IA-specific risk is 2E-09. This result is less than the cumulative target risk of 1E-05 for commercial/industrial workers identified for commercial/industrial land use, with consideration of off-site exposures (OAC 3745-300-09 (B) (1) (a))commercial/industrial; and less than 1E-06. EPC calculations in IA-2 are shown on Tables D1.1 through D1.4 in Appendix D.

IA-4

The IA-specific total risk for commercial/industrial workers at IA-4 is 4E-04 based on direct exposure to surface soil (that is, assuming no extensive intrusive excavation or grading activity [e.g., slab-on-grade construction]) and 2E-04 based on direct exposure to subsurface soil (brought to the surface as the result of extensive intrusive excavation and grading activities [e.g., construction of buildings with basements]) (see Table D7.1 in Appendix D). In both cases, the total risks are driven by potential exposure to carcinogenic PAHs in soil. Potential exposure via inhalation of indoor air contaminated as a result of volatile chemicals migrating via vapor intrusion from subsurface soil contributes a pathway-specific total risk of 1.4E-05 (entirely driven by naphthalene, another PAH). However, risks associated with inhalation of indoor air contaminated as a result of volatile chemicals migrating via vapor intrusion from groundwater contributes only a limited amount of risk (4.8E-09).

Both surface soil-based and subsurface soil-based total IA-specific risks exceed both the cumulative target risk of 1E-05 for commercial/industrial workers identified for commercial/industrial land use, considering off-site exposures (OAC 3745-300-09 (B)(1)(a))commercial/industrial. EPC calculations in IA-4 are shown on Tables D2.1 through D2.5 in Appendix D.

IA-5

The IA-specific total risk for commercial/industrial workers at IA-5 is 1E-05 based on direct exposure to surface soil or subsurface soil (see Table D8.1 in Appendix D). These results are equal to the cumulative target risk of 1E-05 for commercial/industrial workers identified for industrial land use, considering off-site exposures (OAC 3745-300-09 (B)(1)(a)). The risks are driven by potential direct exposure to arsenic (1E-05) in soil. It should be noted that the EPC for arsenic in both surface and subsurface soil is 15 milligrams per kilogram (mg/kg), which is similar to the concentration of arsenic (13.8 to 14 mg/kg) measured in soil samples collected at two locations judged to be insignificantly impacted by property activities (see Table E2 in Appendix E). It is recognized that these two locations do not meet the VAP background requirements (OAC 3745-300-07 (H)). The results from these two soil samples are only

presented to provide context. EPC calculations in IA-5 are shown on Tables D3.1 through 3.5 in Appendix D.

IA-10

The IA-specific total risk for commercial/industrial workers based on inhalation of indoor air at IA-10 is $1\text{E-}05$ (see Table D10.1 in Appendix D). The IA-specific total risk for commercial/industrial workers based on direct contact soil exposure is $3\text{E-}06$ (see Table 3). The overall total IA-specific risk is $1\text{E-}05$. This result is equal to the cumulative target risk of $1\text{E-}05$ for commercial/industrial workers identified for industrial land use, considering consideration of off-site exposures (OAC 3745-300-09 (B)(1)(a))commercial/industrial. The total risks are driven by potential direct exposure to arsenic ($1.2\text{E-}05$) in soil. It should be noted that the EPC for arsenic in both surface and subsurface soil is 18 mg/kg, which is similar to the concentration of arsenic (13.8 to 14 mg/kg) measured in soil samples collected at two locations judged to be insignificantly impacted by property activities (see Table E2 in Appendix E). It is recognized that these two locations do not meet the VAP background requirements (OAC 3745-300-07 (H)). The results from these two soil samples are only presented to provide context. EPC calculations in IA-10 are shown on Tables D5.1 through 5.4 in Appendix D.

IA-14

The IA-specific total risk for commercial/industrial workers based on inhalation of indoor air at IA-14 is $1\text{E-}08$ (see Table D9.1 in Appendix D). This result is less than the cumulative target risk of $1\text{E-}05$ for commercial/industrial workers,, with consideration of off-site exposures (OAC 3745-300-09 (B) (1) (a))commercial/industrial and less than $1\text{E-}06$. EPC calculations in IA-14 are shown on Tables D4.1 through 4.3 in Appendix D.

5.2.1.2 Hazards

This section discusses hazards calculated for commercial/industrial workers for IA-2, IA-4, IA-5, IA-10, and IA-14. It should be noted that hazards specific to IAs 2, 10, and 14 are calculated and presented in two places – risks based on potential exposure through inhalation of indoor air are presented in Tables D1.1, D4.1, and D5.1 in Appendix D and hazards associated with potential exposure through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile COCs are presented in Tables 1 and 3. Direct contact exposures to soil at IA-14 were not calculated because soil samples were collected deeper than 10 feet, the POC for construction/excavation activities. Hazards specific to IAs 4 and 5 are based on potential exposure through incidental ingestion of, dermal contact with, inhalation of fugitive dusts and volatile COCs associated with surface soil, and inhalation of indoor air (see Tables D2.1 and D3.1 in Appendix D).

IA-2

The IA-specific total HI for commercial/industrial workers based on inhalation of indoor air at IA-2 is 7E-03 (see Table D6.1 in Appendix D). The IA-specific total HI for commercial/industrial workers based on direct contact soil exposure is 2E-02 (see Table 1). The overall IA-specific total HI is 3E-02. This result is less than the cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (B) (2)).

IA-4

The IA-specific total HI for commercial/industrial workers at IA-4 is 5E-01 based on direct exposure to surface soil and 2 based on direct exposure to subsurface soil (see Table D7.1 in Appendix D). The surface soil result is less than the cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (C) (2)). The subsurface soil result exceeds the than the cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (B) (2)). However, all COC-specific HIs are less than 1. The largest COC-specific HI is 0.92 for the petroleum fraction C20-C34. The next two highest COC-specific HIs are 0.38 for naphthalene and 0.16 for the petroleum fraction C10-C20. Assuming that the two petroleum fractions cause adverse health effects via similar mechanisms, the segregated HI based on the two petroleum fractions (C20-C34 and C10-C20) is 1.08 or 1 (rounded to one significant figure as recommended by Ohio's VAP (OAC 3745-300-09 (B)(3))).

IA-5

The IA-specific total HIs for commercial/industrial workers at IA--5 based on potential exposure to surface and subsurface soil are 8E-02 and 5E-02 (see Table D8.1 in Appendix D). These results are less than the cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (B) (2)).

IA-10

The IA-specific total HI for commercial/industrial workers based on inhalation of indoor air at IA-10 is 5E-02 (see Table D10.1 in Appendix D). The IA-specific total HI for commercial/industrial workers based on direct contact soil exposure is 2E-02 (see Table 3). The overall IA-specific total HI is 7E-02. This result is less than the cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (B) (2)).

IA-14

The IA-specific total HI for commercial/industrial workers based on inhalation of indoor air at IA-14 is 7E-04 based on exposure to subsurface soil (see Table D9.1 in Appendix D). This result is less than the

cumulative target hazard of 1 identified for industrial land use (OAC 3745-300-09 (B) (2)). (Note: no surface soil samples were collected at IA-14).

5.2.2 Construction/Excavation Workers

This section discusses risks and hazards calculated for construction/excavation workers for each of the IAs evaluated in the risk assessment: IA-2, IA-4, IA-5, IA-10, and IA-14. Total risks and hazards are discussed for the exposure scenario combinations identified in Section 3.3.3. Risks are discussed in Section 5.2.2.1, and hazards are discussed in Section 5.2.2.2. Table 11 summarizes IA-specific risks and hazards for construction/excavation workers.

5.2.2.1 Risks

This section discusses risks calculated for construction/excavation workers for IA-2, IA-4, IA-5, IA-10, and IA-14 (see Tables D6.2 through D10.2 in Appendix D and Tables 1 and 3). It should be noted that risks specific to IAs 2, 10, and 14 are calculated and presented in two places – risks based on potential exposure through inhalation of trench air are presented in Tables D6.2, D8.2, and D9.2 in Appendix D and risks associated with potential exposure through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile COCs in soil are presented in Tables 1 and 3. Direct contact exposures to soil were not calculated for IA-14 because all soil samples were collected deeper than 10 feet, the POC for construction/excavation activities. Risks specific to IAs 4 and 5 based on potential exposure through incidental ingestion of, dermal contact with, inhalation of fugitive dusts and volatile COCs associated with subsurface soil, and inhalation of trench air are presented in Tables D7.2 and D8.2 in Appendix D.

IA-2

The total risk for construction/excavation workers based on inhalation of trench air at IA-2 is $2\text{E-}08$ (see Table D6.2 in Appendix D). The total risk for construction/excavation workers based on direct contact soil exposure is $9\text{E-}12$ (see Table 1). The overall total risk is $2\text{E-}08$. This result is less than the cumulative target risk of $1\text{E-}05$ identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B)(1)(a)) and is less than $1\text{E-}06$.

IA-4

The total risk for construction/excavation workers at IA-4 is $2\text{E-}05$ (see Table D7.2 in Appendix D). This result exceeds the cumulative target risk of $1\text{E-}05$ identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (1) (a)). The total risk is driven by potential exposure to carcinogenic PAHs in subsurface soil.

IA-5

The total risk for construction/excavation workers at IA-5 is $8E-06$ (see Table D8.2 in Appendix D). This result exceeds $1E-06$, but is less than the cumulative target risk of $1E-05$ identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (1) (a)).

IA-10

The total risk for construction/excavation workers based on inhalation of trench air at IA-10 is $9E-06$ (see Table D10.2 in Appendix D). The total risk for construction/excavation workers based on direct contact soil exposure is $2E-07$ (see Table 3). The overall total risk for construction/excavation workers is $9E-06$. This result is less than the cumulative target risk of $1E-05$ identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (1) (a)).

IA-14

The total risk for construction/excavation workers based on inhalation of trench air at IA-14 is $2E-12$ (see Table D9.2 in Appendix D). This result is less than the cumulative target risk of $1E-05$ identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (1) (a)) and is less than $1E-06$.

5.2.2.2 Hazards

This section discusses hazards calculated for construction/excavation workers for IA-2, IA-4, IA-5, IA-10, and IA-14 (see Tables D1.2 through D5.2 in Appendix D). It should be noted that hazards specific to IAs 2, 10, and 14 are calculated and presented in two places – hazards based on potential exposure through inhalation of trench air are presented in Tables D6.2, D8.2, and D9.2 in Appendix D and risks associated with potential exposure through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatile COCs in soil are presented in Tables 1 and 3. Direct contact exposures to soil were not calculated for IA-14 because all soil samples were collected deeper than 10 feet bgs, the POC for construction/excavation activities. Hazards specific to IAs 4 and 5 based on potential exposure through incidental ingestion of, dermal contact with, inhalation of fugitive dusts and volatile COCs associated with subsurface soil, and inhalation of trench air are presented in Tables D7.2 and D8.2 in Appendix D.

IA-2

The total HI for construction/excavation workers based on inhalation of trench air at IA-2 is $1E-02$ (see Table D6.2 in Appendix D). The total HI for construction/excavation workers based on direct contact soil exposure is $2E-02$ (see Table 1). The overall total HI for construction/excavation workers is $3E-02$. This

result is less than the cumulative target hazard of 1 identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (2)).

IA-4

The total HI for construction/excavation workers at IA-4 is 1 (see Table D7.2 in Appendix D). This result equals the cumulative target hazard of 1 identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (2)).

IA-5

The total HI for construction/excavation workers at IA-5 is 2 (see Table D8.2 in Appendix D). This result exceeds the cumulative target hazard of 1 identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (2)). This result is driven by potential exposure to trichloroethene in construction trench air. The concentration of trichloroethene in the air within a construction trench was estimated based on the maximum detected concentration in groundwater at IA-5. In fact, trichloroethene was detected at only a single well (MW5-2S) out of a total of four wells (MW5-1, MW5-2S, MW5-2D, and MW5-4). The maximum detected concentration measured at well MW5-2S in April 2011 was 11 micrograms per liter (µg/L). However, a second sample was collected from MW5-2S in June 2011 and trichloroethene was detected at a concentration of 7.7 µg/L. Using this second concentration, the hazard index (HI) for trichloroethene was reduced to 1.1 and the total HI was reduced from 1.6 (which rounds to 2 at one significant figure) to 1.2 (which rounds to 1 at one significant figure) (see OAC 3745-300-09 (B) (3)).

IA-10

The total HI for construction/excavation workers based on inhalation of trench air at IA-10 is 5E-02 (see Table D10.2 in Appendix D). The total HI for construction/excavation workers based on direct contact soil exposure is 3E-02. The overall total HI for construction/excavation workers is 8E-02. This result is less than the cumulative target hazard of 1 identified for construction/excavation workers under commercial/industrial land use (OAC 3745-300-09 (B) (2)).

IA-14

No hazard was able to be calculated for construction/excavation workers based on inhalation of trench air at IA-14 because none of the identified COCs had noncancer volatile inhalation toxicity factors (see Tables 7, 11, and Table D9.2 in Appendix D).

5.2.3 HAZARD SEGREGATION

As discussed in Section 5.2, with a few identified exceptions, all IA-specific total hazards are less than or equal to the target hazard of 1. At IA-4 for commercial/industrial workers (Section 5.2.1.2) a total hazard greater than 1 was identified, with no COC-specific HI >1. In this case, the total HI (calculated as the sum of all COC-specific HIs regardless of the mechanism(s) of toxicity [see Section 5.1.2]) was reevaluated (or segregated) based on COCs that cause adverse health effects via similar mechanisms. The highest segregated HI (based on the petroleum fractions C10-C20 and C20-C34) was determined to be equal to 1.

5.3 POTENTIAL OFF-SITE EXPOSURES

Members of the general public may be exposed at off-site locations to Subject Property-related chemicals via a variety of exposure pathways. Under VAP requirements at OAC 3745-300-09 (B)(1)(a), when using a target cumulative risk of 1E-05 for a commercial/industrial land use, it must be demonstrated that potential off-site exposures are not associated with a cumulative cancer risk of 1E-05. As discussed in Section 3.2, any potential exposure via inhalation of Subject Property-related soil contaminants that have migrated off-site via volatilization and/or particulate emissions is expected to be insubstantial. Members of the general public may also be exposed via potential potable groundwater use and via direct contact with sediments. Potential risks and hazards associated with these potential off-site exposure pathways are discussed below.

Members of the general public, primarily nearby residents, could also theoretically be exposed through potable use of groundwater. As noted in Section 3.2.3, 1 PWS and 57 state-registered wells are located within 1 mile of the Subject Property. The potential for off-property migration and subsequent exposure via potable groundwater use is expected to be small for a number of reasons. First, while multiple state-registered wells are located within 1 mile of the Subject Property, this entire area is serviced by City water; all residents and businesses receive potable water from the public water supply. Second, groundwater monitoring well MW9-1 is located on the southeast boundary of the Subject Property. All chemicals detected in groundwater samples from this well are at concentrations less than their respective VAP UPUS values (see Appendix E). Finally, groundwater modeling was conducted from groundwater monitoring wells (MW2-1, MW2-2, MW5-2S/D, MW5-4, and MW10-1) at the Subject Property where chemicals (arsenic and trichloroethene) have been detected at concentrations exceeding their respective VAP UPUS values to the boundaries of the Subject Property (see Appendix F). The modeling results show that all modeled concentrations at the boundaries of the Subject Property are less than their respective VAP UPUS.

5.4 ECOLOGICAL RISK CHARACTERIZATION

This section discusses the risks to ecological receptors associated with potential exposure to COCs in sediment from Beer Road Ditch as explained in Section 5.1.4 (see Table 1). The total HI is 19; in all, 24 constituents were detected of which seven had a concentration that resulted in an HQ greater than 1, indicating potential for ecological effects. Constituents identified as COCs (and their maximum HQs) include:

- Acetone (1.7)
- Acenaphthene (2.2)
- Benzo(a)anthracene (1.7)
- Benzo(a)pyrene (1.1)
- Chrysene (1.5)
- Fluoranthene (1.4)
- Pyrene (2.3)

For COCs compared to reference values developed by MacDonald, Ingersoll, and Berger (2000), the threshold effect concentration (TEC) was used. However, all of the COC concentrations were less than their respective probable effect concentrations (PEC). The individual HQs and total HI are expected to be driven by off-property sources rather than the subject Property for the following reasons: (1) no releases of hazardous substances or petroleum products have been reported to the on-property drainage system and (2) viable off-property sources of PAHs are readily apparent and include traffic along Beer Road and various upgradient commercial/industrial operations. As identified in the Phase I ESA report (Tetra Tech 2011), documents provided by the Ohio EPA indicated a spill of diesel fuel originating from 815 North Beer Road (adjacent to the Subject Property's western border). The spill report pertains to an excess of oil and grease first observed in the permitted storm water effluent. Analytical results of discharge water sampled for oil and grease in October 1990 indicated an exceedance of acceptable levels. Ohio EPA and General Motors personnel investigated the source of the petroleum and discovered the probable source was a diesel fuel release at Bender & Loudon Freight at 815 Beer Road. Subsequent to the spill, petroleum was observed entering the drainage network at the subject property, and ultimately making its way through the stormwater pond to the Beer Road Ditch. Absorbent socks were put into place where two drainage ditches flow onto the Subject Property; however, the socks reportedly became tangled allowing the spill to flow onto the Subject Property and into the storm retention pond and beyond.

6.0 UNCERTAINTY ANALYSIS

Uncertainties are associated with all elements of the risk assessment process, from selection of COCs through the exposure and toxicity assessment and risk/hazard characterization steps. In most cases, the methodology used to prepare the risk assessment incorporates conservative assumptions so as to limit the potential to underestimate receptor-specific exposures, risks, and hazards. Some of the potentially most significant areas of uncertainty are discussed in greater detail below.

- The risk assessment assumed steady-state conditions. This assumption ignores the effects of various fate and transport mechanisms that will alter the composition and distribution of chemicals in various media over time. All organic COCs will be impacted by a variety of fate mechanisms (such as biodegradation, metabolism, and bioavailability). Consideration of these factors is expected to reduce receptor-specific exposures, risks, and hazards.
- The risk assessment assumes an institutional control will be implemented prohibiting potable groundwater use at the Subject Property. If such an institutional control is not implemented, potential groundwater exposures may have been underestimated. It should be noted that groundwater beneath the Subject Property is not currently used as a source of potable water.
- The risk assessment used modeling to estimate the concentrations of VOCs in indoor air (Johnson and Ettinger models) and in construction trench air (a methodology developed by the VDEQ). A variety of general uncertainties and limitations are associated with any modeling. In particular, with regard to air modeling, uncertainty (often significant) is associated with the variability and representativeness of air modeling input parameters.
- Ohio EPA currently recommends that an ER value of 1 hr⁻¹ be used (Tetra Tech 2006a, 2007a, OEPA 2007). However, it is not unreasonable to assume that future commercial/industrial buildings constructed on-property will meet ASHRAE guidelines: office space at an ER of 6 hr⁻¹ and plant space (shops and bays) at an ER of 4 to 4.5 hr⁻¹. For the purposes of the risk assessment, it was assumed that these same guidelines would be followed for future operations at the Subject Property. However, in order to be health-protective, an ER value of 1 hr⁻¹ was assumed for commercial/industrial space (about equal to one-fourth of the ASHRAE-recommended value for future Subject Property plant space and one-sixth of the ASHRAE-recommended value for office space).

The impact of changes in the ER value on the results of both Johnson and Ettinger models is linear. Therefore, a change in the ER value from 1 to 2 hr⁻¹ would result in a decrease in risks and hazards estimated by the models by a factor of 2 (2/1). In other words, the exposures, risks, and hazards associated with inhalation of indoor air would be reduced by a factor of 2 if the Johnson and Ettinger models were run with a more realistic (but still conservative) ER value of 2 hr⁻¹, rather than 1 hr⁻¹.

- Indoor air concentrations from groundwater were estimated primarily using EPA's GW-ADV-Feb04.xls spreadsheet (see Tables C-3 through C-29 in Appendix C). As discussed in the text and shown in Tables D.6.1 through D.9.1 in Appendix D, risks and hazards associated with potential inhalation of indoor air do not contribute significantly to total IA-specific risks and hazards. As a second line of evidence, indoor air concentrations (and associated risks and hazards) were also estimated using EPA's VISL Calculator (see Tables C-97 to C-100 in Appendix C). As summarized in Table 12, the indoor air concentrations estimated using EPA's VISL Calculator are between 6 and 416 times higher than indoor air concentrations estimated

using EPA's GW-ADV-Feb04.xls spreadsheet. Even so, all estimated risks and hazards associated with inhalation of indoor air remain insubstantial. For example, the indoor air concentration of tetrachloroethene in groundwater at IA-5 showed the greatest increase based on the use of EPA's VISL Calculator as compared to EPA's GW-ADV-Feb04.xls spreadsheet – an increase of 416 times. Nonetheless, the risk associated with inhalation of indoor air using the VISL-based indoor air concentration resulted in a risk of only 7.8E-09 and a HQ of 2.1E-03. These results indicate that even using EPA's VISL Calculator, risks and hazards associated with inhalation of indoor air are not associated with significant risks and hazards and does not contribute significantly to total risks and hazards.

(Note: there are currently no basements left on the Subject Property as a result of the razing of site structures by the BCDC).

- The methodologies used to develop carcinogenic and noncarcinogenic toxicity factors often incorporate multiple uncertainty factors (usually multiples of 10) and modifying factors to account for extrapolations from animal toxicity results to human receptors, subchronic test data to assumed chronic environmental exposures, and sensitive receptors. All attempts are made to select and use appropriate uncertainty and modifying factors to ensure that the general population (including sensitive receptors) is not adversely impacted. For example, SFs are developed as upper confidence limits on the dose response relationship. As a result, the SF is a conservative estimate of the potential carcinogenic response and may result in overestimation of the true health effects associated with exposure to a given chemical.

However, the use of these factors is not precise. While toxicity factors are designed with the intention of not underestimating a chemical's toxicity, this may not always be the case. Therefore, use of Ohio EPA and EPA-recommended toxicity factors may introduce both some degree of under- and overestimation into the risk assessment.

- The total HI for construction/excavation workers at IA-5 was conservatively calculated as 2, which exceeds the target hazard of 1. However, as described in Section 5.2.2.2 this result can best be characterized as marginally significant and may actually be ≤ 1 .
- The HQs calculated for ecological receptors in Beer Road Ditch are expected to be overestimated as discussed in Section 5.4.

7.0 SUMMARY AND CONCLUSIONS

This section summarizes the procedures used to complete and the results of the risk assessment (Section 7.1), reports, and conclusions based on these results (Section 7.2).

7.1 RISK ASSESSMENT SUMMARY

The property-specific risk assessment was completed in a manner consistent with the procedures specified in OAC 3745-300-09. It is assumed that in the future the Subject Property will be used to support various commercial/industrial operations. Consistent with a future commercial/industrial land use, the risk assessment focused on potential exposures to two groups of receptors: commercial/industrial workers and construction/excavation workers. However, the risk assessment also evaluated off-property general public (primarily residential and recreational) exposures in a semi-quantitative manner.

Exposures, risks, and hazards were evaluated and characterized for those IAs at which at least one chemical had been found at a concentration exceeding medium-specific (soil and groundwater) Ohio EPA VAP GNS values for commercial and industrial land use categories and construction/excavation activities. Additional information for those IAs not addressed further in this property-specific risk assessment (IAs 1, 3, 6, 7, 8, 9, 11, 12, and 13) is presented below:

- IA-1 (IA-1a, -1b, and -1c) – The primary concern at IA-1 was a potential release from the snow melting system beneath the parking lot in that area. Only one COC, ethylene glycol, was identified for shallow soil in IA-1 in accordance with OAC 3745-300-06. Ethylene glycol was not detected in any soil sample collected at IA-1 (IAs -1a and -1b). The only exception was soil boring IA1-6 which was extended to address the potential impact of the Rack Wash building (IA-1c) located immediately upgradient of the boring location and thus sampled for VOCs. The sample from soil boring IA1-6 was collected from 15 feet bgs which is deeper than the range of subsurface soil (0 to 10 feet bgs) considered for potential direct contact for human receptors. It should be noted that all VOCs were detected at concentrations less than their respective medium-specific GNS values. Also, groundwater samples were not collected from IA-1. Therefore, IA-1 was not considered further.
- IA-3 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Therefore, IA-3 was not considered further.
- IA-6 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 2 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1. Similar groundwater results were not added to the Table 2 soil results because the only chemicals detected in IA-6 groundwater (monitoring well MW6-1) were gasoline range organics (GRO) and the C20-C34 petroleum fraction. The Property was given a NFA by the Ohio BUSTR (ODC 2003). Therefore, IA-6 was not considered further.

-
- IA-7 – Wipe sampling for polychlorinated biphenyls (PCB) were all nondetect (see Table E6 in Appendix E). Therefore, IA-7 was not considered further.
 - IA-8 – Information regarding IA-8 includes the results of a geophysical survey conducted within the Main Plant Building and analysis of samples from soil boring IA4-10 (Tetra Tech 2015), – the closest soil boring to the Main Plant Building. IA4-10 was installed to evaluate the horizon corresponding to the “marriage station” as an additional investigative tool to support the geophysical investigation of that feature. The sample depth was targeted to correspond with the elevation of the feature as described in the Site-Specific Work Plan and the Phase II ESA (Tetra Tech 2015). As a result, no soil samples were collected within 25 feet bgs. Therefore, no potential for direct contact with site-related chemicals in soil was identified. Further, all chemical concentrations in soil (sample collected 25 to 27.5 feet bgs) were less than commercial/industrial and construction/excavation GNS values – see Appendix E). Also, groundwater samples were not collected from IA-8. Therefore, IA-8 was not considered further.
 - IA-9 -- The waste water treatment system is a closed loop and no evidence of a release was identified in association with this feature. In addition, the IA was limited to the footprint of the building. As a result, no Phase II PA activities were conducted in this area. This IA is considered resolved. The raw materials storage area to the east that was formerly included in IA-9 has been separated from the WWTP and now represents IA-14.
 - IA-11 – Information regarding IA-11 was requested by Ohio EPA to support cost estimation for demolition of the building. Asbestos-containing building material (ACBM) is outside the scope of the VAP and the abatement work was conducted under Ohio EPA oversight. Therefore, IA-11 was not considered further.
 - IA-12 – Wood block flooring at various locations in the Main Plant Building has been removed. Analytical results were collected at Ohio EPA’s request only to characterize the building materials for disposal purposes. Building materials (such as wood block flooring) are not eligible for inclusion under VAP. Therefore, IA-12 was not considered further.
 - IA-13 – As documented in Appendix E, no chemical-specific exceedances of medium-specific GNS values were identified for this IA. Table 4 presents the results of the cumulative adjustment for multiple chemicals (OAC 3745-300-08 (F)) for soil. The cumulative cancer and noncancer risk ratios for commercial/industrial and construction/excavation workers are all less than 1. Also, groundwater samples were not collected from IA-13. Therefore, IA-13 was not considered further.

Similarly, as documented in Appendix E (see Table E-6), no chemical-specific exceedances of residential soil GNS values (see OAC 3745-300-08 (H) (2) (a)) were exceeded for the single sediment sample (SD12-LAN-0411) from Beer Road Ditch. Therefore, potential exposure by human receptors (recreationalists) to sediment in Beer Road Ditch was not considered further.

Therefore, the risk assessment evaluated exposures and characterized risks and hazards associated with these exposures at the following IAs:

- IA-2
- IA-4
- IA-5

-
- IA-10
 - IA-14

All chemicals positively detected in at least one medium-specific sample (soil and groundwater) were considered COCs for that medium. The 46 soil, 28 groundwater, and 21 sediment COCs identified and carried through the risk assessment are listed in Table 3.

Risks and hazards were evaluated separately for human receptors -- commercial/industrial and construction/excavation workers and off-property members of the general public (qualitatively) (Section 7.1.1) and ecological receptors (Section 7.1.2). These results are summarized Tables 11 (human receptors) and 5 (ecological receptors) and below.

7.1.1 Human Receptors

Commercial/industrial Workers

Based on the intended future commercial/industrial use of the Subject Property, risks and hazards calculated for commercial/industrial workers were compared to a target cumulative risk of 1E-05 (OAC 3745-300-09 (B) (1) (a)) and a target cumulative hazard of 1 (OAC 3745-300-09 (B) (2)). The additional requirement that the cumulative cancer risk to off-property receptors, attributable to COCs, is less than 1E-05 (OAC 3745-300-09 (B) (1) (a)) is discussed in Section 5.4 and summarized below.

Risks

First, total area-specific risks were calculated. The following results were identified:

- Total IA-specific risks for IA-2 (2E-09) and IA-14 (1E-08) are less than 1E-06.
- Total IA-specific risks for IA-5 (1E-05) and IA-10 (1E-05) are equal to the target cumulative risk of 1E-05 (OAC 3745-300-09 (B) (1) (a)). Also, total risks at both IAs are driven by potential exposure to arsenic in soil. The EPCs for arsenic in soil at IA-5 (15 mg/kg) and IA-10 (18 mg/kg) are similar to the concentration of arsenic (13.8 to 14 mg/kg) measured in soil samples collected at two locations judged to be insignificantly impacted by property activities (see Table E2 in Appendix E). It is recognized that these two locations do not meet the VAP background requirements (OAC 3745-300-07 (H)) and are presented for context only.
- Total IA-specific risks for IA-4 based on direct exposure to surface soil (4E-04) and direct exposure to subsurface soil (2E-04) exceed both a target cumulative risk of 1E-05 (OAC 3745-300-09 (B) (1) (a)). These total risks are driven by potential exposure to carcinogenic PAHs.

Hazards

Second, total area-specific hazards were calculated. The following results were identified:

-
- Total IA-specific HIs for IA-2 (7E-03), IA-5 (8E-02 – surface soil and 5E-02 – subsurface soil), IA-10 (5E-02), and IA-14 (7E-04) are less than 1.
 - Total IA-specific HIs for IA-4 are 0.5 (surface soil) and 2 (subsurface soil). The surface soil result is less than 1. The subsurface soil result was further evaluated based on segregation based on similar toxicity mechanism(s) and the highest segregated total HI was 1 based on petroleum fractions C10-C20 and C20-C34. Therefore, the IA-4 hazards for commercial/industrial workers are likely to be insubstantial. However, as discussed in Section 7.2, the total HI for IA 4 is still considered to exceed 1.

Construction/Excavation Workers

Based on the intended future commercial/industrial use of the Subject Property, risks and hazards calculated for construction/excavation workers were compared to a target cumulative risk of 1E-05 and a target cumulative hazard of 1 (OAC 3745-300-09 (B) (1) (a) and 3745-300-09 (B) (2)).

Risks

First, total area-specific risks were calculated. The following results were identified:

- Total risk for IA-2 (2E-08) and IA-14 (1E-12) are less than or equal to 1E-06.
- Total risks for IA-5 (8E-06) and IA-10 (2E-06) are less than the target cumulative risk of 1E-05 (OAC 3745-300-09 (B) (1) (a)).
- Total risk for IA-4 (2E-05) exceeds the target cumulative risk of 1E-05 (OAC 3745-300-09 (B) (1) (a)) and is driven by potential exposure to carcinogenic PAHs.

Hazards

Second, total area-specific hazards were calculated. The following results were identified:

- Total HIs for IA-2 (1E-02), IA-4 (1), IA-10 (5E-02), IA-14 (not applicable – no COCs with noncarcinogenic toxicity factors for inhalation) are less than or equal to 1.
- Total HI for IA-5 (2) exceeds the cumulative target hazard of 1 and is driven by potential exposure to trichloroethene in trench air. However, this result is judged only marginally significant because trichloroethene was detected in only 1 of 4 wells at IA-5. When the most recent trichloroethene concentration is considered, the HI for trichloroethene was reduced from 1.6 to 1.1 and the total HI was reduced from 1.6 to 1.2 (which rounds to 1 at one significant figure).

General Public

Potential risks and hazards for hypothetical off-property residents were compared to a target cumulative risk of 1E-05 and a target cumulative hazard of 1 (OAC 3745-300-09 (B)(1)(a) and 3745-300-09 (B) (2)).

- Potential exposures via off-site inhalation of particulates and volatiles are insubstantial.

-
- Potential exposure to COCs in off-site potable groundwater is less than 1E-05 based on a variety of lines of evidence:
 - All potential nearby off-property receptors receive potable water from the public water supply (e.g., the city).
 - The groundwater concentrations measured in groundwater monitoring well MW9-1, located on the southeast Subject Property boundary, are all less than residential groundwater GNS values.
 - Groundwater concentrations modeled from the on-property groundwater monitoring wells (MW2-1, MW2-2, MW5-2S/D, MW5-4, and MW10-2) to the boundaries of the Subject Property are all less than their respective residential groundwater GNS values.

7.1.2 Ecological Receptors

Potential risks to ecological receptors were evaluated in accordance with OAC 3745-300-08 (I) (see Section 5.1.4). A total HI of 19 was calculated. Seven constituents contributed HQs > 1, including PAHs (acenaphthene, benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, and pyrene), as well as acetone. As discussed above for human exposure to sediment in Beer Road Ditch, ecological hazards should be considered in the context of (1) likely contributions of PAH contamination from off-property sources such as and the documented release from an upgradient industrial/commercial operation along Beer Road and (2) no evidence of on-site releases of hazardous substances or petroleum products to the on-property drainage system. Finally, as discussed in Section 5.4, for most constituents a TEC was used in the HQ calculations. For these constituents all concentrations were less than their respective PECs.

7.2 RISK ASSESSMENT CONCLUSIONS

Based on the risk and hazard results summarized in Section 7.1, the following general conclusions may be drawn:

- Risks and hazards associated with the IA-2, IA-10, and IA-14 are less or equal to receptor-specific target cumulative risks and hazards. Therefore, remediation at these IAs is not required.
- Risks and hazards associated with IA-5 are less than or equal to receptor-specific target cumulative risks and hazards with one exception. The total HI for construction/excavation workers was calculated as 2, which exceeds the target hazard of 1. This total HI is driven by potential exposure to trichloroethene in trench air. However, trichloroethene was detected in only 1 of 4 monitoring wells at IA-5. The HI for trichloroethene (1.6) based on the maximum detected concentration of trichloroethene from monitoring well MW5-2S (11 µg/L) was reduced to 1.1 (and the total HI reduced from 1.6 to 1.2) when the trichloroethene concentration (7.7 µg/L) measured in a second sample collected two months later from MW5-2S is used. The revised total HI of 1.2 reduces to 1 at one significant figure.
- Risks and hazards at IA-4 exceed the target cumulative risk and hazard for commercial/industrial workers and for construction/excavation workers. These risks and hazards are driven by potential

exposure to carcinogenic PAHs in soil. Excavation of PAH-contaminated soils at IA-4 (see Figure 5) will be required.

- Potential off-property risks related to COC exposures from the Subject Property are less than a target cumulative risk of 1E-05 and a target cumulative hazard of 1 (OAC 3745-300-09 (B)(1)(a) and 3745-300-09 (B) (2), respectively) based on (1) insubstantial exposures (inhalation of particulates and vapors) and (2) measured and modeled groundwater concentrations at the Subject Property boundaries less than 1E-05. Potential off-property risks to ecological receptors from the Subject Property exceed a target hazard of 1 associated with potential exposures to constituents (primarily PAHs) in sediment in Beer Road Ditch. This result suggests a potential excess risk to ecological receptors in Beer Road Ditch. However, as noted in Section 7.1.2, these risks are associated with impacts from a documented off-property release of diesel fuel from an adjacent property and other potential sources of contamination (such as traffic along Beer Road and industrial/commercial operations upgradient of Beer Road Ditch) and the fact that no known on-site releases of petroleum or fuel into the on-property drainage system were identified.

The conclusions drawn from this risk assessment are also summarized in the following tables:

Risk Assessment Outcome for Commercial/Industrial Worker Scenario

Area	Risk	Hazard	Recommended Action
IA-2	Pass	Pass	No Action Required
IA-4	Fail	Fail	Excavation of PAH-contaminated soil
IA-5	Pass	Pass	No Action Required
IA-10	Pass	Pass	No Action Required
IA-14	Pass	Pass	No Action Required

Risk Assessment Outcome for Construction/Excavation Worker Scenario

Area	Risk	Hazard	Recommended Action
IA-2	Pass	Pass	No Action Required
IA-4	Fail	Fail	Excavation of PAH-contaminated soil
IA-5	Pass	Pass	No Action Required*
IA-10	Pass	Pass	No Action Required
IA-14	Pass	Pass	No Action Required

* See text for more discussion.

Risk Assessment Outcome for Off-Property Exposure Scenarios

Area	Risk	Hazard	Recommended Action
Off-Property – General (inhalation of fugitive dust and vapors and potable groundwater use)	Pass	Pass	No Action Required

Risk Assessment Outcome for Off-Property Ecological Exposure Scenario

Area	Risk	Recommended Action
Beer Road Ditch	Fail	No Action Required ([1] Documented Release by off-property source of PAHs, [2] No known on-site releases of hazardous substances or petroleum products to on-property drainage system)

8.0 RECOMMENDATIONS

Based on the summary and conclusions in Section 7 and consistent with VAP response requirements specified in OAC 3745-300-09 for commercial/industrial properties, excavation of PAH-contaminated soil at IA-4 is required. Figure 5 presents a preliminary layout of the area where excavation is expected to be necessary.

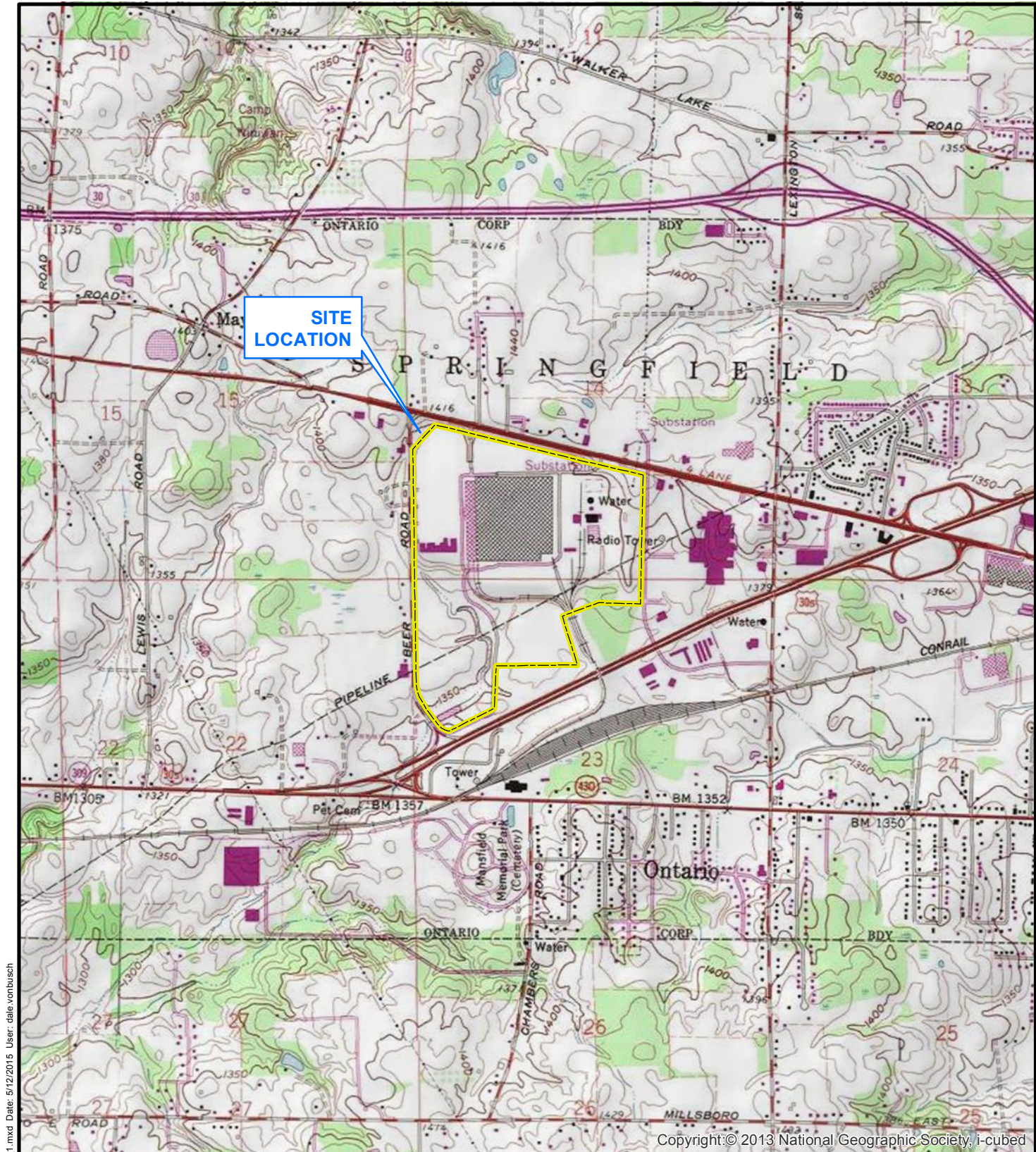
9.0 REFERENCES

- California Environmental Protection Agency (CalEPA). 2004. "Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air." December.
- Ohio Department of Commerce (ODC). 2003. Letter Regarding No Further Action Status Regarding Closure Requirements. From Kelly J. Gill, Corrective Action Supervisor, Bureau of Underground Storage Tank Regulations (BUSTR). To Karen Keys, MFD Group General Motors Corp. March 23.
- Ohio Environmental Protection Agency (Ohio EPA). 2004. "Evaluating Exposure to Groundwater for the Construction Worker and Excavation Activity Receptor Populations." Technical Decision Compendium VA30009.14.002. January. On-Line Address: <http://www.epa.ohio.gov/portals/30/vap/tgc/VA30009-14-002.pdf>
- Ohio EPA. 2008. "Guidance for Conducting Ecological Risk Assessments," Division of Environmental Response and Revitalization. Revised April. On-Line Address: <http://www.epa.ohio.gov/portals/30/rules/RR-031.pdf>
- Ohio EPA. 2010. "Sample Collection and Evaluation of Vapor Intrusion to Indoor Air." Division of Environmental Response and Revitalization. May. On-Line Address: <http://epa.ohio.gov/portals/30/rules/Vapor%20Intrusion%20to%20Indoor%20Air.pdf>
- Ohio EPA. 2014a. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program (VAP). May. On-Line Address: <http://epa.ohio.gov/Portals/30/rules/2014/Risk%20Support%20Document.pdf>
- Ohio EPA. 2014b. Voluntary Action Program Chemical Information Database and Applicable Regulatory Standards (CIDARS). On-Line Address: http://epa.ohio.gov/portals/30/rules/CIDARS_090414.xlsx
- Tetra Tech Inc. (Tetra Tech). 2011. "Phase I Environmental Site Assessment, Mansfield Stamping." January 28.
- Tetra Tech. 2015. "Phase II Environmental Site Assessment Report, Former Mansfield Stamping Plant." Prepared for Ohio EPA, June 2011. Revised for Revitalizing Automotive Communities Environmental Response (RACER) Trust. September.
- Tetra Tech. 2014. Electronic Mail Regarding Selection of Toxicity Values for Chemicals Not Included in Ohio EPA's Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures. From Erin LeGalley, Risk Assessor, Ohio EPA, Division of Environmental Response and Revitalization. To Eric Morton, Senior Environmental Scientist. February 25.
- U.S. Environmental Protection Agency (EPA). 1986. "Guidelines for the Health Risk Assessment of Chemical Mixtures." *Federal Register*. Volume 51, Number 185. Pages 34014 through 34025.
- EPA. 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)" (RAGS). Interim Final. Office of Emergency and Remedial Response (OERR). Washington, DC. EPA/540/1-89/002. December.

-
- EPA. 1990. "National Oil and Hazardous Substances Pollution Contingency Plan." *Federal Register*. Volume 55, Number 46. April 9.
- EPA. 1992. "Guidance for Data Usability in Risk Assessment (Part A) Final." OERR. Publication 9285.7-09A. April.
- EPA. 1996. "Soil Screening Guidance: Technical Background Document." Office of Solid Waste and Emergency Response (OSWER). EPA/540/R95/128. May.
- EPA. 1997. "Health Effects Assessment Summary Tables, FY 1997 Update." OSWER. EPA-540-R-97-036. July.
- EPA. 2002a. "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)." OSWER. EPA530-D-02-004. November. On-Line Address: <http://www.epa.gov/correctiveaction/eis/vapor/complete.pdf>
- EPA. 2002b. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." Office of Emergency and Remedial Response. OSWER 9285.6-10. Washington, DC. December.
- EPA. 2004. "User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings." Prepared by Environmental Quality Management, Inc. for OERR. Revised. February 22.
- EPA. 2004c. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, supplemental Guidance for Dermal Risk Assessment)." Office of Superfund Remediation and Technology Innovation. Final. EPA/540/R/99/005. July.
- EPA. 2009. *RAGS, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)*. Office of Superfund Remediation and Technology Innovation. Washington, DC. OSWER Directive 9285.7-82. EPA-540-R-070-002. January.
- EPA. 2011. "Exposure Factors Handbook: 2011 Edition." National Center for Environmental Assessment, Office of Research and Development. EA/600/R-09/052F. September. On-Line Address: <http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf>
- EPA. 2013. "ProUCL Version 5.0.00 User Guide, Statistical Software for Environmental Applications for Data Sets With and Without Nondetect Observations." ORD Site Characterization and Monitoring Technical Support Center (SCDMTSC). EPA/600/R-07/041. September. On-Line Address: http://www.epa.gov/osp/hstl/tsc/ProUCL_v5.0_user.pdf
- EPA. 2014a. "Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) May 2014." On-Line Address: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf
- EPA. 2014b. "User's Guide for Regional Screening Levels (May 2014)." On-Line Address: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm
- EPA. 2014c. OSWER Vapor Intrusion Assessment, Vapor Intrusion Screening Level (VISL) Calculator, Version 3.3.1, May 2014 RSLs. On-Line Address: <http://www.epa.gov/oswer/vaporintrusion/guidance.html>

Virginia Department of Environmental Quality (VDEQ). 2014. Voluntary Remediation Program Risk Assessment Guidance. August. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

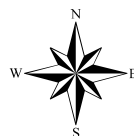
FIGURES



Copyright © 2013 National Geographic Society, i-cubed

Legend

Approximate Site Boundary



0 1,000 2,000
Feet

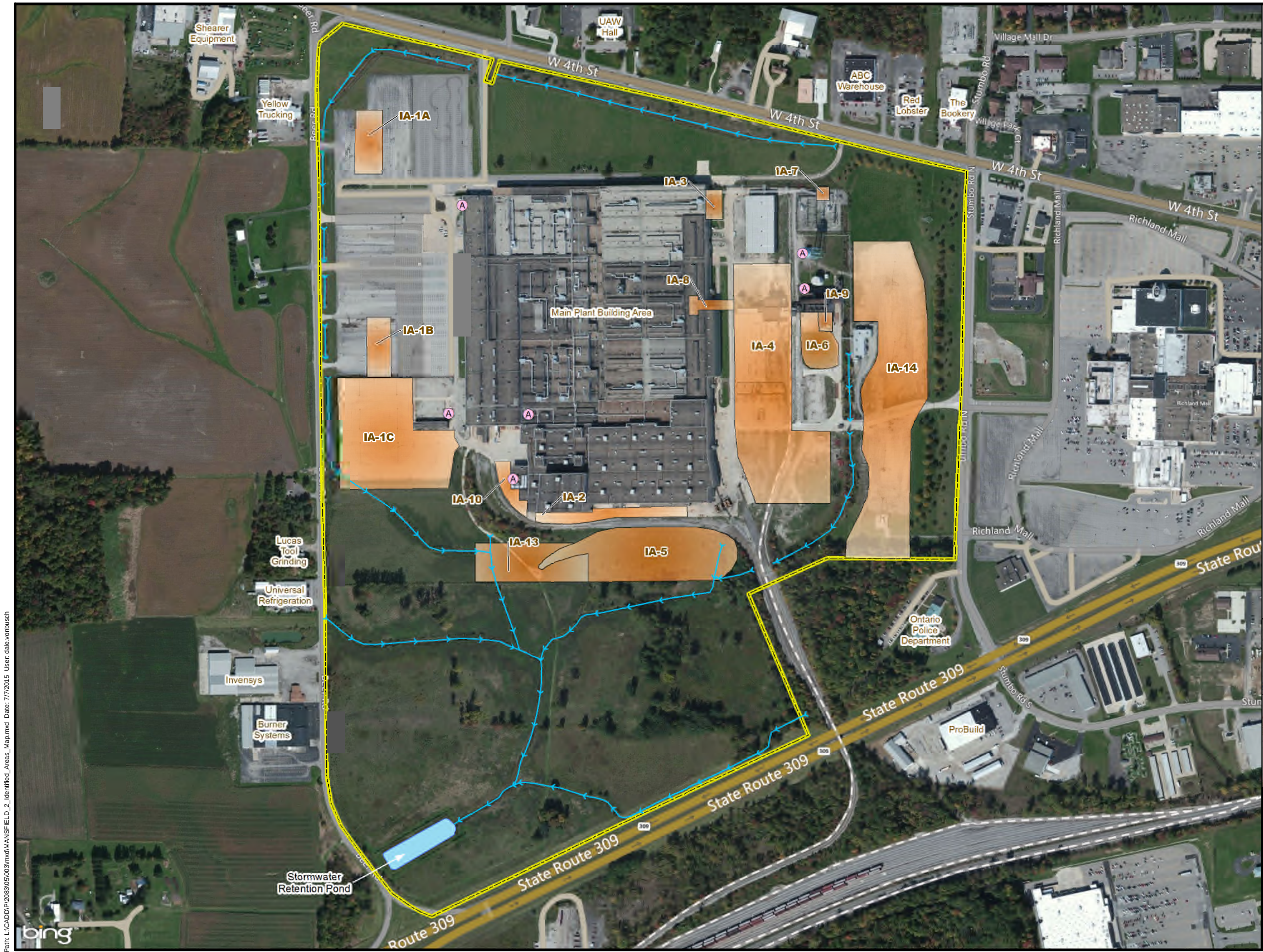
MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 1
SITE LOCATION MAP



SOURCE: MODIFIED FROM USGS, CRESTLINE, OH 1982
& MANSFIELD NORTH, OH 1982 & BLOOMING ROVE, OH 1987
& MANSFIELD SOUTH, OH 1984 QUADRANGLES.

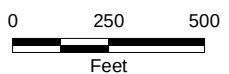
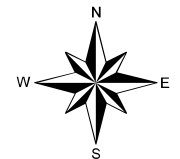
Path: L:\CADD\2018\05\003\mxd\MANSFIELD_2_Identified_Areas_Map.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

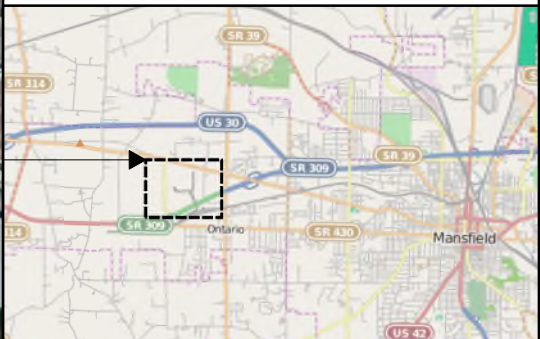
- Aboveground Storage Tank
- Stormwater Collection System
- Identified Areas
- Approximate Site Boundary
- Stormwater Retention Pond

Area Number	Area Name
IA-1A	Snow Staging Area
IA-1B	Snow Staging Area
IA-1C	Rack Storage Area
IA-2	Former UST Farm
IA-3	Missing/Misidentified UST
IA-4	Former WWTP
IA-5	Soil Pile/Slope Fill Area
IA-6	Coal/Raw Material Storage Area
IA-7	Original Switch House
IA-8	Stained Flooring/Sumps/Floor Drains
IA-9	Existing WWTP
IA-10	Hazardous Waste Storage Area
IA-13	South Field Lower Terrace Fill Area
IA-14	Eastern Storage Yard



Notes
IA-11 and IA-12 were excluded.
IA-12 is not displayed since it is found throughout the building.

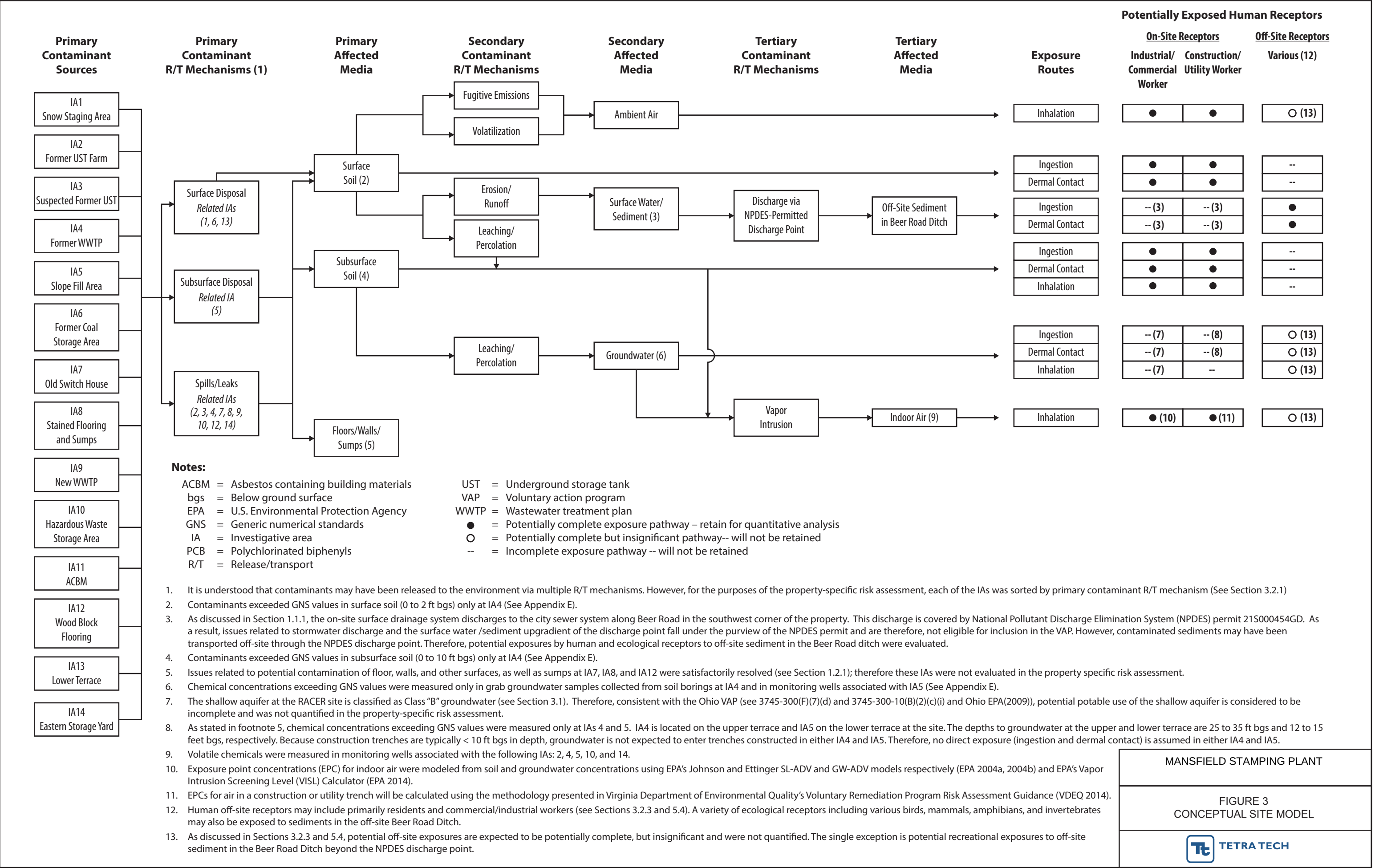
Map Source:
Bing Maps Aerial Imagery, 2010-2012.



MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 2
IDENTIFIED AREAS MAP



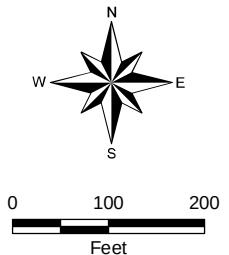




Legend

- Soil Sample
- Sediment Sample
- Aboveground Storage Tank
- Stormwater Collection System
- Identified Areas
- Approximate Site Boundary

Area Number	Area Name
IA-3	Missing/Misidentified UST
IA-4	Former WWTP
IA-5	Soil Pile/Slope Fill Area
IA-6	Coal/Raw Material Storage Area
IA-7	Original Switch House
IA-8	Stained Flooring/Sumps/Floor Drains
IA-9	Existing WWTP
IA-13	South Field Lower Terrace Fill Area
IA-14	Eastern Storage Yard



Map Source:
Bing Maps Aerial Imagery, 2010-2012.



MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4A
IAS AND SAMPLING LOCATIONS - NORTHEAST

TETRA TECH

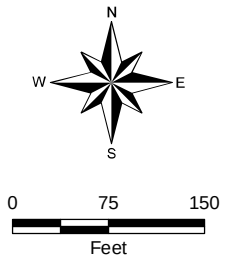
Path: L:\CADD\PI208305\003.mxd\IANSFIELD_3A_IAS-Sampling_Northeast.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

- Soil Sample
- Sediment Sample
- Landfill Soil Sample
- Test Pit
- Aboveground Storage Tank
- Stormwater Collection System
- Identified Areas
- Approximate Site Boundary

Area Number	Area Name
IA-1C	Rack Storage Area
IA-2	Former UST Farm
IA-4	Former WWTP
IA-5	Soil Pile/Slope Fill Area
IA-10	Hazardous Waste Storage Area
IA-13	South Field Lower Terrace Fill Area



Map Source:
Bing Maps Aerial Imagery, 2010-2012.



MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4B
IAs AND SAMPLING LOCATIONS - S. CENTRAL

TETRA TECH



Path: L:\CADD\PI\2083\05\003\mxd\MANFIELD_3C_IAS-Sampling_ Northwest.mxd Date: 7/7/2015 User: dale.vonbusch

Legend

-  Soil Sample
-  Sediment Sample
-  Aboveground Storage Tank
-  Stormwater Collection System
-  Identified Areas
-  Approximate Site Boundary

- ▲ Sediment Sample

- Ⓐ Aboveground Storage Tank

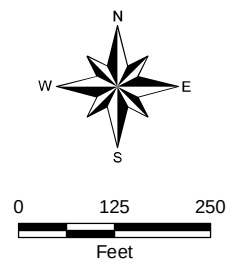
- ### ➤ Stormwater Collection System

- Identified Areas

- Approximate Site Boundary

Area Number	Area Name
IA-1A	Snow Staging Area
IA-1B	Snow Staging Area
IA-1C	Rack Storage Area
IA-2	Former UST Farm
IA-3	Missing/Misidentified UST
IA-8	Stained Flooring/Sumps/Floor Drains
IA-10	Hazardous Waste Storage Area

Area Number	Area Name
IA-1A	Snow Staging Area
IA-1B	Snow Staging Area
IA-1C	Rack Storage Area
IA-2	Former UST Farm
IA-3	Missing/Misidentified UST
IA-8	Stained Flooring/Sumps/Floor Drains
IA-10	Hazardous Waste Storage Area



Map Source:
Bing Maps Aerial Imagery, 2010-2012.

Bing Maps Aerial Imagery, 2010-2012.



MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

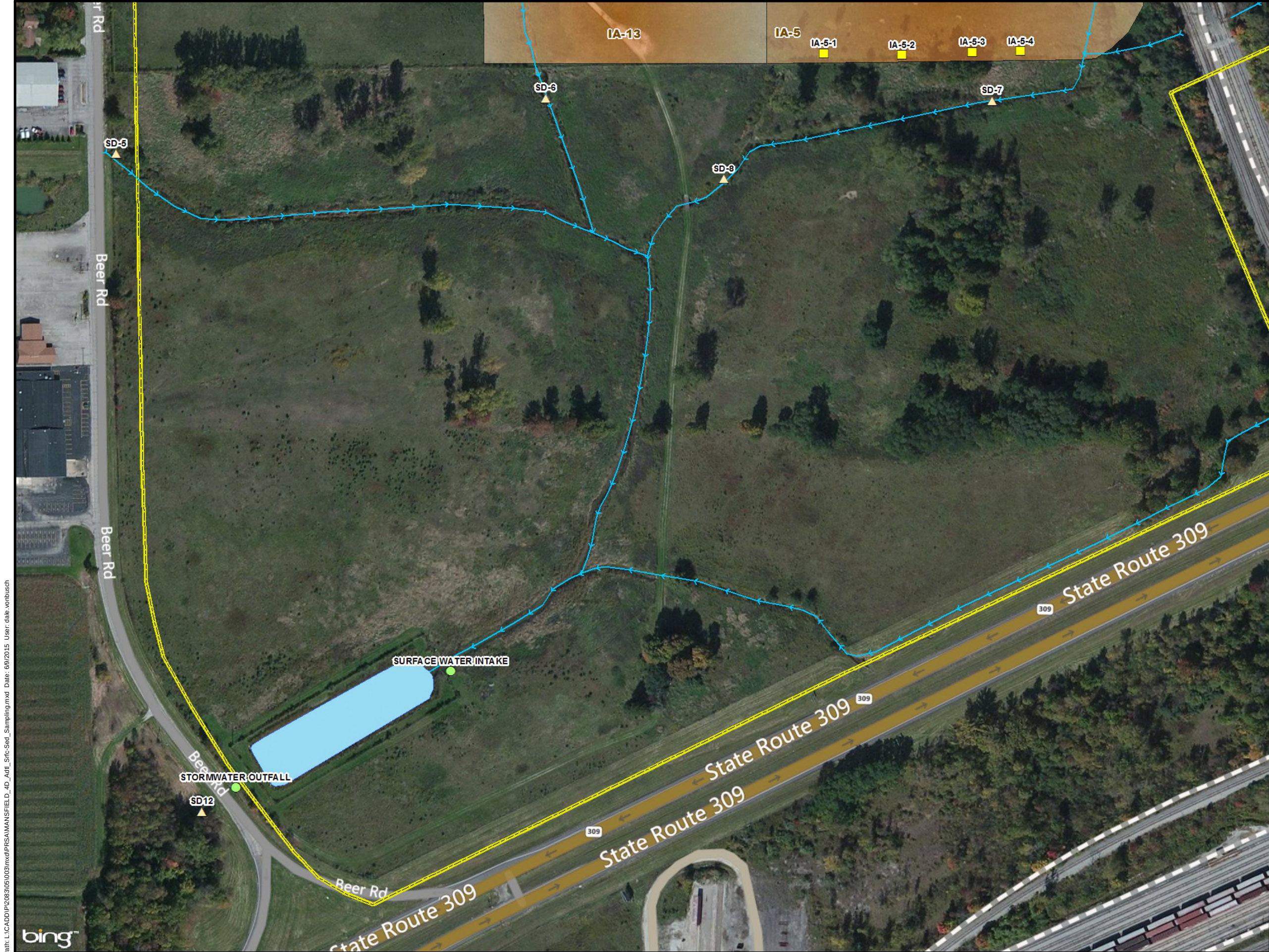
OHIO EPA
MANSFIELD, OHIO

CHLOE A
MANSFIELD, OHIO

FIGURE 4C
IAs AND SAMPLING LOCATIONS N. WEST

IAS AND SAMPLING LOCATIONS N. WEST

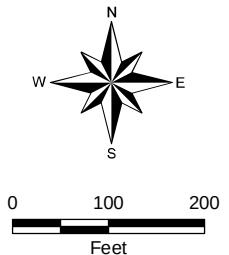




Legend

- Soil Sample
- Sediment Sample
- Surface Water Intake Sample
- Stormwater Collection System
- Identified Areas
- Approximate Site Boundary
- Stormwater Retention Pond

Area Number	Area Name
IA - 5	Soil Pile/Slope Fill Area
IA - 13	South Field Lower Terrace Fill Area



Map Source:
Bing Maps Aerial Imagery, 2010-2012.



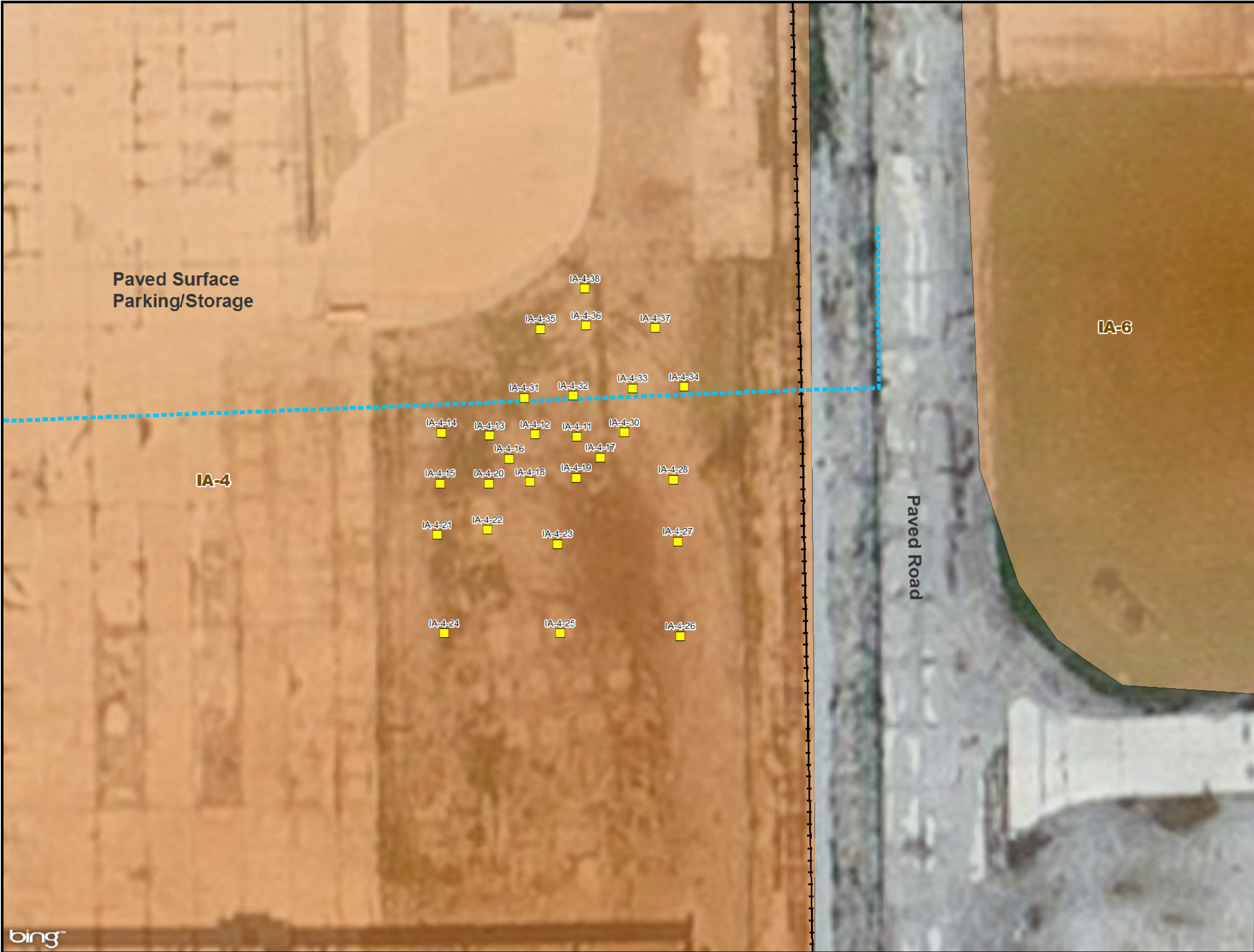
MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4D
ADDITIONAL SEDIMENT & SURFACE
WATER SAMPLING



Path: L:\CADD\IP208305\003.mxd\IPRSMANSFIELD_4D_Adtl_Srfc-Sed_Sampling.mxd Date: 09/20/2015 User: dale.vonbusch

Path: L:\CADD\IP208305\003.mxd\IMANSFIELD_3E_IA-4Soil Borings.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

IA-4 Boring Location

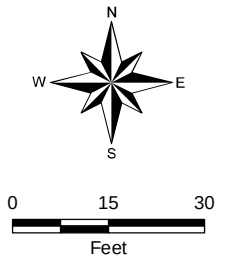
Railroad

Water Line

Identified Areas

Approximate Site Boundary

Area Number	Area Name
IA-4	Former WWTP
IA-6	Coal/Raw Material Storage Area



Map Source:
Bing Maps Aerial Imagery, 2010-2012.

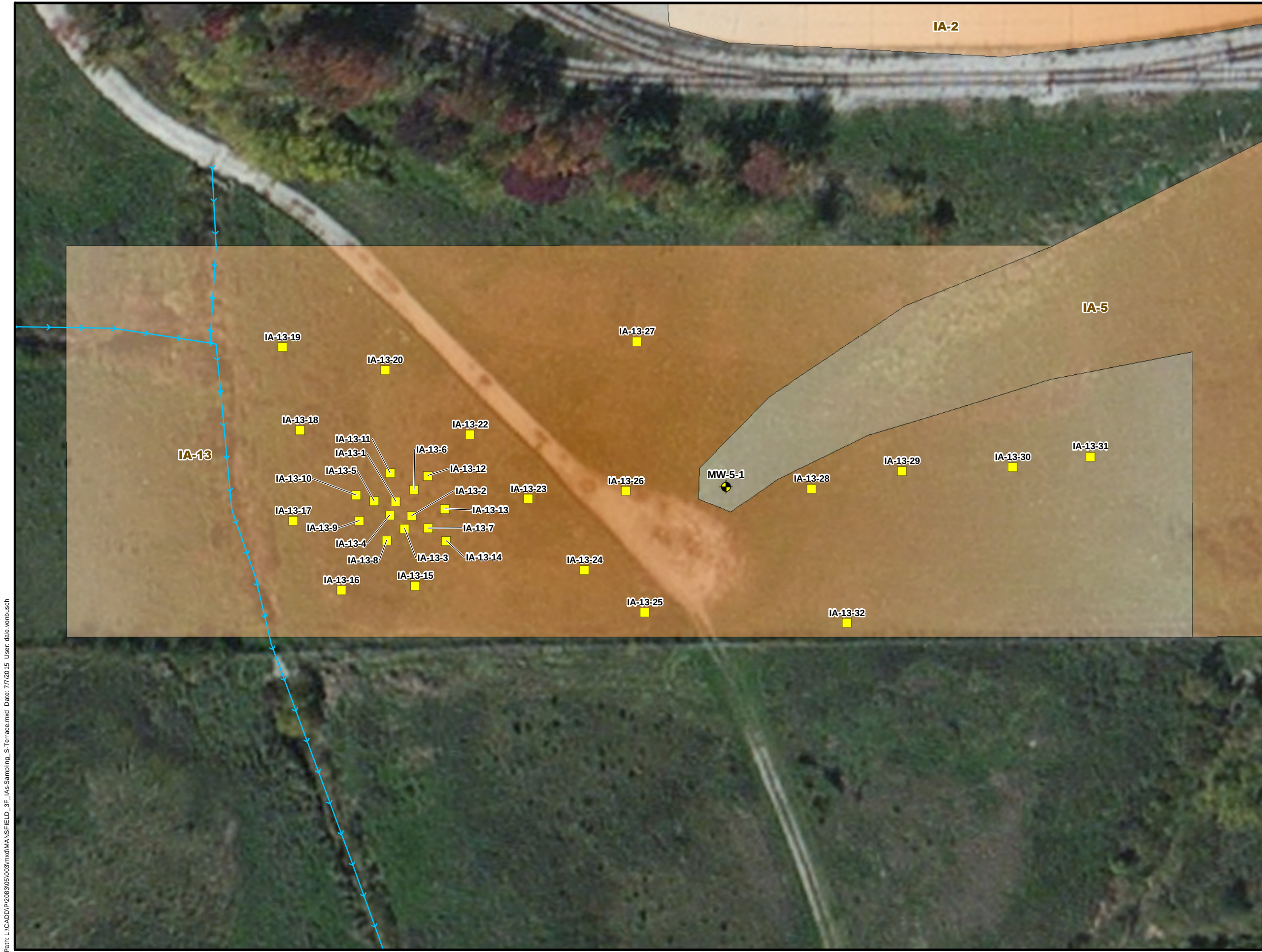


MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4E
IA-4 BORING LOCATIONS



Path: L:\CADD\IP208305\003\mxd\MANSFIELD_3F_IAs-Sampling_S-Terrace.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

Monitoring Well Location

Soil Sample

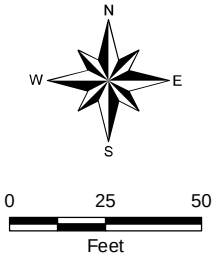
Aboveground Storage Tank

Stormwater Collection System

Identified Areas

Approximate Site Boundary

Area Number	Area Name
IA-5	Soil Pile/Slope Fill Area
IA-13	South Field Lower Terrace Fill Area



Map Source:
Bing Maps Aerial Imagery, 2010-2012.

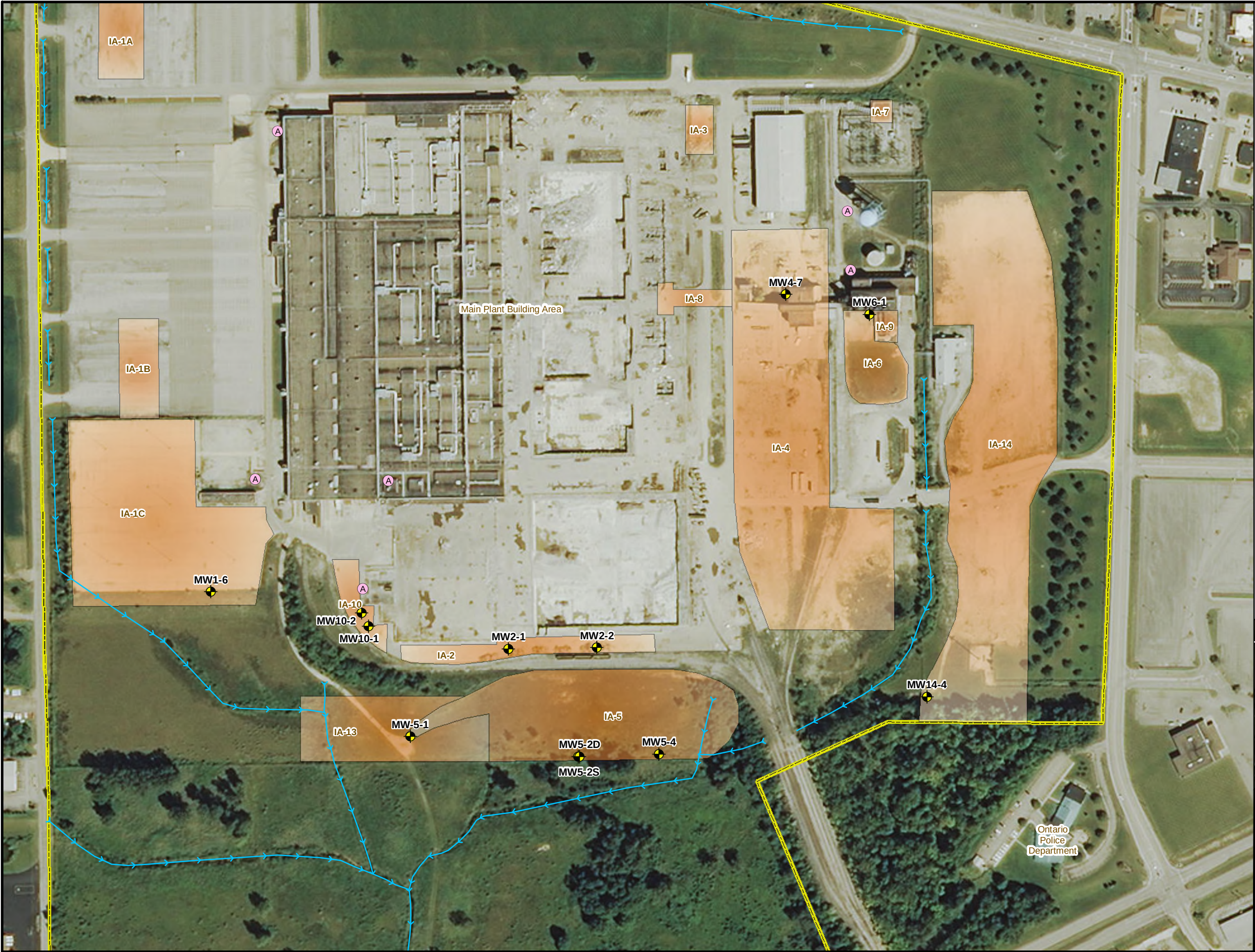


MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4F
IAs AND SAMPLING LOCATIONS-S. TERRACE



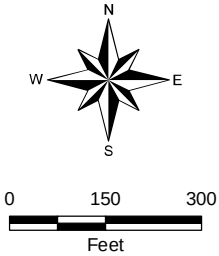
Path: L:\CADD\IP208305\003.mxd\WANSFIELD_3G_Monitoring_Wells.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

- Monitoring Well Location
- Aboveground Storage Tank
- Stormwater Collection System
- Identified Areas
- Approximate Site Boundary

Area Number	Area Name
IA-1A	Snow Staging Area
IA-1B	Snow Staging Area
IA-1C	Rack Storage Area
IA-2	Former UST Farm
IA-3	Missing/Misidentified UST
IA-4	Former WWTP
IA-5	Soil Pile/Slope Fill Area
IA-6	Coal/Raw Material Storage Area
IA-7	Original Switch House
IA-8	Stained Flooring/Sumps/Floor Drains
IA-9	Existing WWTP
IA-10	Hazardous Waste Storage Area
IA-13	South Field Lower Terrace Fill Area
IA-14	Eastern Storage Yard



Map Source:
Bing Maps Aerial Imagery, 2010-2012.

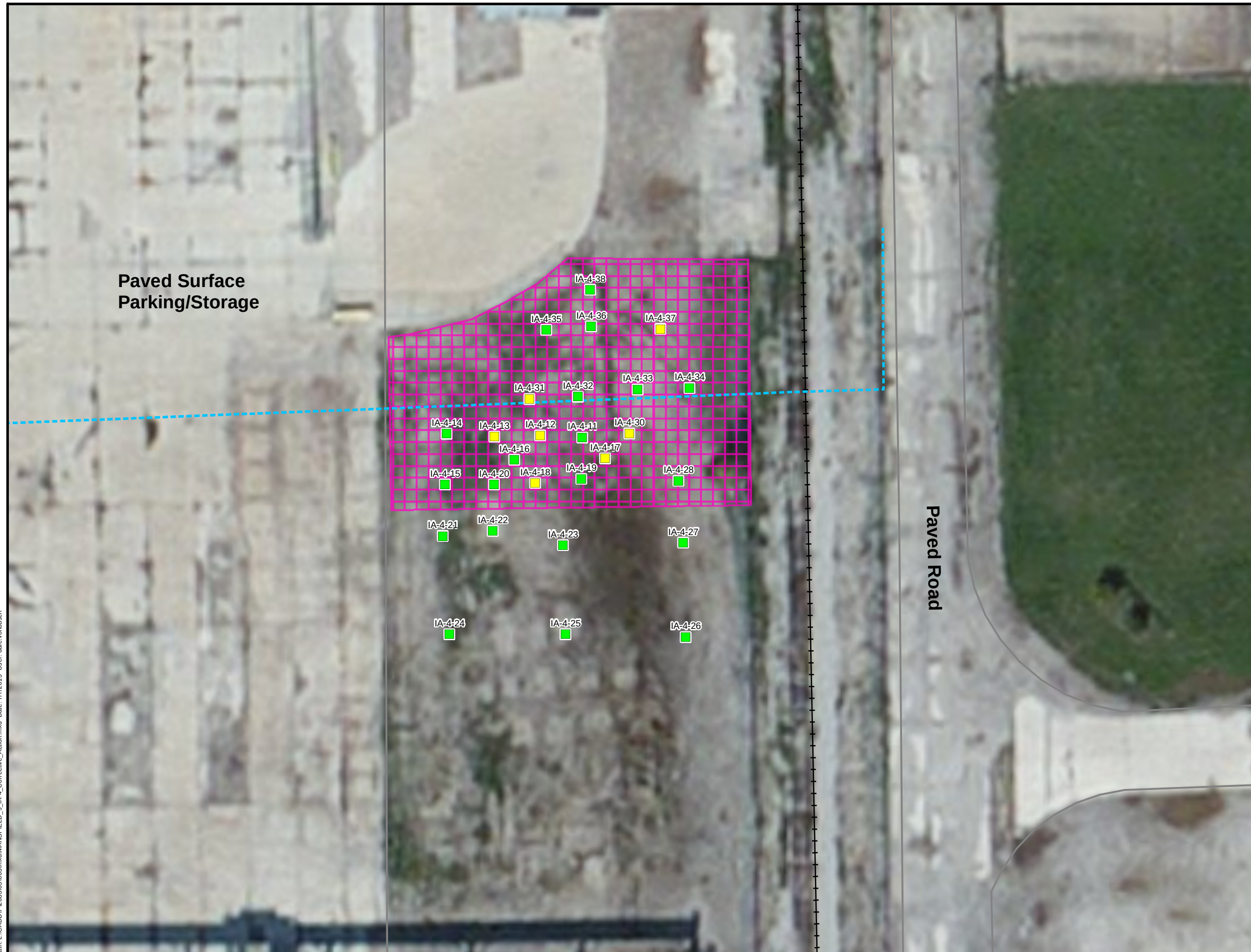


MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 4G
MONITORING WELL LOCATIONS



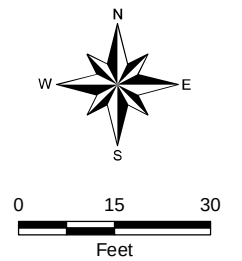
Path: L:\CADD\IP208305\003\mxd\MANSFIELD_9_IA-4_Corrective_Action.mxd Date: 7/7/2015 User: dale.vonbusch



Legend

IA-4 Soil Boring

- PAH Exceeds Generic Numerical Standard
- PAH Below Generic Numerical Standard
- Railroad
- Water Line
- Road/Paved Edge
- Corrective Action/Removal Area to 5 feet below ground surface
- Approximate Site Boundary



Map Source:
Bing Maps Aerial Imagery, 2010-2012.



MANSFIELD STAMPING PLANT
OHIO EPA
MANSFIELD, OHIO

FIGURE 5
IA-4 CORRECTIVE ACTION AREA: 0 TO 5 FEET



TABLES

TABLE 1

**CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL -- IA2
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COC	Maximum Detected Concentration ¹ (mg/kg)	Soil Saturation Standard ² (mg/kg)	Commercial/Industrial Worker ²		Construction/Excavation Worker ²		Commercial/Industrial Worker		Construction/Excavation Worker	
			Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio
Acetone	0.031	110,000	NA	1,000,000	NA	1,000,000	--	3.1E-08		3.1E-08
2-Butanone	0.003	28,000	NA	560,000	NA	48,000	--	5.4E-09		6.3E-08
Methylene Chloride	0.0056	3,300	32,000	9,500	340,000	8,500	1.8E-07	5.9E-07	1.6E-08	6.6E-07
Chrysene	0.01	NA	5,800	NA	120,000	NA	1.7E-06	--	8.3E-08	--
1-Methylnaphthalene	0.025	NA	1,500	110,000	31,000	91,000	1.7E-05	2.3E-07	8.1E-07	2.7E-07
2-Methylnaphthalene	0.022	NA	NA	6,000	NA	5,200	--	3.7E-06	--	4.2E-06
Phenanthrene ³	0.027	NA	NA	450,000	NA	1,000,000	--	6.0E-08	--	2.7E-08
C6-C12 ⁴	0.055	NA	NA	5,000	NA	5,000		1.1E-05		1.1E-05
C10-C20 ⁴	120	NA	NA	10,000	NA	10,000	--	1.2E-02	--	1.2E-02
C20-C34 ⁴	67	NA	NA	20,000	NA	20,000	--	3.4E-03	--	3.4E-03
TOTALS							2E-05	2E-02	9E-07	2E-02
RISK/HAZARD							2E-10	2E-02	9E-12	2E-02

-- Not calculated
 BUSTR Bureau of Underground Storage Tank Regulations
 COC Chemical of concern
 DOC State of Ohio Department of Commerce
 mg/kg Milligram per kilogram
 NA Not applicable (see Footnote 2)
 Ohio EPA Ohio Environmental Protection Agency
¹ See Appendix E for tables of IA-specific soil sample analytical results.
²

Values obtained from Appendix A to OAC 3745-300-08 -- Generic Numerical Standards, Table II: Generic Numerical Direct-Contact Standards (Commercial/Industrial Land Use Category) and Table III: Generic Numerical Standards (Construction/Excavation Activities Category) (<http://epa.ohio.gov/portals/30/Rules/2014/3745-300-08%20Appendix.pdf>).

³ Supplemental criteria from Ohio EPA. 2015. "Voluntary Action Program Chemical Information Database and Applicable Regulatory Standards (CIDARS). February 13.

⁴ The BUSTR Class II Soil Action Level was used as a surrogate value for both commercial/industrial and construction/excavation workers (DOC 2014).

⁵ Risks were calculated as Cumulative Cancer Risk Ratio x 1E-05 (the VAP target risk); because the non-carcinogen-based single chemical standards are based on a target hazard of 1, the hazard is equal to the Cumulative Noncancer Risk Ratio.

TABLE 2

**CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL -- IA6
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COC	Maximum Detected Concentration ¹ (mg/kg)	Soil Saturation Standard ² (mg/kg)	Commercial/Industrial Worker ²		Construction/Excavation Worker ²		Commercial/Industrial Worker		Construction/Excavation Worker	
			Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio
Acenaphthene	0.056	NA	NA	90,000	NA	780,000	--	6.2E-07	--	7.2E-08
Anthracene	0.21	NA	NA	450,000	NA	1,000,000	--	4.7E-07	--	2.1E-07
Benzo(a)anthracene	0.24	NA	58	NA	1,200	NA	4.1E-03	--	2.0E-04	--
Benzo(a)pyrene	0.19	NA	5.8	NA	120	NA	3.3E-02	--	1.6E-03	--
Benzo(b)fluoranthene	0.26	NA	58	NA	1,200	NA	4.5E-03	--	2.2E-04	--
Benzo(g,h,i)perylene ³	0.15	NA	NA	45,000	NA	390,000	--	3.3E-06	--	3.8E-07
Benzo(k)fluoranthene	0.11	NA	580	NA	12,000	NA	1.9E-04	--	9.2E-06	--
Chrysene	0.28	NA	5,800	NA	120,000	NA	4.8E-05	--	2.3E-06	--
Fluoranthene	0.52	NA	NA	60,000	NA	160,000	--	8.7E-06	--	3.3E-06
Fluorene	0.066	NA	NA	60,000	NA	520,000	--	1.1E-06	--	1.3E-07
Indeno(1,2,3-cd)pyrene	0.095	NA	58	NA	1,200	NA	1.6E-03	--	7.9E-05	--
1-Methylnaphthalene	2.4	NA	1,500	110,000	31,000	91,000	1.6E-03	2.2E-05	7.7E-05	2.6E-05
2-Methylnaphthalene	3.8	NA	NA	6,000	NA	5,200	--	6.3E-04	--	7.3E-04
Naphthalene	2.2	NA	450	1,600	3,800	560	4.9E-03	1.4E-03	5.8E-04	3.9E-03
Phenanthrene ³	0.96	NA	NA	450,000	NA	1,000,000	--	2.1E-06	--	9.6E-07
Pyrene	0.41	NA	NA	45,000	NA	390,000	--	9.1E-06	--	1.1E-06
Arsenic	27.6	NA	77	1,200	1,300	690	3.6E-01	2.3E-02	2.1E-02	4.0E-02
Cadmium	0.31	NA	130,000	2,600	95,000	1,000	2.4E-06	1.2E-04	3.3E-06	3.1E-04
Chromium ⁴	15.9	NA	210	12,000	1,200	19,000	7.6E-02	1.3E-03	1.3E-02	8.4E-04
Lead ⁵	25.7	NA	NA	NA	NA	NA	--	--	--	--
Mercury	0.25	3.1	NA	85	NA	31	--	2.9E-03	--	8.1E-03
Selenium	0.59	NA	NA	20,000	NA	11,000	--	3.0E-05	--	5.4E-05
C20-C34 ⁶	240	NA	NA	10,000	NA	10,000	--	2.4E-02	--	2.4E-02
C10-C20 ⁷	150	NA	NA	20,000	NA	20,000	--	7.5E-03	--	7.5E-03
TOTALS							5E-01	6E-02	4E-02	9E-02
RISK/HAZARD⁸							5E-06	6E-02	4E-07	9E-02

- Not calculated
- BUSTR Bureau of Underground Storage Tank Regulations
- COC Chemical of concern
- DOC State of Ohio Department of Commerce
- mg/kg Milligram per kilogram
- NA Not applicable (see Footnote 2)
- Ohio EPA Ohio Environmental Protection Agency
- ¹ See Appendix E for tables of IA-specific soil sample analytical results.
- ² Values obtained from Ohio EPA. 2014. "Voluntary Action Program Chemical Information Database and Applicable Regulatory Standards (CIDARS). August 1.
- ³ Supplemental criteria from Ohio EPA CIDARS - see Footnote 2.
- ⁴ Chromium was conservatively evaluated as hexavalent chromium.
- ⁵ The maximum detected concentration of lead in soil at IA6 (25.7 mg/kg) is less than the generic numerical standards for commercial/industrial workers (800 mg/kg) and construction/excavation workers (400 mg/kg).
- ⁶ The BUSTR Class II Soil Action Level was used as a surrogate value for both commercial/industrial and construction/excavation workers (DOC 2014).
- ⁷ The BUSTR Class II Soil Action Level was used as a surrogate value for both commercial/industrial and construction/excavation workers (DOC 2014).
- ⁸ Risks were calculated as Cumulative Cancer Risk Ratio x 1E-05 (the VAP target risk); because the non-carcinogen-based single chemical standards are based on a target hazard of 1, the hazard is equal to the Cumulative Noncancer Risk Ratio.

TABLE 3

**CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL -- IA10
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COC	Maximum Detected Concentration ¹ (mg/kg)	Soil Saturation Standard ² (mg/kg)	Commercial/Industrial Worker ²		Construction/Excavation Worker ²		Commercial/Industrial Worker		Construction/Excavation Worker	
			Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio
Acetone	0.043	110,000	NA	1,000,000	NA	1,000,000	--	4.3E-08	--	4.3E-08
Benzene	0.00032	1,800	140	1,200	1,200	1,200	2.3E-06	2.7E-07	2.7E-07	2.7E-07
2-Butanone	0.0033	28,000	NA	560,000	NA	48,000	--	5.9E-09	--	6.9E-08
Carbon Disulfide	0.0021	740	NA	9,400	NA	9,400	--	2.2E-07	--	2.2E-07
1,2-Dichloroethane	0.00067	3,000	56	380	480	1,300	1.2E-05	1.8E-06	1.4E-06	5.2E-07
Methylene chloride	0.046	3,300	32,000	9,500	340,000	8,500	1.4E-06	4.8E-06	1.4E-07	5.4E-06
Toluene	0.00035	820	NA	140,000	NA	82,000	--	2.5E-09	--	4.3E-09
Benzo(b)fluoranthene	0.036	NA	58	NA	1,200	NA	6.2E-04	--	3.0E-05	--
Benzo(g,h,i)perylene ³	0.018	NA	NA	45,000	NA	390,000	--	4.0E-07	--	4.6E-08
Chrysene	0.016	NA	5,800	NA	120,000	NA	2.8E-06	--	1.3E-07	--
Fluoranthene	0.018	NA	NA	60,000	NA	160,000	--	3.0E-07	--	1.1E-07
1-Methylnaphthalene	0.041	NA	1,500	110,000	31,000	91,000	2.7E-05	3.7E-07	1.3E-06	4.5E-07
2-Methylnaphthalene	0.039	NA	NA	6,000	NA	5,200	--	6.5E-06	--	7.5E-06
Phenanthrene ³	0.036	NA	NA	450,000	NA	1,000,000	--	8.0E-08	--	3.6E-08
Pyrene	0.015	NA	NA	45,000	NA	390,000	--	3.3E-07	--	3.8E-08
Aroclor 1242	0.024	NA	20	NA	440	NA				
Arsenic	17.6	NA	77	1,200	1,300	690	2.3E-01	1.5E-02	1.4E-02	2.6E-02
Chromium ⁴	10.9	NA	210	12,000	1,200	19,000	5.2E-02	9.1E-04	9.1E-03	5.7E-04
Lead ⁵	15.5	NA	NA	NA	NA	NA	--	--	--	--
Mercury	0.024	3.1	NA	85	NA	31	--	2.8E-04	--	7.7E-04
Selenium	0.53	NA	NA	20,000	NA	11,000	--	2.7E-05	--	4.8E-05
TOTALS							3E-01	2E-02	2E-02	3E-02
RISK/HAZARD⁶							3E-06	2E-02	2E-07	3E-02

-- Not calculated
COC Chemical of concern
DOC State of Ohio Department of Commerce
mg/kg Milligram per kilogram
NA Not applicable (see Footnote 2)
Ohio EPA Ohio Environmental Protection Agency

¹ See Appendix E for tables of IA-specific soil sample analytical results.

²

Values obtained from Appendix A to OAC 3745-300-08 -- Generic Numerical Standards, Table II: Generic Numerical Direct-Contact Standards (Commercial/Industrial Land Use Category) and Table III: Generic Numerical Standards (Construction/Excavation Activities Category) (<http://epa.ohio.gov/portals/30/Rules/2014/3745-300-08%20Appendix.pdf>).

³ Supplemental criteria from Ohio EPA. 2015. "Voluntary Action Program Chemical Information Database and Applicable Regulatory Standards (CIDARS). February 13. (Note: for barium, value is from main CIDARS table and not the supplemental criteria section).

⁴ Chromium was conservatively evaluated as hexavalent chromium.

⁵ The maximum detected concentration of lead in soil at IA10 (15.5 mg/kg) is less than the generic numerical standards for commercial/industrial workers (800 mg/kg) and construction/excavation workers (400 mg/kg).

TABLE 4

**CUMULATIVE CANCER AND NONCANCER RISK RATIOS FOR SOIL -- IA13
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COC	Maximum Detected Concentration ¹ (mg/kg)	Soil Saturation Standard ² (mg/kg)	Commercial/Industrial Worker ²		Construction/Excavation Worker ²		Commercial/Industrial Worker		Construction/Excavation Worker	
			Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Standard for a Single Chemical Non-carcinogen (mg/kg)	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio	Cumulative Cancer Risk Ratio	Cumulative Noncancer Risk Ratio
Acetone	0.78	110,000	NA	1,000,000	NA	1,000,000	--	7.8E-07	--	7.8E-07
Benzene	0.037	1,800	140	1,200	1,200	1,200	2.6E-04	3.1E-05	3.1E-05	3.1E-05
2-Butanone	0.051	28,000	NA	560,000	NA	48,000	--	9.1E-08	--	1.1E-06
cis-1,2-Dichloroethene ³	0.0051	1,700	NA	1,700	NA	7,900	--	3.0E-06	--	6.5E-07
Ethylbenzene	0.031	480	700	58,000	6,100	190,000	4.4E-05	5.3E-07	5.1E-06	1.6E-07
Methylene chloride	0.021	3,300	32,000	9,500	340,000	8,500	6.6E-07	2.2E-06	6.2E-08	2.5E-06
Trichloroethene	0.1	690	170	51	1,400	17	5.9E-04	2.0E-03	7.1E-05	5.9E-03
Xylene (total)	0.049	260	NA	6,800	NA	7,000	--	7.2E-06	--	7.0E-06
TOTALS							9E-04	2E-03	1E-04	6E-03
RISK/HAZARD⁴							9E-09	2E-03	1E-09	6E-03

-- Not calculated

COC Chemical of concern

mg/kg Milligram per kilogram

NA Not applicable (see Footnote 2)

¹ See Appendix E for tables of IA-specific soil sample analytical results.

² Values obtained from Ohio EPA. 2014. "Voluntary Action Program Chemical Information Database and Applicable Regulatory Standards (CIDARS). August 1.

³ Trans-1,2-dichloroethene was identified as an appropriate surrogate for cis-1,2-dichloroethene.

TABLE 5

**ECOLOGICAL RISK SUMMARY -- OFF-PROPERTY SEDIMENT
ECOLOGICAL RISK EVALUATION
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COC	SD12-LAN-0411 Detected Concentration (mg/kg)	Qualifiers	OEPA Sediment Reference Values (mg/kg)	Sediment Quality Guidelines (Macdonald, Ingersoll, and Berger 2000)		Region 5 ESLs (mg/kg)	NOAA SQuIRT	HQ
				TEC	PEC			
VOCs - mg/kg								
Acetone	1.70E-02	J, B				9.90E-03		1.7E+00
2-Butanone	3.30E-03	J, B				4.24E-02		7.8E-02
Methylene chloride	2.30E-03	J, B				1.59E-01		1.4E-02
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg								
Acenaphthene	1.50E-02					6.71E-03		2.2E+00
Anthracene	4.70E-02			5.72E-02	8.45E-01	5.72E-02		8.2E-01
Benzo(a)anthracene	1.80E-01			1.08E-01	1.05E+00	1.08E-01		1.7E+00
Benzo(a)pyrene	1.70E-01			1.50E-01	1.45E+00	1.50E-01		1.1E+00
Benzo(b)fluoranthene	2.90E-01					1.04E+00		2.8E-01
Benzo(g,h,i)perylene ³	1.20E-01					1.70E-01		7.1E-01
Benzo(k)fluoranthene	1.50E-01					2.40E-01		6.3E-01
Chrysene	2.50E-01			1.66E-01	1.29E+00	1.66E-01		1.5E+00
Fluoranthene	5.90E-01			4.23E-01	2.23E+00	4.23E-01		1.4E+00
Fluorene	1.70E-02			7.74E-02	5.36E-01	7.74E-02		2.2E-01
Indeno(1,2,3-cd)pyrene	1.10E-01					2.00E-01		5.5E-01
Phenanthrene ³	2.00E-01			2.04E-01	1.17E+00	2.04E-01		9.8E-01
Pyrene	4.40E-01			1.95E-01	1.52E+00	1.95E-01		2.3E+00
Total PAHs	2.58E+00			1.61E+00	2.28E+01			1.6E+00
Metals - mg/kg								
Arsenic	9.30E+00		2.50E+01	9.79E+00	3.30E+01	9.79E+00		3.7E-01
Lead ⁴	1.73E+01			3.58E+01	1.28E+02	3.58E+01		4.8E-01
Barium	8.97E+01	B	1.90E+02					4.7E-01
Selenium	6.70E-01		1.70E+00					3.9E-01
Cadmium	1.10E-01	J	7.90E-01	9.90E-01	4.98E+00	9.90E-01		1.4E-01
Chromium	1.37E+01		2.90E+01	4.34E+01	1.11E+02	4.34E+01		4.7E-01
Mercury	2.90E-02	J		1.80E-01	1.06E+00	1.74E-01		1.6E-01
Ethylene glycol - mg/kg	<1.23						1.00E+02	<1.2E-02
Total								1.9E+01

Notes:

- Not calculated
 B Value qualified due to detection of analyte in one or more associated laboratory blanks.
 J Value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits.

TABLE 6

CHEMICALS OF CONCERN^a
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Chemical	Soil	Groundwater	Sediment
Acetone	X	X	X
Benzene	X		
Bromodichloromethane		X	
Bromomethane	X	X	
2-Butanone	X	X	X
Carbon disulfide	X	X	
Chloroethane	X	X	
Chloroform		X	
1,1-Dichloroethane	X	X	
1,2-Dichloroethane	X		
1,1-Dichloroethene		X	
cis-1,2-Dichloroethene		X	
trans-1,2-Dichloroethene		X	
Ethyl benzene	X		
2-Hexanone	X		
Isopropylbenzene	X		
Methylene chloride	X		X
4-Methyl-2-pentanone	X		
Tetrachloroethene		X	
Toluene	X	X	
1,2,4-Trichlorobenzene	X		
1,1,1-Trichloroethane		X	
Trichloroethene		X	
Vinyl chloride		X	
Xylenes (total)	X		
Acenaphthene	X	X	X
Acenaphthylene	X		
Anthracene	X		X
Benzo(a)anthracene	X		X
Benzo(b)fluoranthene	X	X	X
Benzo(k)fluoranthene	X		X
Benzo(g,h,i)perylene	X		X
Benzo(a)pyrene	X		X
Chrysene	X	X	
Dibenzo(a,h)anthracene	X		
Fluoranthene	X	X	X
Fluorene	X	X	X
Indeno(1,2,3-cd)pyrene	X		X
Isopropylbenzene	X		
1-Methylnaphthalene	X		
2-Methylnaphthalene	X		
Naphthalene	X	X	
Phenanthrene	X	X	X
Pyrene	X	X	X
Aroclors 1242, -1254, and -1260	X		
C6-C12	X		
C20-C34	X	X	
C10-C20	X	X	
Gasoline Range Organics (GRO)		X	
Arsenic	X		X
Cadmium	X		X
Chromium	X		X
Lead	X		X
Mercury	X	X	X
Selenium	X		X

Note:

^a The chemicals of potential concern (COPC) represent those chemicals detected at least once in a particular medium.

**EXPOSURE POINT CONCENTRATION SUMMARY
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COPC	Identified Area 2					Identified Area 4							Identified Area 5					Identified Area 10					Identified Area 14					
	SS	SB	SB-VI	GW-VI	TA	SS C/I	SS CW/UW	SB C/I	SB CW/UW	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA	
	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	
Acetone	--	0.031	0.304	0.000251	0.000249	--	--	0.086	0.17	0.59	0.001	0.00098	0.018	0.018	0.113	--	--	--	0.043	0.948	--	--	--	--	--	0.0366	--	--
Bromodichloromethane	--	--	--	--	--	--	--	0.0004	0.0004	0.00112	--	--	--	--	--	--	--	--	0.00032	0.00223	--	--	--	--	--	0.0139	--	--
Bromomethane	--	--	--	--	--	--	--	--	--	--	0.000065	0.000441	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	--	0.003	0.0475	--	--	--	--	0.036	0.036	0.203	0.000155	0.00013	--	--	0.0347	--	--	--	0.0033	0.118	--	--	--	--	--	0.00976	--	--
Carbon disulfide	--	--	0.0157	--	--	--	--	0.01	0.01	0.221	0.000852	0.039	0.00089	0.00089	0.0281	--	--	--	0.0021	0.0146	0.000537	0.0254	--	--	0.03	--	--	
Chloroethane	--	--	--	--	--	--	--	--	--	--	0.00057	0.0255	--	--	--	--	--	--	--	0.0251	--	--	--	--	--	--	--	--
Chloroform	--	--	--	--	--	--	--	--	--	--	0.000282	0.0055	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--	--	0.012	0.012	0.277	0.0161	0.261	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene	--	--	--	--	--	--	--	0.00068	0.00068	0.0019	--	--	0.0015	0.0015	0.0244	--	--	--	0.00067	0.0109	--	--	--	--	--	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--	--	--	--	--	0.00582	0.149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00455	43.1	--	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000665	6.29	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	--	--	--	0.013	0.013	0.0364	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--	0.00156	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	--	--	--	--	--	--	--	--	--	0.0229	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	--	0.0056	0.193	--	--	0.0053	0.0053	0.00832	0.011	0.488	--	--	0.029	0.029	0.74	--	--	--	0.046	1.5	--	--	--	--	--	0.0906	--	--
4-Methyl-2-pentanone	--	--	--	--	--	--	--	0.0059	0.0059	0.0165	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00089	4.07	--	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	0.00037	0.00037	0.0141	0.019	0.309	0.000227	0.00533	--	--	--	--	--	--	0.00035	0.00479	--	--	--	--	--	0.00157	--	--
1,2,4-Trichlorobenzene	--	--	0.000111	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethene	--	--	--	--	--	--	--	--	--	--	0.0761	2.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0101	59.1	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00593	12.6	--	--	--	--	--	--	--	--	--	--	--
Xylenes (total)	--	--	--	--	--	--	--	0.016	0.016	0.0447	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	--	--	--	19.95	34	10.04	62.2	3.06	0.00184	0.0025	0.006	0.006	0.000296	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	0.46	0.781	0.115	0.781	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	--	--	--	--	--	39.05	62	19.59	120	--	--	--	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	105.9	200	45.11	230	--	--	--	0.037	0.037	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 7

EXPOSURE POINT CONCENTRATION SUMMARY
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

COPC	Identified Area 2					Identified Area 4							Identified Area 5					Identified Area 10					Identified Area 14				
	SS	SB	SB-VI	GW-VI	TA	SS C/I	SS CW/UW	SB C/I	SB CW/UW	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA	SS	SB	SB-VI	GW-VI	TA
	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³	mg/kg	mg/kg	µg/m ³	µg/m ³	µg/m ³
Benzo(b)fluoranthene	--	--	--	--	--	78.28	100	60.1	210	1.06E-05	5.94E-06	0.00231	0.045	0.045	4.48E-08	--	--	--	0.036	3.58E-08	--	--	--	--	--	9.11E-07	1.84E-05
Benzo(k)fluoranthene	--	--	--	--	--	58.11	82.4	28.7	170	--	--	--	0.021	0.021	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--	32.09	78	19.5	98	--	--	--	0.024	0.024	--	--	--	--	0.018	--	--	--	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--	84.08	160	36.48	190	--	--	--	0.03	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	--	0.011	1.77E-06	--	--	112	230	47.96	250	0.000112	2.25E-05	0.00206	0.045	0.045	1.18E-06	--	--	--	0.016	4.2E-07	--	--	--	--	4.61	2.93E-06	1.85E-05
Dibenzo(a,h)anthracene	--	--	--	--	--	13.28	20.9	6.14	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	--	--	--	153.8	360	108.1	650	--	--	--	0.097	0.097	--	--	--	--	0.018	--	--	--	--	--	--	**	6.14E-06
Fluorene	--	--	--	--	--	17.29	30	8.472	51	0.713	0.000996	0.000749	--	--	--	--	--	--	--	--	--	--	--	--	1.02E-05	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	44.97	72	18.94	93	--	--	--	0.018	0.018	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	--	--	--	--	--	--	--	0.0082	0.0082	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylnaphthalene	--	0.025	--	--	--	1.482	3.65	2.314	3.65	--	--	--	0.0065	0.0065	--	--	--	--	0.041	--	--	--	--	--	--	--	--
2-Methylnaphthalene	--	0.022	--	--	--	3.492	5.7	1.963	13	--	--	--	0.012	0.012	--	--	--	--	0.039	--	--	--	--	--	--	--	--
Naphthalene	--	--	0.000545	--	--	3.172	5.1	1.704	11	4.73	0.000742	0.00271	--	--	--	--	--	--	--	--	--	--	--	--	0.00102	--	--
Phenanthrene	--	0.027	--	--	--	138	360	90.27	510	--	--	--	0.064	0.064	--	--	--	--	0.036	--	--	--	--	--	--	**	6.48E-06
Pyrene	--	--	4.95E-07	--	--	144	400	87.65	450	0.0201	0.00118	0.000528	0.066	0.066	--	--	--	--	0.015	3.48E-06	--	--	--	--	3.48E-07	7.45E-06	3.35E-06
Aroclor 1242	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.024	--	--	--	--	--	--	--	--
Aroclor 1254	--	--	--	--	--	--	--	0.021	0.021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1260	--	--	--	--	--	--	--	0.04	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C6-C12	--	0.055	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C20-C34	--	120	--	--	--	140	140	19000	19000	--	**	**	--	--	--	--	--	--	--	--	--	--	--	--	--	**	**
C10-C20	--	67	--	--	--	63	63	4400	4400	--	**	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline range organics (GRO)	--	--	--	--	--	--	--	--	--	--	**	**	--	--	--	**	**	--	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	14	14	22.74	43.1	--	--	--	15.1	15.1	--	--	--	--	17.6	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	52.6	52.6	102	139	--	--	--	64.6	60	--	--	--	--	54.8	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	0.5	0.5	0.603	1	--	--	--	0.29	0.29	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	10.2	10.2	13.54	16	--	--	--	13.6	13.6	--	--	--	--	10.9	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	12.1	12.1	40.75	57.2	--	--	--	14.9	14.9	--	--	--	--	15.5	--	--	--	--	--	--	--	--
Mercury	--	--	--	7.52E-05	0.00446	--	--	0.0443	0.059	0.12	--	--	0.03	0.021	0.0609	--	--	--	0.024	0.0235	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	0.57	0.57	--	--	--	0.55	0.55	--	--	--	--	0.53	--	--	--	--	--	--	--	--

Notes:

--	Not applicable
COPC	Chemical of potential concern (see Table 7)
µg/m ³	Microgram per cubic meter
GW-VI	Groundwater (GW) concentration used for trench air (Appendix B) and vapor intrusion (VI) modeling (see Appendix C).
SB	Subsurface soil (0 to 10 feet below ground surface)
SB-VI	Subsurface soil concentration used for vapor intrusion (VI) modeling (see Appendix C); for purposes of VI modeling, the maximum concentration found anywhere in the soil column was selected.
SS	Surface soil (0 to 2 feet below ground surface)
TA	Trench air
**	Air concentrations were not modeled because chemical-specific parameters required for modeling were not identified.

TABLE 8

**EXPOSURE PARAMETER VALUES
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

Scenario Timeframe:	Current or Future
Medium:	Soil or Groundwater
Exposure Medium:	Subsurface Soil, Soil Surface, and Vapor Intrusion

Medium	Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation
Subsurface or Surface Soil Or Surface Soil	Ingestion	Commercial/Industrial Worker	Adult	Soil	C _s	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	Intake (mg/kg-day) =
					RBA ¹	Relative Bioavailability Factor	1	unitless	OEPA 2014, EPA 2012	
					IR _s	Ingestion Rate - Soil	50	mg/day	OEPA 2014	$C_s \times RBA \times FI \times IR_s \times EF \times ED \times CF_s$
					FI	Fraction Ingested	1	unitless	Professional judgment	BW x AT _c
					EF	Exposure Frequency	250	days/year	OEPA 2014	
					ED	Exposure Duration	25	years	OPA 2014	Intake (mg/kg-day) =
					CF _s	Conversion Factor -- Soil	1.0E-06	kg/mg	NA	
					BW	Body Weight	70	kg	OEPA 2014	$C_s \times RBA \times FI \times IR_s \times EF \times ED \times CF_s$
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	BW x AT _{nc}
					AT _{nc}	Averaging Time - Noncancer	9,125	days	OEPA 2014	
		Construction Worker	Adult	Soil	C _s	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	Intake (mg/kg-day) =
					RBA ¹	Relative Bioavailability Factor	1	unitless	EPA 2012	
					IR _s	Ingestion Rate - Soil	200	mg/day	OEPA 2014, EPA 2012	$C_s \times RBA \times FI \times IR_s \times EF \times ED \times CF_s$
					FI	Fraction Ingested	1	unitless	Professional judgment	BW x AT _c
					EF	Exposure Frequency	120	days/year	OEPA 2014	
					ED	Exposure Duration	1	years	OEPA 2014	Intake (mg/kg-day) =
					CF _s	Conversion Factor -- Soil	1E-06	kg/mg	NA	
					BW	Body Weight	70	kg	OEPA 2014	$C_s \times RBA \times FI \times IR_s \times EF \times ED \times CF_s$
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	BW x AT _{nc}
					AT _{nc}	Averaging Time - Noncancer	365	days	OEPA 2014	
	Dermal Contact	Commercial/Industrial Worker	Adult	Soil	C _s	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	Intake (mg/kg-day) =
					ABS	Dermal Absorption Factor	Chemical-specific	unitless	See Table 4	
					SA	Exposed Skin Surface Area	3,300	cm ² /day	OEPA 2014	$C_s \times ABS \times SA \times AF \times EF \times ED \times CF_s$
					AF	Soil-to-Skin Adherence Factor	0.2	mg/cm ²	OEPA 2014	BW x AT _c
					EF	Exposure Frequency	250	days/year	OEPA 2014	
					ED	Exposure Duration	25	years	OEPA 2014	Intake (mg/kg-day) =
					CF _s	Conversion Factor -- Soil	1.0E-06	kg/mg	NA	
					BW	Body Weight	70	kg	OEPA 2014	$C_s \times ABS \times SA \times AF \times EF \times ED \times CF_s$
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	BW x AT _{nc}
					AT _{nc}	Averaging Time - Noncancer	9,125	days	OEPA 2014	
		Construction Worker	Adult	Soil	C _s	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	Intake (mg/kg-day) =
					ABS	Dermal Absorption Factor	Chemical-specific	unitless	See Table 4	
					SA	Exposed Skin Surface Area	3,300	cm ² /day	OEPA 2014	$C_s \times ABS \times SA \times AF \times EF \times ED \times CF_s$
					AF	Soil-to-Skin Adherence Factor	0.3	mg/cm ²	OEPA 2014	BW x AT _c
					EF	Exposure Frequency	120	days/year	OEPA 2014	
					ED	Exposure Duration	1	years	OEPA 2014	Intake (mg/kg-day) =
					CF _s	Conversion Factor -- Soil	1.0E-06	kg/mg	NA	
					BW	Body Weight	70	kg	OEPA 2014	$C_s \times ABS \times SA \times AF \times EF \times ED \times CF_s$
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	BW x AT _{nc}
					AT _{nc}	Averaging Time - Noncancer	365	days	OEPA 2014	

TABLE 8

**EXPOSURE PARAMETER VALUES
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

	Inhalation Ambient Air	Commercial/Industrial Worker	Adult	Soil	C _S	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	$\text{Intake}_{\text{cancer}} (\mu\text{g}/\text{m}^3) =$ $\frac{C_S \times (1/\text{PEF}+1/\text{VF}) \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i \times \text{CF}_s}{\text{AT}_c}$ $\text{Intake}_{\text{nc}} (\text{mg}/\text{m}^3) =$ $\frac{C_S \times (1/\text{PEF}+1/\text{VF}) \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i}{\text{AT}_{\text{nc}}}$
					PEF	Particulate Emission Factor	9.50E+08	m ³ /kg	OEPA 2014	
					VF	Volatilization Factor	Chemical-specific	m ³ /kg	See Table 4	
					ET	Exposure Time	8	hours/day	OEPA 2014	
					EF	Exposure Frequency	250	days/year	OEPA 2014	
					ED	Exposure Duration	25	years	OEPA 2014	
					CF _a	Conversion Factor -- Air	1.0E+03	μg/mg	NA	
					CF _i	Conversion Factor -- Time	4.2E-02	day/yr	NA	
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	
					AT _{nc}	Averaging Time - Noncancer	9,125	days	OEPA 2014	
		Construction Worker	Adult	Soil	C _S	Chemical Concentration in Soil	Chemical-specific	mg/kg	See Table 2	$\text{Intake}_{\text{cancer}} (\mu\text{g}/\text{m}^3) =$ $\frac{C_S \times (1/\text{PEF}+1/\text{VF}) \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i \times \text{CF}_s}{\text{AT}_c}$ $\text{Intake}_{\text{nc}} (\text{mg}/\text{m}^3) =$ $\frac{C_S \times (1/\text{PEF}+1/\text{VF}) \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i}{\text{AT}_{\text{nc}}}$
					PEF	Particulate Emission Factor	1.34E+07	m ³ /kg	OEPA 2014	
					VF	Volatilization Factor	Chemical-specific	m ³ /kg	See Table 4	
					ET	Exposure Time	8	hours/day	OEPA 2014	
					EF	Exposure Frequency	120	days/year	OEPA 2014	
					ED	Exposure Duration	1	years	OEPA 2014	
					CF _a	Conversion Factor -- Air	1.0E+03	μg/mg	NA	
					CF _i	Conversion Factor -- Time	4.2E-02	day/yr	NA	
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	
					AT _{nc}	Averaging Time - Noncancer	365	days	OEPA 2014	
	Inhalation Indoor Air (Vapor Intrusion)	Commercial/Industrial Worker	Adult	Soil	C _A	Chemical Concentration in Indoor Air	Chemical-specific	μg/m ³	See Table 2	$\text{Intake}_{\text{cancer}} (\mu\text{g}/\text{m}^3) =$ $\frac{C_A \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i}{\text{AT}_c}$ $\text{Intake}_{\text{nc}} (\text{mg}/\text{m}^3) =$ $\frac{C_A \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i \times \text{CF}_{\text{gw}}}{\text{AT}_{\text{nc}}}$
					ET	Exposure Time	8	hours/day	OEPA 2014	
					EF	Exposure Frequency	250	days/year	OEPA 2014	
					ED	Exposure Duration	25	years	OEPA 2014	
					CF _a	Conversion Factor -- Air	1.0E-03	mg/μg	NA	
					CF _i	Conversion Factor -- Time	4.2E-02	day/yr	NA	
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	
					AT _{nc}	Averaging Time - Noncancer	9,125	days	OEPA 2014	
	Groundwater	Commercial/Industrial Worker	Adult	Indoor Air	C _A	Chemical Concentration in Indoor Air	Chemical-specific	μg/m ³	See Table 2	$\text{Intake}_{\text{cancer}} (\mu\text{g}/\text{m}^3) =$ $\frac{C_A \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i}{\text{AT}_c}$ $\text{Intake}_{\text{nc}} (\text{mg}/\text{m}^3) =$ $\frac{C_A \times \text{ET} \times \text{EF} \times \text{ED} \times \text{CF}_i \times \text{CF}_{\text{gw}}}{\text{AT}_{\text{nc}}}$
					EF	Exposure Frequency	250	days/year	OEPA 2014	
					ED	Exposure Duration	25	years	OEPA 2014	
					ET	Exposure Time	8	hr/day	NA	
					CF _{gw}	Conversion Factor - Groundwater	1.0E-03	mg/μg	NA	
					CF _i	Conversion Factor - Time (1/24)	4.2E-02	day/yr	NA	
					AT _c	Averaging Time - Carcinogens	25,550	days	OEPA 2014	
					AT _{nc}	Averaging Time - Noncarcinogens	9,125	days	OEPA 2014	
		Construction Worker	Adult	Trench Air	C _{TA}	Chemical Concentration in Trench Air	chemical-specific	μg/m ³	See Table 2	$\text{Intake}_{\text{cancer}} (\mu\text{g}/\text{m}^3) =$ $\frac{C_{TA} \times \text{EF} \times \text{ED} \times \text{ET} \times \text{CF}_i}{\text{AT}_c}$ $\text{Intake}_{\text{noncancer}} (\text{mg}/\text{m}^3) =$ $\frac{C_{TA} \times \text{EF} \times \text{ED} \times \text{ET} \times \text{CF}_i \times \text{CF}_{\text{gw}}}{\text{AT}_{\text{nc}}}$
					EF	Exposure Frequency	120	days/year	OEPA 2014	
					ED	Exposure Duration	1	year	OEPA 2014	
					ET	Exposure Time	4	hr/day	VDEQ 2014	
					CF _{gw}	Conversion Factor - Groundwater	1.0E-03	mg/μg	NA	
					CF _i	Conversion Factor - Time (1/24)	4.2E-02	day/yr	NA	
					AT _c	Averaging Time - Cancer	25,550	days	OEPA 2014	
					AT _{nc}	Averaging Time - Noncancer	365	days	OEPA 2014	

Note:

1. Relative bioavailability (RBA) is set to a default value of 1 for all chemicals, except for arsenic, which is set to 0.6 (EPA 2012).

References:

Ohio Environmental Protection Agency (Ohio EPA). 2014. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."

The Voluntary Action Program (VAP). May. On-Line Address: <http://epa.ohio.gov/Portals/30/rules/2014/Risk%20Support%20Document.pdf>

U.S. Environmental Protection Agency (EPA). 2012. "Recommendations for Default Value for Relative Bioavailability of Arsenic in Soil." OSWER 9200.1-113. December.

On-Line Address: <http://www.epa.gov/superfund/bioavailability/pdfs/Arsenic%20Bioavailability%20POLICY%20Memorandum%2012-20-12.pdf>

Virginia Department of Environmental Quality (VDEQ). 2014. Voluntary Remediation Program Risk Assessment Guidance. May. Accessed May 8, 2014.

On-line Address: <http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

TABLE 9

**COC-SPECIFIC CHEMICAL FACTORS
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

Chemical	ABS	Type	D _i	H ¹	D _o	K _{oc}	K _d	Q/C	T _{ic}	T _{ow}	P _b	θ _s	θ _w	n	D _s	VF _{ic}	VF _{ow}
1,1,1-Trichloroethane	0.1	O	6.48E-02	7.03E-01	9.60E-06	4.39E+01	5.18E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.15E-03	2.46E+03	4.92E+02
1,1-Dichloroethane	0.1	O	8.36E-02	2.30E-01	1.06E-05	3.18E+01	3.75E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.92E-03	3.15E+03	6.30E+02
1,1-Dichloroethene	0.1	O	8.63E-02	1.07E+00	1.10E-05	3.18E+01	3.75E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	7.07E-03	1.64E+03	3.28E+02
1,2-Dichloroethane	0.1	O	8.57E-02	4.82E-02	1.10E-05	3.96E+01	4.67E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.72E-04	7.16E+03	1.43E+03
1,2,4-Trichlorobenzene	0.1	O	3.96E-02	5.81E-02	8.40E-06	1.36E+03	1.60E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	7.39E-06	5.08E+04	1.02E+04
2-Butanone	0.1	O	9.14E-02	2.33E-03	1.02E-05	4.51E+00	5.32E-02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	7.21E-05	1.62E+04	3.25E+03
2-Hexanone	0.1	O	7.04E-02	3.81E-03	8.44E-06	1.50E+01	1.77E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	5.03E-05	1.95E+04	3.89E+03
4-Methyl-2-Pentanone	0.1	O	6.98E-02	5.64E-03	8.35E-06	1.26E+01	1.49E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	8.18E-05	1.53E+04	3.08E+03
Acetone	0.1	O	1.06E-01	1.43E-03	1.15E-05	2.36E+00	2.79E-02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	6.18E-05	1.76E+04	3.51E+03
Benzene	0.1	O	8.95E-02	2.27E-01	1.03E-05	1.46E+02	1.72E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	5.65E-04	5.81E+03	1.16E+03
Bromodichloroethane	0.1	O	5.63E-02	8.67E-02	1.07E-05	3.18E+01	3.75E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	5.14E-04	6.09E+03	1.22E+03
Bromomethane	0.1	O	1.00E-01	3.00E-01	1.35E-05	1.32E+01	1.56E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	4.98E-03	1.96E+03	3.91E+02
Carbon Disulfide	0.1	O	1.06E-01	5.89E-01	1.30E-05	2.17E+01	2.56E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	6.96E-03	1.65E+03	3.31E+02
Chloroethane	0.1	O	1.04E-01	4.54E-01	1.16E-05	2.17E+01	2.56E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	5.53E-03	1.86E+03	3.71E+02
Chloroform	0.1	O	7.69E-02	1.50E-01	1.09E-05	3.18E+01	3.75E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.19E-03	4.00E+03	8.01E+02
cis-1,2-Dichloroethene	0.1	O	8.86E-02	1.67E-01	1.13E-05	3.55E+01	4.19E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.39E-03	3.70E+03	7.40E+02
Ethylbenzene	0.1	O	6.85E-02	3.22E-01	8.46E-06	4.46E+02	5.26E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	2.11E-04	9.51E+03	1.90E+03
Isopropylbenzene	0.1	O	6.50E-02	4.70E-01	7.10E-06	8.20E+02	9.68E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.60E-04	1.09E+04	2.18E+03
Methylene Chloride	0.1	O	9.99E-02	1.33E-01	1.25E-05	2.17E+01	2.56E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.80E-03	3.25E+03	6.50E+02
trans-1,2-Dichloroethene	0.1	O	8.76E-02	1.67E-01	1.12E-05	3.96E+01	4.67E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.29E-03	3.68E+03	7.79E+02
Trachloroethene (PCE)	0.1	O	5.05E-02	7.24E-01	9.46E-06	9.49E+01	1.12E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.40E-03	3.70E+03	7.39E+02
Toluene	0.1	O	7.78E-02	2.71E-01	9.20E-06	2.34E+02	2.76E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.76E-04	7.12E+03	1.42E+03
Trichloroethene	0.1	O	6.87E-02	4.03E-01	1.02E-05	6.07E+01	7.16E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.61E-03	3.44E+03	6.89E+02
Vinyl chloride	0.1	O	1.07E-01	1.14E+00	1.20E-05	2.17E+01	2.56E-01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.11E-02	1.31E+03	2.62E+02
Xylenes (total)	0.1	O	8.47E-02	2.12E-01	9.90E-06	3.83E+02	4.52E+00	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	2.00E-04	9.77E+03	1.95E+03
1-Methylnaphthalene	0.13	O	5.28E-02	2.10E-02	7.85E-06	2.53E+03	2.98E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.92E-06	9.96E+04	1.99E+04
2-Methylnaphthalene	0.13	O	5.24E-02	2.12E-02	7.78E-06	2.48E+03	2.92E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.96E-06	9.85E+04	1.97E+04
Acenaphthene	0.13	O	5.06E-02	7.52E-03	8.33E-06	5.03E+03	5.93E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.33E-07	2.39E+05	4.78E+04
Acenaphthylene	0.13	O	5.06E-02	7.52E-03	8.33E-06	5.03E+03	5.93E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.33E-07	2.39E+05	4.78E+04
Anthracene	0.13	O	3.90E-02	2.27E-03	7.85E-06	1.64E+04	1.93E+02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	2.40E-08	8.90E+05	1.78E+05
Benzo(a)anthracene	0.13	O	5.09E-02	4.91E-04	5.94E-06	1.77E+05	2.09E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	6.37E-10	5.47E+06	1.09E+06
Benzo(b)pyrene	0.13	O	4.70E-02	1.87E-05	5.56E-06	5.87E+05	6.93E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.18E-11	4.01E+07	8.02E+06
Benzo(k)fluoranthene	0.13	O	4.76E-02	2.69E-05	5.56E-06	5.99E+05	7.07E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.45E-11	3.63E+07	7.26E+06
Benzo(g,h,i)perylene	0.13	O	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Benzo(k)fluoranthene	0.13	O	4.76E-02	2.39E-05	5.56E-06	5.87E+05	6.93E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.37E-11	3.73E+07	7.46E+06
Chrysene	0.13	O	2.61E-02	2.14E-04	6.75E-06	1.81E+05	2.13E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.56E-10	1.10E+07	2.21E+06
Dibenz(a,h)anthracene	0.13	O	4.46E-02	5.76E-06	5.21E-06	1.91E+06	2.26E+04	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	2.08E-12	9.57E+07	1.91E+07
Fluoranthene	0.13	O	2.76E-02	3.62E-04	7.18E-06	5.55E+04	6.54E+02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	8.62E-10	4.70E+06	9.40E+05
Fluorene	0.13	O	4.40E-02	3.93E-03	7.89E-06	9.16E+03	1.08E+02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	8.32E-08	4.78E+05	9.56E+04
Indeno(1,2,3-cd)pyrene	0.13	O	4.48E-02	6.56E-05	5.23E-06	3.47E+06	4.09E+04	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	4.54E-12	6.48E+07	1.30E+07
Naphthalene	0.13	O	6.05E-02	1.80E-02	8.38E-06	1.54E+03	1.82E+01	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	3.08E-06	7.86E+04	1.57E+04
Phenanthrene	0.13	O	3.90E-02	2.27E-03	7.85E-06	1.64E+04	1.93E+02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	2.40E-08	8.90E+05	1.78E+05
Pyrene	0.13	O	2.78E-02	4.87E-04	7.25E-06	5.43E+04	6.41E+02	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	1.16E-09	4.04E+06	8.09E+05
PCBs	0.14	O	2.22E-02	1.70E-02	8.00E-06	3.09E+05	3.65E+03	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	5.37E-09	1.88E+06	3.77E+05
Cl ₈ -Cl ₁₂	0.1	O	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
C20-C34	0.1	O	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Cl ₁₀ -Cl ₂₀	0.1	O	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Arsenic	0.03	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Barium	0.01	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Cadmium	0.001	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Chromium (total)	0.01	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Hexavalent Chromium	0.01	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Lead	--	I	--	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Mercury	0.01	I	3.07E-02	4.67E-01	6.30E-06	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Selenium	0.01	I	7.77E-02	--	--	--	--	83.2	7.9E+08	3.2E+07	1.5	0.28	0.15	0.43	--	--	--
Units	unitless	--	cm ² /s	cm ² /s	cm ² /s	cm ² /g	cm ² /g	g/m ² -s per kg/m ³	seconds	seconds	g/cm ³	L/L	L/L	L/L	cm ² /s	m ² /kg	m ² /kg

Abbreviations:

-- = N/A available; not applicable
 θ_s = Air-filled soil porosity (liter air per liter water)
 θ_w = Water-filled soil porosity (liter water per liter soil)
 ABS = Dermal absorption factor (unitless)
 COPC = Chemical of potential concern
 DA = Apparent diffusivity (cm²/s)
 Di = Diffusivity of air (square centimeters per second [cm²/s])
 Dw = Diffusivity in water (cm²/s)
 f_{oc} = Fraction organic carbon (Based on average of three on-site soil boring results) Site-specific value: 0.0118
 H = Henry's Law Constant (unitless)
 I = Inorganic
 K_{oc} = Soil-water partition coefficient (cubic centimeters per second [cm³/s])
 K_d = Octanol-water partition coefficient (cubic centimeters per second [cm³/s]); calculated as K_{oc} x f_{oc}
 n = Total soil porosity (liter pore per liter soil)
 O = Organic
 Pb = Dry soil bulk density (grams per cubic centimeter [g/cm³])
 Q/C = Inverse of the mean concentration at the center of a square source [(gram per square meter per second) / (kilogram per cubic meter)]
 T = Lag time per event (hour per event)
 T = Exposure interval

For industrial/commercial (IC) and utility workers, T = 25 years in seconds
 For construction workers (CW), T = 1 year in seconds

VF_{CW} = Volatilization factor (cubic meter per kilogram [m³/kg]) for construction worker

VF_{IC} = Volatilization factor (cubic meter per kilogram [m³/kg]) for industrial/commercial worker

Notes:

Values were obtained from OEPA (2014), as supplemented as needed by EPA (2014).

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
 The Voluntary Action Program (VAP). May. On-Line Address: <http://epa.ohio.gov/Portals/30/rules/2014/Risk%20Support%20Document.pdf>
 U.S. Environmental Protection Agency (EPA). 2014. "Regional Screening Level (RSL) Summary Table, May 2014."
 On-Line Address: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_tables/pdf/master_sl_table_bwnun_MAY2014.pdf

TABLE 10

TOXICITY FACTORS
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Chemicals of Potential Concern	CAS No.	Reference Doses ²				Reference Concentrations ³				Slope Factors ⁴		Inhalation Unit Risks ⁵		Oral Absorption Factor (unitless)
		Oral		Oral Construction		Inhalation		Inhalation Construction		Oral		Inhalation		
Acenaphthene	83-32-9	6.00E-02	IRIS	6.00E-01	PPRTV	NA	--	NA	--	NA	--	NA	--	1
Acenaphthylene ⁶	208-96-8	6.00E-02	IRIS	6.00E-01	PPRTV	NA	--	NA	--	NA	--	NA	--	1
Acetone	67-64-1	9.00E-01	IRIS	2.70E+00	IRIS*	3.1E+01	ATSDR	3.1E+01	ATSDR	NA	--	NA	--	1
Anthracene	120-12-7	3.00E-01	IRIS	3.00E+00	IRIS*	NA	--	NA	--	NA	--	NA	--	1
Aroclor 1242 ⁶	53469-21-9	2.00E-05	IRIS	6.00E-05	IRIS*	NA	--	NA	--	2.00E+00	IRIS	5.70E-04	IRIS	1
Aroclor 1254 ⁶	11097-69-1	2.00E-05	IRIS	6.00E-05	IRIS*	NA	--	NA	--	2.00E+00	IRIS	5.70E-04	IRIS	1
Aroclor 1260 ⁶	11096-82-5	2.00E-05	IRIS	6.00E-05	IRIS*	NA	--	NA	--	2.00E+00	IRIS	5.70E-04	IRIS	1
Arsenic	7440-38-2	3.00E-04	IRIS	3.00E-04	IRIS	1.5E-05	Cal/EPA	1.5E-05	Cal/EPA	1.50E+00	IRIS	4.30E+00	IRIS	1
Barium	7440-39-3	2.00E-01	IRIS	7.00E-02	HEAST	5.00E-04	HEAST	5.00E-03	HEAST	NA	--	NA	--	1
Benzene	71-43-2	4.00E-03	IRIS	1.20E-02	PPRTV	3.00E-02	IRIS	9.00E-02	IRIS*	5.5E-02	IRIS	7.8E-06	IRIS	1
Benzo[a]anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	NA	7.30E-01	ECAO	1.10E-04	Cal/EPA	1
Benzo[a]pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	7.30E+00	IRIS	1.10E-03	Cal/EPA	1
Benzo[b]fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	7.30E-01	ECAO	1.10E-04	Cal/EPA	1
Benzo[g,h,i]perylene	191-24-2	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	1
Benzo[k]fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	NA	7.30E-02	ECAO	1.10E-04	NCEA	1
Bromodichloromethane	75-27-4	2.00E-02	IRIS	8.00E-03	PPRTV	NA	--	NA	--	6.20E-02	IRIS	3.70E-05	Cal/EPA	1
Bromomethane	74-83-9	1.40E-03	IRIS	1.40E-02	IRIS*	5.00E-03	IRIS	1.00E-01	PPRTV	NA	--	NA	--	1
2-Butanone	78-93-3	6.00E-01	IRIS	2.00E+00	HEAST	5.00E+00	IRIS	1.00E+00	HEAST	NA	--	NA	--	1
Cadmium	7440-43-9	1.00E-03	IRIS	1.00E-03	IRIS	1.00E-05	ATSDR	1.00E-05	ATSDR	NA	--	1.80E-03	IRIS	0.03
Carbon disulfide	75-15-0	1.00E-01	IRIS	1.00E-01	HEAST	7.00E-01	IRIS	2.10E+00	IRIS*	NA	--	NA	--	1
Chloroethane	75-00-3	NA	NA	NA	NA	1.00E+01	IRIS	4.00E+00	PPRTV	NA	NA	NA	--	1
Chloroform	67-66-3	1.00E-02	IRIS	1.00E-01	ATSDR	9.80E-02	ATSDR	2.40E-01	ATSDR	3.10E-02	Cal/EPA	2.30E-05	IRIS	1
Chromium (+3)	18065-83-01	1.50E+00	IRIS	1.50E+00	HEAST	NA	--	5.00E-03	ATSDR	NA	--	NA	--	0.01
Chromium (+6)	18540-29-9	3.00E-03	IRIS	9.00E-03	IRIS	1.00E-04	IRIS	3.00E-02	IRIS	5.00E-01	NJDEP	8.40E-02	IRIS	0.03
Chrysene	218-01-9	NA	--	NA	--	NA	--	NA	--	7.30E-03	ECAO	1.10E-05	Cal/EPA	1
Dibenz[a,h]anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	7.30E+00	ECAO	1.20E-03	Cal/EPA	1
1,1-Dichloroethane	75-34-3	2.00E-01	PPRTV	2.00E+00	PPRTV	NA	NA	NA	NA	5.70E-03	Cal/EPA	1.60E-06	Cal/EPA	1
1,2-Dichloroethane	107-06-2	NA	NA	NA	NA	7.00E-03	PPRTV	7.00E-02	PPRTV	9.10E-02	IRIS	2.60E-05	IRIS	1
1,1-Dichloroethene	75-35-4	5.00E-02	IRIS	9.00E-03	HEAST	2.00E-01	IRIS	7.90E-02	ATSDR	NA	NA	NA	NA	1
cis-1,2-Dichloroethene ⁶	156-59-2	2.00E-02	IRIS	2.00E-01	IRIS*	6.00E-02	PPRTV	7.90E-01	ATSDR	NA	NA	NA	NA	1
trans-1,2-Dichloroethene	156-60-5	2.00E-02	IRIS	2.00E-01	IRIS*	6.00E-02	PPRTV	7.90E-01	ATSDR	NA	IRIS	NA	IRIS	1
Ethylbenzene	100-41-4	1.00E-01	IRIS	1.00E+00	IRIS*	1.00E+00	IRIS	9.00E+00	PPRTV	1.10E-02	Cal/EPA	2.50E-06	Cal/EPA	1
Fluoranthene	206-44-0	4.00E-02	IRIS	1.20E-01	IRIS*	NA	--	NA	--	NA	--	NA	--	1
Fluorene	86-73-7	4.00E-02	IRIS	4.00E-01	IRIS*	NA	--	NA	--	NA	--	NA	--	1
2-Hexanone ⁷	591-78-6	5.00E-03	IRIS	5.00E-03	IRIS	3.00E-02	IRIS	3.00E-02	IRIS	NA	--	NA	--	1
Indeno[1,2,3-cd]pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	7.30E-01	ECAO	1.10E-04	Cal/EPA	1
Isopropylbenzene (cumene)	98-82-8	1.00E-01	IRIS	3.00E-01	IRIS*	4.00E-01	IRIS	4.00E+00	IRIS*	NA	--	NA	--	1
Mercury	7439-97-6	NA	NA	NA	NA	3.00E-04	IRIS	3.00E-04	HEAST	NA	NA	NA	NA	1
4-Methyl-2-pentanone	108-10-1	8.00E-02	HEAST	8.00E-01	HEAST	3.00E+00	IRIS	8.00E-01	HEAST	NA	--	NA	--	1
Methylene chloride	75-09-2	6.00E-03	IRIS	6.00E-02	HEAST	6.00E-01	IRIS	1.00E-03	ATSDR	2.00E-03	IRIS	1.00E-08	IRIS	1
1-Methylnaphthalene	90-12-0	7.00E-02	ATSDR	7.00E-02	ATSDR	NA	--	NA	--	2.90E-02	PPRTV	NA	--	1
2-Methylnaphthalene	91-57-6	4.00E-03	ATSDR	4.00E-03	PPRTV	NA	--	NA	--	NA	--	NA	--	1
Naphthalene	91-20-3	2.00E-02	IRIS	2.00E-01	IRIS*	3.00E-03	IRIS	3.00E-03	IRIS	NA	NA	3.40E-05	Cal/EPA	1
Phenanthrene ⁶	85-01-8	3.00E-01	IRIS	3.00E+00	IRIS*	NA	--	NA	--	NA	--	NA	--	1
Pyrene	129-00-0	3.00E-02	IRIS	3.00E-01	IRIS*	NA	--	NA	--	NA	--	NA	--	1
Selenium	7782-49-2	5.00E-03	IRIS	5.00E-03	HEAST	2.00E-02	Cal/EPA	2.00E-02	Cal/EPA	NA	--	NA	--	1
Tetrachloroethene	127-18-4	6.00E-03	IRIS	1.00E-01	HEAST	4.00E-02	IRIS	4.00E-02	IRIS	2.10E-03	IRIS	2.60E-07	IRIS	1
Toluene	108-88-3	8.00E-02	IRIS	8.00E-01	IRIS*	5.00E+00	IRIS	5.00E+00	PPRTV	NA	--	NA	--	1
1,2,4-Trichlorobenzene	120-82-1	1.00E-02	IRIS	1.00E-01	IRIS*	2.00E-03	PPRTV	2.00E-02	PPRTV	2.90E-02	PPRTV	NA	--	1
1,1,1-Trichloroethane	71-55-6	2.00E+00	IRIS	7.00E+00	IRIS	5.00E+00	IRIS	5.00E+00	IRIS	NA	NA	NA	NA	1
Trichloroethene	79-01-6	5.00E-04	IRIS	5.00E-04	IRIS	2.00E-03	IRIS	2.00E-03	IRIS	4.60E-02	IRIS	4.10E-06	IRIS	1
Vinyl chloride	75-01-4	3.00E-03	IRIS	3.00E-03	IRIS	1.00E-01	IRIS	7.70E-02	ATSDR	7.20E-01	IRIS	4.40E-06	IRIS	1
Xylenes (total)	1330-20-7	2.00E-01	IRIS	4.00E-01	PPRTV	1.00E-01	IRIS	3.00E-01	IRIS*	NA	--	NA	--	1
C6-C12 (GRO) ⁸	30-12-0	4.00E-02	VAP	4.00E-02	VAP	2.10E-01	VAP	2.10E-01	VAP	NA	--	NA	--	1
C10-C20 ⁹	30-52-5	4.00E-02	VAP	4.00E-02	VAP	2.10E-01	VAP	2.10E-01	VAP	NA	--	NA	--	1
C20-C34 ⁸	NA	3.00E-02	VAP	3.00E-02	VAP	NA	NA	NA	NA	NA	--	NA	--	1

Abbreviations:

ATSDR	Agency for Toxic Substances and Disease Resistance
Cal/EPA	California Environmental Protection Agency
ECAO	Environmental Criteria Assessment Office
EPA	U.S. Environmental Protection Agency
HEAST	Health Effects Assessment Summary Tables
IRIS	Integrated Risk Information System
IRIS*	IRIS with uncertainty factor for subchronic to chronic removed
NA/-	Not Available
NJDEP	New Jersey Department of Environmental Protection
OEPA	Ohio Environmental Protection Agency
PPRTV	Provisional Peer Reviewed Toxicity Values
VAP	Voluntary Action Program

Notes:

- All values obtained from OEPA (2014), except as noted in Footnote 6.
- Reference doses (RfD) are in units of milligram per kilogram-day (mg/kg-day)
- Reference concentrations (RfC) are in units of milligrams per cubic meter (mg/m³)
- Slope factors are in units of (mg/kg-day)⁻¹
- Inhalation unit risks are in units of (micrograms per cubic meter)⁻¹ (µg/m³)⁻¹.
- The following surrogates were used:
 - Acenaphthene for acenaphthylene
 - Aroclor 1254 for Aroclor 1242 and Aroclor 1260 for RfD.
 - Trans-1,2-dichloroethene for cis-1,2-dichloroethene
 - Anthracene for phenanthrene
- Toxicity factors for the following chemicals were identified from EPA's Regional Screening Level Tables, May 2014 (EPA 2014) -- 2-hexanone.
- Values obtained from Ohio EPA 2010.

References:

- Ohio Environmental Protection Agency (Ohio EPA). 2010. "Guidance for Assessing Petroleum Hydrocarbons in Soil." DERR-00-D1-033. April 2. On-Line Address: <http://epa.ohio.gov/portals/30/rules/D1-033.pdf>
- Ohio EPA. 2014. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program (VAP). May. On-Line Address: <http://epa.ohio.gov/Portals/30/rules/2014/Risk%20Support%20Document.pdf>
- U.S. Environmental Protection Agency (EPA). 2014. "Regional Screening Level (RSL) Summary Table, May 2014." On-Line Address: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_tables/pdf/master_sl_table_bwrn_MAY2014.pdf

TABLE 11

HUMAN HEALTH RISK AND HAZARD SUMMARY
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Receptor	Identified Area (IA)	Tables	Total Risk		COC -- Risk	Total Hazard		COC -- Hazard
I/C Worker	2	D6.1 and 1	2E-09	SB	--	7E-03	SB	--
	4	D7.1	4E-04	SS	Ca PAHs - soil Naphthalene - indoor air (soil)	5E-01	SS	--
			2E-04	SB	Ca PAHs - soil Naphthalene - indoor air (soil)	2E+00	SB	-- ^a
	5	D8.1	1E-05	SS	--	8E-02	SS	--
			1E-05	SB	--	5E-02	SB	--
	10	D9.1 and 3	1E-05	SB	Arsenic - soil	5E-02	SB	--
	14	D10.1	1E-08	SB	--	7E-04	SB	--
CW/UW	2	D6.2 and 1	2E-08	SB	--	1E-02	SB	--
	4	D7.2	2E-05	SB	Ca PAHs - soil	1E+00	SB	--
	5	D8.2	8E-06	SB	--	2E+00	SB	TCE - trench air ^b
	10	D9.2 and 3	9E-06	SB	--	5E-02	SB	--
	14	D10.2	2E-12	SB	--	NA ^c	SB	--

Notes:

Bold = Total risks > 1E-05 or total hazard > 1

-- = Not applicable

SB =

Exposures include potential direct contact with subsurface soil

SED =

Exposures include potential direct contact with sediment

NA = Not available

SS =

Exposures include potential direct contact with surface soil

Ca = Carcinogenic

COC = Chemical of concern (COPCs associated with risk ≥ 1E-05 or hazard > 1, when total risk > 1E-05 or total hazard > 1).

COPC = Chemical of potential concern

CW/UW = Construction worker/utility worker

I/C = Industrial-commercial worker

PAH = Polynuclear aromatic hydrocarbon

^a = All COPC-specific hazards < 1. Similarly, all segregated hazard indexes ≤ 1.^b = As discussed in Section 5.2.2.2, TCE was detected in only 1 of 4 monitoring wells at IA 5. Maximum detected TCE concentration was 11 micrograms per liter (µg/L). HI for TCE reduces to 1.1 and total hazard reduces to 1.2 (which rounds to 1 at one significant figure) when most recent TCE concentration of 7.7 µg/L is used.^c = No COPCs with non-cancer toxicity factors; therefore, hazards could not be calculated.

TABLE 12

**COMPARISON OF ESTIMATED INDOOR AIR CONCENTRATIONS
FROM GROUNDWATER USING EPA'S GW-ADV-FEB04 AND VISL SPREADSHEET MODELS
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

COPC	IA 2		IA 4		IA 5		IA 10		IA 14	
	J&E	VISL	J&E	VISL	J&E	VISL	J&E	VISL	J&E	VISL
Acetone	2.51E-04	1.74E-03	1.00E-03	6.95E-03	--	--	--	--	--	--
Bromodichloromethane	--	--	6.50E-05	9.37E-03	--	--	--	--	--	--
2-Butanone	--	--	1.55E-04	1.50E-03	--	--	--	--	--	--
Carbon disulfide	--	--	8.52E-04	1.79E-01	--	--	5.37E-04	11.6	--	--
Chloroethane	--	--	5.70E-04	1.24E-01	--	--	--	--	--	--
Chloroform	--	--	2.82E-04	5.02E-02	--	--	--	--	--	--
1,1-Dichloroethane	--	--	1.61E-02	3.38	--	--	--	--	--	--
1,1-Dichloroethene	--	--	5.82E-03	1.68	--	--	--	--	--	--
cis-1,2-dichloroethene	--	--	--	--	4.55E-03	NC	--	--	--	--
trans-1,2-dichloroethene	--	--	--	--	6.65E-04	NC	--	--	--	--
Toluene	--	--	2.27E-04	5.39E-02	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	7.61E-02	26.6	--	--	--	--	--	--
Tetrachloroethene	--	--	--	--	8.90E-04	3.70E-01	--	--	--	--
Trichloroethene	--	--	--	--	1.61E-02	2.84	--	--	--	--
Vinyl chloride	--	--	--	--	5.93E-03	1.4	--	--	--	--
Acenaphthene	--	--	1.84E-03	NC	--	--	--	--	--	--
Benzo(b)fluoranthene	--	--	5.94E-06	NC	--	--	--	--	--	--
Chrysene	--	--	2.25E-05	--	--	--	--	--	--	--
Fluorene	--	--	9.96E-04	NC	--	--	--	--	--	--
Naphthalene	--	--	7.42E-04	--	--	--	--	--	--	--
Pyrene	--	--	1.18E-03	NC	--	--	3.48E-06	NC	3.48E-07	NC
Mercury (elemental)	7.52E-05	4.18E-02	--	--	--	--	--	--	--	--

Notes:

All concentrations are in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and can be found in Appendix C.

-- Chemical is not a COPC at this IA.

COPC Chemicals of potential concern

EPA U.S. Environmental Protection Agency

IA Investigative area

J&E Johnson and Ettinger

NC Not calculated in the relevant EPA spreadsheet model

APPENDIX A

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION CALCULATIONS

1,1-Dichloroethane	D_1,1-Dichloroethane	1,2-Dichloroethane	D_1,2-Dichloroethane	1-Methylnaphthalene	D_1-Methylnaphthalene
0.012	1	0.00068	1	0.0304	1
0.0071	0	0.0006	1	0.00498	1
0.0063	0	0.0071	0	3.65	1
0.0057	0	0.0057	0	0.00205	1
0.0061	0	0.0061	0	0.16	1
0.0057	0	0.0057	0	0.0918	1
0.0055	0	0.0055	0	0.261	1
0.0057	0	0.0057	0	0.00693	1
0.0055	0	0.0055	0	0.0795	1
0.0057	0	0.0057	0	0.00619	1
				0.0656	1
				0.00272	0
				2.76	1
				0.00435	1
				2.05	1
				0.131	1
				0.122	1
				0.00266	0
				0.069	1
				0.00498	1
				0.0239	1
				0.00568	1
				0.13	1
				0.0177	1
				0.0879	1
				0.00978	1
				0.026	1
				0.00276	1
				0.232	1
				0.00253	1
				0.00967	1
				0.00406	1
				0.0191	1
				0.00487	1
				0.00557	1
				0.00302	0
				0.122	1
				0.00646	1
				0.922	1
				0.0142	1
				0.011	1
				0.0094	0
				8.5	1
				0.022	1
				0.0082	0
				0.15	0
				0.029	0
				0.0076	0
				0.008	1
				0.0076	0

2-Butanone	D_2-Butanone	2-Methylnaphthalene	D_2-Methylnaphthalene	4-Methyl-2-pentanone	D_4-Methyl-2-pentanone
0.036	1	0.0309	1	0.0059	1
0.0082	1	0.00621	1	0.023	0
0.023	0	4.88	1	0.028	0
0.025	0	0.0025	1	0.025	0
0.023	0	0.182	1	0.023	0
0.024	0	0.13	1	0.024	0
0.022	0	0.33	1	1.1	0
0.023	0	0.00697	1	0.023	0
0.022	0	0.101	1	0.022	0
0.016	1	0.00512	1	0.023	0
		0.088	1		
		0.00142	1		
		3.5	1		
		0.0059	1		
		2.84	1		
		0.18	1		
		0.16	1		
		0.00266	0		
		0.0879	1		
		0.00437	1		
		0.028	1		
		0.00606	1		
		0.176	1		
		0.0163	1		
		0.114	1		
		0.0113	1		
		0.0344	1		
		0.00287	1		
		0.261	1		
		0.00278	1		
		0.0104	1		
		0.00337	1		
		0.0232	1		
		0.00526	1		
		0.00543	1		
		0.00302	0		
		0.152	1		
		0.00548	1		
		1.02	1		
		0.011	1		
		5.7	1		
		0.051	1		
		0.084	1		
		0.071	0		
		0.073	0		
		0.029	0		
		0.092	1		
		0.008	1		
		0.044	1		
		0.021	1		
		0.042	1		
		0.12	1		
		0.088	0		
		0.029	0		
		0.041	1		
		0.049	1		
		0.01	1		
		0.0094	0		
		13	1		
		0.033	1		
		0.0082	0		
		0.22	1		
		0.029	0		
		0.0076	0		
		0.0097	1		
		0.0076	0		

Acenaphthene	D_Acenaphthene	Acenaphthylene	D_Acenaphthylene	Acetone	D_Acetone
0.211	1	0.0154	1	0.064	1
0.00338	1	0.00264	0	0.17	1
26.9	1	0.781	1	0.053	1
0.00344	1	0.0027	0	0.02	1
0.897	1	0.0388	1	0.069	1
1.24	1	0.0172	1	0.057	1
0.746	1	0.0266	1	0.057	1
0.0565	1	0.0015	1	0.022	0
0.206	1	0.00896	1	0.1	1
0.00671	1	0.00269	0	0.023	0
0.31	1	0.00573	1		
0.00272	0	0.00272	0		
21.4	1	0.663	1		
0.0154	1	0.00273	0		
13.7	1	0.361	1		
0.489	1	0.0211	1		
0.629	1	0.0212	1		
0.00266	0	0.00266	0		
0.0457	1	0.00372	1		
0.0027	0	0.0027	0		
0.055	1	0.00795	1		
0.0406	1	0.0017	1		
0.121	1	0.00781	1		
0.00161	1	0.00276	0		
0.244	1	0.0156	1		
0.00298	1	0.00288	0		
0.0129	1	0.00215	1		
0.00293	0	0.00293	0		
1.2	1	0.0571	1		
0.00175	1	0.00313	0		
0.0317	1	0.00154	1		
0.00314	0	0.00314	0		
0.0667	1	0.00779	1		
0.0028	1	0.00161	1		
0.00917	1	0.00308	0		
0.00302	0	0.00302	0		
0.578	1	0.0296	1		
0.00196	1	0.00316	0		
5.46	1	0.242	1		
0.00252	1	0.0029	0		
34	1	1.8	0		
0.073	1	0.0072	0		
0.29	1	0.052	0		
0.32	1	0.071	0		
0.36	1	0.073	0		
0.054	1	0.029	0		
0.14	1	0.029	0		
0.0075	0	0.0075	0		
0.13	1	0.03	0		
0.066	1	0.0072	0		
0.12	1	0.029	0		
0.99	1	0.072	0		
0.5	1	0.094	1		
0.029	0	0.029	0		
0.048	1	0.014	0		
0.019	0	0.019	0		
0.0075	0	0.0075	0		
0.0094	0	0.0094	0		
62.2	1	4.2	0		
0.12	1	0.0077	0		
0.0082	0	0.0082	0		
1.1	1	0.15	0		
0.029	0	0.029	0		
0.0076	0	0.0076	0		
0.0073	0	0.0073	0		
0.0076	0	0.0076	0		

Anthracene	D_Anthracene	Aroclor 1254	D_Aroclor 1254	Aroclor 1260	D_Aroclor 1260
0.693	1	0.021	1	0.04	1
0.0122	1	0.037	0	0.037	0
51.7	1	0.047	0	0.047	0
0.012	1	0.038	0	0.038	0
1.98	1	0.04	0	0.04	0
4.33	1	0.038	0	0.041	0
1.63	1	0.036	0	0.036	0
0.165	1	0.038	0	0.038	0
0.72	1	0.036	0	0.036	0
0.0251	1	0.038	0	0.038	0
0.869	1				
0.00327	1				
46	1				
0.0474	1				
32	1				
1.29	1				
1.69	1				
0.00282	1				
0.181	1				
0.0164	1				
0.241	1				
0.132	1				
0.282	1				
0.00276	0				
0.578	1				
0.00772	1				
0.0384	1				
0.00214	1				
2.39	1				
0.0045	1				
0.0772	1				
0.00314	0				
0.227	1				
0.00446	1				
0.0466	1				
0.00302	0				
1.17	1				
0.0209	1				
10.2	1				
0.00405	1				
62	1				
0.13	1				
0.69	1				
1	1				
0.9	1				
0.13	1				
0.33	1				
0.016	1				
0.3	1				
0.15	1				
0.28	1				
1.9	1				
1.3	1				
0.029	0				
0.11	1				
0.031	1				
0.0075	0				
0.0094	0				
120	1				
0.2	1				
0.0082	0				
2.7	1				
0.029	0				
0.0076	0				
0.0073	0				
0.0076	0				

Arsenic	D_Arsenic	Barium	D_Barium	Benzene	D_Benzene
13.4	1	56.4	1	0.0003	1
13	1	139	1	0.0004	1
16	1	60.4	1	0.00027	1
15.3	1	50.5	1	0.0071	0
14.3	1	42.8	1	0.0057	0
43.1	1	60.5	1	0.0061	0
15.6	1	102	1	0.0055	0
15.7	1	59.1	1	0.0057	0
14	1	52.6	1	0.0055	0
14.5	1	49.7	1	0.0057	0

Benzo(a)anthracene	D_Benzo(a)anthracene	Benzo(a)pyrene	D_Benzo(a)pyrene	Benzo(b)fluoranthene	D_Benzo(b)fluoranthene
1.65	1	1.39	1	1.38	1
0.0305	1	0.0259	1	0.0254	1
121	1	93.2	1	100	1
0.0317	1	0.0269	1	0.0277	1
7.95	1	6.43	1	6.25	1
8.59	1	6.89	1	6.13	1
5.88	1	4.76	1	4.92	1
0.488	1	0.369	1	0.367	1
1.64	1	1.34	1	1.29	1
0.0567	1	0.0441	1	0.0399	1
2.14	1	1.68	1	1.42	1
0.00745	1	0.00584	1	0.00863	1
108	1	87.1	1	89.2	1
0.112	1	0.0899	1	0.0932	1
62.1	1	46.7	1	49	1
3.61	1	2.41	1	2.38	1
4.74	1	3.84	1	3.99	1
0.00742	1	0.00552	1	0.00735	1
0.487	1	0.385	1	0.377	1
0.00234	1	0.0027	0	0.0027	0
0.788	1	0.683	1	0.745	1
0.233	1	0.174	1	0.172	1
1.03	1	0.864	1	0.873	1
0.00334	1	0.00276	0	0.00276	0
2.16	1	1.85	1	1.98	1
0.0212	1	0.017	1	0.0197	1
0.147	1	0.124	1	0.128	1
0.003	1	0.00218	1	0.00293	0
8.41	1	7.26	1	7.47	1
0.00928	1	0.0075	1	0.00973	1
0.276	1	0.224	1	0.213	1
0.00374	1	0.00277	1	0.00415	1
0.831	1	0.756	1	0.804	1
0.00703	1	0.00685	1	0.00866	1
0.126	1	0.11	1	0.111	1
0.00249	1	0.00154	1	0.00352	1
3.98	1	3.29	1	3.48	1
0.00292	1	0.00236	1	0.00316	0
37.9	1	31.7	1	33.5	1
0.0113	1	0.00981	1	0.0134	1
200	1	160	1	0.0075	0
0.33	1	0.25	1	0.0094	0
4.1	1	4	1	210	1
3.6	1	4.3	1	0.47	1
5.4	1	5.5	1	0.02	1
0.46	1	0.45	1	8.2	1
0.74	1	0.63	1	0.029	0
0.044	1	0.036	1	0.0076	0
1.3	1	1.2	1	0.0073	0
0.56	1	0.44	1	0.035	1
1.1	1	1.2	1		
3.2	1	2.4	1		
7.3	1	7.8	1		
0.074	1	0.075	1		
0.6	1	0.54	1		
0.079	1	0.078	1		
0.0075	0	0.0075	0		
0.0094	0	0.0094	0		
230	1	190	1		
0.43	1	0.36	1		
0.018	1	0.014	1		
7.5	1	7	1		
0.029	0	0.029	0		
0.0076	0	0.0076	0		
0.0073	0	0.0073	0		
0.024	1	0.027	1		

Benzo(ghi)perylene	D_Benzo(ghi)perylene	Benzo(k)fluoranthene	D_Benzo(k)fluoranthene	C10-C20	D_C10-C20
1.02	1	1.22	1	94	1
0.0177	1	0.0241	1	4400	1
57.7	1	82.4	1	21	1
0.0188	1	0.0256	1	120	1
3.26	1	6.74	1	42	1
3.29	1	6.56	1	63	1
2.17	1	4.64	1	24	0
0.213	1	0.308	1	20	0
0.798	1	1.22	1	19	0
0.0282	1	0.0434	1	19	0
0.934	1	1.15	1		
0.00592	1	0.00502	1		
52.7	1	79.8	1		
0.0557	1	0.0856	1		
27.4	1	43.4	1		
1.3	1	2.34	1		
2	1	2.33	1		
0.00485	1	0.00562	1		
0.216	1	0.336	1		
0.00543	1	0.0027	0		
0.405	1	0.645	1		
0.0972	1	0.156	1		
0.348	1	0.829	1		
0.00901	1	0.00276	0		
0.801	1	1.74	1		
0.0118	1	0.0144	1		
0.0676	1	0.119	1		
0.00373	1	0.00293	0		
3.45	1	4.89	1		
0.00662	1	0.00669	1		
0.142	1	0.219	1		
0.00398	1	0.00262	1		
0.485	1	0.682	1		
0.009	1	0.00641	1		
0.0734	1	0.11	1		
0.00251	1	0.0056	1		
1.59	1	3.35	1		
0.00677	1	0.00316	0		
18.9	1	30.1	1		
0.015	1	0.00732	1		
78	1	74	1		
0.15	1	0.18	1		
2.7	1	2.9	1		
2.5	1	1.6	1		
3.4	1	3.9	1		
0.22	1	0.26	1		
0.28	1	0.32	1		
0.027	1	0.024	1		
0.68	1	0.75	1		
0.29	1	0.18	1		
0.57	1	0.51	1		
1.3	1	1.7	1		
5	1	4.1	1		
0.043	1	0.063	1		
0.36	1	0.42	1		
0.044	1	0.03	1		
0.0075	0	0.0075	0		
0.0094	0	0.0094	0		
98	1	170	1		
0.22	1	0.24	1		
0.0082	0	0.009	1		
4.1	1	4.7	1		
0.029	0	0.029	0		
0.0076	0	0.042	1		
0.014	1	0.0073	0		
0.024	1	0.021	1		

C20-C34	D_C20-C34	Cadmium	D_Cadmium	Carbon disulfide	D_Carbon disulfide
120	1	0.35	1	0.0013	1
40	1	1	1	0.0013	1
19000	1	0.27	1	0.0076	1
54	1	1	1	0.00057	1
24	1	0.24	1	0.0071	0
1200	1	0.33	1	0.0063	0
57	1	0.22	1	0.0057	0
24	1	0.5	1	0.0061	0
140	1	0.7	0	0.0055	0
19	0	0.49	0	0.0057	0

Chromium	D_Chromium	Chrysene	D_Chrysene	Dibenz(a,h)anthracene	D_Dibenz(a,h)anthracene
11.2	1	1.47	1	0.34	1
13.2	1	0.0304	1	0.00534	1
16	1	111	1	20.9	1
12.3	1	0.034	1	0.00566	1
9	1	7.52	1	1.09	1
13.3	1	7.27	1	1.5	1
12.2	1	5.56	1	0.813	1
14	1	0.417	1	0.0784	1
10.2	1	1.51	1	0.278	1
12.6	1	0.0528	1	0.00858	1
		2.02	1	0.336	1
		0.0133	1	0.00138	1
		102	1	19	1
		0.107	1	0.0186	1
		58.7	1	7.98	1
		3.48	1	0.5	1
		4.44	1	0.726	1
		0.00952	1	0.00176	1
		0.431	1	0.0778	1
		0.00736	1	0.0027	0
		0.782	1	0.139	1
		0.207	1	0.0438	1
		1.02	1	0.134	1
		0.00998	1	0.00276	0
		2.09	1	0.305	1
		0.0229	1	0.00471	1
		0.143	1	0.0228	1
		0.00703	1	0.00293	0
		8.51	1	1.32	1
		0.0125	1	0.0026	1
		0.26	1	0.0454	1
		0.00533	1	0.00314	0
		0.784	1	0.163	1
		0.0116	1	0.00316	1
		0.124	1	0.023	1
		0.0074	1	0.00302	0
		3.93	1	0.61	1
		0.00888	1	0.00316	0
		36.7	1	5.76	1
		0.0192	1	0.00333	1
		230	1	15	1
		0.33	1	0.043	1
		4	1	0.69	1
		4.8	1	0.73	1
		5.2	1	0.83	1
		0.58	1	0.029	0
		0.8	1	0.029	0
		0.05	1	0.0075	0
		1.4	1	0.18	1
		0.6	1	0.077	1
		1.4	1	0.21	1
		3.1	1	0.39	1
		8	1	1.2	1
		0.11	1	0.029	0
		0.65	1	0.089	1
		0.11	1	0.019	0
		0.0075	0	0.0075	0
		0.0094	0	0.0094	0
		250	1	34	1
		0.44	1	0.0077	0
		0.017	1	0.0082	0
		8.2	1	1.6	1
		0.029	0	0.029	0
		0.0076	0	0.0076	0
		0.0073	0	0.0073	0
		0.036	1	0.0076	0

Ethylbenzene	D_Ethylbenzene	Fluoranthene	D_Fluoranthene	Fluorene	D_Fluorene
0.013	1	2.98	1	0.252	1
0.0056	0	0.0595	1	0.00316	1
0.0071	0	234	1	23.1	1
0.0063	0	0.0748	1	0.00327	1
0.0057	0	17	1	0.828	1
0.0061	0	15.3	1	1.22	1
0.0057	0	12.8	1	0.788	1
0.0057	0	1.08	1	0.0545	1
0.0055	0	4.26	1	0.259	1
0.0057	0	0.112	1	0.00728	1
		4.92	1	0.45	1
		0.02	1	0.00272	0
		312	1	18.3	1
		0.248	1	0.0153	1
		134	1	11.2	1
		8.6	1	0.596	1
		10.9	1	0.738	1
		0.0175	1	0.00266	0
		1.13	1	0.058	1
		0.00538	1	0.0027	0
		1.61	1	0.0736	1
		0.478	1	0.0453	1
		2.37	1	0.135	1
		0.00844	1	0.00276	0
		4.91	1	0.236	1
		0.0411	1	0.00215	1
		0.274	1	0.016	1
		0.00966	1	0.00293	0
		19.7	1	1.12	1
		0.02	1	0.00313	0
		0.526	1	0.0324	1
		0.00706	1	0.00314	0
		1.99	1	0.0661	1
		0.0141	1	0.00305	1
		0.268	1	0.0126	1
		0.00439	1	0.00302	0
		9.92	1	0.574	1
		0.01	1	0.00316	0
		82.8	1	4.61	1
		0.0303	1	0.0029	0
		360	1	30	1
		0.7	1	0.054	1
		8.1	1	0.24	1
		8.3	1	0.26	1
		11	1	0.29	1
		1.2	1	0.046	1
		1.7	1	0.15	1
		0.083	1	0.0075	0
		2.9	1	0.12	1
		1.4	1	0.059	1
		2.6	1	0.12	1
		8.1	1	1.4	1
		15	1	0.45	1
		0.19	1	0.029	0
		1.4	1	0.04	1
		0.17	1	0.019	0
		0.0075	0	0.0075	0
		0.0094	0	0.0094	0
		650	1	51	1
		0.13	1	0.97	1
		0.041	1	0.0082	0
		18	1	0.85	1
		0.029	0	0.029	0
		0.0076	0	0.0076	0
		0.015	1	0.0073	0
		0.045	1	0.0076	0

Indeno(1,2,3-cd)pyrene	D_Indeno(1,2,3-cd)pyrene	Isopropylbenzene	D_Isopropylbenzene	Lead	D_Lead
0.993	1	0.0082	1	12.5	1
0.0159	1	0.0056	0	23.2	1
59.4	1	0.0071	0	57.2	1
0.0164	1	0.0063	0	13.4	1
3.47	1	0.0057	0	12.4	1
3.56	1	0.0061	0	33.9	1
2.25	1	0.0057	0	12.7	1
0.221	1	0.0057	0	13.9	1
0.799	1	0.0055	0	12.1	1
0.025	1	0.0057	0	14.9	1
0.918	1				
0.0169	1				
54.7	1				
0.054	1				
28.2	1				
1.4	1				
2.04	1				
0.00362	1				
0.224	1				
0.0027	0				
0.408	1				
0.0979	1				
0.376	1				
0.00171	1				
0.859	1				
0.00917	1				
0.0679	1				
0.00293	0				
3.68	1				
0.0233	1				
0.132	1				
0.00213	1				
0.485	1				
0.00515	1				
0.0693	1				
0.00302	0				
1.68	1				
0.00174	1				
19.1	1				
0.00649	1				
72	1				
0.13	1				
2.5	1				
1.9	1				
3.2	1				
0.18	1				
0.24	1				
0.02	1				
0.58	1				
0.28	1				
0.58	1				
1.2	1				
4.4	1				
0.033	1				
0.034	1				
0.034	1				
0.0075	0				
0.0094	0				
93	1				
0.18	1				
0.0082	0				
3.3	1				
0.029	0				
0.0076	0				
0.0073	0				
0.017	1				

Mercury	D_Mercury	Methylene chloride	D_Methylene chloride	Naphthalene	D_Naphthalene
0.044	1	0.0093	1	0.0276	1
0.059	1	0.0076	1	0.00458	1
0.022	1	0.011	1	4.45	1
0.024	1	0.0073	1	0.00142	1
0.018	1	0.0052	1	0.134	1
0.025	1	0.0082	1	0.232	1
0.044	1	0.0077	1	0.24	1
0.12	0	0.0046	1	0.00761	1
0.068	0	0.0053	1	0.0704	1
0.084	0	0.0045	1	0.00293	1
				0.0659	1
				0.00272	0
				3.12	1
				0.00481	1
				2.85	1
				0.153	1
				0.196	1
				0.00266	0
				0.0551	1
				0.0027	0
				0.0179	1
				0.00453	1
				0.122	1
				0.00276	0
				0.086	1
				0.0045	1
				0.0219	1
				0.00175	1
				0.186	1
				0.00406	1
				0.00619	1
				0.00314	0
				0.0189	1
				0.00365	1
				0.00258	1
				0.00302	0
				0.136	1
				0.00315	1
				0.736	1
				0.00517	1
				5.1	1
				0.028	1
				0.062	1
				0.071	0
				0.073	0
				0.029	0
				0.06	1
				0.0075	0
				0.031	1
				0.012	1
				0.029	1
				0.098	1
				0.088	0
				0.029	0
				0.025	1
				0.026	1
				0.0075	0
				0.0094	0
				11	1
				0.053	1
				0.011	1
				0.15	0
				0.029	0
				0.0076	0
				0.011	1
				0.014	1

Phenanthrene	D Phenanthrene	Pyrene	D Pyrene	Selenium	D Selenium
2.17	1	2.56	1	0.56	1
0.0379	1	0.0496	1	0.57	1
216	1	197	1	0.6	0
0.0498	1	0.0586	1	0.7	0
12	1	13.7	1	0.6	0
12.2	1	12.4	1	0.5	0
9.55	1	10.1	1	0.6	0
0.656	1	0.847	1	0.56	0
2.54	1	2.56	1	0.47	0
0.0806	1	0.0904	1	0.1	0
4.46	1	3.84	1		
0.0155	1	0.0135	1		
236	1	242	1		
0.182	1	0.191	1		
123	1	107	1		
6.97	1	6.61	1		
8.87	1	8.61	1		
0.0114	1	0.0136	1		
0.777	1	0.894	1		
0.0169	1	0.00609	1		
0.964	1	1.29	1		
0.421	1	0.373	1		
1.85	1	1.82	1		
0.0355	1	0.0102	1		
3.46	1	3.88	1		
0.0359	1	0.0341	1		
0.173	1	0.223	1		
0.0175	1	0.00955	1		
14	1	15.4	1		
0.0214	1	0.0183	1		
0.364	1	0.448	1		
0.00891	1	0.00609	1		
0.935	1	1.55	1		
0.0168	1	0.0133	1		
0.173	1	0.212	1		
0.00588	1	0.00301	1		
8.3	1	7.39	1		
0.0216	1	0.00892	1		
58.5	1	66.5	1		
0.0432	1	0.0278	1		
360	1	400	1		
0.56	1	0.5	1		
3.6	1	6.7	1		
3.6	1	6.7	1		
4.2	1	9	1		
0.66	1	0.9	1		
1.4	1	1.3	1		
0.067	1	0.068	1		
1.6	1	2.2	1		
0.8	1	1	1		
1.4	1	2	1		
8.7	1	6.3	1		
5.9	1	12	1		
0.097	1	0.17	1		
0.65	1	1	1		
0.13	1	0.14	1		
0.02	1	0.011	1		
0.0094	0	0.0094	0		
510	1	450	1		
1.1	1	0.88	1		
0.03	1	0.031	1		
8.8	1	13	1		
0.029	0	0.029	0		
0.019	1	0.0076	0		
0.019	1	0.014	1		
0.032	1	0.038	1		

Toluene	D_Toluene	Xylenes (total)	D_Xylenes (total)
0.00042	1	0.00082	1
0.00081	1	0.016	1
0.00033	1	0.0023	0
0.00073	1	0.0028	0
0.019	1	0.0025	0
0.00035	1	0.0023	0
0.00037	1	0.0024	0
0.00036	1	0.0023	0
0.0071	0	0.0022	0
0.0061	0	0.0023	0

1-Methylnaphthalene	D_1-Methylnaphthalene	2-Methylnaphthalene	D_2-Methylnaphthalene	Acenaphthene	D_Acenaphthene	Acenaphthylene	D_Acenaphthylene
0.01	1	0.01	1	0.211	1	0.0154	1
0.0304	1	0.0309	1	26.9	1	0.781	1
3.65	1	4.88	1	0.897	1	0.0388	1
0.16	1	0.182	1	0.746	1	0.0266	1
0.261	1	0.33	1	0.206	1	0.00896	1
0.0795	1	0.101	1	0.31	1	0.00573	1
0.0656	1	0.088	1	21.4	1	0.663	1
2.76	1	3.5	1	13.7	1	0.361	1
2.05	1	2.84	1	0.629	1	0.0212	1
0.122	1	0.16	1	0.0457	1	0.00372	1
0.069	1	0.0879	1	0.055	1	0.00795	1
0.0239	1	0.028	1	0.121	1	0.00781	1
0.13	1	0.176	1	0.244	1	0.0156	1
0.0879	1	0.114	1	0.0129	1	0.00215	1
0.026	1	0.0344	1	1.2	1	0.0571	1
0.232	1	0.261	1	0.0317	1	0.00154	1
0.00967	1	0.0104	1	0.0667	1	0.00779	1
0.0191	1	0.0232	1	0.00917	1	0.00308	0
0.00557	1	0.00543	1	0.578	1	0.0296	1
0.122	1	0.152	1	5.46	1	0.242	1
0.922	1	1.02	1	34	1	1.8	0
		5.7	1	0.29	1	0.052	0
		0.084	1	0.36	1	0.073	0
		0.073	0	0.14	1	0.029	0
		0.092	1	0.13	1	0.03	0
		0.044	1	0.12	1	0.029	0
		0.042	1	0.5	1	0.094	1
		0.088	0	0.048	1	0.014	0
		0.041	1	0.0073	0	0.0073	0

Anthracene	D_Anthracene	Benzo[a]anthracene	D_Benzo[a]anthracene	Benzo[a]pyrene	D_Benzo[a]pyrene	Benzo[b]fluoranthene	D_Benzo[b]fluoranthene
0.693	1	1.65	1	1.39	1	1.38	1
51.7	1	121	1	93.2	1	100	1
1.98	1	7.95	1	6.43	1	6.25	1
1.63	1	5.88	1	4.76	1	4.92	1
0.72	1	1.64	1	1.34	1	1.29	1
0.869	1	2.14	1	1.68	1	1.42	1
46	1	108	1	87.1	1	89.2	1
32	1	62.1	1	46.7	1	49	1
1.69	1	4.74	1	3.84	1	3.99	1
0.181	1	0.487	1	0.385	1	0.377	1
0.241	1	0.788	1	0.683	1	0.745	1
0.282	1	1.03	1	0.864	1	0.873	1
0.578	1	2.16	1	1.85	1	1.98	1
0.0384	1	0.147	1	0.124	1	0.128	1
2.39	1	8.41	1	7.26	1	7.47	1
0.0772	1	0.276	1	0.224	1	0.213	1
0.227	1	0.831	1	0.756	1	0.804	1
0.0466	1	0.126	1	0.11	1	0.111	1
1.17	1	3.98	1	3.29	1	3.48	1
10.2	1	37.9	1	31.7	1	33.5	1
62	1	200	1	160	1	0.0073	0
0.69	1	4.1	1	4	1		
0.9	1	5.4	1	5.5	1		
0.33	1	0.74	1	0.63	1		
0.3	1	1.3	1	1.2	1		
0.28	1	1.1	1	1.2	1		
1.3	1	7.3	1	7.8	1		
0.11	1	0.6	1	0.54	1		
0.0073	0	0.0073	0	0.0073	0		

Benzo[g,h,i]perylene	D_Benzo[g,h,i]perylene	Benzo[k]fluoranthene	D_Benzo[k]fluoranthene	Chrysene	D_Chrysene	Dibenz[a,h]anthracene	D_Dibenz[a,h]anthracene
1.02	1	1.22	1	1.47	1	0.34	1
57.7	1	82.4	1	111	1	20.9	1
3.26	1	6.74	1	7.52	1	1.09	1
2.17	1	4.64	1	5.56	1	0.813	1
0.798	1	1.22	1	1.51	1	0.278	1
0.934	1	1.15	1	2.02	1	0.336	1
52.7	1	79.8	1	102	1	19	1
27.4	1	43.4	1	58.7	1	7.98	1
2	1	2.33	1	4.44	1	0.726	1
0.216	1	0.336	1	0.431	1	0.0778	1
0.405	1	0.645	1	0.782	1	0.139	1
0.348	1	0.829	1	1.02	1	0.134	1
0.801	1	1.74	1	2.09	1	0.305	1
0.0676	1	0.119	1	0.143	1	0.0228	1
3.45	1	4.89	1	8.51	1	1.32	1
0.142	1	0.219	1	0.26	1	0.0454	1
0.485	1	0.682	1	0.784	1	0.163	1
0.0734	1	0.11	1	0.124	1	0.023	1
1.59	1	3.35	1	3.93	1	0.61	1
18.9	1	30.1	1	36.7	1	5.76	1
78	1	74	1	230	1	15	1
2.7	1	2.9	1	4	1	0.69	1
3.4	1	3.9	1	5.2	1	0.83	1
0.28	1	0.32	1	0.8	1	0.029	0
0.68	1	0.75	1	1.4	1	0.18	1
0.57	1	0.51	1	1.4	1	0.21	1
5	1	4.1	1	8	1	1.2	1
0.36	1	0.42	1	0.65	1	0.089	1
0.01	1	0.0073	0	0.0073	0	0.0073	0

Fluoranthene	D_Fluoranthene	Fluorene	D_Fluorene	Indeno[1,2,3-cd]pyrene	D_Indeno[1,2,3-cd]pyrene	Naphthalene	D_Naphthalene
2.98	1	0.0073	0	0.993	1	0.0276	1
234	1	0.0736	1	59.4	1	4.45	1
17	1	0.135	0	3.47	1	0.134	1
12.8	1	0.236	1	2.25	1	0.24	1
4.26	1	0.016	1	0.799	1	0.0704	1
4.92	1	1.12	1	0.918	1	0.0659	1
312	1	0.0324	1	54.7	1	3.12	1
134	1	0.0661	1	28.2	1	2.85	1
10.9	1	0.0126	1	2.04	1	0.196	1
1.13	1	0.574	1	0.224	1	0.0551	1
1.61	1	4.61	1	0.408	1	0.0179	1
2.37	1	0.252	1	0.376	1	0.122	1
4.91	1	23.1	1	0.859	1	0.086	1
0.274	1	0.828	1	0.0679	1	0.0219	1
19.7	1	0.788	1	3.68	1	0.186	1
0.526	1	0.259	1	0.132	1	0.00619	1
1.99	1	0.45	1	0.485	1	0.0189	1
0.268	1	18.3	1	0.0693	1	0.00258	1
9.92	1	11.2	1	1.68	1	0.136	1
82.8	1	0.738	1	19.1	1	0.736	1
360	1	0.058	1	72	1	5.1	1
8.1	1	30	1	2.5	1	0.062	1
11	1	0.24	1	3.2	1	0.073	0
1.7	1	0.29	1	0.24	1	0.06	1
2.9	1	0.15	1	0.58	1	0.031	1
2.6	1	0.12	1	0.58	1	0.029	1
15	1	0.12	1	4.4	1	0.088	0
1.4	1	0.45	1	0.034	1	0.025	1
0.02	1	0.04	1	0.0073	0	0.01	1

Phenanthrene	D_Phenanthrene	Pyrene	D_Pyrene	Arsenic	D_Arsenic	Lead	D_Lead
2.17	1	2.56	1	14	1	12.1	1
216	1	197	1				
12	1	13.7	1				
9.55	1	10.1	1				
2.54	1	2.56	1				
4.46	1	3.84	1				
236	1	242	1				
123	1	107	1				
8.87	1	8.61	1				
0.777	1	0.894	1				
0.964	1	1.29	1				
1.85	1	1.82	1				
3.46	1	3.88	1				
0.173	1	0.223	1				
14	1	15.4	1				
0.364	1	0.448	1				
0.935	1	1.55	1				
0.173	1	0.212	1				
8.3	1	7.39	1				
58.5	1	66.5	1				
360	1	400	1				
3.6	1	6.7	1				
4.2	1	9	1				
1.4	1	1.3	1				
1.6	1	2.2	1				
1.4	1	2	1				
5.9	1	12	1				
0.65	1	1	1				
0.02	1	0.01	1				

[illegible]

[illegible]

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			3/23/2014 9:23:50 PM								
5	From File			EPC Input IA-4 SB_esm rev.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	1,1-Dichloroethane											
11												
12	General Statistics											
13	Total Number of Observations					10	Number of Distinct Observations					6
14	Number of Detects					1	Number of Non-Detects					9
15	Number of Distinct Detects					1	Number of Distinct Non-Detects					5
16												
17	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
18	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF											
19												
20	The data set for variable 1,1-Dichloroethane was not processed!											
21												
22												
23	1,2-Dichloroethane											
24												
25	General Statistics											
26	Total Number of Observations					10	Number of Distinct Observations					6
27	Number of Detects					2	Number of Non-Detects					8
28	Number of Distinct Detects					2	Number of Distinct Non-Detects					4
29	Minimum Detect					6.0000E-4	Minimum Non-Detect					0.0055
30	Maximum Detect					6.8000E-4	Maximum Non-Detect					0.0071
31	Variance Detects					3.2000E-9	Percent Non-Detects					80%
32	Mean Detects					6.4000E-4	SD Detects					5.6569E-5
33	Median Detects					6.4000E-4	CV Detects					0.0884
34	Skewness Detects					N/A	Kurtosis Detects					N/A
35	Mean of Logged Detects					-7.356	SD of Logged Detects					0.0885
36												
37	Warning: Data set has only 2 Detected Values.											
38	This is not enough to compute meaningful or reliable statistics and estimates.											
39												
40												
41	Normal GOF Test on Detects Only											
42	Not Enough Data to Perform GOF Test											
43												
44	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
45	Mean					6.4000E-4	Standard Error of Mean					4.0000E-5
46	SD					4.0000E-5	95% KM (BCA) UCL					N/A
47	95% KM (t) UCL					7.1332E-4	95% KM (Percentile Bootstrap) UCL					N/A
48	95% KM (z) UCL					7.0579E-4	95% KM Bootstrap t UCL					N/A
49	90% KM Chebyshev UCL					7.6000E-4	95% KM Chebyshev UCL					8.1436E-4
50	97.5% KM Chebyshev UCL					8.8980E-4	99% KM Chebyshev UCL					0.00104
51												
52	Gamma GOF Tests on Detected Observations Only											
53	Not Enough Data to Perform GOF Test											
54												
55	Gamma Statistics on Detected Data Only											
56	k hat (MLE)					255.7	k star (bias corrected MLE)					N/A

	A	B	C	D	E	F	G	H	I	J	K	L
57	Theta hat (MLE)					2.5033E-6	Theta star (bias corrected MLE)					N/A
58	nu hat (MLE)					1023	nu star (bias corrected)					N/A
59	MLE Mean (bias corrected)					N/A	MLE Sd (bias corrected)					N/A
60												
61	Gamma Kaplan-Meier (KM) Statistics											
62	k hat (KM)					256	nu hat (KM)					5120
63							Adjusted Level of Significance (β)					0.0267
64	Approximate Chi Square Value (N/A, α)					4955	Adjusted Chi Square Value (N/A, β)					4926
65	5% Gamma Approximate KM-UCL (use when n>=50)					6.6135E-4	95% Gamma Adjusted KM-UCL (use when n<50)					6.6516E-4
66												
67	Lognormal GOF Test on Detected Observations Only											
68	Not Enough Data to Perform GOF Test											
69												
70	Lognormal ROS Statistics Using Imputed Non-Detects											
71	Mean in Original Scale					6.4029E-4	Mean in Log Scale					-7.356
72	SD in Original Scale					4.6901E-5	SD in Log Scale					0.0732
73	95% t UCL (assumes normality of ROS data)					6.6748E-4	95% Percentile Bootstrap UCL					6.6482E-4
74	95% BCA Bootstrap UCL					6.6253E-4	95% Bootstrap t UCL					6.6902E-4
75	95% H-UCL (Log ROS)					N/A						
76												
77	DL/2 Statistics											
78	DL/2 Normal						DL/2 Log-Transformed					
79	Mean in Original Scale					0.00248	Mean in Log Scale					-6.138
80	SD in Original Scale					9.9653E-4	SD in Log Scale					0.647
81	95% t UCL (Assumes normality)					0.00306	95% H-Stat UCL					0.00451
82	DL/2 is not a recommended method, provided for comparisons and historical reasons											
83												
84	Nonparametric Distribution Free UCL Statistics											
85	Data do not follow a Discernible Distribution at 5% Significance Level											
86												
87	Suggested UCL to Use											
88	95% KM (t) UCL					7.1332E-4	95% KM (% Bootstrap) UCL					N/A
89	Warning: One or more Recommended UCL(s) not available!											
90	Warning: Recommended UCL exceeds the maximum observation											
91												
92	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
93	Recommendations are based upon data size, data distribution, and skewness.											
94	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
95	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
96												
97	1-Methylnaphthalene											
98												
99	General Statistics											
100	Total Number of Observations					50	Number of Distinct Observations					47
101	Number of Detects					41	Number of Non-Detects					9
102	Number of Distinct Detects					39	Number of Distinct Non-Detects					8
103	Minimum Detect					0.00205	Minimum Non-Detect					0.00266
104	Maximum Detect					8.5	Maximum Non-Detect					0.15
105	Variance Detects					2.226	Percent Non-Detects					18%
106	Mean Detects					0.48	SD Detects					1.492
107	Median Detects					0.022	CV Detects					3.107
108	Skewness Detects					4.435	Kurtosis Detects					21.81
109	Mean of Logged Detects					-3.33	SD of Logged Detects					2.144
110												
111	Normal GOF Test on Detects Only											
112	Shapiro Wilk Test Statistic					0.373	Shapiro Wilk GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
113	5% Shapiro Wilk Critical Value					0.941	Detected Data Not Normal at 5% Significance Level						
114	Lilliefors Test Statistic					0.436	Lilliefors GOF Test						
115	5% Lilliefors Critical Value					0.138	Detected Data Not Normal at 5% Significance Level						
116	Detected Data Not Normal at 5% Significance Level												
117													
118	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
119	Mean					0.395	Standard Error of Mean					0.193	
120	SD					1.347	95% KM (BCA) UCL					0.761	
121	95% KM (t) UCL					0.718	95% KM (Percentile Bootstrap) UCL					0.726	
122	95% KM (z) UCL					0.712	95% KM Bootstrap t UCL					1.166	
123	90% KM Chebyshev UCL					0.973	95% KM Chebyshev UCL					1.236	
124	97.5% KM Chebyshev UCL					1.599	99% KM Chebyshev UCL					2.314	
125													
126	Gamma GOF Tests on Detected Observations Only												
127	A-D Test Statistic					4.366	Anderson-Darling GOF Test						
128	5% A-D Critical Value					0.874	Detected Data Not Gamma Distributed at 5% Significance Level						
129	K-S Test Statistic					0.266	Kolmogrov-Smirnoff GOF						
130	5% K-S Critical Value					0.151	Detected Data Not Gamma Distributed at 5% Significance Level						
131	Detected Data Not Gamma Distributed at 5% Significance Level												
132													
133	Gamma Statistics on Detected Data Only												
134	k hat (MLE)					0.27	k star (bias corrected MLE)					0.267	
135	Theta hat (MLE)					1.777	Theta star (bias corrected MLE)					1.801	
136	nu hat (MLE)					22.15	nu star (bias corrected)					21.87	
137	MLE Mean (bias corrected)					0.48	MLE Sd (bias corrected)					0.93	
138													
139	Gamma Kaplan-Meier (KM) Statistics												
140	k hat (KM)					0.086	nu hat (KM)					8.601	
141	Approximate Chi Square Value (8.60, α)					3.088	Adjusted Chi Square Value (8.60, β)					2.99	
142	5% Gamma Approximate KM-UCL (use when n>=50)					1.1	95% Gamma Adjusted KM-UCL (use when n<50)					1.136	
143	Gamma (KM) may not be used when k hat (KM) is < 0.1												
144													
145	Gamma ROS Statistics using Imputed Non-Detects												
146	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
147	GROS may not be used when kstar of detected data is small such as < 0.1												
148	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
149	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
150	Minimum					0.00205	Mean					0.396	
151	Maximum					8.5	Median					0.0105	
152	SD					1.36	CV					3.439	
153	k hat (MLE)					0.267	k star (bias corrected MLE)					0.264	
154	Theta hat (MLE)					1.481	Theta star (bias corrected MLE)					1.496	
155	nu hat (MLE)					26.7	nu star (bias corrected)					26.43	
156	MLE Mean (bias corrected)					0.396	MLE Sd (bias corrected)					0.769	
157							Adjusted Level of Significance (β)					0.0452	
158	Approximate Chi Square Value (26.43, α)					15.71	Adjusted Chi Square Value (26.43, β)					15.47	
159	95% Gamma Approximate UCL (use when n>=50)					0.665	95% Gamma Adjusted UCL (use when n<50)					0.676	
160													
161	Lognormal GOF Test on Detected Observations Only												
162	Shapiro Wilk Test Statistic					0.908	Shapiro Wilk GOF Test						
163	5% Shapiro Wilk Critical Value					0.941	Detected Data Not Lognormal at 5% Significance Level						
164	Lilliefors Test Statistic					0.124	Lilliefors GOF Test						
165	5% Lilliefors Critical Value					0.138	Detected Data appear Lognormal at 5% Significance Level						
166	Detected Data appear Approximate Lognormal at 5% Significance Level												
167													
168	Lognormal ROS Statistics Using Imputed Non-Detects												

	A	B	C	D	E	F	G	H	I	J	K	L
169	Mean in Original Scale					0.394	Mean in Log Scale					-3.817
170	SD in Original Scale					1.361	SD in Log Scale					2.252
171	95% t UCL (assumes normality of ROS data)					0.717	95% Percentile Bootstrap UCL					0.785
172	95% BCA Bootstrap UCL					0.881	95% Bootstrap t UCL					1.235
173	95% H-UCL (Log ROS)					0.998						
174												
175	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
176	KM Mean (logged)					-3.727	95% H-UCL (KM -Log)					0.722
177	KM SD (logged)					2.122	95% Critical H Value (KM-Log)					3.794
178	KM Standard Error of Mean (logged)					0.306						
179												
180	DL/2 Statistics											
181	DL/2 Normal						DL/2 Log-Transformed					
182	Mean in Original Scale					0.396	Mean in Log Scale					-3.701
183	SD in Original Scale					1.36	SD in Log Scale					2.161
184	95% t UCL (Assumes normality)					0.718	95% H-Stat UCL					0.836
185	DL/2 is not a recommended method, provided for comparisons and historical reasons											
186												
187	Nonparametric Distribution Free UCL Statistics											
188	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
189												
190	Suggested UCL to Use											
191	99% KM (Chebyshev) UCL					2.314						
192												
193	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
194	Recommendations are based upon data size, data distribution, and skewness.											
195	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
196	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
197												
198	2-Butanone											
199												
200	General Statistics											
201	Total Number of Observations					10	Number of Distinct Observations					7
202	Number of Detects					3	Number of Non-Detects					7
203	Number of Distinct Detects					3	Number of Distinct Non-Detects					4
204	Minimum Detect					0.0082	Minimum Non-Detect					0.022
205	Maximum Detect					0.036	Maximum Non-Detect					0.025
206	Variance Detects					2.0561E-4	Percent Non-Detects					70%
207	Mean Detects					0.0201	SD Detects					0.0143
208	Median Detects					0.016	CV Detects					0.715
209	Skewness Detects					1.174	Kurtosis Detects					N/A
210	Mean of Logged Detects					-4.088	SD of Logged Detects					0.741
211												
212	Warning: Data set has only 3 Detected Values.											
213	This is not enough to compute meaningful or reliable statistics and estimates.											
214												
215												
216	Normal GOF Test on Detects Only											
217	Shapiro Wilk Test Statistic					0.94	Shapiro Wilk GOF Test					
218	5% Shapiro Wilk Critical Value					0.767	Detected Data appear Normal at 5% Significance Level					
219	Lilliefors Test Statistic					0.278	Lilliefors GOF Test					
220	5% Lilliefors Critical Value					0.512	Detected Data appear Normal at 5% Significance Level					
221	Detected Data appear Normal at 5% Significance Level											
222												
223	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
224	Mean					0.0145	Standard Error of Mean					0.00412

	A	B	C	D	E	F	G	H	I	J	K	L
225	SD					0.00807	95% KM (BCA) UCL					N/A
226	95% KM (t) UCL					0.022	95% KM (Percentile Bootstrap) UCL					N/A
227	95% KM (z) UCL					0.0213	95% KM Bootstrap t UCL					N/A
228	90% KM Chebyshev UCL					0.0268	95% KM Chebyshev UCL					0.0324
229	97.5% KM Chebyshev UCL					0.0402	99% KM Chebyshev UCL					0.0555
230												
231	Gamma GOF Tests on Detected Observations Only											
232	Not Enough Data to Perform GOF Test											
233												
234	Gamma Statistics on Detected Data Only											
235	k hat (MLE)					2.95	k star (bias corrected MLE)					N/A
236	Theta hat (MLE)					0.0068	Theta star (bias corrected MLE)					N/A
237	nu hat (MLE)					17.7	nu star (bias corrected)					N/A
238	MLE Mean (bias corrected)					N/A	MLE Sd (bias corrected)					N/A
239												
240	Gamma Kaplan-Meier (KM) Statistics											
241	k hat (KM)					3.225	nu hat (KM)					64.51
242							Adjusted Level of Significance (β)					0.0267
243	Approximate Chi Square Value (64.51, α)					47.03	Adjusted Chi Square Value (64.51, β)					44.44
244	5% Gamma Approximate KM-UCL (use when n>=50)					0.0199	95% Gamma Adjusted KM-UCL (use when n<50)					0.021
245												
246	Lognormal GOF Test on Detected Observations Only											
247	Shapiro Wilk Test Statistic					0.997	Shapiro Wilk GOF Test					
248	5% Shapiro Wilk Critical Value					0.767	Detected Data appear Lognormal at 5% Significance Level					
249	Lilliefors Test Statistic					0.192	Lilliefors GOF Test					
250	5% Lilliefors Critical Value					0.512	Detected Data appear Lognormal at 5% Significance Level					
251	Detected Data appear Lognormal at 5% Significance Level											
252												
253	Lognormal ROS Statistics Using Imputed Non-Detects											
254	Mean in Original Scale					0.0142	Mean in Log Scale					-4.366
255	SD in Original Scale					0.00831	SD in Log Scale					0.459
256	95% t UCL (assumes normality of ROS data)					0.019	95% Percentile Bootstrap UCL					0.0185
257	95% BCA Bootstrap UCL					0.0207	95% Bootstrap t UCL					0.0245
258	95% H-UCL (Log ROS)					0.0196						
259												
260	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
261	KM Mean (logged)					-4.355	95% H-UCL (KM -Log)					0.0201
262	KM SD (logged)					0.468	95% Critical H Value (KM-Log)					2.175
263	KM Standard Error of Mean (logged)					0.293						
264												
265	DL/2 Statistics											
266	DL/2 Normal						DL/2 Log-Transformed					
267	Mean in Original Scale					0.0141	Mean in Log Scale					-4.348
268	SD in Original Scale					0.00792	SD in Log Scale					0.395
269	95% t UCL (Assumes normality)					0.0187	95% H-Stat UCL					0.0184
270	DL/2 is not a recommended method, provided for comparisons and historical reasons											
271												
272	Nonparametric Distribution Free UCL Statistics											
273	Detected Data appear Normal Distributed at 5% Significance Level											
274												
275	Suggested UCL to Use											
276	95% KM (t) UCL					0.022	95% KM (Percentile Bootstrap) UCL					N/A
277	Warning: One or more Recommended UCL(s) not available!											
278												
279	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
280	Recommendations are based upon data size, data distribution, and skewness.											

	A	B	C	D	E	F	G	H	I	J	K	L
281	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
282	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
283												
284	2-Methylnaphthalene											
285												
286	General Statistics											
287	Total Number of Observations				66	Number of Distinct Observations				62		
288	Number of Detects				54	Number of Non-Detects				12		
289	Number of Distinct Detects				54	Number of Distinct Non-Detects				9		
290	Minimum Detect				0.00142	Minimum Non-Detect				0.00266		
291	Maximum Detect				13	Maximum Non-Detect				0.088		
292	Variance Detects				4.26	Percent Non-Detects				18.18%		
293	Mean Detects				0.629	SD Detects				2.064		
294	Median Detects				0.0377	CV Detects				3.282		
295	Skewness Detects				4.738	Kurtosis Detects				25.36		
296	Mean of Logged Detects				-3.117	SD of Logged Detects				2.15		
297												
298	Normal GOF Test on Detects Only											
299	Shapiro Wilk Test Statistic				0.354	Normal GOF Test on Detected Observations Only						
300	5% Shapiro Wilk P Value				0	Detected Data Not Normal at 5% Significance Level						
301	Lilliefors Test Statistic				0.446	Lilliefors GOF Test						
302	5% Lilliefors Critical Value				0.121	Detected Data Not Normal at 5% Significance Level						
303	Detected Data Not Normal at 5% Significance Level											
304												
305	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
306	Mean				0.516	Standard Error of Mean				0.232		
307	SD				1.865	95% KM (BCA) UCL				0.906		
308	95% KM (t) UCL				0.903	95% KM (Percentile Bootstrap) UCL				0.935		
309	95% KM (z) UCL				0.897	95% KM Bootstrap t UCL				1.461		
310	90% KM Chebyshev UCL				1.211	95% KM Chebyshev UCL				1.526		
311	97.5% KM Chebyshev UCL				1.963	99% KM Chebyshev UCL				2.822		
312												
313	Gamma GOF Tests on Detected Observations Only											
314	A-D Test Statistic				5.749	Anderson-Darling GOF Test						
315	5% A-D Critical Value				0.88	Detected Data Not Gamma Distributed at 5% Significance Level						
316	K-S Test Statistic				0.282	Kolmogrov-Smirnoff GOF						
317	5% K-S Critical Value				0.132	Detected Data Not Gamma Distributed at 5% Significance Level						
318	Detected Data Not Gamma Distributed at 5% Significance Level											
319												
320	Gamma Statistics on Detected Data Only											
321	k hat (MLE)				0.265	k star (bias corrected MLE)				0.263		
322	Theta hat (MLE)				2.371	Theta star (bias corrected MLE)				2.393		
323	nu hat (MLE)				28.64	nu star (bias corrected)				28.38		
324	MLE Mean (bias corrected)				0.629	MLE Sd (bias corrected)				1.227		
325												
326	Gamma Kaplan-Meier (KM) Statistics											
327	k hat (KM)				0.0765	nu hat (KM)				10.1		
328	Approximate Chi Square Value (10.10, α)				4.004	Adjusted Chi Square Value (10.10, β)				3.918		
329	5% Gamma Approximate KM-UCL (use when n>=50)				1.301	95% Gamma Adjusted KM-UCL (use when n<50)				1.33		
330	Gamma (KM) may not be used when k hat (KM) is < 0.1											
331												
332	Gamma ROS Statistics using Imputed Non-Detects											
333	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
334	GROS may not be used when kstar of detected data is small such as < 0.1											
335	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
336	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											

	A	B	C	D	E	F	G	H	I	J	K	L
337	Minimum					0.00142	Mean					0.516
338	Maximum					13	Median					0.0187
339	SD					1.879	CV					3.64
340	k hat (MLE)					0.259	k star (bias corrected MLE)					0.257
341	Theta hat (MLE)					1.993	Theta star (bias corrected MLE)					2.006
342	nu hat (MLE)					34.19	nu star (bias corrected)					33.97
343	MLE Mean (bias corrected)					0.516	MLE Sd (bias corrected)					1.018
344							Adjusted Level of Significance (β)					0.0464
345	Approximate Chi Square Value (33.97, α)					21.64	Adjusted Chi Square Value (33.97, β)					21.42
346	95% Gamma Approximate UCL (use when n>=50)					0.81	95% Gamma Adjusted UCL (use when n<50)					0.819
347												
348	Lognormal GOF Test on Detected Observations Only											
349	Lilliefors Test Statistic					0.108	Lilliefors GOF Test					
350	5% Lilliefors Critical Value					0.121	Detected Data appear Lognormal at 5% Significance Level					
351	Detected Data appear Approximate Lognormal at 5% Significance Level											
352												
353	Lognormal ROS Statistics Using Imputed Non-Detects											
354	Mean in Original Scale					0.516	Mean in Log Scale					-3.557
355	SD in Original Scale					1.879	SD in Log Scale					2.202
356	95% t UCL (assumes normality of ROS data)					0.902	95% Percentile Bootstrap UCL					0.931
357	95% BCA Bootstrap UCL					1.106	95% Bootstrap t UCL					1.408
358	95% H-UCL (Log ROS)					0.76						
359												
360	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
361	KM Mean (logged)					-3.522	95% H-UCL (KM -Log)					0.669
362	KM SD (logged)					2.142	95% Critical H Value (KM-Log)					3.108
363	KM Standard Error of Mean (logged)					0.27						
364												
365	DL/2 Statistics											
366	DL/2 Normal					DL/2 Log-Transformed						
367	Mean in Original Scale					0.517	Mean in Log Scale					-3.423
368	SD in Original Scale					1.879	SD in Log Scale					2.109
369	95% t UCL (Assumes normality)					0.903	95% H-Stat UCL					0.676
370	DL/2 is not a recommended method, provided for comparisons and historical reasons											
371												
372	Nonparametric Distribution Free UCL Statistics											
373	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
374												
375	Suggested UCL to Use											
376	97.5% KM (Chebyshev) UCL					1.963						
377												
378	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
379	Recommendations are based upon data size, data distribution, and skewness.											
380	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
381	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
382												
383	4-Methyl-2-pentanone											
384												
385	General Statistics											
386	Total Number of Observations					10	Number of Distinct Observations					7
387	Number of Detects					1	Number of Non-Detects					9
388	Number of Distinct Detects					1	Number of Distinct Non-Detects					6
389												
390	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
391	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF ₁).											
392												

	A	B	C	D	E	F	G	H	I	J	K	L
393	The data set for variable 4-Methyl-2-pentanone was not processed!											
394												
395												
396	Acenaphthene											
397												
398	General Statistics											
399	Total Number of Observations				66	Number of Distinct Observations				62		
400	Number of Detects				50	Number of Non-Detects				16		
401	Number of Distinct Detects				49	Number of Distinct Non-Detects				13		
402	Minimum Detect				0.00161	Minimum Non-Detect				0.00266		
403	Maximum Detect				62.2	Maximum Non-Detect				0.029		
404	Variance Detects				118.7	Percent Non-Detects				24.24%		
405	Mean Detects				3.504	SD Detects				10.9		
406	Median Detects				0.126	CV Detects				3.11		
407	Skewness Detects				4.085	Kurtosis Detects				18.33		
408	Mean of Logged Detects				-1.985	SD of Logged Detects				2.703		
409												
410	Normal GOF Test on Detects Only											
411	Shapiro Wilk Test Statistic				0.379	Shapiro Wilk GOF Test						
412	5% Shapiro Wilk Critical Value				0.947	Detected Data Not Normal at 5% Significance Level						
413	Lilliefors Test Statistic				0.462	Lilliefors GOF Test						
414	5% Lilliefors Critical Value				0.125	Detected Data Not Normal at 5% Significance Level						
415	Detected Data Not Normal at 5% Significance Level											
416												
417	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
418	Mean				2.655	Standard Error of Mean				1.182		
419	SD				9.508	95% KM (BCA) UCL				4.775		
420	95% KM (t) UCL				4.628	95% KM (Percentile Bootstrap) UCL				4.684		
421	95% KM (z) UCL				4.6	95% KM Bootstrap t UCL				6.656		
422	90% KM Chebyshev UCL				6.202	95% KM Chebyshev UCL				7.809		
423	97.5% KM Chebyshev UCL				10.04	99% KM Chebyshev UCL				14.42		
424												
425	Gamma GOF Tests on Detected Observations Only											
426	A-D Test Statistic				4.231	Anderson-Darling GOF Test						
427	5% A-D Critical Value				0.901	Detected Data Not Gamma Distributed at 5% Significance Level						
428	K-S Test Statistic				0.267	Kolmogrov-Smirnoff GOF						
429	5% K-S Critical Value				0.138	Detected Data Not Gamma Distributed at 5% Significance Level						
430	Detected Data Not Gamma Distributed at 5% Significance Level											
431												
432	Gamma Statistics on Detected Data Only											
433	k hat (MLE)				0.223	k star (bias corrected MLE)				0.223		
434	Theta hat (MLE)				15.69	Theta star (bias corrected MLE)				15.7		
435	nu hat (MLE)				22.33	nu star (bias corrected)				22.32		
436	MLE Mean (bias corrected)				3.504	MLE Sd (bias corrected)				7.417		
437												
438	Gamma Kaplan-Meier (KM) Statistics											
439	k hat (KM)				0.078	nu hat (KM)				10.29		
440	Approximate Chi Square Value (10.29, α)				4.126	Adjusted Chi Square Value (10.29, β)				4.039		
441	5% Gamma Approximate KM-UCL (use when n>=50)				6.624	95% Gamma Adjusted KM-UCL (use when n<50)				6.767		
442	Gamma (KM) may not be used when k hat (KM) is < 0.1											
443												
444	Gamma ROS Statistics using Imputed Non-Detects											
445	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
446	GROS may not be used when kstar of detected data is small such as < 0.1											
447	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
448	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											

	A	B	C	D	E	F	G	H	I	J	K	L
449	Minimum					0.00161	Mean					2.657
450	Maximum					62.2	Median					0.0545
451	SD					9.581	CV					3.606
452	k hat (MLE)					0.204	k star (bias corrected MLE)					0.205
453	Theta hat (MLE)					13.03	Theta star (bias corrected MLE)					12.98
454	nu hat (MLE)					26.92	nu star (bias corrected)					27.03
455	MLE Mean (bias corrected)					2.657	MLE Sd (bias corrected)					5.872
456							Adjusted Level of Significance (β)					0.0464
457	Approximate Chi Square Value (27.03, α)					16.17	Adjusted Chi Square Value (27.03, β)					15.99
458	95% Gamma Approximate UCL (use when n>=50)					4.44	95% Gamma Adjusted UCL (use when n<50)					4.492
459												
460	Lognormal GOF Test on Detected Observations Only											
461	Shapiro Wilk Test Statistic					0.952	Shapiro Wilk GOF Test					
462	5% Shapiro Wilk Critical Value					0.947	Detected Data appear Lognormal at 5% Significance Level					
463	Lilliefors Test Statistic					0.0878	Lilliefors GOF Test					
464	5% Lilliefors Critical Value					0.125	Detected Data appear Lognormal at 5% Significance Level					
465	Detected Data appear Lognormal at 5% Significance Level											
466												
467	Lognormal ROS Statistics Using Imputed Non-Detects											
468	Mean in Original Scale					2.655	Mean in Log Scale					-3.021
469	SD in Original Scale					9.581	SD in Log Scale					3.002
470	95% t UCL (assumes normality of ROS data)					4.623	95% Percentile Bootstrap UCL					4.717
471	95% BCA Bootstrap UCL					5.991	95% Bootstrap t UCL					6.795
472	95% H-UCL (Log ROS)					18.37						
473												
474	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
475	KM Mean (logged)					-2.972	95% H-UCL (KM -Log)					13.63
476	KM SD (logged)					2.917	95% Critical H Value (KM-Log)					3.679
477	KM Standard Error of Mean (logged)					0.364						
478												
479	DL/2 Statistics											
480	DL/2 Normal						DL/2 Log-Transformed					
481	Mean in Original Scale					2.656	Mean in Log Scale					-2.886
482	SD in Original Scale					9.581	SD in Log Scale					2.87
483	95% t UCL (Assumes normality)					4.624	95% H-Stat UCL					12.36
484	DL/2 is not a recommended method, provided for comparisons and historical reasons											
485												
486	Nonparametric Distribution Free UCL Statistics											
487	Detected Data appear Lognormal Distributed at 5% Significance Level											
488												
489	Suggested UCL to Use											
490	97.5% KM (Chebyshev) UCL					10.04						
491												
492	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
493	Recommendations are based upon data size, data distribution, and skewness.											
494	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
495	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
496												
497	Acenaphthylene											
498												
499	General Statistics											
500	Total Number of Observations					66	Number of Distinct Observations					58
501	Number of Detects					25	Number of Non-Detects					41
502	Number of Distinct Detects					25	Number of Distinct Non-Detects					33
503	Minimum Detect					0.0015	Minimum Non-Detect					0.00264
504	Maximum Detect					0.781	Maximum Non-Detect					4.2

	A	B	C	D	E	F	G	H	I	J	K	L
505	Variance Detects					0.0424	Percent Non-Detects					62.12%
506	Mean Detects					0.0974	SD Detects					0.206
507	Median Detects					0.0156	CV Detects					2.116
508	Skewness Detects					2.64	Kurtosis Detects					6.305
509	Mean of Logged Detects					-4.031	SD of Logged Detects					1.855
510												
511	Normal GOF Test on Detects Only											
512	Shapiro Wilk Test Statistic					0.519	Shapiro Wilk GOF Test					
513	5% Shapiro Wilk Critical Value					0.918	Detected Data Not Normal at 5% Significance Level					
514	Lilliefors Test Statistic					0.377	Lilliefors GOF Test					
515	5% Lilliefors Critical Value					0.177	Detected Data Not Normal at 5% Significance Level					
516	Detected Data Not Normal at 5% Significance Level											
517												
518	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
519	Mean					0.0399	Standard Error of Mean					0.0171
520	SD					0.134	95% KM (BCA) UCL					0.0697
521	95% KM (t) UCL					0.0685	95% KM (Percentile Bootstrap) UCL					0.0689
522	95% KM (z) UCL					0.0681	95% KM Bootstrap t UCL					0.116
523	90% KM Chebyshev UCL					0.0913	95% KM Chebyshev UCL					0.115
524	97.5% KM Chebyshev UCL					0.147	99% KM Chebyshev UCL					0.211
525												
526	Gamma GOF Tests on Detected Observations Only											
527	A-D Test Statistic					1.833	Anderson-Darling GOF Test					
528	5% A-D Critical Value					0.832	Detected Data Not Gamma Distributed at 5% Significance Level					
529	K-S Test Statistic					0.245	Kolmogrov-Smirnoff GOF					
530	5% K-S Critical Value					0.187	Detected Data Not Gamma Distributed at 5% Significance Level					
531	Detected Data Not Gamma Distributed at 5% Significance Level											
532												
533	Gamma Statistics on Detected Data Only											
534	k hat (MLE)					0.389	k star (bias corrected MLE)					0.369
535	Theta hat (MLE)					0.251	Theta star (bias corrected MLE)					0.264
536	nu hat (MLE)					19.43	nu star (bias corrected)					18.43
537	MLE Mean (bias corrected)					0.0974	MLE Sd (bias corrected)					0.16
538												
539	Gamma Kaplan-Meier (KM) Statistics											
540	k hat (KM)					0.0882	nu hat (KM)					11.65
541	Approximate Chi Square Value (11.65, α)					4.995	Adjusted Chi Square Value (11.65, β)					4.897
542	5% Gamma Approximate KM-UCL (use when n>=50)					0.093	95% Gamma Adjusted KM-UCL (use when n<50)					0.0949
543	Gamma (KM) may not be used when k hat (KM) is < 0.1											
544												
545	Gamma ROS Statistics using Imputed Non-Detects											
546	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
547	GROS may not be used when kstar of detected data is small such as < 0.1											
548	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
549	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
550	Minimum					0.0015	Mean					0.0431
551	Maximum					0.781	Median					0.01
552	SD					0.132	CV					3.069
553	k hat (MLE)					0.509	k star (bias corrected MLE)					0.496
554	Theta hat (MLE)					0.0846	Theta star (bias corrected MLE)					0.0868
555	nu hat (MLE)					67.25	nu star (bias corrected)					65.52
556	MLE Mean (bias corrected)					0.0431	MLE Sd (bias corrected)					0.0612
557							Adjusted Level of Significance (β)					0.0464
558	Approximate Chi Square Value (65.52, α)					47.9	Adjusted Chi Square Value (65.52, β)					47.56
559	95% Gamma Approximate UCL (use when n>=50)					0.0589	95% Gamma Adjusted UCL (use when n<50)					0.0594
560												

	A	B	C	D	E	F	G	H	I	J	K	L	
561	Lognormal GOF Test on Detected Observations Only												
562	Shapiro Wilk Test Statistic					0.933	Shapiro Wilk GOF Test						
563	5% Shapiro Wilk Critical Value					0.918	Detected Data appear Lognormal at 5% Significance Level						
564	Lilliefors Test Statistic					0.112	Lilliefors GOF Test						
565	5% Lilliefors Critical Value					0.177	Detected Data appear Lognormal at 5% Significance Level						
566	Detected Data appear Lognormal at 5% Significance Level												
567													
568	Lognormal ROS Statistics Using Imputed Non-Detects												
569	Mean in Original Scale					0.0383	Mean in Log Scale					-5.43	
570	SD in Original Scale					0.134	SD in Log Scale					1.65	
571	95% t UCL (assumes normality of ROS data)					0.0658	95% Percentile Bootstrap UCL					0.0668	
572	95% BCA Bootstrap UCL					0.0829	95% Bootstrap t UCL					0.107	
573	95% H-UCL (Log ROS)					0.029							
574													
575	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
576	KM Mean (logged)					-5.331	95% H-UCL (KM -Log)					0.03	
577	KM SD (logged)					1.62	95% Critical H Value (KM-Log)					2.545	
578	KM Standard Error of Mean (logged)					0.219							
579													
580	DL/2 Statistics												
581	DL/2 Normal					DL/2 Log-Transformed							
582	Mean in Original Scale					0.088	Mean in Log Scale					-4.723	
583	SD in Original Scale					0.303	SD in Log Scale					1.837	
584	95% t UCL (Assumes normality)					0.15	95% H-Stat UCL					0.091	
585	DL/2 is not a recommended method, provided for comparisons and historical reasons												
586													
587	Nonparametric Distribution Free UCL Statistics												
588	Detected Data appear Lognormal Distributed at 5% Significance Level												
589													
590	Suggested UCL to Use												
591	95% KM (Chebyshev) UCL					0.115							
592													
593	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
594	Recommendations are based upon data size, data distribution, and skewness.												
595	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
596	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
597													
598	Acetone												
599													
600	General Statistics												
601	Total Number of Observations					10	Number of Distinct Observations					9	
602	Number of Detects					8	Number of Non-Detects					2	
603	Number of Distinct Detects					7	Number of Distinct Non-Detects					2	
604	Minimum Detect					0.02	Minimum Non-Detect					0.022	
605	Maximum Detect					0.17	Maximum Non-Detect					0.023	
606	Variance Detects					0.00199	Percent Non-Detects					20%	
607	Mean Detects					0.0738	SD Detects					0.0446	
608	Median Detects					0.0605	CV Detects					0.605	
609	Skewness Detects					1.574	Kurtosis Detects					3.299	
610	Mean of Logged Detects					-2.759	SD of Logged Detects					0.606	
611													
612	Normal GOF Test on Detects Only												
613	Shapiro Wilk Test Statistic					0.838	Shapiro Wilk GOF Test						
614	5% Shapiro Wilk Critical Value					0.818	Detected Data appear Normal at 5% Significance Level						
615	Lilliefors Test Statistic					0.292	Lilliefors GOF Test						
616	5% Lilliefors Critical Value					0.313	Detected Data appear Normal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L
617	Detected Data appear Normal at 5% Significance Level											
618												
619	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
620	Mean					0.063	Standard Error of Mean					0.0146
621	SD					0.0431	95% KM (BCA) UCL					0.0882
622	95% KM (t) UCL					0.0897	95% KM (Percentile Bootstrap) UCL					0.086
623	95% KM (z) UCL					0.087	95% KM Bootstrap t UCL					0.105
624	90% KM Chebyshev UCL					0.107	95% KM Chebyshev UCL					0.127
625	97.5% KM Chebyshev UCL					0.154	99% KM Chebyshev UCL					0.208
626												
627	Gamma GOF Tests on Detected Observations Only											
628	A-D Test Statistic					0.46	Anderson-Darling GOF Test					
629	5% A-D Critical Value					0.72	ected data appear Gamma Distributed at 5% Significance Level					
630	K-S Test Statistic					0.226	Kolmogrov-Smirnoff GOF					
631	5% K-S Critical Value					0.296	ected data appear Gamma Distributed at 5% Significance Level					
632	Detected data appear Gamma Distributed at 5% Significance Level											
633												
634	Gamma Statistics on Detected Data Only											
635	k hat (MLE)					3.438	k star (bias corrected MLE)					2.232
636	Theta hat (MLE)					0.0215	Theta star (bias corrected MLE)					0.033
637	nu hat (MLE)					55.01	nu star (bias corrected)					35.71
638	MLE Mean (bias corrected)					0.0738	MLE Sd (bias corrected)					0.0494
639												
640	Gamma Kaplan-Meier (KM) Statistics											
641	k hat (KM)					2.137	nu hat (KM)					42.74
642	Approximate Chi Square Value (42.74, α)					28.75	Adjusted Chi Square Value (42.74, β)					26.77
643	5% Gamma Approximate KM-UCL (use when n>=50)					0.0937	95% Gamma Adjusted KM-UCL (use when n<50)					0.101
644												
645	Gamma ROS Statistics using Imputed Non-Detects											
646	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
647	GROS may not be used when kstar of detected data is small such as < 0.1											
648	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
649	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
650	Minimum					0.0115	Mean					0.0613
651	Maximum					0.17	Median					0.057
652	SD					0.0473	CV					0.772
653	k hat (MLE)					1.766	k star (bias corrected MLE)					1.303
654	Theta hat (MLE)					0.0347	Theta star (bias corrected MLE)					0.047
655	nu hat (MLE)					35.32	nu star (bias corrected)					26.06
656	MLE Mean (bias corrected)					0.0613	MLE Sd (bias corrected)					0.0537
657							Adjusted Level of Significance (β)					0.0267
658	Approximate Chi Square Value (26.06, α)					15.43	Adjusted Chi Square Value (26.06, β)					14.02
659	95% Gamma Approximate UCL (use when n>=50)					0.104	95% Gamma Adjusted UCL (use when n<50)					0.114
660												
661	Lognormal GOF Test on Detected Observations Only											
662	Shapiro Wilk Test Statistic					0.917	Shapiro Wilk GOF Test					
663	5% Shapiro Wilk Critical Value					0.818	Detected Data appear Lognormal at 5% Significance Level					
664	Lilliefors Test Statistic					0.26	Lilliefors GOF Test					
665	5% Lilliefors Critical Value					0.313	Detected Data appear Lognormal at 5% Significance Level					
666	Detected Data appear Lognormal at 5% Significance Level											
667												
668	Lognormal ROS Statistics Using Imputed Non-Detects											
669	Mean in Original Scale					0.0636	Mean in Log Scale					-2.963
670	SD in Original Scale					0.0448	SD in Log Scale					0.685
671	95% t UCL (assumes normality of ROS data)					0.0896	95% Percentile Bootstrap UCL					0.0862
672	95% BCA Bootstrap UCL					0.0924	95% Bootstrap t UCL					0.104

	A	B	C	D	E	F	G	H	I	J	K	L	
673	95% H-UCL (Log ROS)					0.116							
674													
675	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
676	KM Mean (logged)					-2.99	95% H-UCL (KM -Log)					0.113	
677	KM SD (logged)					0.685	95% Critical H Value (KM-Log)					2.507	
678	KM Standard Error of Mean (logged)					0.232							
679													
680	DL/2 Statistics												
681	DL/2 Normal					DL/2 Log-Transformed							
682	Mean in Original Scale					0.0613	Mean in Log Scale					-3.105	
683	SD in Original Scale					0.0474	SD in Log Scale					0.904	
684	95% t UCL (Assumes normality)					0.0887	95% H-Stat UCL					0.162	
685	DL/2 is not a recommended method, provided for comparisons and historical reasons												
686													
687	Nonparametric Distribution Free UCL Statistics												
688	Detected Data appear Normal Distributed at 5% Significance Level												
689													
690	Suggested UCL to Use												
691	95% KM (t) UCL					0.0897	95% KM (Percentile Bootstrap) UCL					0.086	
692													
693	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
694	Recommendations are based upon data size, data distribution, and skewness.												
695	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
696	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
697													
698	Anthracene												
699													
700	General Statistics												
701	Total Number of Observations					66	Number of Distinct Observations					63	
702	Number of Detects					55	Number of Non-Detects					11	
703	Number of Distinct Detects					54	Number of Distinct Non-Detects					9	
704	Minimum Detect					0.00214	Minimum Non-Detect					0.00276	
705	Maximum Detect					120	Maximum Non-Detect					0.029	
706	Variance Detects					407	Percent Non-Detects					16.67%	
707	Mean Detects					6.381	SD Detects					20.17	
708	Median Detects					0.241	CV Detects					3.161	
709	Skewness Detects					4.215	Kurtosis Detects					19.74	
710	Mean of Logged Detects					-1.365	SD of Logged Detects					2.715	
711													
712	Normal GOF Test on Detects Only												
713	Shapiro Wilk Test Statistic					0.372	Normal GOF Test on Detected Observations Only						
714	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level						
715	Lilliefors Test Statistic					0.445	Lilliefors GOF Test						
716	5% Lilliefors Critical Value					0.119	Detected Data Not Normal at 5% Significance Level						
717	Detected Data Not Normal at 5% Significance Level												
718													
719	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
720	Mean					5.318	Standard Error of Mean					2.286	
721	SD					18.4	95% KM (BCA) UCL					9.205	
722	95% KM (t) UCL					9.133	95% KM (Percentile Bootstrap) UCL					9.429	
723	95% KM (z) UCL					9.078	95% KM Bootstrap t UCL					13.26	
724	90% KM Chebyshev UCL					12.18	95% KM Chebyshev UCL					15.28	
725	97.5% KM Chebyshev UCL					19.59	99% KM Chebyshev UCL					28.06	
726													
727	Gamma GOF Tests on Detected Observations Only												
728	A-D Test Statistic					4.329	Anderson-Darling GOF Test						

A	B	C	D	E	F	G	H	I	J	K	L
729	5% A-D Critical Value				0.901	Detected Data Not Gamma Distributed at 5% Significance Level					
730	K-S Test Statistic				0.241	Kolmogrov-Smirnoff GOF					
731	5% K-S Critical Value				0.133	Detected Data Not Gamma Distributed at 5% Significance Level					
732	Detected Data Not Gamma Distributed at 5% Significance Level										
733											
734	Gamma Statistics on Detected Data Only										
735	k hat (MLE)				0.225	k star (bias corrected MLE)				0.224	
736	Theta hat (MLE)				28.42	Theta star (bias corrected MLE)				28.44	
737	nu hat (MLE)				24.7	nu star (bias corrected)				24.68	
738	MLE Mean (bias corrected)				6.381	MLE Sd (bias corrected)				13.47	
739											
740	Gamma Kaplan-Meier (KM) Statistics										
741	k hat (KM)				0.0835	nu hat (KM)				11.03	
742	Approximate Chi Square Value (11.03, α)				4.592	Adjusted Chi Square Value (11.03, β)				4.5	
743	5% Gamma Approximate KM-UCL (use when n>=50)				12.77	95% Gamma Adjusted KM-UCL (use when n<50)				13.03	
744	Gamma (KM) may not be used when k hat (KM) is < 0.1										
745											
746	Gamma ROS Statistics using Imputed Non-Detects										
747	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
748	GROS may not be used when kstar of detected data is small such as < 0.1										
749	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
750	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
751	Minimum				0.00214	Mean				5.319	
752	Maximum				120	Median				0.141	
753	SD				18.54	CV				3.486	
754	k hat (MLE)				0.205	k star (bias corrected MLE)				0.206	
755	Theta hat (MLE)				25.95	Theta star (bias corrected MLE)				25.85	
756	nu hat (MLE)				27.06	nu star (bias corrected)				27.16	
757	MLE Mean (bias corrected)				5.319	MLE Sd (bias corrected)				11.73	
758						Adjusted Level of Significance (β)				0.0464	
759	Approximate Chi Square Value (27.16, α)				16.27	Adjusted Chi Square Value (27.16, β)				16.09	
760	95% Gamma Approximate UCL (use when n>=50)				8.877	95% Gamma Adjusted UCL (use when n<50)				8.981	
761											
762	Lognormal GOF Test on Detected Observations Only										
763	Lilliefors Test Statistic				0.0652	Lilliefors GOF Test					
764	5% Lilliefors Critical Value				0.119	Detected Data appear Lognormal at 5% Significance Level					
765	Detected Data appear Lognormal at 5% Significance Level										
766											
767	Lognormal ROS Statistics Using Imputed Non-Detects										
768	Mean in Original Scale				5.318	Mean in Log Scale				-2.179	
769	SD in Original Scale				18.54	SD in Log Scale				3.1	
770	95% t UCL (assumes normality of ROS data)				9.127	95% Percentile Bootstrap UCL				9.483	
771	95% BCA Bootstrap UCL				10.97	95% Bootstrap t UCL				13.41	
772	95% H-UCL (Log ROS)				63.51						
773											
774	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
775	KM Mean (logged)				-2.101	95% H-UCL (KM -Log)				39.27	
776	KM SD (logged)				2.963	95% Critical H Value (KM-Log)				3.76	
777	KM Standard Error of Mean (logged)				0.369						
778											
779	DL/2 Statistics										
780	DL/2 Normal					DL/2 Log-Transformed					
781	Mean in Original Scale				5.318	Mean in Log Scale				-2.065	
782	SD in Original Scale				18.54	SD in Log Scale				2.951	
783	95% t UCL (Assumes normality)				9.127	95% H-Stat UCL				38.68	
784	DL/2 is not a recommended method, provided for comparisons and historical reasons										

	A	B	C	D	E	F	G	H	I	J	K	L		
785														
786	Nonparametric Distribution Free UCL Statistics													
787	Detected Data appear Lognormal Distributed at 5% Significance Level													
788														
789	Suggested UCL to Use													
790	97.5% KM (Chebyshev) UCL					19.59								
791														
792	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.													
793	Recommendations are based upon data size, data distribution, and skewness.													
794	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).													
795	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.													
796														
797	Aroclor 1254													
798														
799	General Statistics													
800	Total Number of Observations					10		Number of Distinct Observations				6		
801	Number of Detects					1		Number of Non-Detects				9		
802	Number of Distinct Detects					1		Number of Distinct Non-Detects				5		
803														
804	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!													
805	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF).													
806														
807	The data set for variable Aroclor 1254 was not processed!													
808														
809														
810	Aroclor 1260													
811														
812	General Statistics													
813	Total Number of Observations					10		Number of Distinct Observations				6		
814	Number of Detects					1		Number of Non-Detects				9		
815	Number of Distinct Detects					1		Number of Distinct Non-Detects				6		
816														
817	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!													
818	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF).													
819														
820	The data set for variable Aroclor 1260 was not processed!													
821														
822														
823														
824	Arsenic													
825														
826	General Statistics													
827	Total Number of Observations					10		Number of Distinct Observations				10		
828								Number of Missing Observations				0		
829	Minimum					13		Mean				17.49		
830	Maximum					43.1		Median				14.9		
831	SD					9.054		Std. Error of Mean				2.863		
832	Coefficient of Variation					0.518		Skewness				3.089		
833														
834	Normal GOF Test													
835	Shapiro Wilk Test Statistic					0.473		Shapiro Wilk GOF Test						
836	5% Shapiro Wilk Critical Value					0.842		Data Not Normal at 5% Significance Level						
837	Lilliefors Test Statistic					0.465		Lilliefors GOF Test						
838	5% Lilliefors Critical Value					0.28		Data Not Normal at 5% Significance Level						
839	Data Not Normal at 5% Significance Level													
840														

	A	B	C	D	E	F	G	H	I	J	K	L
841	Assuming Normal Distribution											
842	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
843	95% Student's-t UCL				22.74	95% Adjusted-CLT UCL (Chen-1995)						25.19
844						95% Modified-t UCL (Johnson-1978)						23.2
845												
846	Gamma GOF Test											
847	A-D Test Statistic				2.161	Anderson-Darling Gamma GOF Test						
848	5% A-D Critical Value				0.728	Data Not Gamma Distributed at 5% Significance Level						
849	K-S Test Statistic				0.443	Kolmogrov-Smirnoff Gamma GOF Test						
850	5% K-S Critical Value				0.267	Data Not Gamma Distributed at 5% Significance Level						
851	Data Not Gamma Distributed at 5% Significance Level											
852												
853	Gamma Statistics											
854	k hat (MLE)				7.129	k star (bias corrected MLE)						5.057
855	Theta hat (MLE)				2.453	Theta star (bias corrected MLE)						3.459
856	nu hat (MLE)				142.6	nu star (bias corrected)						101.1
857	MLE Mean (bias corrected)				17.49	MLE Sd (bias corrected)						7.778
858						Approximate Chi Square Value (0.05)						78.94
859	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value						75.53
860												
861	Assuming Gamma Distribution											
862	95% Approximate Gamma UCL (use when n>=50))				22.41	95% Adjusted Gamma UCL (use when n<50)						23.42
863												
864	Lognormal GOF Test											
865	Shapiro Wilk Test Statistic				0.56	Shapiro Wilk Lognormal GOF Test						
866	5% Shapiro Wilk Critical Value				0.842	Data Not Lognormal at 5% Significance Level						
867	Lilliefors Test Statistic				0.42	Lilliefors Lognormal GOF Test						
868	5% Lilliefors Critical Value				0.28	Data Not Lognormal at 5% Significance Level						
869	Data Not Lognormal at 5% Significance Level											
870												
871	Lognormal Statistics											
872	Minimum of Logged Data				2.565	Mean of logged Data						2.79
873	Maximum of Logged Data				3.764	SD of logged Data						0.349
874												
875	Assuming Lognormal Distribution											
876	95% H-UCL				21.91	90% Chebyshev (MVUE) UCL						22.94
877	95% Chebyshev (MVUE) UCL				25.54	97.5% Chebyshev (MVUE) UCL						29.15
878	99% Chebyshev (MVUE) UCL				36.25							
879												
880	Nonparametric Distribution Free UCL Statistics											
881	Data do not follow a Discernible Distribution (0.05)											
882												
883	Nonparametric Distribution Free UCLs											
884	95% CLT UCL				22.2	95% Jackknife UCL						22.74
885	95% Standard Bootstrap UCL				21.92	95% Bootstrap-t UCL						48.64
886	95% Hall's Bootstrap UCL				47.78	95% Percentile Bootstrap UCL						23.17
887	95% BCA Bootstrap UCL				26.01							
888	90% Chebyshev(Mean, Sd) UCL				26.08	95% Chebyshev(Mean, Sd) UCL						29.97
889	97.5% Chebyshev(Mean, Sd) UCL				35.37	99% Chebyshev(Mean, Sd) UCL						45.98
890												
891	Suggested UCL to Use											
892	95% Student's-t UCL				22.74	or 95% Modified-t UCL						23.2
893												
894	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
895	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
896	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											

	A	B	C	D	E	F	G	H	I	J	K	L
897	For additional insight the user may want to consult a statistician.											
898												
899												
900	Barium											
901												
902	General Statistics											
903	Total Number of Observations					10	Number of Distinct Observations					10
904							Number of Missing Observations					0
905	Minimum					42.8	Mean					67.3
906	Maximum					139	Median					57.75
907	SD					29.88	Std. Error of Mean					9.448
908	Coefficient of Variation					0.444	Skewness					1.978
909												
910	Normal GOF Test											
911	Shapiro Wilk Test Statistic					0.712	Shapiro Wilk GOF Test					
912	5% Shapiro Wilk Critical Value					0.842	Data Not Normal at 5% Significance Level					
913	Lilliefors Test Statistic					0.39	Lilliefors GOF Test					
914	5% Lilliefors Critical Value					0.28	Data Not Normal at 5% Significance Level					
915	Data Not Normal at 5% Significance Level											
916												
917	Assuming Normal Distribution											
918	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
919	95% Student's-t UCL					84.62	95% Adjusted-CLT UCL (Chen-1995)					89.16
920							95% Modified-t UCL (Johnson-1978)					85.6
921												
922	Gamma GOF Test											
923	A-D Test Statistic					1.105	Anderson-Darling Gamma GOF Test					
924	5% A-D Critical Value					0.727	Data Not Gamma Distributed at 5% Significance Level					
925	K-S Test Statistic					0.366	Kolmogrov-Smirnoff Gamma GOF Test					
926	5% K-S Critical Value					0.267	Data Not Gamma Distributed at 5% Significance Level					
927	Data Not Gamma Distributed at 5% Significance Level											
928												
929	Gamma Statistics											
930	k hat (MLE)					7.63	k star (bias corrected MLE)					5.408
931	Theta hat (MLE)					8.82	Theta star (bias corrected MLE)					12.45
932	nu hat (MLE)					152.6	nu star (bias corrected)					108.2
933	MLE Mean (bias corrected)					67.3	MLE Sd (bias corrected)					28.94
934							Approximate Chi Square Value (0.05)					85.15
935	Adjusted Level of Significance					0.0267	Adjusted Chi Square Value					81.61
936												
937	Assuming Gamma Distribution											
938	95% Approximate Gamma UCL (use when n>=50))					85.48	95% Adjusted Gamma UCL (use when n<50)					89.19
939												
940	Lognormal GOF Test											
941	Shapiro Wilk Test Statistic					0.808	Shapiro Wilk Lognormal GOF Test					
942	5% Shapiro Wilk Critical Value					0.842	Data Not Lognormal at 5% Significance Level					
943	Lilliefors Test Statistic					0.344	Lilliefors Lognormal GOF Test					
944	5% Lilliefors Critical Value					0.28	Data Not Lognormal at 5% Significance Level					
945	Data Not Lognormal at 5% Significance Level											
946												
947	Lognormal Statistics											
948	Minimum of Logged Data					3.757	Mean of logged Data					4.142
949	Maximum of Logged Data					4.934	SD of logged Data					0.36
950												
951	Assuming Lognormal Distribution											
952	95% H-UCL					85.79	90% Chebyshev (MVUE) UCL					89.69

	A	B	C	D	E	F	G	H	I	J	K	L
953	95% Chebyshev (MVUE) UCL					100.1	97.5% Chebyshev (MVUE) UCL					114.6
954	99% Chebyshev (MVUE) UCL					143						
955												
956	Nonparametric Distribution Free UCL Statistics											
957	Data do not follow a Discernible Distribution (0.05)											
958												
959	Nonparametric Distribution Free UCLs											
960	95% CLT UCL					82.84	95% Jackknife UCL					84.62
961	95% Standard Bootstrap UCL					81.77	95% Bootstrap-t UCL					138
962	95% Hall's Bootstrap UCL					191.7	95% Percentile Bootstrap UCL					83.26
963	95% BCA Bootstrap UCL					88.39						
964	90% Chebyshev(Mean, Sd) UCL					95.64	95% Chebyshev(Mean, Sd) UCL					108.5
965	97.5% Chebyshev(Mean, Sd) UCL					126.3	99% Chebyshev(Mean, Sd) UCL					161.3
966												
967	Suggested UCL to Use											
968	95% Student's-t UCL					84.62	or 95% Modified-t UCL					85.6
969												
970	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
971	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
972	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
973	For additional insight the user may want to consult a statistician.											
974												
975	Benzene											
976												
977	General Statistics											
978	Total Number of Observations					10	Number of Distinct Observations					7
979	Number of Detects					3	Number of Non-Detects					7
980	Number of Distinct Detects					3	Number of Distinct Non-Detects					4
981	Minimum Detect					2.7000E-4	Minimum Non-Detect					0.0055
982	Maximum Detect					4.0000E-4	Maximum Non-Detect					0.0071
983	Variance Detects					4.6333E-9	Percent Non-Detects					70%
984	Mean Detects					3.2333E-4	SD Detects					6.8069E-5
985	Median Detects					3.0000E-4	CV Detects					0.211
986	Skewness Detects					1.361	Kurtosis Detects					N/A
987	Mean of Logged Detects					-8.051	SD of Logged Detects					0.203
988												
989	Warning: Data set has only 3 Detected Values.											
990	This is not enough to compute meaningful or reliable statistics and estimates.											
991												
992												
993	Normal GOF Test on Detects Only											
994	Shapiro Wilk Test Statistic					0.912	Shapiro Wilk GOF Test					
995	5% Shapiro Wilk Critical Value					0.767	Detected Data appear Normal at 5% Significance Level					
996	Lilliefors Test Statistic					0.301	Lilliefors GOF Test					
997	5% Lilliefors Critical Value					0.512	Detected Data appear Normal at 5% Significance Level					
998	Detected Data appear Normal at 5% Significance Level											
999												
1000	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1001	Mean					3.2333E-4	Standard Error of Mean					3.9299E-5
1002	SD					5.5578E-5	95% KM (BCA) UCL					N/A
1003	95% KM (t) UCL					3.9537E-4	95% KM (Percentile Bootstrap) UCL					N/A
1004	95% KM (z) UCL					3.8798E-4	95% KM Bootstrap t UCL					N/A
1005	90% KM Chebyshev UCL					4.4123E-4	95% KM Chebyshev UCL					4.9464E-4
1006	97.5% KM Chebyshev UCL					5.6876E-4	99% KM Chebyshev UCL					7.1436E-4
1007												
1008	Gamma GOF Tests on Detected Observations Only											

	A	B	C	D	E	F	G	H	I	J	K	L
1009	Not Enough Data to Perform GOF Test											
1010												
1011	Gamma Statistics on Detected Data Only											
1012	k hat (MLE)				35.56	k star (bias corrected MLE)				N/A		
1013	Theta hat (MLE)				9.0931E-6	Theta star (bias corrected MLE)				N/A		
1014	nu hat (MLE)				213.3	nu star (bias corrected)				N/A		
1015	MLE Mean (bias corrected)				N/A	MLE Sd (bias corrected)				N/A		
1016												
1017	Gamma Kaplan-Meier (KM) Statistics											
1018	k hat (KM)				33.85	nu hat (KM)				676.9		
1019						Adjusted Level of Significance (β)				0.0267		
1020	Approximate Chi Square Value (676.91, α)				617.5	Adjusted Chi Square Value (676.91, β)				607.7		
1021	5% Gamma Approximate KM-UCL (use when n>=50)				3.5441E-4	95% Gamma Adjusted KM-UCL (use when n<50)				3.6017E-4		
1022												
1023	Lognormal GOF Test on Detected Observations Only											
1024	Shapiro Wilk Test Statistic				0.933	Shapiro Wilk GOF Test						
1025	5% Shapiro Wilk Critical Value				0.767	Detected Data appear Lognormal at 5% Significance Level						
1026	Lilliefors Test Statistic				0.284	Lilliefors GOF Test						
1027	5% Lilliefors Critical Value				0.512	Detected Data appear Lognormal at 5% Significance Level						
1028	Detected Data appear Lognormal at 5% Significance Level											
1029												
1030	Lognormal ROS Statistics Using Imputed Non-Detects											
1031	Mean in Original Scale				3.2190E-4	Mean in Log Scale				-8.051		
1032	SD in Original Scale				4.7716E-5	SD in Log Scale				0.146		
1033	95% t UCL (assumes normality of ROS data)				3.4956E-4	95% Percentile Bootstrap UCL				3.4494E-4		
1034	95% BCA Bootstrap UCL				3.4608E-4	95% Bootstrap t UCL				3.5694E-4		
1035	95% H-UCL (Log ROS)				3.5230E-4							
1036												
1037	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1038	KM Mean (logged)				-8.051	95% H-UCL (KM -Log)				3.5814E-4		
1039	KM SD (logged)				0.166	95% Critical H Value (KM-Log)				1.852		
1040	KM Standard Error of Mean (logged)				0.117							
1041												
1042	DL/2 Statistics											
1043	DL/2 Normal					DL/2 Log-Transformed						
1044	Mean in Original Scale				0.00216	Mean in Log Scale				-6.496		
1045	SD in Original Scale				0.00129	SD in Log Scale				1.08		
1046	95% t UCL (Assumes normality)				0.00291	95% H-Stat UCL				0.00877		
1047	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1048												
1049	Nonparametric Distribution Free UCL Statistics											
1050	Detected Data appear Normal Distributed at 5% Significance Level											
1051												
1052	Suggested UCL to Use											
1053	95% KM (t) UCL				3.9537E-4	95% KM (Percentile Bootstrap) UCL				N/A		
1054	Warning: One or more Recommended UCL(s) not available!											
1055												
1056	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1057	Recommendations are based upon data size, data distribution, and skewness.											
1058	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1059	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1060												
1061	Benzo(a)anthracene											
1062												
1063	General Statistics											
1064	Total Number of Observations				66	Number of Distinct Observations				66		

	A	B	C	D	E	F	G	H	I	J	K	L
1065	Number of Detects					61	Number of Non-Detects					5
1066	Number of Distinct Detects					61	Number of Distinct Non-Detects					5
1067	Minimum Detect					0.00234	Minimum Non-Detect					0.0073
1068	Maximum Detect					230	Maximum Non-Detect					0.029
1069	Variance Detects					1885	Percent Non-Detects					7.576%
1070	Mean Detects					13.96	SD Detects					43.42
1071	Median Detects					0.56	CV Detects					3.111
1072	Skewness Detects					3.914	Kurtosis Detects					15.47
1073	Mean of Logged Detects					-0.831	SD of Logged Detects					3.084
1074												
1075	Normal GOF Test on Detects Only											
1076	Shapiro Wilk Test Statistic					0.369	Normal GOF Test on Detected Observations Only					
1077	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
1078	Lilliefors Test Statistic					0.451	Lilliefors GOF Test					
1079	5% Lilliefors Critical Value					0.113	Detected Data Not Normal at 5% Significance Level					
1080	Detected Data Not Normal at 5% Significance Level											
1081												
1082	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1083	Mean					12.9	Standard Error of Mean					5.158
1084	SD					41.56	95% KM (BCA) UCL					22.19
1085	95% KM (t) UCL					21.51	95% KM (Percentile Bootstrap) UCL					21.86
1086	95% KM (z) UCL					21.38	95% KM Bootstrap t UCL					27.18
1087	90% KM Chebyshev UCL					28.37	95% KM Chebyshev UCL					35.38
1088	97.5% KM Chebyshev UCL					45.11	99% KM Chebyshev UCL					64.23
1089												
1090	Gamma GOF Tests on Detected Observations Only											
1091	A-D Test Statistic					3.461	Anderson-Darling GOF Test					
1092	5% A-D Critical Value					0.909	Detected Data Not Gamma Distributed at 5% Significance Level					
1093	K-S Test Statistic					0.207	Kolmogrov-Smirnoff GOF					
1094	5% K-S Critical Value					0.126	Detected Data Not Gamma Distributed at 5% Significance Level					
1095	Detected Data Not Gamma Distributed at 5% Significance Level											
1096												
1097	Gamma Statistics on Detected Data Only											
1098	k hat (MLE)					0.211	k star (bias corrected MLE)					0.211
1099	Theta hat (MLE)					66.29	Theta star (bias corrected MLE)					66.11
1100	nu hat (MLE)					25.69	nu star (bias corrected)					25.76
1101	MLE Mean (bias corrected)					13.96	MLE Sd (bias corrected)					30.37
1102												
1103	Gamma Kaplan-Meier (KM) Statistics											
1104	k hat (KM)					0.0963	nu hat (KM)					12.71
1105	Approximate Chi Square Value (12.71, α)					5.701	Adjusted Chi Square Value (12.71, β)					5.596
1106	5% Gamma Approximate KM-UCL (use when n>=50)					28.77	95% Gamma Adjusted KM-UCL (use when n<50)					29.31
1107	Gamma (KM) may not be used when k hat (KM) is < 0.1											
1108												
1109	Gamma ROS Statistics using Imputed Non-Detects											
1110	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1111	GROS may not be used when kstar of detected data is small such as < 0.1											
1112	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1113	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1114	Minimum					0.00234	Mean					12.9
1115	Maximum					230	Median					0.474
1116	SD					41.88	CV					3.247
1117	k hat (MLE)					0.2	k star (bias corrected MLE)					0.201
1118	Theta hat (MLE)					64.42	Theta star (bias corrected MLE)					64.1
1119	nu hat (MLE)					26.43	nu star (bias corrected)					26.56
1120	MLE Mean (bias corrected)					12.9	MLE Sd (bias corrected)					28.76

	A	B	C	D	E	F	G	H	I	J	K	L
1121							Adjusted Level of Significance (β)					0.0464
1122	Approximate Chi Square Value (26.56, α)					15.81	Adjusted Chi Square Value (26.56, β)					15.63
1123	95% Gamma Approximate UCL (use when $n \geq 50$)					21.67	95% Gamma Adjusted UCL (use when $n < 50$)					21.93
1124												
1125	Lognormal GOF Test on Detected Observations Only											
1126	Lilliefors Test Statistic					0.0721	Lilliefors GOF Test					
1127	5% Lilliefors Critical Value					0.113	Detected Data appear Lognormal at 5% Significance Level					
1128	Detected Data appear Approximate Lognormal at 5% Significance Level											
1129												
1130	Lognormal ROS Statistics Using Imputed Non-Detects											
1131	Mean in Original Scale					12.9	Mean in Log Scale					-1.172
1132	SD in Original Scale					41.88	SD in Log Scale					3.198
1133	95% t UCL (assumes normality of ROS data)					21.5	95% Percentile Bootstrap UCL					21.75
1134	95% BCA Bootstrap UCL					25.09	95% Bootstrap t UCL					29.17
1135	95% H-UCL (Log ROS)					261.6						
1136												
1137	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1138	KM Mean (logged)					-1.184	95% H-UCL (KM -Log)					251.9
1139	KM SD (logged)					3.192	95% Critical H Value (KM-Log)					4.091
1140	KM Standard Error of Mean (logged)					0.397						
1141												
1142	DL/2 Statistics											
1143	DL/2 Normal					DL/2 Log-Transformed						
1144	Mean in Original Scale					12.9	Mean in Log Scale					-1.168
1145	SD in Original Scale					41.88	SD in Log Scale					3.194
1146	95% t UCL (Assumes normality)					21.5	95% H-Stat UCL					259
1147	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1148												
1149	Nonparametric Distribution Free UCL Statistics											
1150	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1151												
1152	Suggested UCL to Use											
1153	97.5% KM (Chebyshev) UCL					45.11						
1154												
1155	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1156	Recommendations are based upon data size, data distribution, and skewness.											
1157	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1158	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1159												
1160	Benzo(a)pyrene											
1161												
1162	General Statistics											
1163	Total Number of Observations					66	Number of Distinct Observations					64
1164	Number of Detects					59	Number of Non-Detects					7
1165	Number of Distinct Detects					58	Number of Distinct Non-Detects					7
1166	Minimum Detect					0.00154	Minimum Non-Detect					0.0027
1167	Maximum Detect					190	Maximum Non-Detect					0.029
1168	Variance Detects					1267	Percent Non-Detects					10.61%
1169	Mean Detects					11.7	SD Detects					35.59
1170	Median Detects					0.54	CV Detects					3.043
1171	Skewness Detects					3.914	Kurtosis Detects					15.58
1172	Mean of Logged Detects					-0.832	SD of Logged Detects					3.006
1173												
1174	Normal GOF Test on Detects Only											
1175	Shapiro Wilk Test Statistic					0.378	Normal GOF Test on Detected Observations Only					
1176	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L	
1177	Lilliefors Test Statistic					0.442	Lilliefors GOF Test						
1178	5% Lilliefors Critical Value					0.115	Detected Data Not Normal at 5% Significance Level						
1179	Detected Data Not Normal at 5% Significance Level												
1180													
1181	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1182	Mean					10.46	Standard Error of Mean					4.166	
1183	SD					33.56	95% KM (BCA) UCL					18.55	
1184	95% KM (t) UCL					17.41	95% KM (Percentile Bootstrap) UCL					18.27	
1185	95% KM (z) UCL					17.31	95% KM Bootstrap t UCL					24.61	
1186	90% KM Chebyshev UCL					22.96	95% KM Chebyshev UCL					28.62	
1187	97.5% KM Chebyshev UCL					36.48	99% KM Chebyshev UCL					51.91	
1188													
1189	Gamma GOF Tests on Detected Observations Only												
1190	A-D Test Statistic					3.135	Anderson-Darling GOF Test						
1191	5% A-D Critical Value					0.904	Detected Data Not Gamma Distributed at 5% Significance Level						
1192	K-S Test Statistic					0.199	Kolmogrov-Smirnoff GOF						
1193	5% K-S Critical Value					0.128	Detected Data Not Gamma Distributed at 5% Significance Level						
1194	Detected Data Not Gamma Distributed at 5% Significance Level												
1195													
1196	Gamma Statistics on Detected Data Only												
1197	k hat (MLE)					0.22	k star (bias corrected MLE)					0.22	
1198	Theta hat (MLE)					53.11	Theta star (bias corrected MLE)					53.08	
1199	nu hat (MLE)					25.99	nu star (bias corrected)					26	
1200	MLE Mean (bias corrected)					11.7	MLE Sd (bias corrected)					24.92	
1201													
1202	Gamma Kaplan-Meier (KM) Statistics												
1203	k hat (KM)					0.0971	nu hat (KM)					12.81	
1204	Approximate Chi Square Value (12.81, α)					5.768	Adjusted Chi Square Value (12.81, β)					5.662	
1205	5% Gamma Approximate KM-UCL (use when n>=50)					23.23	95% Gamma Adjusted KM-UCL (use when n<50)					23.66	
1206	Gamma (KM) may not be used when k hat (KM) is < 0.1												
1207													
1208	Gamma ROS Statistics using Imputed Non-Detects												
1209	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1210	GROS may not be used when kstar of detected data is small such as < 0.1												
1211	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1212	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1213	Minimum					0.00154	Mean					10.46	
1214	Maximum					190	Median					0.377	
1215	SD					33.82	CV					3.234	
1216	k hat (MLE)					0.205	k star (bias corrected MLE)					0.206	
1217	Theta hat (MLE)					51.05	Theta star (bias corrected MLE)					50.85	
1218	nu hat (MLE)					27.04	nu star (bias corrected)					27.14	
1219	MLE Mean (bias corrected)					10.46	MLE Sd (bias corrected)					23.06	
1220							Adjusted Level of Significance (β)					0.0464	
1221	Approximate Chi Square Value (27.14, α)					16.26	Adjusted Chi Square Value (27.14, β)					16.07	
1222	95% Gamma Approximate UCL (use when n>=50)					17.45	95% Gamma Adjusted UCL (use when n<50)					17.66	
1223													
1224	Lognormal GOF Test on Detected Observations Only												
1225	Lilliefors Test Statistic					0.0681	Lilliefors GOF Test						
1226	5% Lilliefors Critical Value					0.115	Detected Data appear Lognormal at 5% Significance Level						
1227	Detected Data appear Lognormal at 5% Significance Level												
1228													
1229	Lognormal ROS Statistics Using Imputed Non-Detects												
1230	Mean in Original Scale					10.46	Mean in Log Scale					-1.364	
1231	SD in Original Scale					33.82	SD in Log Scale					3.245	
1232	95% t UCL (assumes normality of ROS data)					17.4	95% Percentile Bootstrap UCL					17.78	

	A	B	C	D	E	F	G	H	I	J	K	L
1233	95% BCA Bootstrap UCL					20.06	95% Bootstrap t UCL					24.96
1234	95% H-UCL (Log ROS)					264.3						
1235												
1236	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1237	KM Mean (logged)					-1.361	95% H-UCL (KM -Log)					233.7
1238	KM SD (logged)					3.216	95% Critical H Value (KM-Log)					4.124
1239	KM Standard Error of Mean (logged)					0.4						
1240												
1241	DL/2 Statistics											
1242	DL/2 Normal					DL/2 Log-Transformed						
1243	Mean in Original Scale					10.46	Mean in Log Scale					-1.343
1244	SD in Original Scale					33.82	SD in Log Scale					3.218
1245	95% t UCL (Assumes normality)					17.4	95% H-Stat UCL					240.4
1246	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1247												
1248	Nonparametric Distribution Free UCL Statistics											
1249	Detected Data appear Lognormal Distributed at 5% Significance Level											
1250												
1251	Suggested UCL to Use											
1252	97.5% KM (Chebyshev) UCL					36.48						
1253												
1254	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1255	Recommendations are based upon data size, data distribution, and skewness.											
1256	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1257	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1258												
1259	Benzo(b)fluoranthene											
1260												
1261	General Statistics											
1262	Total Number of Observations					50	Number of Distinct Observations					50
1263	Number of Detects					41	Number of Non-Detects					9
1264	Number of Distinct Detects					41	Number of Distinct Non-Detects					9
1265	Minimum Detect					0.00352	Minimum Non-Detect					0.0027
1266	Maximum Detect					210	Maximum Non-Detect					0.029
1267	Variance Detects					1472	Percent Non-Detects					18%
1268	Mean Detects					13.05	SD Detects					38.36
1269	Median Detects					0.47	CV Detects					2.939
1270	Skewness Detects					4.065	Kurtosis Detects					18.19
1271	Mean of Logged Detects					-0.809	SD of Logged Detects					3.025
1272												
1273	Normal GOF Test on Detects Only											
1274	Shapiro Wilk Test Statistic					0.4	Shapiro Wilk GOF Test					
1275	5% Shapiro Wilk Critical Value					0.941	Detected Data Not Normal at 5% Significance Level					
1276	Lilliefors Test Statistic					0.428	Lilliefors GOF Test					
1277	5% Lilliefors Critical Value					0.138	Detected Data Not Normal at 5% Significance Level					
1278	Detected Data Not Normal at 5% Significance Level											
1279												
1280	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1281	Mean					10.7	Standard Error of Mean					4.965
1282	SD					34.68	95% KM (BCA) UCL					20.88
1283	95% KM (t) UCL					19.03	95% KM (Percentile Bootstrap) UCL					19.46
1284	95% KM (z) UCL					18.87	95% KM Bootstrap t UCL					30.2
1285	90% KM Chebyshev UCL					25.6	95% KM Chebyshev UCL					32.35
1286	97.5% KM Chebyshev UCL					41.71	99% KM Chebyshev UCL					60.1
1287												
1288	Gamma GOF Tests on Detected Observations Only											

	A	B	C	D	E	F	G	H	I	J	K	L	
1289	A-D Test Statistic					2.318	Anderson-Darling GOF Test						
1290	5% A-D Critical Value					0.902	Detected Data Not Gamma Distributed at 5% Significance Level						
1291	K-S Test Statistic					0.183	Kolmogrov-Smirnoff GOF						
1292	5% K-S Critical Value					0.153	Detected Data Not Gamma Distributed at 5% Significance Level						
1293	Detected Data Not Gamma Distributed at 5% Significance Level												
1294													
1295	Gamma Statistics on Detected Data Only												
1296	k hat (MLE)					0.215	k star (bias corrected MLE)					0.216	
1297	Theta hat (MLE)					60.62	Theta star (bias corrected MLE)					60.47	
1298	nu hat (MLE)					17.66	nu star (bias corrected)					17.7	
1299	MLE Mean (bias corrected)					13.05	MLE Sd (bias corrected)					28.1	
1300													
1301	Gamma Kaplan-Meier (KM) Statistics												
1302	k hat (KM)					0.0953	nu hat (KM)					9.529	
1303	Approximate Chi Square Value (9.53, α)					3.649	Adjusted Chi Square Value (9.53, β)					3.542	
1304	5% Gamma Approximate KM-UCL (use when n>=50)					27.95	95% Gamma Adjusted KM-UCL (use when n<50)					28.8	
1305	Gamma (KM) may not be used when k hat (KM) is < 0.1												
1306													
1307	Gamma ROS Statistics using Imputed Non-Detects												
1308	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1309	GROS may not be used when kstar of detected data is small such as < 0.1												
1310	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1311	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1312	Minimum					0.00352	Mean					10.71	
1313	Maximum					210	Median					0.15	
1314	SD					35.03	CV					3.272	
1315	k hat (MLE)					0.192	k star (bias corrected MLE)					0.194	
1316	Theta hat (MLE)					55.83	Theta star (bias corrected MLE)					55.3	
1317	nu hat (MLE)					19.18	nu star (bias corrected)					19.36	
1318	MLE Mean (bias corrected)					10.71	MLE Sd (bias corrected)					24.33	
1319							Adjusted Level of Significance (β)					0.0452	
1320	Approximate Chi Square Value (19.36, α)					10.38	Adjusted Chi Square Value (19.36, β)					10.18	
1321	95% Gamma Approximate UCL (use when n>=50)					19.97	95% Gamma Adjusted UCL (use when n<50)					20.35	
1322													
1323	Lognormal GOF Test on Detected Observations Only												
1324	Shapiro Wilk Test Statistic					0.955	Shapiro Wilk GOF Test						
1325	5% Shapiro Wilk Critical Value					0.941	Detected Data appear Lognormal at 5% Significance Level						
1326	Lilliefors Test Statistic					0.104	Lilliefors GOF Test						
1327	5% Lilliefors Critical Value					0.138	Detected Data appear Lognormal at 5% Significance Level						
1328	Detected Data appear Lognormal at 5% Significance Level												
1329													
1330	Lognormal ROS Statistics Using Imputed Non-Detects												
1331	Mean in Original Scale					10.7	Mean in Log Scale					-1.939	
1332	SD in Original Scale					35.03	SD in Log Scale					3.68	
1333	95% t UCL (assumes normality of ROS data)					19.01	95% Percentile Bootstrap UCL					19.51	
1334	95% BCA Bootstrap UCL					22.93	95% Bootstrap t UCL					29.91	
1335	95% H-UCL (Log ROS)					3137							
1336													
1337	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
1338	KM Mean (logged)					-1.692	95% H-UCL (KM -Log)					588	
1339	KM SD (logged)					3.303	95% Critical H Value (KM-Log)					5.542	
1340	KM Standard Error of Mean (logged)					0.473							
1341													
1342	DL/2 Statistics												
1343	DL/2 Normal						DL/2 Log-Transformed						
1344	Mean in Original Scale					10.7	Mean in Log Scale					-1.714	

	A	B	C	D	E	F	G	H	I	J	K	L	
1345	SD in Original Scale					35.03	SD in Log Scale					3.374	
1346	95% t UCL (Assumes normality)					19.01	95% H-Stat UCL					812.1	
1347	DL/2 is not a recommended method, provided for comparisons and historical reasons												
1348													
1349	Nonparametric Distribution Free UCL Statistics												
1350	Detected Data appear Lognormal Distributed at 5% Significance Level												
1351													
1352	Suggested UCL to Use												
1353	99% KM (Chebyshev) UCL					60.1							
1354													
1355	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
1356	Recommendations are based upon data size, data distribution, and skewness.												
1357	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
1358	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
1359													
1360	Benzo(ghi)perylene												
1361													
1362	General Statistics												
1363	Total Number of Observations					66	Number of Distinct Observations					64	
1364	Number of Detects					61	Number of Non-Detects					5	
1365	Number of Distinct Detects					59	Number of Distinct Non-Detects					5	
1366	Minimum Detect					0.00251	Minimum Non-Detect					0.0075	
1367	Maximum Detect					98	Maximum Non-Detect					0.029	
1368	Variance Detects					344.8	Percent Non-Detects					7.576%	
1369	Mean Detects					6.188	SD Detects					18.57	
1370	Median Detects					0.28	CV Detects					3.001	
1371	Skewness Detects					3.724	Kurtosis Detects					13.84	
1372	Mean of Logged Detects					-1.361	SD of Logged Detects					2.785	
1373													
1374	Normal GOF Test on Detects Only												
1375	Shapiro Wilk Test Statistic					0.384	Normal GOF Test on Detected Observations Only						
1376	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level						
1377	Lilliefors Test Statistic					0.43	Lilliefors GOF Test						
1378	5% Lilliefors Critical Value					0.113	Detected Data Not Normal at 5% Significance Level						
1379	Detected Data Not Normal at 5% Significance Level												
1380													
1381	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1382	Mean					5.72	Standard Error of Mean					2.207	
1383	SD					17.78	95% KM (BCA) UCL					9.749	
1384	95% KM (t) UCL					9.402	95% KM (Percentile Bootstrap) UCL					9.823	
1385	95% KM (z) UCL					9.35	95% KM Bootstrap t UCL					12.41	
1386	90% KM Chebyshev UCL					12.34	95% KM Chebyshev UCL					15.34	
1387	97.5% KM Chebyshev UCL					19.5	99% KM Chebyshev UCL					27.68	
1388													
1389	Gamma GOF Tests on Detected Observations Only												
1390	A-D Test Statistic					3.999	Anderson-Darling GOF Test						
1391	5% A-D Critical Value					0.901	Detected Data Not Gamma Distributed at 5% Significance Level						
1392	K-S Test Statistic					0.198	Kolmogrov-Smirnoff GOF						
1393	5% K-S Critical Value					0.126	Detected Data Not Gamma Distributed at 5% Significance Level						
1394	Detected Data Not Gamma Distributed at 5% Significance Level												
1395													
1396	Gamma Statistics on Detected Data Only												
1397	k hat (MLE)					0.227	k star (bias corrected MLE)					0.226	
1398	Theta hat (MLE)					27.3	Theta star (bias corrected MLE)					27.33	
1399	nu hat (MLE)					27.65	nu star (bias corrected)					27.62	
1400	MLE Mean (bias corrected)					6.188	MLE Sd (bias corrected)					13	

	A	B	C	D	E	F	G	H	I	J	K	L
1401												
1402	Gamma Kaplan-Meier (KM) Statistics											
1403	k hat (KM)				0.104	nu hat (KM)				13.66		
1404	Approximate Chi Square Value (13.66, α)				6.341	Adjusted Chi Square Value (13.66, β)				6.229		
1405	5% Gamma Approximate KM-UCL (use when $n \geq 50$)				12.32	95% Gamma Adjusted KM-UCL (use when $n < 50$)				12.55		
1406												
1407	Gamma ROS Statistics using Imputed Non-Detects											
1408	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1409	GROS may not be used when kstar of detected data is small such as < 0.1											
1410	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1411	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1412	Minimum				0.00251	Mean				5.72		
1413	Maximum				98	Median				0.218		
1414	SD				17.92	CV				3.132		
1415	k hat (MLE)				0.217	k star (bias corrected MLE)				0.217		
1416	Theta hat (MLE)				26.38	Theta star (bias corrected MLE)				26.35		
1417	nu hat (MLE)				28.63	nu star (bias corrected)				28.66		
1418	MLE Mean (bias corrected)				5.72	MLE Sd (bias corrected)				12.28		
1419						Adjusted Level of Significance (β)				0.0464		
1420	Approximate Chi Square Value (28.66, α)				17.44	Adjusted Chi Square Value (28.66, β)				17.24		
1421	95% Gamma Approximate UCL (use when $n \geq 50$)				9.399	95% Gamma Adjusted UCL (use when $n < 50$)				9.506		
1422												
1423	Lognormal GOF Test on Detected Observations Only											
1424	Lilliefors Test Statistic				0.0811	Lilliefors GOF Test						
1425	5% Lilliefors Critical Value				0.113	Detected Data appear Lognormal at 5% Significance Level						
1426	Detected Data appear Approximate Lognormal at 5% Significance Level											
1427												
1428	Lognormal ROS Statistics Using Imputed Non-Detects											
1429	Mean in Original Scale				5.72	Mean in Log Scale				-1.664		
1430	SD in Original Scale				17.92	SD in Log Scale				2.882		
1431	95% t UCL (assumes normality of ROS data)				9.4	95% Percentile Bootstrap UCL				9.432		
1432	95% BCA Bootstrap UCL				10.75	95% Bootstrap t UCL				12.1		
1433	95% H-UCL (Log ROS)				44.07							
1434												
1435	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1436	KM Mean (logged)				-1.653	95% H-UCL (KM -Log)				38.94		
1437	KM SD (logged)				2.848	95% Critical H Value (KM-Log)				3.568		
1438	KM Standard Error of Mean (logged)				0.354							
1439												
1440	DL/2 Statistics											
1441	DL/2 Normal				DL/2 Log-Transformed							
1442	Mean in Original Scale				5.72	Mean in Log Scale				-1.656		
1443	SD in Original Scale				17.92	SD in Log Scale				2.873		
1444	95% t UCL (Assumes normality)				9.4	95% H-Stat UCL				42.84		
1445	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1446												
1447	Nonparametric Distribution Free UCL Statistics											
1448	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1449												
1450	Suggested UCL to Use											
1451	97.5% KM (Chebyshev) UCL				19.5							
1452												
1453	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1454	Recommendations are based upon data size, data distribution, and skewness.											
1455	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1456	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
1457												
1458	Benzo(k)fluoranthene											
1459												
1460	General Statistics											
1461	Total Number of Observations					66	Number of Distinct Observations					64
1462	Number of Detects					58	Number of Non-Detects					8
1463	Number of Distinct Detects					56	Number of Distinct Non-Detects					8
1464	Minimum Detect					0.00262	Minimum Non-Detect					0.0027
1465	Maximum Detect					170	Maximum Non-Detect					0.029
1466	Variance Detects					798.3	Percent Non-Detects					12.12%
1467	Mean Detects					9.336	SD Detects					28.25
1468	Median Detects					0.378	CV Detects					3.026
1469	Skewness Detects					4.169	Kurtosis Detects					19.43
1470	Mean of Logged Detects					-0.914	SD of Logged Detects					2.805
1471												
1472	Normal GOF Test on Detects Only											
1473	Shapiro Wilk Test Statistic					0.387	Normal GOF Test on Detected Observations Only					
1474	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
1475	Lilliefors Test Statistic					0.433	Lilliefors GOF Test					
1476	5% Lilliefors Critical Value					0.116	Detected Data Not Normal at 5% Significance Level					
1477	Detected Data Not Normal at 5% Significance Level											
1478												
1479	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1480	Mean					8.205	Standard Error of Mean					3.282
1481	SD					26.43	95% KM (BCA) UCL					14.14
1482	95% KM (t) UCL					13.68	95% KM (Percentile Bootstrap) UCL					13.83
1483	95% KM (z) UCL					13.6	95% KM Bootstrap t UCL					20.17
1484	90% KM Chebyshev UCL					18.05	95% KM Chebyshev UCL					22.51
1485	97.5% KM Chebyshev UCL					28.7	99% KM Chebyshev UCL					40.86
1486												
1487	Gamma GOF Tests on Detected Observations Only											
1488	A-D Test Statistic					3.604	Anderson-Darling GOF Test					
1489	5% A-D Critical Value					0.899	Detected Data Not Gamma Distributed at 5% Significance Level					
1490	K-S Test Statistic					0.201	Kolmogrov-Smirnoff GOF					
1491	5% K-S Critical Value					0.129	Detected Data Not Gamma Distributed at 5% Significance Level					
1492	Detected Data Not Gamma Distributed at 5% Significance Level											
1493												
1494	Gamma Statistics on Detected Data Only											
1495	k hat (MLE)					0.229	k star (bias corrected MLE)					0.229
1496	Theta hat (MLE)					40.79	Theta star (bias corrected MLE)					40.85
1497	nu hat (MLE)					26.55	nu star (bias corrected)					26.51
1498	MLE Mean (bias corrected)					9.336	MLE Sd (bias corrected)					19.53
1499												
1500	Gamma Kaplan-Meier (KM) Statistics											
1501	k hat (KM)					0.0963	nu hat (KM)					12.72
1502	Approximate Chi Square Value (12.72, α)					5.703	Adjusted Chi Square Value (12.72, β)					5.598
1503	5% Gamma Approximate KM-UCL (use when n>=50)					18.3	95% Gamma Adjusted KM-UCL (use when n<50)					18.64
1504	Gamma (KM) may not be used when k hat (KM) is < 0.1											
1505												
1506	Gamma ROS Statistics using Imputed Non-Detects											
1507	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1508	GROS may not be used when kstar of detected data is small such as < 0.1											
1509	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1510	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1511	Minimum					0.00262	Mean					8.205
1512	Maximum					170	Median					0.25

	A	B	C	D	E	F	G	H	I	J	K	L
1513	SD					26.64	CV					3.246
1514	k hat (MLE)					0.211	k star (bias corrected MLE)					0.211
1515	Theta hat (MLE)					38.96	Theta star (bias corrected MLE)					38.86
1516	nu hat (MLE)					27.8	nu star (bias corrected)					27.87
1517	MLE Mean (bias corrected)					8.205	MLE Sd (bias corrected)					17.86
1518							Adjusted Level of Significance (β)					0.0464
1519	Approximate Chi Square Value (27.87, α)					16.83	Adjusted Chi Square Value (27.87, β)					16.63
1520	95% Gamma Approximate UCL (use when n>=50)					13.59	95% Gamma Adjusted UCL (use when n<50)					13.75
1521												
1522	Lognormal GOF Test on Detected Observations Only											
1523	Lilliefors Test Statistic					0.0637	Lilliefors GOF Test					
1524	5% Lilliefors Critical Value					0.116	Detected Data appear Lognormal at 5% Significance Level					
1525	Detected Data appear Lognormal at 5% Significance Level											
1526												
1527	Lognormal ROS Statistics Using Imputed Non-Detects											
1528	Mean in Original Scale					8.204	Mean in Log Scale					-1.566
1529	SD in Original Scale					26.64	SD in Log Scale					3.181
1530	95% t UCL (assumes normality of ROS data)					13.68	95% Percentile Bootstrap UCL					14.03
1531	95% BCA Bootstrap UCL					15.82	95% Bootstrap t UCL					19.26
1532	95% H-UCL (Log ROS)					164.1						
1533												
1534	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1535	KM Mean (logged)					-1.489	95% H-UCL (KM -Log)					98.06
1536	KM SD (logged)					3.038	95% Critical H Value (KM-Log)					3.878
1537	KM Standard Error of Mean (logged)					0.378						
1538												
1539	DL/2 Statistics											
1540	DL/2 Normal						DL/2 Log-Transformed					
1541	Mean in Original Scale					8.205	Mean in Log Scale					-1.515
1542	SD in Original Scale					26.64	SD in Log Scale					3.104
1543	95% t UCL (Assumes normality)					13.68	95% H-Stat UCL					125.2
1544	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1545												
1546	Nonparametric Distribution Free UCL Statistics											
1547	Detected Data appear Lognormal Distributed at 5% Significance Level											
1548												
1549	Suggested UCL to Use											
1550	97.5% KM (Chebyshev) UCL					28.7						
1551												
1552	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1553	Recommendations are based upon data size, data distribution, and skewness.											
1554	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1555	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1556												
1557	C10-C20											
1558												
1559	General Statistics											
1560	Total Number of Observations					10	Number of Distinct Observations					9
1561	Number of Detects					6	Number of Non-Detects					4
1562	Number of Distinct Detects					6	Number of Distinct Non-Detects					3
1563	Minimum Detect					21	Minimum Non-Detect					19
1564	Maximum Detect					4400	Maximum Non-Detect					24
1565	Variance Detects					3128962	Percent Non-Detects					40%
1566	Mean Detects					790	SD Detects					1769
1567	Median Detects					78.5	CV Detects					2.239
1568	Skewness Detects					2.447	Kurtosis Detects					5.992

	A	B	C	D	E	F	G	H	I	J	K	L
1569	Mean of Logged Detects					4.774	SD of Logged Detects					1.875
1570												
1571	Normal GOF Test on Detects Only											
1572	Shapiro Wilk Test Statistic					0.516	Shapiro Wilk GOF Test					
1573	5% Shapiro Wilk Critical Value					0.788	Detected Data Not Normal at 5% Significance Level					
1574	Lilliefors Test Statistic					0.481	Lilliefors GOF Test					
1575	5% Lilliefors Critical Value					0.362	Detected Data Not Normal at 5% Significance Level					
1576	Detected Data Not Normal at 5% Significance Level											
1577												
1578	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1579	Mean					481.7	Standard Error of Mean					452.6
1580	SD					1307	95% KM (BCA) UCL					1348
1581	95% KM (t) UCL					1311	95% KM (Percentile Bootstrap) UCL					1351
1582	95% KM (z) UCL					1226	95% KM Bootstrap t UCL					23165
1583	90% KM Chebyshev UCL					1839	95% KM Chebyshev UCL					2455
1584	97.5% KM Chebyshev UCL					3308	99% KM Chebyshev UCL					4985
1585												
1586	Gamma GOF Tests on Detected Observations Only											
1587	A-D Test Statistic					1.085	Anderson-Darling GOF Test					
1588	5% A-D Critical Value					0.758	Detected Data Not Gamma Distributed at 5% Significance Level					
1589	K-S Test Statistic					0.44	Kolmogrov-Smirnoff GOF					
1590	5% K-S Critical Value					0.355	Detected Data Not Gamma Distributed at 5% Significance Level					
1591	Detected Data Not Gamma Distributed at 5% Significance Level											
1592												
1593	Gamma Statistics on Detected Data Only											
1594	k hat (MLE)					0.354	k star (bias corrected MLE)					0.288
1595	Theta hat (MLE)					2233	Theta star (bias corrected MLE)					2743
1596	nu hat (MLE)					4.245	nu star (bias corrected)					3.456
1597	MLE Mean (bias corrected)					790	MLE Sd (bias corrected)					1472
1598												
1599	Gamma Kaplan-Meier (KM) Statistics											
1600	k hat (KM)					0.136	nu hat (KM)					2.718
1601	Approximate Chi Square Value (2.72, α)					0.294	Adjusted Chi Square Value (2.72, β)					0.201
1602	5% Gamma Approximate KM-UCL (use when n>=50)					4453	95% Gamma Adjusted KM-UCL (use when n<50)					6508
1603												
1604	Gamma ROS Statistics using Imputed Non-Detects											
1605	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1606	GROS may not be used when kstar of detected data is small such as < 0.1											
1607	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1608	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1609	Minimum					0.01	Mean					474
1610	Maximum					4400	Median					31.5
1611	SD					1380	CV					2.912
1612	k hat (MLE)					0.15	k star (bias corrected MLE)					0.171
1613	Theta hat (MLE)					3168	Theta star (bias corrected MLE)					2765
1614	nu hat (MLE)					2.992	nu star (bias corrected)					3.428
1615	MLE Mean (bias corrected)					474	MLE Sd (bias corrected)					1145
1616							Adjusted Level of Significance (β)					0.0267
1617	Approximate Chi Square Value (3.43, α)					0.51	Adjusted Chi Square Value (3.43, β)					0.356
1618	95% Gamma Approximate UCL (use when n>=50)					3188	95% Gamma Adjusted UCL (use when n<50)					4570
1619												
1620	Lognormal GOF Test on Detected Observations Only											
1621	Shapiro Wilk Test Statistic					0.807	Shapiro Wilk GOF Test					
1622	5% Shapiro Wilk Critical Value					0.788	Detected Data appear Lognormal at 5% Significance Level					
1623	Lilliefors Test Statistic					0.331	Lilliefors GOF Test					
1624	5% Lilliefors Critical Value					0.362	Detected Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1625	Detected Data appear Lognormal at 5% Significance Level											
1626												
1627	Lognormal ROS Statistics Using Imputed Non-Detects											
1628	Mean in Original Scale					474.7	Mean in Log Scale					3.011
1629	SD in Original Scale					1380	SD in Log Scale					2.702
1630	95% t UCL (assumes normality of ROS data)					1275	95% Percentile Bootstrap UCL					1346
1631	95% BCA Bootstrap UCL					1778	95% Bootstrap t UCL					19177
1632	95% H-UCL (Log ROS)					475259						
1633												
1634	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1635	KM Mean (logged)					4.045	95% H-UCL (KM -Log)					2184
1636	KM SD (logged)					1.599	95% Critical H Value (KM-Log)					4.438
1637	KM Standard Error of Mean (logged)					0.554						
1638												
1639	DL/2 Statistics											
1640	DL/2 Normal					DL/2 Log-Transformed						
1641	Mean in Original Scale					478.1	Mean in Log Scale					3.794
1642	SD in Original Scale					1379	SD in Log Scale					1.887
1643	95% t UCL (Assumes normality)					1277	95% H-Stat UCL					6612
1644	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1645												
1646	Nonparametric Distribution Free UCL Statistics											
1647	Detected Data appear Lognormal Distributed at 5% Significance Level											
1648												
1649	Suggested UCL to Use											
1650	99% KM (Chebyshev) UCL					4985						
1651	Warning: Recommended UCL exceeds the maximum observation											
1652												
1653	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1654	Recommendations are based upon data size, data distribution, and skewness.											
1655	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1656	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1657												
1658	C20-C34											
1659												
1660	General Statistics											
1661	Total Number of Observations					10	Number of Distinct Observations					9
1662	Number of Detects					9	Number of Non-Detects					1
1663	Number of Distinct Detects					8	Number of Distinct Non-Detects					1
1664	Minimum Detect					24	Minimum Non-Detect					19
1665	Maximum Detect					19000	Maximum Non-Detect					19
1666	Variance Detects					39382666	Percent Non-Detects					10%
1667	Mean Detects					2295	SD Detects					6276
1668	Median Detects					57	CV Detects					2.734
1669	Skewness Detects					2.98	Kurtosis Detects					8.906
1670	Mean of Logged Detects					4.972	SD of Logged Detects					2.187
1671												
1672	Normal GOF Test on Detects Only											
1673	Shapiro Wilk Test Statistic					0.426	Shapiro Wilk GOF Test					
1674	5% Shapiro Wilk Critical Value					0.829	Detected Data Not Normal at 5% Significance Level					
1675	Lilliefors Test Statistic					0.458	Lilliefors GOF Test					
1676	5% Lilliefors Critical Value					0.295	Detected Data Not Normal at 5% Significance Level					
1677	Detected Data Not Normal at 5% Significance Level											
1678												
1679	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1680	Mean					2068	Standard Error of Mean					1897

	A	B	C	D	E	F	G	H	I	J	K	L
1681	SD					5654	95% KM (BCA) UCL					5850
1682	95% KM (t) UCL					5544	95% KM (Percentile Bootstrap) UCL					5734
1683	95% KM (z) UCL					5187	95% KM Bootstrap t UCL					280384
1684	90% KM Chebyshev UCL					7757	95% KM Chebyshev UCL					10335
1685	97.5% KM Chebyshev UCL					13912	99% KM Chebyshev UCL					20938
1686												
1687	Gamma GOF Tests on Detected Observations Only											
1688	A-D Test Statistic					1.549	Anderson-Darling GOF Test					
1689	5% A-D Critical Value					0.825	Detected Data Not Gamma Distributed at 5% Significance Level					
1690	K-S Test Statistic					0.398	Kolmogrov-Smirnoff GOF					
1691	5% K-S Critical Value					0.304	Detected Data Not Gamma Distributed at 5% Significance Level					
1692	Detected Data Not Gamma Distributed at 5% Significance Level											
1693												
1694	Gamma Statistics on Detected Data Only											
1695	k hat (MLE)					0.256	k star (bias corrected MLE)					0.245
1696	Theta hat (MLE)					8974	Theta star (bias corrected MLE)					9385
1697	nu hat (MLE)					4.604	nu star (bias corrected)					4.403
1698	MLE Mean (bias corrected)					2295	MLE Sd (bias corrected)					4641
1699												
1700	Gamma Kaplan-Meier (KM) Statistics											
1701	k hat (KM)					0.134	nu hat (KM)					2.675
1702	Approximate Chi Square Value (2.67, α)					0.283	Adjusted Chi Square Value (2.67, β)					0.194
1703	5% Gamma Approximate KM-UCL (use when n>=50)					19547	95% Gamma Adjusted KM-UCL (use when n<50)					28538
1704												
1705	Gamma ROS Statistics using Imputed Non-Detects											
1706	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1707	GROS may not be used when kstar of detected data is small such as < 0.1											
1708	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1709	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1710	Minimum					0.01	Mean					2066
1711	Maximum					19000	Median					55.5
1712	SD					5961	CV					2.885
1713	k hat (MLE)					0.203	k star (bias corrected MLE)					0.209
1714	Theta hat (MLE)					10182	Theta star (bias corrected MLE)					9899
1715	nu hat (MLE)					4.058	nu star (bias corrected)					4.174
1716	MLE Mean (bias corrected)					2066	MLE Sd (bias corrected)					4522
1717							Adjusted Level of Significance (β)					0.0267
1718	Approximate Chi Square Value (4.17, α)					0.792	Adjusted Chi Square Value (4.17, β)					0.574
1719	95% Gamma Approximate UCL (use when n>=50)					10893	95% Gamma Adjusted UCL (use when n<50)					15028
1720												
1721	Lognormal GOF Test on Detected Observations Only											
1722	Shapiro Wilk Test Statistic					0.797	Shapiro Wilk GOF Test					
1723	5% Shapiro Wilk Critical Value					0.829	Detected Data Not Lognormal at 5% Significance Level					
1724	Lilliefors Test Statistic					0.283	Lilliefors GOF Test					
1725	5% Lilliefors Critical Value					0.295	Detected Data appear Lognormal at 5% Significance Level					
1726	Detected Data appear Approximate Lognormal at 5% Significance Level											
1727												
1728	Lognormal ROS Statistics Using Imputed Non-Detects											
1729	Mean in Original Scale					2066	Mean in Log Scale					4.474
1730	SD in Original Scale					5961	SD in Log Scale					2.593
1731	95% t UCL (assumes normality of ROS data)					5521	95% Percentile Bootstrap UCL					5744
1732	95% BCA Bootstrap UCL					7740	95% Bootstrap t UCL					280791
1733	95% H-UCL (Log ROS)					947041						
1734												
1735	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1736	KM Mean (logged)					4.769	95% H-UCL (KM -Log)					41373

	A	B	C	D	E	F	G	H	I	J	K	L
1737	KM SD (logged)					2.048	95% Critical H Value (KM-Log)					5.513
1738	KM Standard Error of Mean (logged)					0.687						
1739												
1740	DL/2 Statistics											
1741	DL/2 Normal					DL/2 Log-Transformed						
1742	Mean in Original Scale					2067	Mean in Log Scale					4.7
1743	SD in Original Scale					5961	SD in Log Scale					2.234
1744	95% t UCL (Assumes normality)					5522	95% H-Stat UCL					113200
1745	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1746												
1747	Nonparametric Distribution Free UCL Statistics											
1748	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1749												
1750	Suggested UCL to Use											
1751	99% KM (Chebyshev) UCL					20938						
1752	Warning: Recommended UCL exceeds the maximum observation											
1753												
1754	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1755	Recommendations are based upon data size, data distribution, and skewness.											
1756	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1757	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1758												
1759	Cadmium											
1760												
1761	General Statistics											
1762	Total Number of Observations					10	Number of Distinct Observations					9
1763	Number of Detects					8	Number of Non-Detects					2
1764	Number of Distinct Detects					7	Number of Distinct Non-Detects					2
1765	Minimum Detect					0.22	Minimum Non-Detect					0.49
1766	Maximum Detect					1	Maximum Non-Detect					0.7
1767	Variance Detects					0.107	Percent Non-Detects					20%
1768	Mean Detects					0.489	SD Detects					0.327
1769	Median Detects					0.34	CV Detects					0.669
1770	Skewness Detects					1.171	Kurtosis Detects					-0.442
1771	Mean of Logged Detects					-0.888	SD of Logged Detects					0.604
1772												
1773	Normal GOF Test on Detects Only											
1774	Shapiro Wilk Test Statistic					0.758	Shapiro Wilk GOF Test					
1775	5% Shapiro Wilk Critical Value					0.818	Detected Data Not Normal at 5% Significance Level					
1776	Lilliefors Test Statistic					0.289	Lilliefors GOF Test					
1777	5% Lilliefors Critical Value					0.313	Detected Data appear Normal at 5% Significance Level					
1778	Detected Data appear Approximate Normal at 5% Significance Level											
1779												
1780	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1781	Mean					0.451	Standard Error of Mean					0.0975
1782	SD					0.286	95% KM (BCA) UCL					0.608
1783	95% KM (t) UCL					0.629	95% KM (Percentile Bootstrap) UCL					0.603
1784	95% KM (z) UCL					0.611	95% KM Bootstrap t UCL					0.871
1785	90% KM Chebyshev UCL					0.743	95% KM Chebyshev UCL					0.876
1786	97.5% KM Chebyshev UCL					1.059	99% KM Chebyshev UCL					1.421
1787												
1788	Gamma GOF Tests on Detected Observations Only											
1789	A-D Test Statistic					0.684	Anderson-Darling GOF Test					
1790	5% A-D Critical Value					0.721	Detected data appear Gamma Distributed at 5% Significance Level					
1791	K-S Test Statistic					0.265	Kolmogrov-Smirnoff GOF					
1792	5% K-S Critical Value					0.296	Detected data appear Gamma Distributed at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1793	Detected data appear Gamma Distributed at 5% Significance Level											
1794												
1795	Gamma Statistics on Detected Data Only											
1796	k hat (MLE)				3.066	k star (bias corrected MLE)				1.999		
1797	Theta hat (MLE)				0.159	Theta star (bias corrected MLE)				0.244		
1798	nu hat (MLE)				49.05	nu star (bias corrected)				31.99		
1799	MLE Mean (bias corrected)				0.489	MLE Sd (bias corrected)				0.346		
1800												
1801	Gamma Kaplan-Meier (KM) Statistics											
1802	k hat (KM)				2.479	nu hat (KM)				49.58		
1803	Approximate Chi Square Value (49.58, α)				34.41	Adjusted Chi Square Value (49.58, β)				32.23		
1804	95% Gamma Approximate KM-UCL (use when $n \geq 50$)				0.649	95% Gamma Adjusted KM-UCL (use when $n < 50$)				0.693		
1805												
1806	Gamma ROS Statistics using Imputed Non-Detects											
1807	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1808	GROS may not be used when kstar of detected data is small such as < 0.1											
1809	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1810	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1811	Minimum				0.22	Mean				0.453		
1812	Maximum				1	Median				0.33		
1813	SD				0.298	CV				0.659		
1814	k hat (MLE)				3.422	k star (bias corrected MLE)				2.462		
1815	Theta hat (MLE)				0.132	Theta star (bias corrected MLE)				0.184		
1816	nu hat (MLE)				68.44	nu star (bias corrected)				49.24		
1817	MLE Mean (bias corrected)				0.453	MLE Sd (bias corrected)				0.289		
1818						Adjusted Level of Significance (β)				0.0267		
1819	Approximate Chi Square Value (49.24, α)				34.13	Adjusted Chi Square Value (49.24, β)				31.96		
1820	95% Gamma Approximate UCL (use when $n \geq 50$)				0.653	95% Gamma Adjusted UCL (use when $n < 50$)				0.698		
1821												
1822	Lognormal GOF Test on Detected Observations Only											
1823	Shapiro Wilk Test Statistic				0.857	Shapiro Wilk GOF Test						
1824	5% Shapiro Wilk Critical Value				0.818	Detected Data appear Lognormal at 5% Significance Level						
1825	Lilliefors Test Statistic				0.231	Lilliefors GOF Test						
1826	5% Lilliefors Critical Value				0.313	Detected Data appear Lognormal at 5% Significance Level						
1827	Detected Data appear Lognormal at 5% Significance Level											
1828												
1829	Lognormal ROS Statistics Using Imputed Non-Detects											
1830	Mean in Original Scale				0.453	Mean in Log Scale				-0.945		
1831	SD in Original Scale				0.298	SD in Log Scale				0.546		
1832	95% t UCL (assumes normality of ROS data)				0.626	95% Percentile Bootstrap UCL				0.606		
1833	95% BCA Bootstrap UCL				0.666	95% Bootstrap t UCL				0.985		
1834	95% H-UCL (Log ROS)				0.684							
1835												
1836	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1837	KM Mean (logged)				-0.958	95% H-UCL (KM -Log)				0.663		
1838	KM SD (logged)				0.534	95% Critical H Value (KM-Log)				2.269		
1839	KM Standard Error of Mean (logged)				0.185							
1840												
1841	DL/2 Statistics											
1842	DL/2 Normal					DL/2 Log-Transformed						
1843	Mean in Original Scale				0.451	Mean in Log Scale				-0.956		
1844	SD in Original Scale				0.301	SD in Log Scale				0.558		
1845	95% t UCL (Assumes normality)				0.625	95% H-Stat UCL				0.689		
1846	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1847												
1848	Nonparametric Distribution Free UCL Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
1849	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
1850												
1851	Suggested UCL to Use											
1852	95% KM (t) UCL				0.629		95% KM (Percentile Bootstrap) UCL				0.603	
1853												
1854	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1855	Recommendations are based upon data size, data distribution, and skewness.											
1856	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1857	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1858												
1859	Carbon disulfide											
1860												
1861	General Statistics											
1862	Total Number of Observations				10		Number of Distinct Observations				8	
1863	Number of Detects				4		Number of Non-Detects				6	
1864	Number of Distinct Detects				3		Number of Distinct Non-Detects				5	
1865	Minimum Detect				5.7000E-4		Minimum Non-Detect				0.0055	
1866	Maximum Detect				0.0076		Maximum Non-Detect				0.0071	
1867	Variance Detects				1.0822E-5		Percent Non-Detects				60%	
1868	Mean Detects				0.00269		SD Detects				0.00329	
1869	Median Detects				0.0013		CV Detects				1.222	
1870	Skewness Detects				1.933		Kurtosis Detects				3.799	
1871	Mean of Logged Detects				-6.41		SD of Logged Detects				1.092	
1872												
1873	Normal GOF Test on Detects Only											
1874	Shapiro Wilk Test Statistic				0.719		Shapiro Wilk GOF Test					
1875	5% Shapiro Wilk Critical Value				0.748		Detected Data Not Normal at 5% Significance Level					
1876	Lilliefors Test Statistic				0.414		Lilliefors GOF Test					
1877	5% Lilliefors Critical Value				0.443		Detected Data appear Normal at 5% Significance Level					
1878	Detected Data appear Approximate Normal at 5% Significance Level											
1879												
1880	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1881	Mean				0.00171		Standard Error of Mean				7.4593E-4	
1882	SD				0.00199		95% KM (BCA) UCL				N/A	
1883	95% KM (t) UCL				0.00308		95% KM (Percentile Bootstrap) UCL				N/A	
1884	95% KM (z) UCL				0.00294		95% KM Bootstrap t UCL				N/A	
1885	90% KM Chebyshev UCL				0.00395		95% KM Chebyshev UCL				0.00496	
1886	97.5% KM Chebyshev UCL				0.00637		99% KM Chebyshev UCL				0.00913	
1887												
1888	Gamma GOF Tests on Detected Observations Only											
1889	A-D Test Statistic				0.544		Anderson-Darling GOF Test					
1890	5% A-D Critical Value				0.665		Detected data appear Gamma Distributed at 5% Significance Level					
1891	K-S Test Statistic				0.394		Kolmogrov-Smirnoff GOF					
1892	5% K-S Critical Value				0.402		Detected data appear Gamma Distributed at 5% Significance Level					
1893	Detected data appear Gamma Distributed at 5% Significance Level											
1894												
1895	Gamma Statistics on Detected Data Only											
1896	k hat (MLE)				1.153		k star (bias corrected MLE)				0.455	
1897	Theta hat (MLE)				0.00234		Theta star (bias corrected MLE)				0.00592	
1898	nu hat (MLE)				9.222		nu star (bias corrected)				3.639	
1899	MLE Mean (bias corrected)				0.00269		MLE Sd (bias corrected)				0.00399	
1900												
1901	Gamma Kaplan-Meier (KM) Statistics											
1902	k hat (KM)				0.739		nu hat (KM)				14.79	
1903	Approximate Chi Square Value (14.79, α)				7.113		Adjusted Chi Square Value (14.79, β)				6.211	
1904	5% Gamma Approximate KM-UCL (use when $n \geq 50$)				0.00356		95% Gamma Adjusted KM-UCL (use when $n < 50$)				0.00407	

	A	B	C	D	E	F	G	H	I	J	K	L
1905												
1906	Gamma ROS Statistics using Imputed Non-Detects											
1907	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1908	GROS may not be used when kstar of detected data is small such as < 0.1											
1909	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1910	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1911	Minimum					5.7000E-4	Mean					0.00708
1912	Maximum					0.01	Median					0.01
1913	SD					0.00422	CV					0.597
1914	k hat (MLE)					1.473	k star (bias corrected MLE)					1.098
1915	Theta hat (MLE)					0.0048	Theta star (bias corrected MLE)					0.00644
1916	nu hat (MLE)					29.47	nu star (bias corrected)					21.96
1917	MLE Mean (bias corrected)					0.00708	MLE Sd (bias corrected)					0.00675
1918							Adjusted Level of Significance (β)					0.0267
1919	Approximate Chi Square Value (21.96, α)					12.31	Adjusted Chi Square Value (21.96, β)					11.07
1920	95% Gamma Approximate UCL (use when n>=50)					0.0126	95% Gamma Adjusted UCL (use when n<50)					N/A
1921												
1922	Lognormal GOF Test on Detected Observations Only											
1923	Shapiro Wilk Test Statistic					0.886	Shapiro Wilk GOF Test					
1924	5% Shapiro Wilk Critical Value					0.748	Detected Data appear Lognormal at 5% Significance Level					
1925	Lilliefors Test Statistic					0.335	Lilliefors GOF Test					
1926	5% Lilliefors Critical Value					0.443	Detected Data appear Lognormal at 5% Significance Level					
1927	Detected Data appear Lognormal at 5% Significance Level											
1928												
1929	Lognormal ROS Statistics Using Imputed Non-Detects											
1930	Mean in Original Scale					0.00172	Mean in Log Scale					-6.68
1931	SD in Original Scale					0.00208	SD in Log Scale					0.698
1932	95% t UCL (assumes normality of ROS data)					0.00293	95% Percentile Bootstrap UCL					0.003
1933	95% BCA Bootstrap UCL					0.00365	95% Bootstrap t UCL					0.00816
1934	95% H-UCL (Log ROS)					0.00289						
1935												
1936	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1937	KM Mean (logged)					-6.716	95% H-UCL (KM -Log)					0.00288
1938	KM SD (logged)					0.715	95% Critical H Value (KM-Log)					2.557
1939	KM Standard Error of Mean (logged)					0.323						
1940												
1941	DL/2 Statistics											
1942	DL/2 Normal					DL/2 Log-Transformed						
1943	Mean in Original Scale					0.0029	Mean in Log Scale					-6.045
1944	SD in Original Scale					0.00192	SD in Log Scale					0.708
1945	95% t UCL (Assumes normality)					0.00401	95% H-Stat UCL					0.00555
1946	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1947												
1948	Nonparametric Distribution Free UCL Statistics											
1949	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
1950												
1951	Suggested UCL to Use											
1952	95% KM (t) UCL					0.00308	95% KM (Percentile Bootstrap) UCL					N/A
1953	Warning: One or more Recommended UCL(s) not available!											
1954												
1955	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1956	Recommendations are based upon data size, data distribution, and skewness.											
1957	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1958	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1959												
1960												

	A	B	C	D	E	F	G	H	I	J	K	L
1961	Chromium											
1962												
1963	General Statistics											
1964	Total Number of Observations				10		Number of Distinct Observations				10	
1965							Number of Missing Observations				0	
1966	Minimum				9		Mean				12.4	
1967	Maximum				16		Median				12.45	
1968	SD				1.969		Std. Error of Mean				0.623	
1969	Coefficient of Variation				0.159		Skewness				0.00567	
1970												
1971	Normal GOF Test											
1972	Shapiro Wilk Test Statistic				0.981		Shapiro Wilk GOF Test					
1973	5% Shapiro Wilk Critical Value				0.842		Data appear Normal at 5% Significance Level					
1974	Lilliefors Test Statistic				0.16		Lilliefors GOF Test					
1975	5% Lilliefors Critical Value				0.28		Data appear Normal at 5% Significance Level					
1976	Data appear Normal at 5% Significance Level											
1977												
1978	Assuming Normal Distribution											
1979	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
1980	95% Student's-t UCL				13.54		95% Adjusted-CLT UCL (Chen-1995)				13.43	
1981							95% Modified-t UCL (Johnson-1978)				13.54	
1982												
1983	Gamma GOF Test											
1984	A-D Test Statistic				0.219		Anderson-Darling Gamma GOF Test					
1985	5% A-D Critical Value				0.724		ected data appear Gamma Distributed at 5% Significance Lev					
1986	K-S Test Statistic				0.178		Kolmogrov-Smirnoff Gamma GOF Test					
1987	5% K-S Critical Value				0.266		ected data appear Gamma Distributed at 5% Significance Lev					
1988	Detected data appear Gamma Distributed at 5% Significance Level											
1989												
1990	Gamma Statistics											
1991	k hat (MLE)				42.87		k star (bias corrected MLE)				30.08	
1992	Theta hat (MLE)				0.289		Theta star (bias corrected MLE)				0.412	
1993	nu hat (MLE)				857.4		nu star (bias corrected)				601.5	
1994	MLE Mean (bias corrected)				12.4		MLE Sd (bias corrected)				2.261	
1995							Approximate Chi Square Value (0.05)				545.6	
1996	Adjusted Level of Significance				0.0267		Adjusted Chi Square Value				536.4	
1997												
1998	Assuming Gamma Distribution											
1999	95% Approximate Gamma UCL (use when n>=50))				13.67		95% Adjusted Gamma UCL (use when n<50)				13.91	
2000												
2001	Lognormal GOF Test											
2002	Shapiro Wilk Test Statistic				0.972		Shapiro Wilk Lognormal GOF Test					
2003	5% Shapiro Wilk Critical Value				0.842		Data appear Lognormal at 5% Significance Level					
2004	Lilliefors Test Statistic				0.189		Lilliefors Lognormal GOF Test					
2005	5% Lilliefors Critical Value				0.28		Data appear Lognormal at 5% Significance Level					
2006	Data appear Lognormal at 5% Significance Level											
2007												
2008	Lognormal Statistics											
2009	Minimum of Logged Data				2.197		Mean of logged Data				2.506	
2010	Maximum of Logged Data				2.773		SD of logged Data				0.163	
2011												
2012	Assuming Lognormal Distribution											
2013	95% H-UCL				13.73		90% Chebyshev (MVUE) UCL				14.32	
2014	95% Chebyshev (MVUE) UCL				15.19		97.5% Chebyshev (MVUE) UCL				16.4	
2015	99% Chebyshev (MVUE) UCL				18.78							
2016												

	A	B	C	D	E	F	G	H	I	J	K	L
2017	Nonparametric Distribution Free UCL Statistics											
2018	Data appear to follow a Discernible Distribution at 5% Significance Level											
2019												
2020	Nonparametric Distribution Free UCLs											
2021	95% CLT UCL				13.42	95% Jackknife UCL					13.54	
2022	95% Standard Bootstrap UCL				13.35	95% Bootstrap-t UCL					13.48	
2023	95% Hall's Bootstrap UCL				13.62	95% Percentile Bootstrap UCL					13.37	
2024	95% BCA Bootstrap UCL				13.37							
2025	90% Chebyshev(Mean, Sd) UCL				14.27	95% Chebyshev(Mean, Sd) UCL					15.11	
2026	97.5% Chebyshev(Mean, Sd) UCL				16.29	99% Chebyshev(Mean, Sd) UCL					18.6	
2027												
2028	Suggested UCL to Use											
2029	95% Student's-t UCL				13.54							
2030												
2031	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2032	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
2033	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
2034	For additional insight the user may want to consult a statistician.											
2035												
2036	Chrysene											
2037												
2038	General Statistics											
2039	Total Number of Observations				66	Number of Distinct Observations					64	
2040	Number of Detects				61	Number of Non-Detects					5	
2041	Number of Distinct Detects				59	Number of Distinct Non-Detects					5	
2042	Minimum Detect				0.00533	Minimum Non-Detect					0.0073	
2043	Maximum Detect				250	Maximum Non-Detect					0.029	
2044	Variance Detects				2178	Percent Non-Detects					7.576%	
2045	Mean Detects				14.44	SD Detects					46.67	
2046	Median Detects				0.6	CV Detects					3.233	
2047	Skewness Detects				4.175	Kurtosis Detects					17.77	
2048	Mean of Logged Detects				-0.685	SD of Logged Detects					2.881	
2049												
2050	Normal GOF Test on Detects Only											
2051	Shapiro Wilk Test Statistic				0.352	Normal GOF Test on Detected Observations Only						
2052	5% Shapiro Wilk P Value				0	Detected Data Not Normal at 5% Significance Level						
2053	Lilliefors Test Statistic				0.452	Lilliefors GOF Test						
2054	5% Lilliefors Critical Value				0.113	Detected Data Not Normal at 5% Significance Level						
2055	Detected Data Not Normal at 5% Significance Level											
2056												
2057	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2058	Mean				13.34	Standard Error of Mean					5.543	
2059	SD				44.66	95% KM (BCA) UCL					24.22	
2060	95% KM (t) UCL				22.59	95% KM (Percentile Bootstrap) UCL					23.54	
2061	95% KM (z) UCL				22.46	95% KM Bootstrap t UCL					33.28	
2062	90% KM Chebyshev UCL				29.97	95% KM Chebyshev UCL					37.5	
2063	97.5% KM Chebyshev UCL				47.96	99% KM Chebyshev UCL					68.5	
2064												
2065	Gamma GOF Tests on Detected Observations Only											
2066	A-D Test Statistic				4.059	Anderson-Darling GOF Test						
2067	5% A-D Critical Value				0.906	Detected Data Not Gamma Distributed at 5% Significance Level						
2068	K-S Test Statistic				0.216	Kolmogrov-Smirnoff GOF						
2069	5% K-S Critical Value				0.126	Detected Data Not Gamma Distributed at 5% Significance Level						
2070	Detected Data Not Gamma Distributed at 5% Significance Level											
2071												
2072	Gamma Statistics on Detected Data Only											

	A	B	C	D	E	F	G	H	I	J	K	L
2073	k hat (MLE)					0.217	k star (bias corrected MLE)					0.217
2074	Theta hat (MLE)					66.63	Theta star (bias corrected MLE)					66.54
2075	nu hat (MLE)					26.43	nu star (bias corrected)					26.47
2076	MLE Mean (bias corrected)					14.44	MLE Sd (bias corrected)					30.99
2077												
2078	Gamma Kaplan-Meier (KM) Statistics											
2079	k hat (KM)					0.0892	nu hat (KM)					11.78
2080	Approximate Chi Square Value (11.78, α)					5.082	Adjusted Chi Square Value (11.78, β)					4.984
2081	5% Gamma Approximate KM-UCL (use when n>=50)					30.92	95% Gamma Adjusted KM-UCL (use when n<50)					31.53
2082	Gamma (KM) may not be used when k hat (KM) is < 0.1											
2083												
2084	Gamma ROS Statistics using Imputed Non-Detects											
2085	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2086	GROS may not be used when kstar of detected data is small such as < 0.1											
2087	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2088	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2089	Minimum					0.00533	Mean					13.34
2090	Maximum					250	Median					0.436
2091	SD					45.01	CV					3.373
2092	k hat (MLE)					0.205	k star (bias corrected MLE)					0.206
2093	Theta hat (MLE)					65.03	Theta star (bias corrected MLE)					64.79
2094	nu hat (MLE)					27.08	nu star (bias corrected)					27.19
2095	MLE Mean (bias corrected)					13.34	MLE Sd (bias corrected)					29.4
2096							Adjusted Level of Significance (β)					0.0464
2097	Approximate Chi Square Value (27.19, α)					16.29	Adjusted Chi Square Value (27.19, β)					16.11
2098	95% Gamma Approximate UCL (use when n>=50)					22.26	95% Gamma Adjusted UCL (use when n<50)					22.52
2099												
2100	Lognormal GOF Test on Detected Observations Only											
2101	Lilliefors Test Statistic					0.0826	Lilliefors GOF Test					
2102	5% Lilliefors Critical Value					0.113	Detected Data appear Lognormal at 5% Significance Level					
2103	Detected Data appear Approximate Lognormal at 5% Significance Level											
2104												
2105	Lognormal ROS Statistics Using Imputed Non-Detects											
2106	Mean in Original Scale					13.34	Mean in Log Scale					-1.074
2107	SD in Original Scale					45.01	SD in Log Scale					3.094
2108	95% t UCL (assumes normality of ROS data)					22.59	95% Percentile Bootstrap UCL					23.71
2109	95% BCA Bootstrap UCL					27.05	95% Bootstrap t UCL					35.78
2110	95% H-UCL (Log ROS)					187.2						
2111												
2112	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2113	KM Mean (logged)					-1.008	95% H-UCL (KM -Log)					121
2114	KM SD (logged)					2.971	95% Critical H Value (KM-Log)					3.773
2115	KM Standard Error of Mean (logged)					0.369						
2116												
2117	DL/2 Statistics											
2118	DL/2 Normal						DL/2 Log-Transformed					
2119	Mean in Original Scale					13.34	Mean in Log Scale					-1.032
2120	SD in Original Scale					45.01	SD in Log Scale					3.03
2121	95% t UCL (Assumes normality)					22.59	95% H-Stat UCL					149.9
2122	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2123												
2124	Nonparametric Distribution Free UCL Statistics											
2125	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2126												
2127	Suggested UCL to Use											
2128	97.5% KM (Chebyshev) UCL					47.96						

	A	B	C	D	E	F	G	H	I	J	K	L
2129												
2130	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2131	Recommendations are based upon data size, data distribution, and skewness.											
2132	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2133	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2134												
2135	Dibenz(a,h)anthracene											
2136												
2137	General Statistics											
2138	Total Number of Observations					66	Number of Distinct Observations					60
2139	Number of Detects					47	Number of Non-Detects					19
2140	Number of Distinct Detects					47	Number of Distinct Non-Detects					14
2141	Minimum Detect					0.00138	Minimum Non-Detect					0.0027
2142	Maximum Detect					34	Maximum Non-Detect					0.029
2143	Variance Detects					43.4	Percent Non-Detects					28.79%
2144	Mean Detects					2.495	SD Detects					6.588
2145	Median Detects					0.21	CV Detects					2.64
2146	Skewness Detects					3.471	Kurtosis Detects					12.58
2147	Mean of Logged Detects					-1.737	SD of Logged Detects					2.626
2148												
2149	Normal GOF Test on Detects Only											
2150	Shapiro Wilk Test Statistic					0.438	Shapiro Wilk GOF Test					
2151	5% Shapiro Wilk Critical Value					0.946	Detected Data Not Normal at 5% Significance Level					
2152	Lilliefors Test Statistic					0.426	Lilliefors GOF Test					
2153	5% Lilliefors Critical Value					0.129	Detected Data Not Normal at 5% Significance Level					
2154	Detected Data Not Normal at 5% Significance Level											
2155												
2156	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2157	Mean					1.778	Standard Error of Mean					0.699
2158	SD					5.614	95% KM (BCA) UCL					2.998
2159	95% KM (t) UCL					2.943	95% KM (Percentile Bootstrap) UCL					2.994
2160	95% KM (z) UCL					2.927	95% KM Bootstrap t UCL					3.843
2161	90% KM Chebyshev UCL					3.874	95% KM Chebyshev UCL					4.823
2162	97.5% KM Chebyshev UCL					6.14	99% KM Chebyshev UCL					8.728
2163												
2164	Gamma GOF Tests on Detected Observations Only											
2165	A-D Test Statistic					2.4	Anderson-Darling GOF Test					
2166	5% A-D Critical Value					0.879	Detected Data Not Gamma Distributed at 5% Significance Level					
2167	K-S Test Statistic					0.204	Kolmogrov-Smirnoff GOF					
2168	5% K-S Critical Value					0.141	Detected Data Not Gamma Distributed at 5% Significance Level					
2169	Detected Data Not Gamma Distributed at 5% Significance Level											
2170												
2171	Gamma Statistics on Detected Data Only											
2172	k hat (MLE)					0.265	k star (bias corrected MLE)					0.263
2173	Theta hat (MLE)					9.404	Theta star (bias corrected MLE)					9.502
2174	nu hat (MLE)					24.94	nu star (bias corrected)					24.68
2175	MLE Mean (bias corrected)					2.495	MLE Sd (bias corrected)					4.869
2176												
2177	Gamma Kaplan-Meier (KM) Statistics											
2178	k hat (KM)					0.1	nu hat (KM)					13.24
2179	Approximate Chi Square Value (13.24, α)					6.051	Adjusted Chi Square Value (13.24, β)					5.943
2180	5% Gamma Approximate KM-UCL (use when n>=50)					3.888	95% Gamma Adjusted KM-UCL (use when n<50)					3.96
2181												
2182	Gamma ROS Statistics using Imputed Non-Detects											
2183	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2184	GROS may not be used when kstar of detected data is small such as < 0.1											

	A	B	C	D	E	F	G	H	I	J	K	L
2185	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2186	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2187			Minimum		0.00138					Mean		1.78
2188			Maximum		34					Median		0.0446
2189			SD		5.657					CV		3.178
2190			k hat (MLE)		0.229					k star (bias corrected MLE)		0.229
2191			Theta hat (MLE)		7.758					Theta star (bias corrected MLE)		7.769
2192			nu hat (MLE)		30.28					nu star (bias corrected)		30.24
2193			MLE Mean (bias corrected)		1.78					MLE Sd (bias corrected)		3.719
2194										Adjusted Level of Significance (β)		0.0464
2195			Approximate Chi Square Value (30.24, α)		18.68					Adjusted Chi Square Value (30.24, β)		18.48
2196			95% Gamma Approximate UCL (use when $n \geq 50$)		2.881					95% Gamma Adjusted UCL (use when $n < 50$)		2.913
2197												
2198	Lognormal GOF Test on Detected Observations Only											
2199			Shapiro Wilk Test Statistic		0.963					Shapiro Wilk GOF Test		
2200			5% Shapiro Wilk Critical Value		0.946					Detected Data appear Lognormal at 5% Significance Level		
2201			Lilliefors Test Statistic		0.075					Lilliefors GOF Test		
2202			5% Lilliefors Critical Value		0.129					Detected Data appear Lognormal at 5% Significance Level		
2203	Detected Data appear Lognormal at 5% Significance Level											
2204												
2205	Lognormal ROS Statistics Using Imputed Non-Detects											
2206			Mean in Original Scale		1.778					Mean in Log Scale		-3.011
2207			SD in Original Scale		5.657					SD in Log Scale		3.028
2208			95% t UCL (assumes normality of ROS data)		2.94					95% Percentile Bootstrap UCL		2.981
2209			95% BCA Bootstrap UCL		3.454					95% Bootstrap t UCL		3.877
2210			95% H-UCL (Log ROS)		20.56							
2211												
2212	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2213			KM Mean (logged)		-2.968					95% H-UCL (KM -Log)		15.13
2214			KM SD (logged)		2.942					95% Critical H Value (KM-Log)		3.722
2215			KM Standard Error of Mean (logged)		0.37							
2216												
2217	DL/2 Statistics											
2218			DL/2 Normal							DL/2 Log-Transformed		
2219			Mean in Original Scale		1.779					Mean in Log Scale		-2.829
2220			SD in Original Scale		5.657					SD in Log Scale		2.843
2221			95% t UCL (Assumes normality)		2.941					95% H-Stat UCL		11.79
2222	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2223												
2224	Nonparametric Distribution Free UCL Statistics											
2225	Detected Data appear Lognormal Distributed at 5% Significance Level											
2226												
2227	Suggested UCL to Use											
2228			97.5% KM (Chebyshev) UCL		6.14							
2229												
2230	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2231	Recommendations are based upon data size, data distribution, and skewness.											
2232	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2234												
2235	Ethylbenzene											
2236												
2237	General Statistics											
2238			Total Number of Observations		10					Number of Distinct Observations		7
2239			Number of Detects		1					Number of Non-Detects		9
2240			Number of Distinct Detects		1					Number of Distinct Non-Detects		6

	A	B	C	D	E	F	G	H	I	J	K	L
2241												
2242	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
2243	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF)											
2244												
2245	The data set for variable Ethylbenzene was not processed!											
2246												
2247												
2248	Fluoranthene											
2249												
2250	General Statistics											
2251	Total Number of Observations					66	Number of Distinct Observations					63
2252	Number of Detects					62	Number of Non-Detects					4
2253	Number of Distinct Detects					59	Number of Distinct Non-Detects					4
2254	Minimum Detect					0.00439	Minimum Non-Detect					0.0075
2255	Maximum Detect					650	Maximum Non-Detect					0.029
2256	Variance Detects					10958	Percent Non-Detects					6.0619
2257	Mean Detects					31.86	SD Detects					104.7
2258	Median Detects					1.3	CV Detects					3.285
2259	Skewness Detects					4.454	Kurtosis Detects					21.79
2260	Mean of Logged Detects					-0.126	SD of Logged Detects					3.108
2261												
2262	Normal GOF Test on Detects Only											
2263	Shapiro Wilk Test Statistic					0.357	Normal GOF Test on Detected Observations Only					
2264	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
2265	Lilliefors Test Statistic					0.449	Lilliefors GOF Test					
2266	5% Lilliefors Critical Value					0.113	Detected Data Not Normal at 5% Significance Level					
2267	Detected Data Not Normal at 5% Significance Level											
2268												
2269	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2270	Mean					29.93	Standard Error of Mean					12.52
2271	SD					100.9	95% KM (BCA) UCL					54.43
2272	95% KM (t) UCL					50.83	95% KM (Percentile Bootstrap) UCL					53.6
2273	95% KM (z) UCL					50.53	95% KM Bootstrap t UCL					76.69
2274	90% KM Chebyshev UCL					67.51	95% KM Chebyshev UCL					84.52
2275	97.5% KM Chebyshev UCL					108.1	99% KM Chebyshev UCL					154.5
2276												
2277	Gamma GOF Tests on Detected Observations Only											
2278	A-D Test Statistic					3.711	Anderson-Darling GOF Test					
2279	5% A-D Critical Value					0.912	Detected Data Not Gamma Distributed at 5% Significance Level					
2280	K-S Test Statistic					0.204	Kolmogrov-Smirnoff GOF					
2281	5% K-S Critical Value					0.126	Detected Data Not Gamma Distributed at 5% Significance Level					
2282	Detected Data Not Gamma Distributed at 5% Significance Level											
2283												
2284	Gamma Statistics on Detected Data Only											
2285	k hat (MLE)					0.204	k star (bias corrected MLE)					0.205
2286	Theta hat (MLE)					155.9	Theta star (bias corrected MLE)					155.2
2287	nu hat (MLE)					25.35	nu star (bias corrected)					25.46
2288	MLE Mean (bias corrected)					31.86	MLE Sd (bias corrected)					70.32
2289												
2290	Gamma Kaplan-Meier (KM) Statistics											
2291	k hat (KM)					0.088	nu hat (KM)					11.61
2292	Approximate Chi Square Value (11.61, α)					4.973	Adjusted Chi Square Value (11.61, β)					4.876
2293	5% Gamma Approximate KM-UCL (use when n>=50)					69.9	95% Gamma Adjusted KM-UCL (use when n<50)					71.29
2294	Gamma (KM) may not be used when k hat (KM) is < 0.1											
2295												
2296	Gamma ROS Statistics using Imputed Non-Detects											

	A	B	C	D	E	F	G	H	I	J	K	L
2297	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2298	GROS may not be used when kstar of detected data is small such as < 0.1											
2299	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2300	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2301		Minimum	0.00439							Mean	29.93	
2302		Maximum	650							Median	1.105	
2303		SD	101.7							CV	3.397	
2304		k hat (MLE)	0.195							k star (bias corrected MLE)	0.196	
2305		Theta hat (MLE)	153.8							Theta star (bias corrected MLE)	152.8	
2306		nu hat (MLE)	25.7							nu star (bias corrected)	25.86	
2307		MLE Mean (bias corrected)	29.93							MLE Sd (bias corrected)	67.63	
2308										Adjusted Level of Significance (β)	0.0464	
2309		Approximate Chi Square Value (25.86, α)	15.27							Adjusted Chi Square Value (25.86, β)	15.09	
2310		95% Gamma Approximate UCL (use when n>=50)	50.69							95% Gamma Adjusted UCL (use when n<50)	51.3	
2311												
2312	Lognormal GOF Test on Detected Observations Only											
2313		Lilliefors Test Statistic	0.0744							Lilliefors GOF Test		
2314		5% Lilliefors Critical Value	0.113							Detected Data appear Lognormal at 5% Significance Level		
2315	Detected Data appear Approximate Lognormal at 5% Significance Level											
2316												
2317	Lognormal ROS Statistics Using Imputed Non-Detects											
2318		Mean in Original Scale	29.93							Mean in Log Scale	-0.465	
2319		SD in Original Scale	101.7							SD in Log Scale	3.302	
2320		95% t UCL (assumes normality of ROS data)	50.82							95% Percentile Bootstrap UCL	52.85	
2321		95% BCA Bootstrap UCL	62.38							95% Bootstrap t UCL	73.82	
2322		95% H-UCL (Log ROS)	833.6									
2323												
2324	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2325		KM Mean (logged)	-0.424							95% H-UCL (KM -Log)	589	
2326		KM SD (logged)	3.213							95% Critical H Value (KM-Log)	4.12	
2327		KM Standard Error of Mean (logged)	0.399									
2328												
2329	DL/2 Statistics											
2330	DL/2 Normal			DL/2 Log-Transformed								
2331		Mean in Original Scale	29.93							Mean in Log Scale	-0.433	
2332		SD in Original Scale	101.7							SD in Log Scale	3.251	
2333		95% t UCL (Assumes normality)	50.82							95% H-Stat UCL	688.5	
2334	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2335												
2336	Nonparametric Distribution Free UCL Statistics											
2337	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2338												
2339	Suggested UCL to Use											
2340		97.5% KM (Chebyshev) UCL	108.1									
2341												
2342	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2343	Recommendations are based upon data size, data distribution, and skewness.											
2344	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2345	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2346												
2347	Fluorene											
2348												
2349	General Statistics											
2350		Total Number of Observations	66							Number of Distinct Observations	60	
2351		Number of Detects	46							Number of Non-Detects	20	
2352		Number of Distinct Detects	44							Number of Distinct Non-Detects	17	

	A	B	C	D	E	F	G	H	I	J	K	L
2353	Minimum Detect					0.00215	Minimum Non-Detect					0.00266
2354	Maximum Detect					51	Maximum Non-Detect					0.029
2355	Variance Detects					89.58	Percent Non-Detects					30.3%
2356	Mean Detects					3.279	SD Detects					9.465
2357	Median Detects					0.238	CV Detects					2.886
2358	Skewness Detects					3.79	Kurtosis Detects					15.48
2359	Mean of Logged Detects					-1.579	SD of Logged Detects					2.461
2360												
2361	Normal GOF Test on Detects Only											
2362	Shapiro Wilk Test Statistic					0.405	Shapiro Wilk GOF Test					
2363	5% Shapiro Wilk Critical Value					0.945	Detected Data Not Normal at 5% Significance Level					
2364	Lilliefors Test Statistic					0.448	Lilliefors GOF Test					
2365	5% Lilliefors Critical Value					0.131	Detected Data Not Normal at 5% Significance Level					
2366	Detected Data Not Normal at 5% Significance Level											
2367												
2368	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2369	Mean					2.286	Standard Error of Mean					0.991
2370	SD					7.959	95% KM (BCA) UCL					4.024
2371	95% KM (t) UCL					3.939	95% KM (Percentile Bootstrap) UCL					4.119
2372	95% KM (z) UCL					3.916	95% KM Bootstrap t UCL					5.446
2373	90% KM Chebyshev UCL					5.258	95% KM Chebyshev UCL					6.604
2374	97.5% KM Chebyshev UCL					8.472	99% KM Chebyshev UCL					12.14
2375												
2376	Gamma GOF Tests on Detected Observations Only											
2377	A-D Test Statistic					3.682	Anderson-Darling GOF Test					
2378	5% A-D Critical Value					0.884	Detected Data Not Gamma Distributed at 5% Significance Level					
2379	K-S Test Statistic					0.256	Kolmogrov-Smirnoff GOF					
2380	5% K-S Critical Value					0.143	Detected Data Not Gamma Distributed at 5% Significance Level					
2381	Detected Data Not Gamma Distributed at 5% Significance Level											
2382												
2383	Gamma Statistics on Detected Data Only											
2384	k hat (MLE)					0.256	k star (bias corrected MLE)					0.254
2385	Theta hat (MLE)					12.82	Theta star (bias corrected MLE)					12.93
2386	nu hat (MLE)					23.53	nu star (bias corrected)					23.33
2387	MLE Mean (bias corrected)					3.279	MLE Sd (bias corrected)					6.512
2388												
2389	Gamma Kaplan-Meier (KM) Statistics											
2390	k hat (KM)					0.0825	nu hat (KM)					10.89
2391	Approximate Chi Square Value (10.89, α)					4.507	Adjusted Chi Square Value (10.89, β)					4.415
2392	5% Gamma Approximate KM-UCL (use when n $\geq$ 50)					5.526	95% Gamma Adjusted KM-UCL (use when n $<$ 50)					5.64
2393	Gamma (KM) may not be used when k hat (KM) is $<$ 0.1											
2394												
2395	Gamma ROS Statistics using Imputed Non-Detects											
2396	GROS may not be used when data set has $>$ 50% NDs with many tied observations at multiple DLs											
2397	GROS may not be used when kstar of detected data is small such as $<$ 0.1											
2398	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2399	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2400	Minimum					0.00215	Mean					2.289
2401	Maximum					51	Median					0.0543
2402	SD					8.02	CV					3.504
2403	k hat (MLE)					0.218	k star (bias corrected MLE)					0.219
2404	Theta hat (MLE)					10.48	Theta star (bias corrected MLE)					10.47
2405	nu hat (MLE)					28.82	nu star (bias corrected)					28.85
2406	MLE Mean (bias corrected)					2.289	MLE Sd (bias corrected)					4.896
2407							Adjusted Level of Significance (β)					0.0464
2408	Approximate Chi Square Value (28.85, α)					17.59	Adjusted Chi Square Value (28.85, β)					17.39

	A	B	C	D	E	F	G	H	I	J	K	L
2409	95% Gamma Approximate UCL (use when n>=50)					3.753	95% Gamma Adjusted UCL (use when n<50)					3.796
2410												
2411	Lognormal GOF Test on Detected Observations Only											
2412	Shapiro Wilk Test Statistic					0.964	Shapiro Wilk GOF Test					
2413	5% Shapiro Wilk Critical Value					0.945	Detected Data appear Lognormal at 5% Significance Level					
2414	Lilliefors Test Statistic					0.0877	Lilliefors GOF Test					
2415	5% Lilliefors Critical Value					0.131	Detected Data appear Lognormal at 5% Significance Level					
2416	Detected Data appear Lognormal at 5% Significance Level											
2417												
2418	Lognormal ROS Statistics Using Imputed Non-Detects											
2419	Mean in Original Scale					2.286	Mean in Log Scale					-3.098
2420	SD in Original Scale					8.02	SD in Log Scale					3.113
2421	95% t UCL (assumes normality of ROS data)					3.933	95% Percentile Bootstrap UCL					4.059
2422	95% BCA Bootstrap UCL					4.708	95% Bootstrap t UCL					6.096
2423	95% H-UCL (Log ROS)					26.74						
2424												
2425	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2426	KM Mean (logged)					-2.925	95% H-UCL (KM -Log)					12.69
2427	KM SD (logged)					2.887	95% Critical H Value (KM-Log)					3.63
2428	KM Standard Error of Mean (logged)					0.36						
2429												
2430	DL/2 Statistics											
2431	DL/2 Normal					DL/2 Log-Transformed						
2432	Mean in Original Scale					2.287	Mean in Log Scale					-2.877
2433	SD in Original Scale					8.02	SD in Log Scale					2.883
2434	95% t UCL (Assumes normality)					3.934	95% H-Stat UCL					13.14
2435	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2436												
2437	Nonparametric Distribution Free UCL Statistics											
2438	Detected Data appear Lognormal Distributed at 5% Significance Level											
2439												
2440	Suggested UCL to Use											
2441	97.5% KM (Chebyshev) UCL					8.472						
2442												
2443	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2444	Recommendations are based upon data size, data distribution, and skewness.											
2445	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2446	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2447												
2448	Indeno(1,2,3-cd)pyrene											
2449												
2450	General Statistics											
2451	Total Number of Observations					66	Number of Distinct Observations					63
2452	Number of Detects					57	Number of Non-Detects					9
2453	Number of Distinct Detects					54	Number of Distinct Non-Detects					9
2454	Minimum Detect					0.00171	Minimum Non-Detect					0.0027
2455	Maximum Detect					93	Maximum Non-Detect					0.029
2456	Variance Detects					343.4	Percent Non-Detects					13.64%
2457	Mean Detects					6.476	SD Detects					18.53
2458	Median Detects					0.28	CV Detects					2.862
2459	Skewness Detects					3.465	Kurtosis Detects					11.67
2460	Mean of Logged Detects					-1.236	SD of Logged Detects					2.806
2461												
2462	Normal GOF Test on Detects Only											
2463	Shapiro Wilk Test Statistic					0.401	Normal GOF Test on Detected Observations Only					
2464	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L	
2465	Lilliefors Test Statistic					0.439	Lilliefors GOF Test						
2466	5% Lilliefors Critical Value					0.117	Detected Data Not Normal at 5% Significance Level						
2467	Detected Data Not Normal at 5% Significance Level												
2468													
2469	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
2470	Mean					5.593	Standard Error of Mean					2.138	
2471	SD					17.21	95% KM (BCA) UCL					9.34	
2472	95% KM (t) UCL					9.16	95% KM (Percentile Bootstrap) UCL					9.309	
2473	95% KM (z) UCL					9.109	95% KM Bootstrap t UCL					11.75	
2474	90% KM Chebyshev UCL					12.01	95% KM Chebyshev UCL					14.91	
2475	97.5% KM Chebyshev UCL					18.94	99% KM Chebyshev UCL					26.86	
2476													
2477	Gamma GOF Tests on Detected Observations Only												
2478	A-D Test Statistic					3.474	Anderson-Darling GOF Test						
2479	5% A-D Critical Value					0.898	Detected Data Not Gamma Distributed at 5% Significance Level						
2480	K-S Test Statistic					0.207	Kolmogrov-Smirnoff GOF						
2481	5% K-S Critical Value					0.13	Detected Data Not Gamma Distributed at 5% Significance Level						
2482	Detected Data Not Gamma Distributed at 5% Significance Level												
2483													
2484	Gamma Statistics on Detected Data Only												
2485	k hat (MLE)					0.232	k star (bias corrected MLE)					0.231	
2486	Theta hat (MLE)					27.95	Theta star (bias corrected MLE)					28.01	
2487	nu hat (MLE)					26.41	nu star (bias corrected)					26.35	
2488	MLE Mean (bias corrected)					6.476	MLE Sd (bias corrected)					13.47	
2489													
2490	Gamma Kaplan-Meier (KM) Statistics												
2491	k hat (KM)					0.106	nu hat (KM)					13.94	
2492	Approximate Chi Square Value (13.94, α)					6.527	Adjusted Chi Square Value (13.94, β)					6.414	
2493	5% Gamma Approximate KM-UCL (use when n>=50)					11.94	95% Gamma Adjusted KM-UCL (use when n<50)					12.15	
2494													
2495	Gamma ROS Statistics using Imputed Non-Detects												
2496	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
2497	GROS may not be used when kstar of detected data is small such as < 0.1												
2498	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
2499	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
2500	Minimum					0.00171	Mean					5.594	
2501	Maximum					93	Median					0.18	
2502	SD					17.35	CV					3.101	
2503	k hat (MLE)					0.213	k star (bias corrected MLE)					0.214	
2504	Theta hat (MLE)					26.24	Theta star (bias corrected MLE)					26.19	
2505	nu hat (MLE)					28.15	nu star (bias corrected)					28.2	
2506	MLE Mean (bias corrected)					5.594	MLE Sd (bias corrected)					12.1	
2507							Adjusted Level of Significance (β)					0.0464	
2508	Approximate Chi Square Value (28.20, α)					17.08	Adjusted Chi Square Value (28.20, β)					16.89	
2509	95% Gamma Approximate UCL (use when n>=50)					9.234	95% Gamma Adjusted UCL (use when n<50)					9.34	
2510													
2511	Lognormal GOF Test on Detected Observations Only												
2512	Lilliefors Test Statistic					0.076	Lilliefors GOF Test						
2513	5% Lilliefors Critical Value					0.117	Detected Data appear Lognormal at 5% Significance Level						
2514	Detected Data appear Lognormal at 5% Significance Level												
2515													
2516	Lognormal ROS Statistics Using Imputed Non-Detects												
2517	Mean in Original Scale					5.593	Mean in Log Scale					-1.9	
2518	SD in Original Scale					17.35	SD in Log Scale					3.108	
2519	95% t UCL (assumes normality of ROS data)					9.156	95% Percentile Bootstrap UCL					9.361	
2520	95% BCA Bootstrap UCL					10.65	95% Bootstrap t UCL					11.59	

	A	B	C	D	E	F	G	H	I	J	K	L	
2521	95% H-UCL (Log ROS)					86.74							
2522													
2523	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
2524	KM Mean (logged)				-1.884	95% H-UCL (KM -Log)						73.5	
2525	KM SD (logged)				3.064	95% Critical H Value (KM-Log)						3.914	
2526	KM Standard Error of Mean (logged)				0.382								
2527													
2528	DL/2 Statistics												
2529	DL/2 Normal					DL/2 Log-Transformed							
2530	Mean in Original Scale				5.593	Mean in Log Scale						-1.847	
2531	SD in Original Scale				17.35	SD in Log Scale						3.043	
2532	95% t UCL (Assumes normality)				9.156	95% H-Stat UCL						70	
2533	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2534													
2535	Nonparametric Distribution Free UCL Statistics												
2536	Detected Data appear Lognormal Distributed at 5% Significance Level												
2537													
2538	Suggested UCL to Use												
2539	97.5% KM (Chebyshev) UCL				18.94								
2540													
2541	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
2542	Recommendations are based upon data size, data distribution, and skewness.												
2543	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
2544	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
2545													
2546	Isopropylbenzene												
2547													
2548	General Statistics												
2549	Total Number of Observations				10	Number of Distinct Observations						7	
2550	Number of Detects				1	Number of Non-Detects						9	
2551	Number of Distinct Detects				1	Number of Distinct Non-Detects						6	
2552													
2553	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!												
2554	Suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EF).												
2555													
2556	The data set for variable Isopropylbenzene was not processed!												
2557													
2558													
2559													
2560	Lead												
2561													
2562	General Statistics												
2563	Total Number of Observations				10	Number of Distinct Observations						10	
2564						Number of Missing Observations						0	
2565	Minimum				12.1	Mean						20.62	
2566	Maximum				57.2	Median						13.65	
2567	SD				14.61	Std. Error of Mean						4.619	
2568	Coefficient of Variation				0.708	Skewness						2.15	
2569													
2570	Normal GOF Test												
2571	Shapiro Wilk Test Statistic				0.658	Shapiro Wilk GOF Test							
2572	5% Shapiro Wilk Critical Value				0.842	Data Not Normal at 5% Significance Level							
2573	Lilliefors Test Statistic				0.352	Lilliefors GOF Test							
2574	5% Lilliefors Critical Value				0.28	Data Not Normal at 5% Significance Level							
2575	Data Not Normal at 5% Significance Level												
2576													

	A	B	C	D	E	F	G	H	I	J	K	L
2577	Assuming Normal Distribution											
2578	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2579	95% Student's-t UCL				29.09	95% Adjusted-CLT UCL (Chen-1995)						31.57
2580						95% Modified-t UCL (Johnson-1978)						29.61
2581												
2582	Gamma GOF Test											
2583	A-D Test Statistic				1.319	Anderson-Darling Gamma GOF Test						
2584	5% A-D Critical Value				0.731	Data Not Gamma Distributed at 5% Significance Level						
2585	K-S Test Statistic				0.349	Kolmogrov-Smirnoff Gamma GOF Test						
2586	5% K-S Critical Value				0.268	Data Not Gamma Distributed at 5% Significance Level						
2587	Data Not Gamma Distributed at 5% Significance Level											
2588												
2589	Gamma Statistics											
2590	k hat (MLE)				3.401	k star (bias corrected MLE)						2.447
2591	Theta hat (MLE)				6.064	Theta star (bias corrected MLE)						8.426
2592	nu hat (MLE)				68.01	nu star (bias corrected)						48.94
2593	MLE Mean (bias corrected)				20.62	MLE Sd (bias corrected)						13.18
2594						Approximate Chi Square Value (0.05)						33.88
2595	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value						31.72
2596												
2597	Assuming Gamma Distribution											
2598	95% Approximate Gamma UCL (use when n>=50))				29.79	95% Adjusted Gamma UCL (use when n<50)						31.82
2599												
2600	Lognormal GOF Test											
2601	Shapiro Wilk Test Statistic				0.745	Shapiro Wilk Lognormal GOF Test						
2602	5% Shapiro Wilk Critical Value				0.842	Data Not Lognormal at 5% Significance Level						
2603	Lilliefors Test Statistic				0.326	Lilliefors Lognormal GOF Test						
2604	5% Lilliefors Critical Value				0.28	Data Not Lognormal at 5% Significance Level						
2605	Data Not Lognormal at 5% Significance Level											
2606												
2607	Lognormal Statistics											
2608	Minimum of Logged Data				2.493	Mean of logged Data						2.872
2609	Maximum of Logged Data				4.047	SD of logged Data						0.531
2610												
2611	Assuming Lognormal Distribution											
2612	95% H-UCL				30.39	90% Chebyshev (MVUE) UCL						30.34
2613	95% Chebyshev (MVUE) UCL				35	97.5% Chebyshev (MVUE) UCL						41.48
2614	99% Chebyshev (MVUE) UCL				54.19							
2615												
2616	Nonparametric Distribution Free UCL Statistics											
2617	Data do not follow a Discernible Distribution (0.05)											
2618												
2619	Nonparametric Distribution Free UCLs											
2620	95% CLT UCL				28.22	95% Jackknife UCL						29.09
2621	95% Standard Bootstrap UCL				27.93	95% Bootstrap-t UCL						49.52
2622	95% Hall's Bootstrap UCL				55.48	95% Percentile Bootstrap UCL						28.33
2623	95% BCA Bootstrap UCL				31.35							
2624	90% Chebyshev(Mean, Sd) UCL				34.48	95% Chebyshev(Mean, Sd) UCL						40.75
2625	97.5% Chebyshev(Mean, Sd) UCL				49.46	99% Chebyshev(Mean, Sd) UCL						66.58
2626												
2627	Suggested UCL to Use											
2628	95% Chebyshev (Mean, Sd) UCL				40.75							
2629												
2630	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL											
2631	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
2632	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											

	A	B	C	D	E	F	G	H	I	J	K	L
2633	For additional insight the user may want to consult a statistician.											
2634												
2635	Mercury											
2636												
2637	General Statistics											
2638	Total Number of Observations					10	Number of Distinct Observations					9
2639	Number of Detects					7	Number of Non-Detects					3
2640	Number of Distinct Detects					6	Number of Distinct Non-Detects					3
2641	Minimum Detect					0.018	Minimum Non-Detect					0.068
2642	Maximum Detect					0.059	Maximum Non-Detect					0.12
2643	Variance Detects					2.3424E-4	Percent Non-Detects					30%
2644	Mean Detects					0.0337	SD Detects					0.0153
2645	Median Detects					0.025	CV Detects					0.454
2646	Skewness Detects					0.734	Kurtosis Detects					-0.929
2647	Mean of Logged Detects					-3.476	SD of Logged Detects					0.444
2648												
2649	Normal GOF Test on Detects Only											
2650	Shapiro Wilk Test Statistic					0.873	Shapiro Wilk GOF Test					
2651	5% Shapiro Wilk Critical Value					0.803	Detected Data appear Normal at 5% Significance Level					
2652	Lilliefors Test Statistic					0.287	Lilliefors GOF Test					
2653	5% Lilliefors Critical Value					0.335	Detected Data appear Normal at 5% Significance Level					
2654	Detected Data appear Normal at 5% Significance Level											
2655												
2656	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2657	Mean					0.0337	Standard Error of Mean					0.00578
2658	SD					0.0142	95% KM (BCA) UCL					0.043
2659	95% KM (t) UCL					0.0443	95% KM (Percentile Bootstrap) UCL					0.0429
2660	95% KM (z) UCL					0.0432	95% KM Bootstrap t UCL					0.0489
2661	90% KM Chebyshev UCL					0.0511	95% KM Chebyshev UCL					0.0589
2662	97.5% KM Chebyshev UCL					0.0698	99% KM Chebyshev UCL					0.0913
2663												
2664	Gamma GOF Tests on Detected Observations Only											
2665	A-D Test Statistic					0.487	Anderson-Darling GOF Test					
2666	5% A-D Critical Value					0.71	Detected data appear Gamma Distributed at 5% Significance Level					
2667	K-S Test Statistic					0.283	Kolmogrov-Smirnoff GOF					
2668	5% K-S Critical Value					0.313	Detected data appear Gamma Distributed at 5% Significance Level					
2669	Detected data appear Gamma Distributed at 5% Significance Level											
2670												
2671	Gamma Statistics on Detected Data Only											
2672	k hat (MLE)					5.983	k star (bias corrected MLE)					3.514
2673	Theta hat (MLE)					0.00563	Theta star (bias corrected MLE)					0.00959
2674	nu hat (MLE)					83.77	nu star (bias corrected)					49.2
2675	MLE Mean (bias corrected)					0.0337	MLE Sd (bias corrected)					0.018
2676												
2677	Gamma Kaplan-Meier (KM) Statistics											
2678	k hat (KM)					5.661	nu hat (KM)					113.2
2679	Approximate Chi Square Value (113.23, α)					89.66	Adjusted Chi Square Value (113.23, β)					86.02
2680	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					0.0426	95% Gamma Adjusted KM-UCL (use when $n < 50$)					0.0444
2681												
2682	Gamma ROS Statistics using Imputed Non-Detects											
2683	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2684	GROS may not be used when kstar of detected data is small such as < 0.1											
2685	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2686	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2687	Minimum					0.018	Mean					0.0333
2688	Maximum					0.059	Median					0.0323

	A	B	C	D	E	F	G	H	I	J	K	L
2689	SD					0.0125	CV					0.376
2690	k hat (MLE)					8.455	k star (bias corrected MLE)					5.985
2691	Theta hat (MLE)					0.00394	Theta star (bias corrected MLE)					0.00556
2692	nu hat (MLE)					169.1	nu star (bias corrected)					119.7
2693	MLE Mean (bias corrected)					0.0333	MLE Sd (bias corrected)					0.0136
2694							Adjusted Level of Significance (β)					0.0267
2695	Approximate Chi Square Value (119.70, α)					95.44	Adjusted Chi Square Value (119.70, β)					91.68
2696	95% Gamma Approximate UCL (use when n>=50)					0.0418	95% Gamma Adjusted UCL (use when n<50)					0.0435
2697												
2698	Lognormal GOF Test on Detected Observations Only											
2699	Shapiro Wilk Test Statistic					0.904	Shapiro Wilk GOF Test					
2700	5% Shapiro Wilk Critical Value					0.803	Detected Data appear Lognormal at 5% Significance Level					
2701	Lilliefors Test Statistic					0.256	Lilliefors GOF Test					
2702	5% Lilliefors Critical Value					0.335	Detected Data appear Lognormal at 5% Significance Level					
2703	Detected Data appear Lognormal at 5% Significance Level											
2704												
2705	Lognormal ROS Statistics Using Imputed Non-Detects											
2706	Mean in Original Scale					0.0329	Mean in Log Scale					-3.476
2707	SD in Original Scale					0.0126	SD in Log Scale					0.363
2708	95% t UCL (assumes normality of ROS data)					0.0402	95% Percentile Bootstrap UCL					0.0394
2709	95% BCA Bootstrap UCL					0.0404	95% Bootstrap t UCL					0.0428
2710	95% H-UCL (Log ROS)					0.0423						
2711												
2712	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2713	KM Mean (logged)					-3.476	95% H-UCL (KM -Log)					0.0449
2714	KM SD (logged)					0.411	95% Critical H Value (KM-Log)					2.103
2715	KM Standard Error of Mean (logged)					0.168						
2716												
2717	DL/2 Statistics											
2718	DL/2 Normal						DL/2 Log-Transformed					
2719	Mean in Original Scale					0.0372	Mean in Log Scale					-3.369
2720	SD in Original Scale					0.0151	SD in Log Scale					0.423
2721	95% t UCL (Assumes normality)					0.0459	95% H-Stat UCL					0.0507
2722	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2723												
2724	Nonparametric Distribution Free UCL Statistics											
2725	Detected Data appear Normal Distributed at 5% Significance Level											
2726												
2727	Suggested UCL to Use											
2728	95% KM (t) UCL					0.0443	95% KM (Percentile Bootstrap) UCL					0.0429
2729												
2730	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2731	Recommendations are based upon data size, data distribution, and skewness.											
2732	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2733	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2734												
2735												
2736	Methylene chloride											
2737												
2738	General Statistics											
2739	Total Number of Observations					10	Number of Distinct Observations					10
2740							Number of Missing Observations					0
2741	Minimum					0.0045	Mean					0.00707
2742	Maximum					0.011	Median					0.00745
2743	SD					0.00215	Std. Error of Mean					6.8118E-4
2744	Coefficient of Variation					0.305	Skewness					0.41

	A	B	C	D	E	F	G	H	I	J	K	L
2745												
2746	Normal GOF Test											
2747	Shapiro Wilk Test Statistic					0.928	Shapiro Wilk GOF Test					
2748	5% Shapiro Wilk Critical Value					0.842	Data appear Normal at 5% Significance Level					
2749	Lilliefors Test Statistic					0.194	Lilliefors GOF Test					
2750	5% Lilliefors Critical Value					0.28	Data appear Normal at 5% Significance Level					
2751	Data appear Normal at 5% Significance Level											
2752												
2753	Assuming Normal Distribution											
2754	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
2755	95% Student's-t UCL					0.00832	95% Adjusted-CLT UCL (Chen-1995)					0.00828
2756							95% Modified-t UCL (Johnson-1978)					0.00833
2757												
2758	Gamma GOF Test											
2759	A-D Test Statistic					0.388	Anderson-Darling Gamma GOF Test					
2760	5% A-D Critical Value					0.725	etected data appear Gamma Distributed at 5% Significance Level					
2761	K-S Test Statistic					0.203	Kolmogrov-Smirnoff Gamma GOF Test					
2762	5% K-S Critical Value					0.267	etected data appear Gamma Distributed at 5% Significance Level					
2763	Detected data appear Gamma Distributed at 5% Significance Level											
2764												
2765	Gamma Statistics											
2766	k hat (MLE)					11.99	k star (bias corrected MLE)					8.459
2767	Theta hat (MLE)					5.8967E-4	Theta star (bias corrected MLE)					8.3575E-4
2768	nu hat (MLE)					239.8	nu star (bias corrected)					169.2
2769	MLE Mean (bias corrected)					0.00707	MLE Sd (bias corrected)					0.00243
2770							Approximate Chi Square Value (0.05)					140.1
2771	Adjusted Level of Significance					0.0267	Adjusted Chi Square Value					135.5
2772												
2773	Assuming Gamma Distribution											
2774	95% Approximate Gamma UCL (use when n>=50))					0.00854	95% Adjusted Gamma UCL (use when n<50)					0.00883
2775												
2776	Lognormal GOF Test											
2777	Shapiro Wilk Test Statistic					0.926	Shapiro Wilk Lognormal GOF Test					
2778	5% Shapiro Wilk Critical Value					0.842	Data appear Lognormal at 5% Significance Level					
2779	Lilliefors Test Statistic					0.195	Lilliefors Lognormal GOF Test					
2780	5% Lilliefors Critical Value					0.28	Data appear Lognormal at 5% Significance Level					
2781	Data appear Lognormal at 5% Significance Level											
2782												
2783	Lognormal Statistics											
2784	Minimum of Logged Data					-5.404	Mean of logged Data					-4.994
2785	Maximum of Logged Data					-4.51	SD of logged Data					0.308
2786												
2787	Assuming Lognormal Distribution											
2788	95% H-UCL					0.00871	90% Chebyshev (MVUE) UCL					0.00915
2789	95% Chebyshev (MVUE) UCL					0.0101	97.5% Chebyshev (MVUE) UCL					0.0114
2790	99% Chebyshev (MVUE) UCL					0.014						
2791												
2792	Nonparametric Distribution Free UCL Statistics											
2793	Data appear to follow a Discernible Distribution at 5% Significance Level											
2794												
2795	Nonparametric Distribution Free UCLs											
2796	95% CLT UCL					0.00819	95% Jackknife UCL					0.00832
2797	95% Standard Bootstrap UCL					0.00813	95% Bootstrap-t UCL					0.00843
2798	95% Hall's Bootstrap UCL					0.00828	95% Percentile Bootstrap UCL					0.00814
2799	95% BCA Bootstrap UCL					0.00815						
2800	90% Chebyshev(Mean, Sd) UCL					0.00911	95% Chebyshev(Mean, Sd) UCL					0.01

	A	B	C	D	E	F	G	H	I	J	K	L
2801	97.5% Chebyshev(Mean, Sd) UCL					0.0113	99% Chebyshev(Mean, Sd) UCL					0.0138
2802												
2803	Suggested UCL to Use											
2804	95% Student's-t UCL				0.00832							
2805												
2806	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2807	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
2808	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
2809	For additional insight the user may want to consult a statistician.											
2810												
2811	Naphthalene											
2812												
2813	General Statistics											
2814	Total Number of Observations				66	Number of Distinct Observations				61		
2815	Number of Detects				49	Number of Non-Detects				17		
2816	Number of Distinct Detects				48	Number of Distinct Non-Detects				14		
2817	Minimum Detect				0.00142	Minimum Non-Detect				0.00266		
2818	Maximum Detect				11	Maximum Non-Detect				0.15		
2819	Variance Detects				3.494	Percent Non-Detects				25.76%		
2820	Mean Detects				0.603	SD Detects				1.869		
2821	Median Detects				0.028	CV Detects				3.101		
2822	Skewness Detects				4.296	Kurtosis Detects				20.75		
2823	Mean of Logged Detects				-3.219	SD of Logged Detects				2.202		
2824												
2825	Normal GOF Test on Detects Only											
2826	Shapiro Wilk Test Statistic				0.377	Shapiro Wilk GOF Test						
2827	5% Shapiro Wilk Critical Value				0.947	Detected Data Not Normal at 5% Significance Level						
2828	Lilliefors Test Statistic				0.454	Lilliefors GOF Test						
2829	5% Lilliefors Critical Value				0.127	Detected Data Not Normal at 5% Significance Level						
2830	Detected Data Not Normal at 5% Significance Level											
2831												
2832	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2833	Mean				0.449	Standard Error of Mean				0.201		
2834	SD				1.615	95% KM (BCA) UCL				0.818		
2835	95% KM (t) UCL				0.785	95% KM (Percentile Bootstrap) UCL				0.811		
2836	95% KM (z) UCL				0.78	95% KM Bootstrap t UCL				1.195		
2837	90% KM Chebyshev UCL				1.052	95% KM Chebyshev UCL				1.325		
2838	97.5% KM Chebyshev UCL				1.704	99% KM Chebyshev UCL				2.448		
2839												
2840	Gamma GOF Tests on Detected Observations Only											
2841	A-D Test Statistic				5.252	Anderson-Darling GOF Test						
2842	5% A-D Critical Value				0.882	Detected Data Not Gamma Distributed at 5% Significance Level						
2843	K-S Test Statistic				0.277	Kolmogrov-Smirnoff GOF						
2844	5% K-S Critical Value				0.139	Detected Data Not Gamma Distributed at 5% Significance Level						
2845	Detected Data Not Gamma Distributed at 5% Significance Level											
2846												
2847	Gamma Statistics on Detected Data Only											
2848	k hat (MLE)				0.26	k star (bias corrected MLE)				0.258		
2849	Theta hat (MLE)				2.317	Theta star (bias corrected MLE)				2.338		
2850	nu hat (MLE)				25.49	nu star (bias corrected)				25.27		
2851	MLE Mean (bias corrected)				0.603	MLE Sd (bias corrected)				1.187		
2852												
2853	Gamma Kaplan-Meier (KM) Statistics											
2854	k hat (KM)				0.0774	nu hat (KM)				10.22		
2855	Approximate Chi Square Value (10.22, α)				4.079	Adjusted Chi Square Value (10.22, β)				3.992		
2856	5% Gamma Approximate KM-UCL (use when n>=50)				1.126	95% Gamma Adjusted KM-UCL (use when n<50)				1.15		

	A	B	C	D	E	F	G	H	I	J	K	L
2857	Gamma (KM) may not be used when k hat (KM) is < 0.1											
2858												
2859	Gamma ROS Statistics using Imputed Non-Detects											
2860	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2861	GROS may not be used when kstar of detected data is small such as < 0.1											
2862	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2863	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2864	Minimum				0.00142		Mean				0.45	
2865	Maximum				11		Median				0.0115	
2866	SD				1.627		CV				3.616	
2867	k hat (MLE)				0.255		k star (bias corrected MLE)				0.253	
2868	Theta hat (MLE)				1.766		Theta star (bias corrected MLE)				1.776	
2869	nu hat (MLE)				33.65		nu star (bias corrected)				33.45	
2870	MLE Mean (bias corrected)				0.45		MLE Sd (bias corrected)				0.894	
2871							Adjusted Level of Significance (β)				0.0464	
2872	Approximate Chi Square Value (33.45, α)				21.23		Adjusted Chi Square Value (33.45, β)				21.01	
2873	95% Gamma Approximate UCL (use when n>=50)				0.709		95% Gamma Adjusted UCL (use when n<50)				0.717	
2874												
2875	Lognormal GOF Test on Detected Observations Only											
2876	Shapiro Wilk Test Statistic				0.929		Shapiro Wilk GOF Test					
2877	5% Shapiro Wilk Critical Value				0.947		Detected Data Not Lognormal at 5% Significance Level					
2878	Lilliefors Test Statistic				0.097		Lilliefors GOF Test					
2879	5% Lilliefors Critical Value				0.127		Detected Data appear Lognormal at 5% Significance Level					
2880	Detected Data appear Approximate Lognormal at 5% Significance Level											
2881												
2882	Lognormal ROS Statistics Using Imputed Non-Detects											
2883	Mean in Original Scale				0.449		Mean in Log Scale				-3.948	
2884	SD in Original Scale				1.628		SD in Log Scale				2.336	
2885	95% t UCL (assumes normality of ROS data)				0.783		95% Percentile Bootstrap UCL				0.792	
2886	95% BCA Bootstrap UCL				0.967		95% Bootstrap t UCL				1.195	
2887	95% H-UCL (Log ROS)				0.741							
2888												
2889	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2890	KM Mean (logged)				-3.841		95% H-UCL (KM -Log)				0.587	
2891	KM SD (logged)				2.212		95% Critical H Value (KM-Log)				3.142	
2892	KM Standard Error of Mean (logged)				0.281							
2893												
2894	DL/2 Statistics											
2895	DL/2 Normal					DL/2 Log-Transformed						
2896	Mean in Original Scale				0.451		Mean in Log Scale				-3.701	
2897	SD in Original Scale				1.627		SD in Log Scale				2.181	
2898	95% t UCL (Assumes normality)				0.786		95% H-Stat UCL				0.622	
2899	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2900												
2901	Nonparametric Distribution Free UCL Statistics											
2902	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2903												
2904	Suggested UCL to Use											
2905	97.5% KM (Chebyshev) UCL				1.704							
2906												
2907	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2908	Recommendations are based upon data size, data distribution, and skewness.											
2909	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2910	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2911												
2912	Phenanthrene											

	A	B	C	D	E	F	G	H	I	J	K	L
2913												
2914	General Statistics											
2915	Total Number of Observations					66	Number of Distinct Observations					62
2916	Number of Detects					64	Number of Non-Detects					2
2917	Number of Distinct Detects					60	Number of Distinct Non-Detects					2
2918	Minimum Detect					0.00588	Minimum Non-Detect					0.0094
2919	Maximum Detect					510	Maximum Non-Detect					0.029
2920	Variance Detects					7456	Percent Non-Detects					3.03%
2921	Mean Detects					25.6	SD Detects					86.35
2922	Median Detects					0.719	CV Detects					3.373
2923	Skewness Detects					4.262	Kurtosis Detects					19.13
2924	Mean of Logged Detects					-0.437	SD of Logged Detects					2.939
2925												
2926	Normal GOF Test on Detects Only											
2927	Shapiro Wilk Test Statistic					0.346	Normal GOF Test on Detected Observations Only					
2928	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
2929	Lilliefors Test Statistic					0.46	Lilliefors GOF Test					
2930	5% Lilliefors Critical Value					0.111	Detected Data Not Normal at 5% Significance Level					
2931	Detected Data Not Normal at 5% Significance Level											
2932												
2933	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2934	Mean					24.82	Standard Error of Mean					10.48
2935	SD					84.48	95% KM (BCA) UCL					43.6
2936	95% KM (t) UCL					42.31	95% KM (Percentile Bootstrap) UCL					43.58
2937	95% KM (z) UCL					42.06	95% KM Bootstrap t UCL					67.21
2938	90% KM Chebyshev UCL					56.27	95% KM Chebyshev UCL					70.51
2939	97.5% KM Chebyshev UCL					90.27	99% KM Chebyshev UCL					129.1
2940												
2941	Gamma GOF Tests on Detected Observations Only											
2942	A-D Test Statistic					5.195	Anderson-Darling GOF Test					
2943	5% A-D Critical Value					0.914	Detected Data Not Gamma Distributed at 5% Significance Level					
2944	K-S Test Statistic					0.221	Kolmogrov-Smirnoff GOF					
2945	5% K-S Critical Value					0.124	Detected Data Not Gamma Distributed at 5% Significance Level					
2946	Detected Data Not Gamma Distributed at 5% Significance Level											
2947												
2948	Gamma Statistics on Detected Data Only											
2949	k hat (MLE)					0.2	k star (bias corrected MLE)					0.201
2950	Theta hat (MLE)					128	Theta star (bias corrected MLE)					127.3
2951	nu hat (MLE)					25.6	nu star (bias corrected)					25.73
2952	MLE Mean (bias corrected)					25.6	MLE Sd (bias corrected)					57.09
2953												
2954	Gamma Kaplan-Meier (KM) Statistics											
2955	k hat (KM)					0.0863	nu hat (KM)					11.4
2956	Approximate Chi Square Value (11.40, α)					4.833	Adjusted Chi Square Value (11.40, β)					4.738
2957	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					58.54	95% Gamma Adjusted KM-UCL (use when $n < 50$)					59.72
2958	Gamma (KM) may not be used when k hat (KM) is < 0.1											
2959												
2960	Gamma ROS Statistics using Imputed Non-Detects											
2961	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2962	GROS may not be used when kstar of detected data is small such as < 0.1											
2963	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2964	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2965	Minimum					0.00588	Mean					24.82
2966	Maximum					510	Median					0.658
2967	SD					85.12	CV					3.429
2968	k hat (MLE)					0.196	k star (bias corrected MLE)					0.197

	A	B	C	D	E	F	G	H	I	J	K	L
2969	Theta hat (MLE)					126.9	Theta star (bias corrected MLE)					126.1
2970	nu hat (MLE)					25.82	nu star (bias corrected)					25.98
2971	MLE Mean (bias corrected)					24.82	MLE Sd (bias corrected)					55.96
2972							Adjusted Level of Significance (β)					0.0464
2973	Approximate Chi Square Value (25.98, α)					15.36	Adjusted Chi Square Value (25.98, β)					15.18
2974	95% Gamma Approximate UCL (use when n>=50)					41.98	95% Gamma Adjusted UCL (use when n<50)					42.48
2975												
2976	Lognormal GOF Test on Detected Observations Only											
2977	Lilliefors Test Statistic					0.105	Lilliefors GOF Test					
2978	5% Lilliefors Critical Value					0.111	Detected Data appear Lognormal at 5% Significance Level					
2979	Detected Data appear Approximate Lognormal at 5% Significance Level											
2980												
2981	Lognormal ROS Statistics Using Imputed Non-Detects											
2982	Mean in Original Scale					24.82	Mean in Log Scale					-0.593
2983	SD in Original Scale					85.12	SD in Log Scale					3.032
2984	95% t UCL (assumes normality of ROS data)					42.31	95% Percentile Bootstrap UCL					43.18
2985	95% BCA Bootstrap UCL					50.83	95% Bootstrap t UCL					57.48
2986	95% H-UCL (Log ROS)					235.1						
2987												
2988	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2989	KM Mean (logged)					-0.563	95% H-UCL (KM -Log)					180.1
2990	KM SD (logged)					2.959	95% Critical H Value (KM-Log)					3.753
2991	KM Standard Error of Mean (logged)					0.367						
2992												
2993	DL/2 Statistics											
2994	DL/2 Normal					DL/2 Log-Transformed						
2995	Mean in Original Scale					24.82	Mean in Log Scale					-0.57
2996	SD in Original Scale					85.12	SD in Log Scale					2.991
2997	95% t UCL (Assumes normality)					42.31	95% H-Stat UCL					204.2
2998	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2999												
3000	Nonparametric Distribution Free UCL Statistics											
3001	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
3002												
3003	Suggested UCL to Use											
3004	97.5% KM (Chebyshev) UCL					90.27						
3005												
3006	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
3007	Recommendations are based upon data size, data distribution, and skewness.											
3008	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
3009	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
3010												
3011	Pyrene											
3012												
3013	General Statistics											
3014	Total Number of Observations					66	Number of Distinct Observations					62
3015	Number of Detects					63	Number of Non-Detects					3
3016	Number of Distinct Detects					59	Number of Distinct Non-Detects					3
3017	Minimum Detect					0.00301	Minimum Non-Detect					0.0076
3018	Maximum Detect					450	Maximum Non-Detect					0.029
3019	Variance Detects					7023	Percent Non-Detects					4.545%
3020	Mean Detects					25.74	SD Detects					83.8
3021	Median Detects					0.9	CV Detects					3.256
3022	Skewness Detects					4.069	Kurtosis Detects					16.71
3023	Mean of Logged Detects					-0.369	SD of Logged Detects					3.086
3024												

	A	B	C	D	E	F	G	H	I	J	K	L
3025	Normal GOF Test on Detects Only											
3026	Shapiro Wilk Test Statistic					0.352	Normal GOF Test on Detected Observations Only					
3027	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
3028	Lilliefors Test Statistic					0.454	Lilliefors GOF Test					
3029	5% Lilliefors Critical Value					0.112	Detected Data Not Normal at 5% Significance Level					
3030	Detected Data Not Normal at 5% Significance Level											
3031												
3032	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3033	Mean					24.57	Standard Error of Mean					10.1
3034	SD					81.4	95% KM (BCA) UCL					44.96
3035	95% KM (t) UCL					41.43	95% KM (Percentile Bootstrap) UCL					41.66
3036	95% KM (z) UCL					41.19	95% KM Bootstrap t UCL					55.68
3037	90% KM Chebyshev UCL					54.87	95% KM Chebyshev UCL					68.6
3038	97.5% KM Chebyshev UCL					87.65	99% KM Chebyshev UCL					125.1
3039												
3040	Gamma GOF Tests on Detected Observations Only											
3041	A-D Test Statistic					4.05	Anderson-Darling GOF Test					
3042	5% A-D Critical Value					0.913	Detected Data Not Gamma Distributed at 5% Significance Level					
3043	K-S Test Statistic					0.208	Kolmogrov-Smirnoff GOF					
3044	5% K-S Critical Value					0.125	Detected Data Not Gamma Distributed at 5% Significance Level					
3045	Detected Data Not Gamma Distributed at 5% Significance Level											
3046												
3047	Gamma Statistics on Detected Data Only											
3048	k hat (MLE)					0.203	k star (bias corrected MLE)					0.204
3049	Theta hat (MLE)					126.8	Theta star (bias corrected MLE)					126.3
3050	nu hat (MLE)					25.57	nu star (bias corrected)					25.69
3051	MLE Mean (bias corrected)					25.74	MLE Sd (bias corrected)					57.01
3052												
3053	Gamma Kaplan-Meier (KM) Statistics											
3054	k hat (KM)					0.0911	nu hat (KM)					12.03
3055	Approximate Chi Square Value (12.03, α)					5.245	Adjusted Chi Square Value (12.03, β)					5.145
3056	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					56.35	95% Gamma Adjusted KM-UCL (use when $n < 50$)					57.44
3057	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3058												
3059	Gamma ROS Statistics using Imputed Non-Detects											
3060	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3061	GROS may not be used when kstar of detected data is small such as < 0.1											
3062	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3063	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3064	Minimum					0.00301	Mean					24.57
3065	Maximum					450	Median					0.887
3066	SD					82.03	CV					3.338
3067	k hat (MLE)					0.196	k star (bias corrected MLE)					0.197
3068	Theta hat (MLE)					125.3	Theta star (bias corrected MLE)					124.5
3069	nu hat (MLE)					25.89	nu star (bias corrected)					26.05
3070	MLE Mean (bias corrected)					24.57	MLE Sd (bias corrected)					55.32
3071							Adjusted Level of Significance (β)					0.0464
3072	Approximate Chi Square Value (26.05, α)					15.42	Adjusted Chi Square Value (26.05, β)					15.23
3073	95% Gamma Approximate UCL (use when $n \geq 50$)					41.52	95% Gamma Adjusted UCL (use when $n < 50$)					42.02
3074												
3075	Lognormal GOF Test on Detected Observations Only											
3076	Lilliefors Test Statistic					0.0818	Lilliefors GOF Test					
3077	5% Lilliefors Critical Value					0.112	Detected Data appear Lognormal at 5% Significance Level					
3078	Detected Data appear Approximate Lognormal at 5% Significance Level											
3079												
3080	Lognormal ROS Statistics Using Imputed Non-Detects											

	A	B	C	D	E	F	G	H	I	J	K	L
3081	Mean in Original Scale					24.57	Mean in Log Scale					-0.611
3082	SD in Original Scale					82.03	SD in Log Scale					3.219
3083	95% t UCL (assumes normality of ROS data)					41.42	95% Percentile Bootstrap UCL					42.85
3084	95% BCA Bootstrap UCL					47.58	95% Bootstrap t UCL					59.04
3085	95% H-UCL (Log ROS)					502.5						
3086												
3087	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
3088	KM Mean (logged)					-0.583	95% H-UCL (KM -Log)					383.3
3089	KM SD (logged)					3.149	95% Critical H Value (KM-Log)					4.031
3090	KM Standard Error of Mean (logged)					0.391						
3091												
3092	DL/2 Statistics											
3093	DL/2 Normal					DL/2 Log-Transformed						
3094	Mean in Original Scale					24.57	Mean in Log Scale					-0.582
3095	SD in Original Scale					82.03	SD in Log Scale					3.173
3096	95% t UCL (Assumes normality)					41.42	95% H-Stat UCL					423.9
3097	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3098												
3099	Nonparametric Distribution Free UCL Statistics											
3100	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
3101												
3102	Suggested UCL to Use											
3103	97.5% KM (Chebyshev) UCL					87.65						
3104												
3105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
3106	Recommendations are based upon data size, data distribution, and skewness.											
3107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
3108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
3109												
3110	Selenium											
3111												
3112	General Statistics											
3113	Total Number of Observations					10	Number of Distinct Observations					7
3114	Number of Detects					2	Number of Non-Detects					8
3115	Number of Distinct Detects					2	Number of Distinct Non-Detects					6
3116	Minimum Detect					0.56	Minimum Non-Detect					0.1
3117	Maximum Detect					0.57	Maximum Non-Detect					0.7
3118	Variance Detects					5.0000E-5	Percent Non-Detects					80%
3119	Mean Detects					0.565	SD Detects					0.00707
3120	Median Detects					0.565	CV Detects					0.0125
3121	Skewness Detects					N/A	Kurtosis Detects					N/A
3122	Mean of Logged Detects					-0.571	SD of Logged Detects					0.0125
3123												
3124	Warning: Data set has only 2 Detected Values.											
3125	This is not enough to compute meaningful or reliable statistics and estimates.											
3126												
3127												
3128	Normal GOF Test on Detects Only											
3129	Not Enough Data to Perform GOF Test											
3130												
3131	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3132	Mean					0.255	Standard Error of Mean					0.127
3133	SD					0.219	95% KM (BCA) UCL					N/A
3134	95% KM (t) UCL					0.487	95% KM (Percentile Bootstrap) UCL					N/A
3135	95% KM (z) UCL					0.463	95% KM Bootstrap t UCL					N/A
3136	90% KM Chebyshev UCL					0.635	95% KM Chebyshev UCL					0.807

	A	B	C	D	E	F	G	H	I	J	K	L
3137	97.5% KM Chebyshev UCL					1.045	99% KM Chebyshev UCL					1.514
3138												
3139	Gamma GOF Tests on Detected Observations Only											
3140	Not Enough Data to Perform GOF Test											
3141												
3142	Gamma Statistics on Detected Data Only											
3143	k hat (MLE)					12769	k star (bias corrected MLE)					N/A
3144	Theta hat (MLE)					4.4249E-5	Theta star (bias corrected MLE)					N/A
3145	nu hat (MLE)					51075	nu star (bias corrected)					N/A
3146	MLE Mean (bias corrected)					N/A	MLE Sd (bias corrected)					N/A
3147												
3148	Gamma Kaplan-Meier (KM) Statistics											
3149	k hat (KM)					1.353	nu hat (KM)					27.06
3150							Adjusted Level of Significance (β)					0.0267
3151	Approximate Chi Square Value (27.06, α)					16.2	Adjusted Chi Square Value (27.06, β)					14.76
3152	5% Gamma Approximate KM-UCL (use when n>=50)					0.426	95% Gamma Adjusted KM-UCL (use when n<50)					0.468
3153												
3154	Lognormal GOF Test on Detected Observations Only											
3155	Not Enough Data to Perform GOF Test											
3156												
3157	Lognormal ROS Statistics Using Imputed Non-Detects											
3158	Mean in Original Scale					0.544	Mean in Log Scale					-0.608
3159	SD in Original Scale					0.0137	SD in Log Scale					0.025
3160	95% t UCL (assumes normality of ROS data)					0.552	95% Percentile Bootstrap UCL					0.551
3161	95% BCA Bootstrap UCL					0.553	95% Bootstrap t UCL					0.555
3162	95% H-UCL (Log ROS)					N/A						
3163												
3164	DL/2 Statistics											
3165	DL/2 Normal					DL/2 Log-Transformed						
3166	Mean in Original Scale					0.32	Mean in Log Scale					-1.291
3167	SD in Original Scale					0.152	SD in Log Scale					0.671
3168	95% t UCL (Assumes normality)					0.408	95% H-Stat UCL					0.601
3169	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3170												
3171	Nonparametric Distribution Free UCL Statistics											
3172	Data do not follow a Discernible Distribution at 5% Significance Level											
3173												
3174	Suggested UCL to Use											
3175	95% KM (t) UCL					0.487	95% KM (% Bootstrap) UCL					N/A
3176	Warning: One or more Recommended UCL(s) not available!											
3177												
3178	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
3179	Recommendations are based upon data size, data distribution, and skewness.											
3180	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
3181	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
3182												
3183	Toluene											
3184												
3185	General Statistics											
3186	Total Number of Observations					10	Number of Distinct Observations					10
3187	Number of Detects					8	Number of Non-Detects					2
3188	Number of Distinct Detects					8	Number of Distinct Non-Detects					2
3189	Minimum Detect					3.3000E-4	Minimum Non-Detect					0.0061
3190	Maximum Detect					0.019	Maximum Non-Detect					0.0071
3191	Variance Detects					4.2902E-5	Percent Non-Detects					20%
3192	Mean Detects					0.0028	SD Detects					0.00655

	A	B	C	D	E	F	G	H	I	J	K	L
3193	Median Detects					3.9500E-4	CV Detects					2.342
3194	Skewness Detects					2.824	Kurtosis Detects					7.981
3195	Mean of Logged Detects					-7.236	SD of Logged Detects					1.366
3196												
3197	Normal GOF Test on Detects Only											
3198	Shapiro Wilk Test Statistic					0.441	Shapiro Wilk GOF Test					
3199	5% Shapiro Wilk Critical Value					0.818	Detected Data Not Normal at 5% Significance Level					
3200	Lilliefors Test Statistic					0.494	Lilliefors GOF Test					
3201	5% Lilliefors Critical Value					0.313	Detected Data Not Normal at 5% Significance Level					
3202	Detected Data Not Normal at 5% Significance Level											
3203												
3204	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3205	Mean					0.00233	Standard Error of Mean					0.00188
3206	SD					0.00556	95% KM (BCA) UCL					0.00609
3207	95% KM (t) UCL					0.00578	95% KM (Percentile Bootstrap) UCL					0.00601
3208	95% KM (z) UCL					0.00542	95% KM Bootstrap t UCL					0.082
3209	90% KM Chebyshev UCL					0.00797	95% KM Chebyshev UCL					0.0105
3210	97.5% KM Chebyshev UCL					0.0141	99% KM Chebyshev UCL					0.021
3211												
3212	Gamma GOF Tests on Detected Observations Only											
3213	A-D Test Statistic					1.9	Anderson-Darling GOF Test					
3214	5% A-D Critical Value					0.767	Detected Data Not Gamma Distributed at 5% Significance Level					
3215	K-S Test Statistic					0.452	Kolmogrov-Smirnoff GOF					
3216	5% K-S Critical Value					0.31	Detected Data Not Gamma Distributed at 5% Significance Level					
3217	Detected Data Not Gamma Distributed at 5% Significance Level											
3218												
3219	Gamma Statistics on Detected Data Only											
3220	k hat (MLE)					0.473	k star (bias corrected MLE)					0.379
3221	Theta hat (MLE)					0.00592	Theta star (bias corrected MLE)					0.00738
3222	nu hat (MLE)					7.56	nu star (bias corrected)					6.059
3223	MLE Mean (bias corrected)					0.0028	MLE Sd (bias corrected)					0.00454
3224												
3225	Gamma Kaplan-Meier (KM) Statistics											
3226	k hat (KM)					0.176	nu hat (KM)					3.524
3227	Approximate Chi Square Value (3.52, α)					0.543	Adjusted Chi Square Value (3.52, β)					0.381
3228	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					0.0151	95% Gamma Adjusted KM-UCL (use when $n < 50$)					0.0216
3229												
3230	Gamma ROS Statistics using Imputed Non-Detects											
3231	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3232	GROS may not be used when kstar of detected data is small such as < 0.1											
3233	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3234	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3235	Minimum					3.3000E-4	Mean					0.00424
3236	Maximum					0.019	Median					5.7500E-4
3237	SD					0.00653	CV					1.54
3238	k hat (MLE)					0.509	k star (bias corrected MLE)					0.423
3239	Theta hat (MLE)					0.00833	Theta star (bias corrected MLE)					0.01
3240	nu hat (MLE)					10.17	nu star (bias corrected)					8.454
3241	MLE Mean (bias corrected)					0.00424	MLE Sd (bias corrected)					0.00652
3242							Adjusted Level of Significance (β)					0.0267
3243	Approximate Chi Square Value (8.45, α)					3	Adjusted Chi Square Value (8.45, β)					2.465
3244	95% Gamma Approximate UCL (use when $n \geq 50$)					0.0119	95% Gamma Adjusted UCL (use when $n < 50$)					0.0145
3245												
3246	Lognormal GOF Test on Detected Observations Only											
3247	Shapiro Wilk Test Statistic					0.621	Shapiro Wilk GOF Test					
3248	5% Shapiro Wilk Critical Value					0.818	Detected Data Not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L	
3249	Lilliefors Test Statistic					0.341	Lilliefors GOF Test						
3250	5% Lilliefors Critical Value					0.313	Detected Data Not Lognormal at 5% Significance Level						
3251	Detected Data Not Lognormal at 5% Significance Level												
3252													
3253	Lognormal ROS Statistics Using Imputed Non-Detects												
3254	Mean in Original Scale					0.00235	Mean in Log Scale					-7.284	
3255	SD in Original Scale					0.00585	SD in Log Scale					1.209	
3256	95% t UCL (assumes normality of ROS data)					0.00574	95% Percentile Bootstrap UCL					0.00603	
3257	95% BCA Bootstrap UCL					0.00792	95% Bootstrap t UCL					0.0861	
3258	95% H-UCL (Log ROS)					0.00596							
3259													
3260	DL/2 Statistics												
3261	DL/2 Normal						DL/2 Log-Transformed						
3262	Mean in Original Scale					0.0029	Mean in Log Scale					-6.932	
3263	SD in Original Scale					0.00578	SD in Log Scale					1.365	
3264	95% t UCL (Assumes normality)					0.00625	95% H-Stat UCL					0.0146	
3265	DL/2 is not a recommended method, provided for comparisons and historical reasons												
3266													
3267	Nonparametric Distribution Free UCL Statistics												
3268	Data do not follow a Discernible Distribution at 5% Significance Level												
3269													
3270	Suggested UCL to Use												
3271	97.5% KM (Chebyshev) UCL					0.0141							
3272													
3273	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
3274	Recommendations are based upon data size, data distribution, and skewness.												
3275	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
3276	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
3277													
3278	Xylenes (total)												
3279													
3280	General Statistics												
3281	Total Number of Observations					10	Number of Distinct Observations					7	
3282	Number of Detects					2	Number of Non-Detects					8	
3283	Number of Distinct Detects					2	Number of Distinct Non-Detects					5	
3284	Minimum Detect					8.2000E-4	Minimum Non-Detect					0.0022	
3285	Maximum Detect					0.016	Maximum Non-Detect					0.0028	
3286	Variance Detects					1.1522E-4	Percent Non-Detects					80%	
3287	Mean Detects					0.00841	SD Detects					0.0107	
3288	Median Detects					0.00841	CV Detects					1.276	
3289	Skewness Detects					N/A	Kurtosis Detects					N/A	
3290	Mean of Logged Detects					-5.621	SD of Logged Detects					2.101	
3291													
3292	Warning: Data set has only 2 Detected Values.												
3293	This is not enough to compute meaningful or reliable statistics and estimates.												
3294													
3295													
3296	Normal GOF Test on Detects Only												
3297	Not Enough Data to Perform GOF Test												
3298													
3299	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
3300	Mean					0.00234	Standard Error of Mean					0.00204	
3301	SD					0.00455	95% KM (BCA) UCL					N/A	
3302	95% KM (t) UCL					0.00607	95% KM (Percentile Bootstrap) UCL					N/A	
3303	95% KM (z) UCL					0.00569	95% KM Bootstrap t UCL					N/A	
3304	90% KM Chebyshev UCL					0.00845	95% KM Chebyshev UCL					0.0112	

A	B	C	D	E	F	G	H	I	J	K	L
3305	97.5% KM Chebyshev UCL				0.0151	99% KM Chebyshev UCL				0.0226	
3306											
3307	Gamma GOF Tests on Detected Observations Only										
3308	Not Enough Data to Perform GOF Test										
3309											
3310	Gamma Statistics on Detected Data Only										
3311	k hat (MLE)				0.715	k star (bias corrected MLE)				N/A	
3312	Theta hat (MLE)				0.0118	Theta star (bias corrected MLE)				N/A	
3313	nu hat (MLE)				2.861	nu star (bias corrected)				N/A	
3314	MLE Mean (bias corrected)				N/A	MLE Sd (bias corrected)				N/A	
3315											
3316	Gamma Kaplan-Meier (KM) Statistics										
3317	k hat (KM)				0.264	nu hat (KM)				5.271	
3318						Adjusted Level of Significance (β)				0.0267	
3319	Approximate Chi Square Value (5.27, α)				1.28	Adjusted Chi Square Value (5.27, β)				0.973	
3320	5% Gamma Approximate KM-UCL (use when $n \geq 50$)				0.00963	95% Gamma Adjusted KM-UCL (use when $n < 50$)				0.0127	
3321											
3322	Lognormal GOF Test on Detected Observations Only										
3323	Not Enough Data to Perform GOF Test										
3324											
3325	Lognormal ROS Statistics Using Imputed Non-Detects										
3326	Mean in Original Scale				0.00248	Mean in Log Scale				-6.824	
3327	SD in Original Scale				0.0048	SD in Log Scale				1.13	
3328	95% t UCL (assumes normality of ROS data)				0.00526	95% Percentile Bootstrap UCL				0.00537	
3329	95% BCA Bootstrap UCL				0.00709	95% Bootstrap t UCL				0.0366	
3330	95% H-UCL (Log ROS)				0.00735						
3331											
3332	DL/2 Statistics										
3333	DL/2 Normal					DL/2 Log-Transformed					
3334	Mean in Original Scale				0.00264	Mean in Log Scale				-6.511	
3335	SD in Original Scale				0.0047	SD in Log Scale				0.845	
3336	95% t UCL (Assumes normality)				0.00536	95% H-Stat UCL				0.00468	
3337	DL/2 is not a recommended method, provided for comparisons and historical reasons										
3338											
3339	Nonparametric Distribution Free UCL Statistics										
3340	Data do not follow a Discernible Distribution at 5% Significance Level										
3341											
3342	Suggested UCL to Use										
3343	99% KM (Chebyshev) UCL				0.0226						
3344	Warning: Recommended UCL exceeds the maximum observation										
3345											
3346	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
3347	Recommendations are based upon data size, data distribution, and skewness.										
3348	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).										
3349	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										
3350											

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			3/25/2014 3:57:22 PM								
5	From File			EPC Input IA-4 SS_esm rev.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	1-Methylnaphthalene											
12												
13	General Statistics											
14	Total Number of Observations				21		Number of Distinct Observations				20	
15							Number of Missing Observations				0	
16	Minimum				0.00557		Mean				0.516	
17	Maximum				3.65		Median				0.0879	
18	SD				1.015		Std. Error of Mean				0.222	
19	Coefficient of Variation				1.968		Skewness				2.338	
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic				0.554		Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value				0.908		Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic				0.409		Lilliefors GOF Test					
25	5% Lilliefors Critical Value				0.193		Data Not Normal at 5% Significance Level					
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
30	95% Student's-t UCL				0.898		95% Adjusted-CLT UCL (Chen-1995)				1.001	
31							95% Modified-t UCL (Johnson-1978)				0.917	
32												
33	Gamma GOF Test											
34	A-D Test Statistic				1.503		Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value				0.824		Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic				0.251		Kolmogrov-Smirnoff Gamma GOF Test					
37	5% K-S Critical Value				0.203		Data Not Gamma Distributed at 5% Significance Level					
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)				0.409		k star (bias corrected MLE)				0.382	
42	Theta hat (MLE)				1.262		Theta star (bias corrected MLE)				1.35	
43	nu hat (MLE)				17.17		nu star (bias corrected)				16.05	
44	MLE Mean (bias corrected)				0.516		MLE Sd (bias corrected)				0.835	
45						Approximate Chi Square Value (0.05)				8.001		
46	Adjusted Level of Significance				0.0383		Adjusted Chi Square Value				7.566	
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))				1.035		95% Adjusted Gamma UCL (use when n<50)				1.095	

	A	B	C	D	E	F	G	H	I	J	K	L
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic					0.95	Shapiro Wilk Lognormal GOF Test					
53	5% Shapiro Wilk Critical Value					0.908	Data appear Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.121	Lilliefors Lognormal GOF Test					
55	5% Lilliefors Critical Value					0.193	Data appear Lognormal at 5% Significance Level					
56	Data appear Lognormal at 5% Significance Level											
57												
58	Lognormal Statistics											
59	Minimum of Logged Data					-5.19	Mean of logged Data					-2.265
60	Maximum of Logged Data					1.295	SD of logged Data					1.837
61												
62	Assuming Lognormal Distribution											
63	95% H-UCL					2.742	90% Chebyshev (MVUE) UCL					1.166
64	95% Chebyshev (MVUE) UCL					1.481	97.5% Chebyshev (MVUE) UCL					1.92
65	99% Chebyshev (MVUE) UCL					2.781						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71	95% CLT UCL					0.88	95% Jackknife UCL					0.898
72	95% Standard Bootstrap UCL					0.864	95% Bootstrap-t UCL					1.297
73	95% Hall's Bootstrap UCL					0.886	95% Percentile Bootstrap UCL					0.871
74	95% BCA Bootstrap UCL					1.003						
75	90% Chebyshev(Mean, Sd) UCL					1.181	95% Chebyshev(Mean, Sd) UCL					1.482
76	97.5% Chebyshev(Mean, Sd) UCL					1.9	99% Chebyshev(Mean, Sd) UCL					2.721
77												
78	Suggested UCL to Use											
79	95% Chebyshev (Mean, Sd) UCL					1.482						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86	2-Methylnaphthalene											
87												
88	General Statistics											
89	Total Number of Observations					29	Number of Distinct Observations					28
90	Number of Detects					27	Number of Non-Detects					2
91	Number of Distinct Detects					27	Number of Distinct Non-Detects					2
92	Minimum Detect					0.00543	Minimum Non-Detect					0.073
93	Maximum Detect					5.7	Maximum Non-Detect					0.088
94	Variance Detects					2.429	Percent Non-Detects					6.897%
95	Mean Detects					0.742	SD Detects					1.558
96	Median Detects					0.092	CV Detects					2.1
97	Skewness Detects					2.378	Kurtosis Detects					4.662
98	Mean of Logged Detects					-2.082	SD of Logged Detects					1.864

	A	B	C	D	E	F	G	H	I	J	K	L
99												
100	Normal GOF Test on Detects Only											
101	Shapiro Wilk Test Statistic					0.523	Shapiro Wilk GOF Test					
102	5% Shapiro Wilk Critical Value					0.923	Detected Data Not Normal at 5% Significance Level					
103	Lilliefors Test Statistic					0.419	Lilliefors GOF Test					
104	5% Lilliefors Critical Value					0.171	Detected Data Not Normal at 5% Significance Level					
105	Detected Data Not Normal at 5% Significance Level											
106												
107	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
108	Mean					0.693	Standard Error of Mean					0.281
109	SD					1.487	95% KM (BCA) UCL					1.156
110	95% KM (t) UCL					1.172	95% KM (Percentile Bootstrap) UCL					1.172
111	95% KM (z) UCL					1.156	95% KM Bootstrap t UCL					1.518
112	90% KM Chebyshev UCL					1.537	95% KM Chebyshev UCL					1.919
113	97.5% KM Chebyshev UCL					2.45	99% KM Chebyshev UCL					3.492
114												
115	Gamma GOF Tests on Detected Observations Only											
116	A-D Test Statistic					2.507	Anderson-Darling GOF Test					
117	5% A-D Critical Value					0.836	Detected Data Not Gamma Distributed at 5% Significance Level					
118	K-S Test Statistic					0.291	Kolmogrov-Smirnoff GOF					
119	5% K-S Critical Value					0.181	Detected Data Not Gamma Distributed at 5% Significance Level					
120	Detected Data Not Gamma Distributed at 5% Significance Level											
121												
122	Gamma Statistics on Detected Data Only											
123	k hat (MLE)					0.373	k star (bias corrected MLE)					0.356
124	Theta hat (MLE)					1.989	Theta star (bias corrected MLE)					2.083
125	nu hat (MLE)					20.15	nu star (bias corrected)					19.24
126	MLE Mean (bias corrected)					0.742	MLE Sd (bias corrected)					1.243
127												
128	Gamma Kaplan-Meier (KM) Statistics											
129	k hat (KM)					0.217	nu hat (KM)					12.61
130	Approximate Chi Square Value (12.61, α)					5.631	Adjusted Chi Square Value (12.61, β)					5.353
131	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					1.552	95% Gamma Adjusted KM-UCL (use when $n < 50$)					1.633
132												
133	Gamma ROS Statistics using Imputed Non-Detects											
134	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
135	GROS may not be used when kstar of detected data is small such as < 0.1											
136	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
137	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
138	Minimum					0.00543	Mean					0.692
139	Maximum					5.7	Median					0.088
140	SD					1.514	CV					2.188
141	k hat (MLE)					0.355	k star (bias corrected MLE)					0.342
142	Theta hat (MLE)					1.946	Theta star (bias corrected MLE)					2.025
143	nu hat (MLE)					20.61	nu star (bias corrected)					19.81
144	MLE Mean (bias corrected)					0.692	MLE Sd (bias corrected)					1.183
145							Adjusted Level of Significance (β)					0.0407
146	Approximate Chi Square Value (19.81, α)					10.71	Adjusted Chi Square Value (19.81, β)					10.31
147	95% Gamma Approximate UCL (use when $n \geq 50$)					1.279	95% Gamma Adjusted UCL (use when $n < 50$)					1.329

	A	B	C	D	E	F	G	H	I	J	K	L
148												
149	Lognormal GOF Test on Detected Observations Only											
150	Shapiro Wilk Test Statistic					0.929	Shapiro Wilk GOF Test					
151	5% Shapiro Wilk Critical Value					0.923	Detected Data appear Lognormal at 5% Significance Level					
152	Lilliefors Test Statistic					0.16	Lilliefors GOF Test					
153	5% Lilliefors Critical Value					0.171	Detected Data appear Lognormal at 5% Significance Level					
154	Detected Data appear Lognormal at 5% Significance Level											
155												
156	Lognormal ROS Statistics Using Imputed Non-Detects											
157	Mean in Original Scale					0.693	Mean in Log Scale					-2.193
158	SD in Original Scale					1.513	SD in Log Scale					1.843
159	95% t UCL (assumes normality of ROS data)					1.171	95% Percentile Bootstrap UCL					1.184
160	95% BCA Bootstrap UCL					1.305	95% Bootstrap t UCL					1.471
161	95% H-UCL (Log ROS)					2.186						
162												
163	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
164	KM Mean (logged)					-2.194	95% H-UCL (KM -Log)					2.051
165	KM SD (logged)					1.823	95% Critical H Value (KM-Log)					3.634
166	KM Standard Error of Mean (logged)					0.347						
167												
168	DL/2 Statistics											
169	DL/2 Normal					DL/2 Log-Transformed						
170	Mean in Original Scale					0.694	Mean in Log Scale					-2.16
171	SD in Original Scale					1.513	SD in Log Scale					1.82
172	95% t UCL (Assumes normality)					1.172	95% H-Stat UCL					2.103
173	DL/2 is not a recommended method, provided for comparisons and historical reasons											
174												
175	Nonparametric Distribution Free UCL Statistics											
176	Detected Data appear Lognormal Distributed at 5% Significance Level											
177												
178	Suggested UCL to Use											
179	99% KM (Chebyshev) UCL					3.492						
180												
181	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
182	Recommendations are based upon data size, data distribution, and skewness.											
183	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
184	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
185												
186	Acenaphthene											
187												
188	General Statistics											
189	Total Number of Observations					29	Number of Distinct Observations					29
190	Number of Detects					28	Number of Non-Detects					1
191	Number of Distinct Detects					28	Number of Distinct Non-Detects					1
192	Minimum Detect					0.00917	Minimum Non-Detect					0.0073
193	Maximum Detect					34	Maximum Non-Detect					0.0073
194	Variance Detects					79.25	Percent Non-Detects					3.448%
195	Mean Detects					3.872	SD Detects					8.902
196	Median Detects					0.267	CV Detects					2.299

	A	B	C	D	E	F	G	H	I	J	K	L
197	Skewness Detects					2.535	Kurtosis Detects					5.571
198	Mean of Logged Detects					-1.006	SD of Logged Detects					2.197
199												
200	Normal GOF Test on Detects Only											
201	Shapiro Wilk Test Statistic					0.495	Shapiro Wilk GOF Test					
202	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
203	Lilliefors Test Statistic					0.439	Lilliefors GOF Test					
204	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
205	Detected Data Not Normal at 5% Significance Level											
206												
207	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
208	Mean					3.739	Standard Error of Mean					1.63
209	SD					8.618	95% KM (BCA) UCL					6.71
210	95% KM (t) UCL					6.511	95% KM (Percentile Bootstrap) UCL					6.56
211	95% KM (z) UCL					6.419	95% KM Bootstrap t UCL					8.761
212	90% KM Chebyshev UCL					8.628	95% KM Chebyshev UCL					10.84
213	97.5% KM Chebyshev UCL					13.92	99% KM Chebyshev UCL					19.95
214												
215	Gamma GOF Tests on Detected Observations Only											
216	A-D Test Statistic					2.719	Anderson-Darling GOF Test					
217	5% A-D Critical Value					0.857	Detected Data Not Gamma Distributed at 5% Significance Level					
218	K-S Test Statistic					0.288	Kolmogrov-Smirnoff GOF					
219	5% K-S Critical Value					0.18	Detected Data Not Gamma Distributed at 5% Significance Level					
220	Detected Data Not Gamma Distributed at 5% Significance Level											
221												
222	Gamma Statistics on Detected Data Only											
223	k hat (MLE)					0.293	k star (bias corrected MLE)					0.286
224	Theta hat (MLE)					13.2	Theta star (bias corrected MLE)					13.55
225	nu hat (MLE)					16.43	nu star (bias corrected)					16
226	MLE Mean (bias corrected)					3.872	MLE Sd (bias corrected)					7.244
227												
228	Gamma Kaplan-Meier (KM) Statistics											
229	k hat (KM)					0.188	nu hat (KM)					10.91
230	Approximate Chi Square Value (10.91, α)					4.521	Adjusted Chi Square Value (10.91, β)					4.276
231	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					9.026	95% Gamma Adjusted KM-UCL (use when $n < 50$)					9.541
232												
233	Gamma ROS Statistics using Imputed Non-Detects											
234	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
235	GROS may not be used when kstar of detected data is small such as < 0.1											
236	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
237	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
238	Minimum					0.00917	Mean					3.739
239	Maximum					34	Median					0.244
240	SD					8.771	CV					2.346
241	k hat (MLE)					0.284	k star (bias corrected MLE)					0.278
242	Theta hat (MLE)					13.16	Theta star (bias corrected MLE)					13.46
243	nu hat (MLE)					16.48	nu star (bias corrected)					16.11
244	MLE Mean (bias corrected)					3.739	MLE Sd (bias corrected)					7.095
245							Adjusted Level of Significance (β)					0.0407

	A	B	C	D	E	F	G	H	I	J	K	L
246	Approximate Chi Square Value (16.11, α)					8.037	Adjusted Chi Square Value (16.11, β)					7.697
247	95% Gamma Approximate UCL (use when $n \geq 50$)					7.492	95% Gamma Adjusted UCL (use when $n < 50$)					7.823
248												
249	Lognormal GOF Test on Detected Observations Only											
250	Shapiro Wilk Test Statistic					0.934	Shapiro Wilk GOF Test					
251	5% Shapiro Wilk Critical Value					0.924	Detected Data appear Lognormal at 5% Significance Level					
252	Lilliefors Test Statistic					0.127	Lilliefors GOF Test					
253	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
254	Detected Data appear Lognormal at 5% Significance Level											
255												
256	Lognormal ROS Statistics Using Imputed Non-Detects											
257	Mean in Original Scale					3.738	Mean in Log Scale					-1.194
258	SD in Original Scale					8.771	SD in Log Scale					2.383
259	95% t UCL (assumes normality of ROS data)					6.509	95% Percentile Bootstrap UCL					6.546
260	95% BCA Bootstrap UCL					7.421	95% Bootstrap t UCL					8.695
261	95% H-UCL (Log ROS)					39.71						
262												
263	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
264	KM Mean (logged)					-1.141	95% H-UCL (KM -Log)					23.91
265	KM SD (logged)					2.237	95% Critical H Value (KM-Log)					4.288
266	KM Standard Error of Mean (logged)					0.423						
267												
268	DL/2 Statistics											
269	DL/2 Normal					DL/2 Log-Transformed						
270	Mean in Original Scale					3.738	Mean in Log Scale					-1.165
271	SD in Original Scale					8.771	SD in Log Scale					2.321
272	95% t UCL (Assumes normality)					6.509	95% H-Stat UCL					32.1
273	DL/2 is not a recommended method, provided for comparisons and historical reasons											
274												
275	Nonparametric Distribution Free UCL Statistics											
276	Detected Data appear Lognormal Distributed at 5% Significance Level											
277												
278	Suggested UCL to Use											
279	99% KM (Chebyshev) UCL					19.95						
280												
281	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
282	Recommendations are based upon data size, data distribution, and skewness.											
283	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
284	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
285												
286	Acenaphthylene											
287												
288	General Statistics											
289	Total Number of Observations					29	Number of Distinct Observations					28
290	Number of Detects					20	Number of Non-Detects					9
291	Number of Distinct Detects					20	Number of Distinct Non-Detects					8
292	Minimum Detect					0.00154	Minimum Non-Detect					0.00308
293	Maximum Detect					0.781	Maximum Non-Detect					1.8
294	Variance Detects					0.051	Percent Non-Detects					31.03%

	A	B	C	D	E	F	G	H	I	J	K	L
295	Mean Detects					0.12	SD Detects					0.226
296	Median Detects					0.0184	CV Detects					1.889
297	Skewness Detects					2.277	Kurtosis Detects					4.352
298	Mean of Logged Detects					-3.677	SD of Logged Detects					1.816
299												
300	Normal GOF Test on Detects Only											
301	Shapiro Wilk Test Statistic					0.578	Shapiro Wilk GOF Test					
302	5% Shapiro Wilk Critical Value					0.905	Detected Data Not Normal at 5% Significance Level					
303	Lilliefors Test Statistic					0.359	Lilliefors GOF Test					
304	5% Lilliefors Critical Value					0.198	Detected Data Not Normal at 5% Significance Level					
305	Detected Data Not Normal at 5% Significance Level											
306												
307	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
308	Mean					0.0876	Standard Error of Mean					0.0374
309	SD					0.193	95% KM (BCA) UCL					0.151
310	95% KM (t) UCL					0.151	95% KM (Percentile Bootstrap) UCL					0.153
311	95% KM (z) UCL					0.149	95% KM Bootstrap t UCL					0.255
312	90% KM Chebyshev UCL					0.2	95% KM Chebyshev UCL					0.251
313	97.5% KM Chebyshev UCL					0.321	99% KM Chebyshev UCL					0.46
314												
315	Gamma GOF Tests on Detected Observations Only											
316	A-D Test Statistic					1.358	Anderson-Darling GOF Test					
317	5% A-D Critical Value					0.819	Detected Data Not Gamma Distributed at 5% Significance Level					
318	K-S Test Statistic					0.231	Kolmogrov-Smirnoff GOF					
319	5% K-S Critical Value					0.207	Detected Data Not Gamma Distributed at 5% Significance Level					
320	Detected Data Not Gamma Distributed at 5% Significance Level											
321												
322	Gamma Statistics on Detected Data Only											
323	k hat (MLE)					0.42	k star (bias corrected MLE)					0.391
324	Theta hat (MLE)					0.284	Theta star (bias corrected MLE)					0.306
325	nu hat (MLE)					16.82	nu star (bias corrected)					15.63
326	MLE Mean (bias corrected)					0.12	MLE Sd (bias corrected)					0.191
327												
328	Gamma Kaplan-Meier (KM) Statistics											
329	k hat (KM)					0.207	nu hat (KM)					11.98
330	Approximate Chi Square Value (11.98, α)					5.217	Adjusted Chi Square Value (11.98, β)					4.951
331	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					0.201	95% Gamma Adjusted KM-UCL (use when $n < 50$)					0.212
332												
333	Gamma ROS Statistics using Imputed Non-Detects											
334	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
335	GROS may not be used when kstar of detected data is small such as < 0.1											
336	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
337	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
338	Minimum					0.00154	Mean					0.0856
339	Maximum					0.781	Median					0.01
340	SD					0.193	CV					2.257
341	k hat (MLE)					0.432	k star (bias corrected MLE)					0.41
342	Theta hat (MLE)					0.198	Theta star (bias corrected MLE)					0.209
343	nu hat (MLE)					25.03	nu star (bias corrected)					23.77

	A	B	C	D	E	F	G	H	I	J	K	L
344	MLE Mean (bias corrected)					0.0856	MLE Sd (bias corrected)					0.134
345							Adjusted Level of Significance (β)					0.0407
346	Approximate Chi Square Value (23.77, α)					13.68	Adjusted Chi Square Value (23.77, β)					13.22
347	95% Gamma Approximate UCL (use when n>=50)					0.149	95% Gamma Adjusted UCL (use when n<50)					0.154
348												
349	Lognormal GOF Test on Detected Observations Only											
350	Shapiro Wilk Test Statistic					0.946	Shapiro Wilk GOF Test					
351	5% Shapiro Wilk Critical Value					0.905	Detected Data appear Lognormal at 5% Significance Level					
352	Lilliefors Test Statistic					0.116	Lilliefors GOF Test					
353	5% Lilliefors Critical Value					0.198	Detected Data appear Lognormal at 5% Significance Level					
354	Detected Data appear Lognormal at 5% Significance Level											
355												
356	Lognormal ROS Statistics Using Imputed Non-Detects											
357	Mean in Original Scale					0.0847	Mean in Log Scale					-4.149
358	SD in Original Scale					0.193	SD in Log Scale					1.723
359	95% t UCL (assumes normality of ROS data)					0.146	95% Percentile Bootstrap UCL					0.147
360	95% BCA Bootstrap UCL					0.17	95% Bootstrap t UCL					0.248
361	95% H-UCL (Log ROS)					0.216						
362												
363	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
364	KM Mean (logged)					-4.148	95% H-UCL (KM -Log)					0.233
365	KM SD (logged)					1.748	95% Critical H Value (KM-Log)					3.519
366	KM Standard Error of Mean (logged)					0.353						
367												
368	DL/2 Statistics											
369	DL/2 Normal					DL/2 Log-Transformed						
370	Mean in Original Scale					0.118	Mean in Log Scale					-3.804
371	SD in Original Scale					0.244	SD in Log Scale					1.785
372	95% t UCL (Assumes normality)					0.195	95% H-Stat UCL					0.366
373	DL/2 is not a recommended method, provided for comparisons and historical reasons											
374												
375	Nonparametric Distribution Free UCL Statistics											
376	Detected Data appear Lognormal Distributed at 5% Significance Level											
377												
378	Suggested UCL to Use											
379	99% KM (Chebyshev) UCL					0.46						
380												
381	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
382	Recommendations are based upon data size, data distribution, and skewness.											
383	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												
386	Anthracene											
387												
388	General Statistics											
389	Total Number of Observations					29	Number of Distinct Observations					29
390	Number of Detects					28	Number of Non-Detects					1
391	Number of Distinct Detects					28	Number of Distinct Non-Detects					1
392	Minimum Detect					0.0384	Minimum Non-Detect					0.0073

	A	B	C	D	E	F	G	H	I	J	K	L
393	Maximum Detect					62	Maximum Non-Detect					0.0073
394	Variance Detects					299.1	Percent Non-Detects					3.448%
395	Mean Detects					7.808	SD Detects					17.29
396	Median Detects					0.707	CV Detects					2.215
397	Skewness Detects					2.353	Kurtosis Detects					4.324
398	Mean of Logged Detects					-0.0623	SD of Logged Detects					2.033
399												
400	Normal GOF Test on Detects Only											
401	Shapiro Wilk Test Statistic					0.5	Shapiro Wilk GOF Test					
402	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
403	Lilliefors Test Statistic					0.444	Lilliefors GOF Test					
404	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
405	Detected Data Not Normal at 5% Significance Level											
406												
407	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
408	Mean					7.539	Standard Error of Mean					3.167
409	SD					16.75	95% KM (BCA) UCL					13.81
410	95% KM (t) UCL					12.93	95% KM (Percentile Bootstrap) UCL					13.03
411	95% KM (z) UCL					12.75	95% KM Bootstrap t UCL					16.54
412	90% KM Chebyshev UCL					17.04	95% KM Chebyshev UCL					21.34
413	97.5% KM Chebyshev UCL					27.32	99% KM Chebyshev UCL					39.05
414												
415	Gamma GOF Tests on Detected Observations Only											
416	A-D Test Statistic					2.872	Anderson-Darling GOF Test					
417	5% A-D Critical Value					0.849	Detected Data Not Gamma Distributed at 5% Significance Level					
418	K-S Test Statistic					0.304	Kolmogrov-Smirnoff GOF					
419	5% K-S Critical Value					0.179	Detected Data Not Gamma Distributed at 5% Significance Level					
420	Detected Data Not Gamma Distributed at 5% Significance Level											
421												
422	Gamma Statistics on Detected Data Only											
423	k hat (MLE)					0.322	k star (bias corrected MLE)					0.311
424	Theta hat (MLE)					24.25	Theta star (bias corrected MLE)					25.09
425	nu hat (MLE)					18.03	nu star (bias corrected)					17.43
426	MLE Mean (bias corrected)					7.808	MLE Sd (bias corrected)					14
427												
428	Gamma Kaplan-Meier (KM) Statistics											
429	k hat (KM)					0.203	nu hat (KM)					11.75
430	Approximate Chi Square Value (11.75, α)					5.064	Adjusted Chi Square Value (11.75, β)					4.803
431	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					17.5	95% Gamma Adjusted KM-UCL (use when $n < 50$)					18.45
432												
433	Gamma ROS Statistics using Imputed Non-Detects											
434	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
435	GROS may not be used when kstar of detected data is small such as < 0.1											
436	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
437	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
438	Minimum					0.01	Mean					7.539
439	Maximum					62	Median					0.693
440	SD					17.04	CV					2.261
441	k hat (MLE)					0.307	k star (bias corrected MLE)					0.298

	A	B	C	D	E	F	G	H	I	J	K	L
442	Theta hat (MLE)					24.57	Theta star (bias corrected MLE)					25.29
443	nu hat (MLE)					17.8	nu star (bias corrected)					17.29
444	MLE Mean (bias corrected)					7.539	MLE Sd (bias corrected)					13.81
445							Adjusted Level of Significance (β)					0.0407
446	Approximate Chi Square Value (17.29, α)					8.879	Adjusted Chi Square Value (17.29, β)					8.519
447	95% Gamma Approximate UCL (use when n>=50)					14.68	95% Gamma Adjusted UCL (use when n<50)					15.3
448												
449	Lognormal GOF Test on Detected Observations Only											
450	Shapiro Wilk Test Statistic					0.919	Shapiro Wilk GOF Test					
451	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Lognormal at 5% Significance Level					
452	Lilliefors Test Statistic					0.144	Lilliefors GOF Test					
453	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
454	Detected Data appear Approximate Lognormal at 5% Significance Level											
455												
456	Lognormal ROS Statistics Using Imputed Non-Detects											
457	Mean in Original Scale					7.539	Mean in Log Scale					-0.235
458	SD in Original Scale					17.04	SD in Log Scale					2.202
459	95% t UCL (assumes normality of ROS data)					12.92	95% Percentile Bootstrap UCL					13.29
460	95% BCA Bootstrap UCL					14.67	95% Bootstrap t UCL					16.13
461	95% H-UCL (Log ROS)					51.99						
462												
463	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
464	KM Mean (logged)					-0.23	95% H-UCL (KM -Log)					43.66
465	KM SD (logged)					2.153	95% Critical H Value (KM-Log)					4.152
466	KM Standard Error of Mean (logged)					0.407						
467												
468	DL/2 Statistics											
469	DL/2 Normal					DL/2 Log-Transformed						
470	Mean in Original Scale					7.539	Mean in Log Scale					-0.254
471	SD in Original Scale					17.04	SD in Log Scale					2.247
472	95% t UCL (Assumes normality)					12.92	95% H-Stat UCL					60.19
473	DL/2 is not a recommended method, provided for comparisons and historical reasons											
474												
475	Nonparametric Distribution Free UCL Statistics											
476	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
477												
478	Suggested UCL to Use											
479	99% KM (Chebyshev) UCL					39.05						
480												
481	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
482	Recommendations are based upon data size, data distribution, and skewness.											
483	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
484	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
485												
486	Benzo[a]anthracene											
487												
488	General Statistics											
489	Total Number of Observations					29	Number of Distinct Observations					29
490	Number of Detects					28	Number of Non-Detects					1

	A	B	C	D	E	F	G	H	I	J	K	L
491	Number of Distinct Detects					28	Number of Distinct Non-Detects					1
492	Minimum Detect					0.126	Minimum Non-Detect					0.0073
493	Maximum Detect					200	Maximum Non-Detect					0.0073
494	Variance Detects					2201	Percent Non-Detects					3.4489
495	Mean Detects					21.13	SD Detects					46.91
496	Median Detects					2.15	CV Detects					2.22
497	Skewness Detects					2.819	Kurtosis Detects					7.964
498	Mean of Logged Detects					1.151	SD of Logged Detects					1.959
499												
500	Normal GOF Test on Detects Only											
501	Shapiro Wilk Test Statistic					0.51	Shapiro Wilk GOF Test					
502	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
503	Lilliefors Test Statistic					0.428	Lilliefors GOF Test					
504	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
505	Detected Data Not Normal at 5% Significance Level											
506												
507	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
508	Mean					20.41	Standard Error of Mean					8.591
509	SD					45.43	95% KM (BCA) UCL					36.85
510	95% KM (t) UCL					35.02	95% KM (Percentile Bootstrap) UCL					35.96
511	95% KM (z) UCL					34.54	95% KM Bootstrap t UCL					49.31
512	90% KM Chebyshev UCL					46.18	95% KM Chebyshev UCL					57.85
513	97.5% KM Chebyshev UCL					74.06	99% KM Chebyshev UCL					105.9
514												
515	Gamma GOF Tests on Detected Observations Only											
516	A-D Test Statistic					2.265	Anderson-Darling GOF Test					
517	5% A-D Critical Value					0.843	Detected Data Not Gamma Distributed at 5% Significance Level					
518	K-S Test Statistic					0.28	Kolmogrov-Smirnoff GOF					
519	5% K-S Critical Value					0.178	Detected Data Not Gamma Distributed at 5% Significance Level					
520	Detected Data Not Gamma Distributed at 5% Significance Level											
521												
522	Gamma Statistics on Detected Data Only											
523	k hat (MLE)					0.353	k star (bias corrected MLE)					0.339
524	Theta hat (MLE)					59.82	Theta star (bias corrected MLE)					62.29
525	nu hat (MLE)					19.79	nu star (bias corrected)					19
526	MLE Mean (bias corrected)					21.13	MLE Sd (bias corrected)					36.28
527												
528	Gamma Kaplan-Meier (KM) Statistics											
529	k hat (KM)					0.202	nu hat (KM)					11.7
530	Approximate Chi Square Value (11.70, α)					5.032	Adjusted Chi Square Value (11.70, β)					4.772
531	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					47.46	95% Gamma Adjusted KM-UCL (use when $n < 50$)					50.04
532												
533	Gamma ROS Statistics using Imputed Non-Detects											
534	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
535	GROS may not be used when kstar of detected data is small such as < 0.1											
536	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
537	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
538	Minimum					0.01	Mean					20.41
539	Maximum					200	Median					2.14

	A	B	C	D	E	F	G	H	I	J	K	L
540	SD					46.23	CV					2.266
541	k hat (MLE)					0.329	k star (bias corrected MLE)					0.318
542	Theta hat (MLE)					62	Theta star (bias corrected MLE)					64.16
543	nu hat (MLE)					19.09	nu star (bias corrected)					18.45
544	MLE Mean (bias corrected)					20.41	MLE Sd (bias corrected)					36.18
545							Adjusted Level of Significance (β)					0.0407
546	Approximate Chi Square Value (18.45, α)					9.716	Adjusted Chi Square Value (18.45, β)					9.337
547	95% Gamma Approximate UCL (use when $n \geq 50$)					38.75	95% Gamma Adjusted UCL (use when $n < 50$)					40.32
548												
549	Lognormal GOF Test on Detected Observations Only											
550	Shapiro Wilk Test Statistic					0.946	Shapiro Wilk GOF Test					
551	5% Shapiro Wilk Critical Value					0.924	Detected Data appear Lognormal at 5% Significance Level					
552	Lilliefors Test Statistic					0.13	Lilliefors GOF Test					
553	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
554	Detected Data appear Lognormal at 5% Significance Level											
555												
556	Lognormal ROS Statistics Using Imputed Non-Detects											
557	Mean in Original Scale					20.41	Mean in Log Scale					0.982
558	SD in Original Scale					46.23	SD in Log Scale					2.127
559	95% t UCL (assumes normality of ROS data)					35.01	95% Percentile Bootstrap UCL					35.92
560	95% BCA Bootstrap UCL					40.68	95% Bootstrap t UCL					48.88
561	95% H-UCL (Log ROS)					133.7						
562												
563	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
564	KM Mean (logged)					0.941	95% H-UCL (KM -Log)					161.6
565	KM SD (logged)					2.191	95% Critical H Value (KM-Log)					4.213
566	KM Standard Error of Mean (logged)					0.414						
567												
568	DL/2 Statistics											
569	DL/2 Normal						DL/2 Log-Transformed					
570	Mean in Original Scale					20.41	Mean in Log Scale					0.917
571	SD in Original Scale					46.23	SD in Log Scale					2.297
572	95% t UCL (Assumes normality)					35.01	95% H-Stat UCL					235
573	DL/2 is not a recommended method, provided for comparisons and historical reasons											
574												
575	Nonparametric Distribution Free UCL Statistics											
576	Detected Data appear Lognormal Distributed at 5% Significance Level											
577												
578	Suggested UCL to Use											
579	99% KM (Chebyshev) UCL					105.9						
580												
581	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
582	Recommendations are based upon data size, data distribution, and skewness.											
583	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
584	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
585												
586	Benzo[a]pyrene											
587												
588	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
589	Total Number of Observations					29	Number of Distinct Observations					28
590	Number of Detects					28	Number of Non-Detects					1
591	Number of Distinct Detects					27	Number of Distinct Non-Detects					1
592	Minimum Detect					0.11	Minimum Non-Detect					0.0073
593	Maximum Detect					160	Maximum Non-Detect					0.0073
594	Variance Detects					1381	Percent Non-Detects					3.4489
595	Mean Detects					16.95	SD Detects					37.16
596	Median Detects					1.765	CV Detects					2.192
597	Skewness Detects					2.853	Kurtosis Detects					8.255
598	Mean of Logged Detects					0.998	SD of Logged Detects					1.937
599												
600	Normal GOF Test on Detects Only											
601	Shapiro Wilk Test Statistic					0.514	Shapiro Wilk GOF Test					
602	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
603	Lilliefors Test Statistic					0.419	Lilliefors GOF Test					
604	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
605	Detected Data Not Normal at 5% Significance Level											
606												
607	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
608	Mean					16.36	Standard Error of Mean					6.805
609	SD					35.99	95% KM (BCA) UCL					27.49
610	95% KM (t) UCL					27.94	95% KM (Percentile Bootstrap) UCL					28.54
611	95% KM (z) UCL					27.56	95% KM Bootstrap t UCL					38.36
612	90% KM Chebyshev UCL					36.78	95% KM Chebyshev UCL					46.03
613	97.5% KM Chebyshev UCL					58.86	99% KM Chebyshev UCL					84.08
614												
615	Gamma GOF Tests on Detected Observations Only											
616	A-D Test Statistic					2.098	Anderson-Darling GOF Test					
617	5% A-D Critical Value					0.84	Detected Data Not Gamma Distributed at 5% Significance Level					
618	K-S Test Statistic					0.26	Kolmogrov-Smirnoff GOF					
619	5% K-S Critical Value					0.178	Detected Data Not Gamma Distributed at 5% Significance Level					
620	Detected Data Not Gamma Distributed at 5% Significance Level											
621												
622	Gamma Statistics on Detected Data Only											
623	k hat (MLE)					0.365	k star (bias corrected MLE)					0.349
624	Theta hat (MLE)					46.48	Theta star (bias corrected MLE)					48.51
625	nu hat (MLE)					20.42	nu star (bias corrected)					19.57
626	MLE Mean (bias corrected)					16.95	MLE Sd (bias corrected)					28.67
627												
628	Gamma Kaplan-Meier (KM) Statistics											
629	k hat (KM)					0.207	nu hat (KM)					11.99
630	Approximate Chi Square Value (11.99, α)					5.222	Adjusted Chi Square Value (11.99, β)					4.957
631	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					37.58	95% Gamma Adjusted KM-UCL (use when $n < 50$)					39.59
632												
633	Gamma ROS Statistics using Imputed Non-Detects											
634	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
635	GROS may not be used when kstar of detected data is small such as < 0.1											
636	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
637	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											

	A	B	C	D	E	F	G	H	I	J	K	L
638	Minimum					0.01	Mean					16.36
639	Maximum					160	Median					1.68
640	SD					36.62	CV					2.238
641	k hat (MLE)					0.34	k star (bias corrected MLE)					0.327
642	Theta hat (MLE)					48.19	Theta star (bias corrected MLE)					49.98
643	nu hat (MLE)					19.7	nu star (bias corrected)					18.99
644	MLE Mean (bias corrected)					16.36	MLE Sd (bias corrected)					28.6
645							Adjusted Level of Significance (β)					0.0407
646	Approximate Chi Square Value (18.99, α)					10.11	Adjusted Chi Square Value (18.99, β)					9.724
647	95% Gamma Approximate UCL (use when n>=50)					30.74	95% Gamma Adjusted UCL (use when n<50)					31.96
648												
649	Lognormal GOF Test on Detected Observations Only											
650	Shapiro Wilk Test Statistic					0.952	Shapiro Wilk GOF Test					
651	5% Shapiro Wilk Critical Value					0.924	Detected Data appear Lognormal at 5% Significance Level					
652	Lilliefors Test Statistic					0.114	Lilliefors GOF Test					
653	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
654	Detected Data appear Lognormal at 5% Significance Level											
655												
656	Lognormal ROS Statistics Using Imputed Non-Detects											
657	Mean in Original Scale					16.36	Mean in Log Scale					0.831
658	SD in Original Scale					36.62	SD in Log Scale					2.104
659	95% t UCL (assumes normality of ROS data)					27.93	95% Percentile Bootstrap UCL					28.71
660	95% BCA Bootstrap UCL					31.8	95% Bootstrap t UCL					38.17
661	95% H-UCL (Log ROS)					106.3						
662												
663	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
664	KM Mean (logged)					0.794	95% H-UCL (KM -Log)					124.2
665	KM SD (logged)					2.159	95% Critical H Value (KM-Log)					4.162
666	KM Standard Error of Mean (logged)					0.408						
667												
668	DL/2 Statistics											
669	DL/2 Normal						DL/2 Log-Transformed					
670	Mean in Original Scale					16.36	Mean in Log Scale					0.77
671	SD in Original Scale					36.62	SD in Log Scale					2.264
672	95% t UCL (Assumes normality)					27.93	95% H-Stat UCL					178.8
673	DL/2 is not a recommended method, provided for comparisons and historical reasons											
674												
675	Nonparametric Distribution Free UCL Statistics											
676	Detected Data appear Lognormal Distributed at 5% Significance Level											
677												
678	Suggested UCL to Use											
679	99% KM (Chebyshev) UCL					84.08						
680												
681	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
682	Recommendations are based upon data size, data distribution, and skewness.											
683	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
684	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
685												
686	Benzo[b]fluoranthene											

	A	B	C	D	E	F	G	H	I	J	K	L
687												
688	General Statistics											
689	Total Number of Observations					21	Number of Distinct Observations					21
690	Number of Detects					20	Number of Non-Detects					1
691	Number of Distinct Detects					20	Number of Distinct Non-Detects					1
692	Minimum Detect					0.111	Minimum Non-Detect					0.0073
693	Maximum Detect					100	Maximum Non-Detect					0.0073
694	Variance Detects					890.6	Percent Non-Detects					4.7629
695	Mean Detects					15.36	SD Detects					29.84
696	Median Detects					1.7	CV Detects					1.943
697	Skewness Detects					2.231	Kurtosis Detects					4.02
698	Mean of Logged Detects					0.938	SD of Logged Detects					2.026
699												
700	Normal GOF Test on Detects Only											
701	Shapiro Wilk Test Statistic					0.566	Shapiro Wilk GOF Test					
702	5% Shapiro Wilk Critical Value					0.905	Detected Data Not Normal at 5% Significance Level					
703	Lilliefors Test Statistic					0.404	Lilliefors GOF Test					
704	5% Lilliefors Critical Value					0.198	Detected Data Not Normal at 5% Significance Level					
705	Detected Data Not Normal at 5% Significance Level											
706												
707	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
708	Mean					14.63	Standard Error of Mean					6.397
709	SD					28.57	95% KM (BCA) UCL					25.02
710	95% KM (t) UCL					25.66	95% KM (Percentile Bootstrap) UCL					25.01
711	95% KM (z) UCL					25.15	95% KM Bootstrap t UCL					36.52
712	90% KM Chebyshev UCL					33.82	95% KM Chebyshev UCL					42.51
713	97.5% KM Chebyshev UCL					54.58	99% KM Chebyshev UCL					78.28
714												
715	Gamma GOF Tests on Detected Observations Only											
716	A-D Test Statistic					1.289	Anderson-Darling GOF Test					
717	5% A-D Critical Value					0.83	Detected Data Not Gamma Distributed at 5% Significance Level					
718	K-S Test Statistic					0.232	Kolmogrov-Smirnoff GOF					
719	5% K-S Critical Value					0.208	Detected Data Not Gamma Distributed at 5% Significance Level					
720	Detected Data Not Gamma Distributed at 5% Significance Level											
721												
722	Gamma Statistics on Detected Data Only											
723	k hat (MLE)					0.371	k star (bias corrected MLE)					0.349
724	Theta hat (MLE)					41.36	Theta star (bias corrected MLE)					44.01
725	nu hat (MLE)					14.85	nu star (bias corrected)					13.96
726	MLE Mean (bias corrected)					15.36	MLE Sd (bias corrected)					26
727												
728	Gamma Kaplan-Meier (KM) Statistics											
729	k hat (KM)					0.262	nu hat (KM)					11
730	Approximate Chi Square Value (11.00, α)					4.578	Adjusted Chi Square Value (11.00, β)					4.263
731	5% Gamma Approximate KM-UCL (use when n>=50)					35.15	95% Gamma Adjusted KM-UCL (use when n<50)					37.75
732												
733	Gamma ROS Statistics using Imputed Non-Detects											
734	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
735	GROS may not be used when kstar of detected data is small such as < 0.1											

A	B	C	D	E	F	G	H	I	J	K	L
736	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
737	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
738	Minimum				0.01	Mean				14.63	
739	Maximum				100	Median				1.42	
740	SD				29.28	CV				2.002	
741	k hat (MLE)				0.337	k star (bias corrected MLE)				0.32	
742	Theta hat (MLE)				43.43	Theta star (bias corrected MLE)				45.64	
743	nu hat (MLE)				14.15	nu star (bias corrected)				13.46	
744	MLE Mean (bias corrected)				14.63	MLE Sd (bias corrected)				25.84	
745						Adjusted Level of Significance (β)				0.0383	
746	Approximate Chi Square Value (13.46, α)				6.202	Adjusted Chi Square Value (13.46, β)				5.826	
747	95% Gamma Approximate UCL (use when $n \geq 50$)				31.74	95% Gamma Adjusted UCL (use when $n < 50$)				33.78	
748											
749	Lognormal GOF Test on Detected Observations Only										
750	Shapiro Wilk Test Statistic				0.952	Shapiro Wilk GOF Test					
751	5% Shapiro Wilk Critical Value				0.905	Detected Data appear Lognormal at 5% Significance Level					
752	Lilliefors Test Statistic				0.114	Lilliefors GOF Test					
753	5% Lilliefors Critical Value				0.198	Detected Data appear Lognormal at 5% Significance Level					
754	Detected Data appear Lognormal at 5% Significance Level										
755											
756	Lognormal ROS Statistics Using Imputed Non-Detects										
757	Mean in Original Scale				14.63	Mean in Log Scale				0.699	
758	SD in Original Scale				29.28	SD in Log Scale				2.258	
759	95% t UCL (assumes normality of ROS data)				25.65	95% Percentile Bootstrap UCL				25.82	
760	95% BCA Bootstrap UCL				28.92	95% Bootstrap t UCL				38.05	
761	95% H-UCL (Log ROS)				260.3						
762											
763	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
764	KM Mean (logged)				0.659	95% H-UCL (KM -Log)				293.4	
765	KM SD (logged)				2.296	95% Critical H Value (KM-Log)				4.652	
766	KM Standard Error of Mean (logged)				0.514						
767											
768	DL/2 Statistics										
769	DL/2 Normal				DL/2 Log-Transformed						
770	Mean in Original Scale				14.63	Mean in Log Scale				0.626	
771	SD in Original Scale				29.28	SD in Log Scale				2.438	
772	95% t UCL (Assumes normality)				25.65	95% H-Stat UCL				528.3	
773	DL/2 is not a recommended method, provided for comparisons and historical reasons										
774											
775	Nonparametric Distribution Free UCL Statistics										
776	Detected Data appear Lognormal Distributed at 5% Significance Level										
777											
778	Suggested UCL to Use										
779	99% KM (Chebyshev) UCL				78.28						
780											
781	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
782	Recommendations are based upon data size, data distribution, and skewness.										
783	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).										
784	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.										

	A	B	C	D	E	F	G	H	I	J	K	L		
785														
786														
787	Benzo[g,h,l]perylene													
788														
789	General Statistics													
790	Total Number of Observations					29		Number of Distinct Observations				29		
791								Number of Missing Observations				0		
792	Minimum					0.01		Mean				9.154		
793	Maximum					78		Median				0.934		
794	SD					19.78		Std. Error of Mean				3.672		
795	Coefficient of Variation					2.16		Skewness				2.567		
796														
797	Normal GOF Test													
798	Shapiro Wilk Test Statistic					0.518		Shapiro Wilk GOF Test						
799	5% Shapiro Wilk Critical Value					0.926		Data Not Normal at 5% Significance Level						
800	Lilliefors Test Statistic					0.411		Lilliefors GOF Test						
801	5% Lilliefors Critical Value					0.165		Data Not Normal at 5% Significance Level						
802	Data Not Normal at 5% Significance Level													
803														
804	Assuming Normal Distribution													
805	95% Normal UCL					95% UCLs (Adjusted for Skewness)								
806	95% Student's-t UCL					15.4		95% Adjusted-CLT UCL (Chen-1995)				17.07		
807								95% Modified-t UCL (Johnson-1978)				15.69		
808														
809	Gamma GOF Test													
810	A-D Test Statistic					1.985		Anderson-Darling Gamma GOF Test						
811	5% A-D Critical Value					0.847		Data Not Gamma Distributed at 5% Significance Level						
812	K-S Test Statistic					0.254		Kolmogrov-Smirnoff Gamma GOF Test						
813	5% K-S Critical Value					0.176		Data Not Gamma Distributed at 5% Significance Level						
814	Data Not Gamma Distributed at 5% Significance Level													
815														
816	Gamma Statistics													
817	k hat (MLE)					0.342		k star (bias corrected MLE)				0.33		
818	Theta hat (MLE)					26.76		Theta star (bias corrected MLE)				27.77		
819	nu hat (MLE)					19.84		nu star (bias corrected)				19.12		
820	MLE Mean (bias corrected)					9.154		MLE Sd (bias corrected)				15.94		
821								Approximate Chi Square Value (0.05)				10.21		
822	Adjusted Level of Significance					0.0407		Adjusted Chi Square Value				9.816		
823														
824	Assuming Gamma Distribution													
825	95% Approximate Gamma UCL (use when n>=50))					17.15		95% Adjusted Gamma UCL (use when n<50)				17.83		
826														
827	Lognormal GOF Test													
828	Shapiro Wilk Test Statistic					0.969		Shapiro Wilk Lognormal GOF Test						
829	5% Shapiro Wilk Critical Value					0.926		Data appear Lognormal at 5% Significance Level						
830	Lilliefors Test Statistic					0.112		Lilliefors Lognormal GOF Test						
831	5% Lilliefors Critical Value					0.165		Data appear Lognormal at 5% Significance Level						
832	Data appear Lognormal at 5% Significance Level													
833														

	A	B	C	D	E	F	G	H	I	J	K	L
834	Lognormal Statistics											
835	Minimum of Logged Data					-4.605	Mean of logged Data					0.241
836	Maximum of Logged Data					4.357	SD of logged Data					2.117
837												
838	Assuming Lognormal Distribution											
839	95% H-UCL					61.59	90% Chebyshev (MVUE) UCL					25.08
840	95% Chebyshev (MVUE) UCL					32.05	97.5% Chebyshev (MVUE) UCL					41.72
841	99% Chebyshev (MVUE) UCL					60.73						
842												
843	Nonparametric Distribution Free UCL Statistics											
844	Data appear to follow a Discernible Distribution at 5% Significance Level											
845												
846	Nonparametric Distribution Free UCLs											
847	95% CLT UCL					15.19	95% Jackknife UCL					15.4
848	95% Standard Bootstrap UCL					15.02	95% Bootstrap-t UCL					21.1
849	95% Hall's Bootstrap UCL					15.4	95% Percentile Bootstrap UCL					15.4
850	95% BCA Bootstrap UCL					17.03						
851	90% Chebyshev(Mean, Sd) UCL					20.17	95% Chebyshev(Mean, Sd) UCL					25.16
852	97.5% Chebyshev(Mean, Sd) UCL					32.09	99% Chebyshev(Mean, Sd) UCL					45.69
853												
854	Suggested UCL to Use											
855	97.5% Chebyshev (Mean, Sd) UCL					32.09						
856												
857	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
858	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
859	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
860	For additional insight the user may want to consult a statistician.											
861												
862	Benzo[k]fluoranthene											
863												
864	General Statistics											
865	Total Number of Observations					29	Number of Distinct Observations					28
866	Number of Detects					28	Number of Non-Detects					1
867	Number of Distinct Detects					27	Number of Distinct Non-Detects					1
868	Minimum Detect					0.11	Minimum Non-Detect					0.0073
869	Maximum Detect					82.4	Maximum Non-Detect					0.0073
870	Variance Detects					634.7	Percent Non-Detects					3.448%
871	Mean Detects					12.6	SD Detects					25.19
872	Median Detects					1.48	CV Detects					1.999
873	Skewness Detects					2.192	Kurtosis Detects					3.491
874	Mean of Logged Detects					0.763	SD of Logged Detects					1.911
875												
876	Normal GOF Test on Detects Only											
877	Shapiro Wilk Test Statistic					0.534	Shapiro Wilk GOF Test					
878	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
879	Lilliefors Test Statistic					0.413	Lilliefors GOF Test					
880	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
881	Detected Data Not Normal at 5% Significance Level											
882												

	A	B	C	D	E	F	G	H	I	J	K	L
883	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
884	Mean					12.17	Standard Error of Mean					4.617
885	SD					24.42	95% KM (BCA) UCL					19.83
886	95% KM (t) UCL					20.02	95% KM (Percentile Bootstrap) UCL					20.22
887	95% KM (z) UCL					19.76	95% KM Bootstrap t UCL					24.84
888	90% KM Chebyshev UCL					26.02	95% KM Chebyshev UCL					32.29
889	97.5% KM Chebyshev UCL					41	99% KM Chebyshev UCL					58.11
890												
891	Gamma GOF Tests on Detected Observations Only											
892	A-D Test Statistic					2.215	Anderson-Darling GOF Test					
893	5% A-D Critical Value					0.838	Detected Data Not Gamma Distributed at 5% Significance Level					
894	K-S Test Statistic					0.261	Kolmogrov-Smirnoff GOF					
895	5% K-S Critical Value					0.178	Detected Data Not Gamma Distributed at 5% Significance Level					
896	Detected Data Not Gamma Distributed at 5% Significance Level											
897												
898	Gamma Statistics on Detected Data Only											
899	k hat (MLE)					0.375	k star (bias corrected MLE)					0.359
900	Theta hat (MLE)					33.56	Theta star (bias corrected MLE)					35.1
901	nu hat (MLE)					21.02	nu star (bias corrected)					20.1
902	MLE Mean (bias corrected)					12.6	MLE Sd (bias corrected)					21.03
903												
904	Gamma Kaplan-Meier (KM) Statistics											
905	k hat (KM)					0.248	nu hat (KM)					14.4
906	Approximate Chi Square Value (14.40, α)					6.847	Adjusted Chi Square Value (14.40, β)					6.536
907	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					25.59	95% Gamma Adjusted KM-UCL (use when $n < 50$)					26.81
908												
909	Gamma ROS Statistics using Imputed Non-Detects											
910	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
911	GROS may not be used when kstar of detected data is small such as < 0.1											
912	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
913	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
914	Minimum					0.01	Mean					12.17
915	Maximum					82.4	Median					1.22
916	SD					24.85	CV					2.042
917	k hat (MLE)					0.35	k star (bias corrected MLE)					0.337
918	Theta hat (MLE)					34.76	Theta star (bias corrected MLE)					36.12
919	nu hat (MLE)					20.3	nu star (bias corrected)					19.54
920	MLE Mean (bias corrected)					12.17	MLE Sd (bias corrected)					20.96
921							Adjusted Level of Significance (β)					0.0407
922	Approximate Chi Square Value (19.54, α)					10.51	Adjusted Chi Square Value (19.54, β)					10.11
923	95% Gamma Approximate UCL (use when $n \geq 50$)					22.62	95% Gamma Adjusted UCL (use when $n < 50$)					23.5
924												
925	Lognormal GOF Test on Detected Observations Only											
926	Shapiro Wilk Test Statistic					0.933	Shapiro Wilk GOF Test					
927	5% Shapiro Wilk Critical Value					0.924	Detected Data appear Lognormal at 5% Significance Level					
928	Lilliefors Test Statistic					0.119	Lilliefors GOF Test					
929	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
930	Detected Data appear Lognormal at 5% Significance Level											
931												

	A	B	C	D	E	F	G	H	I	J	K	L
932	Lognormal ROS Statistics Using Imputed Non-Detects											
933	Mean in Original Scale					12.17	Mean in Log Scale					0.599
934	SD in Original Scale					24.85	SD in Log Scale					2.074
935	95% t UCL (assumes normality of ROS data)					20.02	95% Percentile Bootstrap UCL					20.15
936	95% BCA Bootstrap UCL					22.64	95% Bootstrap t UCL					25.11
937	95% H-UCL (Log ROS)					75.85						
938												
939	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
940	KM Mean (logged)					0.567	95% H-UCL (KM -Log)					84.88
941	KM SD (logged)					2.116	95% Critical H Value (KM-Log)					4.093
942	KM Standard Error of Mean (logged)					0.4						
943												
944	DL/2 Statistics											
945	DL/2 Normal					DL/2 Log-Transformed						
946	Mean in Original Scale					12.17	Mean in Log Scale					0.543
947	SD in Original Scale					24.85	SD in Log Scale					2.219
948	95% t UCL (Assumes normality)					20.02	95% H-Stat UCL					120.4
949	DL/2 is not a recommended method, provided for comparisons and historical reasons											
950												
951	Nonparametric Distribution Free UCL Statistics											
952	Detected Data appear Lognormal Distributed at 5% Significance Level											
953												
954	Suggested UCL to Use											
955	99% KM (Chebyshev) UCL					58.11						
956												
957	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
958	Recommendations are based upon data size, data distribution, and skewness.											
959	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
960	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
961												
962	Chrysene											
963												
964	General Statistics											
965	Total Number of Observations					29	Number of Distinct Observations					28
966	Number of Detects					28	Number of Non-Detects					1
967	Number of Distinct Detects					27	Number of Distinct Non-Detects					1
968	Minimum Detect					0.124	Minimum Non-Detect					0.0073
969	Maximum Detect					230	Maximum Non-Detect					0.0073
970	Variance Detects					2513	Percent Non-Detects					3.4489
971	Mean Detects					21.44	SD Detects					50.13
972	Median Detects					2.055	CV Detects					2.338
973	Skewness Detects					3.231	Kurtosis Detects					11.31
974	Mean of Logged Detects					1.138	SD of Logged Detects					1.96
975												
976	Normal GOF Test on Detects Only											
977	Shapiro Wilk Test Statistic					0.486	Shapiro Wilk GOF Test					
978	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
979	Lilliefors Test Statistic					0.423	Lilliefors GOF Test					
980	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
981	Detected Data Not Normal at 5% Significance Level											
982												
983	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
984	Mean				20.71	Standard Error of Mean				9.178		
985	SD				48.53	95% KM (BCA) UCL				37.85		
986	95% KM (t) UCL				36.32	95% KM (Percentile Bootstrap) UCL				37.16		
987	95% KM (z) UCL				35.8	95% KM Bootstrap t UCL				55.88		
988	90% KM Chebyshev UCL				48.24	95% KM Chebyshev UCL				60.71		
989	97.5% KM Chebyshev UCL				78.02	99% KM Chebyshev UCL				112		
990												
991	Gamma GOF Tests on Detected Observations Only											
992	A-D Test Statistic				2.283	Anderson-Darling GOF Test						
993	5% A-D Critical Value				0.843	Detected Data Not Gamma Distributed at 5% Significance Level						
994	K-S Test Statistic				0.278	Kolmogrov-Smirnoff GOF						
995	5% K-S Critical Value				0.178	Detected Data Not Gamma Distributed at 5% Significance Level						
996	Detected Data Not Gamma Distributed at 5% Significance Level											
997												
998	Gamma Statistics on Detected Data Only											
999	k hat (MLE)				0.349	k star (bias corrected MLE)				0.335		
1000	Theta hat (MLE)				61.44	Theta star (bias corrected MLE)				63.93		
1001	nu hat (MLE)				19.55	nu star (bias corrected)				18.78		
1002	MLE Mean (bias corrected)				21.44	MLE Sd (bias corrected)				37.03		
1003												
1004	Gamma Kaplan-Meier (KM) Statistics											
1005	k hat (KM)				0.182	nu hat (KM)				10.56		
1006	Approximate Chi Square Value (10.56, α)				4.292	Adjusted Chi Square Value (10.56, β)				4.056		
1007	5% Gamma Approximate KM-UCL (use when $n \geq 50$)				50.92	95% Gamma Adjusted KM-UCL (use when $n < 50$)				53.89		
1008												
1009	Gamma ROS Statistics using Imputed Non-Detects											
1010	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1011	GROS may not be used when kstar of detected data is small such as < 0.1											
1012	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1013	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1014	Minimum				0.01	Mean				20.71		
1015	Maximum				230	Median				2.02		
1016	SD				49.39	CV				2.385		
1017	k hat (MLE)				0.325	k star (bias corrected MLE)				0.315		
1018	Theta hat (MLE)				63.61	Theta star (bias corrected MLE)				65.77		
1019	nu hat (MLE)				18.88	nu star (bias corrected)				18.26		
1020	MLE Mean (bias corrected)				20.71	MLE Sd (bias corrected)				36.9		
1021						Adjusted Level of Significance (β)				0.0407		
1022	Approximate Chi Square Value (18.26, α)				9.578	Adjusted Chi Square Value (18.26, β)				9.203		
1023	95% Gamma Approximate UCL (use when $n \geq 50$)				39.47	95% Gamma Adjusted UCL (use when $n < 50$)				41.08		
1024												
1025	Lognormal GOF Test on Detected Observations Only											
1026	Shapiro Wilk Test Statistic				0.948	Shapiro Wilk GOF Test						
1027	5% Shapiro Wilk Critical Value				0.924	Detected Data appear Lognormal at 5% Significance Level						
1028	Lilliefors Test Statistic				0.126	Lilliefors GOF Test						
1029	5% Lilliefors Critical Value				0.167	Detected Data appear Lognormal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L
1030	Detected Data appear Lognormal at 5% Significance Level											
1031												
1032	Lognormal ROS Statistics Using Imputed Non-Detects											
1033	Mean in Original Scale				20.71	Mean in Log Scale				0.969		
1034	SD in Original Scale				49.39	SD in Log Scale				2.128		
1035	95% t UCL (assumes normality of ROS data)				36.31	95% Percentile Bootstrap UCL				37.37		
1036	95% BCA Bootstrap UCL				42.64	95% Bootstrap t UCL				54.56		
1037	95% H-UCL (Log ROS)				132.5							
1038												
1039	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1040	KM Mean (logged)				0.929	95% H-UCL (KM -Log)				159.5		
1041	KM SD (logged)				2.19	95% Critical H Value (KM-Log)				4.213		
1042	KM Standard Error of Mean (logged)				0.414							
1043												
1044	DL/2 Statistics											
1045	DL/2 Normal				DL/2 Log-Transformed							
1046	Mean in Original Scale				20.71	Mean in Log Scale				0.905		
1047	SD in Original Scale				49.39	SD in Log Scale				2.297		
1048	95% t UCL (Assumes normality)				36.31	95% H-Stat UCL				231.7		
1049	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1050												
1051	Nonparametric Distribution Free UCL Statistics											
1052	Detected Data appear Lognormal Distributed at 5% Significance Level											
1053												
1054	Suggested UCL to Use											
1055	99% KM (Chebyshev) UCL				112							
1056												
1057	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1058	Recommendations are based upon data size, data distribution, and skewness.											
1059	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1060	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1061												
1062	Dibenz[a,h]anthracene											
1063												
1064	General Statistics											
1065	Total Number of Observations				29	Number of Distinct Observations				29		
1066	Number of Detects				27	Number of Non-Detects				2		
1067	Number of Distinct Detects				27	Number of Distinct Non-Detects				2		
1068	Minimum Detect				0.0228	Minimum Non-Detect				0.0073		
1069	Maximum Detect				20.9	Maximum Non-Detect				0.029		
1070	Variance Detects				34.63	Percent Non-Detects				6.897%		
1071	Mean Detects				2.899	SD Detects				5.885		
1072	Median Detects				0.34	CV Detects				2.03		
1073	Skewness Detects				2.36	Kurtosis Detects				4.512		
1074	Mean of Logged Detects				-0.661	SD of Logged Detects				1.901		
1075												
1076	Normal GOF Test on Detects Only											
1077	Shapiro Wilk Test Statistic				0.535	Shapiro Wilk GOF Test						
1078	5% Shapiro Wilk Critical Value				0.923	Detected Data Not Normal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L	
1079	Lilliefors Test Statistic					0.421	Lilliefors GOF Test						
1080	5% Lilliefors Critical Value					0.171	Detected Data Not Normal at 5% Significance Level						
1081	Detected Data Not Normal at 5% Significance Level												
1082													
1083	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1084	Mean					2.7	Standard Error of Mean					1.064	
1085	SD					5.62	95% KM (BCA) UCL					4.496	
1086	95% KM (t) UCL					4.509	95% KM (Percentile Bootstrap) UCL					4.42	
1087	95% KM (z) UCL					4.449	95% KM Bootstrap t UCL					5.534	
1088	90% KM Chebyshev UCL					5.89	95% KM Chebyshev UCL					7.335	
1089	97.5% KM Chebyshev UCL					9.341	99% KM Chebyshev UCL					13.28	
1090													
1091	Gamma GOF Tests on Detected Observations Only												
1092	A-D Test Statistic					1.981	Anderson-Darling GOF Test						
1093	5% A-D Critical Value					0.834	Detected Data Not Gamma Distributed at 5% Significance Level						
1094	K-S Test Statistic					0.265	Kolmogrov-Smirnoff GOF						
1095	5% K-S Critical Value					0.181	Detected Data Not Gamma Distributed at 5% Significance Level						
1096	Detected Data Not Gamma Distributed at 5% Significance Level												
1097													
1098	Gamma Statistics on Detected Data Only												
1099	k hat (MLE)					0.384	k star (bias corrected MLE)					0.366	
1100	Theta hat (MLE)					7.548	Theta star (bias corrected MLE)					7.919	
1101	nu hat (MLE)					20.74	nu star (bias corrected)					19.77	
1102	MLE Mean (bias corrected)					2.899	MLE Sd (bias corrected)					4.791	
1103													
1104	Gamma Kaplan-Meier (KM) Statistics												
1105	k hat (KM)					0.231	nu hat (KM)					13.38	
1106	Approximate Chi Square Value (13.38, α)					6.151	Adjusted Chi Square Value (13.38, β)					5.859	
1107	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					5.874	95% Gamma Adjusted KM-UCL (use when $n < 50$)					6.166	
1108													
1109	Gamma ROS Statistics using Imputed Non-Detects												
1110	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1111	GROS may not be used when kstar of detected data is small such as < 0.1												
1112	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1113	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1114	Minimum					0.01	Mean					2.699	
1115	Maximum					20.9	Median					0.336	
1116	SD					5.72	CV					2.119	
1117	k hat (MLE)					0.349	k star (bias corrected MLE)					0.336	
1118	Theta hat (MLE)					7.728	Theta star (bias corrected MLE)					8.03	
1119	nu hat (MLE)					20.26	nu star (bias corrected)					19.5	
1120	MLE Mean (bias corrected)					2.699	MLE Sd (bias corrected)					4.656	
1121							Adjusted Level of Significance (β)					0.0407	
1122	Approximate Chi Square Value (19.50, α)					10.48	Adjusted Chi Square Value (19.50, β)					10.09	
1123	95% Gamma Approximate UCL (use when $n \geq 50$)					5.021	95% Gamma Adjusted UCL (use when $n < 50$)					5.218	
1124													
1125	Lognormal GOF Test on Detected Observations Only												
1126	Shapiro Wilk Test Statistic					0.947	Shapiro Wilk GOF Test						
1127	5% Shapiro Wilk Critical Value					0.923	Detected Data appear Lognormal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L	
1128	Lilliefors Test Statistic					0.126	Lilliefors GOF Test						
1129	5% Lilliefors Critical Value					0.171	Detected Data appear Lognormal at 5% Significance Level						
1130	Detected Data appear Lognormal at 5% Significance Level												
1131													
1132	Lognormal ROS Statistics Using Imputed Non-Detects												
1133	Mean in Original Scale					2.699	Mean in Log Scale					-0.948	
1134	SD in Original Scale					5.72	SD in Log Scale					2.129	
1135	95% t UCL (assumes normality of ROS data)					4.506	95% Percentile Bootstrap UCL					4.478	
1136	95% BCA Bootstrap UCL					4.978	95% Bootstrap t UCL					5.6	
1137	95% H-UCL (Log ROS)					19.59							
1138													
1139	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
1140	KM Mean (logged)					-0.928	95% H-UCL (KM -Log)					15.46	
1141	KM SD (logged)					2.056	95% Critical H Value (KM-Log)					3.999	
1142	KM Standard Error of Mean (logged)					0.39							
1143													
1144	DL/2 Statistics												
1145	DL/2 Normal					DL/2 Log-Transformed							
1146	Mean in Original Scale					2.699	Mean in Log Scale					-0.955	
1147	SD in Original Scale					5.72	SD in Log Scale					2.144	
1148	95% t UCL (Assumes normality)					4.506	95% H-Stat UCL					20.53	
1149	DL/2 is not a recommended method, provided for comparisons and historical reasons												
1150													
1151	Nonparametric Distribution Free UCL Statistics												
1152	Detected Data appear Lognormal Distributed at 5% Significance Level												
1153													
1154	Suggested UCL to Use												
1155	99% KM (Chebyshev) UCL					13.28							
1156													
1157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
1158	Recommendations are based upon data size, data distribution, and skewness.												
1159	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
1160	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
1161													
1162													
1163	Fluoranthene												
1164													
1165	General Statistics												
1166	Total Number of Observations					29	Number of Distinct Observations					29	
1167							Number of Missing Observations					0	
1168	Minimum					0.02	Mean					43.49	
1169	Maximum					360	Median					4.91	
1170	SD					95.1	Std. Error of Mean					17.66	
1171	Coefficient of Variation					2.187	Skewness					2.56	
1172													
1173	Normal GOF Test												
1174	Shapiro Wilk Test Statistic					0.508	Shapiro Wilk GOF Test						
1175	5% Shapiro Wilk Critical Value					0.926	Data Not Normal at 5% Significance Level						
1176	Lilliefors Test Statistic					0.426	Lilliefors GOF Test						

	A	B	C	D	E	F	G	H	I	J	K	L	
1177	5% Lilliefors Critical Value					0.165	Data Not Normal at 5% Significance Level						
1178	Data Not Normal at 5% Significance Level												
1179													
1180	Assuming Normal Distribution												
1181	95% Normal UCL						95% UCLs (Adjusted for Skewness)						
1182	95% Student's-t UCL					73.53	95% Adjusted-CLT UCL (Chen-1995)					81.51	
1183							95% Modified-t UCL (Johnson-1978)					74.93	
1184													
1185	Gamma GOF Test												
1186	A-D Test Statistic					1.966	Anderson-Darling Gamma GOF Test						
1187	5% A-D Critical Value					0.849	Data Not Gamma Distributed at 5% Significance Level						
1188	K-S Test Statistic					0.252	Kolmogrov-Smirnoff Gamma GOF Test						
1189	5% K-S Critical Value					0.176	Data Not Gamma Distributed at 5% Significance Level						
1190	Data Not Gamma Distributed at 5% Significance Level												
1191													
1192	Gamma Statistics												
1193	k hat (MLE)					0.332	k star (bias corrected MLE)					0.321	
1194	Theta hat (MLE)					130.8	Theta star (bias corrected MLE)					135.5	
1195	nu hat (MLE)					19.28	nu star (bias corrected)					18.62	
1196	MLE Mean (bias corrected)					43.49	MLE Sd (bias corrected)					76.75	
1197							Approximate Chi Square Value (0.05)					9.839	
1198	Adjusted Level of Significance					0.0407	Adjusted Chi Square Value					9.458	
1199													
1200	Assuming Gamma Distribution												
1201	95% Approximate Gamma UCL (use when n>=50))					82.29	95% Adjusted Gamma UCL (use when n<50)					85.6	
1202													
1203	Lognormal GOF Test												
1204	Shapiro Wilk Test Statistic					0.964	Shapiro Wilk Lognormal GOF Test						
1205	5% Shapiro Wilk Critical Value					0.926	Data appear Lognormal at 5% Significance Level						
1206	Lilliefors Test Statistic					0.114	Lilliefors Lognormal GOF Test						
1207	5% Lilliefors Critical Value					0.165	Data appear Lognormal at 5% Significance Level						
1208	Data appear Lognormal at 5% Significance Level												
1209													
1210	Lognormal Statistics												
1211	Minimum of Logged Data					-3.912	Mean of logged Data					1.732	
1212	Maximum of Logged Data					5.886	SD of logged Data					2.213	
1213													
1214	Assuming Lognormal Distribution												
1215	95% H-UCL					386.3	90% Chebyshev (MVUE) UCL					137	
1216	95% Chebyshev (MVUE) UCL					175.8	97.5% Chebyshev (MVUE) UCL					229.7	
1217	99% Chebyshev (MVUE) UCL					335.5							
1218													
1219	Nonparametric Distribution Free UCL Statistics												
1220	Data appear to follow a Discernible Distribution at 5% Significance Level												
1221													
1222	Nonparametric Distribution Free UCLs												
1223	95% CLT UCL					72.53	95% Jackknife UCL					73.53	
1224	95% Standard Bootstrap UCL					72.71	95% Bootstrap-t UCL					94.22	
1225	95% Hall's Bootstrap UCL					76.01	95% Percentile Bootstrap UCL					75.2	

	A	B	C	D	E	F	G	H	I	J	K	L
1226	95% BCA Bootstrap UCL					85.38						
1227	90% Chebyshev(Mean, Sd) UCL					96.47	95% Chebyshev(Mean, Sd) UCL					120.5
1228	97.5% Chebyshev(Mean, Sd) UCL					153.8	99% Chebyshev(Mean, Sd) UCL					219.2
1229												
1230	Suggested UCL to Use											
1231	97.5% Chebyshev (Mean, Sd) UCL					153.8						
1232												
1233	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1234	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1235	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1236	For additional insight the user may want to consult a statistician.											
1237												
1238	Fluorene											
1239												
1240	General Statistics											
1241	Total Number of Observations					29	Number of Distinct Observations					27
1242	Number of Detects					27	Number of Non-Detects					2
1243	Number of Distinct Detects					25	Number of Distinct Non-Detects					2
1244	Minimum Detect					0.0126	Minimum Non-Detect					0.0073
1245	Maximum Detect					30	Maximum Non-Detect					0.135
1246	Variance Detects					61.2	Percent Non-Detects					6.8979
1247	Mean Detects					3.486	SD Detects					7.823
1248	Median Detects					0.259	CV Detects					2.244
1249	Skewness Detects					2.531	Kurtosis Detects					5.627
1250	Mean of Logged Detects					-0.951	SD of Logged Detects					2.131
1251												
1252	Normal GOF Test on Detects Only											
1253	Shapiro Wilk Test Statistic					0.505	Shapiro Wilk GOF Test					
1254	5% Shapiro Wilk Critical Value					0.923	Detected Data Not Normal at 5% Significance Level					
1255	Lilliefors Test Statistic					0.434	Lilliefors GOF Test					
1256	5% Lilliefors Critical Value					0.171	Detected Data Not Normal at 5% Significance Level					
1257	Detected Data Not Normal at 5% Significance Level											
1258												
1259	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1260	Mean					3.248	Standard Error of Mean					1.412
1261	SD					7.459	95% KM (BCA) UCL					5.869
1262	95% KM (t) UCL					5.649	95% KM (Percentile Bootstrap) UCL					5.527
1263	95% KM (z) UCL					5.57	95% KM Bootstrap t UCL					7.225
1264	90% KM Chebyshev UCL					7.482	95% KM Chebyshev UCL					9.4
1265	97.5% KM Chebyshev UCL					12.06	99% KM Chebyshev UCL					17.29
1266												
1267	Gamma GOF Tests on Detected Observations Only											
1268	A-D Test Statistic					2.428	Anderson-Darling GOF Test					
1269	5% A-D Critical Value					0.85	Detected Data Not Gamma Distributed at 5% Significance Level					
1270	K-S Test Statistic					0.29	Kolmogrov-Smirnoff GOF					
1271	5% K-S Critical Value					0.182	Detected Data Not Gamma Distributed at 5% Significance Level					
1272	Detected Data Not Gamma Distributed at 5% Significance Level											
1273												
1274	Gamma Statistics on Detected Data Only											

	A	B	C	D	E	F	G	H	I	J	K	L
1275	k hat (MLE)					0.312	k star (bias corrected MLE)					0.302
1276	Theta hat (MLE)					11.19	Theta star (bias corrected MLE)					11.56
1277	nu hat (MLE)					16.82	nu star (bias corrected)					16.29
1278	MLE Mean (bias corrected)					3.486	MLE Sd (bias corrected)					6.348
1279												
1280	Gamma Kaplan-Meier (KM) Statistics											
1281	k hat (KM)					0.19	nu hat (KM)					11
1282	Approximate Chi Square Value (11.00, α)					4.573	Adjusted Chi Square Value (11.00, β)					4.327
1283	5% Gamma Approximate KM-UCL (use when n>=50)					7.809	95% Gamma Adjusted KM-UCL (use when n<50)					8.253
1284												
1285	Gamma ROS Statistics using Imputed Non-Detects											
1286	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1287	GROS may not be used when kstar of detected data is small such as < 0.1											
1288	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1289	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1290	Minimum					0.01	Mean					3.246
1291	Maximum					30	Median					0.252
1292	SD					7.592	CV					2.339
1293	k hat (MLE)					0.291	k star (bias corrected MLE)					0.284
1294	Theta hat (MLE)					11.15	Theta star (bias corrected MLE)					11.43
1295	nu hat (MLE)					16.88	nu star (bias corrected)					16.47
1296	MLE Mean (bias corrected)					3.246	MLE Sd (bias corrected)					6.092
1297							Adjusted Level of Significance (β)					0.0407
1298	Approximate Chi Square Value (16.47, α)					8.294	Adjusted Chi Square Value (16.47, β)					7.948
1299	95% Gamma Approximate UCL (use when n>=50)					6.446	95% Gamma Adjusted UCL (use when n<50)					6.727
1300												
1301	Lognormal GOF Test on Detected Observations Only											
1302	Shapiro Wilk Test Statistic					0.938	Shapiro Wilk GOF Test					
1303	5% Shapiro Wilk Critical Value					0.923	Detected Data appear Lognormal at 5% Significance Level					
1304	Lilliefors Test Statistic					0.138	Lilliefors GOF Test					
1305	5% Lilliefors Critical Value					0.171	Detected Data appear Lognormal at 5% Significance Level					
1306	Detected Data appear Lognormal at 5% Significance Level											
1307												
1308	Lognormal ROS Statistics Using Imputed Non-Detects											
1309	Mean in Original Scale					3.247	Mean in Log Scale					-1.214
1310	SD in Original Scale					7.592	SD in Log Scale					2.308
1311	95% t UCL (assumes normality of ROS data)					5.645	95% Percentile Bootstrap UCL					5.784
1312	95% BCA Bootstrap UCL					6.314	95% Bootstrap t UCL					7.501
1313	95% H-UCL (Log ROS)					29.02						
1314												
1315	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1316	KM Mean (logged)					-1.167	95% H-UCL (KM -Log)					19.25
1317	KM SD (logged)					2.186	95% Critical H Value (KM-Log)					4.205
1318	KM Standard Error of Mean (logged)					0.415						
1319												
1320	DL/2 Statistics											
1321	DL/2 Normal					DL/2 Log-Transformed						
1322	Mean in Original Scale					3.248	Mean in Log Scale					-1.172
1323	SD in Original Scale					7.591	SD in Log Scale					2.247

	A	B	C	D	E	F	G	H	I	J	K	L
1324	95% t UCL (Assumes normality)					5.646	95% H-Stat UCL					24.04
1325	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1326												
1327	Nonparametric Distribution Free UCL Statistics											
1328	Detected Data appear Lognormal Distributed at 5% Significance Level											
1329												
1330	Suggested UCL to Use											
1331	99% KM (Chebyshev) UCL					17.29						
1332												
1333	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1334	Recommendations are based upon data size, data distribution, and skewness.											
1335	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1336	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1337												
1338	Indeno[1,2,3-cd]pyrene											
1339												
1340	General Statistics											
1341	Total Number of Observations					29	Number of Distinct Observations					28
1342	Number of Detects					28	Number of Non-Detects					1
1343	Number of Distinct Detects					27	Number of Distinct Non-Detects					1
1344	Minimum Detect					0.034	Minimum Non-Detect					0.0073
1345	Maximum Detect					72	Maximum Non-Detect					0.0073
1346	Variance Detects					387.6	Percent Non-Detects					3.4489
1347	Mean Detects					9.407	SD Detects					19.69
1348	Median Detects					0.956	CV Detects					2.093
1349	Skewness Detects					2.392	Kurtosis Detects					4.659
1350	Mean of Logged Detects					0.32	SD of Logged Detects					2.056
1351												
1352	Normal GOF Test on Detects Only											
1353	Shapiro Wilk Test Statistic					0.526	Shapiro Wilk GOF Test					
1354	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
1355	Lilliefors Test Statistic					0.422	Lilliefors GOF Test					
1356	5% Lilliefors Critical Value					0.167	Detected Data Not Normal at 5% Significance Level					
1357	Detected Data Not Normal at 5% Significance Level											
1358												
1359	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1360	Mean					9.083	Standard Error of Mean					3.607
1361	SD					19.07	95% KM (BCA) UCL					15.58
1362	95% KM (t) UCL					15.22	95% KM (Percentile Bootstrap) UCL					15.42
1363	95% KM (z) UCL					15.02	95% KM Bootstrap t UCL					19.3
1364	90% KM Chebyshev UCL					19.9	95% KM Chebyshev UCL					24.8
1365	97.5% KM Chebyshev UCL					31.61	99% KM Chebyshev UCL					44.97
1366												
1367	Gamma GOF Tests on Detected Observations Only											
1368	A-D Test Statistic					1.947	Anderson-Darling GOF Test					
1369	5% A-D Critical Value					0.843	Detected Data Not Gamma Distributed at 5% Significance Level					
1370	K-S Test Statistic					0.25	Kolmogrov-Smirnoff GOF					
1371	5% K-S Critical Value					0.178	Detected Data Not Gamma Distributed at 5% Significance Level					
1372	Detected Data Not Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1373												
1374	Gamma Statistics on Detected Data Only											
1375	k hat (MLE)					0.35	k star (bias corrected MLE)					0.336
1376	Theta hat (MLE)					26.88	Theta star (bias corrected MLE)					27.97
1377	nu hat (MLE)					19.6	nu star (bias corrected)					18.83
1378	MLE Mean (bias corrected)					9.407	MLE Sd (bias corrected)					16.22
1379												
1380	Gamma Kaplan-Meier (KM) Statistics											
1381	k hat (KM)					0.227	nu hat (KM)					13.15
1382	Approximate Chi Square Value (13.15, α)					5.995	Adjusted Chi Square Value (13.15, β)					5.707
1383	5% Gamma Approximate KM-UCL (use when $n \geq 50$)					19.93	95% Gamma Adjusted KM-UCL (use when $n < 50$)					20.93
1384												
1385	Gamma ROS Statistics using Imputed Non-Detects											
1386	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1387	GROS may not be used when kstar of detected data is small such as < 0.1											
1388	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1389	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1390	Minimum					0.01	Mean					9.083
1391	Maximum					72	Median					0.918
1392	SD					19.41	CV					2.137
1393	k hat (MLE)					0.33	k star (bias corrected MLE)					0.319
1394	Theta hat (MLE)					27.51	Theta star (bias corrected MLE)					28.47
1395	nu hat (MLE)					19.15	nu star (bias corrected)					18.5
1396	MLE Mean (bias corrected)					9.083	MLE Sd (bias corrected)					16.08
1397							Adjusted Level of Significance (β)					0.0407
1398	Approximate Chi Square Value (18.50, α)					9.754	Adjusted Chi Square Value (18.50, β)					9.374
1399	95% Gamma Approximate UCL (use when $n \geq 50$)					17.23	95% Gamma Adjusted UCL (use when $n < 50$)					17.92
1400												
1401	Lognormal GOF Test on Detected Observations Only											
1402	Shapiro Wilk Test Statistic					0.958	Shapiro Wilk GOF Test					
1403	5% Shapiro Wilk Critical Value					0.924	Detected Data appear Lognormal at 5% Significance Level					
1404	Lilliefors Test Statistic					0.107	Lilliefors GOF Test					
1405	5% Lilliefors Critical Value					0.167	Detected Data appear Lognormal at 5% Significance Level					
1406	Detected Data appear Lognormal at 5% Significance Level											
1407												
1408	Lognormal ROS Statistics Using Imputed Non-Detects											
1409	Mean in Original Scale					9.083	Mean in Log Scale					0.142
1410	SD in Original Scale					19.41	SD in Log Scale					2.235
1411	95% t UCL (assumes normality of ROS data)					15.21	95% Percentile Bootstrap UCL					15.14
1412	95% BCA Bootstrap UCL					16.8	95% Bootstrap t UCL					19.58
1413	95% H-UCL (Log ROS)					85.44						
1414												
1415	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1416	KM Mean (logged)					0.139	95% H-UCL (KM -Log)					75.65
1417	KM SD (logged)					2.202	95% Critical H Value (KM-Log)					4.232
1418	KM Standard Error of Mean (logged)					0.416						
1419												
1420	DL/2 Statistics											
1421	DL/2 Normal						DL/2 Log-Transformed					

	A	B	C	D	E	F	G	H	I	J	K	L
1422	Mean in Original Scale					9.082	Mean in Log Scale					0.115
1423	SD in Original Scale					19.41	SD in Log Scale					2.3
1424	95% t UCL (Assumes normality)					15.21	95% H-Stat UCL					106.6
1425	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1426												
1427	Nonparametric Distribution Free UCL Statistics											
1428	Detected Data appear Lognormal Distributed at 5% Significance Level											
1429												
1430	Suggested UCL to Use											
1431	99% KM (Chebyshev) UCL					44.97						
1432												
1433	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1434	Recommendations are based upon data size, data distribution, and skewness.											
1435	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1436	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1437												
1438	Naphthalene											
1439												
1440	General Statistics											
1441	Total Number of Observations					29	Number of Distinct Observations					29
1442	Number of Detects					27	Number of Non-Detects					2
1443	Number of Distinct Detects					27	Number of Distinct Non-Detects					2
1444	Minimum Detect					0.00258	Minimum Non-Detect					0.073
1445	Maximum Detect					5.1	Maximum Non-Detect					0.088
1446	Variance Detects					2.024	Percent Non-Detects					6.897%
1447	Mean Detects					0.661	SD Detects					1.423
1448	Median Detects					0.0659	CV Detects					2.151
1449	Skewness Detects					2.345	Kurtosis Detects					4.389
1450	Mean of Logged Detects					-2.367	SD of Logged Detects					1.968
1451												
1452	Normal GOF Test on Detects Only											
1453	Shapiro Wilk Test Statistic					0.512	Shapiro Wilk GOF Test					
1454	5% Shapiro Wilk Critical Value					0.923	Detected Data Not Normal at 5% Significance Level					
1455	Lilliefors Test Statistic					0.431	Lilliefors GOF Test					
1456	5% Lilliefors Critical Value					0.171	Detected Data Not Normal at 5% Significance Level					
1457	Detected Data Not Normal at 5% Significance Level											
1458												
1459	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1460	Mean					0.618	Standard Error of Mean					0.257
1461	SD					1.356	95% KM (BCA) UCL					1.108
1462	95% KM (t) UCL					1.055	95% KM (Percentile Bootstrap) UCL					1.106
1463	95% KM (z) UCL					1.04	95% KM Bootstrap t UCL					1.281
1464	90% KM Chebyshev UCL					1.388	95% KM Chebyshev UCL					1.737
1465	97.5% KM Chebyshev UCL					2.221	99% KM Chebyshev UCL					3.172
1466												
1467	Gamma GOF Tests on Detected Observations Only											
1468	A-D Test Statistic					2.583	Anderson-Darling GOF Test					
1469	5% A-D Critical Value					0.843	Detected Data Not Gamma Distributed at 5% Significance Level					
1470	K-S Test Statistic					0.284	Kolmogrov-Smirnoff GOF					

	A	B	C	D	E	F	G	H	I	J	K	L	
1471	5% K-S Critical Value					0.182	Detected Data Not Gamma Distributed at 5% Significance Level						
1472	Detected Data Not Gamma Distributed at 5% Significance Level												
1473													
1474	Gamma Statistics on Detected Data Only												
1475	k hat (MLE)					0.345	k star (bias corrected MLE)					0.331	
1476	Theta hat (MLE)					1.918	Theta star (bias corrected MLE)					1.997	
1477	nu hat (MLE)					18.63	nu star (bias corrected)					17.89	
1478	MLE Mean (bias corrected)					0.661	MLE Sd (bias corrected)					1.149	
1479													
1480	Gamma Kaplan-Meier (KM) Statistics												
1481	k hat (KM)					0.208	nu hat (KM)					12.05	
1482	Approximate Chi Square Value (12.05, α)					5.262	Adjusted Chi Square Value (12.05, β)					4.995	
1483	5% Gamma Approximate KM-UCL (use when n>=50)					1.416	95% Gamma Adjusted KM-UCL (use when n<50)					1.492	
1484													
1485	Gamma ROS Statistics using Imputed Non-Detects												
1486	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1487	GROS may not be used when kstar of detected data is small such as < 0.1												
1488	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1489	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1490	Minimum					0.00258	Mean					0.617	
1491	Maximum					5.1	Median					0.062	
1492	SD					1.381	CV					2.24	
1493	k hat (MLE)					0.333	k star (bias corrected MLE)					0.321	
1494	Theta hat (MLE)					1.853	Theta star (bias corrected MLE)					1.919	
1495	nu hat (MLE)					19.29	nu star (bias corrected)					18.63	
1496	MLE Mean (bias corrected)					0.617	MLE Sd (bias corrected)					1.088	
1497							Adjusted Level of Significance (β)					0.0407	
1498	Approximate Chi Square Value (18.63, α)					9.849	Adjusted Chi Square Value (18.63, β)					9.468	
1499	95% Gamma Approximate UCL (use when n>=50)					1.166	95% Gamma Adjusted UCL (use when n<50)					1.213	
1500													
1501	Lognormal GOF Test on Detected Observations Only												
1502	Shapiro Wilk Test Statistic					0.933	Shapiro Wilk GOF Test						
1503	5% Shapiro Wilk Critical Value					0.923	Detected Data appear Lognormal at 5% Significance Level						
1504	Lilliefors Test Statistic					0.132	Lilliefors GOF Test						
1505	5% Lilliefors Critical Value					0.171	Detected Data appear Lognormal at 5% Significance Level						
1506	Detected Data appear Lognormal at 5% Significance Level												
1507													
1508	Lognormal ROS Statistics Using Imputed Non-Detects												
1509	Mean in Original Scale					0.618	Mean in Log Scale					-2.447	
1510	SD in Original Scale					1.38	SD in Log Scale					1.92	
1511	95% t UCL (assumes normality of ROS data)					1.054	95% Percentile Bootstrap UCL					1.057	
1512	95% BCA Bootstrap UCL					1.175	95% Bootstrap t UCL					1.275	
1513	95% H-UCL (Log ROS)					2.158							
1514													
1515	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
1516	KM Mean (logged)					-2.457	95% H-UCL (KM -Log)					2.057	
1517	KM SD (logged)					1.908	95% Critical H Value (KM-Log)					3.766	
1518	KM Standard Error of Mean (logged)					0.364							
1519													

	A	B	C	D	E	F	G	H	I	J	K	L
1520	DL/2 Statistics											
1521	DL/2 Normal					DL/2 Log-Transformed						
1522	Mean in Original Scale					0.619	Mean in Log Scale					-2.426
1523	SD in Original Scale					1.38	SD in Log Scale					1.909
1524	95% t UCL (Assumes normality)					1.055	95% H-Stat UCL					2.131
1525	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1526												
1527	Nonparametric Distribution Free UCL Statistics											
1528	Detected Data appear Lognormal Distributed at 5% Significance Level											
1529												
1530	Suggested UCL to Use											
1531	99% KM (Chebyshev) UCL					3.172						
1532												
1533	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1534	Recommendations are based upon data size, data distribution, and skewness.											
1535	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1536	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1537												
1538												
1539	Phenanthrene											
1540												
1541	General Statistics											
1542	Total Number of Observations					29	Number of Distinct Observations					27
1543							Number of Missing Observations					0
1544	Minimum					0.02	Mean					37.34
1545	Maximum					360	Median					3.46
1546	SD					86.76	Std. Error of Mean					16.11
1547	Coefficient of Variation					2.324	Skewness					2.75
1548												
1549	Normal GOF Test											
1550	Shapiro Wilk Test Statistic					0.492	Shapiro Wilk GOF Test					
1551	5% Shapiro Wilk Critical Value					0.926	Data Not Normal at 5% Significance Level					
1552	Lilliefors Test Statistic					0.434	Lilliefors GOF Test					
1553	5% Lilliefors Critical Value					0.165	Data Not Normal at 5% Significance Level					
1554	Data Not Normal at 5% Significance Level											
1555												
1556	Assuming Normal Distribution											
1557	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
1558	95% Student's-t UCL					64.75	95% Adjusted-CLT UCL (Chen-1995)					72.63
1559							95% Modified-t UCL (Johnson-1978)					66.12
1560												
1561	Gamma GOF Test											
1562	A-D Test Statistic					2.306	Anderson-Darling Gamma GOF Test					
1563	5% A-D Critical Value					0.856	Data Not Gamma Distributed at 5% Significance Level					
1564	K-S Test Statistic					0.265	Kolmogrov-Smirnoff Gamma GOF Test					
1565	5% K-S Critical Value					0.177	Data Not Gamma Distributed at 5% Significance Level					
1566	Data Not Gamma Distributed at 5% Significance Level											
1567												
1568	Gamma Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
1569	k hat (MLE)					0.302	k star (bias corrected MLE)					0.293
1570	Theta hat (MLE)					123.8	Theta star (bias corrected MLE)					127.2
1571	nu hat (MLE)					17.5	nu star (bias corrected)					17.02
1572	MLE Mean (bias corrected)					37.34	MLE Sd (bias corrected)					68.93
1573							Approximate Chi Square Value (0.05)					8.688
1574	Adjusted Level of Significance					0.0407	Adjusted Chi Square Value					8.332
1575												
1576	Assuming Gamma Distribution											
1577	95% Approximate Gamma UCL (use when n>=50))					73.16	95% Adjusted Gamma UCL (use when n<50)					76.28
1578												
1579	Lognormal GOF Test											
1580	Shapiro Wilk Test Statistic					0.964	Shapiro Wilk Lognormal GOF Test					
1581	5% Shapiro Wilk Critical Value					0.926	Data appear Lognormal at 5% Significance Level					
1582	Lilliefors Test Statistic					0.111	Lilliefors Lognormal GOF Test					
1583	5% Lilliefors Critical Value					0.165	Data appear Lognormal at 5% Significance Level					
1584	Data appear Lognormal at 5% Significance Level											
1585												
1586	Lognormal Statistics											
1587	Minimum of Logged Data					-3.912	Mean of logged Data					1.337
1588	Maximum of Logged Data					5.886	SD of logged Data					2.271
1589												
1590	Assuming Lognormal Distribution											
1591	95% H-UCL					323.6	90% Chebyshev (MVUE) UCL					104.9
1592	95% Chebyshev (MVUE) UCL					135	97.5% Chebyshev (MVUE) UCL					176.7
1593	99% Chebyshev (MVUE) UCL					258.5						
1594												
1595	Nonparametric Distribution Free UCL Statistics											
1596	Data appear to follow a Discernible Distribution at 5% Significance Level											
1597												
1598	Nonparametric Distribution Free UCLs											
1599	95% CLT UCL					63.84	95% Jackknife UCL					64.75
1600	95% Standard Bootstrap UCL					63.89	95% Bootstrap-t UCL					88.73
1601	95% Hall's Bootstrap UCL					66.01	95% Percentile Bootstrap UCL					66.13
1602	95% BCA Bootstrap UCL					77.72						
1603	90% Chebyshev(Mean, Sd) UCL					85.67	95% Chebyshev(Mean, Sd) UCL					107.6
1604	97.5% Chebyshev(Mean, Sd) UCL					138	99% Chebyshev(Mean, Sd) UCL					197.6
1605												
1606	Suggested UCL to Use											
1607	97.5% Chebyshev (Mean, Sd) UCL					138						
1608												
1609	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1610	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1611	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1612	For additional insight the user may want to consult a statistician.											
1613												
1614												
1615	Pyrene											
1616												
1617	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
1618	Total Number of Observations					29	Number of Distinct Observations					28
1619							Number of Missing Observations					0
1620	Minimum					0.01	Mean					38.66
1621	Maximum					400	Median					3.84
1622	SD					90.81	Std. Error of Mean					16.86
1623	Coefficient of Variation					2.349	Skewness					3.017
1624												
1625	Normal GOF Test											
1626	Shapiro Wilk Test Statistic					0.487	Shapiro Wilk GOF Test					
1627	5% Shapiro Wilk Critical Value					0.926	Data Not Normal at 5% Significance Level					
1628	Lilliefors Test Statistic					0.429	Lilliefors GOF Test					
1629	5% Lilliefors Critical Value					0.165	Data Not Normal at 5% Significance Level					
1630	Data Not Normal at 5% Significance Level											
1631												
1632	Assuming Normal Distribution											
1633	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
1634	95% Student's-t UCL					67.35	95% Adjusted-CLT UCL (Chen-1995)					76.49
1635							95% Modified-t UCL (Johnson-1978)					68.92
1636												
1637	Gamma GOF Test											
1638	A-D Test Statistic					2.049	Anderson-Darling Gamma GOF Test					
1639	5% A-D Critical Value					0.853	Data Not Gamma Distributed at 5% Significance Level					
1640	K-S Test Statistic					0.264	Kolmogrov-Smirnoff Gamma GOF Test					
1641	5% K-S Critical Value					0.176	Data Not Gamma Distributed at 5% Significance Level					
1642	Data Not Gamma Distributed at 5% Significance Level											
1643												
1644	Gamma Statistics											
1645	k hat (MLE)					0.315	k star (bias corrected MLE)					0.306
1646	Theta hat (MLE)					122.6	Theta star (bias corrected MLE)					126.5
1647	nu hat (MLE)					18.29	nu star (bias corrected)					17.73
1648	MLE Mean (bias corrected)					38.66	MLE Sd (bias corrected)					69.93
1649							Approximate Chi Square Value (0.05)					9.195
1650	Adjusted Level of Significance					0.0407	Adjusted Chi Square Value					8.828
1651												
1652	Assuming Gamma Distribution											
1653	95% Approximate Gamma UCL (use when n>=50))					74.54	95% Adjusted Gamma UCL (use when n<50)					77.64
1654												
1655	Lognormal GOF Test											
1656	Shapiro Wilk Test Statistic					0.963	Shapiro Wilk Lognormal GOF Test					
1657	5% Shapiro Wilk Critical Value					0.926	Data appear Lognormal at 5% Significance Level					
1658	Lilliefors Test Statistic					0.12	Lilliefors Lognormal GOF Test					
1659	5% Lilliefors Critical Value					0.165	Data appear Lognormal at 5% Significance Level					
1660	Data appear Lognormal at 5% Significance Level											
1661												
1662	Lognormal Statistics											
1663	Minimum of Logged Data					-4.605	Mean of logged Data					1.486
1664	Maximum of Logged Data					5.991	SD of logged Data					2.284
1665												
1666	Assuming Lognormal Distribution											

	A	B	C	D	E	F	G	H	I	J	K	L
1667	95% H-UCL					394.1	90% Chebyshev (MVUE) UCL					125.3
1668	95% Chebyshev (MVUE) UCL					161.2	97.5% Chebyshev (MVUE) UCL					211.1
1669	99% Chebyshev (MVUE) UCL					309						
1670												
1671	Nonparametric Distribution Free UCL Statistics											
1672	Data appear to follow a Discernible Distribution at 5% Significance Level											
1673												
1674	Nonparametric Distribution Free UCLs											
1675	95% CLT UCL					66.4	95% Jackknife UCL					67.35
1676	95% Standard Bootstrap UCL					65.75	95% Bootstrap-t UCL					90.9
1677	95% Hall's Bootstrap UCL					75.35	95% Percentile Bootstrap UCL					67.88
1678	95% BCA Bootstrap UCL					76.99						
1679	90% Chebyshev(Mean, Sd) UCL					89.25	95% Chebyshev(Mean, Sd) UCL					112.2
1680	97.5% Chebyshev(Mean, Sd) UCL					144	99% Chebyshev(Mean, Sd) UCL					206.4
1681												
1682	Suggested UCL to Use											
1683	97.5% Chebyshev (Mean, Sd) UCL					144						
1684												
1685	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1686	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1687	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1688	For additional insight the user may want to consult a statistician.											
1689												
1690												
1691	Arsenic											
1692												
1693	General Statistics											
1694	Total Number of Observations					1	Number of Distinct Observations					1
1695							Number of Missing Observations					0
1696	Minimum					14	Mean					14
1697	Maximum					14	Median					14
1698												
1699	Warning: This data set only has 1 observations!											
1700	Data set is too small to compute reliable and meaningful statistics and estimates!											
1701	The data set for variable Arsenic was not processed!											
1702												
1703	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1704	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1705												
1706												
1707												
1708	Lead											
1709												
1710	General Statistics											
1711	Total Number of Observations					1	Number of Distinct Observations					1
1712							Number of Missing Observations					0
1713	Minimum					12.1	Mean					12.1
1714	Maximum					12.1	Median					12.1
1715												

	A	B	C	D	E	F	G	H	I	J	K	L
1716	Warning: This data set only has 1 observations!											
1717	Data set is too small to compute reliable and meaningful statistics and estimates!											
1718	The data set for variable Lead was not processed!											
1719												
1720	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1721	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1722												
1723												
1724												
1725	Barium											
1726												
1727	General Statistics											
1728	Total Number of Observations				1		Number of Distinct Observations				1	
1729							Number of Missing Observations				0	
1730	Minimum				52.6		Mean				52.6	
1731	Maximum				52.6		Median				52.6	
1732												
1733	Warning: This data set only has 1 observations!											
1734	Data set is too small to compute reliable and meaningful statistics and estimates!											
1735	The data set for variable Barium was not processed!											
1736												
1737	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1738	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1739												
1740												
1741												
1742	Chromium											
1743												
1744	General Statistics											
1745	Total Number of Observations				1		Number of Distinct Observations				1	
1746							Number of Missing Observations				0	
1747	Minimum				10.2		Mean				10.2	
1748	Maximum				10.2		Median				10.2	
1749												
1750	Warning: This data set only has 1 observations!											
1751	Data set is too small to compute reliable and meaningful statistics and estimates!											
1752	The data set for variable Chromium was not processed!											
1753												
1754	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1755	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1756												
1757												
1758												
1759	Cadmium											
1760												
1761	General Statistics											
1762	Total Number of Observations				1		Number of Distinct Observations				1	
1763							Number of Missing Observations				0	
1764	Minimum				0.5		Mean				0.5	

	A	B	C	D	E	F	G	H	I	J	K	L	
1765	Maximum					0.5						Median	0.5
1766													
1767	Warning: This data set only has 1 observations!												
1768	Data set is too small to compute reliable and meaningful statistics and estimates!												
1769	The data set for variable Cadmium was not processed!												
1770													
1771	It is suggested to collect at least 8 to 10 observations before using these statistical methods!												
1772	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.												
1773													
1774													
1775													
1776	Methylene chloride												
1777													
1778	General Statistics												
1779	Total Number of Observations					1	Number of Distinct Observations					1	
1780							Number of Missing Observations					0	
1781	Minimum					0.0053	Mean					0.0053	
1782	Maximum					0.0053	Median					0.0053	
1783													
1784	Warning: This data set only has 1 observations!												
1785	Data set is too small to compute reliable and meaningful statistics and estimates!												
1786	The data set for variable Methylene chloride was not processed!												
1787													
1788	It is suggested to collect at least 8 to 10 observations before using these statistical methods!												
1789	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.												
1790													
1791													
1792													
1793	Toluene												
1794													
1795	General Statistics												
1796	Total Number of Observations					1	Number of Distinct Observations					1	
1797							Number of Missing Observations					0	
1798	Minimum					3.7000E-4	Mean					3.7000E-4	
1799	Maximum					3.7000E-4	Median					3.7000E-4	
1800													
1801	Warning: This data set only has 1 observations!												
1802	Data set is too small to compute reliable and meaningful statistics and estimates!												
1803	The data set for variable Toluene was not processed!												
1804													
1805	It is suggested to collect at least 8 to 10 observations before using these statistical methods!												
1806	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.												
1807													
1808													
1809													
1810	C20-C34												
1811													
1812	General Statistics												
1813	Total Number of Observations					1	Number of Distinct Observations					1	

	A	B	C	D	E	F	G	H	I	J	K	L	
1814							Number of Missing Observations					0	
1815						Minimum	140	Mean					140
1816						Maximum	140	Median					140
1817													
1818	Warning: This data set only has 1 observations!												
1819	Data set is too small to compute reliable and meaningful statistics and estimates!												
1820	The data set for variable C20-C34 was not processed!												
1821													
1822	It is suggested to collect at least 8 to 10 observations before using these statistical methods!												
1823	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.												
1824													
1825													
1826													
1827	C10-C20												
1828													
1829	General Statistics												
1830	Total Number of Observations					1	Number of Distinct Observations					1	
1831							Number of Missing Observations					0	
1832						Minimum	63	Mean					63
1833						Maximum	63	Median					63
1834													
1835	Warning: This data set only has 1 observations!												
1836	Data set is too small to compute reliable and meaningful statistics and estimates!												
1837	The data set for variable C10-C20 was not processed!												
1838													
1839	It is suggested to collect at least 8 to 10 observations before using these statistical methods!												
1840	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.												
1841													
1842													

APPENDIX B

GROUNDWATER-TO-OUTDOOR AIR MODEL FOR CONSTRUCTION WORKER TRENCH SCENARIO

APPENDIX B

GROUNDWATER-TO-OUTDOOR AIR MODEL FOR CONSTRUCTION/UTILITY WORKER TRENCH

Chemical-specific volatilization factors (VF) that relate concentrations of volatile chemicals in groundwater accumulated in a construction trench to airborne concentrations that may be inhaled by construction and utility workers were used to estimate exposure point concentrations (EPC) from volatile chemicals of potential concern (COPC) in groundwater beneath Identified Areas (IA) at the RACER Ontario Stamping Plant Site in Ontario, Richland County, Ohio. Calculation of the VFs for this scenario were based on Virginia Department of Environmental Quality (VDEQ) guidance, which provides a combination of a vadose zone model to estimate volatilization of gaseous COPCs from groundwater into a trench and a box model to estimate dispersion of the COPCs from the air inside the trench into aboveground air (VDEQ 2014). These models, which can be described by six equations, are detailed below. Tables B-1 through B-5 present the estimated EPCs in construction/utility trench air from the construction/utility trench groundwater-to-outdoor air modeling for IAs 2, 4, 5, 9, and 10, respectively.

$$C_{\text{trench}} = CGW \times VF \quad (\text{Equation 1})$$

where

$$C_{\text{trench}} = \text{Concentration of contaminant in the trench (micrograms per cubic meter } [\mu\text{g}/\text{m}^3])$$

$$CGW = \text{Concentration of contaminant in groundwater (micrograms per liter } [\mu\text{g}/\text{L}])$$

$$VF = \text{Volatilization factor (see Equations 2 through 5) (liters per cubic meter } [\text{L}/\text{m}^3])$$

For situations where the depth to groundwater is greater than 15 feet below ground surface (bgs), the following four equations (Equations 2 through 5) (see VDEQ Table 3.8) were used to calculate VF. These equations were used to evaluate IAs 2, 4, 9, and 10 which are located in the Upper Terrace where the depth to groundwater is about 25 feet bgs.

$$VF = (K_i \times A \times F \times 10^{-3} \times 10^4 \times 3,600) / (ACH \times V) \quad (\text{Equation 2})$$

where

K_i	=	Mass transfer coefficient of contaminant (see Equation 3) (centimeters per second [cm/s])
A	=	Area of the trench (square meters [m ²])
F	=	Fraction of floor through which contaminant can enter (unitless)
ACH	=	Air changes per hour (hour ⁻¹ [h ⁻¹])
V	=	Volume of trench (cubic meters [m ³])
10^{-3}	=	Conversion factor (liter per cubic centimeter [L/cm ³])
10^4	=	Conversion factor (square centimeters per square meter [cm ² /m ²])
3,600	=	Conversion factor (seconds per hour [s/hr])

If the ratio of trench width to trench depth is less than or equal to 1, VDEQ (2014) recommends an ACH of 2 per hour. If the ratio of trench width to trench depth is greater than one, VDEQ (2014) recommends an ACH of 360 per hour. Based on the VDEQ (2014) default values trench dimensions of 3 feet wide and 8 feet deep, a width to depth ratio of 0.375 is calculated which is < 1 . Therefore, an ACH value of 2 was used. It should be noted that the use of default dimensions will result in conservative (overestimated) air concentrations in instances where the actual width to depth ratio is greater than one. In such instances, the air concentrations estimated using an ACH of 2 will be 180 times higher than those estimated using an ACH of 360 as recommended for situations where the width to depth ratio > 1 , such as may be the case in excavation of an basement.

$$K_i = 1 / \{ (1/k_{iL}) + [(R T) / (H_i k_{iG})] \} \quad \text{(Equation 3)}$$

where

k_{iL}	=	Liquid-phase mass transfer coefficient of i (see Equation 4) (cm/s)
R	=	Ideal gas constant (atmosphere – cubic meter per mole – degree Kelvin [atm-m ³ /mol-K])
T	=	Average system absolute temperature (degree Kelvin [K])
H_i	=	Henry's Law Constant of I (atmosphere – cubic meter per mol [atm-m ³ /mol])

k_{iG} = Gas-phase mass transfer coefficient of i (see Equation 5) (cm/s)

The value for R is 8.2×10^{-5} atm-m³/mol-K. A default value of 278 K was used for T in Equation 3. This value is based on the upper end of the range of groundwater temperatures (12.03 to 15.94 °C) measured at RACER in June 2011.

$$k_{iL} = (MW_{O_2}/MW_i)^{0.5} \times (T/298) \times k_{L,O_2} \quad (\text{Equation 4})$$

where

k_{iL} = Liquid-phase mass transfer coefficient of component I (cm/s)

MW_{O_2} = Molecular weight of O₂ (gram per mole [g/mol])

MW_i = Molecular weight of component I (g/mol)

k_{L,O_2} = Liquid-phase mass transfer coefficient of oxygen at 25 °C (cm/s)

The value of k_{L,O_2} in Equation 4 is 0.002 cm/s.

$$k_{iG} = (MW_{H_2O}/MW_i)^{0.335} \times (T/298)^{1.005} \times k_{G,H_2O} \quad (\text{Equation 5})$$

where

k_{iG} = Gas-phase mass transfer coefficient of component I (cm/s)

MW_{H_2O} = Molecular weight of water (g/mol)

k_{G,H_2O} = Gas-phase mass transfer coefficient of water vapor at 25°C (cm/s)

The value of k_{G,H_2O} in Equation 5 is 0.833 cm/s.

For situations where the depth to groundwater is less than or equal to 15 feet bgs, the following equation (VDEQ Table 3.7) was used to estimate VF. Equation 6 was used to evaluate IA 5 which is located in the Lower Terrace where the depth to groundwater is approximately 12 feet bgs.

$$VF = \frac{(H_i \times D_{air} \times AC_{vad}^{3.33} \times A \times F \times 10^{-3} \times 10^{-4} \times 3,600)}{R \times T \times L_D \times ACH \times V \times Por_{vad}^2}$$

Where:

H_i	= Henry's Law constant for contaminant (Table 3.7)	atm-m ³ /mol
D_{air}	= diffusion coefficient in air (Table 3.7)	cm ² /s
AC_{vad}	= volumetric air content in vadose zone soil	cm ³ /cm ³
A	= area of trench	m ²
F	= fraction of floor through which contaminant can enter	unitless
R	= ideal gas constant	atm-m ³ / mole-K
T	= average system absolute temperature	K
L_d	= distance between trench bottom and groundwater (Equation 3-3)	cm
ACH	= air changes per hour	h ⁻¹
V	= volume of trench	m ³
Por_{vad}	= total soil porosity in vadose zone	cm ³ /cm ³
10^{-3}	= conversion factor	L/cm ³
10^4	= conversion factor	cm ² /m ²
3600	= conversion factor	s/hr

REFERENCE

Virginia Department of Environmental Quality (VDEQ). 2014. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

APPENDIX C

JOHNSON AND ETTINGER MODELING RESULTS

TABLE C-1

**JOHNSON AND ETTINGER
INPUT PARAMETER VALUES
FOR USE IN GW-ADV, VERSION 3.1; 02/04
RACER ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

Parameter	Units	Value	Basis
Average soil/groundwater temperature (T_s)	°C	16	High end of range of groundwater temperatures measured at RACER Ontario Stamping Plant in June 2011 (12.03 to 15.94 °C).
Depth below grade to bottom of enclosed space (L_E)	cm	200	Default assuming buildings will include a basement.
Depth below grade to water table (L_{WT}) - IAs 2, 4, 9, and 10	cm	762	Average depth to groundwater in Upper Terrace at RACER site (25 feet below ground surface [bgs]).
Depth below grade to water table (L_{WT}) - IA 5	cm	366	Average depth to groundwater in Lower Terrace at RACER site (12 feet bgs).
Thickness of stratum A (h_A) - IAs 2, 4, 9, and 10	cm	762	Simplified assumption that overall, Stratum A resembled a single layer above the water table.
Thickness of stratum A (h_A) - IA 5	cm	366	Simplified assumption that overall, Stratum A resembled a single layer above the water table.
Soil stratum directly above water table - IAs 2, 4, 5, 9, and 10	NA	A	Conservative assumption -- see basis for thickness of Stratum A.
SCS soil type directly above water table - IA 4	NA	SIC	Simplified assumption based on review of site-specific soil borings.
Soil vapor permeability (k_v)	cm ²	Model default	Based on SCS soil type
Stratum A SCS soil type	NA	SIC	Simplified assumption based on review of site-specific soil borings.
Stratum A soil bulk density (P_b^A)	g/cm ³	1.38	Default based on SCS soil type.
Stratum A soil total porosity (n^A)	Unitless	0.481	Default based on SCS soil type.
Stratum A soil water-filled porosity (Θ_w^A)	cm ³ /cm ³	0.216	Default based on SCS soil type.
Enclosed floor space thickness (L_{crack})	cm	10	Default
Soil-bldg pressure differential (ΔP)	g/cm-s ²	40	Default
Enclosed space floor length (L_B)	cm	1,000	Default
Enclosed space floor width (W_B)	cm	1,000	Default
Enclosed space height (H_B)	cm	304.8	Default -- assumes a basement
Floor-wall seam crack width (w)	cm	0.1	Default
Indoor air exchange rate (ER)	1/h	1	Value recommended by OEPA (2010).
Average vapor flow rate into bldg (Q_{soil})	L/m	5	Default
Averaging time for carcinogens (AT _c)	yrs	70	Default
Averaging time for noncarcinogens (AT _{NC})	yrs	25	Default (Table 1, OEPA 2014)
Exposure duration - industrial workers (ED _{IW})	yrs	25	Default (Table 1, OEPA 2014)
Exposure frequency - industrial workers (EF _{IW})	days/yr	250	Default (Table 1, OEPA 2014)
Target risk for carcinogens - industrial (TR _c)	Unitless	1.00E-04	Default - Ohio Administrative Code (OAC) 3745-300-09 (C) (1) (b) (i)
Target hazard index for noncarcinogens - industrial (THQ _i)	Unitless	1	Default - OAC 3745-300-09 (C) (2)

Notes:

Parameters based on use of the Johnson & Ettinger model GW-ADV, Version 3.1; 02/04.

Ohio Environmental Protection Agency (OEPA). 2010. "Sample Collection and Evaluation of Vapor Intrusion to Indoor Air." Division of Environmental Response and Revitalization." May. On-Line Address: <http://epa.ohio.gov/portals/30/rules/Vapor%20to%20Indoor%20Air.pdf>

OEPA. 2014. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program. Division of Emergency and Remedial Response. May.

TABLE C-2

**JOHNSON AND ETTINGER
INPUT PARAMETER VALUES
FOR USE IN SL-ADV, VERSION 3.1; 02/04
RACER ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

Parameter	Units	Value	Basis
Average soil/groundwater temperature (T_s)	°C	16	High end of range of groundwater temperatures measured at RACER Ontario Stamping Plant in June 2011 (12.03 to 15.94 °C).
Depth below grade to bottom of enclosed space (L_F)	cm	200	Default assuming buildings will include a basement.
Depth below grade to top of contamination (L_t)	cm	IA- and chemical-specific	Based on shallowest IA- and chemical-specific depth at which a chemical was detected in soil.
Depth below grade to bottom of contamination (L_b)	cm	IA- and chemical-specific	Based on deepest IA- and chemical-specific depth at which a chemical was detected in soil.
Thickness of stratum A (h_A) - IAs 2, 4, 5, 9, and 10	cm	Variable	Simplified assumption setting equal to L_t .
Soil Stratum A SCS Soil Type	NA	SIC	Simplified assumption based on review of site-specific soil borings.
Soil vapor permeability (k_v)	cm ²	Model default	Based on SCS soil type
Stratum A SCS soil type	NA	SIC	Simplified assumption based on review of site-specific soil borings.
Stratum A soil bulk density (P_b^A)	g/cm ³	1.7	Site-specific: based on average of results from three soil borings (SB-21, SB-24, and SB-26).
Stratum A soil total porosity (n^A)	Unitless	0.377	Site-specific: based on average of results from three soil borings (SB-21, SB-24, and SB-26).
Stratum A soil water-filled porosity (Θ_w^A)	cm ³ /cm ³	0.164	Site-specific: based on average of results from three soil borings (SB-21, SB-24, and SB-26).
Stratum A soil organic carbon fraction (foc)	Unitless	0.0118	Site-specific: based on average of results from three soil borings (SB-21, SB-24, and SB-26).
Enclosed floor space thickness (L_{crack})	cm	10	Default
Soil-bldg pressure differential (ΔP)	g/cm-s ²	40	Default
Enclosed space floor length (L_B)	cm	1,000	Default
Enclosed space floor width (W_B)	cm	1,000	Default
Enclosed space height (H_B)	cm	304.8	Default -- assumes a basement
Floor-wall seam crack width (w)	cm	0.1	Default
Indoor air exchange rate (ER)	1/h	1	Value recommended by OEPA (2010).
Average vapor flow rate into bldg (Q_{soil})	L/m	5	Default
Averaging time for carcinogens (AT_c)	yrs	70	Default
Averaging time for noncarcinogens (AT_{NC})	yrs	25	Default (Table 1, OEPA 2014)
Exposure duration - industrial workers (ED_{IW})	yrs	25	Default (Table 1, OEPA 2014)
Exposure frequency - industrial workers (EF_{IW})	days/yr	250	Default (Table 1, OEPA 2014)
Target risk for carcinogens - industrial (TR_c)	Unitless	1.00E-04	Default - Ohio Administrative Code (OAC) 3745-300-09 (C) (1) (b) (i)
Target hazard index for noncarcinogens - industrial (THQ_i)	Unitless	1	Default - OAC 3745-300-09 (C) (2)

Notes:

Parameters based on use of the Johnson & Ettinger model GW-ADV, Version 3.1; 02/04.

Ohio Environmental Protection Agency (OEPA). 2010. "Sample Collection and Evaluation of Vapor Intrusion to Indoor Air." Division of Environmental Response and Revitalization. May. On-Line Address: <http://epa.ohio.gov/portals/30/rules/Vapor%20to%20Indoor%20Air.pdf>

OEPA. 2014. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program. Division of Emergency and Remedial Response. May.

TABLE C-3
DATA ENTRY SHEET FOR ACETONE IN GROUNDWATER - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	67641	1.80E+00	Chemical Acetone									
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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			a	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01

END

TABLE C-3 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACETONE IN GROUNDWATER - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
	8.47E+04	1.80E+06	2.22E-04	200	7,485	2.36E-05	9.96E-04	1.77E-04	5.80E-03	0.00E+00	0.00E+00	2.89E-03	4.32E-03
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μ 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., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.79E+00	0.10	8.33E+01	5.80E-03	4.00E+02	9.78E+155	1.40E-04	2.51E-04	NA	3.1E+01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.00E+09	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.5E-09

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-4
DATA ENTRY SHEET FOR MERCURY IN GROUNDATER - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	7439976	1.90E-01	Chemical Mercury (elemental)									
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)	
	16	200	762	762			a	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
3.07E-02	6.30E-06	1.14E-02	25	14,127	629.88	1750.00	No Koc	6.00E-02	NA	3.0E-04

END

Listed value of Koc is actually value of Kd for mercury.

TABLE C-4 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR MERCURY IN GROUNDWATER - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	15,299	5.11E-03	2.16E-01	1.77E-04	1.59E-03	0.00E+00	0.00E+00	1.70E-05	4.86E-05	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	4.09E+01	0.10	8.33E+01	1.59E-03	4.00E+02	#NUM!	1.84E-06	7.52E-05	NA	3.0E-04			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	6.00E+01	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.7E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-5
DATA ENTRY SHEET FOR 1,1-DICHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPINT PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	2.17E+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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

END	Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)
8.36E-02	1.06E-05	5.62E-03	25	6,895	330.55	523.00	3.18E+01	5.04E+03	1.6E-06	NA

END

TABLE C-5 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,1-DICHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPINT PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	7,384	3.81E-03	1.61E-01	1.77E-04	4.34E-03	0.00E+00	0.00E+00	4.29E-05	1.23E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	3.49E+03	0.10	8.33E+01	4.34E-03	4.00E+02	2.29E+208	4.63E-06	1.61E-02	1.6E-06	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	5.04E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
6.3E-09	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-6
DATA ENTRY SHEET FOR 1,1-DICHLOROETHYLENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	2.20E+00	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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
	Used to calculate risk-based groundwater concentration.											
END												

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
8.63E-02	1.10E-05	2.61E-02	25	6,247	304.75	576.05	3.18E+01	2.42E+03	NA	2.0E-01

END

TABLE C-6 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,1-DICHLOROETHYLENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	6,353	1.87E-02	7.88E-01	1.77E-04	4.48E-03	0.00E+00	0.00E+00	3.09E-05	8.90E-05	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.73E+03	0.10	8.33E+01	4.48E-03	4.00E+02	9.55E+201	3.36E-06	5.82E-03	NA	2.0E-01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.42E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.0E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-7
DATA ENTRY SHEET FOR 1,1,1-TRICHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	5.71E+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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

END	Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
6.48E-02	9.60E-06	1.72E-02	25	7,136	347.24	545.00	4.39E+01	1.29E+03	NA	5.0E+00

END

TABLE C-7 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,1,1-TRICHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_{τ}^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	7,820	1.14E-02	4.81E-01	1.77E-04	3.36E-03	0.00E+00	0.00E+00	2.55E-05	7.35E-05	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	2.74E+04	0.10	8.33E+01	3.36E-03	4.00E+02	8.83E+268	2.77E-06	7.61E-02	NA	5.0E+00			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.29E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.0E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-8
DATA ENTRY SHEET FOR ACENAPHTHENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	83329	1.20E+01	Chemical Acenaphthene									
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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			a	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
5.06E-02	8.33E-06	1.84E-04	25	12,155	550.54	803.15	5.03E+03	3.90E+00	NA	NA

END

TABLE C-8 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACENAPHTHENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	16,049	7.92E-05	3.34E-03	1.77E-04	2.69E-03	0.00E+00	0.00E+00	6.34E-04	1.28E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	4.00E+01	0.10	8.33E+01	2.69E-03	4.00E+02	#NUM!	4.60E-05	1.84E-03	NA	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.90E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-9
DATA ENTRY SHEET FOR ACETONE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	67641	7.20E+00	Acetone									

	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)
↓	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
↓	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
↓	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01

END

TABLE C-9 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACETONE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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)
8.47E+04	1.80E+06	2.22E-04	200	7,485	2.36E-05	9.96E-04	1.77E-04	5.80E-03	0.00E+00	0.00E+00	2.89E-03	4.32E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	7.17E+00	0.10	8.33E+01	5.80E-03	4.00E+02	9.78E+155	1.40E-04	1.00E-03	NA	3.1E+01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.00E+09	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.2E-08

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-10
DATA ENTRY SHEET FOR BENZO(b)FLUORANTHENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	205992	2.90E+01	Benzo(b)fluoranthene									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			a	SIC	SIC		

	ENTER Stratum A SCS soil type	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	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	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA

END

TABLE C-10 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(b)FLUORANTHENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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)
8.47E+04	1.80E+06	2.22E-04	200	25,484	1.72E-07	7.26E-06	1.77E-04	2.26E-02	0.00E+00	0.00E+00	1.90E-01	3.23E-02	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/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, $\text{exp}(\text{Pe}^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.09E-02	0.10	8.33E+01	2.26E-02	4.00E+02	1.13E+40	5.45E-04	5.94E-06	1.1E-04	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	1.50E+00	NA	1.6E-10	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Groundwater concentration >= solubility limit (S). Risk/HQ calculated at S.
MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-11
DATA ENTRY SHEET FOR BROMODICHLOROMETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	75274	1.70E-01	Bromodichloromethane									

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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

MORE ↓	ENTER Stratum A SCS soil type	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	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	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)
	Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

END	Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
5.63E-02	1.07E-05	2.12E-03	25	7,800	363.15	585.85	3.18E+01	3.03E+03	3.7E-05	NA

END

TABLE C-11 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BROMODICHLOROMETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	8,606	1.35E-03	5.69E-02	1.77E-04	2.92E-03	0.00E+00	0.00E+00	6.45E-05	1.81E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	9.66E+00	0.10	8.33E+01	2.92E-03	4.00E+02	#NUM!	6.79E-06	6.56E-05	3.7E-05	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.03E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.9E-10	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-12
DATA ENTRY SHEET FOR CARBON DISULFIDE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	75150	4.30E-01	Chemical Carbon disulfide									
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 Totals must add up to value of L _{WT} (cell G28)			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)	
	16	200	762	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)	A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01

END

TABLE C-12 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	5.52E-03	0.00E+00	0.00E+00	4.13E-05	1.19E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.84E+02	0.10	8.33E+01	5.52E-03	4.00E+02	5.87E+163	4.48E-06	8.25E-04	NA	7.0E-01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.16E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	8.1E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-13
DATA ENTRY SHEET FOR CHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	3.70E-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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
1.04E-01	1.16E-05	1.11E-02	25	5,879	285.30	460.40	2.17E+01	6.71E+03	NA	1.0E+01

END

TABLE C-13 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHLOROETHANE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	5,835	8.17E-03	3.44E-01	1.77E-04	5.39E-03	0.00E+00	0.00E+00	4.13E-05	1.19E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.27E+02	0.10	8.33E+01	5.39E-03	4.00E+02	1.04E+168	4.48E-06	5.70E-04	NA	1.0E+01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	6.71E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.9E-08

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-14
DATA ENTRY SHEET FOR CHLOROFORM IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	67663	5.00E-01	Chemical 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 Totals must add up to value of L _{WT} (cell G28)			ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	OR		ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	200	762	762			A	SIC			SIC	
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
7.69E-02	1.09E-05	3.67E-03	25	6,988	334.32	536.40	3.18E+01	7.95E+03	2.3E-05	9.8E-02

END

TABLE C-14 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHLOROFORM IN GROUNDWATER - 1A
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{ie} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	7,492	2.48E-03	1.04E-01	1.77E-04	3.99E-03	0.00E+00	0.00E+00	5.03E-05	1.43E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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, $exp(Pe')$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	5.22E+01	0.10	8.33E+01	3.99E-03	4.00E+02	3.24E+226	5.40E-06	2.82E-04	2.3E-05	9.8E-02			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	7.95E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.6E-09	2.0E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-15
DATA ENTRY SHEET FOR CHRYSENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	218019	2.90E+01	Chrysene									

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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			a	SIC	SIC		

MORE ↓	ENTER Stratum A SCS soil type	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	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	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)
	Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

END	Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA

END

TABLE C-15 (CONTINUED)
INTERMEDIATE CALCULATIONS FOR CHRYSENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	4.25E-03	0.00E+00	0.00E+00	2.73E-02	5.97E-03	562

Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
200	1.23E-01	0.10	8.33E+01	4.25E-03	4.00E+02	9.58E+212	1.84E-04	2.25E-05	1.1E-05	NA

END

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.00E+00	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
6.1E-11	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Groundwater concentration >= solubility limit (S). Risk/HQ calculated at S.
MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-16
DATA ENTRY SHEET FOR FLUORENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	86737	9.30E+00	Fluorene									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type	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	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	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
4.40E-02	7.89E-06	9.62E-05	25	12,666	570.44	870.00	9.16E+03	1.69E+00	NA	NA

END

TABLE C-16 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR FLUORENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	16,174	4.11E-05	1.73E-03	1.77E-04	2.40E-03	0.00E+00	0.00E+00	1.14E-03	1.74E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.61E+01	0.10	8.33E+01	2.40E-03	4.00E+02	#NUM!	6.18E-05	9.96E-04	NA	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.69E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-17
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	78933	1.00E+00	Methylethylketone (2-butanone)									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00

END

TABLE C-17 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_{eff}^T (cm ² /s)	Diffusion path length, L_d (cm)
8.47E+04	1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	4.92E-03	0.00E+00	0.00E+00	1.66E-03	2.94E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.55E+00	0.10	8.33E+01	4.92E-03	4.00E+02	8.90E+183	1.00E-04	1.55E-04	NA	5.0E+00			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.23E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.1E-08

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-18
DATA ENTRY SHEET FOR NAPHTHALENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	91203	3.30E+00	Chemical Naphthalene									
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 Totals must add up to value of L _{WT} (cell G28)			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)	
	16	200	762	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)	A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
6.05E-02	8.38E-06	4.40E-04	25	10,373	491.14	748.40	1.54E+03	3.10E+01	3.4E-05	3.0E-03

END

TABLE C-18 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR NAPHTHALENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	12,851	2.24E-04	9.44E-03	1.77E-04	3.16E-03	0.00E+00	0.00E+00	2.39E-04	6.10E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	3.12E+01	0.10	8.33E+01	3.16E-03	4.00E+02	1.15E+286	2.25E-05	7.02E-04	3.4E-05	3.0E-03			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.10E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.8E-09	1.6E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-19
DATA ENTRY SHEET FOR PYRENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	129000	6.00E+01	Pyrene									

	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)
	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA

END

TABLE C-19 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR PYRENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	20,621	4.03E-06	1.70E-04	1.77E-04	2.56E-03	0.00E+00	0.00E+00	1.06E-02	3.46E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.02E+01	0.10	8.33E+01	2.56E-03	4.00E+02	#NUM!	1.16E-04	1.18E-03	NA	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.35E+02	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-20
DATA ENTRY SHEET FOR TOLUENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	108883	3.20E-01	Chemical Toluene									
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 Totals must add up to value of L _{WT} (cell G28)			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)	
	16	200	762	762			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
7.78E-02	9.20E-06	6.64E-03	25	7,930	383.78	591.79	2.34E+02	5.26E+02	NA	5.0E+00

END

TABLE C-20 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TOLUENE IN GROUNDWATER - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)
	8.47E+04	1.80E+06	2.22E-04	200	9,089	4.12E-03	1.74E-01	1.77E-04	4.04E-03	0.00E+00	0.00E+00	3.78E-05	1.09E-04
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	5.56E+01	0.10	8.33E+01	4.04E-03	4.00E+02	1.02E+224	4.09E-06	2.27E-04	NA	5.0E+00			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	5.26E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.1E-08

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-21
DATA ENTRY SHEET FOR CIS-1,2-DICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	156592	6.90E+00	Chemical 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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	457	457			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
8.84E-02	1.13E-05	4.08E-03	25	7,192	333.65	544.00	3.96E+01	6.41E+03	NA	NA

END

TABLE C-21 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CIS-1,2-DICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	257	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, $\Delta H_{w,TS}$ (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)
8.47E+04	1.80E+06	2.22E-04	200	7,674	2.73E-03	1.15E-01	1.77E-04	4.59E-03	0.00E+00	0.00E+00	5.24E-05	6.98E-05	257
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	7.93E+02	0.10	8.33E+01	4.59E-03	4.00E+02	1.26E+197	5.74E-06	4.55E-03	NA	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	6.41E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-22
DATA ENTRY SHEET FOR TETRACHLOROETHENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	127184	8.43E-01	Chemical 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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	457	457			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
5.05E-02	9.46E-06	1.77E-02	25	8,288	394.40	620.20	9.49E+01	2.06E+02	2.6E-07	4.0E-02

END

TABLE C-22 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TETRACHLOROETHENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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, θ _{a,cz} (cm ³ /cm ³)	Water-filled porosity in capillary zone, θ _{w,cz} (cm ³ /cm ³)	Floor-wall seam perimeter, X _{crack} (cm)
7.88E+08	257	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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, ΔH _{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)
	8.47E+04	1.80E+06	2.22E-04	200	9,492	1.07E-02	4.53E-01	1.77E-04	2.62E-03	0.00E+00	0.00E+00	2.12E-05	2.82E-05
Convection path length, L _p (cm)	Source vapor conc., C _{source} (μg/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} (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	3.82E+02	0.10	8.33E+01	2.62E-03	4.00E+02	#NUM!	2.33E-06	8.90E-04	2.6E-07	4.0E-02			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.06E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.7E-11	1.5E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-23
DATA ENTRY SHEET FOR TRANS-1,2-DICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	1.00E+00	trans-1,2-Dichloroethylene									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	457	457			A	SIC	SIC		

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
8.76E-02	1.12E-05	4.08E-03	25	6,717	320.85	516.50	3.96E+01	4.52E+03	NA	6.0E-02

END

TABLE C-23 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TRANS-1,2-DICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	257	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	7,073	2.81E-03	1.19E-01	1.77E-04	4.55E-03	0.00E+00	0.00E+00	5.12E-05	6.82E-05	257
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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, $\text{exp}(\text{Pe}^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.19E+02	0.10	8.33E+01	4.55E-03	4.00E+02	7.83E+198	5.61E-06	6.65E-04	NA	6.0E-02			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	4.52E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	7.6E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-24
DATA ENTRY SHEET FOR TRICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	1.10E+01	Trichloroethylene									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	457	457			A	SIC	SIC		

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.				

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
6.87E-02	1.02E-05	9.85E-03	25	7,505	360.36	544.20	6.07E+01	1.28E+03	4.1E-06	2.0E-03

END

TABLE C-24 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TRICHLOROETHYLENE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	1.28E+06	NA	1.0E-08	3.4E-03

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-25
DATA ENTRY SHEET FOR VINYL CHLORIDE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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	1.60E+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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	457	457			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)
1.07E-01	1.20E-05	2.78E-02	25	5,250	259.25	432.00	2.17E+01	8.80E+03	4.4E-06	1.0E-01

END

TABLE C-25 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR VINYL CHLORIDE IN GROUNDWATER - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	8.80E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
6.4E-09	4.1E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-26
DATA ENTRY SHEET FOR CARBON DISULFIDE IN GROUNDWATER - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	75150	2.80E-01	Carbon disulfide									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type	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	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	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01

END

TABLE C-26 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN GROUNDWATER - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	5.52E-03	0.00E+00	0.00E+00	4.13E-05	1.19E-04	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.20E+02	0.10	8.33E+01	5.52E-03	4.00E+02	5.87E+163	4.48E-06	5.37E-04	NA	7.0E-01			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.16E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.3E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-27
DATA ENTRY SHEET FOR BENZO(b)FLUORANTHENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	205992	2.30E-01	Chemical Benzo(b)fluoranthene									
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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA

END

TABLE C-27 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(b)FLUORANTHENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
	8.47E+04	1.80E+06	2.22E-04	200	25,484	1.72E-07	7.26E-06	1.77E-04	2.26E-02	0.00E+00	0.00E+00	1.90E-01	3.23E-02
Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.67E-03	0.10	8.33E+01	2.26E-02	4.00E+02	1.13E+40	5.45E-04	9.11E-07	1.1E-04	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.50E+00	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.5E-11	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-28
DATA ENTRY SHEET FOR CHRYSENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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)										
	218019	2.60E-01	Chemical Chrysene									
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 Totals must add up to value of L _{WT} (cell G28) 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)	
	16	200	762	762			A	SIC	SIC			
MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)				
	10	40	1000	1000	304.8	0.1	1	5				
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-04	1						
END					Used to calculate risk-based groundwater concentration.							

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA

END

TABLE C-28 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
8.47E+04	1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	4.25E-03	0.00E+00	0.00E+00	2.73E-02	5.97E-03	562
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	1.59E-02	0.10	8.33E+01	4.25E-03	4.00E+02	9.58E+212	1.84E-04	2.93E-06	1.1E-05	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.00E+00	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
7.9E-12	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-29
DATA ENTRY SHEET FOR PYRENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

GW-ADV
Version 3.1; 02/04

Reset to
Defaults

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									
	129000	3.80E-01	Pyrene									

	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 Totals must add up to value of L _{WT} (cell G28) 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)
	16	200	762	762			A	SIC	SIC		

	ENTER Stratum A SCS soil type	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	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	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)
	SIC	1.38	0.481	0.216	C	1.43	0.459	0.215	C	1.43	0.459	0.215

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based groundwater concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA

END

TABLE C-29 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR PYRENE IN GROUNDWATER - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{le} (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	562	0.265	0.244	0.244	0.284	1.50E-09	0.844	1.26E-09	192.31	0.481	0.057	0.424	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)
	8.47E+04	1.80E+06	2.22E-04	200	20,621	4.03E-06	1.70E-04	1.77E-04	2.56E-03	0.00E+00	0.00E+00	1.06E-02	3.46E-03
Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)			
200	6.45E-02	0.10	8.33E+01	2.56E-03	4.00E+02	#NUM!	1.16E-04	7.45E-06	NA	NA			
END													

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.35E+02	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-30
DATA ENTRY SHEET FOR 2-HEXANONE IN SOIL - 1A2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)	Chemical												
591796	1.00E+00	Hexanone, 2-												

ENTER	ENTER	ENTER	ENTER	ENTER			ENTER	ENTER			
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Totals must add up to value of L _t (cell G28) Thickness of soil stratum A, h _A (cm)			Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	457	609.6	457					SIC		

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)	
SIC	1.7	0.377	0.164	0.0118											

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm·s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
7.04E-02	8.44E-06	9.32E-05	25	8,610	400.60	600.90	1.50E+01	1.72E+04	0.0E+00	3.0E-02	0.0E+00

END

ONTARIO, RICHLAND COUNTY, OHIO

END

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.70E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.6E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-31
DATA ENTRY SHEET FOR 2-METHYLNAPHTHALENE CHLORIDE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical												
	91576	5.40E+01	2-Methylnaphthalene												

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	229	686	229			SIC			

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC		1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5	

	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-04	1	

	Used to calculate risk-based soil concentration.				

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.24E-02	7.78E-06	5.18E-04	25	12,600	514.26	761.00	2.48E+03	2.46E+01	NA	NA	S

END

TABLE C-31 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 2-METHYLNAPHTHALENE CHLORIDE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	29	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	5.40E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,163	2.22E-04	9.34E-03	1.77E-04	2.15E-03	0.00E+00	0.00E+00	2.15E-03	29	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.92E+01	1.72E+01	0.10	8.33E+01	2.15E-03	4.00E+02	#NUM!	NA	NA	2.60E+00	4.80E-10	3.44E+11	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
5.90E-04	NA	1.01E-02	1.01E-02	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.22E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-32
DATA ENTRY SHEET FOR 1,2,4-TRICHLORO BENZENE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

120821 5.10E-01

1,2,4-Trichlorobenzene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	457	609.6	457			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118										

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
3.96E-02	8.40E-06	1.42E-03	25	10,471	486.15	725.00	1.36E+03	4.90E+01	NA	2.0E-03	L

END

TABLE C-32 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,2,4-TRICHLOROBENZENE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)

7.88E+08	257	0.213	ERROR	ERROR	0.199	1.50E-09	0.894	1.34E-09	4,000	5.10E-01	8.47E+04

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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)

1.80E+06	2.22E-04	200	13,161	7.11E-04	3.00E-02	1.77E-04	1.62E-03	0.00E+00	0.00E+00	1.62E-03	257	200

Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)

1.60E+01	9.49E-01	0.10	8.33E+01	1.62E-03	4.00E+02	#NUM!	NA	NA	1.14E+00	2.69E-11	3.17E+10	NO

Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)

1.17E-04	NA	1.11E-04	1.11E-04	NA	2.0E-03

END

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.89E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.8E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-33
DATA ENTRY SHEET FOR ACETONE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	67641	6.90E+01	Acetone											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	229	686	229			SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1
Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01	L

END

TABLE C-33 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACETONE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)

7.88E+08	29	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	6.90E+01	8.47E+04

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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)

1.80E+06	2.22E-04	200	7,485	2.36E-05	9.96E-04	1.77E-04	4.52E-03	0.00E+00	0.00E+00	4.52E-03	29	200

Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)

2.79E-02	5.52E+02	0.10	8.33E+01	4.52E-03	4.00E+02	1.39E+200	NA	NA	4.37E+00	2.53E-08	7.63E+09	NO

Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)

5.50E-04	NA	3.04E-01	3.04E-01	NA	3.1E+01

END

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.24E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	6.7E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-34
DATA ENTRY SHEET FOR CARBON DISULFIDE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75150 1.50E+00

Carbon disulfide

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	457	686	457			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01	L

END

TABLE C-34 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)

7.88E+08	257	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.50E+00	8.47E+04

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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)

1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	4.35E-03	0.00E+00	0.00E+00	4.35E-03	257	200

Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)

2.56E-01	1.58E+03	0.10	8.33E+01	4.35E-03	4.00E+02	1.69E+208	NA	NA	1.37E+00	4.08E-08	3.96E+07	YES

Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)

NA	1.57E-02	NA	1.57E-02	NA	7.0E-01

END

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.78E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.5E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-35
DATA ENTRY SHEET FOR CHRYSENE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	218019	9.10E+01	Chrysene											

MORE
↓

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
16	200	229	686	229			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based
soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA	S

END

TABLE C-35 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)
7.88E+08	29	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	9.10E+01	8.47E+04

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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	2.95E-03	0.00E+00	0.00E+00	2.95E-03	29	200

Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.13E+03	2.62E-03	0.10	8.33E+01	2.95E-03	4.00E+02	8.19E+306	NA	NA	3.20E+00	5.93E-14	2.94E+15	NO

Finite source indoor attenuation coefficient, <α> (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
6.76E-04	NA	1.77E-06	1.77E-06	1.1E-05	NA

END

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	4.26E+03	NA	4.8E-12	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-36
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

78933

9.40E+00

Methylethylketone (2-butanone)

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	229	610	229			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00	L

END

TABLE C-36 (CONTINUED)
 TIONS SHEET FOR METHYLETHYLKETONE (MEK)
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (cm ³ /cm ³)	Stratum A intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{iq} (cm ²)	Stratum A soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	29	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	9.40E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	3.85E-03	0.00E+00	0.00E+00	3.85E-03	29	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Finite source β term (unitless)	Finite source ν term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.32E-02	9.70E+01	0.10	8.33E+01	3.85E-03	4.00E+02	2.06E+235	NA	NA	3.86E+00	2.78E-08	4.94E+09	NO
Finite source indoor attenuation coefficient, α (unitless)	Mass limit bldg. conc., $C_{building}$ (μg/m ³)	Finite source bldg. conc., $C_{building}$ (μg/m ³)	Final finite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
4.89E-04	NA	4.75E-02	4.75E-02	NA	5.0E+00							
END												

TABLE C-32
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	3.34E+07	NA	NA	6.5E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-37
DATA ENTRY SHEET FOR METHYLENE CHLORIDE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75092 9.20E+00

Methylene chloride

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	229	686	229			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.99E-02	1.25E-05	3.25E-03	25	6,706	313.00	510.00	2.17E+01	1.30E+04	1.0E-08	6.0E-01	L

END

TABLE C-37 (CONTINUED)
 CALCULATIONS SHEET FOR METHYLENE CHLORIDE
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.74E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.7E-10	2.2E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-38
DATA ENTRY SHEET FOR NAPHTHALENE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

91203 9.30E+00

Naphthalene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	610	686	610			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.05E-02	8.38E-06	4.40E-04	25	10,373	491.14	748.40	1.54E+03	3.10E+01	3.4E-05	3.0E-03	S

END

TABLE C-38 (CONTINUED)
E CALCULATIONS SHEET FOR NAPHTHALENE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	410	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	9.30E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	12,851	2.24E-04	9.44E-03	1.77E-04	2.48E-03	0.00E+00	0.00E+00	2.48E-03	410	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μg/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, $exp(Pe)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μg/m ³)	Finite source β term (unitless)	Finite source γ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.82E+01	4.79E+00	0.10	8.33E+01	2.48E-03	4.00E+02	#NUM!	NA	NA	1.13E+00	4.48E-12	5.06E+10	NO
Finite indoor attenuation coefficient, $\langle\alpha\rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μg/m ³)	Finite source bldg. conc., $C_{building}$ (μg/m ³)	Final finite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.14E-04	NA	5.45E-04	5.45E-04	3.4E-05	3.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	5.68E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.5E-09	1.2E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-39
DATA ENTRY SHEET FOR PYRENE IN SOIL - 1A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

129000

1.40E+01

Pyrene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	457	686	457			SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA	S

END

TABLE C-39 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR PYRENE IN SOIL - IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	257	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.40E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	20,621	4.03E-06	1.70E-04	1.77E-04	1.86E-03	0.00E+00	0.00E+00	1.86E-03	257	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
6.41E+02	3.71E-03	0.10	8.33E+01	1.86E-03	4.00E+02	#NUM!	NA	NA	1.16E+00	4.39E-15	3.25E+14	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.33E-04	NA	4.94E-07	4.94E-07	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.66E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-40
DATA ENTRY SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

91576 1.30E+04

2-Methylnaphthalene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	381	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.24E-02	7.78E-06	5.18E-04	25	12,600	514.26	761.00	2.48E+03	2.46E+01	NA	NA	S

END

TABLE C-40 (CONTINUED)
INTERMEDIATE CALCULATION SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.30E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,163	2.22E-04	9.34E-03	1.77E-04	2.15E-03	0.00E+00	0.00E+00	2.15E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.92E+01	4.14E+03	0.10	8.33E+01	2.15E-03	4.00E+02	#NUM!	NA	NA	4.75E+01	4.03E-07	6.19E+10	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.04E-04	NA	3.74E+00	3.74E+00	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	7.22E+05	NA	NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-41
DATA ENTRY SHEET FOR 1,1-DICHLOROETHANE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75343 2.40E+01

1,1-Dichloroethane

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	457.2	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
8.36E-02	1.06E-05	5.62E-03	25	6.895	330.55	523.00	3.18E+01	5.04E+03	1.6E-06	NA	L

END

TABLE C-41 (CONTINUED)
CALCULATIONS SHEET FOR 1,1-DICHLOROETHYLENE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.40E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} AS No. not found (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	7,384	3.81E-03	1.61E-01	1.77E-04	3.42E-03	0.00E+00	0.00E+00	3.42E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (m ³ /s)	Crack effective diffusion coefficient, D_{crack}^{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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
3.75E-01	7.84E+03	0.10	8.33E+01	3.42E-03	4.00E+02	8.62E+264	NA	NA	7.48E+01	6.56E-04	7.97E+07	YES
Finite source indoor attenuation coefficient, $\langle\alpha\rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	2.83E-01	NA	2.83E-01	1.6E-06	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.48E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.1E-07	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-42
DATA ENTRY SHEET FOR 1,2-DICHLOROETHANE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	107062	6.80E-01	1,2-Dichloroethane											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	200	261	200	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
8.57E-02	1.10E-05	1.18E-03	25	7,643	356.65	561.00	3.96E+01	8.60E+03	2.6E-05	7.0E-03	L

END

TABLE C-42 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,2-DICHLOROETHANE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	6.80E-01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,457	7.57E-04	3.19E-02	1.77E-04	3.50E-03	0.00E+00	0.00E+00	3.50E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
4.67E-01	3.82E+01	0.10	8.33E+01	3.50E-03	4.00E+02	1.46E+258	NA	NA	7.67E+01	1.16E-04	5.65E+07	YES
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.90E-03	NA	1.90E-03	2.6E-05	7.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.88E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-08	1.9E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-43
DATA ENTRY SHEET FOR ACENAPHTHENE IN SOIL - 1A 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	83329	6.20E+04	Acenaphthene											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	16	200	200	381	200	0	0	SIC		

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.06E-02	8.33E-06	1.84E-04	25	12,155	550.54	803.15	5.03E+03	3.90E+00	NA	NA	S

END

TABLE C-43 (CONTINUED)
INTERMEDIATE CALCULATION SHEET FOR ACENAPHTHENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	6.20E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,049	7.92E-05	3.34E-03	1.77E-04	2.11E-03	0.00E+00	0.00E+00	2.11E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.93E+01	3.48E+03	0.10	8.33E+01	2.11E-03	4.00E+02	#NUM!	NA	NA	4.65E+01	6.97E-08	3.56E+11	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.51E-04	NA	3.31E+00	3.31E+00	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.32E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-44
DATA ENTRY SHEET FOR ACETONE IN SOIL - 1A.4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	67641	1.20E+02	Acetone											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	15	76	914	76	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type Lookup Soil Parameters	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

END	Used to calculate risk-based soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01	L

END

TABLE C-44 (CONTINUED)
 DATE CALCULATIONS SHEET FOR ACETONE
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{gA} (cm ²)	Stratum A soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	61	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.20E+02	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.06E+06	3.77E-04	15	7.485	2.36E-05	9.96E-04	1.77E-04	4.52E-03	0.00E+00	0.00E+00	4.52E-03	61	15
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source γ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.79E-02	9.60E+02	0.10	8.33E+01	4.52E-03	4.00E+02	1.39E+200	NA	NA	1.94E+00	5.71E-09	2.12E+10	NO
Finite source indoor attenuation coefficient, $\langle\alpha\rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RIC (mg/m ³)							
3.36E-04	NA	3.23E-01	3.23E-01	NA	3.1E+01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.24E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	7.1E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-45
DATA ENTRY SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	205992	2.10E+05	Benzo(b)fluoranthene											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	200	381	200	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA	S

END

TABLE C-45 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.06E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	25,484	1.72E-07	7.26E-06	1.77E-04	1.50E-02	0.00E+00	0.00E+00	1.50E-02	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
7.07E+03	1.09E-02	0.10	8.33E+01	1.50E-02	4.00E+02	1.56E+60	NA	NA	3.26E+02	9.07E-12	8.30E+15	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
9.81E-04	NA	1.07E-05	1.07E-05	1.1E-04	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.06E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.9E-10	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-46
INTERMEDIATE CALCULATIONS SHEET FOR BENZENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

71432 4.00E-01

Benzene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
8.95E-02	1.03E-05	5.55E-03	25	7,342	353.24	562.16	1.46E+02	1.79E+03	7.8E-06	3.0E-02	L

END

TABLE C-46 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.00E-01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,061	3.63E-03	1.53E-01	1.77E-04	3.66E-03	0.00E+00	0.00E+00	3.66E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.72E+00	3.34E+01	0.10	8.33E+01	3.66E-03	4.00E+02	3.16E+247	NA	NA	8.00E+01	1.79E-04	3.76E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.12E-03	NA	1.12E-03	7.8E-06	3.0E-02							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.29E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.1E-09	2.6E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-47
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)													
75150	7.60E+00	Carbon disulfide												

ENTER	ENTER	ENTER	ENTER	ENTER Totals must add up to value of L _i (cell G28)			ENTER	ENTER
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	200	838	200	0	0	SIC	

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{clack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm·s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01	L

END

TABLE C-47 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	7.60E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	4.35E-03	0.00E+00	0.00E+00	4.35E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	8.01E+03	0.10	8.33E+01	4.35E-03	4.00E+02	1.69E+208	NA	NA	9.49E+01	2.69E-03	9.81E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
NA	2.22E-01	NA	2.22E-01	NA	7.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.78E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.2E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-48
DATA ENTRY SHEET FOR CHRYSENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	218019	2.50E+05	Chrysene											

MORE
↓

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
16	200	200	914	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA	S

END

TABLE C-48 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.26E+03	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	2.95E-03	0.00E+00	0.00E+00	2.95E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.13E+03	1.23E-01	0.10	8.33E+01	2.95E-03	4.00E+02	8.19E+306	NA	NA	6.47E+01	4.99E-11	6.03E+15	NO
Finite source indoor attenuation coefficient, $<\alpha>$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.69E-04	NA	1.19E-04	1.19E-04	1.1E-05	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	4.26E+03	NA	3.2E-10	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-49
DATA ENTRY SHEET FOR CUMENE IN SOIL - 1A 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	98828	8.20E+00	Cumene											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	200	261	200	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1
				Used to calculate risk-based soil concentration.	

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.03E-02	7.86E-06	1.15E-02	25	10,335	425.56	631.10	6.98E+02	6.13E+01	NA	4.0E-01	L

END

TABLE C-49 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CUMENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	8.20E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	12,560	5.94E-03	2.51E-01	1.77E-04	2.46E-03	0.00E+00	0.00E+00	2.46E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
8.23E+00	2.46E+02	0.10	8.33E+01	2.46E-03	4.00E+02	#NUM!	NA	NA	5.42E+01	4.34E-05	1.19E+08	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	2.29E-02	NA	2.29E-02	NA	4.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	5.13E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.9E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-50
DATA ENTRY SHEET FOR ETHYLBENZENE IN SOIL - 1A 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	100414	1.30E+01	Ethylbenzene											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	200	200	261	200	0	0	SIC	

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
6.85E-02	8.46E-06	7.88E-03	25	8,501	409.34	617.20	4.46E+02	1.69E+02	2.5E-06	1.0E+00	L

END

TABLE C-50 (CONTINUED)
E CALCULATIONS SHEET FOR ETHYLBENZENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.30E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	10.087	4.64E-03	1.95E-01	1.77E-04	2.80E-03	0.00E+00	0.00E+00	2.80E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (m ³ /s)	Crack effective diffusion coefficient, D_{crack}^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe ⁴) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.26E+00	4.72E+02	0.10	8.33E+01	2.80E-03	4.00E+02	#NUM!	NA	NA	6.14E+01	5.97E-05	9.39E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	3.64E-02	NA	3.64E-02	2.5E-06	1.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	9.10E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.2E-08	2.5E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-51
DATA ENTRY SHEET FOR FLUORENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

86737 5.10E+04

Fluorene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{cack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
4.40E-02	7.89E-06	9.62E-05	25	12,666	570.44	870.00	9.16E+03	1.69E+00	NA	NA	S

END

TABLE C-51 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR FLUORENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	5.10E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS}^{eff} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,174	4.11E-05	1.73E-03	1.77E-04	1.87E-03	0.00E+00	0.00E+00	1.87E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.08E+02	8.17E+02	0.10	8.33E+01	1.87E-03	4.00E+02	#NUM!	NA	NA	4.14E+01	1.76E-08	2.49E+11	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
9.57E-04	NA	7.82E-01	7.82E-01	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.83E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-52
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

78933

3.60E+01

Methylethylketone (2-butanone)

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	609.6	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{cack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00	L

END

TABLE C-52 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	3.85E-03	0.00E+00	0.00E+00	3.85E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.32E-02	3.72E+02	0.10	8.33E+01	3.85E-03	4.00E+02	2.06E+235	NA	NA	8.41E+01	2.33E-05	5.07E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
5.57E-04	NA	2.07E-01	2.07E-01	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.34E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.8E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-53
DATA ENTRY SHEET FOR MERCURY IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical													
7439976	5.90E+01	Mercury (elemental)													

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)	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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	200	261	200	0	0	SIC			

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
3.07E-02	6.30E-06	1.14E-02	25	14,127	629.88	1750.00	5.20E+01	6.00E-02	NA	3.0E-04	L

END

Listed value of Koc is actually value of Kd for mercury.

TABLE C-53 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR MERCURY IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	5.90E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	15,299	5.11E-03	2.16E-01	1.77E-04	1.25E-03	0.00E+00	0.00E+00	1.25E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.20E+01	2.44E+02	0.10	8.33E+01	1.25E-03	4.00E+02	#NUM!	NA	NA	2.81E+01	3.05E-06	1.17E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
5.18E-04	NA	1.26E-01	1.26E-01	NA	3.0E-04							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.13E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.9E-01

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-54
DATA ENTRY SHEET FOR METHYLENE CHLORIDE IN SOIL - 1A 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75092 1.50E+01

Methylene chloride

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	914	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{cack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.99E-02	1.25E-05	3.25E-03	25	6,706	313.00	510.00	2.17E+01	1.30E+04	1.0E-08	6.0E-01	L

END

TABLE C-54 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.50E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS}^* (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,970	2.25E-03	9.50E-02	1.77E-04	4.08E-03	0.00E+00	0.00E+00	4.08E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	3.91E+03	0.10	8.33E+01	4.08E-03	4.00E+02	4.91E+221	NA	NA	8.92E+01	6.25E-04	5.10E+08	YES
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
NA	4.91E-01	NA	4.91E-01	1.0E-08	6.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.74E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-09	5.6E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-55
DATA ENTRY SHEET FOR METHYLISOBUTYLKETONE (4-METHYL-2-PENTANONE) IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	108101	5.90E+00	Methylisobutylketone (4-methyl-2-pentanone)											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
16	200	200	261	200	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.98E-02	8.35E-06	1.38E-04	25	8,243	389.50	571.00	1.26E+01	1.90E+04	NA	3.0E+00	L

END

TABLE C-55 (CONTINUED)
SHEET FOR METHYLISOBUTYLKETONE (4-ME
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	5.90E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	9,781	8.25E-05	3.48E-03	1.77E-04	2.89E-03	0.00E+00	0.00E+00	2.89E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (m ³ /s)	Crack effective diffusion coefficient, D_{crack}^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe ⁴) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.49E-01	8.36E+01	0.10	8.33E+01	2.89E-03	4.00E+02	#NUM!	NA	NA	6.34E+01	2.41E-05	2.38E+08	YES
Finite source indoor attenuation coefficient, $\langle\alpha\rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.65E-02	NA	1.65E-02	NA	3.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.67E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.8E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-56
DATA ENTRY SHEET FOR NAPHTHALENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

91203 1.10E+04

Naphthalene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	304.8	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.05E-02	8.38E-06	4.40E-04	25	10,373	491.14	748.40	1.54E+03	3.10E+01	3.4E-05	3.0E-03	S

END

TABLE C-56 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR NAPHTHALENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.10E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	12,851	2.24E-04	9.44E-03	1.77E-04	2.48E-03	0.00E+00	0.00E+00	2.48E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.82E+01	5.67E+03	0.10	8.33E+01	2.48E-03	4.00E+02	#NUM!	NA	NA	5.47E+01	7.53E-07	1.49E+10	NO
Finite source indoor attenuation coefficient, α (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
8.86E-04	NA	5.02E+00	5.02E+00	3.4E-05	3.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	5.68E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.2E-05	1.1E+00

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-57
DATA ENTRY SHEET FOR PYRENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R ($\mu\text{g/kg}$)	Chemical											
	129000	4.50E+05	Pyrene											

MORE ↓	ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28)			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)
	Thickness of soil stratum A, h_a (cm)	Thickness of soil stratum B, (Enter value or 0) h_b (cm)	Thickness of soil stratum C, (Enter value or 0) h_c (cm)							
	16	200	200	610	200	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA	S

END

TABLE C-57 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR PYRENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	8.66E+04	8.47E+04	
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. soil temperature, $\Delta H_{i,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	20,621	4.03E-06	1.70E-04	1.77E-04	1.86E-03	0.00E+00	0.00E+00	1.86E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
6.41E+02	2.29E+01	0.10	8.33E+01	1.86E-03	4.00E+02	#NUM!	NA	NA	4.13E+01	2.90E-10	3.48E+14	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.60E-04	NA	2.20E-02	2.20E-02	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.66E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-58
DATA ENTRY SHEET FOR TOLUENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	108883	1.90E+01	Toluene											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	200	914	200	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
7.78E-02	9.20E-06	6.64E-03	25	7,930	383.78	591.79	2.34E+02	5.26E+02	NA	5.0E+00	L

END

TABLE C-58 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TOLUENE IN SOIL - IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.90E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	9,089	4.12E-03	1.74E-01	1.77E-04	3.18E-03	0.00E+00	0.00E+00	3.18E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.76E+00	1.15E+03	0.10	8.33E+01	3.18E-03	4.00E+02	6.79E+284	NA	NA	6.96E+01	1.13E-04	2.70E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
2.72E-04	NA	3.12E-01	3.12E-01	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.51E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.3E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-59
DATA ENTRY SHEET SHEET FOR XYLENES IN SOIL - 1A 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

106423 1.60E+01

p-Xylene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.82E-02	8.42E-06	6.90E-03	25	8,525	411.52	616.20	3.75E+02	1.62E+02	NA	1.0E-01	L

END

TABLE C-59 (CONTINUED)
 DATE CALCULATIONS SHEET FOR XYLENES
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{g_i} (cm ²)	Stratum A soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	10,178	4.04E-03	1.70E-01	1.77E-04	2.79E-03	0.00E+00	0.00E+00	2.79E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $exp(Pe)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source γ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
4.43E+00	6.00E+02	0.10	8.33E+01	2.79E-03	4.00E+02	#NUM!	NA	NA	6.12E+01	6.14E-05	9.11E+07	YES
Finite source indoor attenuation coefficient, $<\alpha>$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RIC (mg/m ³)							
NA	4.47E-02	NA	4.47E-02	NA	1.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.37E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.1E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-60
DATA ENTRY SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

91576 7.40E+01

2-Methylnaphthalene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{cack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.24E-02	7.78E-06	5.18E-04	25	12,600	514.26	761.00	2.48E+03	2.46E+01	NA	NA	S

END

TABLE C-60 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	7.40E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,163	2.22E-04	9.34E-03	1.77E-04	2.15E-03	0.00E+00	0.00E+00	2.15E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.92E+01	2.36E+01	0.10	8.33E+01	2.15E-03	4.00E+02	#NUM!	NA	NA	4.75E+01	4.03E-07	1.18E+10	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.04E-04	NA	2.13E-02	2.13E-02	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.22E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-61
DATA ENTRY SHEET FOR 1,2-DICHLOROETHANE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	107062	1.50E+00	1,2-Dichloroethane											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	200	200	261	200	0	0	SIC	

	ENTER Stratum A SCS soil type Lookup Soil Parameters	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
8.57E-02	1.10E-05	1.18E-03	25	7,643	356.65	561.00	3.96E+01	8.60E+03	2.6E-05	7.0E-03	L

END

TABLE C-61 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 1,2-DICHLOROETHANE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.50E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,457	7.57E-04	3.19E-02	1.77E-04	3.50E-03	0.00E+00	0.00E+00	3.50E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
4.67E-01	8.43E+01	0.10	8.33E+01	3.50E-03	4.00E+02	1.46E+258	NA	NA	7.67E+01	1.16E-04	5.65E+07	YES
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	4.19E-03	NA	4.19E-03	2.6E-05	7.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.88E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.7E-08	4.1E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-62
DATA ENTRY SHEET FOR ACENAPHTHENE IN SOIL - 1A 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

83329

6.00E+00

Acenaphthene

MORE
↓

ENTER
Average
soil
temperature,
 T_s
($^{\circ}\text{C}$)

ENTER
Depth
below grade
to bottom
of enclosed
space floor,
 L_f
(cm)

ENTER
Depth below
grade to top
of contamination,
 L_t
(cm)

ENTER
Depth below
grade to bottom
of contamination,
(enter value of 0
if value is unknown)
 L_b
(cm)

ENTER
Totals must add up to value of L_t (cell G28)

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 A
SCS
soil type
(used to estimate
soil vapor
permeability)

OR

ENTER
User-defined
stratum A
soil vapor
permeability,
 k_v
(cm^2)

16

200

200

261

200

0

0

SIC

MORE
↓

ENTER
Stratum A
SCS
soil type
(Lookup Soil
Parameters)

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 A
soil organic
carbon fraction,
 f_{oc}^A
(unitless)

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 B
soil organic
carbon fraction,
 f_{oc}^B
(unitless)

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)

ENTER
Stratum C
soil organic
carbon fraction,
 f_{oc}^C
(unitless)

SIC

1.7

0.377

0.164

0.0118

0

0

0

0

0

0

0

0

0

0

MORE
↓

ENTER
Enclosed
space
floor
thickness,
 L_{crack}
(cm)

ENTER
Soil-bldg.
pressure
differential,
 ΔP
($\text{g/cm} \cdot \text{s}^2$)

ENTER
Enclosed
space
floor
length,
 L_s
(cm)

ENTER
Enclosed
space
floor
width,
 W_s
(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)

10

40

1000

1000

304.8

0.1

1

5

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-04

1

Used to calculate risk-based
soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.06E-02	8.33E-06	1.84E-04	25	12,155	550.54	803.15	5.03E+03	3.90E+00	NA	NA	S

END

TABLE C-62 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACENAPHTHENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	6.00E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,049	7.92E-05	3.34E-03	1.77E-04	2.11E-03	0.00E+00	0.00E+00	2.11E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.93E+01	3.37E-01	0.10	8.33E+01	2.11E-03	4.00E+02	#NUM!	NA	NA	4.65E+01	6.97E-08	6.75E+10	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.51E-04	NA	3.21E-04	3.21E-04	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.32E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-63
DATA ENTRY SHEET FOR ACETONE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R ($\mu\text{g/kg}$)	Chemical											
	67641	2.30E+01	Acetone											

MORE ↓	ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28)			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)
	Thickness of soil stratum A, h_a (cm)	Thickness of soil stratum B, (Enter value or 0) h_b (cm)	Thickness of soil stratum C, (Enter value or 0) h_c (cm)							
	16	200	200	671	200	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1
Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01	L

END

TABLE C-63 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACETONE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.30E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	7,485	2.36E-05	9.96E-04	1.77E-04	4.52E-03	0.00E+00	0.00E+00	4.52E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.79E-02	1.84E+02	0.10	8.33E+01	4.52E-03	4.00E+02	1.39E+200	NA	NA	9.86E+01	2.13E-05	7.40E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
6.27E-04	NA	1.15E-01	1.15E-01	NA	3.1E+01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.24E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.5E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-64
DATA ENTRY SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

205992 4.50E+01

Benzo(b)fluoranthene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA	S

END

TABLE C-64 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.50E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	25,484	1.72E-07	7.26E-06	1.77E-04	1.50E-02	0.00E+00	0.00E+00	1.50E-02	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
7.07E+03	4.62E-05	0.10	8.33E+01	1.50E-02	4.00E+02	1.56E+60	NA	NA	3.26E+02	9.07E-12	2.39E+15	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
9.81E-04	NA	4.53E-08	4.53E-08	1.1E-04	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.06E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-12	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-65
DATA ENTRY SHEET FOR CARBON DISULFIDE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75150 1.10E+00

Carbon disulfide

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	762	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01	L

END

TABLE C-65 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - 1A 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.10E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	4.35E-03	0.00E+00	0.00E+00	4.35E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	1.16E+03	0.10	8.33E+01	4.35E-03	4.00E+02	1.69E+208	NA	NA	9.49E+01	2.69E-03	7.85E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
NA	2.83E-02	NA	2.83E-02	NA	7.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.78E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.8E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-66
DATA ENTRY SHEET FOR CHRYSENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	218019	4.50E+01	Chrysene											

MORE
↓

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
16	200	200	671	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based
soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA	S

END

TABLE C-66 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.50E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}^*$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	2.95E-03	0.00E+00	0.00E+00	2.95E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.13E+03	1.29E-03	0.10	8.33E+01	2.95E-03	4.00E+02	8.19E+306	NA	NA	6.47E+01	4.99E-11	2.83E+15	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
9.69E-04	NA	1.25E-06	1.25E-06	1.1E-05	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.26E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
3.4E-12	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-67
DATA ENTRY SHEET FOR FLUORENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

86737 4.00E+00

Fluorene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	200	261	200	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
4.40E-02	7.89E-06	9.62E-05	25	12,666	570.44	870.00	9.16E+03	1.69E+00	NA	NA	S

END

TABLE C-67 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR FLUORENE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.00E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS}^* (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,174	4.11E-05	1.73E-03	1.77E-04	1.87E-03	0.00E+00	0.00E+00	1.87E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.08E+02	6.41E-02	0.10	8.33E+01	1.87E-03	4.00E+02	#NUM!	NA	NA	4.14E+01	1.76E-08	2.49E+11	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
9.57E-04	NA	6.13E-05	6.13E-05	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.83E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-68
DATA ENTRY SHEET FOR MERCURY (ELEMENTAL) IN SOIL - 1A 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	7439976	3.00E+01	Mercury (elemental)											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	200	200	261	200	0	0	SIC	

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
3.07E-02	6.30E-06	1.14E-02	25	14,127	629.88	1750.00	5.20E+01	6.00E-02	NA	3.0E-04	L

END

Listed value of Koc is actually value of Kd for mercury.

TABLE C-68 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR MERCURY (ELEMENTAL) IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	1	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.00E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	15,299	5.11E-03	2.16E-01	1.77E-04	1.25E-03	0.00E+00	0.00E+00	1.25E-03	1	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.20E+01	1.24E+02	0.10	8.33E+01	1.25E-03	4.00E+02	#NUM!	NA	NA	2.81E+01	3.05E-06	1.17E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
5.18E-04	NA	6.43E-02	6.43E-02	NA	3.0E-04							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.13E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.5E-01

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-69
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)	Chemical												
78933	2.10E+01	Methylethylketone (2-butanone)												

ENTER	ENTER	ENTER	ENTER	ENTER			ENTER	ENTER	
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Totals must add up to value of L _t (cell G28)			Soil stratum A SCS soil type (used to estimate soil vapor permeability)	User-defined stratum A soil vapor permeability, k _v (cm ²)	
				Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)	OR		
16	200	610	671	610	0	0	SIC		

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm·s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00	L

END

TABLE C-69 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	410	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.10E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	3.85E-03	0.00E+00	0.00E+00	3.85E-03	410	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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) ¹ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.32E-02	2.17E+02	0.10	8.33E+01	3.85E-03	4.00E+02	2.06E+235	NA	NA	1.20E+00	1.39E-10	1.37E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.60E-04	NA	3.47E-02	3.47E-02	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.34E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.7E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-70
DATA ENTRY SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	75092	2.90E+01	Methylene chloride											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)				OR		
16	200	200	762	200	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.99E-02	1.25E-05	3.25E-03	25	6,706	313.00	510.00	2.17E+01	1.30E+04	1.0E-08	6.0E-01	L

END

TABLE C-70 (CONTINUED)
CALCULATIONS SHEET FOR METHYLENE CHLORIDE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.74E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.8E-09	8.5E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-71
DATA ENTRY SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)	Chemical												
91576	1.30E+04	2-Methylnaphthalene												

ENTER	ENTER	ENTER	ENTER	ENTER			ENTER	ENTER						
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Totals must add up to value of L _t (cell G28)			Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR User-defined stratum A soil vapor permeability, k _v (cm ²)						
				Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)								
16	200	304.8	914	304.8	0	0	SIC							

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)	
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0	

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm-s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)		
70	25	25	250	1.0E-04	1		

Used to calculate risk-based soil concentration.						

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.24E-02	7.78E-06	5.18E-04	25	12,600	514.26	761.00	2.48E+03	2.46E+01	NA	NA	S

END

TABLE C-71 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.30E+04	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,163	2.22E-04	9.34E-03	1.77E-04	2.15E-03	0.00E+00	0.00E+00	2.15E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.92E+01	4.14E+03	0.10	8.33E+01	2.15E-03	4.00E+02	#NUM!	NA	NA	1.44E+00	3.67E-11	6.89E+11	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
3.01E-04	NA	1.24E+00	1.24E+00	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.22E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-72
DATA ENTRY SHEET FOR 1,2-DICHLOROETHANE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	107062	6.70E-01	1,2-Dichloroethane											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	304.8	914	304.8	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1
Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
8.57E-02	1.10E-05	1.18E-03	25	7,643	356.65	561.00	3.96E+01	8.60E+03	2.6E-05	7.0E-03	L

END

TABLE C-72 (CONTINUED)
CALCULATIONS SHEET FOR 1,2-DICHLOROETHYLENE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	6.70E-01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,457	7.57E-04	3.19E-02	1.77E-04	3.50E-03	0.00E+00	0.00E+00	3.50E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
4.67E-01	3.76E+01	0.10	8.33E+01	3.50E-03	4.00E+02	1.46E+258	NA	NA	1.72E+00	1.05E-08	2.55E+09	NO
Finite source indoor attenuation coefficient, <α> (unitless)	Mass limit bldg. conc., $C_{building}$ (μg/m ³)	Finite source bldg. conc., $C_{building}$ (μg/m ³)	Final finite source bldg. conc., $C_{building}$ (μg/m ³)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
2.31E-04	NA	8.70E-03	8.70E-03	2.6E-05	7.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.88E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.5E-08	8.5E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-73
DATA ENTRY SHEET FOR ACETONE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

67641 2.00E+02

Acetone

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	914	1067	914	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01	L

END

TABLE C-73 (CONTINUED)
 DATE CALCULATIONS SHEET FOR ACETONE
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{gA} (cm ²)	Stratum A soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	714	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.00E+02	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D^{eff}_T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	7.485	2.36E-05	9.96E-04	1.77E-04	4.52E-03	0.00E+00	0.00E+00	4.52E-03	714	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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, $exp(Pe)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source γ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.79E-02	1.60E+03	0.10	8.33E+01	4.52E-03	4.00E+02	1.39E+200	NA	NA	1.14E+00	4.17E-11	6.39E+09	NO
Finite source indoor attenuation coefficient, $<\alpha>$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RIC (mg/m ³)							
1.17E-04	NA	1.87E-01	1.87E-01	NA	3.1E+01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.24E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.1E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-74
DATA ENTRY SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	205992	3.60E+01	Benzo(b)fluoranthene											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)				OR		
16	15	152	304.8	152	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA	S

END

TABLE C-74 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	137	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.06E+06	3.77E-04	15	25,484	1.72E-07	7.26E-06	1.77E-04	1.50E-02	0.00E+00	0.00E+00	1.50E-02	137	15
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
7.07E+03	3.69E-05	0.10	8.33E+01	1.50E-02	4.00E+02	1.56E+60	NA	NA	2.40E+00	4.83E-16	6.81E+15	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
5.73E-04	NA	2.12E-08	2.12E-08	1.1E-04	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.06E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.7E-13	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-75
DATA ENTRY SHEET FOR BENZENE IN SOIL - 1A 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

71432 3.20E-01

Benzene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	304.8	914	304.8	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
8.95E-02	1.03E-05	5.55E-03	25	7,342	353.24	562.16	1.46E+02	1.79E+03	7.8E-06	3.0E-02	L

END

TABLE C-75 (CONTINUED)
STATE CALCULATIONS SHEET FOR BENZENE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.29E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.1E-08	1.3E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-76
DATA ENTRY SHEET FOR CARBON DISULFIDE IN SOIL - 1A 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75150 2.10E+00

Carbon disulfide

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	304.8	457	304.8	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01	L

END

TABLE C-76 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.10E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	4.35E-03	0.00E+00	0.00E+00	4.35E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	2.21E+03	0.10	8.33E+01	4.35E-03	4.00E+02	1.69E+208	NA	NA	1.90E+00	2.45E-07	1.55E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.47E-02	NA	1.47E-02	NA	7.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.78E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.4E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-77
DATA ENTRY SHEET FOR CHLOROETHANE (ETHYL CHLORIDE) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	75003	1.80E+00	Chloroethane (ethyl chloride)											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)				OR		
16	200	610	914	610	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.04E-01	1.16E-05	1.11E-02	25	5,879	285.30	460.40	2.17E+01	6.71E+03	NA	1.0E+01	L

END

TABLE C-77 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHLOROETHANE (ETHYL CHLORIDE) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	410	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.80E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	5,835	8.17E-03	3.44E-01	1.77E-04	4.24E-03	0.00E+00	0.00E+00	4.24E-03	410	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	1.56E+03	0.10	8.33E+01	4.24E-03	4.00E+02	4.24E+213	NA	NA	1.22E+00	1.29E-08	9.17E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	2.51E-02	NA	2.51E-02	NA	1.0E+01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.66E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.7E-06

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-78
DATA ENTRY SHEET FOR CHRYSENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	218019	1.60E+01	Chrysene											

MORE
↓

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)		h _A (cm)	h _B (cm)	h _C (cm)	OR	k _v (cm ²)
16	200	304.8	457	304.8	0	0	SIC	

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based
soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA	S

END

TABLE C-78 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	2.95E-03	0.00E+00	0.00E+00	2.95E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.13E+03	4.60E-04	0.10	8.33E+01	2.95E-03	4.00E+02	8.19E+306	NA	NA	1.61E+00	4.54E-15	7.46E+14	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
3.72E-04	NA	1.71E-07	1.71E-07	1.1E-05	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.26E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.6E-13	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-79
DATA ENTRY SHEET FOR MERCURY (ELEMENTAL) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

7439976 3.00E+01

Mercury (elemental)

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	304.8	914	304.8	0	0	SIC	

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
3.07E-02	6.30E-06	1.14E-02	25	14,127	629.88	1750.00	5.20E+01	6.00E-02	NA	3.0E-04	L

END

Listed value of Koc is actually value of Kd for mercury.

TABLE C-79 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR MERCURY (ELEMENTAL) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.00E+01	8.47E+04	
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. soil temperature, $\Delta H_{i,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, D_{eff_T} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	15,299	5.11E-03	2.16E-01	1.77E-04	1.25E-03	0.00E+00	0.00E+00	1.25E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.20E+01	1.24E+02	0.10	8.33E+01	1.25E-03	4.00E+02	#NUM!	NA	NA	1.26E+00	2.78E-10	8.72E+10	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.90E-04	NA	2.35E-02	2.35E-02	NA	3.0E-04							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.13E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	5.4E-02

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-80
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

78933

3.20E+01

Methylethylketone (2-butanone)

MORE
↓

ENTER Average soil temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to top of contamination, L_I (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_B (cm)	ENTER Totals must add up to value of L_I (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	304.8	914	304.8	0	0	SIC	

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00	L

END

TABLE C-80 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{ie} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.20E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	3.85E-03	0.00E+00	0.00E+00	3.85E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.32E-02	3.30E+02	0.10	8.33E+01	3.85E-03	4.00E+02	2.06E+235	NA	NA	1.79E+00	2.13E-09	1.29E+10	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
3.58E-04	NA	1.18E-01	1.18E-01	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.34E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.6E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-81
DATA ENTRY SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	75092	4.60E+01	Methylene chloride											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	16	200	304.8	914	304.8	0	0	SIC		

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.99E-02	1.25E-05	3.25E-03	25	6,706	313.00	510.00	2.17E+01	1.30E+04	1.0E-08	6.0E-01	L

END

TABLE C-81 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,970	2.25E-03	9.50E-02	1.77E-04	4.08E-03	0.00E+00	0.00E+00	4.08E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	1.20E+04	0.10	8.33E+01	4.08E-03	4.00E+02	4.91E+221	NA	NA	1.84E+00	5.69E-08	4.85E+08	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
NA	1.28E+00	NA	1.28E+00	1.0E-08	6.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.74E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
3.1E-09	1.5E-03

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-82
DATA ENTRY SHEET FOR PYRENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	129000	1.50E+01	Pyrene											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	15	152	304.8	152	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA	S

END

TABLE C-82 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR PYRENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	137	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.50E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.06E+06	3.77E-04	15	20,621	4.03E-06	1.70E-04	1.77E-04	1.86E-03	0.00E+00	0.00E+00	1.86E-03	137	15
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
6.41E+02	3.97E-03	0.10	8.33E+01	1.86E-03	4.00E+02	#NUM!	NA	NA	1.17E+00	1.55E-14	1.25E+14	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
1.45E-04	NA	5.76E-07	5.76E-07	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.66E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-83
DATA ENTRY SHEET FOR TOLUENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

108883 3.70E-01

Toluene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	304.8	914	304.8	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
7.78E-02	9.20E-06	6.64E-03	25	7,930	383.78	591.79	2.34E+02	5.26E+02	NA	5.0E+00	L

END

TABLE C-83 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR TOLUENE IN SOIL - IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	104.8	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.70E-01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	9,089	4.12E-03	1.74E-01	1.77E-04	3.18E-03	0.00E+00	0.00E+00	3.18E-03	104.8	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.76E+00	2.23E+01	0.10	8.33E+01	3.18E-03	4.00E+02	6.79E+284	NA	NA	1.65E+00	1.03E-08	2.58E+09	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
2.15E-04	NA	4.79E-03	4.79E-03	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.51E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	6.6E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-84
DATA ENTRY SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	91576	7.70E+01	2-Methylnaphthalene											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
T _s (°C)	L _f (cm)	L _t (cm)	L _b (cm)	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)			k _v (cm ²)
16	200	762	914	762	0	0	SIC		

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
5.24E-02	7.78E-06	5.18E-04	25	12,600	514.26	761.00	2.48E+03	2.46E+01	NA	NA	S

END

TABLE C-84 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR 2-METHYLNAPHTHALENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	7.70E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	16,163	2.22E-04	9.34E-03	1.77E-04	2.15E-03	0.00E+00	0.00E+00	2.15E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.92E+01	2.45E+01	0.10	8.33E+01	2.15E-03	4.00E+02	#NUM!	NA	NA	1.08E+00	1.28E-12	2.58E+11	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
7.52E-05	NA	1.84E-03	1.84E-03	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	7.22E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-85
DATA ENTRY SHEET FOR ACETONE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

67641

3.20E+01

Acetone

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	762	914	762	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.15E-05	3.50E-05	25	6,955	329.20	508.10	2.36E+00	1.00E+06	NA	3.1E+01	L

END

TABLE C-85 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR ACETONE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	3.20E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	7,485	2.36E-05	9.96E-04	1.77E-04	4.52E-03	0.00E+00	0.00E+00	4.52E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.79E-02	2.56E+02	0.10	8.33E+01	4.52E-03	4.00E+02	1.39E+200	NA	NA	1.17E+00	6.73E-11	5.26E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.43E-04	NA	3.66E-02	3.66E-02	NA	3.1E+01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.24E+08	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	8.1E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-86
DATA ENTRY SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	205992	1.50E+01	Benzo(b)fluoranthene											

ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
				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)	OR	
16	200	762	914	762	0	0	SIC	

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
4.76E-02	5.56E-06	6.57E-07	25	17,000	715.90	969.27	5.99E+05	1.50E-03	1.1E-04	NA	S

END

TABLE C-86 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZO(B)FLUORANTHENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.50E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	25,484	1.72E-07	7.26E-06	1.77E-04	1.50E-02	0.00E+00	0.00E+00	1.50E-02	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
7.07E+03	1.54E-05	0.10	8.33E+01	1.50E-02	4.00E+02	1.56E+60	NA	NA	1.58E+00	2.87E-17	1.61E+16	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
3.60E-04	NA	5.55E-09	5.55E-09	1.1E-04	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.06E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.5E-13	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-87
DATA ENTRY SHEET FOR BENZENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)	Chemical												
71432	2.00E+00	Benzene												

ENTER	ENTER	ENTER	ENTER	ENTER			ENTER	ENTER				
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Totals must add up to value of L _t (cell G28)			Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR User-defined stratum A soil vapor permeability, k _v (cm ²)				
				Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)						
16	200	762	914	762	0	0	SIC					

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)	
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0	

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{clack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm·s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER		
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)		
70	25	25	250	1.0E-04	1		

Used to calculate risk-based soil concentration.						

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
8.95E-02	1.03E-05	5.55E-03	25	7,342	353.24	562.16	1.46E+02	1.79E+03	7.8E-06	3.0E-02	L

END

TABLE C-87 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BENZENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.00E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,061	3.63E-03	1.53E-01	1.77E-04	3.66E-03	0.00E+00	0.00E+00	3.66E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.72E+00	1.67E+02	0.10	8.33E+01	3.66E-03	4.00E+02	3.16E+247	NA	NA	1.14E+00	5.68E-10	6.08E+08	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.39E-02	NA	1.39E-02	7.8E-06	3.0E-02							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.29E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.7E-08	3.2E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-88
DATA ENTRY SHEET FOR BROMOMETHANE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

ENTER	ENTER													
Chemical CAS No. (numbers only, no dashes)	Initial soil conc., C _R (µg/kg)	Chemical												
74839	2.80E+00	Methyl bromide												

ENTER	ENTER	ENTER	ENTER	ENTER			ENTER	ENTER				
Average soil temperature, T _s (°C)	Depth below grade to bottom of enclosed space floor, L _f (cm)	Depth below grade to top of contamination, L _t (cm)	Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	Totals must add up to value of L _t (cell G28)			Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR User-defined stratum A soil vapor permeability, k _v (cm ²)				
				Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)						
16	200	762	838	762	0	0	SIC					

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ _b ^A (g/cm ³)	Stratum A soil total porosity, n ^A (unitless)	Stratum A soil water-filled porosity, θ _w ^A (cm ³ /cm ³)	Stratum A soil organic carbon fraction, f _{oc} ^A (unitless)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ _b ^B (g/cm ³)	Stratum B soil total porosity, n ^B (unitless)	Stratum B soil water-filled porosity, θ _w ^B (cm ³ /cm ³)	Stratum B soil organic carbon fraction, f _{oc} ^B (unitless)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ _b ^C (g/cm ³)	Stratum C soil total porosity, n ^C (unitless)	Stratum C soil water-filled porosity, θ _w ^C (cm ³ /cm ³)	Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Enclosed space floor thickness, L _{clack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm·s ²)	Enclosed space floor length, L _s (cm)	Enclosed space floor width, W _s (cm)	Enclosed space height, H _b (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q _{soil} (L/m)
10	40	1000	1000	304.8	0.1	1	5

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Averaging time for carcinogens, AT _C (yrs)	Averaging time for noncarcinogens, AT _{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-04	1

Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
1.00E-01	1.35E-05	7.34E-03	25	5,714	276.71	467.00	1.32E+01	1.52E+04	NA	5.0E-03	G

END

TABLE C-88 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR BROMOMETHANE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.80E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	5,591	5.47E-03	2.31E-01	1.77E-04	4.10E-03	0.00E+00	0.00E+00	4.10E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.56E-01	2.29E+03	0.10	8.33E+01	4.10E-03	4.00E+02	3.37E+220	NA	NA	1.16E+00	6.26E-09	2.65E+07	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	9.76E-03	NA	9.76E-03	NA	5.0E-03							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.28E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.3E-03

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-89
DATA ENTRY SHEET FOR CARBON DISULFIDE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75150

4.30E+00

Carbon disulfide

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28)	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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	762	914	762	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.06E-01	1.30E-05	1.44E-02	25	6,391	319.00	552.00	2.17E+01	2.16E+03	NA	7.0E-01	L

END

TABLE C-89 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CARBON DISULFIDE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.30E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,636	1.02E-02	4.28E-01	1.77E-04	4.35E-03	0.00E+00	0.00E+00	4.35E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	4.53E+03	0.10	8.33E+01	4.35E-03	4.00E+02	1.69E+208	NA	NA	1.17E+00	8.52E-09	4.13E+07	YES
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	3.00E-02	NA	3.00E-02	NA	7.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	8.78E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	2.9E-05

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-90
DATA ENTRY SHEET FOR CHRYSENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

218019

1.60E+01

Chrysene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	762	914	762	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.61E-02	6.75E-06	5.23E-06	25	16,455	714.15	979.00	1.81E+05	2.00E-03	1.1E-05	NA	S

END

TABLE C-90 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR CHRYSENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{fe} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.60E+01	8.47E+04	
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. soil temperature, $\Delta H_{i,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil 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)	Total overall effective diffusion coefficient, $D_{eff,T}$ (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	24,364	1.45E-06	6.13E-05	1.77E-04	2.95E-03	0.00E+00	0.00E+00	2.95E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.13E+03	4.60E-04	0.10	8.33E+01	2.95E-03	4.00E+02	8.19E+306	NA	NA	1.11E+00	1.58E-16	2.14E+15	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
1.00E-04	NA	4.61E-08	4.61E-08	1.1E-05	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.26E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-13	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-91
DATA ENTRY SHEET FOR FLUORENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

86737 9.60E+00

Fluorene

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	762	838	762	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
4.40E-02	7.89E-06	9.62E-05	25	12,666	570.44	870.00	9.16E+03	1.69E+00	NA	NA	S

END

TABLE C-91 (CONTINUED)
STATE CALCULATIONS SHEET FOR FLUORENE
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	9.60E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, η_{HS} (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)	Total overall effective diffusion coefficient, D_{eff_T} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.90E+06	2.22E-04	200	16,174	4.11E-05	1.73E-03	1.77E-04	1.87E-03	0.00E+00	0.00E+00	1.87E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ν term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
1.08E+02	1.54E-01	0.10	8.33E+01	1.87E-03	4.00E+02	#NUM!	NA	NA	1.07E+00	5.59E-14	2.76E+12	NO
Finite source indoor attenuation coefficient, $\langle \alpha \rangle$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
6.61E-05	NA	1.02E-05	1.02E-05	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.83E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-92
DATA ENTRY SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	78933	2.60E+00	Methylethylketone (2-butanone)											

	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)
	16	200	762	838	762	0	0	SIC	

	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

	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-04	1

	Used to calculate risk-based soil concentration.					

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.14E-02	1.02E-05	5.69E-05	25	7,481	352.50	536.78	4.51E+00	2.23E+05	NA	5.0E+00	L

END

TABLE C-92 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLETHYLKETONE (2-BUTANONE) IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.60E+00	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	8,345	3.67E-05	1.55E-03	1.77E-04	3.85E-03	0.00E+00	0.00E+00	3.85E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
5.32E-02	2.68E+01	0.10	8.33E+01	3.85E-03	4.00E+02	2.06E+235	NA	NA	1.15E+00	7.39E-11	2.22E+09	NO
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
1.24E-04	NA	3.33E-03	3.33E-03	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	3.34E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.6E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-93
DATA ENTRY SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

ENTER
Chemical
CAS No.
(numbers only,
no dashes)

ENTER
Initial
soil
conc.,
 C_R
($\mu\text{g/kg}$)

Chemical

75092 1.30E+01

Methylene chloride

MORE
↓

ENTER Average soil temperature, T_s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_f (cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L_b (cm)	ENTER Totals must add up to value of L_t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
16	200	762	914	762	0	0	SIC		

MORE
↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f_{oc}^A (unitless)	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 B soil organic carbon fraction, f_{oc}^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f_{oc}^C (unitless)
SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE
↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($\text{g/cm} \cdot \text{s}^2$)	ENTER Enclosed space floor length, L_s (cm)	ENTER Enclosed space floor width, W_s (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)
10	40	1000	1000	304.8	0.1	1	5

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-04	1

END

Used to calculate risk-based
soil concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
9.99E-02	1.25E-05	3.25E-03	25	6,706	313.00	510.00	2.17E+01	1.30E+04	1.0E-08	6.0E-01	L

END

TABLE C-93 (CONTINUED)
INTERMEDIATE CALCULATIONS SHEET FOR METHYLENE CHLORIDE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	1.30E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	6,970	2.25E-03	9.50E-02	1.77E-04	4.08E-03	0.00E+00	0.00E+00	4.08E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (µg/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 ¹) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.56E-01	3.38E+03	0.10	8.33E+01	4.08E-03	4.00E+02	4.91E+221	NA	NA	1.16E+00	1.98E-09	1.77E+08	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (µg/m ³)	Finite source bldg. conc., $C_{building}$ (µg/m ³)	Final finite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
NA	9.06E-02	NA	9.06E-02	1.0E-08	6.0E-01							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	4.74E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.2E-10	1.0E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-94
DATA ENTRY SHEET FOR NAPHTHALENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES ☐

OR

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

YES ☒

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	91203	2.60E+01	Naphthalene											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	838	914	838	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm·s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
6.05E-02	8.38E-06	4.40E-04	25	10,373	491.14	748.40	1.54E+03	3.10E+01	3.4E-05	3.0E-03	S

END

TABLE C-94 (CONTINUED)
E CALCULATIONS SHEET FOR NAPHTHALENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

[illegible]

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	5.68E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
8.5E-09	2.3E-04

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

TABLE C-95
DATA ENTRY SHEET FOR PYRENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)	Chemical											
	129000	2.00E+01	Pyrene											

MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _f (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28)			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)
	Thickness of soil stratum A, h _A (cm)	Thickness of soil stratum B, (Enter value or 0) h _B (cm)	Thickness of soil stratum C, (Enter value or 0) h _C (cm)							
	16	200	762	914	762	0	0	SIC		

MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0		0	0	0	0

MORE ↓	ENTER Enclosed space floor thickness, L _{clack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s ²)	ENTER Enclosed space floor length, L _s (cm)	ENTER Enclosed space floor width, W _s (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)
	10	40	1000	1000	304.8	0.1	1	5

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-04	1

Used to calculate risk-based soil concentration.

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
2.78E-02	7.25E-06	1.19E-05	25	14,370	667.95	936.00	5.43E+04	1.35E-01	NA	NA	S

END

TABLE C-95 (CONTINUED)
 ATE CALCULATIONS SHEET FOR PYRENE IN SOIL - IA 14
 PROPERTY-SPECIFIC RISK ASSESSMENT
 RACER TRUST ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

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_{se} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{ig} (cm ²)	Stratum A effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	2.00E+01	8.47E+04	
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. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{HS} (g/cm-s)	Stratum A effective diffusion coefficient, D_A^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_B^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_C^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)
1.80E+06	2.22E-04	200	20,621	4.03E-06	1.70E-04	1.77E-04	1.86E-03	0.00E+00	0.00E+00	1.86E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ψ term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
6.41E+02	5.29E-03	0.10	8.33E+01	1.86E-03	4.00E+02	#NUM!	NA	NA	1.07E+00	9.19E-16	3.55E+14	NO
Finite source indoor attenuation coefficient, $<\alpha>$ (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RFC (mg/m ³)							
6.58E-05	NA	3.48E-07	3.48E-07	NA	NA							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	8.66E+04	NA	NA	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

SCROLL
DOWN
TO "END"

END

TABLE C-96
DATA ENTRY SHEET FOR TOLUENE IN SOIL - IA 14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

SL-ADV
Version 3.1; 02/04

Reset to
Defaults

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

YES

OR

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

YES

X

	ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C _R (µg/kg)													
	108883	4.50E-01	Chemical Toluene												
MORE ↓	ENTER Average soil temperature, T _s (°C)	ENTER Depth below grade to bottom of enclosed space floor, L _F (cm)	ENTER Depth below grade to top of contamination, L _t (cm)	ENTER Depth below grade to bottom of contamination, (enter value of 0 if value is unknown) L _b (cm)	ENTER Totals must add up to value of L _t (cell G28) 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 A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k _v (cm ²)			
	16	200	762	838	762	0	0	SIC							
MORE ↓	ENTER Stratum A SCS soil type (Lookup Soil Parameters)	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 A soil organic carbon fraction, f _{oc} ^A (unitless)	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 B soil organic carbon fraction, f _{oc} ^B (unitless)	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)	ENTER Stratum C soil organic carbon fraction, f _{oc} ^C (unitless)
	SIC	1.7	0.377	0.164	0.0118		0	0	0	0	0		0	0	0
MORE ↓	ENTER Enclosed space floor thickness, L _{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-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)							
	10	40	1000	1000	304.8	0.1	1	5							
	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-04	1									
END	Used to calculate risk-based soil concentration.														

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm ² /s)	Diffusivity in water, D_w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
7.78E-02	9.20E-06	6.64E-03	25	7,930	383.78	591.79	2.34E+02	5.26E+02	NA	5.0E+00	L

END

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_{Aa} (cm ³ /cm ³)	Stratum B soil air-filled porosity, θ_{Ba} (cm ³ /cm ³)	Stratum C soil air-filled porosity, θ_{Ca} (cm ³ /cm ³)	Stratum A effective total fluid saturation, S_{e0} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k_i (cm ²)	Stratum A soil relative air permeability, k_{g0} (cm ²)	Stratum A soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μ g/kg)	Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	
7.88E+08	562	0.213	0.000	0.000	0.199	1.50E-09	0.894	1.34E-09	4,000	4.50E-01	8.47E+04	
Area of enclosed space below grade, A_e (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm·s)	Stratum A effective diffusion coefficient, D_{eA}^{eff} (cm ² /s)	Stratum B effective diffusion coefficient, D_{eB}^{eff} (cm ² /s)	Stratum C effective diffusion coefficient, D_{eC}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_{eT}^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_b (cm)
1.80E+06	2.22E-04	200	9,089	4.12E-03	1.74E-01	1.77E-04	3.18E-03	0.00E+00	0.00E+00	3.18E-03	562	200
Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{source} (μ 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}^{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent Peclet number, exp(Pe) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)	Finite source β term (unitless)	Finite source ν term (sec) ⁻¹	Time for source depletion, τ_D (sec)	Exposure duration > time for source depletion (YES/NO)
2.76E+00	2.71E+01	0.10	8.33E+01	3.18E-03	4.00E+02	6.79E+284	NA	NA	1.12E+00	3.57E-10	4.51E+08	YES
Finite source indoor attenuation coefficient, < α > (unitless)	Mass limit bldg. conc., $C_{building}$ (μ g/m ³)	Finite source bldg. conc., $C_{building}$ (μ g/m ³)	Final finite source bldg. conc., $C_{building}$ (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)							
NA	1.57E-03	NA	1.57E-03	NA	5.0E+00							
END												

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C _{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	1.51E+06	NA	NA	2.1E-07

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL
DOWN
TO "END"

END

VLOOKUP TABLES

Soil Properties Lookup Table										
SCS Soil Type	K _s (cm/h)	α _s (1/cm)	N (unitless)	M (unitless)	n (cm ³ /cm ³)	θ _i (cm ³ /cm ³)	Mean Grain Diameter (cm)	Bulk Density (g/cm ³)	θ _w (cm ³ /cm ³)	SCS Soil Name
C	0.61	0.01496	1.253	0.2019	0.459	0.098	0.0092	1.43	0.215	Clay
CL	0.34	0.01581	1.416	0.2938	0.442	0.079	0.016	1.48	0.168	Clay Loam
L	0.50	0.01112	1.472	0.3207	0.399	0.061	0.020	1.59	0.148	Loam
LS	4.38	0.03475	1.746	0.4273	0.390	0.049	0.040	1.62	0.076	Loamy Sand
S	26.78	0.03524	3.177	0.6852	0.375	0.053	0.044	1.66	0.054	Sand
SC	0.47	0.03342	1.208	0.1722	0.385	0.117	0.025	1.63	0.197	Sandy Clay
SCL	0.55	0.02109	1.330	0.2481	0.384	0.063	0.029	1.63	0.146	Sandy Clay Loam
SI	1.82	0.00658	1.679	0.4044	0.489	0.050	0.0046	1.35	0.167	Silt
SIC	0.40	0.01622	1.321	0.2430	0.481	0.111	0.0039	1.38	0.216	Silty Clay
SICL	0.46	0.00839	1.521	0.3425	0.482	0.090	0.0056	1.37	0.198	Silty Clay Loam
SIL	0.76	0.00506	1.663	0.3987	0.439	0.065	0.011	1.49	0.180	Silt Loam
SL	1.60	0.02667	1.449	0.3099	0.387	0.039	0.030	1.62	0.103	Sandy Loam

Chemical Properties Lookup Table																
CAS No.	Chemical	Organic carbon partition coefficient, K _{oc} (cm ² /g)	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)	URF extrapolated (X)	RfC extrapolated (X)
56235	Carbon tetrachloride	4.39E+01	5.71E-02	9.78E-06	7.93E+02	1.13E+00	2.76E-02	25	349.90	556.60	7,127	6.0E-06	1.0E-01	L		56-23-5
12789036	Chlordane	3.38E+04	3.44E-02	4.02E-06	5.60E-02	1.99E-03	4.86E-05	25	624.24	885.73	14,000	1.0E-04	7.0E-04	S		12789-03-6
58899	gamma-HCH (Lindane)	2.81E+03	4.33E-02	5.06E-06	7.30E+00	2.10E-04	5.14E-06	25	596.55	839.36	15,000	3.1E-04		S	X	58-89-9
60297	Ethyl ether	9.70E+00	8.52E-02	9.36E-06	6.04E-04	5.03E-02	1.23E-03	25	307.50	466.74	6,338			L		60-29-7
60571	Dieldrin	2.01E+04	2.33E-02	6.01E-06	1.95E-01	4.09E-04	1.00E-05	25	613.32	842.25	17,000	4.6E-03		S		60-57-1
67641	Acetone	2.36E+00	1.06E-01	1.15E-05	1.00E+06	1.43E-03	3.50E-05	25	329.20	508.10	6,955		3.1E+01	L		67-64-1
67663	Chloroform	3.18E+01	7.69E-02	1.09E-05	7.95E+03	1.50E-01	3.67E-03	25	334.32	536.40	6,988	2.3E-05	9.8E-02	L		67-66-3
67721	Hexachloroethane	1.97E+02	3.21E-02	8.89E-06	5.00E+01	1.59E-01	3.89E-03	25	458.00	695.00	9,510	1.1E-05	3.0E-02	S		67-72-1
71432	Benzene	1.46E+02	8.95E-02	1.03E-05	1.79E+03	2.27E-01	5.55E-03	25	353.24	562.16	7,342	7.8E-06	3.0E-02	L		71-43-2
71556	1,1,1-Trichloroethane	4.39E+01	6.48E-02	9.60E-06	1.29E+03	7.03E-01	1.72E-02	25	347.24	545.00	7,136		5.0E+00	L		71-55-6
72435	Methoxychlor	2.69E+04	2.21E-02	5.59E-06	1.00E-01	8.30E-06	2.03E-07	25	651.02	848.49	16,000			S		72-43-5
72559	DDE	1.18E+05	4.08E-02	4.76E-06	4.00E-02	1.70E-03	4.16E-05	25	636.44	860.38	15,000	9.7E-05		S	X	72-55-9
74839	Methyl bromide	1.32E+01	1.00E-01	1.35E-05	1.52E+04	3.00E-01	7.34E-03	25	276.71	467.00	5,714		5.0E-03	G		74-83-9
74873	Methyl chloride (chloromethane)	1.32E+01	1.24E-01	1.36E-05	5.32E+03	3.61E-01	8.82E-03	25	249.00	416.25	5,115		9.0E-02	L		74-87-3
74908	Hydrogen cyanide	No Koc	1.68E-01	1.68E-05	1.00E+06	5.44E-03	1.33E-04	25	299.00	456.70	6,676		8.0E-04	L		74-90-8
74953	Methylene bromide	2.17E+01	5.51E-02	1.19E-05	1.19E+04	3.36E-02	8.22E-04	25	370.00	583.00	7,868		4.0E-03	L		74-95-3
75003	Chloroethane (ethyl chloride)	2.17E+01	1.04E-01	1.16E-05	6.71E+03	4.54E-01	1.11E-02	25	285.30	460.40	5,879		1.0E+01	L	X	75-00-3
75014	Vinyl chloride (chloroethene)	2.17E+01	1.07E-01	1.20E-05	8.80E+03	1.14E+00	2.78E-02	25	259.25	432.00	5,250	4.4E-06	1.0E-01	G		75-01-4
75058	Acetonitrile	4.67E+00	1.34E-01	1.41E-05	1.00E+06	1.41E-03	3.45E-05	25	354.60	545.50	7,110		6.0E-02	L		75-05-8
75070	Acetaldehyde	1.00E+00	1.28E-01	1.35E-05	1.00E+06	2.73E-03	6.67E-05	25	293.10	466.00	6,157	2.2E-06	9.0E-03	L		75-07-0
75092	Methylene chloride	2.17E+01	9.99E-02	1.25E-05	1.30E+04	1.33E-01	3.25E-03	25	313.00	510.00	6,706	1.0E-08	6.0E-01	L		75-09-2
75150	Carbon disulfide	2.17E+01	1.06E-01	1.30E-05	2.16E+03	5.89E-01	1.44E-02	25	319.00	552.00	6,391		7.0E-01	L		75-15-0
75218	Ethylene oxide	3.24E+00	1.34E-01	1.45E-05	1.00E+06	6.05E-03	1.48E-04	25	283.60	469.00	6,104	8.8E-05	3.0E-02	L		75-21-8
75252	Bromoform	3.18E+01	3.57E-02	1.04E-05	3.10E+03	2.19E-02	5.35E-04	25	422.35	696.00	9,479	1.1E-06		L		75-25-2
75274	Bromodichloromethane	3.18E+01	5.63E-02	1.07E-05	3.03E+03	8.67E-02	2.12E-03	25	363.15	585.85	7,800	3.7E-05		L	X	75-27-4
75296	2-Chloropropane	No Koc	No Da	No Dw	No S	No H'	No H	25	308.70	485.00	6,286	#N/A	#N/A	L		75-29-6
75343	1,1-Dichloroethane	3.18E+01	8.36E-02	1.06E-05	5.04E+03	2.30E-01	5.62E-03	25	330.55	523.00	6,895	1.6E-06		L		75-34-3
75354	1,1-Dichloroethylene	3.18E+01	8.63E-02	1.10E-05	2.42E+03	1.07E+00	2.61E-02	25	304.75	576.05	6,247		2.0E-01	L		75-35-4
75456	Chlorodifluoromethane	3.18E+01	1.03E-01	1.33E-05	2.77E+03	1.66E+00	4.06E-02	25	232.40	369.30	4,836		5.0E+01	L		75-45-6
75694	Trichlorofluoromethane	4.39E+01	6.54E-02	1.00E-05	1.10E+03	3.97E+00	9.70E-02	25	296.70	471.00	5,999		7.0E-01	L		75-69-4
75718	Dichlorodifluoromethane	4.39E+01	7.60E-02	1.08E-05	2.80E+02	1.40E+01	3.43E-01	25	243.20	384.95	9,421		1.0E-01	L		75-71-8
76131	1,1,2-Trichloro-1,2,2-trifluoroethar	1.97E+02	3.76E-02	8.59E-06	1.70E+02	2.15E-01	5.26E-01	25	320.70	487.30	6,463		3.0E+01	L		76-13-1
76448	Heptachlor	4.13E+04	2.23E-02	5.70E-06	1.80E-01	1.20E-02	2.94E-04	25	603.69	846.31	13,000	1.3E-03		S		76-44-8
77474	Hexachlorocyclopentadiene	1.40E+03	2.72E-02	7.22E-06	1.80E+00	1.10E+00	2.70E-02	25	512.15	746.00	10,931		2.0E-04	L		77-47-4
78831	Isobutanol	2.92E+00	8.97E-02	1.00E-05	8.50E+04	4.00E-04	9.78E-06	25	381.04	547.78	10,936			L		78-83-1
78875	1,2-Dichloropropane	6.07E+01	7.33E-02	9.73E-06	2.80E+03	1.15E-01	2.82E-03	25	369.52	572.00	7,590	1.0E-05	4.0E-03	L	X	78-87-5
78933	Methylethylketone (2-butanone)	4.51E+00	9.14E-02	1.02E-05	2.23E+05	2.33E-03	5.69E-05	25	352.50	536.78	7,481		5.0E+00	L		78-93-3
79005	1,1,2-Trichloroethane	6.07E+01	6.69E-02	1.00E-05	4.59E+03	3.37E-02	8.24E-04	25	386.15	602.00	8,322	1.6E-05	2.0E-04	L		79-00-5
79016	Trichloroethylene	6.07E+01	6.87E-02	1.02E-05	1.28E+03	4.03E-01	9.85E-03	25	360.36	544.20	7,505	4.1E-06	2.0E-03	L	X	79-01-6
79209	Methyl acetate	3.06E+00	9.58E-02	1.10E-05	2.43E+05	4.70E-03	1.15E-04	25	329.80	506.70	7,260			L		79-20-9
79345	1,1,2,2-Tetrachloroethane	9.49E+01	4.89E-02	9.29E-06	2.83E+03	1.50E-02	3.67E-04	25	419.60	661.15	8,996	5.8E-05		L		79-34-5
79469	2-Nitropropane	3.08E+01	8.47E-02	1.02E-05	1.70E+04	4.87E-03	1.19E-04	25	393.20	594.00	8,383	2.7E-03	2.0E-02	L		79-46-9
80626	Methylmethacrylate	9.14E+00	7.50E-02	9.21E-06	1.50E+04	1.30E-02	3.19E-04	25	373.50	567.00	8,975		7.0E-01	L		80-62-6
83329	Acenaphthene	5.03E+03	5.06E-02	8.33E-06	3.90E+00	7.52E-03	1.84E-04	25	550.54	803.15	12,155			S		83-32-9
86737	Fluorene	9.16E+03	4.40E-02	7.89E-06	1.69E+00	3.93E-03	9.62E-05	25	570.44	870.00	12,666			S		86-73-7
87683	Hexachloro-1,3-butadiene	8.45E+02	2.67E-02	7.03E-06	3.20E+00	4.21E-01	1.03E-02	25	486.15	738.00	10,206	2.2E-05		L		87-68-3
88722	o-Nitrotoluene	3.71E+02	5.88E-02	8.67E-06	6.50E+02	5.11E-04	1.25E-05	25	495.00	720.00	12,239			L		88-72-2
91203	Naphthalene	1.54E+03	6.05E-02	8.38E-06	3.10E+01	1.80E-02	4.40E-04	25	491.14	748.40	10,373	3.4E-05	3.0E-03	S		91-20-3
91576	2-Methylnaphthalene	2.48E+03	5.24E-02	7.78E-06	2.46E+01	2.12E-02	5.18E-04	25	514.26	761.00	12,600			S		91-57-6
92524	Biphenyl	5.13E+03	4.71E-02	7.56E-06	6.94E+00	1.26E-02	3.08E-04	25	529.10	789.00	10,890		4.0E-04	S		92-52-4
95476	o-Xylene	3.83E+02	6.89E-02	8.53E-06	1.78E+02	2.12E-01	5.18E-03	25	417.60	630.30	8,661		1.0E-01	L		95-47-6

VLOOKUP TABLES

95501 1,2-Dichlorobenzene	3.83E+02	5.62E-02	8.92E-06	1.56E+02	7.85E-02	1.92E-03	25	453.57	705.00	9,700	2.0E-01	L		95-50-1	
95578 2-Chlorophenol	3.07E+02	6.61E-02	9.48E-06	1.13E+04	4.58E-04	1.12E-05	25	447.53	675.00	9,572		L	X	95-57-8	
95636 1,2,4-Trimethylbenzene	6.14E+02	6.07E-02	7.92E-06	5.70E+01	2.52E-01	6.16E-03	25	442.30	649.17	9,369	7.0E-03	L		95-63-6	
96184 1,2,3-Trichloropropane	1.16E+02	5.75E-02	9.24E-06	1.75E+03	1.40E-02	3.43E-04	25	430.00	652.00	9,171	3.0E-04	L	X	96-18-4	
96333 Methyl acrylate	5.84E+00	8.60E-02	1.02E-05	4.94E+04	8.14E-03	1.99E-04	25	353.70	536.00	7,749	2.0E-02	L	X	96-33-3	
97632 Ethylmethacrylate	1.67E+01	6.53E-02	8.38E-06	5.40E+03	2.34E-02	5.73E-04	25	390.00	571.00	10,957	3.0E-01	L	X	97-63-2	
98066 tert-Butylbenzene	1.00E+03	5.30E-02	7.37E-06	2.95E+01	5.40E-01	1.32E-02	25	442.10	1220.00	8,980		L	X	98-06-6	
98828 Cumene	6.98E+02	6.03E-02	7.86E-06	6.13E+01	4.70E-01	1.15E-02	25	425.56	631.10	10,335	4.0E-01	L		98-82-8	
98862 Acetophenone	5.19E+01	6.52E-02	8.72E-06	6.13E+03	4.25E-04	1.04E-05	25	475.00	709.50	11,732		S,L	X	98-86-2	
98953 Nitrobenzene	2.26E+02	6.81E-02	9.45E-06	2.09E+03	9.81E-04	2.40E-05	25	483.95	719.00	10,566	4.0E-05	9.0E-03	L		98-95-3
100414 Ethylbenzene	4.46E+02	6.85E-02	8.46E-06	1.69E+02	3.22E-01	7.88E-03	25	409.34	617.20	8,501	2.5E-06	1.0E+00	L		100-41-4
100425 Styrene	4.46E+02	7.11E-02	8.78E-06	3.10E+02	1.12E-01	2.75E-03	25	418.31	636.00	8,737		1.0E+00	L		100-42-5
100447 Benzylchloride	4.46E+02	6.34E-02	8.81E-06	5.25E+02	1.68E-02	4.12E-04	25	452.00	685.00	8,773	4.9E-05	1.0E-03	L	X	100-44-7
100527 Benzaldehyde	1.11E+01	7.44E-02	9.46E-06	6.95E+03	1.09E-03	2.67E-05	25	452.00	695.00	11,658				X	100-52-7
103651 n-Propylbenzene	8.13E+02	6.02E-02	7.83E-06	5.22E+01	4.29E-01	1.05E-02	25	432.20	630.00	9,123	1.0E+00	L		X	103-65-1
104518 n-Butylbenzene	1.48E+03	5.28E-02	7.33E-06	1.18E+01	6.50E-01	1.59E-02	25	456.46	660.50	9,290		L		X	104-51-8
106423 p-Xylene	3.75E+02	6.82E-02	8.42E-06	1.62E+02	2.82E-01	6.90E-03	25	411.52	616.20	8,525		1.0E-01	L		106-42-3
106467 1,4-Dichlorobenzene	3.75E+02	5.50E-02	8.68E-06	8.13E+01	9.85E-02	2.41E-03	25	447.21	684.75	9,271	1.1E-05	8.0E-01	S		106-46-7
106934 1,2-Dibromoethane (ethylene dibr	3.96E+01	4.30E-02	1.04E-05	3.91E+03	2.66E-02	6.50E-04	25	404.60	583.00	8,310	6.0E-04	9.0E-03	L		106-93-4
106990 1,3-Butadiene	3.96E+01	1.00E-01	1.03E-05	7.35E+02	3.01E+00	7.36E-02	25	268.60	425.00	5,370	3.0E-05	2.0E-03	L		106-99-0
107028 Acrolein	1.00E+00	1.12E-01	1.22E-05	2.12E+05	4.99E-03	1.22E-04	25	325.60	506.00	6,731		2.0E-05	L		107-02-8
107062 1,2-Dichloroethane	3.96E+01	8.57E-02	1.10E-05	8.60E+03	4.82E-02	1.18E-03	25	356.65	561.00	7,643	2.6E-05	7.0E-03	L		107-06-2
107131 Acrylonitrile	8.51E+00	1.14E-01	1.23E-05	7.45E+04	5.64E-03	1.38E-04	25	350.30	519.00	7,786	6.8E-05	2.0E-03	L		107-13-1
108054 Vinyl acetate	5.58E+00	8.49E-02	1.00E-05	2.00E+04	2.09E-02	5.11E-04	25	345.65	519.13	7,800		2.0E-01	L		108-05-4
108101 Methylisobutylketone (4-methyl-2-	1.26E+01	6.98E-02	8.35E-06	1.90E+04	5.64E-03	1.38E-04	25	389.50	571.00	8,243	3.0E+00	L			108-10-1
108383 m-Xylene	3.75E+02	6.84E-02	8.44E-06	1.61E+02	2.94E-01	7.18E-03	25	412.27	617.05	8,523	1.0E-01	L			108-38-3
108678 1,3,5-Trimethylbenzene	6.02E+02	6.02E-02	7.84E-06	4.82E+01	3.59E-01	8.77E-03	25	437.89	637.25	9,321		L			108-67-8
108872 Methylcyclohexane	No Koc	No Da	No Dw	No S	No H'	No H	25	373.90	572.20	7,474	#N/A	#N/A	L		108-87-2
108883 Toluene	2.34E+02	7.78E-02	9.20E-06	5.26E+02	2.71E-01	6.64E-03	25	383.78	591.79	7,930		5.0E+00	L		108-88-3
108907 Chlorobenzene	2.34E+02	7.21E-02	9.48E-06	4.98E+02	1.27E-01	3.11E-03	25	404.87	632.40	8,410		5.0E-02	L		108-90-7
109693 1-Chlorobutane	7.22E+01	7.84E-02	9.33E-06	1.10E+03	6.83E-01	1.67E-02	25	351.60	542.00	7,263			L	X	109-69-3
110009 Furan	8.00E+01	1.03E-01	1.17E-05	1.00E+04	2.21E-01	5.40E-03	25	304.60	490.20	6,477			L	X	110-00-9
110543 Hexane	1.32E+02	7.31E-02	8.17E-06	9.50E+00	7.36E+01	1.80E+00	25	341.70	508.00	6,895		7.0E-01	L		110-54-3
111444 Bis(2-chloroethyl)ether	3.22E+01	5.67E-02	8.71E-06	1.72E+04	6.95E-04	1.70E-05	25	451.15	659.79	10,803	3.3E-04		L		111-44-4
115297 Endosulfan	6.76E+03	2.25E-02	5.76E-06	3.25E-01	2.66E-03	6.50E-05	25	674.43	942.94	14,000			S	X	115-29-7
118741 Hexachlorobenzene	6.20E+03	2.90E-02	7.85E-06	6.20E-03	6.95E-02	1.70E-03	25	582.55	825.00	14,447	4.6E-04		S	X	118-74-1
120821 1,2,4-Trichlorobenzene	1.36E+03	3.96E-02	8.40E-06	4.90E+01	5.81E-02	1.42E-03	25	486.15	725.00	10,471		2.0E-03	L		120-82-1
123739 Crotonaldehyde (2-butenal)	1.79E+00	9.59E-02	1.08E-05	1.50E+05	7.93E-04	1.94E-05	25	375.20	568.00	9			L	X	123-73-9
124481 Chlorodibromomethane	3.18E+01	3.66E-02	1.06E-05	2.70E+03	3.20E-02	7.83E-04	25	416.14	678.20	5,900	2.7E-05		L	X	124-48-1
126987 Methacrylonitrile	1.31E+01	9.64E-02	1.06E-05	2.54E+04	1.01E-02	2.47E-04	25	363.30	554.00	7,600		3.0E-02	L		126-98-7
126998 2-Chloro-1,3-butadiene (chloropre	6.07E+01	8.41E-02	1.00E-05	8.37E+02	2.29E+00	5.61E-02	25	332.40	525.00	8,075	3.0E-04	2.0E-02	L		126-99-8
127184 Tetrachloroethylene	9.49E+01	5.05E-02	9.46E-06	2.06E+02	7.24E-01	1.77E-02	25	394.40	620.20	8,288	2.6E-07	4.0E-02	L		127-18-4
129000 Pyrene	5.43E+04	2.78E-02	7.25E-06	1.35E-01	4.87E-04	1.19E-05	25	667.95	936	14370			S	X	129-00-0
132649 Dibenzofuran	9.16E+03	4.10E-02	7.38E-06	3.10E+00	8.71E-03	2.13E-04	25	560	824	66400			S	X	132-64-9
135988 sec-Butylbenzene	1.33E+03	5.28E-02	7.34E-06	1.76E+01	7.20E-01	1.76E-02	25	446.5	679	88730			L	X	135-98-8
141786 Ethylacetate	5.58E+00	8.23E-02	9.70E-06	8.00E+04	5.48E-03	1.34E-04	25	350.26	523.3	7633.66		7.0E-02	L	X	141-78-6
156592 cis-1,2-Dichloroethylene	3.96E+01	8.84E-02	1.13E-05	6.41E+03	1.67E-01	4.08E-03	25	333.65	544	7192			L	X	156-59-2
156605 trans-1,2-Dichloroethylene	3.96E+01	8.76E-02	1.12E-05	4.52E+03	1.67E-01	4.08E-03	25	320.85	516.5	6717		6.0E-02	L	X	156-60-5
205992 Benzo(b)fluoranthene	5.99E+05	4.76E-02	5.56E-06	1.50E-03	2.69E-05	6.57E-07	25	715.9	969.27	17000	1.1E-04		S	X	205-99-2
218019 Chrysene	1.81E+05	2.61E-02	6.75E-06	2.00E-03	2.14E-04	5.23E-06	25	714.15	979	16455	1.1E-05		S	X	218-01-9
309002 Aldrin	8.20E+04	3.72E-02	4.35E-06	1.70E-02	1.80E-03	4.40E-05	25	603.01	839.37	15000	4.9E-03		S		309-00-2
319846 alpha-HCH (alpha-BHC)	2.81E+03	4.33E-02	5.06E-06	2.00E+00	2.10E-04	5.14E-06	25	596.55	839.36	15000	1.8E-03		S		319-84-6
541731 1,3-Dichlorobenzene	No Koc	No Da	No Dw	No S	No H'	No H	25	446	684	9230.18	#N/A	#N/A	L	X	541-73-1
542756 1,3-Dichloropropene	7.22E+01	7.63E-02	1.01E-05	2.80E+03	1.45E-01	3.55E-03	25	381.15	587.38	7900	4.0E-06	2.0E-02	L		542-75-6
630206 1,1,1,2-Tetrachloroethane	8.60E+01	4.82E-02	9.10E-06	1.07E+03	1.02E-01	2.50E-03	25	403.5	624	9768.282525	7.4E-06		L	X	630-20-6
1634044 MTBE	1.16E+01	7.53E-02	8.59E-06	5.10E+04	2.40E-02	5.87E-04	25	328.3	497.1	6677.66	2.6E-07	3.0E+00	L		1634-04-4
7439976 Mercury (elemental)	No Koc	3.07E-02	6.30E-06	6.00E-02	4.67E-01	1.14E-02	25	629.88	1750	14127		3.0E-04	L		7439-97-6
85018 Phenanthrene		3.90E-02	7.85E-06	4.34E-02	2.27E-03	5.56E-05	25	612.9	873	13121					85-01-8
591786 Hexanone, 2-	1.50E+01	7.04E-02	8.44E-06	1.72E+04	3.81E-03	9.32E-05	25	400.6	600.9	8610.39		3.0E-02			

Toxicity and Chemical-specific Information													Contaminant		Screening Levels												Protection of Ground Water SSLs	
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ²	K _e (y)	RfD _s (mg/kg-day)	K _e (y)	RfC _i (mg/m ³)	K _e (y)	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (ug/mg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)		
1.8E-02 8.7E-03	C	5.1E-06	C	1.5E-01 4.0E-03	I					1	0.1	ALAR	1596-84-5	2.7E+01	c	9.6E+01	c	4.8E-01	c	2.4E+00	c	3.7E+00	c		8.2E-04			
										1	0.1	Acephate	30560-19-1	5.6E+01	c**	2.0E+02	c*					7.7E+00	c**		1.7E-03			
		2.2E-06	I			9.0E-03	I	V		1	1.1E+05	Acetaldehyde	75-07-0	1.0E+01	c**	5.2E+01	c**	1.1E+00	c**	5.6E+00	c**	2.2E+00	c**		4.5E-04			
				2.0E-02	I					1	0.1	Acetochlor	34256-82-1	1.2E+03	n	1.2E+04	n					2.7E+02	n		2.2E-01			
		9.0E-01	I	3.1E+01	A	V				1	1.1E+05	Acetone	67-64-1	6.1E+04	n	6.3E+05	nms	3.2E+04	n	1.4E+05	n	1.2E+04	n		2.4E+00			
				2.0E-03	X	V				1	1.1E+05	Acetone Cyanohydrin	75-86-5	5.3E+01	n	2.2E+02	n	2.1E+00	n	8.8E+00	n	4.2E+00	n		8.4E-04			
				6.0E-02	I	V				1	1.3E+05	Acetonitrile	75-05-8	8.7E+02	n	3.7E+03	n	6.3E+01	n	2.6E+02	n	1.3E+02	n		2.6E-02			
				1.0E-01	I			V		1	2.5E+03	Acetophenone	98-86-2	7.8E+03	ns	1.0E+05	nms					1.5E+03	n		4.5E-01			
3.8E+00	C	1.3E-03	C							1	0.1	Acetylaminofluorene, 2-	53-96-3	1.3E-01	c	4.5E-01	c	1.9E-03	c	9.4E-03	c	1.3E-02	c		6.2E-05			
				5.0E-04	I	2.0E-05	I	V		1	2.3E+04	Acrolein	107-02-8	1.5E-01	n	6.5E-01	n	2.1E-02	n	8.8E-02	n	4.1E-02	n		8.4E-06			
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I	M		1	0.1	Acrylamide	79-06-1	2.3E-01	c	3.4E+00	c	9.6E-03	c	1.2E-01	c	4.3E-02	c		9.1E-06			
				5.0E-01	I	1.0E-03	I			1	0.1	Acrylic Acid	79-10-7	3.0E+04	n	2.9E+05	nm	1.0E+00	n	4.4E+00	n	7.7E+03	n		1.6E+00			
5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V		1	1.1E+04	Acrylonitrile	107-13-1	2.4E-01	c*	1.2E+00	c*	3.6E-02	c*	1.8E-01	c*	4.5E-02	c*		9.8E-06			
						6.0E-03	P			1	0.1	Adiponitrile	111-69-3	8.5E+06	nm	3.6E+07	nm	6.3E+00	n	2.6E+01	n							
5.6E-02	C			1.0E-02	I					1	0.1	Alachlor	15972-60-8	8.7E+00	c*	3.1E+01	c					9.1E-01	c	2.0E+00	7.5E-04	1.6E-03		
				1.0E-03	I					1	0.1	Aldicarb	116-06-3	6.1E+01	n	6.2E+02	n					1.5E+01	n	3.0E+00	3.8E-03	7.5E-04		
				1.0E-03	I					1	0.1	Aldicarb Sulfone	1646-88-4	6.1E+01	n	6.2E+02	n					1.6E+01	n	2.0E+00	3.4E-03	4.4E-04		
										1	0.1	Aldicarb sulfoxide	1646-87-3											4.0E+00		8.8E-04		
1.7E+01	I	4.9E-03	I	3.0E-05	I					1	0.1	Aldrin	309-00-2	2.9E-02	c*	1.0E-01	c	5.0E-04	c	2.5E-03	c	4.0E-03	c		6.5E-04			
				2.5E-01	I					1	0.1	Allyl	74223-64-6	1.5E+04	n	1.5E+05	nm					3.8E+03	n		1.5E+00			
				5.0E-03	I	1.0E-04	X			1	0.1	Allyl Alcohol	107-18-6	3.0E+02	n	3.1E+03	n	1.0E-01	n	4.4E-01	n	7.8E+01	n		1.6E-02			
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1	1.4E+03	Allyl Chloride	107-05-1	6.8E-01	c**	3.4E+00	c**	4.1E-01	c**	2.0E+00	c**	6.3E-01	c**		2.0E-04			
				1.0E+00	P	5.0E-03	P			1		Aluminum	7429-90-5	7.7E+04	n	9.9E+05	nm	5.2E+00	n	2.2E+01	n	1.6E+04	n		2.3E+04			
				4.0E-04	I					1		Aluminum Phosphide	20859-73-8	3.1E+01	n	4.1E+02	n					6.2E+00	n					
				3.0E-04	I					1	0.1	Amdro	67485-29-4	1.8E+01	n	1.8E+02	n					4.6E+00	n		1.7E+03			
				9.0E-03	I					1	0.1	Ametryn	834-12-8	5.5E+02	n	5.5E+03	n					1.2E+02	n		1.2E-01			
2.1E+01	C	6.0E-03	C							1	0.1	Aminobiphenyl, 4-	92-47-1	2.3E-02	c	8.2E-02	c	4.1E-04	c	2.0E-03	c	2.6E-03	c		1.3E-05			
				8.0E-02	P					1	0.1	Aminophenol, m-	591-27-5	4.9E+03	n	4.9E+04	n					1.2E+03	n		4.7E-01			
				2.0E-02	P					1	0.1	Aminophenol, p-	123-30-8	1.2E+03	n	1.2E+04	n					3.1E+02	n		1.2E-01			
				2.5E-03	I					1	0.1	Amirtraz	33089-61-1	1.5E+02	n	1.5E+03	n					5.9E+00	n		3.0E+00			
						1.0E-01	I			1		Ammonia	7664-41-7	1.6E+04	n	2.0E+05	nm	1.0E+02	n	4.4E+02	n							
				2.0E-01	I					1		Ammonium Sulfamate	7773-06-0	8.8E+01	n	3.7E+02	nm	3.1E+00	n	1.3E+01	n	3.1E+03	n		1.3E-03			
						3.0E-03	X	V		1	1.4E+04	Amyl Alcohol, tert-	75-85-4	8.8E+01	n	3.7E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.3E-03			
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I			1	0.1	Aniline	62-53-3	8.5E+01	c**	3.0E+02	c*	1.0E+00	n	4.4E+00	n	1.2E+01	c**		3.9E-03			
4.0E-02	P			2.0E-03	X					1	0.1	Anthraquinone, 9,10-	84-65-1	1.2E+01	c*	4.3E+01	c*					1.2E+00	c*		1.2E-02			
				4.0E-04	I				0.15			Antimony (metallic)	7440-36-0	3.1E+01	n	4.1E+02	n					6.0E+00	n	6.0E+00	2.7E-01	2.7E-01		
				5.0E-04	H				0.15			Antimony Pentoxide	1314-60-9	3.9E+01	n	5.1E+02	n					7.5E+00	n					
				9.0E-04	H				0.15			Antimony Potassium Tartrate	11071-15-1	7.0E+01	n	9.2E+02	n					1.3E+01	n					
				4.0E-04	H				0.15			Antimony Tetroxide	1332-81-6	3.1E+01	n	4.1E+02	n					6.0E+00	n					
						2.0E-04	I		0.15			Antimony Trioxide	1309-64-4	2.8E+05	nm	1.2E+06	nm	2.1E-01	n	8.8E-01	n							
2.5E-02	I	7.1E-06	I	1.3E-02	I					1	0.1	Apollo	74115-24-5	7.9E+02	n	8.0E+03	n					1.8E+02	n		1.1E+01			
				5.0E-02	H					1	0.1	Aramite	140-57-8	1.9E+01	c	6.9E+01	c	3.4E-01	c	1.7E+00	c	1.1E+00	c		1.3E-02			
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C			1	0.03	Arsenic, Inorganic	7440-38-2	6.1E-01	c*R	2.4E+00	cR	5.7E-04	c*	2.9E-03	c*	4.5E-02	c	1.0E+01	1.3E-03	2.9E-01		
				3.5E-06	C	5.0E-05	I			1		Arsine	7784-42-1	2.7E-01	n	3.6E+00	n	5.2E-02	n	2.2E-01	n	5.4E-02	n					
				9.0E-03	I					1	0.1	Assure	76578-14-8	5.5E+02	n	5.5E+03	n					9.3E+01	n		1.4E+00			
				5.0E-02	I					1	0.1	Asulam	3337-71-1	3.1E+03	n	3.1E+04	n					7.8E+02	n		2.0E-01			
2.3E-01	C			3.5E-02	I					1	0.1	Atrazine	1912-24-9	2.1E+00	c	7.5E+00	c					2.6E-01	c	3.0E+00	1.7E-04	1.9E-03		
8.8E-01	C	2.5E-04	C							1	0.1	Auramine	492-80-8	5.5E-01	c	2.0E+00	c	9.7E-03	c	4.9E-02	c	5.7E-02	c		5.2E-04			
				4.0E-04	I					1	0.1	Avermectin B1	65195-55-3	2.4E+01	n	2.5E+02	n					6.3E+00	n		1.1E+01			
1.1E-01	I	3.1E-05	I					V		1		Azobenzene	103-33-3	5.1E+00	c	2.3E+01	c	7.8E-02	c	4.0E-01	c	1.0E-01	c		8.0E-04			
				2.0E-01	I	5.0E-04	H		0.07			Barium	7440-39-3	1.5E+04	n	1.9E+05	nm	5.2E-01	n	2.2E+00	n	2.9E+03	n	2.0E+03	1.2E+02	8.2E+01		
				4.0E-03	I					1	0.1	Baygon	114-26-1	2.4E+02	n	2.5E+03	n					6.1E+01	n		2.0E-02			
				3.0E-02	I					1	0.1	Bayleton	43121-43-3	1.8E+03	n	1.8E+04	n					4.3E+02	n		3.4E-01			
				2.5E-02	I					1	0.1	Baythroid	68359-37-5	1.5E+03	n	1.5E+04	n					8.7E+01	n		2.3E+01			
				3.0E-01																								

Toxicity and Chemical-specific Information															Contaminant										Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ²	K _e (y)	RF _D (mg/kg-day)	K _e (y)	RF _C (mg/m ³) ³	K _e (y)	V _o (y)	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (ug/m ³)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)										
		2.4E-03	I	2.0E-03	I	2.0E-05	I					0.007	Beryllium and compounds	7440-41-7	1.6E+02	n	2.0E+03	n	1.0E-03	c*	5.1E-03	c*	1.6E+01	n	4.0E+00	1.3E+01	3.2E+00										
				1.0E-04	I							1	0.1	Bidrin	141-66-2	6.1E+00	n	6.2E+01	n					1.6E+00	n		3.6E-04										
				9.0E-03	P							1	0.1	Bifenox	42576-02-3	5.5E+02	n	5.5E+03	n					7.5E+01	n		5.7E-01										
				1.5E-02	I							1	0.1	Biphenthrin	82657-04-3	9.2E+02	n	9.2E+03	n					2.3E+02	n		1.1E+03										
8.0E-03	I			5.0E-01	I	4.0E-04	X	V				1		Biphenyl, 1,1'-	92-52-4	5.1E+01	n	2.1E+02	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		8.7E-03										
7.0E-02	H	1.0E-05	H	4.0E-02	I			V				1	1.0E+03	Bis(2-chloro-1-methylethyl) ether	108-60-1	4.6E+00	c	2.2E+01	c	2.4E-01	c	1.2E+00	c	3.1E-01	c		1.1E-04										
				3.0E-03	P							1	0.1	Bis(2-chloroethoxy)methane	111-91-1	1.8E+02	n	1.8E+03	n					4.6E+01	n		1.1E-02										
1.1E+00	I	3.3E-04	I						V			1	5.1E+03	Bis(2-chloroethyl)ether	111-44-4	2.1E-01	c	1.0E+00	c	7.4E-03	c	3.7E-02	c	1.2E-02	c		3.1E-06										
2.2E+02	I	6.2E-02	I						V			1	4.2E+03	Bis(chloromethyl)ether	542-88-1	7.7E-05	c	3.9E-04	c	3.9E-05	c	2.0E-04	c	6.2E-05	c		1.5E-08										
				5.0E-02	I							1	0.1	Bisphenol A	80-05-7	3.1E+03	n	3.1E+04	n					5.8E+02	n		4.4E+01										
				2.0E-01	I	2.0E-02	H					1		Boron And Borates Only	7440-42-8	1.6E+04	n	2.0E+05	nm	2.1E+01	n	8.8E+01	n	3.1E+03	n		9.9E+00										
				2.0E+00	P	2.0E-02	P					1		Boron Trichloride	10294-34-5	1.6E+05	nm	2.0E+06	nm	2.1E+01	n	8.8E+01	n	3.1E+04	n												
				4.0E-02	C	1.3E-02	C					1		Boron Trifluoride	7637-07-2	3.1E+03	n	4.1E+04	n	1.4E+01	n	5.7E+01	n	6.2E+02	n												
7.0E-01	I			4.0E-03	I							1		Bromate	15541-45-4	9.1E-01	c	4.1E+00	c					9.6E-02	c	1.0E+01	7.4E-04	7.7E-02									
2.0E+00	X	6.0E-04	X						V			1	2.4E+03	Bromo-2-chloroethane, 1-	107-04-0	2.4E-02	c	1.2E-01	c	4.1E-03	c	2.0E-02	c	6.4E-03	c		1.8E-06										
				8.0E-03	I	6.0E-02	I	V				1	6.8E+02	Bromobenzene	108-86-1	3.0E+02	n	1.8E+03	ns	6.3E+01	n	2.6E+02	n	5.4E+01	n		3.6E-02										
				4.0E-03	X	V						1	4.0E+03	Bromochloromethane	74-97-5	1.6E+02	n	6.8E+02	n	4.2E+01	n	1.8E+02	n	8.3E+01	n		2.1E-02										
6.2E-02	I	3.7E-05	C	2.0E-02	I							1	9.3E+02	Bromodichloromethane	75-27-4	2.7E-01	c	1.4E+00	c	6.6E-02	c	3.3E-01	c	1.2E-01	c		3.2E-05	2.2E-02									
7.9E-03	I	1.1E-06	I	2.0E-02	I							1	0.1	Bromoform	75-25-2	6.2E+01	c*	2.2E+02	c*	2.2E+00	c	1.1E+01	c	7.9E+00	c*	8.0E+01(F)	2.1E-03	2.1E-02									
				1.4E-03	I	5.0E-03	I	V				1	3.6E+03	Bromomethane	74-83-9	7.3E+00	n	3.2E+01	n	5.2E+00	n	2.2E+01	n	7.0E+00	n		1.8E-03										
				5.0E-03	H							1	0.1	Bromophos	2104-96-3	3.1E+02	n	3.1E+03	n					2.6E+01	n		1.1E-01										
				2.0E-02	I							1	0.1	Bromoxynil	1689-84-5	1.2E+03	n	1.2E+04	n					2.5E+02	n		2.2E-01										
				2.0E-02	I							1	0.1	Bromoxynil Octanoate	1689-99-2	1.2E+03	n	1.2E+04	n					1.0E+02	n		8.7E-01										
3.4E+00	C	3.0E-05	I			2.0E-03	I	V				1	6.7E+02	Butadiene, 1,3-	106-99-0	5.4E-02	c*	2.6E-01	c*	8.1E-02	c*	4.1E-01	c*	1.6E-02	c		8.6E-06										
				1.0E-01	I							1	0.1	Butanol, N-	71-36-3	6.1E+03	n	6.2E+04	n					1.5E+03	n		3.2E-01										
1.9E-03	P			2.0E-01	I							1	0.1	Butyl Benzyl Phthlate	85-63-7	2.6E+02	c*	9.1E+02	nm					1.4E+01	c*		2.0E-01										
				2.0E+00	P	3.0E+01	P					1	0.1	Butyl alcohol, sec-	78-92-2	1.2E+05	nm	1.2E+06	nm	3.1E+04	n	1.3E+05	n	3.1E+04	n		6.3E+00										
				5.0E-02	I							1	0.1	Butylate	2008-41-5	3.1E+03	n	3.1E+04	n					3.4E+02	n		3.3E-01										
2.0E-04	C	5.7E-08	C									1	0.1	Butylated hydrocyanazole	25013-16-5	2.4E+03	c	8.6E+03	c	4.3E+01	c	2.2E+02	c	2.1E+02	c		3.9E-01										
3.6E-03	P			3.0E-01	P							1	0.1	Butylated hydroxytoluene	128-37-0	1.4E+02	c	4.8E+02	c					2.9E+00	c		8.6E-02										
				5.0E-02	P			V				1	1.1E+02	Butylbenzene, n-	104-51-8	3.9E+03	ns	5.1E+04	ns					7.8E+02	n		2.5E+00										
				1.0E-01	X			V				1	1.5E+02	Butylbenzene, sec-	135-98-8	7.8E+03	ns	1.0E+05	nms					1.6E+03	n		4.6E+00										
				1.0E-01	X			V				1	1.8E+02	Butylbenzene, tert-	98-06-6	7.8E+03	ns	1.0E+05	nms					5.1E+02	n		1.1E+00										
				2.0E-02	A							1	0.1	Caodylic Acid	75-60-5	1.2E+03	n	1.2E+04	n					3.1E+02	n												
		1.8E-03	I	1.0E-03	I	1.0E-05	A			0.025	0.001			Cadmium (Diet)	7440-43-9	7.0E+01	n	8.0E+02	n					6.9E+00	n	5.0E+00	5.2E-01	3.8E-01									
		1.8E-03	I	5.0E-04	I	1.0E-05	A			0.05	0.001			Cadmium (Water)	7440-43-9					1.4E-03	c**	6.8E-03	c**	6.9E+00	n												
				5.0E-01	I	2.2E-03	C			1	0.1			Caprolactam	105-60-2	3.0E+04	n	3.0E+05	nm	2.3E+00	n	9.6E+00	n	7.7E+03	n		1.9E+00										
1.5E-01	C	4.3E-05	C	2.0E-03	I					1	0.1			Captafol	2425-06-1	3.2E+00	c*	1.1E+01	c	5.7E-02	c	2.9E-01	c	3.5E-01	c*		6.1E-04										
2.3E-03	C	6.6E-07	C	1.3E-01	I					1	0.1			Captan	133-06-2	2.1E+02	c*	7.5E+02	c	3.7E+00	c	1.9E+01	c	2.7E+01	c*		1.9E-02										
				1.0E-01	I							1	0.1	Carbaryl	63-25-2	6.1E+03	n	6.2E+04	n					1.4E+03	n		1.3E+00										
				5.0E-03	I							1	0.1	Carbofuran	1563-66-2	3.1E+02	n	3.1E+03	n					7.3E+01	n	4.0E+01	2.8E-02	1.6E-02									
				1.0E-01	I	7.0E-01	I	V				1	7.4E+02	Carbon Disulfide	75-15-0	8.2E+02	ns	3.7E+03	ns	7.3E+02	n	3.1E+03	n	7.2E+02	n		2.1E-01										
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V				1	4.6E+02	Carbon Tetrachloride	56-23-5	6.1E-01	c	3.0E+00	c	4.1E-01	c	2.0E+00	c	3.9E-01	c	5.0E+00	1.5E-04	1.9E-03									
				1.0E-02	I							1	0.1	Carbosulfan	55285-14-8	6.1E+02	n	6.2E+03	n					3.7E+01	n		9.0E-01										
				1.0E-01	I							1	0.1	Carboxin	5234-68-4	6.1E+03	n	6.2E+04	n					1.5E+03	n		8.0E-01										
				9.0E-04	I							1		Ceric oxide	1306-38-3	1.3E+06	nm	5.4E+06	nm	9.4E-01	n	3.9E+00	n				3.1E-01										
				1.0E-01	I							1	0.1	Chloral Hydrate	302-17-0	6.1E+03	n	6.2E+04	n					2.2E+02	n		5.5E-02										
				1.5E-02	I							1	0.1	Chloramben	133-90-4	9.2E+02	n	9.2E+03	n					1.6E-01	c		1.3E-04										
4.0E-01	H											1	0.1	Chloranil	118-75-2	1.2E+00	c	4.3E+00	c					1.6E-01	c		1.3E-04										
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I			1	0.04			Chlordane	12789-03-6	1.6E+00	c*	6.5E+00	c*	2.4E-02	c*	1.2E-01	c*	1.9E-01	c*	2.0E+00	1.3E-02										

Key: I = IRIIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEASTJ; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); S = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																													
Toxicity and Chemical-specific Information													Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	K _e y	IUR (ug/m ³) ²	K _e y	RD ₅₀ (mg/kg-day)	K _e y	RF _{C1} (mg/m ³) ²	K _e y	o	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³) ²	key	Industrial Air (ug/m ³) ²	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)		
2.4E+00	C	6.9E-04	C	3.0E-03	P	1.0E-05	X	V	1	1	0.1	1.3E+03	Chloromethane	74-87-3	1.2E+02	n	5.0E+02	n	9.4E+01	n	3.9E+02	n	1.9E+02	n		4.9E-02			
3.0E-01	P			1.0E-03	P	6.0E-04	P	V	1	1	0.1	2.6E+04	Chloromethyl Methyl Ether	107-30-2	1.9E-02	c	9.4E-02	c	3.5E-03	c	1.8E-02	c	5.6E-03	c		1.2E-06			
6.3E-03	P			3.0E-03	P	1.0E-05	X	V	1	1	0.1	2.2E+04	Chloronitrobenzene, o-	88-73-3	1.6E+00	c	5.7E+00	c	1.0E-02	n	4.4E-02	n	2.0E-01	c		1.9E-04			
				1.0E-03	P	6.0E-04	P	V	1	1	0.1	2.2E+04	Chloronitrobenzene, p-	100-00-5	6.1E+01	n	2.7E+02	c**	6.3E-01	n	2.6E+00	n	9.4E+00	c**		8.7E-03			
				5.0E-03	I			V	1	1	0.1	2.2E+04	Chlorophenol, 2-	95-57-8	3.9E+02	n	5.1E+03	n					7.1E+01	n		5.7E-02			
				4.0E-04	C	V	1		1	1	0.1	6.2E+02	Chloropicrin	76-06-2	2.1E+00	n	8.8E+00	n	4.2E-01	n	1.8E+00	n	8.3E-01	n		2.5E-04			
3.1E-03	C	8.9E-07	C	1.5E-02	I			V	1	1	0.1	9.1E+02	Chlorothalolil	1897-45-6	1.6E+02	c**	5.6E+02	c*	2.7E+00	c	1.4E+01	c	1.9E+01	c*		4.3E-02			
				2.0E-02	I			V	1	1	0.1	2.5E+02	Chlorotoluene, o-	95-49-8	1.6E+03	ns	2.0E+04	ns					1.8E+02	n		1.7E-01			
				2.0E-02	X			V	1	1	0.1	2.5E+02	Chlorotoluene, p-	106-43-4	1.6E+03	ns	2.0E+04	ns					1.9E+02	n		1.8E-01			
2.4E+02	C	6.9E-02	C	2.0E-01	I				1	1	0.1		Chlorozotocin	54749-90-5	2.0E-03	c	7.2E-03	c	3.5E-05	c	1.8E-04	c	2.8E-04	c		6.2E-08			
				1.0E-03	A				1	1	0.1		Chlorpropham	101-21-3	1.2E+04	n	1.2E+05	nm					2.2E+03	n		1.9E+00			
				1.0E-02	H				1	1	0.1		Chlorpyrifos	2921-88-2	6.1E+01	n	6.2E+02	n					6.2E+00	n		9.2E-02			
				1.0E-02	H				1	1	0.1		Chlorpyrifos Methyl	5598-13-0	6.1E+02	n	6.2E+03	n					8.9E+01	n		4.1E-01			
				5.0E-02	I				1	1	0.1		Chlorsulfuron	64902-72-3	3.1E+03	n	3.1E+04	n					7.7E+02	n		6.5E-01			
				8.0E-04	H				1	1	0.1		Chlorthiophos	60238-56-4	4.9E+01	n	4.9E+02	n					2.0E+00	n		5.2E-02			
5.0E-01	J	8.4E-02	S	1.5E+00	I	1.0E-04	I	M	0.013				Chromium(III), Insoluble Salts	16065-83-1	1.2E+05	nm	1.5E+06	nm	1.1E-05	c	1.5E-04	c	1.6E+04	n		2.8E+07			
				3.0E-03	I	1.0E-04	I	M	0.025	0.013			Chromium(VI)	18540-29-9	2.9E-01	c	5.6E+00	c	1.1E-05	c	1.5E-04	c	3.1E-02	c	1.0E+02	5.9E-04			
				3.0E-03	I	1.0E-04	I	M	0.013	0.013			Chromium, Total	7440-47-3	2.9E-01	c	5.6E+00	c	1.1E-05	c	1.5E-04	c	3.1E-02	c		5.9E-04			
9.0E-03	P	6.2E-04	I	3.0E-04	P	6.0E-06	P	M	1	1	0.1		Cobalt	7440-48-4	2.3E+01	n	3.0E+02	n	2.7E-04	c*	1.4E-03	c*	4.7E+00	n		2.1E-01			
				4.0E-02	H				1	1	0.1		Coke Oven Emissions	8007-45-2	2.3E+01	n	3.0E+02	n	1.5E-03	c	2.0E-02	c	6.2E+02	n	1.3E+03	2.2E+01	4.6E+01		
				5.0E-02	I	6.0E-01	C		1	1	0.1		Cresol, m-	108-39-4	3.1E+03	n	3.1E+04	n	6.3E+02	n	2.6E+03	n	7.2E+02	n		5.7E-01			
				5.0E-02	I	6.0E-01	C		1	1	0.1		Cresol, o-	95-43-7	3.1E+03	n	3.1E+04	n	6.3E+02	n	2.6E+03	n	7.2E+02	n		5.8E-01			
				1.0E-01	A	6.0E-01	C		1	1	0.1		Cresol, p-	106-44-5	6.1E+03	n	6.2E+04	n	6.3E+02	n	2.6E+03	n	1.4E+03	n		1.1E+00			
				1.0E-01	A	6.0E-01	C		1	1	0.1		Cresol, p-chloro-m-	59-53-7	6.1E+03	n	6.2E+04	n					1.1E+03	n		1.3E+00			
				1.0E-01	A	6.0E-01	C		1	1	0.1		Cresol, o-	95-43-7	6.1E+03	n	6.2E+04	n					1.4E+03	n		1.2E+00			
1.9E+00	H			1.0E-03	P			V	1	1	0.1	1.7E+04	Crotonaldehyde, trans-	173-73-9	3.4E-01	c	1.5E+00	c					3.5E-02	c		7.1E-06			
				1.0E-01	I	4.0E-01	I	V	1	1	0.1	2.7E+02	Cumene	98-82-8	2.1E+03	ns	1.1E+04	ns	4.2E+02	n	1.8E+03	n	3.9E+02	n		6.4E-01			
2.2E-01	C	6.3E-05	C	2.0E-03	H				1	1	0.1		Cupferron	135-20-6	2.2E+00	c	7.8E+00	c	3.9E-02	c	1.9E-01	c	3.1E-01	c		5.3E-04			
8.4E-01	H			2.0E-03	H				1	1	0.1		Cyanazine	21725-46-2	5.8E-01	c	2.1E+00	c	3.9E-02	c	1.9E-01	c	7.6E-02	c		3.5E-05			
				1.0E-03	I				1	1	0.1		Cyanides	592-01-8	7.8E+01	n	1.0E+03	n					1.6E+01	n					
				5.0E-03	I				1	1	0.1		Calcium Cyanide	544-82-3	3.9E+02	n	5.1E+03	n					7.8E+01	n					
				5.0E-03	I				1	1	0.1		Copper Cyanide	544-82-3	3.9E+02	n	5.1E+03	n					7.8E+01	n					
6.0E-04	I	8.0E-04	S	V	1	1.0E+07							Cyanide [CN-]	57-12-5	2.2E+01	n	1.4E+02	n	8.3E-01	n	3.5E+00	n	1.4E+00	n	2.0E+02	1.4E-02	2.0E+00		
1.0E-03	I			V	1	1.0E+07							Cyanogen	460-19-5	7.8E+01	n	1.0E+03	n					1.6E+01	n					
9.0E-02	I			V	1	1.0E+07							Cyanogen Bromide	506-68-3	7.0E+03	n	9.2E+04	n					1.4E+03	n					
5.0E-02	I			V	1	1.0E+07							Cyanogen Chloride	506-77-4	3.9E+03	n	5.1E+04	n					7.8E+02	n					
6.0E-04	I	8.0E-04	I	V	1	1.0E+07							Hydrogen Cyanide	74-90-8	2.3E+01	n	1.5E+02	n	8.3E-01	n	3.5E+00	n	1.4E+00	n		1.4E-02			
2.0E-03	I				1	1.0E+07							Potassium Cyanide	151-50-8	1.6E+02	n	2.0E+03	n					3.1E+01	n					
5.0E-03	I				0.04								Potassium Silver Cyanide	506-61-6	3.9E+02	n	5.1E+03	n					5.9E+01	n					
1.0E-01	I				0.04								Silver Cyanide	506-64-9	7.8E+03	n	1.0E+05	nm					1.3E+03	n					
1.0E-03	I				1								Sodium Cyanide	143-33-9	7.8E+01	n	1.0E+03	n					1.6E+01	n	2.0E+02				
2.0E-04	P				1								Thiocyanates	NA	1.6E+01	n	2.0E+02	n					3.1E+00	n					
2.0E-04	X				1								Thiocyanic Acid	463-56-9	1.6E+01	n	2.0E+02	n					3.1E+00	n					
5.0E-02	I				1								Zinc Cyanide	557-21-1	3.9E+03	n	5.1E+04	n					7.8E+02	n					
2.3E-02	H			6.0E+00	I	V	1	1.2E+02					Cyclohexane	110-82-7	7.0E+03	ns	2.9E+04	ns	6.3E+03	n	2.6E+04	n	1.3E+04	n		1.3E+01			
				5.0E+00	I	7.0E-01	P	1	0.1				Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	2.1E+01	c	7.5E+01	c					2.1E+00	c		1.2E-02			
				5.0E+00	I	7.0E-01	P	1	0.1				Cyclohexanone	108-94-1	3.1E+05	nm	3.1E+06	nm	7.3E+02	n	3.1E+03	n	7.7E+04	n		1.8E+01			
5.0E-03	P	1.0E+00	X	V	1	2.8E+02							Cyclohexene	110-83-8	3.1E+02	ns	2.8E+03	ns	1.0E+03	n	4.4E+03	n	5.3E+01	n		3.5E-02			
2.0E-01	I				1	0.1							Cyclohexylamine	108-91-8	1.2E+04	n	1.2E+05	nm					3.0E+03	n		7.9E-01			
5.0E-03	I				1	0.1							Cyhalothrin/karate	68085-85-8	3.1E+02	n	3.1E+03	n					7.8E+01	n		5.3E+01			
1.0E-02	I				1	0.1							Cypermethrin	52315-07-8															

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information												Contaminant		Screening Levels										Protection of Ground Water SSLs			
SFO (mg/kg-day)	K _e (y)	IUR (ug/m ³) ^{1/2}	K _e (y)	RfD _s (mg/kg-day)	K _e (y)	RfC _i (mg/m ³)	K _e (y)	o	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)
				3.0E-04	P						1	0.1	Dibutyltin Compounds	NA	1.8E+01	n	1.8E+02	n					4.7E+00	n			
				3.0E-02	I						1	0.1	Dicamba	1918-00-9	1.8E+03	n	1.8E+04	n					4.4E+02	n			
				4.2E-03	P				V		1	5.2E+02	Dichloro-2-butene, 1,4-	764-41-0	6.9E-03	c	3.5E-02	c	5.8E-04	c	2.9E-03	c	1.2E-03	c			
				4.2E-03	P				V		1	0.1	Dichloro-2-butene, cis-1,4-	1476-11-5	6.9E-03	c	3.5E-02	c	5.8E-04	c	2.9E-03	c	1.2E-03	c			
				4.2E-03	P				V		1	0.1	Dichloro-2-butene, trans-1,4-	110-57-6	6.9E-03	c	3.5E-02	c	5.8E-04	c	2.9E-03	c	1.2E-03	c			
				5.0E-02	I						1	0.1	Dichloroacetic Acid	79-43-6	9.7E+00	c*	3.4E+01	c*					1.3E+00	c*	6.0E+01		
				9.0E-02	I						1	3.8E+02	Dichlorobenzene, 1,2-	95-50-1	1.9E+03	ns	9.8E+03	ns	2.1E+02	n	8.8E+02	n	2.8E+02	n	6.0E+02		
				7.0E-02	A						1	0.1	Dichlorobenzene, 1,4-	106-46-7	2.4E+00	c	1.2E+01	c	2.2E-01	c	1.1E+00	c	4.2E-01	c	7.5E+01		
				4.5E-01	I						1	0.1	Dichlorobenzidine, 3,3'-	91-94-1	1.1E+00	c	3.8E+00	c	7.2E-03	c	3.6E-02	c	1.6E-01	c			
				9.0E-03	X						1	0.1	Dichlorobenzophenone, 4,4'-	90-98-2	5.5E+02	n	5.5E+03	n					5.7E+01	n			
				2.0E-01	I						1	8.5E+02	Dichlorodifluoromethane	75-71-8	9.4E+01	n	4.0E+02	n	1.0E+02	n	4.4E+02	n	1.9E+02	n			
				2.0E-01	P						1	1.7E+03	Dichloroethane, 1,1-	75-34-3	3.3E+00	c	1.7E+01	c	1.5E+00	c	7.7E+00	c	2.4E+00	c			
				6.0E-03	X						1	3.0E+03	Dichloroethane, 1,2-	107-06-2	4.3E-01	c*	2.2E+00	c*	9.4E-02	c*	4.7E-01	c*	1.5E-01	c*	5.0E+00		
				5.0E-02	I						1	1.2E+03	Dichloroethylene, 1,1-	75-35-4	2.4E+02	n	1.1E+03	n	2.1E+02	n	8.8E+02	n	2.6E+02	n			
				9.0E-03	H						1	1.3E+03	Dichloroethylene, 1,2- (Mixed isomers)	540-59-0	7.0E+02	n	9.2E+03	ns					1.3E+02	n			
				2.0E-03	I						1	2.4E+03	Dichloroethylene, 1,2-cis-	156-59-2	1.6E+02	n	2.0E+03	n					2.8E+01	n	7.0E+01		
				2.0E-02	I						1	1.7E+03	Dichloroethylene, 1,2-trans-	156-60-5	1.5E+02	n	6.9E+02	n	6.3E+01	n	2.6E+02	n	8.6E+01	n	1.0E+02		
				3.0E-03	I						1	0.1	Dichlorophenol, 2,4-	120-33-2	1.8E+02	n	1.8E+03	n					3.5E+01	n			
				1.0E-02	I						1	0.05	Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	6.9E-02	n	7.7E+03	n					1.3E+02	n	7.0E+01		
				8.0E-03	I						1	0.1	Dichlorophenylhydrazine Add, 3,3',4,4'-	94-82-6	4.9E+02	n	4.9E+03	n					9.1E+01	n			
				9.0E-02	A						1	1.4E+03	Dichloropropene, 1,2-	78-67-5	9.4E-01	c*	4.7E+00	c*	2.4E-01	c*	1.2E+00	c*	3.8E-01	c*	5.0E+00		
				2.0E-02	P						1	1.5E+03	Dichloropropene, 1,3-	142-28-9	1.6E+03	ns	2.0E+04	ns					2.9E+02	n			
				3.0E-03	I						1	0.1	Dichloropropene, 1,3-	75-35-4	1.8E+02	n	1.8E+03	n					4.6E+01	n			
				3.0E-02	I						1	1.6E+03	Dichloropropene, 1,3-	542-75-6	1.7E+00	c*	8.3E+00	c*	6.1E-01	c*	3.1E+00	c*	4.1E-01	c*			
				5.0E-04	I						1	0.1	Dichlorvos	62-73-7	1.7E+00	c*	5.9E+00	c*	2.9E-02	c*	1.5E-01	c*	2.3E-01	c*			
				8.0E-03	P						1		Dicyclopentadiene	77-73-6	3.1E+01	n	1.3E+02	n	7.3E+00	n	3.1E+01	n	1.2E+01	n			
				5.0E-05	I						1	0.1	Dieldrin	60-57-1	3.0E-02	c	1.1E-01	c	5.3E-04	c	2.7E-03	c	1.5E-03	c			
				5.0E-03	I						1	0.1	Diesel Engine Exhaust	NA	1.2E+02	n	1.2E+04	n	8.1E-03	c	4.1E-02	c					
				2.0E-03	P						1	0.1	Diethanolamine	111-42-2	1.2E+02	n	1.2E+03	n	2.1E-01	n	8.8E-01	n	3.1E+01	n			
				3.0E-02	P						1	0.1	Diethylene Glycol Monobutyl Ether	112-34-5	1.8E+03	n	1.8E+04	n	1.0E-01	n	4.4E-01	n	4.7E+02	n			
				6.0E-02	P						1	0.1	Diethylene Glycol Monoethyl Ether	111-90-0	3.6E+03	n	3.6E+04	n	3.1E-01	n	1.3E+00	n	9.4E+02	n			
				1.0E-03	P						1	0.1	Diethylformamide	617-84-5	6.1E+01	n	6.2E+02	n					1.6E+01	n			
				3.5E+02	C						1	0.1	Diethylstilbestrol	56-53-1	1.4E-03	c	4.9E-03	c	2.4E-05	c	1.2E-04	c	4.3E-05	c			
				8.0E-02	I						1	0.1	Difenzoquat	43222-48-6	4.9E+03	n	4.9E+04	n					1.2E+03	n			
				2.0E-02	I						1	0.1	Diffenuron	35367-38-5	1.2E+03	n	1.2E+04	n					2.2E+02	n			
				4.0E+01	I						1	1.4E+03	Difluoroethane, 1,1-	75-37-6	5.2E+04	ns	2.2E+05	nms	4.2E+04	n	1.8E+05	n	8.3E+04	n			
				7.0E-01	P						1	0.1	Dihydrosafrole	94-58-6	2.4E-01	c	1.2E+00	c	1.9E-01	c	9.4E-01	c	2.6E-01	c			
				8.0E-02	I						1	2.3E+03	Diisopropyl Ether	108-20-3	2.4E+03	ns	1.0E+04	ns	7.3E+02	n	3.1E+03	n	1.5E+03	n			
											1	5.3E+02	Diisopropyl Methylphosphonate	1445-75-6	6.3E+03	ns	8.2E+04	ns					1.2E+03	n			
				2.0E-02	I						1	0.1	Dimethipin	55290-64-7	1.2E+03	n	1.2E+04	n					3.1E+02	n			
				2.0E-04	I						1	0.1	Dimethoate	60-51-5	1.2E+01	n	1.2E+02	n					3.1E+00	n			
				6.0E-02	P						1	0.1	Dimethoxybenzidine, 3,3'-	119-90-4	3.0E-01	c	1.1E+00	c					4.1E-02	c			
				1.7E-03	P						1	0.1	Dimethyl methylphosphonate	756-79-6	2.9E+02	c*	1.0E+03	c*					3.9E+01	c*			
				4.6E+00	C						1	0.1	Dimethylamino azobenzene [p-]	60-11-7	1.1E-01	c	3.7E-01	c	1.9E-03	c	9.4E-03	c	4.3E-03	c			
				5.8E-01	H						1	0.1	Dimethylaniline HCl, 2,4-	21436-96-4	8.4E-01	c	3.0E+00	c					1.2E-01	c			
				2.0E-01	P						1	0.1	Dimethylaniline, 2,4-	95-68-1	2.4E+00	c*	8.6E+00	c					3.2E-01	c*			
				2.0E-03	I						1	8.3E+02	Dimethylaniline, N,N-	121-69-7	1.6E-02	n	2.0E+03	ns					2.7E+01	n			
											1	0.1	Dimethylbenzidine, 3,3'-	119-93-7	4.4E-02	c	1.6E-01	c					5.6E-03	c			
				1.0E-01	P						1	0.1	Dimethylformamide	68-12-2	6.1E+03	n	6.2E+04	n	3.1E+01	n	1.3E+02	n	1.6E+03	n			
				1.0E-04	X						1	0.1	Dimethylhydrazine, 1,1-	57-14-7	6.1E+00	n	6.1E+01	n	2.1E-03	n	8.8E-03	n	1.6E+00	n			
											1	0.1	Dimethylhydrazine, 1,2-	540-73-8	8.8E-04	c	3.1E-03	c	1.5E-05	c	7.7E-05	c	1.2E-04	c			
				2.0E-02	I						1	0.1	Dimethylphenol, 2,4-	105-67-9	1.2E+03	n	1.2E+04	n					2.7E+02	n			
				6.0E-04	I						1	0.1	Dimethylphenol, 2,6-	576-26-1	3.7E+01	n	3.7E+02	n					8.1E+00	n			
				1.0E-03	I						1	0.1	Dimethylphenol, 3,4-	95-65-8	6.1E+01	n	6.2E+02	n					1.4E+01	n			

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs	
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ²	K _e (y)	RfD _s (mg/kg-day)	A (y)	RfC ₁ (mg/m ³)	E (y)	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)	
6.2E+03	I	1.3E+00	I								1	0.03	Dioxins	NA	9.4E-05	c	3.9E-04	c	1.9E-06	c	9.4E-06	c	1.1E-05	c		1.5E-05	
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C				1	0.03	*TCDD, 2,3,7,8-	1746-01-6	4.5E-06	c*	1.8E-05	c*	6.4E-08	c	3.2E-07	c	5.2E-07	c*	3.0E-05	2.6E-07	1.5E-05
				3.0E-02	I						1	0.1	Diphenamid	957-51-7	1.8E+03	n	1.8E+04	n					4.1E+02	n		4.0E+00	
				8.0E-04	X						1	0.1	Diphenyl Sulfone	127-63-9	4.9E+01	n	4.9E+02	n					1.1E+01	n		2.8E-02	
				2.5E-02	I						1	0.1	Diphenylamine	122-39-4	1.5E+03	n	1.5E+04	n					2.4E+02	n		4.4E-01	
8.0E-01	I	2.2E-04	I								1	0.1	Diphenylhydrazine, 1,2-Diquat	122-66-7	6.1E-01	c	2.2E+00	c	1.1E-02	c	5.6E-02	c	6.7E-02	c		2.2E-04	
				2.2E-03	I						1	0.1		85-00-7	1.3E+02	n	1.4E+03	n					3.4E+01	n	2.0E+01	6.5E-01	3.7E-01
7.4E+00	C	2.1E-03	C								1	0.1	Direct Black 38	1937-37-7	6.6E-02	c	2.3E-01	c	1.2E-03	c	5.8E-03	c	9.1E-03	c		4.4E+00	
											1	0.1	Direct Blue 6	2602-46-2	6.6E-02	c	2.3E-01	c	1.2E-03	c	5.8E-03	c	9.1E-03	c		1.4E+01	
											1	0.1	Direct Brown 95	16071-86-6	7.3E-02	c	2.6E-01	c	1.3E-03	c	6.5E-03	c	1.0E-02	c			
				4.0E-05	I						1	0.1	Disulfoton	298-04-4	2.4E+00	n	2.5E+01	n					3.8E-01	n		7.1E-04	
				1.0E-02	I			V			1	0.1	Dithiane, 1,4-	505-29-3	6.1E+02	n	6.2E+03	n					1.5E+02	n		7.6E-02	
				2.0E-03	I						1	0.1	Dlurion	330-54-1	1.2E+02	n	1.2E+03	n					2.8E+01	n		1.2E-02	
				4.0E-03	I						1	0.1	Dodine	2435-10-3	2.4E+02	n	2.5E+03	n					6.2E+01	n		3.2E-01	
				2.5E-02	I			V			1		EPTC	759-34-4	2.0E+03	n	2.6E+04	n					2.9E+02	n		1.5E-01	
				6.0E-03	I						1	0.1	Endosulfan	115-29-7	3.7E+02	n	3.7E+03	n					7.8E+01	n		1.1E+00	
				2.0E-02	I						1	0.1	Endothal	145-73-3	1.2E+03	n	1.2E+04	n					3.0E+02	n	1.0E+02	7.1E-02	2.4E-02
				3.0E-04	I						1	0.1	Enfrin	72-33-8	1.8E+01	n	1.8E+02	n					1.7E+00	n	2.0E+00	6.8E-02	8.1E-02
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V			1	1.1E+04	Epichlorohydrin	106-89-8	2.0E+01	n	8.8E+01	n	1.0E+00	n	4.4E+00	n	2.0E+00	n		4.5E-04	
				2.0E-02	I	V					1	1.5E+04	Epoxybutane, 1,2-	106-88-7	1.7E+02	n	7.2E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		9.2E-03	
				5.0E-03	I						1	0.1	Ethephon	16672-87-0	3.1E+02	n	3.1E+03	n					7.8E+01	n		1.6E-02	
				5.0E-04	I						1	0.1	Ethion	563-12-2	3.1E+01	n	3.1E+02	n					3.2E+00	n		6.3E-03	
				1.0E-01	P	6.0E-02	P				1	0.1	Ethoxyethanol Acetate, 2-	111-15-9	6.1E+03	n	6.2E+04	n	6.3E+01	n	2.6E+02	n	1.5E+03	n		3.2E-01	
				9.0E-02	P	2.0E-01	I				1	0.1	Ethoxyethanol, 2-	110-80-5	5.5E+03	n	5.5E+04	n	2.1E+02	n	8.8E+02	n	1.4E+03	n		2.8E-01	
				9.0E-01	I	7.0E-02	P	V			1	1.1E+04	Ethyl Acetate	141-78-6	6.7E+02	n	2.8E+03	n	7.3E+01	n	3.1E+02	n	1.4E+02	n		3.1E-02	
4.8E-02	H										1	2.5E+03	Ethyl Acrylate	140-88-5	1.3E+01	c	6.0E+01	c					1.4E+00	c		3.0E-04	
											1	2.1E+03	Ethyl Chloride (Chloroethane)	75-00-3	1.5E+04	ns	6.1E+04	ns	1.0E+04	n	4.4E+04	n	2.1E+04	n		5.9E+00	
				2.0E-01	I			V			1	1.0E+04	Ethyl Ether	60-29-7	1.6E+04	ns	2.0E+05	nms					3.1E+03	n		6.8E-01	
				9.0E-02	H	3.0E-01	P	V			1	1.1E+03	Ethyl Methacrylate	97-63-2	1.5E+03	ns	7.5E+03	ns	3.1E+02	n	1.3E+03	n	4.2E+02	n		9.9E-02	
				1.0E-05	I						1	0.1	Ethyl-p-nitrophenyl Phosphonate	2104-64-5	6.1E-01	n	6.2E+00	n					6.6E-02	n		2.1E-03	
1.1E-02	C	2.5E-06	C	1.0E-01	I	1.0E+00	I	V			1	4.8E+02	Ethylbenzene	100-41-4	5.4E+00	c	2.7E+01	c	9.7E-01	c	4.9E+00	c	1.3E+00	c	7.0E+02	1.5E-03	7.8E-01
				7.0E-02	P						1	0.1	Ethylene Cyanohydrin	109-78-4	4.3E+03	n	4.3E+04	n					1.1E+03	n		2.2E-01	
				9.0E-02	P						1	0.1	Ethylene Diamine	107-15-3	5.5E+03	n	5.5E+04	n					1.4E+03	n		3.2E-01	
				2.0E+00	I	4.0E-01	C				1	0.1	Ethylene Glycol	107-21-1	1.2E+05	nm	1.2E+06	nm	4.2E+02	n	1.8E+03	n	3.1E+04	n		6.3E+00	
				1.0E-01	I	1.6E+00	I				1	0.1	Ethylene Glycol Monobutyl Ether	111-76-2	6.1E+03	n	6.2E+04	n	1.7E+03	n	7.0E+03	n	1.5E+03	n		3.2E-01	
3.1E-01	C	8.8E-05	C								1	1.2E+05	Ethylene Oxide	75-21-8	1.7E-01	c	8.3E-01	c	2.8E-02	c	1.4E-01	c	4.4E-02	c		9.1E-06	
4.5E-02	C	1.3E-05	C	8.0E-05	I						1	0.1	Ethylene Thiourea	96-45-7	4.9E+00	n	3.8E+01	c**	1.9E-01	c	9.4E-01	c	1.2E+00	n		2.8E-04	
6.5E+01	C	1.9E-02	C					V			1	1.5E+05	Ethyleneimine	151-56-4	2.3E-03	c	1.0E-02	c	1.3E-04	c	6.5E-04	c	2.1E-04	c		4.5E-08	
				3.0E+00	I						1	0.1	Ethylphthalyl Ethyl Glycolate	84-72-0	1.8E+05	nm	1.8E+06	nm					4.5E+04	n		1.0E+02	
				8.0E-03	I						1	0.1	Express	101200-48-	4.9E+02	n	4.9E+03	n					1.2E+02	n		4.7E-02	
				2.5E-04	I						1	0.1	Fenamiphos	22224-92-6	1.5E+01	n	1.5E+02	n					3.4E+00	n		3.3E-03	
				2.5E-02	I						1	0.1	Fenpropathrin	39515-41-8	1.5E+03	n	1.5E+04	n					4.6E+01	n		2.1E+00	
				1.3E-02	I						1	0.1	Fluometuron	2164-17-2	7.9E+02	n	8.0E+03	n					1.9E+02	n		1.4E-01	
				4.0E-02	C	1.3E-02	C				1		Fluoride	16984-48-8	3.1E+03	n	4.1E+04	n	1.4E+01	n	5.7E+01	n	6.2E+02	n		9.3E+01	
				6.0E-02	I	1.3E-02	C				1		Fluorine (Soluble Fluoride)	7782-41-4	4.7E+03	n	6.1E+04	n	1.4E+01	n	5.7E+01	n	9.3E+02	n	4.0E+03	1.4E+02	6.0E+02
				8.0E-02	I						1	0.1	Fluridone	59756-60-4	4.9E+03	n	4.9E+04	n					1.1E+03	n		1.3E+02	
				2.0E-02	I						1	0.1	Flurprimidol	56425-91-3	1.2E+03	n	1.2E+04	n					2.6E+02	n		1.2E+00	
				6.0E-02	I						1	0.1	Flutolanil	66332-96-5	3.7E+03	n	3.7E+04	n					7.2E+02	n		3.9E+00	
				1.0E-02	I						1	0.1	Fluvalinate	69409-94-5	6.1E+02	n	6.2E+03	n					1.6E+02	n		2.3E+02	
3.5E-03	I			1.0E-01	I						1	0.1	Folpet	133-07-3	1.4E+02	c*	4.9E+02	c					1.7E+01	c*		4.1E-03	
1.9E-01	I										1	0.1	Fomesafen	72178-02-0	2.6E+00	c	9.1E+00	c					3.4E-01	c		1.1E-03	
				2.0E-03	I						1	0.1	Fonofos	944-22-9	1.2E+02	n	1.2E+03	n					1.8E+00	n		3.5E-02	

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); S = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																												
Toxicity and Chemical-specific Information												Contaminant		Screening Levels												Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	^k _e IUR (ug/m ³) ²	^k _e IUR (ug/m ³) ²	^k _e IUR (ug/m ³) ²	RfD _a (mg/kg-day)	^k _e RfD _a (mg/kg-day)	^k _e RfC _i (mg/m ³)	^k _e RfC _i (mg/m ³)	^k _e RfC _i (mg/m ³)	o muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)	
				3.0E-03	A	1.0E-02	A						Guthion	86-50-0	1.8E+02	n	1.8E+03	n	1.0E+01	n	4.4E+01	n	4.3E+01	n		1.3E-02		
				5.0E-05	I								Haloxypol, Methyl	69806-40-2	3.1E+00	n	3.1E+01	n					5.8E-01	n		6.4E-03		
				1.3E-02	I								Harmony	79277-27-3	7.9E+02	n	8.0E+03	n					2.0E+02	n		6.1E-02		
4.5E+00	I	1.3E-03	I	5.0E-04	I							1	0.1	Heptachlor	76-44-8	1.1E-01	c	3.8E-01	c	1.9E-03	c	9.4E-03	c	1.8E-03	c	4.0E-01	1.4E-04	3.3E-02
9.1E+00	I	2.6E-03	I	1.3E-05	I							1	0.1	Heptachlor Epoxide	1024-57-3	5.3E-02	c*	1.9E-01	c*	9.4E-04	c	4.7E-03	c	3.3E-03	c*	2.0E-01	6.8E-05	4.1E-03
				2.0E-03	I							1	0.1	Hexabromobenzene	87-82-1	1.2E+00	n	1.2E+03	n					3.1E+01	n		1.8E-01	
				2.0E-04	I							1	0.1	Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	1.2E+01	n	1.2E+02	n					3.1E+00	n			
1.6E+00	I	4.6E-04	I	8.0E-04	I							1	0.1	Hexachlorobenzene	118-74-1	3.0E-01	c	1.1E+00	c	5.3E-03	c	2.7E-02	c	4.2E-02	c	1.0E+00	5.3E-04	1.3E-02
7.8E-02	I	2.2E-05	I	1.0E-03	P							1	0.1	Hexachlorobutadiene	87-63-3	6.2E+00	c**	2.2E+01	c*	1.1E-01	c	5.6E-01	c	2.6E-01	c*		5.0E-04	
6.3E+00	I	1.8E-03	I	8.0E-03	A							1	0.1	Hexachlorocyclohexane, Alpha-	319-34-6	7.7E-02	c	2.7E-01	c	1.4E-03	c	6.8E-03	c	6.2E-03	c		3.6E-05	
1.8E+00	I	5.3E-04	I									1	0.1	Hexachlorocyclohexane, Beta-	319-35-7	2.7E-01	c	9.6E-01	c	4.6E-03	c	2.3E-02	c	2.2E-02	c	2.0E-01	1.3E-04	
1.1E+00	C	3.1E-04	C	3.0E-04	I							1	0.04	Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	5.2E-01	c*	2.1E+00	c	7.8E-03	c	4.0E-02	c	3.6E-02	c*		2.1E-04	1.2E-03
1.8E+00	I	5.1E-04	I									1	0.1	Hexachlorocyclohexane, Technical	608-73-1	2.7E-01	c	9.6E-01	c	4.8E-03	c	2.4E-02	c	2.2E-02	c		1.3E-04	
				6.0E-03	I	2.0E-04	I					1	0.1	Hexachlorocyclopentadiene	77-47-4	3.7E+02	n	3.7E+03	n	2.1E-01	n	8.8E-01	n	2.2E+01	n	5.0E+01	7.0E-02	1.6E-01
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I					1	0.1	Hexachloroethane	67-72-1	1.2E+01	c**	4.3E+01	c*	2.2E-01	c	1.1E+00	c	7.9E-01	c**		4.8E-04	
				3.0E-04	I							1	0.1	Hexachlorophene	70-30-4	1.8E+01	n	1.8E+02	n					4.7E+00	n		6.3E+00	
1.1E-01	I			3.0E-03	I							1	0.015	Heptachlor 1,3,5 trinitro 1,3,5 triazine (NOX)	121-82-4	5.6E+00	c*	2.4E+01	c					6.1E-01	c*		2.3E-04	
						1.0E-05	I	V				1	5.2E+01	Hexamethylene Diisocyanate, 1,6-	822-06-0	3.4E+00	n	1.4E+01	n	1.0E-02	n	4.4E-02	n	2.1E-02	n		2.1E-04	
				4.0E-04	P							1	0.1	Hexamethylphosphoramide	680-31-9	2.4E-01	n	2.5E+02	n					6.2E+00	n		1.4E-03	
				6.0E-02	H	7.0E-01	I	V				1	1.4E+02	Hexane, N-	110-54-3	5.7E+02	ns	2.6E+03	ns	7.3E+02	n	3.1E+03	n	2.5E+02	n		1.8E+00	
				2.0E+00	P							1	0.1	Hexanedioic Acid	124-04-9	1.2E+05	nm	1.2E+06	nm					3.1E+04	n		7.7E+00	
				5.0E-03	I	3.0E-02	I	V				1	3.3E+03	Hexanone, 2-	591-78-6	2.1E+02	n	1.4E+03	n	3.1E+01	n	1.3E+02	n	3.4E+01	n		7.9E-03	
3.0E+00	I	4.9E-03	I			3.0E-05	P					1	0.1	Hexazinone	51235-04-2	2.0E+03	n	2.0E+04	n					5.0E+02	n		2.3E-01	
				3.3E-02	I							1	0.1	Hydrazine	302-01-2	2.1E-01	c	9.5E-01	c	5.0E-04	c*	2.5E-03	c*	2.2E-02	c			
3.0E+00	I	4.9E-03	I									1		Hydrazine Sulfate	10034-93-2	2.1E-01	c	9.5E-01	c	5.0E-04	c	2.5E-03	c	2.2E-02	c			
						2.0E-02	I					1		Hydrogen Chloride	7647-01-0	2.8E+07	nm	1.2E+08	nm	2.1E+01	n	8.8E+01	n					
				4.0E-02	C	1.4E-02	C					1		Hydrogen Fluoride	7664-39-3	3.1E+03	n	4.1E+04	n	1.5E+01	n	6.1E+01	n	6.2E+02	n			
						2.0E-03	I					1		Hydrogen Sulfide	7783-06-4	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n					
6.0E-02	P			4.0E-02	P							1	0.1	Hydroquinone	123-31-9	8.1E+00	c	2.9E+01	c					1.1E+00	c		7.5E-04	
				1.3E-02	I							1	0.1	Imazali	35554-44-0	7.9E+02	n	8.0E+03	n					1.4E+02	n		2.5E+00	
				2.5E-01	I							1	0.1	Imazaquin	81335-37-7	1.5E+04	n	1.5E+05	nm					3.8E+03	n		1.9E+01	
				1.0E-02	A							1		Iodine	7553-56-2	7.8E+02	n	1.0E+04	n					1.6E+02	n		9.4E+00	
				4.0E-02	I							1	0.1	Iprodione	36734-19-7	2.4E+03	n	2.5E+04	n					5.7E+02	n		1.7E-01	
				7.0E-01	P							1		Iron	7439-89-6	5.5E+04	n	7.2E+05	nm					1.1E+04	n		2.7E+02	
9.5E-04	I			3.0E-01	I							1	0.1	Isobutyl Alcohol	78-83-1	1.8E+04	n	1.8E+05	nm					4.6E+03	n		9.5E-01	
				2.0E-01	I	2.0E+00	C					1	0.1	Isophorone	78-59-1	5.1E+02	c*	1.8E+03	c*	2.1E+03	n	8.8E+03	n	6.7E+01	c*		2.2E-02	
				1.5E-02	I							1	0.1	Isopropalin	33820-53-0	9.2E+02	n	9.2E+03	n					2.9E+01	n		6.6E-01	
						7.0E+00	C					1	0.1	Isopropanol	67-63-0	9.9E+09	nm	4.2E+10	nm	7.3E+03	n	3.1E+04	n					
				1.0E-01	I							1	0.1	Isopropyl Methyl Phosphonic Acid	1832-54-8	6.1E+03	n	6.2E+04	n					1.6E+03	n		3.4E-01	
				5.0E-02	I							1	0.1	Isoxaben	82558-50-7	3.1E+03	n	3.1E+04	n					5.6E+02	n		1.5E+00	
						3.0E-01	A	V				1		JP-7	NA	4.3E+08	nm	1.8E+09	nm	3.1E+02	n	1.3E+03	n	6.3E+02	n			
				7.5E-02	I							1	0.1	Kerb	23950-58-5	4.6E+03	n	4.6E+04	n					9.0E+02	n		9.1E-01	
				2.0E-03	I							1	0.1	Lactofen	77501-63-4	1.2E+02	n	1.2E+03	n					1.9E+01	n		8.7E-01	
													Lead Compounds															
2.8E-01	C	8.0E-05	C									1	0.1	*Lead acetate	301-04-2	1.7E+00	c	6.2E+00	c	3.0E-02	c	1.5E-01	c	2.4E-01	c			
												1		*Lead and Compounds	7439-92-1	4.0E+02	L	8.0E+02	L	1.5E-01	L					1.5E+01		1.4E+01
3.8E-02	C	1.1E-05	C									1	0.1	*Lead subacetate	1335-32-6	1.3E+01	c	4.5E+01	c	2.2E-01	c	1.1E+00	c	1.8E+00	c			
				1.0E-07	I							1	0.1	*Tetraethyl Lead	78-00-2	6.1E-03	n	6.2E-02	n					9.9E-04	n		3.5E-06	
				2.0E-03	I							1	0.1	Linuron	330-55-2	1.2E+02	n	1.2E+03	n					2.6E+01	n		2.3E-02	
				2.0E-03	P							1		Lithium	7439-93-2	1.6E+02	n	2.0E+03	n					3.1E+01	n		9.3E+00	
				2.0E-01	I																							

Toxicity and Chemical-specific Information													Contaminant										Screening Levels										Protection of Ground Water SSLs	
SFO (mg/kg-day)	k _e y	IUR (ug/m ³) ¹	k _e y	RfD _a (mg/kg-day)	k _e y	RfC _a (mg/m ³)	k _e y	muta- gen	GIABS	ABS	Cat (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)								
3.0E-05	I				I					1	0.1	Merphos	150-50-5	1.8E+00	n	1.8E+01	n					4.7E-01	n		4.6E-02									
3.0E-05	I				I					1	0.1	Merphos Oxide	78-48-8	1.8E+00	n	1.8E+01	n					6.1E-02	n		3.0E-04									
6.0E-02	I				I					1	0.1	Metalaxyl	57837-19-1	3.7E+03	n	3.7E+04	n					9.2E+02	n		2.5E-01									
1.0E-04	I			3.0E-02	P	V				1	4.6E+03	Methacrylonitrile	126-98-7	7.6E+00	n	9.2E+01	n	3.1E+01	n	1.3E+02	n	1.5E+00	n		3.4E-04									
5.0E-05	I				I					1	0.1	Methamidophos	10265-92-6	3.1E+00	n	3.1E+01	n					7.8E-01	n		1.6E-04									
2.0E+00	I			2.0E+01	I					1	0.1	Methanol	67-55-1	1.2E+05	nm	1.2E+06	nm	2.1E+04	n	8.8E+04	n	3.1E+04	n		6.3E+00									
1.0E-03	I				I					1	0.1	Methidathion	950-37-8	6.1E+01	n	6.2E+02	n					1.5E+01	n		3.7E-03									
2.5E-02	I				I					1	0.1	Methomyl	16752-77-5	1.5E+03	n	1.5E+04	n					3.9E+02	n		8.5E-02									
4.9E-02	C	1.4E-05	C							1	0.1	Methoxy-5-nitroaniline, 2-	99-53-2	9.9E+00	c	3.5E+01	c	1.7E-01	c	8.8E-01	c	1.3E+00	c		4.6E-04									
5.0E-03	I				I					1	0.1	Methoxychlor	72-43-5	3.1E+02	n	3.1E+03	n					2.7E+01	n	4.0E+01	1.5E+00	2.2E+00								
8.0E-03	P	1.0E-03	P							1	0.1	Methoxyethanol Acetate, 2-	110-49-6	4.9E+02	n	4.9E+03	n	1.0E+00	n	4.4E+00	n	1.2E+02	n		2.6E-02									
5.0E-03	P	2.0E-02	I							1	0.1	Methoxyethanol, 2-	109-86-4	3.1E+02	n	3.1E+03	n	2.1E+01	n	8.8E+01	n	7.8E+01	n		1.6E-02									
1.0E+00	X				V					1	2.9E+04	Methyl Acetate	79-20-9	7.8E+04	ns	1.0E+06	nms					1.6E+04	n		3.2E+00									
3.0E-02	H	2.0E-02	P	V						1	6.8E+03	Methyl Acrylate	96-33-3	1.5E+02	n	6.4E+02	n	2.1E+01	n	8.8E+01	n	3.8E+01	n		8.1E-03									
6.0E-01	I	5.0E+00	I	V						1	2.8E+04	Methyl Ethyl Ketone (2-Butanone)	78-93-3	2.8E+04	n	2.0E+05	nms	5.2E+03	n	2.2E+04	n	4.9E+03	n		1.0E+00									
1.0E-03	X				P	2.0E-05	X			1	0.1	Methyl Hydrazine	60-34-4	6.1E+01	n	6.1E+02	n	2.4E-03	c**	1.2E-02	c**	1.6E+01	n		3.5E-03									
8.0E-02	H	3.0E+00	I	V						1	3.4E+03	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	5.3E+03	ns	5.3E+04	ns	3.1E+03	n	1.3E+04	n	1.0E+03	n		2.3E-01									
				1.0E-03	C	V				1	0.1	Methyl Isocyanate	624-83-9	5.0E+00	n	2.1E+01	n	1.0E+00	n	4.4E+00	n	2.1E+00	n		5.9E-04									
1.4E+00	I	7.0E-01	I	V						1	2.4E+03	Methyl Methacrylate	80-62-6	4.8E+03	ns	2.1E+04	ns	7.3E+02	n	3.1E+03	n	1.4E+03	n		3.0E-01									
2.5E-04	I				I					1	0.1	Methyl Parathion	298-00-0	1.5E+01	n	1.5E+02	n					3.4E+00	n		5.7E-03									
6.0E-02	X				I					1	0.1	Methyl Phosphonic Acid	993-13-5	3.7E+03	n	3.7E+04	n					9.4E+02	n		1.9E-01									
9.9E-02	C	2.8E-05	C							1	0.1	Methyl Styrene (Mixed Isomers)	25013-15-4	2.4E+02	n	1.5E+03	ns	4.2E+01	n	1.8E+02	n	3.2E+01	n		5.2E-02									
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		1	8.9E+03	Methyl methanesulfonate	66-27-3	4.9E+00	c	1.7E+01	c	8.7E-02	c	4.4E-01	c	6.8E-01	c		1.4E-04									
				3.0E-04	X					1	0.1	Methyl tert-Butyl Ether (MTBE)	1634-04-4	4.3E+01	c	2.2E+02	c	9.4E+00	c	4.7E+01	c	1.2E+01	c		2.8E-03									
9.0E-03	P			2.0E-02	X					1	0.1	Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	1.8E+01	n	1.8E+02	n					4.7E+00	n		2.8E-03									
8.3E+00	C	2.4E-03	C							1	0.1	Methyl-5-Nitroaniline, 2-	99-55-8	5.4E+01	c*	1.9E+02	c*					7.0E+00	c*		3.9E-03									
										1	0.1	Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	5.9E-02	c	2.1E-01	c	1.0E-03	c	5.1E-03	c	8.1E-03	c		2.8E-06									
1.3E-01	C	3.7E-05	C							1	0.1	Methylaniline Hydrochloride, 2-	636-21-5	3.7E+00	c	1.3E+01	c	6.6E-02	c	3.3E-01	c	5.0E-01	c		2.1E-04									
				1.0E-02	A					1	0.1	Methylarsonic acid	124-58-3	6.1E+02	n	6.2E+03	n					1.6E+02	n		1.6E-02									
				2.0E-04	X					1	0.1	Methylbenzene,1,4-diamine monohydrochloride, 2-	74612-12-7	1.2E+01	n	1.2E+02	n					3.1E+00	n		3.1E-00									
1.0E-01	X			3.0E-04	X					1	0.1	Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	4.9E+00	c**	1.7E+01	c*					6.7E-01	c**		1.9E-03									
2.2E+01	C	6.3E-03	C						M	1	0.1	Methylcholanthrene, 3-	56-49-5	5.2E-03	c	7.8E-02	c	1.5E-04	c	1.9E-03	c	9.8E-04	c		2.5E-03									
2.0E-03	I	1.0E-08	I			6.0E-01	I	V	M	1	3.3E+03	Methylene Chloride	75-09-2	5.6E+01	c**	9.6E+02	c**	9.6E+01	c**	1.2E+03	c**	9.9E+00	c**	5.0E+00	1.9E-03	1.3E-03								
1.0E-01	P	4.3E-04	C	2.0E-03	P				M	1	0.1	Methylene-bis(2-chloroaniline), 4,4'	101-14-4	1.2E+00	c	1.7E+01	c*	2.2E-03	c	2.9E-02	c	1.4E-01	c		1.6E-03									
4.6E-02	I	1.3E-05	C							1	0.1	Methylene-bis(N,N-dimethyl) Aniline, 4,4'	101-61-1	1.1E+01	c	3.7E+01	c	1.9E-01	c	9.4E-01	c	4.1E-01	c		2.3E-03									
1.6E+00	C	4.6E-04	C			2.0E-02	C			1	0.1	Methylenebisbenzenamine, 4,4'	101-77-9	3.0E-01	c	1.1E+00	c	5.3E-03	c	2.7E-02	c	4.1E-02	c		1.8E-04									
				6.0E-04	I					1	0.1	Methylenediphenyl Diisocyanate	101-68-8	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n													
7.0E-02	X				V					1	0.1	Methylstyrene, Alpha-	98-83-9	5.5E+03	ns	7.2E+04	ns					5.8E+02	n		9.3E-01									
1.5E-01	I				I					1	0.1	Metolachlor	51218-45-2	9.2E+03	n	9.2E+04	ns					2.1E+03	n		2.5E+00									
2.5E-01	I			1.4E-05	C					1	0.1	Metribuzin	21087-64-9	1.5E+03	n	1.5E+04	n					3.8E+02	n		1.2E-01									
1.8E+01	C	5.1E-03	C	2.0E-04	P			V		1	3.4E-01	Mineral oils	8012-95-1	1.8E+05	nms	1.8E+06	nms					4.7E+04	n		1.9E+03									
				2.0E-04	I					1	0.1	Mirex	2385-85-5	2.7E-02	c	9.6E-02	c	4.8E-04	c	2.4E-03	c	3.7E-03	c		2.7E-03									
				2.0E-03	I					1	0.1	Molinate	2212-67-1	1.2E+02	n	1.2E+03	n					2.3E+01	n		1.3E-02									
				5.0E-03	I					1		Molybdenum	7439-98-7	3.9E+02	n	5.1E+03	n					7.8E+01	n		1.6E+00									
				1.0E-01	I					1		Monochloramine	10599-90-3	7.8E+03	n	1.0E+05	nm					1.6E+03	n	4.0E+03	1.3E-03									
				2.0E-03	P					1	0.1	Monomethylamine	100-61-8	1.2E+02	n	1.2E+03	n					3.0E+01	n		1.1E-02									
				3.0E-04	X					1	0.1	N,N'-Diphenyl-1,4-benzenediamine	74-31-7	1.8E+01	n	1.8E+02	n					2.7E+00	n		2.8E-01									
				2.0E-03	I					1	0.1	Naled	300-76-5	1.2E+02	n	1.2E+03	n					3.1E+01	n		1.4E-02									
1.8E+00	C	0.0E+00	C	3.0E-02	X	1.0E-01	P	V		1		Naphtha, High Flash Aromatic (HFAN)	64724-95-6	2.3E+03	n	3.1E+04	n	1.0E+02	n	4.4E+02	n	1.4E+02	n		1.7E-04									
				1.0E-01	I					1	0.1	Naphthylamine, 2-	91-59-8	2.7E-01	c	9.6E-01	c					3.3E-02	c		8.3E+00									
										1	0.1	Napropamide	15299-99-7	6.1E+03	n	6.2E+04	n					1.3E+03	n											
				1.1E-02	C	1.4E-05	C			0.04		Nickel Carbonyl	13463-39-3	8.2E+02	n	9.9E+03	n	1.5E-02	n	6.1E-02	n	1.5E+02	n											

Regional Screening Level (RSL), Summary Table (TR=1E-6, HQ=1) November 2013

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	K _e (yr) ²	IUR (ug/m ³) ³	K _e (yr) ⁴	RfD _s (mg/kg-day)	K _e (yr) ⁵	RfC _i (mg/m ³)	K _e (yr) ⁶	V _c (yr) ⁷	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	M			1	0.1	Nitrosodimethylamine, N-	62-75-9	2.3E-03	c	3.4E-02	c	6.9E-05	c	8.8E-04	c	4.2E-04	c		1.0E-07	
4.9E-03	I	2.6E-06	C								1	0.1	Nitrosodiphenylamine, N-	86-30-6	9.9E+01	c	3.5E+02	c	9.4E-01	c	4.7E+00	c	1.0E+01	c		5.7E-02	
2.2E+01	I	6.3E-03	C								1	0.1	Nitrosomethylthylamine, N-	10595-95-6	2.2E-02	c	7.8E-02	c	3.9E-04	c	1.9E-03	c	3.0E-03	c		8.7E-07	
6.7E+00	C	1.9E-03	C								1	0.1	Nitrosomorpholine [N-]	59-89-2	7.3E-02	c	2.6E-01	c	1.3E-03	c	6.5E-03	c	1.0E-02	c		2.5E-06	
9.4E+00	C	2.7E-03	C								1	0.1	Nitrosopiperidine [N-]	100-75-4	5.2E-02	c	1.8E-01	c	9.0E-04	c	4.5E-03	c	7.1E-03	c		3.8E-06	
2.1E+00	I	6.1E-04	I								1	0.1	Nitrosopyrrolidine, N-	930-55-2	2.3E-01	c	8.2E-01	c	4.0E-03	c	2.0E-02	c	3.2E-02	c		1.2E-05	
2.2E-01	P			1.0E-04	X						1	0.1	Nitrotoluene, m-	99-08-1	6.1E+00	n	6.2E+01	n					1.3E+00	n		1.2E-03	
1.6E-02	P			9.0E-04	P				V		1		Nitrotoluene, d-	88-72-2	2.9E+00	c*	1.3E+01	c*					2.7E-01	c*		2.5E-04	
				4.0E-03	P						1	0.1	Nitrotoluene, p-	99-09-0	3.0E+01	c**	1.1E+02	c*					3.7E+00	c*		3.4E-03	
				3.0E-04	X	2.0E-02	P	V			1		Nonane, n-	111-84-2	1.2E+01	ns	7.4E+01	ns	2.1E+01	n	8.8E+01	n	4.2E+00	n		6.0E-02	
				4.0E-02	I						1	0.1	Norflurazon	27314-13-2	2.4E+03	n	2.5E+04	n					6.0E+02	n		3.9E+00	
				7.0E-04	I						1	0.1	Nustar	85509-19-9	4.3E+01	n	4.3E+02	n					8.3E+00	n		1.4E+00	
				3.0E-03	I						1	0.1	Octabromodiphenyl Ether	32536-52-0	1.8E+02	n	1.8E+03	n					4.7E+01	n		9.3E+00	
				5.0E-02	I						1	0.006	Octahydro-1,3,5,7-tetrahydro-1,3,5,7-tetrazocine (HMX)	2691-41-0	3.8E+03	n	4.9E+04	n					7.8E+02	n		9.9E-01	
				2.0E-03	H						1	0.1	Octamethylpyrophosphoramide	152-16-9	1.2E+02	n	1.2E+03	n					3.1E+01	n		7.5E-03	
				5.0E-02	I						1	0.1	Oryzalin	19044-88-3	3.1E+03	n	3.1E+04	n					6.2E+02	n		1.1E+00	
				5.0E-03	I						1	0.1	Oxadiazon	19666-30-9	3.1E+02	n	3.1E+03	n					3.5E+01	n		3.6E-01	
				2.5E-02	I						1	0.1	Oxamyl	23135-22-0	1.5E+03	n	1.5E+04	n					3.9E+02	n	2.0E+02	8.6E-02	4.4E-02
				1.3E-02	I						1	0.1	Paclobutrazol	76738-62-0	7.9E-02	n	8.0E+03	n					1.7E+02	n		3.6E-01	
				4.5E-03	I						1	0.1	Paraquat Dichloride	1910-42-5	2.7E+02	n	2.8E+03	n					7.0E+01	n		9.7E-01	
				6.0E-03	H						1	0.1	Parathion	56-38-2	3.7E+02	n	3.7E+03	n					6.5E+01	n		3.3E-01	
				5.0E-02	H						1	0.1	Pebulate	1114-71-2	3.1E+03	n	3.1E+04	n					4.2E+02	n		3.3E-01	
				4.0E-02	I						1	0.1	Pendimethalin	40487-42-1	2.4E+03	n	2.5E+04	n					1.3E+02	n		1.5E+00	
				2.0E-03	I						1	0.1	Pentabromodiphenyl Ether	32534-81-9	1.2E+02	n	1.2E+03	n					3.1E+01	n		1.4E+00	
				1.0E-04	I						1	0.1	Pentabromodiphenyl ether, 2,2',4,4',5-	60348-60-9	6.1E+00	n	6.2E+01	n					1.6E+00	n		6.8E-02	
				8.0E-04	I						1	0.1	Pentachlorobenzene	608-93-5	4.9E+01	n	4.9E+02	n					2.3E+00	n		1.7E-02	
9.0E-02	P										1	0.1	Pentachloroethane	76-01-7	5.4E+00	c	1.9E+01	c					5.6E-01	c		2.7E-04	
2.6E-01	H			3.0E-03	I						1	0.1	Pentachloronitrobenzene	82-68-8	1.9E+00	c*	6.6E+00	c					1.0E-01	c	1.0E+00	1.3E-03	
4.0E-01	I	5.1E-06	C	5.0E-03	I						1	0.25	Pentachlorophenol	87-86-5	8.9E-01	c	2.7E+00	c	4.8E-01	c	2.4E+00	c	3.5E-02	c		3.6E-04	1.0E-02
4.0E-03	X			2.0E-03	P						1	0.1	Pentaerythritol tetranitrate (PETN)	78-11-5	1.2E+02	c**	4.3E+02	c**					1.6E+01	c**		2.4E-02	
				1.0E+00	P	V					1		Pentane, n-	109-66-0	8.7E+02	ns	3.7E+03	ns	1.0E+03	n	4.4E+03	n	2.1E+03	n		1.0E+01	
				7.0E-04	I						1		Perchlorates														
				7.0E-04	I						1		*Ammonium Perchlorate	7790-98-9	5.5E+01	n	7.2E+02	n					1.1E+01	n			
				7.0E-04	I						1		*Lithium Perchlorate	7791-03-9	5.5E+01	n	7.2E+02	n					1.1E+01	n			
				7.0E-04	I						1		*Perchlorate and Perchlorate Salts	14797-73-0	5.5E+01	n	7.2E+02	n					1.1E+01	n	1.5E+01(F)		
				7.0E-04	I						1		*Potassium Perchlorate	7778-74-7	5.5E+01	n	7.2E+02	n					1.1E+01	n			
				7.0E-04	I						1		*Sodium Perchlorate	7601-89-0	5.5E+01	n	7.2E+02	n					1.1E+01	n			
2.2E-03	C	6.3E-07	C	5.0E-02	I						1	0.1	Permethrin	52645-53-1	3.1E+03	n	3.1E+04	n					7.8E+02	n		1.9E+02	
				2.5E-01	I						1	0.1	Phenacetin	62-44-2	2.2E+02	c	7.8E+02	c	3.9E+00	c	1.9E+01	c	3.0E+01	c		8.3E-03	
				3.0E-01	I	2.0E-01	C				1	0.1	Phenmedipham	13684-63-4	1.5E+04	n	1.5E+05	nm					3.0E+03	n		1.6E+01	
				5.0E-04	X						1	0.1	Phenol	108-95-2	1.8E+04	n	1.8E+05	nm	2.1E+02	n	8.8E+02	n	4.5E+03	n		2.6E+00	
4.7E-02	H			6.0E-03	I						1	0.1	Phenothiazine	92-84-2	3.1E+01	n	3.1E+02	n					3.2E+00	n		1.0E-02	
				1.9E-03	H						1	0.1	Phenylenediamine, m-	108-45-2	3.7E+02	n	3.7E+03	n					9.4E+01	n		2.5E-02	
				2.0E-04	H						1	0.1	Phenylenediamine, o-	95-54-5	1.0E+01	c	3.7E+01	c					1.4E+00	c		3.8E-04	
				1.9E-01	I						1	0.1	Phenylenediamine, p-	106-50-3	1.2E+04	n	1.2E+05	nm					3.0E+03	n		7.9E-01	
1.9E-03	H			2.0E-04	H						1	0.1	Phenylphenol, 2-	90-43-7	2.5E+02	c	8.9E+02	c					2.6E+01	c		3.5E-01	
				3.0E-04	I	V					1	0.1	Phorate	298-02-2	1.2E+01	n	1.2E+02	n					2.3E+00	n		2.6E-03	
				2.0E-02	I						1	0.1	Phosgene	75-44-5	3.3E-01	n	1.4E+00	n	3.1E-01	n	1.3E+00	n					
				4.9E+01	P						1		Phosmet	732-11-6	1.2E+03	n	1.2E+04	n					2.9E+02	n		6.4E-02	
				4.9E+01	P						1		Phosphates, inorganic														
				4.9E+01	P						1		*Aluminum metaphosphate	13776-88-0	3.8E+06	nm	5.0E+07	nm					7.6E+05	n			
				4.9E+01	P						1		*Ammonium polyphosphate	68333-79-9	3.8E+06	nm	5.0E+07	nm					7.6E+05	n			
				4.9E+01	P						1		*Calcium pyrophosphate	7790-76-3	3.8E+06	nm	5.0E+07	nm					7.6E+05	n</			

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = See FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ²	K _e (y)	RfD ₅₀ (mg/kg-day)	K _e (y)	RfC ₁₀ (mg/m ³)	K _e (y)	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)	
				4.9E+01	P					1		*Tetrasodium pyrophosphate	7722-88-5	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				4.9E+01	P					1		*Trialluminum sodium tetra decahydrogen octaorthophosphate (dihydrate)	15136-87-5	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				4.9E+01	P					1		*Tricalcium phosphate	7758-87-4	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				4.9E+01	P					1		*Trimagnesium phosphate	7757-87-1	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				4.9E+01	P					1		*Tripotassium phosphate	7778-53-2	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				4.9E+01	P					1		*Trisodium phosphate	7601-54-9	3.8E+06	nm	5.0E+07	nm					7.6E+05	n				
				3.0E-04	I	3.0E-04	I			1		Phosphine	7803-51-2	2.3E+01	n	3.1E+02	n	3.1E-01	n	1.3E+00	n	4.7E+00	n				
				4.9E+01	P	1.0E-02	I			1		Phosphoric Acid	7664-38-2	3.0E+06	nm	2.7E+07	nm	1.0E+01	n	4.4E+01	n	7.6E+05	n				
				2.0E-05	I					1		Phosphorus, White	7723-14-0	1.6E+00	n	2.0E+01	n					3.1E-01	n		1.1E-03		
1.4E-02	I	2.4E-06	C	2.0E-02	I					1	0.1	Phthalates															
				1.0E+00	I						0.1	*Bis(2-ethylhexyl)phthalate	117-81-7	3.5E+01	c*	1.2E+02	c	1.0E+00	c	5.1E+00	c	4.8E+00	c*	6.0E+00	1.1E+00	1.4E+00	
											0.1	*Butylphthalyl Butylglycolate	85-70-1	6.1E+04	n	6.2E+05	nm					1.0E+04	n		2.3E+02		
				1.0E-01	I						0.1	*Dibutyl Phthalate	84-74-2	6.1E+03	n	6.2E+04	n					6.7E+02	n		1.7E+00		
				8.0E-01	I						0.1	*Diethyl Phthalate	84-66-2	4.9E+04	n	4.9E+05	nm					1.1E+04	n		4.7E+00		
				1.0E-01	I			V				*Dimethylterephthalate	120-61-6	7.8E+03	n	1.0E+05	nm					1.4E+03	n		3.8E-01		
				1.0E-02	P						0.1	*Octyl Phthalate, di-N-	117-84-0	6.1E+02	n	6.2E+03	n					1.6E+02	n		4.4E+01		
				1.0E+00	H						0.1	*Phthalic Acid, P-	100-21-0	6.1E+04	n	6.2E+05	nm					1.5E+04	n		5.3E+00		
				2.0E+00	I	2.0E-02	C				0.1	*Phthalic Anhydride	85-44-9	1.2E+05	nm	1.2E+06	nm	2.1E+01	n	8.8E+01	n	3.0E+04	n		6.6E+00		
				7.0E-02	I						0.1	Picloram	1918-02-1	4.3E+03	n	4.3E+04	n					1.1E+03	n	5.0E+02	2.9E-01	1.4E-01	
				1.0E-04	X						0.1	Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	6.1E+00	n	6.2E+01	n					1.5E+00	n		1.0E+03		
				1.0E-02	I						0.1	Pirimiphos, Methyl	29232-93-7	6.1E+02	n	6.2E+03	n					9.1E+01	n		8.7E-02		
3.0E+01	C	8.6E-03	C	7.0E-06	H						0.1	Polybrominated Biphenyls	59536-65-1	1.6E-02	c*	5.7E-02	c*	2.8E-04	c	1.4E-03	c	2.2E-03	c*				
				7.0E-02	S	2.0E-05	S				0.14	Polychlorinated Biphenyls (PCBs)															
												*Aroclor 1016	12674-11-2	3.9E+00	n	2.1E+01	c**	1.2E-01	c	6.1E-01	c	9.6E-01	c**		9.2E-02		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1221	11104-28-2	1.4E-01	c	5.4E-01	c	4.3E-03	c	2.1E-02	c	4.0E-03	c		6.9E-05		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1232	11141-16-5	1.4E-01	c	5.4E-01	c	4.3E-03	c	2.1E-02	c	4.0E-03	c		6.9E-05		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1242	53469-21-9	2.2E-01	c	7.4E-01	c	4.3E-03	c	2.1E-02	c	3.4E-02	c		5.3E-03		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1248	12672-29-6	2.2E-01	c	7.4E-01	c	4.3E-03	c	2.1E-02	c	3.4E-02	c		5.2E-03		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1254	11097-69-1	2.2E-01	c**	7.4E-01	c*	4.3E-03	c	2.1E-02	c	3.4E-02	c**		8.8E-03		
				2.0E+00	S	5.7E-04	S				1	*Aroclor 1260	11096-82-5	2.2E-01	c	7.4E-01	c	4.3E-03	c	2.1E-02	c	3.4E-02	c		2.4E-02		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Heptachlorobiphenyl, 2,3,3',4,4',5,5'-(PCB 189)	39635-31-9	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		1.2E-02		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Hexachlorobiphenyl, 2,3',4,4',5,5'-(PCB 167)	52663-72-6	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		7.2E-03		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Hexachlorobiphenyl, 2,3,3',4,4',5'-(PCB 157)	69782-90-7	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		7.4E-03		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Hexachlorobiphenyl, 2,3,3',4,4',5'-(PCB 156)	38380-08-4	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		7.4E-03		
3.9E+03	E	1.1E+00	E	2.3E-08	E	1.3E-06	E				0.14	*Hexachlorobiphenyl, 3,3',4,4',5,5'-(PCB 169)	32774-16-6	1.1E-04	c*	3.8E-04	c*	2.1E-06	c	1.1E-05	c	1.7E-05	c*		7.2E-06		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Pentachlorobiphenyl, 2,3,4,4',5'-(PCB 123)	65510-44-3	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		4.5E-03		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Pentachlorobiphenyl, 2,3',4,4',5'-(PCB 118)	31508-00-6	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		4.4E-03		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Pentachlorobiphenyl, 2,3,3',4,4'-(PCB 105)	32598-14-4	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		4.5E-03		
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E				0.14	*Pentachlorobiphenyl, 2,3,4,4',5'-(PCB 114)	74472-37-0	1.1E-01	c*	3.8E-01	c*	2.1E-03	c	1.1E-02	c	1.7E-02	c*		4.5E-03		
1.3E+04	E	3.8E+00	E	7.0E-09	E	4.0E-07	E				0.14	*Pentachlorobiphenyl, 3,3',4,4',5'-(PCB 126)	57465-28-8	3.4E-05	c*	1.1E-04	c*	6.4E-07	c	3.2E-06	c	5.2E-06	c*		1.3E-06		
2.0E+00	I	5.7E-04	I								0.14	*Polychlorinated Biphenyls (high risk)	1336-36-3	2.2E-01	c	7.4E-01	c	4.3E-03	c	2.1E-02	c						
4.0E-01	I	1.0E-04	I								0.14	*Polychlorinated Biphenyls (low risk)	1336-36-3					2.4E-02	c	1.2E-01	c	1.7E-01	c	5.0E-01	2.6E-02	7.8E-02	
7.0E-02	I	2.0E-05	I								0.14	*Polychlorinated Biphenyls (lowest risk)	1336-36-3					1.2E-01	c	6.1E-01	c						
1.3E+01	E	3.8E-03	E	7.0E-06	E	4.0E-04	E				0.14	*Tetrachlorobiphenyl, 3,3',4,4'-(PCB 77)	32598-13-3	3.4E-02	c*	1.1E-01	c*	6.4E-04	c	3.2E-03	c	5.2E-03	c*		8.1E-04		
3.9E+01	E	1.1E-02	E	2.3E-06	E	1.3E-04	E				0.14	*Tetrachlorobiphenyl, 3,4,4',5'-(PCB 81)	70362-50-4	1.1E-02	c*	3.8E-02	c*	2.1E-04	c	1.1E-03	c	1.7E-03	c*		2.7E-04		
				6.0E-04	I						0.1	Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n						
												Polynuclear Aromatic Hydrocarbons (PAHs)															
				6.0E-02	I			V			0.13	*Acenaphthene	83-32-9	3.4E+03	n	3.3E+04	n					4.0E+02	n		4.1E+00		
				3.0E-01	I						0.13	*Anthracene	120-12-7	1.7E+04	n	1.7E+05	nm					1.3E+03	n		4.2E+01		
7.3E-01	E	1.1E-04	C								0.13	*Benz[a]anthracene	56-55-3	1.5E-01	c	2.1E+00	c	8.7E-03	c	1.1E-01	c	2.9E-02	c		1.0E-02		
1.2E+00	C	1.1E-0.																									

Toxicity and Chemical-specific Information														Contaminant		Screening Levels										Protection of Ground Water SSLs	
SFO (mg/kg-day) ¹	K _e y	IUR (ug/m ³) ²	K _e y	RfD _s (mg/kg-day)	K _e y	RfC ₁ (mg/m ³)	K _e y	V _o c	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)
				2.0E-02	I							0.1	Propazine	139-40-2	1.2E+03	n	1.2E+04	n					2.6E+02	n		2.3E-01	
				2.0E-02	I							0.1	Propham	122-42-9	1.2E+03	n	1.2E+04	n					2.7E+02	n		1.7E-01	
				1.3E-02	I							0.1	Propiconazole	60207-90-1	7.9E+02	n	8.0E+03	n					1.6E+02	n		5.3E-01	
						8.0E-03	I	V				1	Propionaldehyde	123-38-6	8.0E+01	n	3.4E+02	n	8.3E+00	n	3.5E+01	n	1.7E+01	n		3.4E-03	
				1.0E-01	X	1.0E+00	X	V				0.1	Propyl benzene	103-65-1	3.4E+03	ns	2.1E+04	ns	1.0E+03	n	4.4E+03	n	5.3E+02	n		9.9E-01	
						3.0E+00	C	V				0.1	Propylene	115-07-1	2.4E+03	ns	1.0E+04	ns	3.1E+03	n	1.3E+04	n	6.3E+03	n		6.0E+00	
				2.0E+01	P							0.1	Propylene Glycol	57-55-6	1.2E+06	nm	1.2E+07	nm					3.1E+05	n		6.3E+01	
						2.7E-04	A					1	Propylene Glycol Dinitrate	6423-43-4	3.9E+05	nm	1.6E+06	nm	2.8E-01	n	1.2E+00	n				2.2E+00	
				7.0E-01	H							0.1	Propylene Glycol Monoethyl Ether	1569-02-4	4.3E+04	n	4.3E+05	nm					1.1E+04	n			
2.4E-01	I	3.7E-06	I			2.0E+00	I					0.1	Propylene Glycol Monomethyl Ether	107-98-2	4.3E+04	n	4.3E+05	nm	2.1E+03	n	8.8E+03	n	1.1E+04	n		2.2E+00	
						3.0E-02	I	V				0.1	Propylene Oxide	75-56-9	2.0E+00	c	9.0E+00	c	6.6E-01	c*	3.3E+00	c*	2.3E-01	c		4.8E-05	
				2.5E-01	I							1	Pursuit	81335-77-5	1.5E+04	n	1.5E+05	nm					3.6E+03	n		3.2E+00	
				2.5E-02	I							0.1	Pydrin	51630-58-1	1.5E+03	n	1.5E+04	n					3.9E+02	n		2.5E+02	
				1.0E-03	I							0.1	Pyridine	110-86-1	7.8E+01	n	1.0E+03	n					1.5E+01	n		5.3E-03	
				5.0E-04	I							0.1	Quinalphos	13593-03-8	3.1E+01	n	3.1E+02	n					3.8E+00	n		3.2E-02	
3.0E+00	I					3.0E-02	A					0.1	Quinoline	91-22-5	1.6E-01	c	5.7E-01	c					2.1E-02	c		6.8E-05	
												1	Refractory Ceramic Fibers	NA	4.3E+07	nm	1.8E+08	nm	3.1E+01	n	1.3E+02	n				3.0E+01	
				3.0E-02	I							0.1	Resmethrin	10453-86-8	1.8E+03	n	1.8E+04	n					4.8E+01	n		2.7E+00	
				5.0E-02	H							0.1	Ronnel	299-84-3	3.1E+03	n	3.1E+04	n					3.0E+02	n		2.4E+01	
				4.0E-03	I							0.1	Rotenone	83-79-4	2.4E+02	n	2.5E+03	n					4.7E+01	n		5.1E-05	
2.2E-01	C	6.3E-05	C									0.1	Safrole	94-59-7	5.2E-01	c	7.8E+00	c	1.5E-02	c	1.9E-01	c	8.3E-02	c		3.6E-01	
				2.5E-02	I							0.1	Savay	78587-05-0	1.5E+03	n	1.5E+04	n					8.1E+01	n		3.6E-01	
				5.0E-03	I							1	Selenious Acid	7783-00-8	3.9E+02	n	5.1E+03	n					7.8E+01	n		7.8E+01	
				5.0E-03	I	2.0E-02	C					1	Selenium	7782-49-2	3.9E+02	n	5.1E+03	n	2.1E+01	n	8.8E+01	n	7.8E+01	n	5.0E+01	4.0E-01	2.6E-01
				5.0E-03	C	2.0E-02	C					1	Selenium Sulfide	7446-34-6	3.9E+02	n	5.1E+03	n	2.1E+01	n	8.8E+01	n	7.8E+01	n		6.9E+00	
				9.0E-02	I							0.1	Sethoxydim	74051-80-2	5.5E+03	n	5.5E+04	n					7.8E+02	n			
						3.0E-03	C					1	Silica (crystalline, respirable)	7631-86-9	4.3E+06	nm	1.8E+07	nm	3.1E+00	n	1.3E+01	n					
1.2E-01	H			5.0E-03	I					0.04			Silver	7440-22-4	3.9E+02	n	5.1E+03	n					7.1E+01	n		6.0E-01	
				5.0E-03	I							0.1	Simazine	122-34-9	4.1E+00	c*	1.4E+01	c					5.2E-01	c	4.0E+00	2.6E-04	2.0E-03
				1.3E-02	I							0.1	Sodium Acifluorfen	62476-59-9	7.9E+02	n	8.0E+03	n					2.0E+02	n		1.6E+00	
2.7E-01	H			4.0E-03	I							1	Sodium Azide	26628-22-8	3.1E+02	n	4.1E+03	n					6.2E+01	n			
				3.0E-02	I							0.1	Sodium Diethyldithiocarbamate	148-18-5	1.8E+00	c	6.4E+00	c					2.5E-01	c			
				5.0E-02	A	1.3E-02	C					0.1	Sodium Fluoride	7681-49-4	3.9E+03	n	5.1E+04	n	1.4E+01	n	5.7E+01	n	7.8E+02	n			
2.4E-02	H			2.0E-05	I							0.1	Sodium Fluoroacetate	62-74-8	1.2E+00	n	1.2E+01	n					3.1E-01	n		6.3E-05	
				1.0E-03	H							1	Sodium Metavanadate	13718-26-8	7.8E+01	n	1.0E+03	n					1.6E+01	n		7.0E-03	
				3.0E-02	I							1	Stirofos (Tetrachlorovinphos)	961-11-5	2.0E+01	c*	7.2E+01	c					2.4E+00	c			
				6.0E-01	I							1	Strontium, Stable	7440-24-6	4.7E+04	n	6.1E+05	nm					9.3E+03	n		3.3E+02	
				3.0E-04	I							0.1	Strychnine	57-24-9	1.8E+01	n	1.8E+02	n					4.6E+00	n		5.1E-02	
				2.0E-01	I	1.0E+00	I	V				1	Styrene	100-42-5	6.3E+03	ns	3.6E+04	ns	1.0E+03	n	4.4E+03	n	1.1E+03	n	1.0E+02	1.2E+00	1.1E-01
				1.0E-03	P	2.0E-03	P					0.1	Sulfolane	126-33-0	6.1E+01	n	6.2E+02	n	2.1E+00	n	8.8E+00	n	1.6E+01	n		3.4E-03	
				8.0E-04	P							0.1	Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	4.9E+01	n	4.9E+02	n					8.3E+00	n		4.9E-02	
						1.0E-03	C					1	Sulfuric Acid	7664-93-9	1.4E+06	nm	6.0E+06	nm	1.0E+00	n	4.4E+00	n					
				2.5E-02	I							0.1	Systhane	88671-89-0	1.5E+03	n	1.5E+04	n					3.5E+02	n		4.3E+00	
				3.0E-02	H							0.1	TCMTB	21564-17-0	1.8E+03	n	1.8E+04	n					3.7E+02	n		2.6E+00	
				7.0E-02	I							0.1	Tebuthiuron	34014-18-1	4.3E+03	n	4.3E+04	n					1.1E+03	n		3.0E-01	
				2.0E-02	H							0.1	Temephos	3383-96-8	1.2E+03	n	1.2E+04	n					3.1E+02	n		6.0E+01	
				1.3E-02	I							0.1	Terbacil	5902-51-2	7.9E+02	n	8.0E+03	n					2.0E+02	n		5.9E-02	
				2.5E-05	H							0.1	Terbufos	13071-79-9	1.5E+00	n	1.5E+01	n					1.8E-01	n		3.9E-04	
				1.0E-03	I							0.1	Terbutryn	886-50-0	6.1E+01	n	6.2E+02	n					1.0E+01	n		1.4E-02	
				1.0E-04	I							0.1	Tetrabromodiphenyl ether, 2,2',4,4'-(BDE-47)	5436-43-1	6.1E+00	n	6.2E+01	n					1.6E+00	n		4.2E-02	
				3.0E-04	I							0.1	Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.8E+01	n	1.8E+02	n					1.2E+00	n		5.8E-03	
2.6E-02	I	7.4E-06	I	3.0E-02	I							1	Tetrachloroethane, 1,1,1,2-	630-20-6	1.9E+00	c	9.3E+00	c	3.3E-01	c	1.7E+00	c	5.0E-01	c		1.9E-04	
2.0E-01	I	5.8E-05	C	2.0E-02	I							1	Tetrachloroethane, 1,1,2,2-	79-34-5	5.6E-01	c	2.8E+00	c	4.2E-02	c	2.1E-01	c	6.6E-02	c		2.6E-05	
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V				1	Tetrachloroethylene	127-18-4	2.2E+01	c**	1.1E+02	c**	9.4E+00	c**	4.7E+01	c**	9.7E+00</				

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = PPRTV Appendix; H = HEAST; J = New Jersey; O = EPA Office of Water; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; F = see FAQ; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day) ^a	k _e (ug/m ³) ¹	IUR (ug/m ³) ¹	k _e (mg/kg-day)	RfD _o (mg/kg-day)	k _e (mg/m ³)	RfC _o (mg/m ³)	k _e (mg/kg-day)	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	MCL-based SSL (mg/kg)	
	1.9E-07	P		3.0E+00	P		6.0E-01	P	V	1	0.1	1.4E-02	Total Petroleum Hydrocarbons (Aliphatic High)	NA	1.8E+05	nm	1.8E+06	nm					4.7E+04	n		1.9E+03	
	4.5E-06	P		1.0E-02	P		1.0E-01	P	V	1		6.9E+00	Total Petroleum Hydrocarbons (Aliphatic Low)	NA	1.1E+01	c*	5.8E+01	c*	1.3E+01	c*	6.5E+01	c*	2.6E+01	c*		1.8E-01	
										1			Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	6.1E-01	c	3.1E+00	c	5.4E-01	c	2.7E+00	c	1.1E+00	c*		1.5E-02	
7.3E+00	P			4.0E-02	P					1	0.1		Total Petroleum Hydrocarbons (Aromatic High)	NA	6.7E-02	c	2.4E-01	c					9.2E-03	c		1.0E-03	
5.5E-02	P	7.8E-06	P	4.0E-03	P		3.0E-02	P	V	1		1.8E+03	Total Petroleum Hydrocarbons (Aromatic Low)	NA	1.1E+00	c*	5.4E+00	c*	3.1E-01	c	1.6E+00	c*	3.9E-01	c*		2.0E-04	
				4.0E-03	P		3.0E-03	P	V	1			Total Petroleum Hydrocarbons (Aromatic Medium)	NA	1.1E+02	n	6.3E+02	n	3.1E+00	n	1.3E+01	n	5.2E+00	n		2.2E-02	
1.1E+00	I	3.2E-04	I							1	0.1		Toxaphene	8001-35-2	4.8E+01	c	1.6E+00	c	7.6E-03	c	3.8E-02	c	1.3E-02	c	3.0E+00	2.1E-03	4.6E-01
				7.5E-03	I		0.1			1	0.1		Tralometrin	66841-25-6	4.6E+02	n	4.6E+03	n					1.2E+02	n		4.5E+03	
				3.0E-04	A					1	0.1		Tri-n-butyltin	688-73-3	1.4E+01	n	1.8E+02	n					2.8E+00	n		6.2E-02	
				8.0E+01	X					1	0.1		Triacetin	102-76-1	4.9E+06	nm	4.9E+07	nm					1.2E+06	n		3.5E+02	
				1.3E-02	I					1	0.1		Triallate	2303-17-5	7.9E+02	n	8.0E+03	n					8.7E+01	n		1.9E-01	
				1.0E-02	I					1	0.1		Triasulfuron	82097-50-5	6.1E+02	n	6.2E+03	n					1.6E+02	n		1.6E-01	
9.0E-03	P			5.0E-03	I					1	0.1		Tribromobenzene, 1,2,4-	615-54-3	3.1E+02	n	3.1E+03	n					3.3E+01	n		4.7E-02	
				1.0E-02	P					1	0.1		Tributyl Phosphate	126-73-8	5.4E+01	c*	1.9E+02	c*					4.5E+00	c*		2.2E-02	
				3.0E-04	P					1	0.1		Tributyltin Compounds	NA	1.8E+01	n	1.8E+02	n					4.7E+00	n			
				3.0E-04	I					1	0.1		Tributyltin Oxide	56-35-9	1.8E+01	n	1.8E+02	n					4.4E+00	n		2.3E+02	
7.0E-02	I			3.0E-01	I	3.0E+01	H	V			9.1E+02	Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	4.3E+04	ns	1.8E+05	nms	3.1E+04	n	1.3E+05	n				1.3E+02		
2.9E-02	H			2.0E-02	I					1	0.1		Trichloroacetic Acid	76-03-9	6.9E+00	c	2.5E+01	c					9.4E-01	c	6.0E+01	1.9E-04	1.2E-02
7.0E-03	X			3.0E-05	X					1	0.1		Trichloroaniline HCl, 2,4,6-	33663-50-2	1.7E+01	c	5.9E+01	c					2.3E+00	c		6.4E-03	
				8.0E-04	X					1	0.1		Trichloroaniline, 2,4,6-	634-93-5	1.8E+00	n	1.8E+01	n					3.0E-01	n		2.7E-03	
								V		1	0.1		Trichlorobenzene, 1,2,3-	87-61-6	4.9E+01	n	4.9E+02	n					5.2E+00	n		1.5E-02	
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		1	4.0E-02	Trichlorobenzene, 1,2,4-	120-82-1	2.2E+01	c**	9.9E+01	c**	2.1E+00	n	8.8E+00	n	9.9E-01	c**	7.0E+01	2.9E-03	2.0E-01	
				2.0E+00	I	5.0E+00	I	V		1	6.4E-02	Trichloroethane, 1,1,1-	71-55-6	8.7E+03	ns	3.8E+04	ns	5.2E+03	n	2.2E+04	n	7.5E+03	n	2.0E+02	2.6E+00	7.0E-02	
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		1	2.2E-03	Trichloroethane, 1,1,2-	79-00-5	1.1E+00	c**	5.3E+00	c**	1.5E-01	c**	7.7E-01	c**	2.4E-01	c**	5.0E+00	7.7E-05	1.6E-03	
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	1	6.9E-02	Trichloroethylene	79-01-6	9.1E-01	c**	6.4E+00	c**	4.3E-01	c**	3.0E+00	c**	4.4E-01	c**	5.0E+00	1.6E-04	1.8E-03	
				3.0E-01	I	7.0E-01	H	V		1	1.2E+03	Trichlorofluoromethane	75-69-4	7.9E+01	n	3.4E+03	ns	7.3E+02	n	3.1E+03	n	1.1E+03	n		6.9E-01		
				1.0E-01	I					1	0.1		Trichlorophenol, 2,4,5-	95-95-4	6.1E+03	n	6.2E+04	n					8.9E+02	n	3.3E+00		
1.1E-02	I	3.1E-06	I	1.0E-03	P					1	0.1		Trichlorophenol, 2,4,6-	88-06-2	4.4E+01	c**	1.6E+02	c**	7.8E-01	c	4.0E+00	c	3.5E+00	c**		1.3E-02	
				1.0E-02	I					1	0.1		Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	6.1E+02	n	6.2E+03	n					1.2E+02	c		5.2E-02	
				8.0E-03	I					1	0.1		Trichlorophenoxypropionic acid, -2,4,5	92-72-1	4.9E+02	n	4.9E+03	n					8.4E-01	c	5.0E+01	4.6E-02	2.8E-02
3.0E+01	I			5.0E-03	I			V		1	1.3E-03	Trichloropropane, 1,1,2-	98-77-6	3.9E+02	n	5.1E+03	ns					6.8E-01	n		2.7E-02		
				4.0E-03	I	3.0E-04	I	V	M	1	1.4E-03	Trichloropropane, 1,2,3-	96-13-4	5.0E-03	c	9.5E-02	c	3.1E-01	n	1.3E+00	n	6.5E-04	c		2.8E-07		
				3.0E-03	X	3.0E-04	P	V		1	4.5E-02	Trichloropropene, 1,2,3-	96-13-5	7.8E-01	n	3.3E+00	n	3.1E-01	n	1.3E+00	n	6.2E-01	n		3.1E-04		
				2.0E-02	A					1	0.1		Tricresyl Phosphate (TCP)	1330-78-5	5.6E+03	n	3.1E+04	n					1.2E+02	c		1.1E+01	
				3.0E-03	I					1	0.1		Triethylamine	58138-08-2	1.8E+02	n	1.8E+03	n					1.3E+01	n		9.3E-02	
7.7E-03	I			7.5E-03	I					1	0.1			121-44-8	1.2E+02	n	5.2E+02	n	7.3E+00	n	3.1E+01	n	1.5E+01	n		4.4E-03	
2.0E-02	P			1.0E-02	P					1	0.1		Trifluralin	3582-09-8	6.3E+01	c**	2.2E+02	c*					2.2E+00	c*		7.2E-02	
				5.0E-03	P	V				1	2.9E+02	Trimethyl Phosphate	512-56-1	2.4E+01	c*	8.6E+01	c*					3.4E+00	c		7.4E-04		
												Trimethylbenzene, 1,2,3-	526-73-8	5.3E+01	n	2.2E+02	n	5.2E+00	n	2.2E+01	n	1.0E+01	n		1.5E-02		
				7.0E-03	P	V				1	2.2E-02	Trimethylbenzene, 1,2,4-	95-63-6	6.2E+01	n	2.6E+02	ns	7.3E+00	n	3.1E+01	n	1.5E-01	n		2.1E-02		
				1.0E-02	X			V		1	1.8E-02	10Methylbiphenyle, 1,3,5-	108-67-8	7.8E+02	n	7.0E+04	ns	2.9E-04	c*	1.1E+02	c*	8.7E-01	c		1.2E-01		
				3.0E-02	I					1	0.019	1,3-Dinitrobenzene, 1,3,5-	99-35-4	2.2E+03	n	2.7E+04	n					4.6E+01	n		1.7E+00		
3.0E-02	I			5.0E-04	I					1	0.032	Trinitrotoluene, 2,4,6-	118-96-7	1.9E+01	c**	7.9E+01	c**					2.2E+00	c**		1.3E-02		
				2.0E-02	P					1	0.1		Triphenylphosphine Oxide	791-28-6	1.2E+03	n	1.2E+04	n					2.8E+02	n		1.2E+00	
				2.0E-02	A					1	0.1		Tris[1,3-Dichloro-2-propyl] Phosphate	13674-87-8	1.2E+03	n	1.2E+04	n					2.8E+02	n		6.2E+00	
2.0E-02	P			1.0E-02	X					1	0.1		Tris[1-chloro-2-propyl]phosphate	13674-84-5	6.1E+02	n	6.2E+03	n					1.5E+02	n		5.0E-01	
3.2E-03	P			7.0E-03	P					1	0.1		Tris(2-chloroethyl)phosphate	115-96-8	2.4E+01	c*	8.6E+01	c*					3.3E+00	c*		3.2E-03	
				1.0E-01	P					1	0.1		Tris(2-ethylhexyl)phosphate	78-42-2	1.5E+02	c*	5.4E+02	c					2.1E+01	c*		1.0E+02	
1.0E+00	C	2.9E-04	C	3.0E-03	I	4.0E-05	A		M	1	0.1		Uranium (Soluble Salts)	NA	2.3E+02	n	3.0E+03	n	4.2E-02	n	1.8E-01	n	4.7E+01	n	3.0E+01	2.1E+01	1.4E+01
		8.3E-03	P	9.0E-03	I	7.0E-06	P			0.026			Urethane	51-79-6	1.2E-01	c	1.7E+00	c	3.3E-03	c	4.2E-02	c	2.1E-02	c		4.8E-06	
				5.0E-03	S	1.0E-04	A			0.026			1314-62-1	1314-62-1	4.0E+02	c**	2.0E+03	c**	2.9E-04	c*	1.5E-03	c*	1.1E-02	c*		1.1E-02	
				1.0E-03	I					1	0.1		Vanadium and Compounds	1440-22-2	3.9E+02	n	5.1E+03	n	1.0E-01	n	4.4E-01	n	3.3E+01	n		6.3E+01	
				2.5E-02	I					1	0.1		Vernolate	1929-77-7	6.1E+01	n	6.2E+02	n					8.3E+00	n		6.6E-03	
										1	0.1		Vinclozolin	50471-44-8	1.5E+03	n	1.5E+04	n					3.4E+02	n		2.6E-01	
				1.0E+00	H	2.0E-01	I	V		1	2.8E+03	Vinyl Acetate	108-05-4	9.7E+02	n	4.1E+03	ns	2.1E+02	n	8.8E+02	n	4.1E+02	n		8.7E-02		
		3.2E-05	H			3.0E-03	I	V		1	3.4E+03	Vinyl Bromide	593-60-2	1.1E-01	c*	5.6E-01	c*	7.6E-02	c*	3.8E-01	c*	1.5E-01	c*		4.4E-05		
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	1	3.9E+03	Vinyl Chloride	75-01-4	6.0E-02	c	1.7E+00	c	1.6E-01	c	2.8E+01	c	1.5E-02	c	2.0E+00	5.3E-06	6.9E-04	
				3.0E-04	I					1	0.1		Warfarin	81-81-2	1.8E+01	n	1.8E+02	n					4.4E+00	n		4.6E-03	
				2.0E-01	S	1.0E-01	S	V		1	3.9E+02	Xylene															

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table November 2013

Contaminant	Molecular		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon		Water Solubility		Permeability		
Analyte	CAS No.	MW	MW Ref	H ^a (unitless)	H ^b (atm-m ³ /mole)	H ^c and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	K _{oc} (L/kg)	K _{oc} Ref	S (mg/L)	S Ref	K _p (cm ² /d)	KPREF
Chloroaniline, p-	106-47-8	127.57	EPI	0.0000474	0.00000116	EPI	1.429	CRCB9	0.07038	WATER9	0.0000103	WATER9	112.7	EPI	3900	EPI	0.00496	EPI
Chlorobenzene	108-90-7	112.56	EPI	0.01271464	0.00311	EPI	1.1058	CRCB9	0.07213	WATER9	9.477E-06	WATER9	233.9	EPI	498	EPI	0.0282	EPI
Chlorobenzenate	510-15-6	325.19	EPI	2.96E-06	7.24E-08	EPI	1.2816	CRCB9	0.02178	WATER9	5.478E-06	WATER9	1539	EPI	13	EPI	0.0331	EPI
Chlorobenzoic Acid, p-	74-11-3	156.57	EPI	1.58E-06	3.88E-08	EPI	1.541	PERRY	0.05469	WATER9	9.487E-06	WATER9	26.56	EPI	72	EPI	0.012	EPI
Chlorobenzotrifluoride, 4-	98-56-6	180.56	EPI	1.418E-07	0.0347	EPI	1.334	CRCB9	0.0385	WATER9	7.987E-06	WATER9	1606	EPI	11.73	EPI	0.0375	EPI
Chlorobutane, 1-	109-69-3	92.57	EPI	0.6827473	0.0167	EPI	0.8857	CRCB9	0.07841	WATER9	9.327E-06	WATER9	72.17	EPI	1100	EPI	0.0269	EPI
Chlorodifluoromethane	75-45-6	86.47	EPI	1.6598528	0.0406	EPI	1.4909	CRCB9	0.10338	WATER9	0.0000133	WATER9	31.82	EPI	2770	EPI	0.00268	EPI
Chloroethanol, 2-	107-07-3	80.51	EPI	0.0000311	0.000000761	EPI	1.2019	CRCB9	0.09999	WATER9	0.0000122	WATER9	1.904	EPI	1000000	EPI	0.000579	EPI
Chloroform	67-66-3	119.38	EPI	0.1500409	0.0367	EPI	1.4788	CRCB9	0.07692	WATER9	0.0000109	WATER9	31.82	EPI	7950	EPI	0.00683	EPI
Chloromethane	74-87-3	50.49	EPI	0.3605887	0.00882	EPI	0.911	CRCB9	0.12396	WATER9	0.0000136	WATER9	13.22	EPI	5320	EPI	0.00328	EPI
Chloromethyl Methyl Ether	107-30-2	80.51	EPI	0.0124285	0.00304	EPI	1.063	CRCB9	0.09497	WATER9	0.0000113	WATER9	5.322	EPI	192400	EPI	0.000905	EPI
Chloronitrobenzene, o-	88-73-3	157.56	EPI	0.0003802	0.0000093	EPI	1.368	CRCB9	0.05135	WATER9	8.8E-06	WATER9	370.6	EPI	441	EPI	0.0063	EPI
Chloronitrobenzene, p-	100-00-5	157.56	EPI	0.0001999	0.00000489	EPI	1.2979	CRCB9	0.05016	WATER9	8.526E-06	WATER9	363.2	EPI	225	EPI	0.00793	EPI
Chlorophenol, 2-	95-57-8	128.56	EPI	0.0004579	0.0000112	EPI	1.2634	CRCB9	0.06612	WATER9	9.478E-06	WATER9	306.5	EPI	11300	EPI	0.00799	EPI
Chlorophenol	76-06-2	164.38	EPI	0.0838103	0.00205	EPI	1.6558	CRCB9	0.05176	WATER9	9.62E-06	WATER9	44.19	EPI	1620	EPI	0.00459	EPI
Chlorothalofol	1897-45-6	265.91	EPI	0.0000818	0.000002	EPI	1.7	CRCB9	0.02758	WATER9	7.323E-06	WATER9	1041	EPI	0.81	EPI	0.00537	EPI
Chlorotoluene, o-	95-49-8	126.59	EPI	0.1459526	0.00357	EPI	1.0825	CRCB9	0.0629	WATER9	8.719E-06	WATER9	382.9	EPI	374	EPI	0.0572	EPI
Chlorotoluene, p-	106-43-4	126.59	EPI	0.1790679	0.00438	EPI	1.0697	CRCB9	0.06257	WATER9	8.657E-06	WATER9	375.3	EPI	106	EPI	0.0498	EPI
Chlorozotcin	54749-90-5	313.7	EPI	1.5E-20	3.67E-22	EPI			0.04115	WATER9	4.809E-06	WATER9	10	EPI	1000000	EPI	9.91E-06	EPI
Chloropropane	101-21-3	213.67	EPI	0.0000233	0.000000569	EPI	1.18	CRCB9	0.02609	WATER9	6.707E-06	WATER9	350.7	EPI	89	EPI	0.0213	EPI
Chlorpyrifos	2921-88-2	350.59	EPI	0.0001198	0.00000293	EPI			0.03821	WATER9	4.465E-06	WATER9	7283	EPI	1.12	EPI	0.0334	EPI
Chlorpyrifos Methyl	5598-13-0	322.53	EPI	0.0001533	0.00000375	EPI			0.0404	WATER9	4.72E-06	WATER9	2193	EPI	4.76	EPI	0.0178	EPI
Chlorsulfuron	64902-72-3	357.77	EPI	1.398E-14	3.42E-16	EPI			0.0377	WATER9	4.405E-06	WATER9	322	EPI	31000	EPI	0.000328	EPI
Chlorthiophos	60238-56-4	361.24	EPI	0.0000491	0.0000012	EPI			0.03746	WATER9	4.377E-06	WATER9	12790	EPI	0.3	EPI	0.106	EPI
Chromium(III), Insoluble Salts	16065-83-1	52	EPI				5.22	CRCB9									0.001	RAGSE
Chromium(VI)	18540-29-9	52	EPI				7.15	CRCB9									0.002	RAGSE
Chromium, Total	7440-47-3	52	EPI				8.86	CRCB9									0.001	RAGSE
Cobalt	7440-48-4	58.93	EPI														0.004	RAGSE
Coke Oven Emissions	8007-45-2	78.11	EPI	0.2269011	0.00555	EPI			0.10398	WATER9	0.0000121	WATER9	145.8	EPI	1790	EPI	0.0149	EPI
Copper	7440-50-8	63.55	EPI				8.96	CRCB9									0.001	RAGSE
Cresol, m-	108-39-4	108.14	EPI	0.000035	0.000000856	EPI	1.0339	CRCB9	0.07287	WATER9	9.323E-06	WATER9	300.4	EPI	22700	EPI	0.00777	EPI
Cresol, o-	95-48-7	108.14	EPI	0.0000491	0.0000012	EPI	1.0327	CRCB9	0.07284	WATER9	9.317E-06	WATER9	306.5	EPI	25900	EPI	0.00766	EPI
Cresol, p-	106-44-5	108.14	EPI	0.0000409	0.000001	EPI	1.0185	CRCB9	0.07239	WATER9	9.24E-06	WATER9	300.4	EPI	21500	EPI	0.00754	EPI
Cresol, p-chloro-m-	59-50-7	142.59	EPI	0.0001002	0.00000245	EPI			0.06961	WATER9	8.134E-06	WATER9	491.8	EPI	3830	EPI	0.0285	EPI
Cresols	1319-77-3	108.14	EPI	0.0000491	0.0000012	EPI			0.08371	WATER9	9.781E-06	WATER9	306.5	EPI	25900	EPI	0.00766	EPI
Crotonaldehyde, trans-	123-73-9	70.09	EPI	0.0007931	0.0000194	EPI	0.8516	CRCB9	0.09593	WATER9	0.0000108	WATER9	1.793	EPI	150000	EPI	0.00159	EPI
Cumene	98-02-8	120.2	EPI	0.4701554	0.0115	EPI	0.864	CRCB9	0.0603	WATER9	7.857E-06	WATER9	697.8	EPI	61.3	EPI	0.0897	EPI
Cupferron	135-20-6	155.16	EPI	8.667E-16	2.12E-17	EPI			0.0658	WATER9	7.688E-06	WATER9	762.4	EPI	204310	EPI	1.67E-06	EPI
Cyanazine	21725-46-2	240.7	EPI	1.051E-10	2.57E-12	EPI			0.0491	WATER9	5.737E-06	WATER9	134.1	EPI	170	EPI	0.00209	EPI
Cyanides																		
*Calcium Cyanide	592-01-8	92.11	EPI														0.001	RAGSE
*Copper Cyanide	544-92-3	89.56	EPI				2.9	CRCB9							23	EPI	0.001	RAGSE
*Cyanide (CN-)	57-12-5	27.03	EPI	0.0054374	0.000133	EPI			0.21095	WATER9	0.0000246	WATER9			1000000	EPI	0.001	RAGSE
*Cyanogen	460-19-5	52.04	EPI	0.2207686	0.0054	EPI	0.9537	CRCB9	0.12375	WATER9	0.0000138	WATER9	9487	YAWS			0.00089	RAGSE
*Cyanogen Bromide	506-68-3	105.92	EPI	1	0.0245	EPI	2.015	CRCB9	0.09841	WATER9	0.0000141	WATER9					0.000255	RAGSE
*Cyanogen Chloride	506-77-4	61.47	EPI	0.0787186	0.0019412	YAWS	1.186	CRCB9	0.12075	WATER9	0.0000142	WATER9			30000	YAWS	0.000394	RAGSE
*Hydrogen Cyanide	74-90-8	27.03	EPI	0.0054374	0.000133	EPI	0.6876	CRCB9	0.1678	WATER9	0.0000168	WATER9			1000000	EPI	0.001	RAGSE
*Potassium Cyanide	151-50-8	65.12	EPI				1.55	CRCB9							720000	EPI	0.002	RAGSE
*Potassium Silver Cyanide	506-61-6	199	EPI														0.002	RAGSE
*Silver Cyanide	506-64-9	133.89	EPI				3.95	CRCB9							23	EPI	0.001	RAGSE
*Sodium Cyanide	143-33-9	49.01	EPI				1.6	CRCB9							582000	CRCB9	0.001	RAGSE
*Thiocyanates	NA																	
*Thiocyanic Acid	463-56-9	59.09	EPI				1.126	PPRVT									0.001	RAGSE
*Zinc Cyanide	557-21-1	117.43	EPI				1.852	CRCB9							17100	EPI	0.0006	RAGSE
Cyclohexane	110-82-7	84.16	EPI	6.1324612	0.15	EPI	0.7739	CRCB9	0.07998	WATER9	9.108E-06	WATER9	145.8	EPI	55	EPI	0.102	EPI
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	513.09	EPI	4.374E-10	1.07E-11	EPI			0.02965	WATER9	3.464E-06	WATER9	2807	EPI	0.45388	EPI	0.00283	EPI
Cyclohexanone	108-94-1	98.15	EPI	0.0003679	0.000009	EPI	0.9478	CRCB9	0.07676	WATER9	9.379E-06	WATER9	17.38	EPI	25000	EPI	0.00152	EPI
Cyclohexene	110-83-8	82.15	EPI	1.8601799	0.0455	EPI			0.10054	WATER9	0.0000117	WATER9	145.8	EPI	213	EPI	0.0431	EPI
Cyclohexylamine	108-91-8	99.18	EPI	0.0001701	0.00000416	EPI	0.8191	CRCB9	0.07129	WATER9	8.539E-06	WATER9	32.17	EPI	1000000	EPI	0.00425	EPI
Cyhalothrin/Karate	68085-85-8	449.86	EPI	0.0000605	0.00000148	EPI			0.03236	WATER9	7.81E-06	WATER9	341300	EPI	0.005	EPI	0.21	EPI
Cypermethrin	52315-07-8	416.31	EPI	0.0000172	0.00000042	EPI	1.25	CRCB9	0.0189	WATER9	4.653E-06	WATER9	79750	EPI	0.004	EPI	0.0769	EPI
Cyromazine	66215-27-8	166.19	EPI	2.31E-12	5.65E-14	EPI			0.06286	WATER9	7.344E-06	WATER9	28.73	EPI	13000	EPI	0.000797	EPI
DDD	72-54-8	320.05	EPI	0.0002698	0.0000066	EPI			0.04061	WATER9	4.745E-06	WATER9	117500	EPI	0.09	EPI	0.251	EPI
DDE, p,p'-	72-55-9	318.03	EPI	0.00017007	0.00000416	EPI			0.04078	WATER9	4.765E-06	WATER9	117500	EPI	0.04	EPI	0.545	EPI
DDE, o,o'-	354-49-3	354.49	EPI	0.00000031	0.000000031	EPI			0.0376	WATER9	4.432E-06	WATER9	158600	EPI	0.0655	EPI	0.622	EPI
Dachal	1861-32-1	331.97	EPI	0.0000081	0.000000218	EPI			0.03963	WATER9	4.63E-06	WATER9	511.1	EPI	0.5	EPI	0.015	EPI
Dalapon	75-99-0	142.97	EPI	2.314E-06	5.66E-08	EPI	1.389	CRCB9	0.06008	WATER9	9.413E-06	WATER9	3.231	EPI	502000	EPI	0.000815	EPI
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'-(BDE-209)	1163-19-5	959.17	EPI	1.819E-06	4.45E-08	EPI	3	IRIS	0.01954	WATER9	2.283E-06	WATER9	276200	EPI	0.0001	EPI	0.725	EPI
Demeton	8065-48-3	258.33	EPI						0.04684	WATER9	5.473E-06	WATER9	837.9	EPI	60	EPI	0.00761	EPI
Di(2-ethylhexyl)adipate	103-23-1	370.58	EPI	0.0000177	0.000000434	EPI	0.922	CRCB9	0.01729	WATER9	4.1							

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table November 2013

Contaminant		Molecular		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H' (unitless)	HLC (atm-m ³ /mole)	H' and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	Kp (cm/hr)	KPREF
Dimethylphenol, 2,4-Dimethylphenol, 2,6-Dimethylphenol, 3,4-Dimethylphenol, 4-Dimethylvinylchloride	105-67-9 576-26-1 95-65-8 513-37-1	122.17 122.17 122.17 90.35	EPI EPI EPI EPI	0.0000389 0.00002719 0.0000017 0.00000572	0.000000951 0.000000665 0.000000415 0.00000014	EPI EPI EPI EPI	0.965 0.983 0.983 0.9186	CR C89 CR C89 CR C89 CR C89	0.06225 0.07717 0.06276 0.05117	WATER9 WATER9 WATER9 WATER9	8.314E-06 9.017E-06 8.407E-06 8.661E-06	WATER9 WATER9 WATER9 WATER9	491.8 501.9 491.8 60.7	EPI EPI EPI EPI	7870 6050 4760 1000	EPI EPI EPI EPI	0.0109 0.012 0.0058 0.0253	EPI EPI EPI EPI
Dinitro-o-cresol, 4,6-Dinitro-o-cyclohexyl Phenol, 4,6-Dinitrobenzene, 1,2-Dinitrobenzene, 1,3-Dinitrobenzene, 1,4-Dinitrophenol, 2,4-Dinitrotoluene Mixture, 2,4/2,6-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Amino-4,6-Dinitrotoluene	528-29-0 99-65-0 100-25-4 51-28-5 NA 182.14 121-14-2 606-20-2 35572-78-2 19406-51-0	168.11 168.11 168.11 184.11 182.14 182.14 182.14 182.14 197.15 197.15	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI	2.179E-06 2.003E-06 0.0000151 3.516E-06 0.0000162 2.208E-06 0.0000305 6.623E-09 6.623E-09	5.33E-08 0.000000049 0.00000037 0.000000086 0.000000397 0.000000054 0.000000747 1.62E-10 1.62E-10	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI	1.3119 1.5751 1.625 1.683 1.3208 1.2833	CR C89 CR C89 CR C89 CR C89 CR C89 CR C89 CR C89 CR C89 CR C89 CR C89	0.04472 0.04591 0.04591 0.04067 0.05913 0.03751 0.03703 0.05609 0.05609	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	8.254E-06 9.211E-06 9.385E-06 9.076E-06 6.909E-06 7.898E-06 7.763E-06 6.554E-06 6.554E-06	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	358.8 351.6 351.6 460.8 587.4 575.6 587.4 283 283	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI	133 533 69 2790 270 200 182 319.49 319.49	EPI EPI EPI EPI EPI EPI SSL EPI EPI	0.00237 0.00174 0.00167 0.00187 0.00416 0.00308 0.0037 0.00204 0.00204	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI
Dinitrotoluene, Technical grade Dinoseb Dioxane, 1,4-Dioxins	25321-14-6 88-85-7 123-91-1 NA 1746-01-6	182.14 240.22 88.11 390.87 321.98	EPI EPI EPI EPI EPI	0.0000162 0.0000186 0.0001962 0.0002233 0.0020442	0.000000397 0.000000456 0.00000048 0.0000057 0.00005	EPI EPI EPI EPI EPI	1.265 1.0337	CR C89 CR C89	0.05913 0.08737	WATER9 WATER9	6.909E-06 0.0000105	WATER9 WATER9	587.4 2.633	EPI EPI	270 1000000	EPI EPI	0.00416 0.000332	EPI EPI
*Hexachlorodibenzo-p-dioxin, Mixture *TCDD, 2,3,7,8-Diphenamid	NA 1746-01-6 957-51-7	390.87 321.98 239.32	EPI EPI EPI	0.0002233 0.0020442 1.484E-09	0.0000057 0.00005 3.63E-11	EPI EPI EPI	1.17	CR C89	0.04268 0.04703	WATER9 WATER9	4.153E-06 4.726E-06	WATER9 WATER9	695200 249100	EPI EPI	0.000004 0.0002	EPI EPI	2.86 0.808	EPI EPI
Diphenyl Sulfone Diphenylamine Diphenylhydrazine, 1,2-Diquat Direct Black 38	127-63-9 122-39-4 122-66-7 85-00-7 1937-37-7	218.27 169.23 184.24 344.05 737.77	EPI EPI EPI EPI EPI	0.0000102 0.00001 0.0000195 5.805E-12 3.365E-38	0.000000249 0.000000269 0.000000478 1.42E-13 1.62E-43	EPI EPI EPI EPI EPI	1.252 1.158 1.158 1.24	CR C89 CR C89 CR C89 CR C89	0.02652 0.04171 0.03431 0.02081	WATER9 WATER9 WATER9 WATER9	6.862E-06 7.628E-06 7.249E-06 5.192E-06	WATER9 WATER9 WATER9 WATER9	1109 825.8 1505 9272	EPI EPI EPI EPI	9.4191 53 221 708000	EPI EPI EPI EPI	0.00367 0.0373 0.013 2.44E-07	EPI EPI EPI EPI
Direct Blue 6 Direct Brown 95 Disulfoton	2602-46-2 16071-86-6 298-04-4	821.67 760.11 274.39	EPI EPI EPI	6.705E-42 6.705E-42 0.0000883	1.64E-43 1.64E-43 0.00000216	EPI EPI EPI	1.144	CR C89	0.02166 0.02281 0.02254	WATER9 WATER9 WATER9	2.531E-06 2.655E-06 5.666E-06	WATER9 WATER9 WATER9	79080000 6985000 837.9	EPI EPI EPI	8.217E-07 9.717E-07 16.3	EPI EPI EPI	1.73E-09 3.87E-12 0.0212	EPI EPI EPI
Dithiane, 1,4-Diuron Dodecane EPTC	505-29-3 330-54-1 2439-10-3	120.23 233.1 287.45	EPI EPI EPI	0.0017171 2.061E-08 3.684E-09	0.0000042 5.04E-10 9.01E-11	EPI EPI EPI	1.078 0.9546	CR C89 CR C89	0.078 0.05016	WATER9 WATER9	9.113E-06 5.861E-06	WATER9 WATER9	145.8 109.1	EPI EPI	3000 42	EPI EPI	0.00108 0.00466	EPI EPI
Endosulfan Endothal Endrin	115-29-7 145-73-3 72-20-8	406.92 186.17 380.91	EPI EPI EPI	0.0026574 1.574E-14 0.0004088	0.0000065 3.85E-16 0.00001	EPI EPI EPI	1.745 1.431	CR C89 CR C89	0.02248 0.03675 0.03616	WATER9 WATER9 WATER9	5.763E-06 8.179E-06 4.225E-06	WATER9 WATER9 WATER9	6761 19.41 20090	EPI EPI EPI	0.325 100000 0.25	EPI EPI EPI	0.00286 0.00263 0.0326	EPI EPI EPI
Epichlorohydrin Epoxybutane, 1,2-Ethephon Etolon	106-88-7 16672-87-0 563-12-2	72.11 144.5 384.46	EPI EPI EPI	0.007359 2.33E-10 2.453E-06	0.0000304 5.7E-12 0.00000379	EPI EPI EPI	1.183 1.2 0.974	PERRY CR C89 CR C89	0.08887 0.05548 0.03148	WATER9 WATER9 WATER9	0.000011 8.568E-06 4.81E-06	WATER9 WATER9 WATER9	9.907 5.028 892	EPI EPI EPI	65900 100000 100000	EPI EPI EPI	0.000944 0.000173 0.0255	EPI EPI EPI
Ethoxyethanol Acetate, 2-Ethoxyethanol, 2-Ethyl Acetate Ethyl Acrylate Ethyl Chloride (Chloroethane) Ethyl Ether Ethyl Methacrylate	141-78-6 140-88-5 75-00-3 60-29-7 97-63-2	88.11 100.12 64.52 74.12 114.15	EPI EPI EPI EPI EPI	0.0005473 0.0138594 0.45380E-1 0.0502862 0.032426	0.00000047 0.0000339 0.0111 0.00123 0.000573	EPI EPI EPI EPI EPI	0.9253 0.9003 0.8902 0.7138 0.9135	CR C89 CR C89 CR C89 CR C89 CR C89	0.08176 0.08231 0.10375 0.08525 0.06534	WATER9 WATER9 WATER9 WATER9 WATER9	9.731E-06 9.703E-06 9.124E-06 9.364E-06 8.79E-06	WATER9 WATER9 WATER9 WATER9 WATER9	1 5.583 10.65 9.699 16.66	EPI EPI EPI EPI EPI	1000000 80000 15000 60400 5400	EPI EPI EPI EPI EPI	0.0003 0.00153 0.00324 0.00235 0.00698	EPI EPI EPI EPI EPI
Ethyl-p-nitrophenyl Phosphonate Ethylbenzene Ethylene Cyanohydrin Ethylene Diamine Ethylene Glycol Ethylene Glycol Monobutyl Ether	2104-64-5 100-41-4 109-78-4 107-15-3 167-21-1 111-76-2	323.31 106.17 71.08 60.1 62.07 118.18	EPI EPI EPI EPI EPI EPI	0.0000182 0.3221586 3.066E-07 7.073E-08 2.453E-06 0.0000054	0.000000444 0.00788 7.5E-09 1.73E-09 0.0000006 0.0000016	EPI EPI EPI EPI EPI EPI	1.27 0.8626 1.0404 0.8979 1.1135 0.9015	CR C89 CR C89 CR C89 CR C89 CR C89 CR C89	0.02175 0.06847 0.10331 0.10544 0.03148 0.06262	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	5.467E-06 8.456E-06 0.000012 0.000012 4.81E-06 8.142E-06	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	15470 446.1 1 14.87 1 2.823	EPI EPI EPI EPI EPI EPI	100000 169 100000 100000 100000 100000	EPI EPI EPI EPI EPI EPI	0.0361 0.0493 0.00148 0.0000318 0.0000877 0.00121	EPI EPI EPI EPI EPI EPI
Ethylene Oxide Ethylene Thiourea Ethyleneimine Ethylphthalyl Ethyl Glycolate Express Fenamiphos	75-21-8 96-45-7 151-56-4 84-72-0 101200-48 22224-92-6	44.05 102.15 43.07 280.28 395.39 303.36	EPI EPI EPI EPI EPI EPI	0.0006057 0.0000137 0.0004947 3.16E-08 4.17E-12 4.947E-08	0.0000148 0.00000336 0.0000121 7.73E-10 1.02E-13 1.21E-09	EPI EPI EPI EPI EPI EPI	0.8821 0.8695 0.1383 0.04436 0.03527 0.02144	CR C89 CR C89 CR C89 CR C89 CR C89 CR C89	0.13397 0.08263 0.13823 0.5184E-06 4.121E-06 5.352E-06	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	0.0000145 0.0000102 0.0000142 5.184E-06 4.121E-06 5.352E-06	WATER9 WATER9 WATER9 WATER9 WATER9 WATER9	3.237 12.97 9.043 1019 94.69 398	EPI EPI EPI EPI EPI EPI	1000000 20000 1000000 992.56 50 329	EPI EPI EPI EPI EPI EPI	0.00056 0.000152 0.000581 0.00119 0.000468 0.00436	EPI EPI EPI EPI EPI EPI
Fenprophatin Fluometuron Fluoride Fluorine (Soluble Fluoride) Fluorone Flurimimidol	39515-41-8 2164-17-2 16984-48-8 7782-41-4 68-08-8 56425-91-3	349.43 232.21 38 38 329 312.29	EPI EPI EPI EPI EPI EPI	0.0003123 1.067E-07 6.828E-06 3.12E-07 5.355E-08 3.12E-07	0.00000764 2.61E-09 0.00000167 8.1E-09 1.31E-09 8.1E-09	EPI EPI EPI EPI EPI EPI	1.553	CR C89	0.0383 0.05029 0.03984 0.04128	WATER9 WATER9 WATER9 WATER9	4.475E-06 5.876E-06 4.655E-06 4.823E-06	WATER9 WATER9 WATER9 WATER9	22490 285.3 56770 2189	EPI EPI EPI EPI	0.33 110 1.69	EPI EPI EPI	0.167 0.00316 0.001	EPI RAGSE RAGSE
Flutolanil Fluvalinate Folpet Fomesafen Fonofos Formaldehyde Formic Acid Fosetyl-AL Furans	66332-96-5 69409-94-5 133-07-3 72178-02-0 944-22-9 50-00-0 64-18-6 39148-24-8	323.32 502.92 296.56 438.76 246.32 30.03 46.03 354.11	EPI EPI EPI EPI EPI EPI EPI EPI	1.3E-07 5.928E-07 3.132E-06 3.078E-11 0.0002854 0.0000138 6.828E-06 3.078E-11	3.18E-09 1.45E-08 7.66E-08 7.53E-13 0.00000698 0.00000337 0.00000167 7.53E-13	EPI EPI EPI EPI EPI EPI EPI EPI	1.28 1.16 0.815 1.22	CR C89 CR C89 CR C89 CR C89	0.01861 0.02402 0.16707 0.14786	WATER9 WATER9 WATER9 WATER9	4.574E-06 6.096E-06 0.0000174 0.0000172	WATER9 WATER9 WATER9 WATER9	1546 855.8 1 685	EPI EPI EPI EPI	50 15.7 400000 100000	EPI EPI EPI EPI	0.000457 0.027 0.00182 0.000378	EPI EPI EPI EPI
Furazolidone Furfural Furium Furmecyclo Glufosinate, Ammonium Glutaraldehyde Glycidyl Glyphosate Goal Guthion	67-45-8 98-01-1 531-82-8 60568-05-0 77182-82-2 111-30-8 765-34-4 1071-83-6 42874-03-3 86-50-0	256.16 96.09 253.23 251.33 198.16 100.12 72.06 169.07 361.71 317.32	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI	1.333E-09 0.000154 5.437E-14 2.817E-07 1.034E-22 9.771E-07 0.0000321 8.585E-11 0.0000335 9.771E-07	3.26E-11 0.00000377 1.33E-15 6.89E-09 2.53E-24 2.39E-08 0.00000784 2.1E-12 0.00000082 2.39E-08	EPI EPI EPI EPI EPI EPI EPI EPI EPI EPI	1.44 1.44 1.35	CR C89 CR C89 CR C89	0.05134 0.08532 0.04747 0.04771	WATER9 WATER9 WATER9 WATER9	5.998E-06 0.0000107 5.466E-06 5.574E-06	WATER9 WATER9 WATER9 WATER9	858.4 6.083 577.6 429	EPI EPI EPI EPI	40 74100 4205.3 0.3	EPI EPI EPI EPI	0.0000803 0.000848 0.000935 0.0499	EPI EPI EPI EPI
Glufosinate, Ammonium Glutaraldehyde Glycidyl Glyphosate Goal Guthion	77182-82-2 111-30-8 765-34-4 1071-83-6 42874-03-3 86-50-0	198.16 100.12 72.06 169.07 361.71 317.32	EPI EPI EPI EPI EPI EPI	1.034E-22 9.771E-07 0.0000321 8.585E-11 0.0000335 9.771E-07	2.53E-24 2.39E-08 0.00000784 2.1E-12 0.00000082 2.39E-08	EPI EPI EPI EPI EPI EPI	1.44 1.44 1.35	CR C89 CR C89 CR C89	0.05134 0.08532 0.04747 0.04771	WATER9 WATER9 WATER9 WATER9	5.998E-06 0.0000107 5.466E-06 5.574E-06	WATER9 WATER9 WATER9 WATER9	858.4 6.083 577.6 429	EPI EPI EPI EPI	40 74100 4205.3 0.3	EPI EPI EPI EPI	0.000803 0.000848 0.000935 0.0499	EPI EPI EPI EPI
Glufosinate, Ammonium Glutaraldehyde Glycidyl Glyphosate Goal Guthion	77182-82-2 111-30-8 765-34-4 1071-83-6 42874-03-3 86-50-0	198.16 100.12 72.06 169.07 361.71 317.32	EPI EPI EPI EPI EPI EPI	1.034E-22 9.771E-07 0.0000321 8.585E-11 0.0000335 9.771E-07	2.53E-24 2.39E-08 0.00000784 2.1E-12 0.00000082 2.39E-08	EPI EPI EPI EPI EPI EPI	1.44 1.44 1.35	CR C89 CR C89 CR C89	0.05134 0.08532 0.04747 0.04771	WATER9 WATER9 WATER9 WATER9	5.998E-06 0.0000107 5.466E-06 5.574E-06	WATER9 WATER9 WATER9 WATER9	858.4 6.083 577.6 429	EPI EPI EPI EPI	40 74100 4205.3 0.3	EPI EPI EPI EPI	0.000803 0.000848 0.000935 0.0499	EPI EPI EPI EPI
Glufosinate, Ammonium Glutaraldehyde Glycidyl Glyphosate Goal Guthion	77182-82-2 111-30-8 765-34-4 1071-83-6 42874-03-3 86-50-0	198.16 100.12 72.06 169.07 361.71 317.32	EPI EPI EPI EPI EPI EPI	1.034E-22 9.771E-07 0.0000321 8.585E-11 0.0000335 9.771E-07	2.53E-24 2.39E-08 0.00000784 2.1E-12 0.00000082 2.39E-08	EPI EPI EPI EPI EPI EPI	1.44 1.44 1.35	CR C89 CR C89 CR C89	0.05134 0.08532 0.04747 0.04771	WATER9 WATER9 WATER9 WATER9	5.998E-06 0.0000107 5.466E-06 5.574E-06	WATER9 WATER9 WATER9 WATER9	858.4 6.083 577.6 429	EPI EPI EPI EPI	40 74100 4205.3 0.3	EPI EPI EPI EPI	0.000803 0.000848 0.000935 0.049	

Contaminant	Molecular		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon		Water Solubility		Permeability		
Analyte	CAS No.	MW	MW Ref	H' (unitless)	HLC (atm-m ³ /mole)	H' and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	Kp (cm ² /d)	KPREF
Lactofen	77501-63-4	461.78	EPI	0.00000193	0.000000472	EPI			0.0318	WATER9	3.716E-06	WATER9	23030	EPI	0.1	EPI	0.00631	EPI
Lead Compounds	301-04-2	325.29	EPI				3.25	CRC89	0.03337	WATER9	9.573E-06	WATER9	1	EPI	443000	CRC89	0.0000208	EPI
Lead acetate	7439-92-1	207.2	EPI				11.3	CRC89	0.02194	WATER9	2.564E-06	WATER9	10.37	EPI	63000	CRC89	0.0001	RAGSE
Lead and Compounds	1335-32-6	805.7	EPI						0.02464	WATER9	6.403E-06	WATER9	647.9	EPI	0.29	EPI	0.0137	EPI
Lead subacetate	78-00-2	323.45	EPI	23.221586	0.568	EPI	1.653	CRC89	0.04799	WATER9	5.608E-06	WATER9	339.8	EPI	75	EPI	0.00839	EPI
Tetraethyl Lead	330-55-2	249.1	EPI	2.555E-07	6.25E-09	EPI			0.0344	WATER9	4.02E-06	WATER9	27.76	EPI	120	EPI	0.001	RAGSE
Linuron	7439-93-2	6.94	EPI	1.545E-13	3.78E-15	EPI	0.534	CRC89	0.05544	WATER9	6.478E-06	WATER9	29.63	EPI	630	EPI	0.0169	EPI
Lithium	83055-99-6	410.4	EPI	1.108E-07	2.71E-09	EPI			0.05081	WATER9	5.937E-06	WATER9	98.4	EPI	48	EPI	0.0173	EPI
MCPA	94-74-6	200.62	EPI	3.663E-08	8.96E-10	EPI			0.053	WATER9	6.193E-06	WATER9	48.51	EPI	620	EPI	0.0131	EPI
MCPB	94-81-5	228.68	EPI						0.02099	WATER9	5.237E-06	WATER9	31.27	EPI	143	EPI	0.000812	EPI
MCPP	93-65-2	214.65	EPI	1.999E-07	4.89E-09	EPI	1.2076	CRC89	0.08839	WATER9	0.0000114	WATER9	1	EPI	163000	PERRY	0.00525	EPI
Malathion	121-75-5	330.35	EPI	1.083E-09	2.65E-11	EPI	1.314	CRC89	0.08173	WATER9	9.549E-06	WATER9	3.303	EPI	4510	EPI	0.000102	EPI
Maleic Anhydride	108-31-6	98.06	EPI	5.356E-06	0.00000031	EPI	1.191	CRC89	0.11507	WATER9	0.0000136	WATER9	3.334	EPI	133000	EPI	0.000266	EPI
Maleic Hydrazide	123-33-1	112.09	EPI	0.0000231	0.000000564	EPI			0.05338	WATER9	6.237E-06	WATER9	607.6	EPI	1000000	EPI	0.000771	EPI
Malononitrile	109-77-3	66.06	EPI	0.0000231	0.000000564	EPI												
Mancozeb	8018-01-7	212.36	EPI				7.3	CRC89	0.03925	WATER9	4.587E-06	WATER9	56.44	EPI	4370	EPI	0.000599	EPI
Maneb	12427-38-2	212.36	EPI	2.314E-08	5.66E-10	EPI	7.3	CRC89	0.0307	SSL	0.0000063	SSL			0.06	EPI	0.001	RAGSE
Manganese (Diet)	7439-96-5	54.94	EPI	0.467	0.0114228	SSL	13.534	CRC89	0.0307	SSL	0.0000063	SSL			0.06	EPI	0.001	RAGSE
Manganese (Non-diet)	7439-96-5	54.94	EPI						0.03925	WATER9	4.587E-06	WATER9	56.44	EPI	4370	EPI	0.000599	EPI
Mephosfolan	950-10-7	269.32	EPI	0.0000127	0.000000294	EPI	1.02	CRC89	0.0204	WATER9	5.029E-06	WATER9	48970	EPI	0.0009971	EPI	4.15	EPI
Mepiquat Chloride	24307-26-4	149.67	EPI	0.0000127	0.000000294	EPI	1.057	CRC89	0.02019	WATER9	4.979E-06	WATER9	2350	EPI	2.3	EPI	0.165	EPI
Mercury Compounds	7487-94-7	271.5	EPI	0.0000127	0.000000294	EPI			0.04446	WATER9	5.195E-06	WATER9	38.57	EPI	8400	EPI	0.00058	EPI
*Mercuric Chloride (and other Mercury salts)	7487-94-7	271.5	EPI	2.314E-08	5.66E-10	EPI			0.09643	WATER9	0.0000106	WATER9	13.05	EPI	25400	EPI	0.00186	EPI
*Mercury (elemental)	7439-97-6	200.59	EPI	0.0000127	0.000000294	EPI			0.05962	WATER9	6.195E-06	WATER9	5.407	EPI	1000000	EPI	0.0000744	EPI
*Methyl Mercury	22967-92-6	215.63	EPI	0.0000127	0.000000294	EPI			0.15828	WATER9	0.0000165	WATER9	1	EPI	1000000	EPI	0.000319	EPI
*Phenylmercury Acetate	62-38-4	336.74	EPI	0.0000127	0.000000294	EPI			0.04218	WATER9	4.928E-06	WATER9	21.24	EPI	187	EPI	0.000913	EPI
Merphos	150-50-5	298.5	EPI	0.0000127	0.000000294	EPI			0.04759	WATER9	3.866E-06	WATER9	10	EPI	58000	EPI	0.000482	EPI
Merphos Oxide	78-48-8	314.5	EPI	0.0000127	0.000000294	EPI			0.04305	WATER9	7.849E-06	WATER9	71.31	EPI	115	EPI	0.00169	EPI
Metalaxyl	57837-19-1	279.34	EPI	1.206E-07	2.95E-09	EPI			0.02208	WATER9	5.593E-06	WATER9	26890	EPI	0.1	EPI	0.0428	EPI
Methacrylonitrile	126-98-7	67.09	EPI	0.0100981	0.000247	EPI	0.8001	CRC89	0.09643	WATER9	0.0000106	WATER9	13.05	EPI	25400	EPI	0.00186	EPI
Methamidophos	10265-92-6	141.13	EPI	3.549E-08	8.68E-10	EPI	1.31	CRC89	0.05962	WATER9	6.195E-06	WATER9	5.407	EPI	1000000	EPI	0.0000744	EPI
Methanol	67-56-1	32.04	EPI	0.0000186	0.00000455	EPI	0.7914	CRC89	0.15828	WATER9	0.0000165	WATER9	1	EPI	1000000	EPI	0.000319	EPI
Methidathion	950-37-8	302.32	EPI	2.931E-07	7.17E-09	EPI			0.04218	WATER9	4.928E-06	WATER9	21.24	EPI	187	EPI	0.000913	EPI
Methylol	16752-77-5	162.21	EPI	8.054E-10	1.97E-11	EPI	1.2946	CRC89	0.04759	WATER9	3.866E-06	WATER9	10	EPI	58000	EPI	0.000482	EPI
Methoxy-5-nitroaniline, 2-	99-59-2	168.15	EPI	6.01E-07	1.47E-08	EPI	1.2068	CRC89	0.04305	WATER9	7.849E-06	WATER9	71.31	EPI	115	EPI	0.00169	EPI
Methoxychlor	72-43-5	345.66	EPI	8.299E-06	0.000000203	EPI	1.41	CRC89	0.02208	WATER9	5.593E-06	WATER9	26890	EPI	0.1	EPI	0.0428	EPI
Methoxyethanol Acetate, 2-	110-49-6	118.13	EPI	0.0000127	0.000000311	EPI	1.0074	CRC89	0.06583	WATER9	8.705E-06	WATER9	2.492	EPI	1000000	EPI	0.000396	EPI
Methoxyethanol, 2-	109-86-4	76.1	EPI	0.0000135	0.00000033	EPI	0.9647	CRC89	0.09515	WATER9	0.000011	WATER9	1	EPI	1000000	EPI	0.00018	EPI
Methyl Acetate	79-20-9	74.08	EPI	0.0047016	0.000115	EPI	0.9342	CRC89	0.09578	WATER9	0.000011	WATER9	3.054	EPI	243000	EPI	0.000792	EPI
Methyl Acrylate	96-33-8	86.09	EPI	0.0001357	0.000199	EPI	0.935	CRC89	0.086	WATER9	0.0000102	WATER9	5.844	EPI	49400	EPI	0.00384	EPI
Methyl Ethyl Ketone (2-Butanone)	78-93-3	72.11	EPI	0.002322	0.0000569	EPI	0.7999	CRC89	0.09144	WATER9	0.0000102	WATER9	4.561	EPI	223000	EPI	0.000962	EPI
Methyl Hydrazine	60-34-4	46.07	EPI	1.292E-06	3.16E-08	EPI	0.866	LANGE	0.12909	WATER9	0.000014	WATER9	13.31	EPI	1000000	EPI	0.000173	EPI
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	100.16	EPI	0.0056419	0.000138	EPI	0.7965	CRC89	0.06978	WATER9	3.848E-06	WATER9	12.6	EPI	19000	EPI	0.00319	EPI
Methyl Isocyanate	624-83-9	57.05	EPI	0.0378577	0.000926	EPI	0.9588	CRC89	0.11655	WATER9	0.0000131	WATER9	39.6	EPI	48330	EPI	0.0025	EPI
Methyl Methacrylate	80-62-6	100.12	EPI	0.0130417	0.000319	EPI	0.9377	CRC89	0.07504	WATER9	9.209E-06	WATER9	9.14	EPI	15000	EPI	0.00355	EPI
Methyl Parathion	298-00-0	263.21	EPI	4.088E-06	0.0000001	EPI	1.358	CRC89	0.02498	WATER9	6.439E-06	WATER9	729.3	EPI	37.7	EPI	0.00416	EPI
Methyl Phosphonic Acid	993-13-5	96.02	EPI	4.988E-10	1.22E-11	EPI			0.09061	WATER9	0.0000106	WATER9	1.407	EPI	20000	EPI	0.0000984	EPI
Methyl Styrene (Mixed Isomers)	25013-15-4	118.18	EPI	0.1230581	0.00301	EPI			0.0789	WATER9	9.218E-06	WATER9	715.8	EPI	89	EPI	0.066	EPI
Methyl methanesulfonate	66-27-3	110.13	EPI	0.0001648	0.00000403	EPI	1.2943	CRC89	0.07891	WATER9	0.0000106	WATER9	4.332	EPI	200000	LANGE	0.000138	EPI
Methyl tert-Butyl Ether (MTBE)	1634-04-4	88.15	EPI	0.0239984	0.000587	EPI	0.7353	CRC89	0.07527	WATER9	8.591E-06	WATER9	11.56	EPI	51000	EPI	0.00211	EPI
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	195.09	EPI	2.61E-16	6.38E-18	EPI			0.05648	WATER9	6.6E-06	WATER9	201.5	EPI	389.71	EPI	5.39E-06	EPI
Methyl-5-Nitroaniline, 2-	99-55-8	152.15	EPI	7.931E-07	1.94E-08	EPI			0.0667	WATER9	7.89E-06	WATER9	178.6	EPI	113.11	EPI	0.00384	EPI
Methyl-N-nitro-N-nitrosoguanidine, N	70-25-7	147.09	EPI	4.988E-11	1.22E-12	EPI			0.06819	WATER9	7.967E-06	WATER9	72.02	EPI	1000000	EPI	0.0000572	EPI
Methylaniline Hydrochloride, 2-	636-21-5	143.62	EPI	0.0000809	0.00000198	EPI			0.06928	WATER9	8.095E-06	WATER9	115	EPI	16600	EPI	0.00296	EPI
Methylarsonic Acid	124-58-3	139.97	EPI						0.07048	WATER9	8.235E-06	WATER9	43.89	EPI	256000	EPI	0.0000419	EPI
Methylbenzene,1,4-diamine monohydrochloride, 2-	74612-12-7																	
Methylbenzene,1,4-diamine sulfate, 2-	615-50-9																	
Methylcholanthrene, 3-	56-49-5	268.36	EPI	0.0002142	0.00000524	EPI	1.28	CRC89	0.02406	WATER9	6.143E-06	WATER9	961600	EPI	0.0029	EPI	0.903	EPI
Methylene Chloride	75-09-2	84.93	EPI	0.13287	0.00325	EPI	1.3266	CRC89	0.09994	WATER9	0.0000125	WATER9	21.73	EPI	13000	EPI	0.00354	EPI
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	267.16	EPI	4.661E-10	1.14E-11	EPI			0.0458	WATER9	5.352E-06	WATER9	5698	EPI	13.9	EPI	0.0197	EPI
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	254.38	EPI	4.947E-06	0.000000121	EPI			0.04733	WATER9	5.53E-06	WATER9	2667	EPI	5.4926	EPI	0.0843967	RAGSE
Methylenebisbenzenamine, 4,4'-	101-77-9	198.27	EPI	6.46E-10	1.58E-11	EPI			0.05588	WATER9	6.529E-06	WATER9	2126	EPI	1000	EPI	0.00138	EPI
Methylenediphenyl Diisocyanate	101-68-8	250.26	EPI	0.0000366	0.000000895	EPI	1.197	CRC89	0.02417	WATER9	6.153E-06	WATER9	284900	EPI	1.836	EPI	0.181	EPI
Methylstyrene, Alpha-	98-83-9	118.18	EPI	0.1043518	0.0025	EPI	0.9106	CRC89	0.0629	WATER9	8.455E-06	WATER9	697.8	EPI	116	EPI	0.0659	EPI
Metolachlor	51218-45-2	283.8	EPI	3.68E-07	0.000000009	EPI	1.12	CRC89	0.02192	WATER9	5.483E-06	WATER9	489.5	EPI	531	EPI	0.00339	EPI
Metribuzin	21087-64-9	214.29	EPI	4.783E-09	1.17E-10	EPI	1.31	CRC89	0.02734	WATER9	7.129E-06	WATER9	53.13	EPI	1050	EPI	0.	

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table November 2013

Contaminant	Molecular		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon		Water Solubility		Permeability		
Analyte	CAS No.	MW	MW Ref	H ¹ (unitless)	HLC (atm-m ³ /mole)	H ¹ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	Kp (cm ² /d)	KPREF
Pentachloronitrobenzene	82-68-8	295.34	EPI	0.001807	0.0000442	EPI	1.718	CRC89	0.02627	WATER9	6.92E-06	WATER9	5996	EPI	0.44	EPI	0.0418	EPI
Pentachlorophenol	87-86-5	266.34	EPI	1.002E-06	2.45E-08	EPI	1.978	CRC89	0.02952	WATER9	8.012E-06	WATER9	4959	EPI	14	EPI	0.127	EPI
Pentaerythritol tetranitrate (PETN)	78-11-5	316.14	EPI	4.906E-10	1.2E-11	EPI	1.773	CRC89	0.02576	WATER9	6.77E-06	WATER9	647.9	EPI	43	EPI	0.00101	EPI
Pentane, n-	109-66-0	72.15	EPI	51.103843	1.25	EPI	0.6262	CRC89	0.08213	WATER9	8.798E-06	WATER9	72.17	EPI	38	EPI	0.11	EPI
Perchlorates																		
Ammonium Perchlorate	7790-98-9	117.49	EPI				1.95	CRC89							200000	EPI	0.001	RAGSE
Lithium Perchlorate	7791-03-9	106.39	CRC89				2.428	CRC89							587000	CRC89	0.001	RAGSE
Perchlorate and Perchlorate Salts	14797-73-0	117.49	CRC89												245000	CRC89	0.001	RAGSE
Potassium Perchlorate	7778-74-7	138.55	EPI				2.52	CRC89							15000	EPI	0.002	RAGSE
Sodium Perchlorate	7601-89-0	122.44	EPI				2.52	CRC89							2100000	EPI	0.001	RAGSE
Permethrin	52645-53-1	391.3	EPI	0.0000765	0.00000187	EPI	1.23	CRC89	0.01938	WATER9	4.783E-06	WATER9	118800	EPI	0.006	EPI	0.208	EPI
Phenacetin	62-44-2	179.22	EPI	8.708E-09	2.13E-10	EPI			0.05977	WATER9	6.984E-06	WATER9	40.99	EPI	766	EPI	0.00173	EPI
Phenmedipham	13684-63-4	300.32	EPI	3.438E-11	8.41E-13	EPI			0.04237	WATER9	4.95E-06	WATER9	2594	EPI	4.7	EPI	0.00786	EPI
Phenol	108-95-2	94.11	EPI	0.0000136	0.000000333	EPI	1.0545	CRC89	0.0834	WATER9	0.0000103	WATER9	187.2	EPI	82800	EPI	0.00434	EPI
Phenothiazine	92-84-2	199.27	EPI	1.14E-06	2.78E-08	EPI			0.05569	WATER9	6.507E-06	WATER9	1475	EPI	1.59	EPI	0.0683	EPI
Phenylenediamine, m-	108-45-2	108.14	EPI	5.11E-08	1.25E-09	EPI	1.0096	CRC89	0.07212	WATER9	9.131E-06	WATER9	33.83	EPI	238000	EPI	0.000234	EPI
Phenylenediamine, o-	95-54-5	108.14	EPI	2.944E-07	7.2E-09	EPI			0.08371	WATER9	9.781E-06	WATER9	34.52	EPI	40400	EPI	0.000487	EPI
Phenylenediamine, p-	106-50-3	108.14	EPI	3.63E-08	8.88E-10	EPI			0.08371	WATER9	9.781E-06	WATER9	33.83	EPI	37000	EPI	0.000245	EPI
Phenylphenol, 2-	90-43-7	170.21	EPI	0.0000429	0.00000105	EPI	1.213	CRC89	0.04209	WATER9	7.816E-06	WATER9	6722	EPI	700	EPI	0.0196	EPI
Phosphate	298-02-2	260.37	EPI	0.0001787	0.00000437	EPI	1.16	CRC89	0.02333	WATER9	5.897E-06	WATER9	459.8	EPI	50	EPI	0.0126	EPI
Phosgene	75-44-5	98.92	EPI	0.6827473	0.0167	EPI	1.3719	CRC89	0.08933	WATER9	0.0000117	WATER9	1	EPI	6825.5	YAWS	0.000147	EPI
Phosmet	732-11-6	317.32	EPI	3.426E-07	8.38E-09	EPI			0.04084	WATER9	4.772E-06	WATER9	10	EPI	24.4	EPI	0.00183	EPI
Phosphates, Inorganic																		
Aluminum metaphosphate	13776-88-0	263.9	CRC89				2.779	CRC89									0.001	RAGSE
Ammonium polyphosphate	68333-79-9																0.001	RAGSE
Calcium pyrophosphate	7790-76-3	254.1	CRC89				3.09	CRC89									0.001	RAGSE
Diammonium phosphate	7783-28-0	132.06	EPI														0.001	RAGSE
Dicalcium phosphate	7757-93-9	136.06	EPI														0.001	RAGSE
Diamagnesium phosphate	7782-75-4	174.33	CRC89				2.123	CRC89									0.001	RAGSE
Dipotassium phosphate	7758-11-4	174.18	EPI														0.001	RAGSE
Disodium phosphate	7558-79-4	141.96	EPI														0.001	RAGSE
Monoaluminum phosphate	13530-50-2	317.94	CRC89														0.001	RAGSE
Monoammonium phosphate	7722-76-1	115.03	EPI														0.001	RAGSE
Monocalcium phosphate	7758-23-8	234.05	EPI														0.001	RAGSE
Monomagnesium phosphate	7757-86-0	120.28	CRC89														0.001	RAGSE
Monopotassium phosphate	7778-77-0	136.09	EPI														0.001	RAGSE
Monosodium phosphate	7558-80-7	119.98	EPI														0.001	RAGSE
Polysphoric acid	8017-16-1	257.96	EPI														0.001	RAGSE
Potassium tripolyphosphate	13845-36-8																0.001	RAGSE
Sodium acid pyrophosphate	7758-16-9	221.94	EPI														0.001	RAGSE
Sodium aluminum phosphate (acidic)	7785-88-8																0.001	RAGSE
Sodium aluminum phosphate (anhydrous)	10279-59-1																0.001	RAGSE
Sodium aluminum phosphate (tetrahydrate)	10305-76-7																0.001	RAGSE
Sodium hexametaphosphate	10124-56-8	611.17	CRC89														0.001	RAGSE
Sodium polyphosphate	68915-31-1	359.92	EPI														0.001	RAGSE
Sodium trimetaphosphate	7785-84-4	305.89	EPI														0.001	RAGSE
Sodium tripolyphosphate	7758-29-4	367.86	EPI														0.001	RAGSE
Tetrapotassium phosphate	7320-34-5	330.34	EPI														0.001	RAGSE
Tetrasodium pyrophosphate	7722-88-5	265.9	EPI														0.001	RAGSE
Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5						3.14	CRC89									0.001	RAGSE
Tricalcium phosphate	7758-87-4	310.18	CRC89														0.001	RAGSE
Trimagnesium phosphate	7757-87-1	262.86	CRC89														0.001	RAGSE
Trisodium phosphate	7778-53-2	212.27	EPI														0.001	RAGSE
Trisodium phosphate	7601-54-9	163.94	EPI														0.001	RAGSE
Phosphine	7803-51-2	34	EPI				1.39	CRC89							3.3	EPI	0.001	RAGSE
Phosphoric Acid	7664-38-2	98	EPI				1.834	PERRY							5480000	CRC89	0.001	RAGSE
Phosphorus, White	7723-14-0	30.974	CRC89				2.69	CRC89							3.3	EPI	0.001	RAGSE
Phthalates																		
Bis(2-ethylhexyl)phthalate	117-81-7	390.57	EPI	0.000011	0.00000027	EPI	0.981	CRC89	0.01734	WATER9	4.181E-06	WATER9	119600	EPI	0.27	EPI	1.13	EPI
Butylphthalyl Butylglycolate	85-70-1	336.39	EPI	1.259E-07	3.08E-09	EPI	1.1	LANGE	0.01987	WATER9	4.898E-06	WATER9	11240	EPI	8.4709	EPI	0.0116	EPI
Dibutyl Phthalate	84-74-2	278.35	EPI	0.000074	0.00000181	EPI	1.0465	CRC89	0.02144	WATER9	5.326E-06	WATER9	1157	EPI	11.2	EPI	0.042	EPI
Diethyl Phthalate	84-66-2	222.24	EPI	0.0000249	0.00000061	EPI	1.232	CRC89	0.02607	WATER9	6.723E-06	WATER9	104.9	EPI	1080	EPI	0.0036	EPI
Dimethylterephthalate	120-61-6	194.19	EPI	0.00054783	0.000134	EPI	1.075	CRC89	0.02853	WATER9	6.717E-06	WATER9	30.96	EPI	19	EPI	0.00399	EPI
Octyl Phthalate, di-N-	117-84-0	390.57	EPI	0.0001051	0.00000257	EPI			0.03556	WATER9	4.155E-06	WATER9	140800	EPI	0.022	EPI	2.43	EPI
9-Octadecylic Acid, n-	500-21-0	166.13	EPI	1.586E-11	3.88E-13	EPI	1.51	PERRY	0.04872	WATER9	9.045E-06	WATER9	79.24	EPI	15	EPI	0.0043	EPI
Phthalic Anhydride	85-44-9	148.12	EPI	6.664E-07	1.63E-08	EPI	1.527	CRC89	0.05948	WATER9	9.755E-06	WATER9	10	EPI	6200	EPI	0.0267	EPI
Picloram	1918-02-1	241.46	EPI	2.179E-12	5.33E-14	EPI			0.049	WATER9	5.725E-06	WATER9	38.77	EPI	430	EPI	0.00127	EPI
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	199.12	EPI	7.604E-13	1.86E-14	EPI			0.05572	WATER9	6.51E-06	WATER9	226.5	EPI	1400	EPI	0.000496	EPI
Pirimiphos, Methyl	29232-93-7	305.33	EPI	0.0000287	0.000000701	EPI	1.17	CRC89	0.02154	WATER9	5.387E-06	WATER9	374.7	EPI	8.6	EPI	0.0187	EPI
Polybrominated Biphenyls	59536-65-1																	
Polychlorinated Biphenyls (PCBs)																		
Aroclor 1016	12674-11-2	257.55	EPI	0.0081766	0.0002	EPI			0.04694	WATER9	5.484E-06	WATER9	47700	EPI	0.42	EPI	0.305	EPI
Aroclor 1221	11104-28-2	188.66	EPI	0.0300899	0.000736	EPI			0.05776	WATER9	6.749E-06	WATER9	8397	EPI	15	EPI	0.168	EPI
Aroclor 1232	11141-16-5	188.66	EPI	0.0300899	0.000736	EPI			0.05776	WATER9	6.749E-06	WATER9	8397	EPI	1.45	EPI	0.168	EPI
Aroclor 1242	53469-21-9	291.99	EPI	0.0077678	0.00019	EPI			0.04317	WATER9	5.044E-06	WATER9	78100	EPI	0.277	EPI	0.545	EPI
Aroclor 1248	12672-29-6	291.99	EPI	0.0179886	0.00044	EPI			0.04317	WATER9	5.044E-06	WATER9	76530	EPI	0.1	EPI	0.475	EPI
Aroclor 1254	11097-69-1	326.44	EPI	0.0115699	0.000283	EPI			0.04008	WATER9	4.683E-06	WATER9	130500	EPI	0.043	EPI	0.751	EPI
Aroclor 1260	11096-82-5	395.33	EPI	0.0137367	0.000336	EPI			0.03527	WATER9	4.121E-06	WATER9	349700	EPI	0.0144	EPI	0.986	EPI
Heptachlorobiphenyl, 2,3',4',4',5,5' (PCB 189)	39635-31-9	395.33	EPI	0.0056419	0.000138	EPI			0.03527	WATER9	4.121E-06	WATER9	349700	EPI	0.000753	EPI	2.96	EPI
Hexachlorobiphenyl, 2,3',4',4',5,5' (PCB 187)	52663-72-6	360.88	EPI	0.0066231	0.000162	EPI			0.03748	WATER9	4.38E-06	WATER9	209300	EPI	0.00223	EPI	1.43	EPI
Hexachlorobiphenyl, 2,3',4',4',5' (PCB 157)	69782-90-7	360.88	EPI															

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table November 2013

Contaminant	Molecular		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon		Water Solubility		Permeability		
Analyte	CAS No.	MW	MW Ref	H' (unitless)	H' (atm-m ³ /mole)	H' and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	Kp (cm ² /d)	KPREF
Propylene Glycol	57-55-6	76.1	EPI	5.274E-07	1.29E-08	EPI	1.0361	CRC89	0.09806	WATER9	0.0000115	WATER9	1	EPI	1000000	EPI	0.000143	EPI
Propylene Glycol Dinitrate	6423-43-4	166.09	EPI	0.0000385	0.00000942	EPI			0.06288	WATER9	7.347E-06	WATER9	60.7	EPI	3261.9	EPI	0.00208	EPI
Propylene Glycol Monoethyl Ether	1569-02-4	104.15	EPI	1.002E-06	2.45E-08	EPI			0.08583	WATER9	0.0000115	WATER9	1.303	EPI	7899.70	EPI	0.000409	EPI
Propylene Glycol Monomethyl Ether	107-98-2	90.12	EPI	0.0000376	0.0000092	EPI	0.962	CRC89	0.08315	WATER9	0.0000115	WATER9	1	EPI	1000000	EPI	0.0003717	RAGSE
Propylene Oxide	75-56-9	58.08	EPI	0.0028455	0.0000696	EPI	0.831	PERRY	0.10851	WATER9	0.0000119	WATER9	5.194	EPI	590000	EPI	0.000774	EPI
Pursult	81335-77-5	289.34	EPI	4.252E-15	1.04E-16	EPI			0.04343	WATER9	5.075E-06	WATER9	339.1	EPI	1400	EPI	0.002	EPI
Pydrin	51630-58-1	419.91	EPI	1.411E-06	3.45E-08	EPI	1.15	CRC89	0.01806	WATER9	4.404E-06	WATER9	317000	EPI	0.024	EPI	0.0938	EPI
Pyridine	110-86-1	79.1	EPI	0.0004497	0.000011	EPI	0.9819	CRC89	0.09309	WATER9	0.0000109	WATER9	71.72	EPI	1000000	EPI	0.00152	EPI
Quinalphos	13593-03-8	298.3	EPI	1.897E-06	4.64E-08	EPI			0.04256	WATER9	4.973E-06	WATER9	4185	EPI	22	EPI	0.0296	EPI
Quinoline	91-22-5	129.16	EPI	0.0000683	0.00000167	EPI	1.0977	CRC89	0.0618	WATER9	8.687E-06	WATER9	1544	EPI	6110	EPI	0.00659	EPI
Refractory Ceramic Fibers	NA																0.001	RAGSE
Resmethrin	10453-86-8	338.45	EPI	5.437E-06	0.000000133	EPI			0.03912	WATER9	4.571E-06	WATER9	311400	EPI	0.0379	EPI	0.238	EPI
Ronnel	299-84-3	321.54	EPI	0.0013083	0.000032	EPI	1.44	CRC89	0.02316	WATER9	5.915E-06	WATER9	4457	EPI	1	EPI	0.043	EPI
Rotenone	83-79-4	394.43	EPI	4.579E-12	1.12E-13	EPI			0.03533	WATER9	4.128E-06	WATER9	261100	EPI	0.2	EPI	0.00509	EPI
Safrole	94-59-7	162.19	EPI	0.0003708	0.00000907	EPI	1.1	CRC89	0.04423	WATER9	7.587E-06	WATER9	207.2	EPI	5.8996	EPI	0.011285	RAGSE
Savay	78587-05-0	352.88	EPI	9.689E-07	2.37E-08	EPI			0.03805	WATER9	4.446E-06	WATER9	2120	EPI	0.5	EPI	0.0828	EPI
Selenious Acid	7783-00-8	128.97	EPI				3	CRC89							900000	PERRY	0.001	RAGSE
Selenium	7782-49-2	78.96	CRC89				4.809	CRC89									0.001	RAGSE
Selenium Sulfide	7446-34-6	111.02	EPI														0.001	RAGSE
Sethoxydim	74051-80-2	327.49	EPI	8.831E-10	2.16E-11	EPI	1.043	CRC89	0.01963	WATER9	4.821E-06	WATER9	4374	EPI	25	EPI	0.0185	EPI
Silica (crystalline, respirable)	7631-86-9	60.08	EPI				2.32	PERRY									0.001	RAGSE
Silver	7440-22-4	107.87	EPI				10.5	CRC89									0.0006	RAGSE
Simazine	122-34-9	201.66	EPI	3.851E-08	9.42E-10	EPI	1.302	CRC89	0.02814	WATER9	7.367E-06	WATER9	146.5	EPI	6.2	EPI	0.00325	EPI
Sodium Acifluorfen	62476-59-9	383.65	EPI	2.473E-09	6.05E-11	EPI			0.03599	WATER9	4.205E-06	WATER9	3880	EPI	250000	EPI	0.0000195	EPI
Sodium Azide	26628-22-8	65.01	EPI				1.846	CRC89							408000	CRC89	0.001	RAGSE
Sodium Diethyldithiocarbamate	148-18-5	171.25	EPI						0.06161	WATER9	7.199E-06	WATER9	204.5	EPI	427890	EPI	0.0000192	EPI
Sodium Fluoride	7681-49-4	41.99	EPI				2.78	CRC89							42200	EPI	0.001	RAGSE
Sodium Fluoroacetate	62-74-8	100.03	EPI	0.0000446	0.00000109	EPI			0.08817	WATER9	0.0000103	WATER9	1.44	EPI	1110000	EPI	1.32E-06	EPI
Sodium Metavanadate	13718-26-8	121.93	CRC89												210000	CRC89	0.001	RAGSE
Stirofos (Tetrachlorovinphos)	961-11-5	365.97	EPI	7.523E-08	1.84E-09	EPI			0.03714	WATER9	4.339E-06	WATER9	1375	EPI	11	EPI	0.00307	EPI
Strontium, Stable	7440-24-6	87.62	EPI				2.64	CRC89									0.001	RAGSE
Strychnine	57-24-9	334.42	EPI	2.437E-12	5.96E-14	EPI	1.36	CRC89	0.02208	WATER9	5.582E-06	WATER9	5403	EPI	160	EPI	0.000399	EPI
Styrene	100-42-5	104.15	EPI	0.1124285	0.00275	EPI	0.9016	CRC89	0.07111	WATER9	8.784E-06	WATER9	446.1	EPI	310	EPI	0.0372	EPI
Sulfolane	126-33-0	120.17	EPI	0.000198	0.00000485	EPI	1.2723	CRC89	0.0716	WATER9	9.912E-06	WATER9	9.079	EPI	292860	EPI	0.000102	EPI
Sulfonilbils(4-chlorobenzene), 1,1'-	80-07-9	287.16	EPI	5.601E-06	0.000000137	EPI			0.04365	WATER9	5.1E-06	WATER9	2855	EPI	0.51209	EPI	0.0149	EPI
Sulfuric Acid	7664-93-9	98.07	EPI				1.8302	CRC89							1000000	EPI	0.001	RAGSE
Systhane	88671-89-0	288.78	EPI	1.75E-07	4.28E-09	EPI			0.04349	WATER9	5.081E-06	WATER9	6075	EPI	142	EPI	0.00337	EPI
TCMTB	21564-17-0	238.34	EPI	2.653E-10	6.49E-12	EPI			0.04943	WATER9	5.775E-06	WATER9	3374	EPI	125	EPI	0.0112	EPI
Tebuthiuron	34014-18-1	228.31	EPI	4.906E-09	1.2E-10	EPI			0.05086	WATER9	5.943E-06	WATER9	42.35	EPI	2500	EPI	0.00127	EPI
Temephos	3383-96-8	466.46	EPI	8.013E-08	1.95E-09	EPI	1.32	CRC89	0.01829	WATER9	4.451E-06	WATER9	95600	EPI	0.27	EPI	0.0345	EPI
Terbacol	5902-51-2	216.67	EPI	4.906E-09	1.2E-10	EPI	1.105	CRC89	0.02747	WATER9	7.139E-06	WATER9	50.1	EPI	710	EPI	0.00137	EPI
Terbufos	13071-79-9	288.42	EPI	0.0009812	0.000024	EPI	1.105	CRC89	0.0216	WATER9	5.386E-06	WATER9	998.9	EPI	5.07	EPI	0.0358	EPI
Terbutryn	886-50-0	241.36	EPI	8.79E-07	2.15E-08	EPI	1.115	CRC89	0.02383	WATER9	6.026E-06	WATER9	607	EPI	25	EPI	0.0212	EPI
Tetrabromodiphenyl ether, 2,2',4,4'-(BDE-47)	5436-43-1	485.8	EPI	0.0003467	0.000000848	EPI			0.03075	WATER9	3.592E-06	WATER9	13230	EPI	0.054234	EPI	0.0929	EPI
Tetrachlorobenzene, 1,2,4,5-	95-94-3	215.89	EPI	0.0408831	0.001	EPI	1.858	CRC89	0.0319	WATER9	8.753E-06	WATER9	2220	EPI	0.595	EPI	0.117	EPI
Tetrachloroethane, 1,1,1,2-	630-20-6	167.85	EPI	0.1022077	0.0025	EPI	1.5406	CRC89	0.04818	WATER9	9.098E-06	WATER9	86.03	EPI	1070	EPI	0.0159	EPI
Tetrachloroethane, 1,1,2,2-	79-34-5	167.85	EPI	0.0150041	0.000367	EPI	1.5953	CRC89	0.04892	WATER9	9.29E-06	WATER9	94.94	EPI	2830	EPI	0.00694	EPI
Tetrachloroethylene	127-18-4	165.83	EPI	0.7236304	0.0177	EPI	1.623	CRC89	0.05047	WATER9	9.455E-06	WATER9	94.94	EPI	206	EPI	0.0334	EPI
Tetrachlorophenol, 2,3,4,6-	58-90-2	231.89	EPI	0.0003614	0.00000884	EPI			0.05034	WATER9	5.882E-06	WATER9	2969	EPI	23	EPI	0.071	EPI
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	229.92	EPI	0.0078904	0.000193	EPI	1.4463	CRC89	0.02759	WATER9	7.252E-06	WATER9	1606	EPI	6.1149	EPI	0.0836	EPI
Tetraethyl Dithiophosphosphate	3689-24-5	322.31	EPI	0.0000189	0.00000445	EPI	1.196	CRC89	0.02116	WATER9	5.284E-06	WATER9	26.5	EPI	30	EPI	0.0109	EPI
Tetrafluoroethane, 1,1,1,2-	811-97-2	102.03	EPI	2.0441537	0.05	EPI	1.2072	CRC89	0.08231	WATER9	0.0000106	WATER9	86.03	EPI	1089.7	EPI	0.00548	EPI
4-Terpyl (Tris(2-pyridylmethyl)amine)	479-45-8	287.16	EPI	1.108E-07	2.71E-09	EPI	1.57	CRC89	0.02556	WATER9	6.667E-06	WATER9	4605	EPI	74	EPI	0.000474	EPI
Thallium (I) Nitrate	10102-45-1	266.39	EPI				5.55	CRC89							95500	EPI	0.001	RAGSE
Thallium (Soluble Salts)	7440-28-0	204.38	EPI				11.8	CRC89									0.001	RAGSE
Thallium Acetate	563-68-8	263.43	EPI				3.68	CRC89							10000	EPI	0.001	RAGSE
Thallium Carbonate	6533-73-9	468.78	EPI				7.11	CRC89							52000	EPI	0.001	RAGSE
Thallium Chloride	7791-12-0	239.84	EPI				7	CRC89							2900	EPI	0.001	RAGSE
Thallium Sulfate	7446-18-6	504.82	EPI				6.77	CRC89							54700	CRC89	0.001	RAGSE
Thiobencarb	28249-77-6	257.78	EPI	0.0000109	0.000000267	EPI	1.16	CRC89	0.02345	WATER9	5.932E-06	WATER9	1628	EPI	28	EPI	0.0102	EPI
Thiodiglycol	111-48-8	122.18	EPI	1.12E-11	2.74E-13	EPI	1.1793	CRC89	0.06802	WATER9	9.377E-06	WATER9	1	EPI	1000000	EPI	0.000123	EPI
Thiofanox	39196-18-8	218.32	EPI	3.839E-07	9.39E-09	EPI			0.0524	WATER9	6.123E-06	WATER9	72.4	EPI	5200	EPI	0.00627	EPI
Thiophanate, Methyl	23564-05-4	342.39	EPI	4.947E-08	1.21E-09	EPI			0.03882	WATER9	4.536E-06	WATER9	32.74	EPI	26.6	EPI	0.00016	EPI
Thiram	137-26-8	240.42	EPI	7.441E-06	0.000000182	EPI	1.29	CRC89	0.02557	WATER9	6.592E-06	WATER9	611.4	EPI	30	EPI	0.00099	EPI
Thiuron	7440-31-5	118.71	CRC89				7.287	CRC89									0.001	RAGSE
Titanium Tetrachloride	7550-45-0	189.68	EPI				1.73	CRC89									0.001	RAGSE
Toluene	108-88-3	92.14	EPI	0.2714636	0.00664	EPI	0.8623	CRC89	0.07781	WATER9	9.205E-06	WATER9	233.9	EPI	526	EPI	0.0311	EPI
Toluene-2,5-diamine	95-70-5	122.17	EPI	3.892E-08	9.52E-10	EPI			0.07717	WATER9	9.017E-06	WATER9	55.39	EPI	13847	EPI	0.00041	EPI
Toluidine, p-	106-49-0	107.16	EPI	0.0000826	0.00000202	EPI	0.9619	CRC89	0.07122	WATER9	8.977E-06	WATER9	112.7	EPI	6500	EPI	0.00329	EPI
Total Petroleum Hydrocarbons (Aliphatic High)	NA	170.34	EPI	334.42355	8.18	EPI			0.06183	WATER9	7.225E-06	WATER9	4818	EPI	0.0037	EPI	1	

Workbook Overview

Introduction:

This tool provides screening level concentrations for groundwater, soil gas (sub-slab and exterior), and indoor air to assist Agency staff with making a VI determination based on limited, initial data.

The main source of information used is EPA's Regional Screening Levels (RSL), which are updated semi-annually (EPA 2014). Revisions to the RSL values may result in changes to the calculator output.

Because the RSLs are updated semi-annually, the most recent toxicity information may not be included in the calculator between updates.

Please refer to EPA's draft VI Guidance (EPA 2002) and other EPA documents (EPA 2009, 2010) for additional information on assessing the VI pathway at Superfund and Resource Conservation and Recovery Act (RCRA) sites.

For questions, please contact:

Dave Bartenfelder
Office of Superfund Remediation & Technology Innovation
(703) 603-9047
Email: Bartenfelder.David@epamail.epa.gov

Worksheet Summary:

Worksheet Name	Acronym definition	Description
VISL	VISL = Vapor intrusion screening level	Main worksheet where the user can enter the scenario, risk information, and select chemicals to calculate the target values for groundwater, soil gas (sub-slab and exterior), and indoor air. The tool calculates target values for cancer risk (including mutagenic-mode-of-action) and noncancer hazard. It is designed to correctly handle chemicals such as trichloroethylene (which has cancer risk from both the standard and mutagenic modes of action), and vinyl chloride (which uses a special cancer risk equation).
SG_IA_calc	SG_IA_calc = Soil gas to indoor air calculator	Forward risk calculator where the user can enter the scenario, risk information, soil gas concentrations, and select chemicals to calculate indoor air concentration and indoor air risk.
GW_IA_calc	GW_IA_calc = Groundwater to indoor air calculator	Forward risk calculator where the user can enter the scenario, risk information, groundwater concentrations, and select chemicals to calculate indoor air concentration and indoor air risk.
IA_risk_calc	IA_risk_calc = Indoor air to risk calculator	Forward risk calculator where the user can enter the scenario, risk information, indoor air concentrations, and select chemicals to calculate indoor air risk.
ChemProps	N/A	Supporting worksheet that contains a compilation of physical and chemical properties of each chemical, which are used in the calculations for the VISL worksheet. Not all parameters in the ChemProps table are used in the VISL.
Tox Summary	Tox = Toxicity	Supporting worksheet that is a duplicate of the "Summary" table from the latest update of the EPA RSL table.
Parameters Summary	N/A	Supporting worksheet that is a duplicate of the "Parameters" table from the latest update of the EPA RSL table.
Version Notes	N/A	Lists changes made to each version of the VISL calculator workbook.

Note that the Tox Summary and Parameters Summary worksheets are downloaded from EPA's RSL website at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm.

Worksheet Use:

Be sure to enable macros to use full functionality of the calculator.

Note that changes to supporting data may affect the results of the calculator. As such, some cells have been locked to protect the integrity of the tool.

If modifications are made to values or scenarios, it is suggested the user save each file in order to capture those changes for future reproducibility.

The worksheets are protected using the password "visl"; advanced users may wish to unlock the worksheets for alternate exposure scenarios or use of pivot tables, etc.

VISL Worksheet

The user can enter the following information into the VISL worksheet to calculate target values for groundwater, soil gas (sub-slab and exterior), and indoor air:

Selected Parameters	Value/Instructions	Variable Name
Exposure scenario	Select either "residential" or "commercial"	Scenario
Target risk for carcinogens	Enter a numerical value	TCR
Target hazard quotient for non-carcinogens	Enter a numerical value	THQ
Average groundwater temperature	Enter a numerical value (in Celsius). This temperature should reflect actual site conditions if possible (for example, stabilized temperature measured during well purging prior to groundwater sampling).	Tgw

The VISL worksheet is ordered by chemical name. The user can select "view checked chemicals" or "view all chemicals." To view a select, site-specific set of chemicals, enter "x" in column A adjacent to chemicals of interest.

In order to use this functionality, macros must be enabled for Excel.

The table below describes the types of data provided in the VISL sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A				variable	x or blank	The user can enter an "x" into Column A to indicate which rows will be displayed. To show only the chemicals with an "x" in Column A, use the "View Checked Chemicals" button, or use the autofilter arrow in cell A12 to uncheck the box for "(Blanks)". The "View All Chemicals" button or the autofilter can be used to show all chemicals.
B	CAS			fixed	numerical value	The Chemical Abstracts Service (CAS) Number associated with a chemical.
C	Chemical Name			fixed	text	The chemical name.

Column	Heading	Units	Symbol	Data type	Options	Description
D	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source?		$C_{vp} > C_{ia,target}$	calculated	No, Yes, No VP, or No MW	Yes/no question with several other options: Yes and no are self-explanatory, and are derived from logical inspection of the target sub-slab and exterior soil gas concentration. Note that the soil gas attenuation factor is not used in this assessment. The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical. C_{vp} is calculated in column K, which is hidden.
E	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source?		$C_{hc} > C_{ia,target}$	calculated	No, Yes, No VP, or No MW	Yes/no question with a several other options: Yes and no are self-explanatory, and are derived from logical inspection of the target groundwater concentration. Note that the groundwater attenuation factor is not used in this assessment. The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical. C_{hc} is calculated in column L, which is hidden.
F	Target Indoor Air Conc. @ TCR=VALUE or THQ=VALUE	ug/m ³	$C_{ia,target}$	calculated	NVT, No VP, No MW, or numerical value	The target indoor air concentration ($C_{ia,target}$) will be one of the following depending on whether the chemical has an IUR, a RFC, or both: IUR only: Target indoor air concentration = Target indoor air concentration for carcinogens ($C_{ia,c}$) RFC only: Target indoor air concentration = Target indoor air concentration for non-carcinogens ($C_{ia,nc}$) IUR and RFC: Target indoor air concentration = Minimum of target indoor air concentrations for carcinogens ($C_{ia,c}$) and non-carcinogens ($C_{ia,nc}$). If the calculated target indoor air concentration is higher than the pure phase vapor concentration at 25 C, then "NVT" (for not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium) is entered instead of a concentration value. The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical.
G	Toxicity Basis			calculated	C or NC	The toxicity basis for the target indoor air concentration, either carcinogenic (C) or non-carcinogenic (NC).
H	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR=VALUE or THQ=VALUE	ug/m ³	C_{sg}	calculated	NVT, No VP, No MW, or numerical value	The target sub-slab and exterior soil gas concentration (C_{sg}) is the target indoor air concentration divided by the generic attenuation factor for soil gas (default value = 0.1). $C_{sg} = \frac{C_{ia,target}}{AF_{ss}}$ If the calculated target soil gas concentration is higher than the pure phase vapor concentration at 25 C, then "NVT" (for not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium) is entered instead of a concentration value. The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical.

Column	Heading	Units	Symbol	Data type	Options	Description
I	Target Ground Water Conc. @ TCR=VALUE or THQ=VALUE	ug/L	Cgw	calculated	NVT, No VP, No MW, or numerical value	The equation for the target groundwater concentration (Cgw) is: $C_{gw} = \frac{C_{ia,target}}{A_{Fgw} \times (1000 \text{ L/m}^3) \times HLC}$ where Cia is the target indoor air concentration, AFgw is the generic attenuation factor for groundwater (default value = 0.001) and HLC is Henry's Law Constant. If the calculated target groundwater concentration is higher than the pure component water solubility, then "NVT" (for not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium) is entered instead of a concentration value. The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical.
J	Is Target Ground Water Conc. < MCL?	MCL = ug/L	Cgw<MCL	calculated	Yes, No, --	If the chemical has an MCL, "Yes" or "No" shown to indicate whether Cgw exceeds the MCL. Either way, the MCL is listed in parentheses after the "Yes" or "No". If no MCL is available, "--" is listed.
K (this column is hidden)	Pure Phase Vapor Conc. @ 25°C	ug/m ³	Cvp	linked to data table	numerical value, No VP, or No MW	The pure phase vapor concentration at 25 degrees C. The equation is as follows: $C_{vp} = \frac{MW \times VP \times (1E+06 \text{ ug/g}) \times (1E+03 \text{ L/m}^3)}{R \times T \times (760 \text{ mmHg/atm})}$ where MW is the molecular weight in g/mol, VP is the vapor pressure in millimeters of mercury, R is the universal gas constant (0.082057 L-atm/mol-K) and T is the temperature (298.15 K or 25 C). The other possible answers are: No VP, which means there was no vapor pressure for the chemical. No MW, which means there was no molecular weight for the chemical.
L (this column is hidden)	Groundwater Vapor Conc.	ug/m ³	Chc	calculated	numerical value, No HLC, or No S	The vapor concentration above groundwater from the Henry's Law Constant and the pure component water solubility. The other possible answers are: No HLC, which means there was no Henry's Law Constant for the chemical. No S, which means there was no pure component water solubility for the chemical.
M	Temperature for Groundwater Vapor Conc.	°C	Tgw or 25	calculated	Tgw or 25	The column shows whether the groundwater vapor concentration was calculated using a Henry's Law Constant at the groundwater temperature (Tgw) or at 25 °C.
N	Lower Explosive Limit	% by volume	LEL	fixed	numerical value or blank	The lower explosive limit for the chemical (LEL), which is the minimum concentration of the stated compound in air (% by volume) that is needed for the gas to ignite and explode.
O	LEL Source			fixed	letter for reference	The source of the LEL value (see notes E, N, M).
P	blank		blank	blank	blank	blank, used to improve readability of table
Q	Inhalation Unit Risk	(ug/m ³) ⁻¹	IUR	linked to data table	numerical value or blank	The inhalation unit risk factor for the chemical (IUR), from the EPA RSL worksheet. This is the potential carcinogenic risk per unit concentration exposure associated with inhalation of the chemical.
R	IUR Source			linked to data table	letter for reference	The original source of the inhalation unit risk factor in the EPA RSL worksheet.
S	Reference Concentration	mg/m ³	RfC	linked to data table	numerical value or blank	The reference concentration for the chemical (RfC), from the EPA RSL worksheet. This is the potential noncancer hazard per unit concentration exposure associated with inhalation of the chemical.
T	RfC Source			linked to data table	letter for reference	The original source of the reference concentration in the EPA RSL worksheet.
U	Mutagenic Indicator		i	fixed or linked to data table	Mut, TCE, or VC	This indicator is used to trigger special case calculations for mutagenic mode of action (Mut), as well as chemical-specific equations or toxicity values for trichloroethylene (TCE) and vinyl chloride (VC).

Column	Heading	Units	Symbol	Data type	Options	Description
V	Target Indoor Air Conc. for Carcinogens	ug/m ³	Cia,c	calculated	numerical value or blank	The indoor air concentration for carcinogenic chemicals (Cia,c) that results in a target risk for carcinogens equal to TCR. The concentration is calculated using the inhalation unit risk and several exposure parameters for residential or commercial exposure to the chemical in air. See table below for the inhalation pathway exposure parameters used. The equation is as follows: $Cia,c = \frac{TCR \times ATc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)}}{EF \times ED \times ET \times IUR}$ where TCR is the target risk for carcinogens, IUR is the inhalation unit risk, and ATc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate. For mutagens, the same equation is used, except that an adjusted exposure duration is used in place of the standard exposure duration: $Cia,c = \frac{TCR \times ATc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)}}{EF \times EDMMOA \times ET \times IUR}$ EDMMOA is calculated using the equation: $EDMMOA = (ED0-2 \times AF0-2) + (ED2-6 \times AF2-6) + (ED6-16 \times AF6-16) + (ED16-26 \times AF16-26)$ where EDx-y is the exposure duration for the age cohort, and AFx-y is 10 for ages 0 to 2, 3 for ages 2 to 6 and 6 to 16, and 1 for ages 16 to 26 (EPA 2014). For trichloroethylene, two Cia,c values are calculated using the mutagenic and non-mutagenic components of the IUR, and the reciprocal of the sum of the reciprocals of those Cia,c values is used to calculate the Cia,c value, in accordance with the RSL guidance (EPA 2014). For vinyl chloride, the equation is: $Cia,c = \frac{TCR}{IUR + \frac{(IUR \times EF \times ED \times ET \times (1 \text{ day} / 24 \text{ hours}))}{(ATc \times 365 \text{ (days/year))}}}$
W	Target Indoor Air Conc. for Non-Carcinogens	ug/m ³	Cia,nc	calculated	numerical value or blank	The indoor air concentration for non-carcinogenic chemicals (Cia,nc) that results in a target hazard quotient for non-carcinogens equal to THQ. The concentration is calculated using the reference concentration and several exposure parameters for residential or commercial exposure to the chemical in air. See table below for the inhalation pathway exposure parameters used. The equation is as follows: $Cia,nc = \frac{THQ \times RfC \times ATnc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)} \times 1,000 \text{ (ug/mg)}}{EF \times ED \times ET}$ where THQ is the target hazard for non-carcinogens, RfC is the reference concentration, and ATnc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate.

The table below summarizes the reasonable maximum exposure parameters used to calculate VISLs (EPA 2009).

Inhalation Pathway Exposure Parameters (RME):	Units	Symbol	Value	Symbol	Value
Exposure Scenario			Residential	Commercial	
Averaging time for carcinogens	yrs	ATc_R	70	ATc_C	70
Averaging time for non-carcinogens	yrs	ATnc_R	26	ATnc_C	25
Exposure duration	yrs	ED_R	26	ED_C	25
Exposure duration for mutagenic-mode-of-action	yrs	EDM_R	76		
Exposure frequency	days/yr	EF_R	350	EF_C	250
Exposure time	hr/day	ET_R	24	ET_C	8

The table below summarizes the generic attenuation factors used to calculate VISLs (EPA 2002).

Generic Attenuation Factors:	Units	Symbol	Value	Symbol	Value
Source Medium of Vapors					
Groundwater	(-)	AFgw_R	0.001	AFgw_C	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R	0.1	AFss_C	0.1

SG_IA_calc Worksheet

The user can enter the following information into the SG_IA_calc worksheet to calculate risks and hazards from soil gas concentrations.

Selected Parameters	Value/Instructions	Variable Name
Exposure scenario	Select either "residential" or "commercial"	Scenario
Target risk for carcinogens	Enter target risk for carcinogens	TCR
Target hazard quotient for non-carcinogens	Enter target hazard quotient for non-carcinogens	THQ
Site Sub-slab or Exterior Soil Gas Concentration	Enter a numerical value (in ug/m ³) for the site sub-slab or exterior soil gas concentration for each chemical in column D of the main table (see description for column D below).	Csg

The table below describes the types of data provided in the SG_IA_calc sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A				variable	x or blank	The user can enter an "x" into Column A of the VISL worksheet to indicate which rows will be displayed. The values shown on the SG_IA_calc worksheet are carried over from the VISL worksheet. To show only the chemicals with an "x" in Column A, use the autofilter arrow in cell A12 to uncheck the box for "(Blanks)". The autofilter can also be used to show all chemicals.
B	CAS			fixed	numerical value	The Chemical Abstracts Service (CAS) Number associated with a chemical.
C	Chemical Name			fixed	text	The chemical name.
D	Site Sub-slab or Exterior Soil Gas Concentration	ug/m ³	Csg	concentration entered by user or leave blank	numerical value, "No VP," "No MW," or blank	The site sub-slab or exterior soil gas concentration, as entered by the user.
E	Calculated Indoor Air Concentration	ug/m ³	Cia	calculated	numerical value, "No VP," or blank	The indoor air concentration is calculated from the site sub-slab or exterior soil gas concentration, using the generic attenuation factor for indoor air from sub-slab and exterior soil gas.
F	VI Carcinogenic Risk		CR	calculated	numerical value, blank, or "No IUR"	The carcinogenic risk from the vapor intrusion pathway for the chemical, calculated using the equation: $CR = \frac{Cia \times EF \times ED \times ET \times IUR}{ATc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)}}$ where Cia is the indoor air concentration, IUR is the inhalation unit risk, and ATc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate. Special cases are used for mutagenic chemicals, vinyl chloride, and trichloroethylene. For the equations used for these cases, refer to the VISL section of this Navigation Guide or the EPA RSL User's Guide (EPA 2014).
G	VI Hazard		HQ	calculated	numerical value, blank, or "No RfC"	The noncancer hazard from the vapor intrusion pathway for the chemical, calculated using the equation: $HQ = \frac{Cia \times EF \times ED \times ET}{RfC \times ATnc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)} \times 1,000 \text{ (ug/mg)}}$ where Cia is the indoor air concentration, RfC is the reference concentration, and ATnc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate.
H	blank		blank	blank	blank	blank, used to improve readability of table
I	Inhalation Unit Risk	(ug/m ³) ⁻¹	IUR	linked to data table	numerical value or blank	The inhalation unit risk factor for the chemical (IUR), from the EPA RSL worksheet. This is the potential carcinogenic risk per unit concentration exposure associated with inhalation of the chemical.
J	IUR Source			linked to data table	letter for reference	The original source of the inhalation unit risk factor in the EPA RSL worksheet.
K	Reference Concentration	mg/m ³	RfC	linked to data table	numerical value or blank	The reference concentration for the chemical (RfC), from the EPA RSL worksheet. This is the potential noncancer hazard per unit concentration exposure associated with inhalation of the chemical.
L	RfC Source			linked to data table	letter for reference	The original source of the reference concentration in the EPA RSL worksheet.
M	Mutagenic Indicator		i	linked to data table	Mut, TCE, or VC	This indicator is used to trigger special case calculations for mutagenic mode of action (Mut), as well as chemical-specific equations or toxicity values for trichloroethylene (TCE) and vinyl chloride (VC).

GW_IA_calc Worksheet

The user can enter the following information into the GW_IA_calc worksheet to calculate risks and hazards from groundwater concentrations.

Selected Parameters	Value/Instructions	Variable Name
Exposure scenario	Select either "residential" or "commercial"	Scenario
Target risk for carcinogens	Enter target risk for carcinogens	TCR
Target hazard quotient for non-carcinogens	Enter target hazard quotient for non-carcinogens	THQ
Average groundwater temperature	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations. This temperature should reflect actual site conditions if possible (for example, stabilized temperature measured during well purging prior to groundwater sampling).	Tgw
Groundwater concentration	Enter a numerical value (in ug/L) for the site groundwater concentration for each chemical in column D of the main table (see description for column D below).	Cgw

The table below describes the types of data provided in the GW_IA_calc sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A				variable	x or blank	The user can enter an "x" into Column A of the VISL worksheet to indicate which rows will be displayed. The values shown on the GW_IA_calc worksheet are carried over from the VISL worksheet. To show only the chemicals with an "x" in Column A, use the autofilter arrow in cell A12 to uncheck the box for "(Blanks)". The autofilter can also be used to show all chemicals.
B	CAS			fixed	numerical value	The Chemical Abstracts Service (CAS) Number associated with a chemical.
C	Chemical Name			fixed	text	The chemical name.
D	Site Groundwater Concentration	ug/L	Cgw	concentration entered by user or leave blank	numerical value or blank	The site groundwater concentration, as entered by the user.
E	Calculated Indoor Air Concentration	ug/m ³	Cia	calculated	numerical value, "No HLC," or blank	The indoor air concentration is calculated from the site groundwater concentration, using the generic attenuation factor for indoor air from groundwater.
F	VI Carcinogenic Risk		CR	calculated	numerical value, "No HLC," "No IUR," or blank	The carcinogenic risk from the vapor intrusion pathway for the chemical, calculated using the equation: $CR = \frac{Cia \times EF \times ED \times ET \times IUR}{ATc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)}}$ where Cia is the indoor air concentration, IUR is the inhalation unit risk, and ATc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate. Special cases are used for mutagenic chemicals, vinyl chloride, and trichloroethylene. For the equations used for these cases, refer to the VISL section of this Navigation Guide or the EPA RSL User's Guide (EPA 2014).
G	VI Hazard		HQ	calculated	numerical value, "No HLC," "No RfC," or blank	The noncancer hazard from the vapor intrusion pathway for the chemical, calculated using the equation: $HQ = \frac{Cia \times EF \times ED \times ET}{RfC \times ATnc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)} \times 1,000 \text{ (ug/mg)}}$ where Cia is the indoor air concentration, RfC is the reference concentration, and ATnc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate.
H	blank		blank	blank	blank	blank, used to improve readability of table
I	Inhalation Unit Risk	(ug/m ³) ⁻¹	IUR	linked to data table	numerical value or blank	The inhalation unit risk factor for the chemical (IUR), from the EPA RSL worksheet. This is the potential carcinogenic risk per unit concentration exposure associated with inhalation of the chemical.
J	IUR Source			linked to data table	letter for reference	The original source of the inhalation unit risk factor in the EPA RSL worksheet.
K	Reference Concentration	mg/m ³	RfC	linked to data table	numerical value or blank	The reference concentration for the chemical (RfC), from the EPA RSL worksheet. This is the potential noncancer hazard per unit concentration exposure associated with inhalation of the chemical.
L	RfC Source			linked to data table	letter for reference	The original source of the reference concentration in the EPA RSL worksheet.
M	Mutagenic Indicator		i	linked to data table	Mut, TCE, or VC	This indicator is used to trigger special case calculations for mutagenic mode of action (Mut), as well as chemical-specific equations or toxicity values for trichloroethylene (TCE) and vinyl chloride (VC).

IA_risk_calc Worksheet

The user can enter the following information into the IA_risk_calc worksheet to calculate risks and hazards from soil gas concentrations.

Selected Parameters	Value/Instructions	Variable Name
Exposure scenario	Select either "residential" or "commercial"	Scenario
Target risk for carcinogens	Enter target risk for carcinogens	TCR
Target hazard quotient for non-carcinogens	Enter target hazard quotient for non-carcinogens	THQ
Indoor air concentration	Enter a numerical value (in ug/m ³) for the site indoor air concentration for each chemical in column D of the main table (see description for column D below).	Cia

The table below describes the types of data provided in the IA_risk_calc sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A				variable	x or blank	The user can enter an "x" into Column A of the VISL worksheet to indicate which rows will be displayed. The values shown on the IA_risk_calc worksheet are carried over from the VISL worksheet. To show only the chemicals with an "x" in Column A, use the autofilter arrow in cell A12 to uncheck the box for "(Blanks)". The autofilter can also be used to show all chemicals.
B	CAS			fixed	numerical value	The Chemical Abstracts Service (CAS) Number associated with a chemical.
C	Chemical Name			fixed	text	The chemical name.
D	Site Indoor Air Concentration	ug/m ³	Cia	concentration entered by user or leave blank	numerical value, "No VP," "No MW," or blank	The indoor air concentration, as entered by the user.
E	VI Carcinogenic Risk		CR	calculated	numerical value, "No VP," "No IUR," or blank	The carcinogenic risk from the vapor intrusion pathway for the chemical, calculated using the equation: $CR = \frac{Cia \times EF \times ED \times ET \times IUR}{ATc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)}}$ where Cia is the indoor air concentration, IUR is the inhalation unit risk, and ATc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate. Special cases are used for mutagenic chemicals, vinyl chloride, and trichloroethylene. For the equations used for these cases, refer to the VISL section of this Navigation Guide or the EPA RSL User's Guide (EPA 2014).
F	VI Hazard		HQ	calculated	numerical value, blank, or "No RfC"	The noncancer hazard from the vapor intrusion pathway for the chemical, calculated using the equation: $HQ = \frac{Cia \times EF \times ED \times ET}{RfC \times ATnc \times 365 \text{ (days/year)} \times 24 \text{ (hours/day)} \times 1,000 \text{ (ug/mg)}}$ where Cia is the indoor air concentration, RfC is the reference concentration, and ATnc, EF, ED, and ET are the default exposure parameters for residential or commercial exposure as appropriate.
G	blank		blank	blank	blank	blank, used to improve readability of table
H	Inhalation Unit Risk	(ug/m ³) ⁻¹	IUR	linked to data table	numerical value or blank	The inhalation unit risk factor for the chemical (IUR), from the EPA RSL worksheet. This is the potential carcinogenic risk per unit concentration exposure associated with inhalation of the chemical.
I	IUR Source			linked to data table	letter for reference	The original source of the inhalation unit risk factor in the EPA RSL worksheet.
J	Reference Concentration	mg/m ³	RfC	linked to data table	numerical value or blank	The reference concentration for the chemical (RfC), from the EPA RSL worksheet. This is the potential noncancer hazard per unit concentration exposure associated with inhalation of the chemical.
K	RfC Source			linked to data table	letter for reference	The original source of the reference concentration in the EPA RSL worksheet.
L	Mutagenic Indicator		i	linked to data table	Mut, TCE, or VC	This indicator is used to trigger special case calculations for mutagenic mode of action (Mut), as well as chemical-specific equations or toxicity values for trichloroethylene (TCE) and vinyl chloride (VC).

Chem Props Worksheet

The table below describes the types of data provided in the **Chem Props** sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A	CAS			fixed	numerical value	The Chemical Abstracts Service (CAS) Number associated with a chemical.
B	Alphabetized List of Compounds			fixed	alphanumeric value	The name of the chemical.
C	Molecular weight	g/mole	Mw	fixed or linked to data table	numerical value or No MW	The molecular weight of the chemical in grams per mole. If "No MW" is listed, no molecular weight was available for the chemical.
D	Molecular weight source			fixed	letter for reference	The source of the molecular weight of the chemical.
E	Vapor Pressure	mm Hg	VP	fixed	numerical value or No VP	The vapor pressure of the chemical in millimeters of mercury. If "No VP" is listed, no vapor pressure was available for the chemical.
F	Vapor Pressure			fixed	letter for reference	The source of the vapor pressure of the chemical.
G	Pure Component Water Solubility	mg/L	S	fixed or linked to data table	numerical value or No S	The solubility of the chemical as a pure component in water. If "No S" is listed, no pure component water solubility was available for the chemical.
H	Pure Component Water Solubility source			fixed	letter for reference	The source of the water solubility of the chemical.
I	MCL	ug/L	MCL	fixed	numerical value or blank	The Maximum Contaminant Level for the chemical, if applicable, in micrograms per liter.
J	Henry's Law Constant @ 25°C	atm-m ³ /mol	Hc25	fixed or linked to data table	numerical value or No Hc25	The Henry's Law Constant for the chemical at 25 degrees Celsius. If "No Hc25" is listed, no Henry's Law Constant for the chemical at 25 degrees Celsius was available.
K	Henry's Law Constant @ 25°C source			fixed	letter for reference	The source of the Henry's Law Constant for the chemical.
L	Henry's Law Constant @ 25°C	unitless	H'25	calculated	numerical value or blank	The unitless Henry's Law Constant for the chemical at 25 degrees Celsius. This is the ratio of the concentration of the chemical in the aqueous phase to the concentration of the chemical in the gas phase at 25 degrees Celsius. $H'25 = \frac{Hc25 \times (1000 \text{ L/m}^3)}{R \times (298.15 \text{ K})}$ where R is the universal gas constant (0.082057 L-atm/mol-K). If the cell is blank, no value for Hc25 was available.
M	Henry's Law Constant @ Tgw	unitless	H'Tgw	calculated	numerical value or blank	The unitless Henry's Law Constant for the chemical at the groundwater temperature. This is the ratio of the concentration of the chemical in the aqueous phase to the concentration of the chemical in the gas phase at the groundwater temperature. $H'Tgw = Hc25 \times \exp \left(\frac{DHv,b}{RC} \right) \times \left[\frac{(1-Tgw/Tcrit)}{(1-Tboil/Tcrit)} \right]^n \times [(1/Tgw)-(1/298.15 \text{ K})]$ where DHv,b is the enthalpy of vaporization at the normal boiling point in cal/mol, RC is the universal gas constant (1.9872 cal/mol-K), Tgw is the groundwater temperature in K, Tcrit is the critical temperature in K, Tboil is the normal boiling point in K, and n = 0.3 if Tboil/Tcrit < 0.57, n = 0.41 if Tboil/Tcrit > 0.71, and n = (0.74 x Tboil/Tcrit - 0.116) if 0.57 ≤ Tboil/Tcrit ≤ 0.71. If the cell is blank, then a value for Hc25, Tcrit, or DHv,b was not available.
N	Henry's Law Constant Used in Calculator	unitless	HLC	calculated	numerical value or blank	The unitless Henry's Law Constant used in the calculator. If H'Tgw can be calculated, this value is used; otherwise H'25 is used. If the cell is blank, then a value for Hc25 was not available.
O	Vapor Pressure @ Tgw	ug/m ³	VPTgw	calculated	numerical value or blank	The vapor pressure of the chemical in millimeters of mercury. $VPTgw = \frac{VP \times MW \times (1E+06 \text{ ug/g}) \times (1E+03 \text{ L/m}^3) \times H'Tgw}{Hc25 \times R \times T \times (760 \text{ mmHg/atm})}$ where R is the universal gas constant (0.082057 L-atm/mol-K) and T is the temperature (298.15 K or 25 C). If the cell is blank, then a value for VP was not available.
P	Diffusivity in air	cm ² /s	Da	fixed or linked to data table	numerical value or No Da	The diffusivity of the chemical in air. If no diffusivity in air was available, "No Da" is listed.
Q	Diffusivity in air source			fixed	letter for reference	The source of the diffusivity of the chemical in air.
R	Diffusivity in water	cm ² /s	Dw	fixed or linked to data table	numerical value or No Dw	The diffusivity of the chemical in water. If no diffusivity in water was available, "No Dw" is listed.
S	Diffusivity in water source			fixed	letter for reference	The source of the diffusivity of the chemical in water.
T	Normal Boiling Point	K	Tboil	fixed	numerical value or No Tboil	The normal boiling point of the chemical (the boiling point at 1 atmosphere pressure). If no boiling point was available, "No Tboil" is listed.
U	Normal Boiling Point source			fixed	letter for reference	The source of the normal boiling point of the chemical.

Column	Heading	Units	Symbol	Data type	Options	Description
V	Critical Temp.	K	Tcrit	fixed or linked to data table	numerical value or No Tcrit	The critical temperature of the chemical (the temperature at which solid, liquid, and gas can all coexist). If no critical temperature was available, "No Tcrit" is listed.
W	Critical Temp. source			fixed	letter for reference	The source of the critical temperature of the chemical.
X	Enthalpy of vaporization at the normal boiling point	cal/mol	DH _{v,b}	fixed or linked to data table	numerical value or No DH _{v,b}	The enthalpy of vaporization of the chemical at the normal boiling point. If no enthalpy of vaporization was available, "No DH _{v,b} " is listed.
Y	Enthalpy of vaporization at the normal boiling point source			fixed	letter for reference	The source of the enthalpy of vaporization of the chemical.
Z	Organic Carbon Partition Coefficient	cm ³ /g	Koc	fixed or linked to data table	numerical value or No Koc	The partition coefficient of the chemical between organic carbon and water. If no partition coefficient between organic carbon and water was available, "No Koc" is listed.
AA	Organic Carbon Partition Coefficient source			fixed	letter for reference	The source of the organic carbon partition coefficient.
AB	blank					
AC	Alternative Chemical Name			fixed	alphanumeric value	An alternative name of the chemical if there is one, or if not, the name of the chemical is repeated.

Version Notes Worksheet

The table below describes the types of data provided in the **Version Notes** sheet.

Column	Heading	Units	Symbol	Data type	Options	Description
A	Version			fixed	numerical value	The version number.
B	Date			fixed	date	The date of the version.
C	Changes			fixed	text	A description of the changes made for the version.

References:

EPA. (2002). *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*. November. EPA 530-D-02-004.

www.epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf

EPA. (2009). *Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)*. January. EPA 540-R-070-002.

www.epa.gov/oswer/riskassessment/ragsf/pdf/partf_200901_final.pdf

EPA. (2010). Review of the Draft 2002 Subsurface Vapor Intrusion Guidance. Office of Solid Waste and Emergency Response.

www.epa.gov/oswer/vaporintrusion/documents/review_of_2002_draft_vi_guidance_final.pdf

EPA. (2014). Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

OSWER VAPOR INTRUSION ASSESSMENT
Vapor Intrusion Screening Level (VSL) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source?	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source?	Target Indoor Air Conc. @ TCR = 1E-06 or THQ = 1	Toxicity Basis	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR = 1E-06 or THQ = 1	Target Ground Water Conc. @ TCR = 1E-06 or THQ = 1	Is Target Ground Water Conc. < MCL?	Temperature for Groundwater Vapor Conc.	Lower Explosive Limit*	LEL Source
		Cvp > C _{ia} target?	C _{gw} > C _{ia} target?	MIN(C _{ia} ,C _{ia,nc})	C _{sg}	C _{gw}	C _{gw} /MCL?	T _{gw} or 25	LEL		
		Yes/No	Yes/No	(ug/m ³)	C/CNC	(ug/m ³)	(ug/L)	Yes/No (MCL ug/L)	C	(% by vol)	
75-07-0	Acetaldehyde	Yes	Yes	1.3E+00	C	1.3E+01	4.7E+02	--	25	4	E
67-64-1	Acetone	Yes	Yes	3.2E+04	NC	3.2E+05	2.3E+07	--	25	2.6	E
75-86-5	Acetone Cyanohydrin	Yes	Yes	2.1E+00	NC	2.1E+01	3.9E+03	--	25		
75-05-8	Acetonitrile	Yes	Yes	6.3E+01	NC	6.3E+02	4.4E+04	--	25	3	N
107-02-8	Acrolein	Yes	Yes	2.1E-02	NC	2.1E-01	4.2E+00	--	25	2.8	N
107-13-1	Acrylonitrile	Yes	Yes	4.1E-02	C	4.1E-01	7.3E+00	--	25	3	N
107-05-1	Allyl Chloride	Yes	Yes	4.7E-01	C	4.7E+00	1.0E+00	--	25		
75-85-4	Amyl Alcohol, tert.	Yes	Yes	3.1E+00	NC	3.1E+01	5.5E+03	--	25	1.3	M
11104-28-2	Aroclor 1221	Yes	Yes	4.9E-03	C	4.9E-02	1.6E-01	--	25		
11411-16-5	Aroclor 1232	Yes	Yes	4.9E-03	C	4.9E-02	1.6E-01	--	25		
103-33-3	Azobenzene	Yes	Yes	9.1E-02	C	9.1E-01	1.6E+02	--	25		
71-43-2	Benzene	Yes	Yes	3.6E-01	C	3.6E+00	1.6E+00	Yes (5)	25	1.2	N
100-44-7	Benzyl Chloride	Yes	Yes	5.7E-02	C	5.7E-01	3.4E+00	--	25	1.1	N
92-52-4	Biphenyl, 1,1'-	Yes	Yes	4.2E-01	NC	4.2E+00	3.3E+01	--	25	0.6	N
108-90-1	Bis(2-chloro-1-methylethyl) ether	Yes	Yes	2.8E-01	C	2.8E+00	9.3E+01	--	25		
111-44-4	Bis(2-chloroethoxy)ether	Yes	Yes	8.5E-03	C	8.5E-02	1.2E+01	--	25	2.7	N
542-88-1	Bis(chloromethyl)ether	Yes	Yes	4.5E-05	C	4.5E-04	2.5E-04	--	25		
107-04-0	Bromo-2-chloroethane, 1-	Yes	Yes	4.7E-03	C	4.7E-02	1.3E-01	--	25		
108-86-1	Bromobenzene	Yes	Yes	6.3E+01	NC	6.3E+02	6.2E+02	--	25		
74-97-5	Bromochloromethane	Yes	Yes	4.2E+01	NC	4.2E+02	7.0E+02	--	25		
75-27-4	Bromodichloromethane	Yes	Yes	7.6E-02	C	7.6E-01	8.8E-01	Yes (80)	25		
74-83-9	Bromomethane	Yes	Yes	5.2E+00	NC	5.2E+01	1.7E+01	--	25	10	N
106-99-0	Butadiene, 1,3-	Yes	Yes	9.4E-02	C	9.4E-01	3.1E-02	--	25	2	N
75-15-0	Carbon Disulfide	Yes	Yes	7.3E+02	NC	7.3E+03	1.2E+03	--	25	1.3	N
56-23-5	Carbon Tetrachloride	Yes	Yes	4.7E-01	C	4.7E+00	4.1E-01	Yes (5)	25		
75-68-3	Chloro-1,1-difluoroethane, 1-	Yes	Yes	5.2E+04	NC	5.2E+05	2.2E+04	--	25		
126-99-8	Chloro-1,3-butadiene, 2-	Yes	Yes	9.4E-03	C	9.4E-02	4.1E-03	--	25	1.9	N
108-90-7	Chlorobenzene	Yes	Yes	5.2E+01	NC	5.2E+02	4.1E+02	No (100)	25	1.3	N
98-56-6	Chlorobenzotrifluoride, 4-	Yes	Yes	3.1E+02	NC	3.1E+03	2.2E+02	--	25		
75-45-6	Chlorodifluoromethane	Yes	Yes	5.2E+04	NC	5.2E+05	3.1E+04	--	25		
67-66-3	Chloroform	Yes	Yes	1.2E-01	C	1.2E+00	8.1E-01	Yes (80)	25		
74-87-3	Chloromethane	Yes	Yes	9.4E+01	NC	9.4E+02	2.6E+02	--	25	8.1	N
107-30-2	Chloromethyl Methyl Ether	Yes	Yes	4.1E-03	C	4.1E-02	3.3E-01	--	25		
76-06-2	Chloropropan	Yes	Yes	4.2E-01	NC	4.2E+00	5.0E+00	--	25		
98-82-8	Cumene	Yes	Yes	4.2E+02	NC	4.2E+03	8.9E+02	--	25	0.9	N
57-12-5	Cyanide (CN-)	Yes	Yes	8.3E-01	NC	8.3E+00	1.5E+02	Yes (200)	25		
110-82-7	Cyclohexane	Yes	Yes	6.3E+03	NC	6.3E+04	1.0E+03	--	25		
110-83-9	Cyclohexene	Yes	Yes	1.0E+03	NC	1.0E+04	5.6E+02	--	25		
95-12-8	Dibromo-3-chloropropane, 1,2-	Yes	Yes	1.7E-04	C	1.7E-03	2.8E-02	Yes (0.2)	25		
124-48-1	Dibromochloromethane	Yes	Yes	1.0E-01	C	1.0E+00	3.2E+00	Yes (80)	25		
106-93-4	Dibromomethane, 1,2-	Yes	Yes	4.7E-03	C	4.7E-02	1.8E-01	No (0.05)	25		
74-95-3	Dibromomethane (Methylene Bromide)	Yes	Yes	4.2E+00	NC	4.2E+01	1.2E+02	--	25		
764-11-0	Dichloro-2-butene, 1,4-	Yes	Yes	6.7E-04	C	6.7E-03	2.5E-02	--	25		
1476-11-5	Dichloro-2-butene, cis-1,4-	Yes	Yes	6.7E-04	C	6.7E-03	2.5E-02	--	25		
110-57-6	Dichloro-2-butene, trans-1,4-	Yes	Yes	6.7E-04	C	6.7E-03	2.5E-02	--	25		
95-50-1	Dichlorobenzene, 1,2-	Yes	Yes	2.1E+02	NC	2.1E+03	2.7E+03	No (600)	25	2.2	N
106-46-7	Dichlorobenzene, 1,4-	Yes	Yes	2.6E-01	C	2.6E+00	2.6E+00	Yes (75)	25	2.5	N
75-71-8	Dichlorodifluoromethane	Yes	Yes	1.0E+02	NC	1.0E+03	7.4E+00	--	25		
75-34-3	Dichloroethane, 1,1-	Yes	Yes	1.8E+00	C	1.8E+01	7.6E+00	--	25	5.4	N
107-06-2	Dichloroethane, 1,2-	Yes	Yes	1.1E-01	C	1.1E+00	2.2E+00	Yes (5)	25	6.2	N
75-35-4	Dichloroethylene, 1,1-	Yes	Yes	2.1E+02	NC	2.1E+03	2.0E+02	No (7)	25	6.5	N
78-87-5	Dichloropropane, 1,2-	Yes	Yes	2.8E-01	C	2.8E+00	2.4E+00	Yes (5)	25	3.4	N
542-75-6	Dichloropropane, 1,3-	Yes	Yes	7.0E-01	C	7.0E+00	4.8E+00	--	25	5.3	N
77-73-6	Dicyclopentadiene	Yes	Yes	3.1E-01	NC	3.1E+00	1.2E-01	--	25		
75-37-6	Difluoroethane, 1,1-	Yes	Yes	4.2E+04	NC	4.2E+05	5.0E+04	--	25		
94-58-8	Dihydroisofurole	Yes	Yes	2.2E-01	C	2.2E+00	3.2E-02	--	25		
108-20-3	Dihydroxypropanol Ether	Yes	Yes	7.3E+02	NC	7.3E+03	7.0E+03	--	25		
513-37-1	Dimethylvinylchloride	Yes	Yes	2.2E-01	C	2.2E+00	6.5E-02	--	25		
106-89-8	Epichlorohydrin	Yes	Yes	1.0E+00	NC	1.0E+01	8.4E+02	--	25	3.8	N
106-88-7	Epoxybutane, 1,2-	Yes	Yes	2.1E+01	NC	2.1E+02	2.8E+03	--	25		
141-78-6	Ethyl Acetate	Yes	Yes	7.3E+01	NC	7.3E+02	1.3E+04	--	25	2	N
75-00-3	Ethyl Chloride (Chloroethane)	Yes	Yes	1.0E+03	NC	1.0E+05	2.3E+04	--	25	3.8	N
97-63-2	Ethyl Methacrylate	Yes	Yes	3.1E+02	NC	3.1E+03	1.3E+04	--	25	1.8	M
100-41-4	Ethylbenzene	Yes	Yes	1.1E+00	C	1.1E+01	3.5E+00	Yes (700)	25	0.8	N
75-21-8	Ethylene Oxide	Yes	Yes	3.2E-02	C	3.2E-01	5.3E+00	--	25	3	N
151-56-4	Ethyleneimine	Yes	Yes	6.3E-04	C	6.3E-03	5.0E-03	--	25	3.3	N
822-06-0	Hexamethylene Diisocyanate, 1,6-	Yes	Yes	1.0E-02	NC	1.0E-01	5.3E+00	--	25		
110-54-3	Hexane, N-	Yes	Yes	7.3E+02	NC	7.3E+03	9.9E+00	--	25	1.1	N
591-78-6	Hexanone, 2-	Yes	Yes	3.1E+01	NC	3.1E+02	8.2E+03	--	25		
74-90-8	Hydrogen Cyanide	Yes	Yes	8.3E-01	NC	8.3E+00	1.9E+02	--	25	5.6	N
7439-97-6	Mercury (elemental)	Yes	Yes	3.1E-01	C	3.1E+00	6.7E-01	Yes (2)	25		
126-98-7	Methacrylonitrile	Yes	Yes	3.1E+01	NC	3.1E+02	3.1E+03	--	25	2	N
96-33-3	Methyl Acrylate	Yes	Yes	2.1E+01	NC	2.1E+02	2.6E+03	--	25	2.8	N
78-93-3	Methyl Ethyl Ketone (2-Butanone)	Yes	Yes	5.2E+03	NC	5.2E+04	2.2E+06	--	25	1.4	N
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	Yes	Yes	3.1E+03	C	3.1E+04	5.6E+05	--	25	1.2	N
824-83-9	Methyl Isocyanate	Yes	Yes	1.0E+00	NC	1.0E+01	2.8E+01	--	25	5.3	N
80-62-6	Methyl Methacrylate	Yes	Yes	7.3E+02	NC	7.3E+03	5.6E+04	--	25	1.7	N
25013-15-4	Methyl Styrene (Mixed Isomers)	Yes	Yes	4.2E+01	NC	4.2E+02	3.4E+02	--	25		
1634-04-4	Methyl tert-Butyl Ether (MTBE)	Yes	Yes	1.1E+01	C	1.1E+02	4.9E+02	--	25	1.6	M
75-09-2	Methylene Chloride	Yes	Yes	1.0E+03	C	1.0E+03	7.6E+02	No (5)	25	13	N
91-20-3	Naphthalene	Yes	Yes	8.3E-02	C	8.3E-01	4.6E+00	--	25	0.9	N
98-95-3	Nitrobenzene	Yes	Yes	7.0E-02	C	7.0E-01	7.2E+01	--	25	1.8	N
75-52-5	Nitromethane	Yes	Yes	3.2E-01	C	3.2E+00	2.7E+02	--	25		
75-46-9	Nitropropane, 2-	Yes	Yes	1.0E-03	C	1.0E-02	2.1E-01	--	25	2.6	N
924-15-3	Nitroso-d-N-butylamine, N-	Yes	Yes	1.8E-03	C	1.8E-02	3.3E+00	--	25		
111-84-2	Nonane, n-	Yes	Yes	2.1E+01	NC	2.1E+02	1.5E-01	--	25		

Inhalation Unit Risk	IUR Source*	Reference Concentration RfC	RfC Source*	Mutagenic Indicator	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 1
IUR		RfC		I	C _{ia,c}	C _{ia,nc}
(ug/m ³) ⁻¹		(mg/m ³)			(ug/m ³)	(ug/m ³)
2.20E-06	I	9.00E-03	I		1.3E+00	9.4E+00
		3.10E+01	A			3.2E+04
		2.00E-03	X			2.1E+00
		6.00E-02	I			6.3E+01
		2.00E-05	I			2.1E-02
6.80E-05	I	2.00E-03	I		4.1E-02	2.1E+00
6.00E-06	CA	1.00E-03	I		4.7E-01	1.0E+00
		3.00E-03	X			3.1E+00
5.70E-04	S				4.9E-03	
5.70E-04	S				4.9E-03	
3.10E-05	I				9.1E-02	
7.80E-06	I	3.00E-02	I		3.6E-01	3.1E+01
4.90E-05	CA	1.00E-03	P		5.7E-02	1.0E+00
	H	4.90E-04	X			4.2E-01
1.00E-05					2.8E-01	
3.30E-04	I				8.5E-03	
6.20E-02	I				4.5E-05	
6.00E-04	X				4.7E-03	
		6.00E-02	I			6.3E+01
		4.00E-02	X			4.2E+01
3.70E-05	CA				7.6E-02	
		5.00E-03	I			5.2E+00
3.00E-05	I	2.00E-03	I		9.4E-02	2.1E+00
		7.00E-01	I			7.3E+02
6.00E-06	I	1.00E-01	I		4.7E-01	1.0E+02
		5.00E+01	I			5.2E+04
3.00E-04	I	2.00E-02	I		9.4E-03	2.1E+01
		5.00E-02	P			5.2E+01
		3.00E-01	P			3.1E+02
		5.00E+01	I			5.2E+04
2.30E-05	I	9.80E-02	A		1.2E-01	1.0E+02
		9.00E-02	I			9.4E+01
6.90E-04	CA				4.1E-03	
		4.00E-04	CA			4.2E-01
		4.00E-01	I			4.2E+02
		8.00E-04	S			8.3E-01
		6.00E+00	I			6.3E+03
		1.00E+00	X			1.0E+03
6.00E-03	P	2.00E-04	I	Mut	1.7E-04	2.1E-01
2.70E-05	CA				1.0E-01	
6.00E-04	I	9.00E-03	I		4.7E-03	9.4E+00
	P	4.00E-03	X			4.2E+00
4.20E-03	P	2.00E-01	H		6.7E-04	2.1E+02
4.20E-03	P	8.0E-01	I			8.3E+02
4.20E-03	P	1.00E-01	X		6.7E-04	1.0E+02
1.10E-05	CA				2.6E-01	
		1.00E-01	P			1.0E+02
1.60E-06	CA				1.8E+00	
2.60E-05	I	7.00E-03	X		1.1E-01	7.3E+00
		2.00E-01	I			2.1E+02
1.00E-05	CA				2.8E-01	4.1E+00
4.00E-06	I	2.00E-02	I		7.0E-01	2.1E+01
		3.00E-04	X			3.1E-01
		4.00E+01	I			4.2E+04
1.30E-05	CA				2.2E-01	
1.30E-05	CA	7.00E-01	P			7.3E+02
1.20E-06	I	1.00E-03	I		2.3E+00	1.0E+00
		2.00E-02	I			2.1E+01
		7.00E-02	P			7.3E+01
		1.00E+01	I			1.0E+04
		3.00E-01	P			3.1E+02
2.50E-06	CA	1.00E+00	I		1.1E+00	1.0E+03
8.80E-05	CA	3.00E-02	CA		3.2E-02	3.1E+01
1.90E-02	CA				1.5E-04	
		1.00E-05	I			1.0E-02
		7.00E-01	I			7.3E+02
		3.00E-02	I			3.1E+01
		8.00E-04	I			8.3E-01
		3.00E-04	I			3.1E-01
		3.00E-02	P			3.1E+01
		2.00E-02	P			2.1E+01
		5.00E+00	I			5.2E+03
		3.00E+00	I			3.1E+03
		1.00E-03	CA			1.0E+00
		7.00E-01	I			7.3E+02
		4.00E-02	H			4.2E+01
2.60E-07	CA	3.00E+00	I			3.1E+03
1.00E-08	I	6.00E-01	I	Mut	1.1E+01	6.3E+02
3.40E-05	CA	3.00E-03	I		8.3E-02	3.1E+00
4.00E-05	I	9.00E-03	I		7.0E-02	9.4E+00
8.80E-06	P	5.00E-03	P		3.2E-01	5.2E+00
2.70E-03	H	2.00E-02	I		1.0E-03	2.1E+01
1.60E-03					1.8E-03	
		2.00E-02	P			2.1E+01

OSWER VAPOR INTRUSION ASSESSMENT
Vapor Intrusion Screening Level (VISL) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source?		Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source?		Target Indoor Air Conc. @ TCR = 1E-06 or THQ = 1	Toxicity Basis	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR = 1E-06 or THQ = 1	Target Ground Water Conc. @ TCR = 1E-06 or THQ = 1	Is Target Ground Water Conc. < MCL?	Temperature for Groundwater Vapor Conc. Tgw or 25	Lower Explosive Limit**	LEL Source
		Cvp > Cia.target?	Cvc > Cia.target?	MIN(Cia,c,Cia,nc)	Csg	Cgw							
		Yes/No	Yes/No	(ug/m ³)	C/N/C	(ug/m ³)		(ug/L)	Yes/No (MCL ug/L)				
109-66-0	Pentane, n-	Yes	Yes	1.0E+03	NC	1.0E+04	2.0E+01	--	25				
75-44-5	Phosgene	Yes	Yes	3.1E-01	NC	3.1E+00	4.6E-01	--	25				
123-38-6	Propionaldehyde	Yes	Yes	8.3E+00	NC	8.3E+01	2.8E+03	--	25				
103-65-1	Propyl benzene	Yes	Yes	1.0E+03	NC	1.0E+04	2.4E+03	--	25	0.8	M		
115-07-1	Propylene	Yes	Yes	3.1E+03	NC	3.1E+04	3.9E+02	--	25	2	E		
75-56-9	Propylene Oxide	Yes	Yes	7.6E-01	C	7.6E+00	2.7E+02	--	25				
100-42-5	Styrene	Yes	Yes	1.0E+03	NC	1.0E+04	9.3E+03	No (100)	25	1.1	E		
630-20-6	Tetrachloroethane, 1,1,1,2-	Yes	Yes	3.8E-01	C	3.8E+00	3.7E+00	--	25				
x 79-34-5	Tetrachloroethane, 1,1,2,2-	Yes	Yes	4.8E-02	C	4.8E-01	3.2E+00	--	25				
x 127-18-4	Tetrachloroethylene	Yes	Yes	1.1E+01	C	1.1E+02	1.5E+01	No (5)	25				
811-97-2	Tetrafluoroethane, 1,1,1,2-	Yes	Yes	8.3E+04	NC	8.3E+05	4.1E+04	--	25				
109-99-9	Tetrahydrofuran	Yes	Yes	2.1E+03	NC	2.1E+04	7.2E+05	--	25	2	N		
x 108-88-3	Toluene	Yes	Yes	5.2E+03	NC	5.2E+04	1.9E+04	No (1000)	25	1.1	N		
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	Yes	Yes	3.1E+04	NC	3.1E+05	1.5E+03	--	25				
120-82-1	Trichlorobenzene, 1,2,4-	Yes	Yes	2.1E+00	NC	2.1E+01	3.6E+01	Yes (70)	25	2.5	N		
x 71-55-6	Trichloroethene, 1,1,1-	Yes	Yes	5.2E+03	NC	5.2E+04	7.4E+03	No (200)	25	7.5	N		
x 79-00-5	Trichloroethane, 1,1,2-	Yes	Yes	1.8E-01	C	1.8E+00	5.2E+00	No (5)	25	6	N		
x 79-01-6	Trichloroethylene	Yes	Yes	4.8E-01	C	4.8E+00	1.2E+00	Yes (5)	25	8	N		
75-69-4	Trichlorofluoromethane	Yes	Yes	7.3E+02	NC	7.3E+03	1.8E+02	--	25				
96-18-4	Trichloropropane, 1,2,3-	Yes	Yes	3.1E-01	NC	3.1E+00	2.2E+01	--	25	3.2	N		
96-19-5	Trichloropropane, 1,2,3-	Yes	Yes	3.1E-01	NC	3.1E+00	4.3E-01	--	25				
121-44-8	Triethylamine	Yes	Yes	7.3E+00	NC	7.3E+01	1.2E+03	--	25				
526-73-8	Trimethylbenzene, 1,2,3-	Yes	Yes	5.2E+00	NC	5.2E+01	2.9E+01	--	25				
96-53-6	Trimethylbenzene, 1,2,4-	Yes	Yes	7.3E+00	NC	7.3E+01	2.9E+01	--	25	0.9	N		
108-05-4	Vinyl Acetate	Yes	Yes	2.1E+02	NC	2.1E+03	1.0E+04	--	25	2.6	N		
593-60-2	Vinyl Bromide	Yes	Yes	8.8E-02	C	8.8E-01	1.7E-01	--	25				
x 75-01-4	Vinyl Chloride	Yes	Yes	1.7E-01	C	1.7E+00	1.5E-01	Yes (2)	25	3.6	N		
108-38-3	Xylene, m-	Yes	Yes	1.0E+02	NC	1.0E+03	3.6E+02	--	25	1.1	N		
x 95-47-6	Xylene, o-	Yes	Yes	1.0E+02	NC	1.0E+03	4.9E+02	--	25	0.9	N		
x 108-42-3	Xylene, p-	Yes	Yes	1.0E+02	NC	1.0E+03	3.7E+02	--	25	1	N		
x 1330-20-7	Xylenes	Yes	Yes	1.0E+02	NC	1.0E+03	4.9E+02	Yes (10000)	25				

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 1
IUR	IUR	RIC	RIC	I	Cia,c	Cia,nc
(ug/m ³) ⁻¹		(mg/m ³)			(ug/m ³)	(ug/m ³)
		1.00E+00	P			1.0E+03
		3.00E+04	I			3.1E-01
		8.00E-03	I			8.3E+00
		1.0E+00	X			1.0E+03
		3.00E+00	CA			3.1E+03
3.70E-06	I	3.00E-02	I		7.6E-01	3.1E+01
		1.00E+00	I			1.0E+03
7.40E-06	I				3.8E-01	
5.80E-05	CA				4.8E-02	
2.60E-07	I	4.00E-02	I		1.1E+01	4.2E+01
		8.00E+01	I			8.3E+04
		2.00E+00	I			2.1E+03
		8.00E+04	I			5.2E+03
		3.00E+01	H			3.1E+04
		2.00E+03	P			2.1E+00
		5.00E+00	I			5.2E+03
1.60E-05	I	2.00E-04	X		1.8E-01	2.1E-01
see note	I	2.00E-03	I	TCE	4.8E-01	2.1E+00
		7.00E-01	H			7.3E+02
		3.00E-04	I	Mut		3.1E-01
		3.00E-04	P			3.1E+04
		7.00E-03	I			7.3E+00
		5.00E-03	P			5.2E+00
		7.00E-03	P			7.3E+00
		2.00E-01	I			2.1E+02
3.20E-05	H				8.8E-02	3.1E+00
4.40E-06	I	1.00E-01	I	VC	1.7E-01	1.0E+02
		1.00E-01	S			1.0E+02
		1.00E-01	S			1.0E+02
		1.00E-01	S			1.0E+02
		1.00E-01	S			1.0E+02

Notes:

(1)	Inhalation Pathway Exposure Parameters (RME):		Units		Residential		Commercial		Selected (based on scenario in cell E5)	
	Exposure Scenario				Symbol	Value	Symbol	Value	Symbol	Value
	Averaging time for carcinogens		(yrs)		ATc_R	70	ATc_C	70	ATc	70
	Averaging time for non-carcinogens		(yrs)		ATnc_R	26	ATnc_C	25	ATnc	26
	Exposure duration		(yrs)		ED_R	26	ED_C	25	ED	26
	Exposure frequency		(days/yr)		EF_R	350	EF_C	250	EF	350
	Exposure time		(hr/day)		ET_R	24	ET_C	8	ET	24
	(2)	Generic Attenuation Factors:				Residential		Commercial		Selected (based on scenario in cell E5)
Source Medium of Vapors				Symbol	Value	Symbol	Value	Symbol	Value	
Groundwater		(-)		AFgw_R	0.001	AFgw_C	0.001	AFgw	0.001	
Sub-Slab and Exterior Soil Gas		(-)		AFss_R	0.1	AFss_C	0.1	AFss	0.1	
(3)	Formulas									
	Cia,target = MIN(Cia,c; Cia,nc)									
	Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)									
	Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RIC x (1000 ug/mg) / (ED x EF x ET)									
(4)	Special Case Chemicals				Residential		Commercial		Selected (based on scenario in cell E5)	
	Trichloroethylene				Symbol	Value	Symbol	Value	Symbol	Value
					mIURTCR_R	1.00E-06	mIURTCR_C	0.00E+00	mIURTCR	1.00E-06
					IURTCR_R	3.10E-06	IURTCR_C	4.10E-06	IURTCR	3.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration (years)	Age-dependent adjustment factor
0 - 2 years	10	
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMAOA) adjustment factor 72

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

NVT = Not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium

C = Carcinogenic

NC = Non-carcinogenic

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

P = PPRTV: EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhprrty.cerl.gov/pprvty.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://epa-heat.cerl.gov/heat.shtml>

H = HEAST: EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heat.cerl.gov/heat.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

E = The Engineering ToolBox. Available online at http://www.engineeringtoolbox.com/explosive-concentration-limits-d_423.html

N = Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. Available online at:

<http://www.cdc.gov/niosh/npg/default.html>

M = Chemical-specific MSDS

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

OSWER VAPOR INTRUSION ASSESSMENT
Vapor Intrusion Screening Level (VISL) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source?	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source?	Target Indoor Air Conc. @ TCR = 1E-06 or THQ = 1	Toxicity Basis	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR = 1E-06 or THQ = 1	Target Ground Water Conc. @ TCR = 1E-06 or THQ = 1	Is Target Ground Water Conc. < MCL?	Temperature for Groundwater Vapor Conc.	Lower Explosive Limit**	LEL Source	Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 1
		Cvp > Cia.target?	Chc > Cia.target?	MIN(Cia,C, Cia.nc)		Csg	Cgw	Cgas < MCL?	Tgw or 25	LEL		IUR		RFC		I	Cia,C	Cia,nc
		Yes/No	Yes/No	(ug/m ³)	C/N/C	(ug/m ³)	(ug/L)	(MCL ug/L)	C	(% by vol)		(ug/m ³) ⁻¹	(ug/m ³)	(mg/m ³)			(ug/m ³)	(ug/m ³)

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

**Lower explosive limit is the minimum concentration of the compound in air (% by volume) that is needed for the gas to ignite and explode.

OSWER VAPOR INTRUSION ASSESSMENT

Sub-slab or Exterior Soil Gas Concentration to Indoor Air Concentration (SGC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR_SG	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ_SG	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)

CAS	Chemical Name	Site Sub-slab or Exterior Soil Gas Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Csg (ug/m ³)	Cia (ug/m ³)	CR	HQ
75-07-0	Acetaldehyde		--	--	--
x 67-64-1	Acetone		--	--	--
x 75-86-5	Acetone Cyanohydrin		--	--	--
x 75-05-8	Acetonitrile		--	--	--
x 107-02-8	Acrolein		--	--	--
x 107-13-1	Acrylonitrile		--	--	--
107-05-1	Allyl Chloride		--	--	--
75-85-4	Amyl Alcohol, tert-		--	--	--
11104-28-2	Aroclor 1221		--	--	--
11141-16-5	Aroclor 1232		--	--	--
103-33-3	Azobenzene		--	--	--
71-43-2	Benzene		--	--	--
100-44-7	Benzyl Chloride		--	--	--
92-52-4	Biphenyl, 1,1'-		--	--	--
108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--
111-44-4	Bis(2-chloroethyl)ether		--	--	--
542-88-1	Bis(chloromethyl)ether		--	--	--
x 107-04-0	Bromo-2-chloroethane, 1-		--	--	--
108-86-1	Bromobenzene		--	--	--
74-97-5	Bromochloromethane		--	--	--
75-27-4	Bromodichloromethane		--	--	--
74-83-9	Bromomethane		--	--	--
106-99-0	Butadiene, 1,3-		--	--	--
75-15-0	Carbon Disulfide		--	--	--
56-23-5	Carbon Tetrachloride		--	--	--
75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--
126-99-8	Chloro-1,3-butadiene, 2-		--	--	--
108-90-7	Chlorobenzene		--	--	--
98-56-6	Chlorobenzotrifluoride, 4-		--	--	--
x 75-45-6	Chlorodifluoromethane		--	--	--
67-66-3	Chloroform		--	--	--
74-87-3	Chloromethane		--	--	--
107-30-2	Chloromethyl Methyl Ether		--	--	--
76-06-2	Chloropicrin		--	--	--
98-82-8	Cumene		--	--	--
57-12-5	Cyanide (CN-)		--	--	--
110-82-7	Cyclohexane		--	--	--
x 110-83-8	Cyclohexene		--	--	--
96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--
124-48-1	Dibromochloromethane		--	--	--
106-93-4	Dibromoethane, 1,2-		--	--	--
74-95-3	Dibromomethane (Methylene Bromide)		--	--	--
764-41-0	Dichloro-2-butene, 1,4-		--	--	--
1476-11-5	Cyclohexene		--	--	--
110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--
95-50-1	Dichlorobenzene, 1,2-		--	--	--
106-46-7	Dichlorobenzene, 1,4-		--	--	--
75-71-8	Dichlorodifluoromethane		--	--	--
75-34-3	Dichloroethane, 1,1-		--	--	--
107-06-2	Dichloroethane, 1,2-		--	--	--
75-35-4	Dichloroethylene, 1,1-		--	--	--
78-87-5	Dichloropropane, 1,2-		--	--	--
x 542-75-6	Dichloropropene, 1,3-		--	--	--
x 77-73-6	Dicyclopentadiene		--	--	--
x 75-37-6	Difluoroethane, 1,1-		--	--	--
94-58-6	Dihydrosafrole		--	--	--
x 108-20-3	Diisopropyl Ether		--	--	--
513-37-1	Dimethylvinylchloride		--	--	--
106-89-8	Epichlorohydrin		--	--	--
106-88-7	Epoxbutane, 1,2-		--	--	--

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR (ug/m ³) ⁻¹		RfC (mg/m ³)		i
2.20E-06	I	9.00E-03	I	
		3.10E+01	A	
		2.00E-03	X	
		6.00E-02	I	
		2.00E-05	I	
6.80E-05	I	2.00E-03	I	
6.00E-06	CA	1.00E-03	I	
		3.00E-03	X	
5.70E-04	S			
5.70E-04	S			
3.10E-05	I			
7.80E-06	I	3.00E-02	I	
4.90E-05	CA	1.00E-03	P	
		4.00E-04	X	
1.00E-05	H			
3.30E-04	I			
6.20E-02	I			
6.00E-04	X			
		6.00E-02	I	
		4.00E-02	X	
3.70E-05	CA			
		5.00E-03	I	
3.00E-05	I	2.00E-03	I	
		7.00E-01	I	
6.00E-06	I	1.00E-01	I	
		5.00E+01	I	
3.00E-04	I	2.00E-02	I	
		5.00E-02	P	
		3.00E-01	P	
		5.00E+01	I	
2.30E-05	I	9.80E-02	A	
		9.00E-02	I	
6.90E-04	CA			
		4.00E-04	CA	
		4.00E-01	I	
		8.00E-04	S	
		6.00E+00	I	
		1.00E+00	X	
6.00E-03	P	2.00E-04	I	Mut
2.70E-05	CA			
6.00E-04	I	9.00E-03	I	
		4.00E-03	X	
4.20E-03	P			
4.20E-03	P			
4.20E-03	P			
		2.00E-01	H	
1.10E-05	CA	8.00E-01	I	
		1.00E-01	X	
1.60E-06	CA			
2.60E-05	I	7.00E-03	P	
		2.00E-01	I	
1.00E-05	CA	4.00E-03	I	
4.00E-06	I	2.00E-02	I	
		3.00E-04	X	
		4.00E+01	I	
1.30E-05	CA			
		7.00E-01	P	
1.30E-05	CA			
1.20E-06	I	1.00E-03	I	
		2.00E-02	I	

OSWER VAPOR INTRUSION ASSESSMENT

Sub-slab or Exterior Soil Gas Concentration to Indoor Air Concentration (SGC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR_SG	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ_SG	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)

CAS	Chemical Name	Site Sub-slab or Exterior Soil Gas Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Csg (ug/m ³)	Cia (ug/m ³)	CR	HQ
141-78-6	Ethyl Acetate		--	--	--
75-00-3	Ethyl Chloride (Chloroethane)		--	--	--
97-63-2	Ethyl Methacrylate		--	--	--
100-41-4	Ethylbenzene		--	--	--
75-21-8	Ethylene Oxide		--	--	--
151-56-4	Ethyleneimine		--	--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--
110-54-3	Hexane, N-		--	--	--
591-78-6	Hexanone, 2-		--	--	--
74-90-8	Hydrogen Cyanide		--	--	--
7439-97-6	Mercury (elemental)		--	--	--
126-98-7	Methacrylonitrile		--	--	--
96-33-3	Methyl Acrylate		--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--
624-83-9	Methyl Isocyanate		--	--	--
80-62-6	Methyl Methacrylate		--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--
75-09-2	Methylene Chloride		--	--	--
91-20-3	Naphthalene		--	--	--
98-95-3	Nitrobenzene		--	--	--
75-52-5	Nitromethane		--	--	--
79-46-9	Nitropropane, 2-		--	--	--
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--
111-84-2	Nonane, n-		--	--	--
109-66-0	Pentane, n-		--	--	--
75-44-5	Phosgene		--	--	--
123-38-6	Propionaldehyde		--	--	--
103-65-1	Propyl benzene		--	--	--
115-07-1	Propylene		--	--	--
75-56-9	Propylene Oxide		--	--	--
100-42-5	Styrene		--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--
x 127-18-4	Tetrachloroethylene		--	--	--
x 811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--
109-99-9	Tetrahydrofuran		--	--	--
x 108-88-3	Toluene		--	--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--
x 71-55-6	Trichloroethane, 1,1,1-		--	--	--
x 79-00-5	Trichloroethane, 1,1,2-		--	--	--
x 79-01-6	Trichloroethylene		--	--	--
75-69-4	Trichlorofluoromethane		--	--	--
96-18-4	Trichloropropane, 1,2,3-		--	--	--
96-19-5	Trichloropropene, 1,2,3-		--	--	--
121-44-8	Triethylamine		--	--	--
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
x 75-01-4	Vinyl Chloride		--	--	--
108-38-3	Xylene, m-		--	--	--
x 95-47-6	Xylene, o-		--	--	--
x 106-42-3	Xylene, P-		--	--	--
x 1330-20-7	Xylenes		--	--	--

Notes:

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR (ug/m ³) ⁻¹		RfC (mg/m ³)		i
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

OSWER VAPOR INTRUSION ASSESSMENT

Sub-slab or Exterior Soil Gas Concentration to Indoor Air Concentration (SGC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR_SG	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ_SG	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)

CAS	Chemical Name	Site Sub-slab or Exterior Soil Gas Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard	Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
		Csg	Cia	CR	HQ	IUR		RfC		
		(ug/m ³)	(ug/m ³)			(ug/m ³) ⁻¹		(mg/m ³)		i
(1)	<u>Inhalation Pathway Exposure Parameters (RME):</u>		Units	Residential		Commercial		Selected (based on scenario)		
	Exposure Scenario			Symbol	Value	Symbol	Value	Symbol	Value	
	Averaging time for carcinogens		(yrs)	ATc_R_SG	70	ATc_C_SG	70	ATc_SG	70	
	Averaging time for non-carcinogens		(yrs)	ATnc_R_SG	26	ATnc_C_SG	25	ATnc_SG	26	
	Exposure duration		(yrs)	ED_R_SG	26	ED_C_SG	25	ED_SG	26	
	Exposure frequency		(days/yr)	EF_R_SG	350	EF_C_SG	250	EF_SG	350	
	Exposure time		(hr/day)	ET_R_SG	24	ET_C_SG	8	ET_SG	24	
(2)	<u>Generic Attenuation Factors:</u>			Residential		Commercial		Selected (based on scenario)		
	Source Medium of Vapors			Symbol	Value	Symbol	Value	Symbol	Value	
	Groundwater		(-)	AFgw_R_SG	0.001	AFgw_C_SG	0.001	AFgw_SG	0.001	
	Sub-Slab and Exterior Soil Gas		(-)	AFss_R_SG	0.1	AFss_C_SG	0.1	AFss_SG	0.1	
(3)	<u>Formulas</u>									
	Cia, target = MIN(Cia,c; Cia,nc)									
	Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)									
	Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)									
(4)	<u>Special Case Chemicals</u>			Residential		Commercial		Selected (based on scenario)		
	Trichloroethylene			Symbol	Value	Symbol	Value	Symbol	Value	
				mIURTCE_R_SG	1.00E-06	nIURTCE_C_SG	0.00E+00	mIURTCE_SG	1.00E-06	
				IURTCE_R_SG	3.10E-06	IURTCE_C_SG	4.10E-06	IURTCE_SG	3.10E-06	

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor

72

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

P = PPRTV: EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhpprtv.ornl.gov/pprtv.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

H = HEAST: EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heast.ornl.gov/heast.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

TABLE C-97

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
75-07-0	Acetaldehyde		--	--	--
67-64-1	Acetone	1.8E+00	1.74E-03	No IUR	1.3E-08
75-86-5	Acetone Cyanohydrin		--	--	--
75-05-8	Acetonitrile		--	--	--
107-02-8	Acrolein		--	--	--
107-13-1	Acrylonitrile		--	--	--
107-05-1	Allyl Chloride		--	--	--
75-85-4	Amyl Alcohol, tert-		--	--	--
11104-28-2	Aroclor 1221		--	--	--
11141-16-5	Aroclor 1232		--	--	--
103-33-3	Azobenzene		--	--	--
x 71-43-2	Benzene		--	--	--
100-44-7	Benzyl Chloride		--	--	--
92-52-4	Biphenyl, 1,1'-		--	--	--
108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--
111-44-4	Bis(2-chloroethyl) ether		--	--	--
542-88-1	Bis(chloromethyl) ether		--	--	--
107-04-0	Bromo-2-chloroethane, 1-		--	--	--
108-86-1	Bromobenzene		--	--	--
74-97-5	Bromochloromethane		--	--	--
75-27-4	Bromodichloromethane		--	--	--
74-83-9	Bromomethane		--	--	--
106-99-0	Butadiene, 1,3-		--	--	--
x 75-15-0	Carbon Disulfide		--	--	--
56-23-5	Carbon Tetrachloride		--	--	--
75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--
126-99-8	Chloro-1,3-butadiene, 2-		--	--	--
108-90-7	Chlorobenzene		--	--	--
98-56-6	Chlorobenzotrifluoride, 4-		--	--	--
75-45-6	Chlorodifluoromethane		--	--	--
67-66-3	Chloroform		--	--	--
x 74-87-3	Chloromethane		--	--	--
107-30-2	Chloromethyl Methyl Ether		--	--	--
76-06-2	Chloropicrin		--	--	--
98-82-8	Cumene		--	--	--
57-12-5	Cyanide (CN-)		--	--	--
110-82-7	Cyclohexane		--	--	--
110-83-8	Cyclohexene		--	--	--
96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--
124-48-1	Dibromochloromethane		--	--	--
106-93-4	Dibromoethane, 1,2-		--	--	--
74-95-3	Dibromomethane (Methylene Bromide)		--	--	--
764-41-0	Dichloro-2-butene, 1,4-		--	--	--
1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--
110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--
95-50-1	Dichlorobenzene, 1,2-		--	--	--
x 106-46-7	Dichlorobenzene, 1,4-		--	--	--
x 75-71-8	Dichlorodifluoromethane		--	--	--
x 75-34-3	Dichloroethane, 1,1-		--	--	--
107-06-2	Dichloroethane, 1,2-		--	--	--
x 75-35-4	Dichloroethylene, 1,1-		--	--	--
78-87-5	Dichloropropane, 1,2-		--	--	--
542-75-6	Dichloropropene, 1,3-		--	--	--
77-73-6	Dicyclopentadiene		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
2.20E-06	I	9.00E-03	I	
		3.10E+01	A	
		2.00E-03	X	
		6.00E-02	I	
		2.00E-05	I	
6.80E-05	I	2.00E-03	I	
6.00E-06	CA	1.00E-03	I	
		3.00E-03	X	
5.70E-04	S			
5.70E-04	S			
3.10E-05	I			
7.80E-06	I	3.00E-02	I	
4.90E-05	CA	1.00E-03	P	
		4.00E-04	X	
1.00E-05	H			
3.30E-04	I			
6.20E-02	I			
6.00E-04	X			
		6.00E-02	I	
		4.00E-02	X	
3.70E-05	CA			
		5.00E-03	I	
3.00E-05	I	2.00E-03	I	
		7.00E-01	I	
6.00E-06	I	1.00E-01	I	
		5.00E+01	I	
3.00E-04	I	2.00E-02	I	
		5.00E-02	P	
		3.00E-01	P	
		5.00E+01	I	
2.30E-05	I	9.80E-02	A	
		9.00E-02	I	
6.90E-04	CA			
		4.00E-04	CA	
		4.00E-01	I	
		8.00E-04	S	
		6.00E+00	I	
		1.00E+00	X	
6.00E-03	P	2.00E-04	I	Mut
2.70E-05	CA			
6.00E-04	I	9.00E-03	I	
		4.00E-03	X	
4.20E-03	P			
4.20E-03	P			
4.20E-03	P			
		2.00E-01	H	
1.10E-05	CA	8.00E-01	I	
		1.00E-01	X	
1.60E-06	CA			
2.60E-05	I	7.00E-03	P	
		2.00E-01	I	
1.00E-05	CA	4.00E-03	I	
4.00E-06	I	2.00E-02	I	
		3.00E-04	X	

TABLE C-97

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
75-37-6	Difluoroethane, 1,1-	--	--	--	--
94-58-6	Dihydrosafrole	--	--	--	--
108-20-3	Diisopropyl Ether	--	--	--	--
513-37-1	Dimethylvinylchloride	--	--	--	--
106-89-8	Epichlorohydrin	--	--	--	--
106-88-7	Epoxybutane, 1,2-	--	--	--	--
141-78-6	Ethyl Acetate	--	--	--	--
75-00-3	Ethyl Chloride (Chloroethane)	--	--	--	--
97-63-2	Ethyl Methacrylate	--	--	--	--
100-41-4	Ethylbenzene	--	--	--	--
75-21-8	Ethylene Oxide	--	--	--	--
151-56-4	Ethyleneimine	--	--	--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-	--	--	--	--
110-54-3	Hexane, N-	--	--	--	--
591-78-6	Hexanone, 2-	--	--	--	--
74-90-8	Hydrogen Cyanide	--	--	--	--
7439-97-6	Mercury (elemental)	1.9E-01	4.18E-02	No IUR	3.2E-02
126-98-7	Methacrylonitrile	--	--	--	--
96-33-3	Methyl Acrylate	--	--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)	--	--	--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	--	--	--	--
624-83-9	Methyl Isocyanate	--	--	--	--
80-62-6	Methyl Methacrylate	--	--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)	--	--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)	--	--	--	--
75-09-2	Methylene Chloride	--	--	--	--
91-20-3	Naphthalene	--	--	--	--
98-95-3	Nitrobenzene	--	--	--	--
75-52-5	Nitromethane	--	--	--	--
79-46-9	Nitropropane, 2-	--	--	--	--
924-16-3	Nitroso-di-N-butylamine, N-	--	--	--	--
111-84-2	Nonane, n-	--	--	--	--
109-66-0	Pentane, n-	--	--	--	--
75-44-5	Phosgene	--	--	--	--
123-38-6	Propionaldehyde	--	--	--	--
103-65-1	Propyl benzene	--	--	--	--
115-07-1	Propylene	--	--	--	--
75-56-9	Propylene Oxide	--	--	--	--
100-42-5	Styrene	--	--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-	--	--	--	--
x 79-34-5	Tetrachloroethane, 1,1,2,2-	--	--	--	--
x 127-18-4	Tetrachloroethylene	--	--	--	--
811-97-2	Tetrafluoroethane, 1,1,1,2-	--	--	--	--
109-99-9	Tetrahydrofuran	--	--	--	--
x 108-88-3	Toluene	--	--	--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	--	--	--	--
120-82-1	Trichlorobenzene, 1,2,4-	--	--	--	--
x 71-55-6	Trichloroethane, 1,1,1-	--	--	--	--
x 79-00-5	Trichloroethane, 1,1,2-	--	--	--	--
x 79-01-6	Trichloroethylene	--	--	--	--
75-69-4	Trichlorofluoromethane	--	--	--	--
96-18-4	Trichloropropane, 1,2,3-	--	--	--	--
96-19-5	Trichloropropene, 1,2,3-	--	--	--	--
121-44-8	Triethylamine	--	--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
1.30E-05	CA	4.00E+01	I	
		7.00E-01	P	
1.30E-05	CA	1.00E-03	I	
1.20E-06	I	2.00E-02	I	
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	

TABLE C-97

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration C _{gw} (ug/L)	Calculated Indoor Air Concentration C _{ia} (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
x 75-01-4	Vinyl Chloride		--	--	--
108-38-3	Xylene, m-		--	--	--
x 95-47-6	Xylene, o-		--	--	--
x 106-42-3	Xylene, p-		--	--	--
x 1330-20-7	Xylenes		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

Notes:

(1) Inhalation Pathway Exposure Parameters (RME):

Exposure Scenario

Averaging time for carcinogens (yrs)
Averaging time for non-carcinogens (yrs)
Exposure duration (yrs)
Exposure frequency (days/yr)
Exposure time (hr/day)

Units

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
ATnc_R_GW	26	ATnc_C_GW	25	ATnc_GW	25
ED_R_GW	26	ED_C_GW	25	ED_GW	25
EF_R_GW	350	EF_C_GW	250	EF_GW	250
ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) Generic Attenuation Factors:

Source Medium of Vapors

Groundwater (-)
Sub-Slab and Exterior Soil Gas (-)

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
AFss_R_GW	0.1	AFss_C_GW	0.1	AFss_GW	0.1

(3) Formulas

C_{ia}, target = MIN(C_{ia,c}; C_{ia,nc})
C_{ia,c} (ug/m³) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
C_{ia,nc} (ug/m³) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) Special Case Chemicals

Trichloroethylene

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
mlURTCE_R_GW	1.00E-06	lURTCE_C_GW	0.00E+00	mlURTCE_GW	0.00E+00
lURTCE_R_GW	3.10E-06	lURTCE_C_GW	4.10E-06	lURTCE_GW	4.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMAO) adjustment factor

25

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for C_{ia,c} for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

TABLE C-97

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RfC		
(ug/m ³) ⁻¹		(mg/m ³)		

P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhpprtv.ornl.gov/pprtv.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heast.ornl.gov/heast.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

TABLE C-98

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
75-07-0	Acetaldehyde		--	--	--
67-64-1	Acetone	7.2E+00	6.95E-03	No IUR	5.1E-08
75-86-5	Acetone Cyanohydrin		--	--	--
75-05-8	Acetonitrile		--	--	--
107-02-8	Acrolein		--	--	--
107-13-1	Acrylonitrile		--	--	--
107-05-1	Allyl Chloride		--	--	--
75-85-4	Amyl Alcohol, tert-		--	--	--
11104-28-2	Aroclor 1221		--	--	--
11141-16-5	Aroclor 1232		--	--	--
103-33-3	Azobenzene		--	--	--
x 71-43-2	Benzene		--	--	--
100-44-7	Benzyl Chloride		--	--	--
92-52-4	Biphenyl, 1,1'-		--	--	--
108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--
111-44-4	Bis(2-chloroethyl) ether		--	--	--
542-88-1	Bis(chloromethyl) ether		--	--	--
107-04-0	Bromo-2-chloroethane, 1-		--	--	--
108-86-1	Bromobenzene		--	--	--
74-97-5	Bromochloromethane		--	--	--
75-27-4	Bromodichloromethane	1.7E-01	9.37E-03	2.8E-08	No RfC
74-83-9	Bromomethane		--	--	--
106-99-0	Butadiene, 1,3-		--	--	--
x 75-15-0	Carbon Disulfide	4.3E-01	1.79E-01	No IUR	5.8E-05
56-23-5	Carbon Tetrachloride		--	--	--
75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--
126-99-8	Chloro-1,3-butadiene, 2-		--	--	--
108-90-7	Chlorobenzene		--	--	--
98-56-6	Chlorobenzotrifluoride, 4-		--	--	--
75-45-6	Chlorodifluoromethane		--	--	--
x 67-66-3	Chloroform	5.0E-01	5.06E-02	9.5E-08	1.2E-04
74-87-3	Chloromethane		--	--	--
107-30-2	Chloromethyl Methyl Ether		--	--	--
76-06-2	Chloropicrin		--	--	--
98-82-8	Cumene		--	--	--
57-12-5	Cyanide (CN-)		--	--	--
110-82-7	Cyclohexane		--	--	--
110-83-8	Cyclohexene		--	--	--
96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--
124-48-1	Dibromochloromethane		--	--	--
106-93-4	Dibromoethane, 1,2-		--	--	--
74-95-3	Dibromomethane (Methylene Bromide)		--	--	--
764-41-0	Dichloro-2-butene, 1,4-		--	--	--
1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--
110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--
95-50-1	Dichlorobenzene, 1,2-		--	--	--
x 106-46-7	Dichlorobenzene, 1,4-		--	--	--
x 75-71-8	Dichlorodifluoromethane		--	--	--
x 75-34-3	Dichloroethane, 1,1-	2.2E+01	3.38E+00	4.4E-07	No RfC
107-06-2	Dichloroethane, 1,2-		--	--	--
x 75-35-4	Dichloroethylene, 1,1-	2.2E+00	1.68E+00	No IUR	1.9E-03
78-87-5	Dichloropropane, 1,2-		--	--	--
542-75-6	Dichloropropene, 1,3-		--	--	--
77-73-6	Dicyclopentadiene		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
2.20E-06	I	9.00E-03	I	
		3.10E+01	A	
		2.00E-03	X	
		6.00E-02	I	
		2.00E-05	I	
6.80E-05	I	2.00E-03	I	
6.00E-06	CA	1.00E-03	I	
		3.00E-03	X	
5.70E-04	S			
5.70E-04	S			
3.10E-05	I			
7.80E-06	I	3.00E-02	I	
4.90E-05	CA	1.00E-03	P	
		4.00E-04	X	
1.00E-05	H			
3.30E-04	I			
6.20E-02	I			
6.00E-04	X			
		6.00E-02	I	
		4.00E-02	X	
3.70E-05	CA			
		5.00E-03	I	
3.00E-05	I	2.00E-03	I	
6.00E-06	I	7.00E-01	I	
		5.00E+01	I	
3.00E-04	I	2.00E-02	I	
		5.00E-02	P	
		3.00E-01	P	
		5.00E+01	I	
2.30E-05	I	9.80E-02	A	
		9.00E-02	I	
6.90E-04	CA			
		4.00E-04	CA	
		4.00E-01	I	
		8.00E-04	S	
		6.00E+00	I	
		1.00E+00	X	
6.00E-03	P	2.00E-04	I	Mut
2.70E-05	CA			
6.00E-04	I	9.00E-03	I	
		4.00E-03	X	
4.20E-03	P			
4.20E-03	P			
4.20E-03	P			
		2.00E-01	H	
1.10E-05	CA	8.00E-01	I	
		1.00E-01	X	
1.60E-06	CA			
2.60E-05	I	7.00E-03	P	
		2.00E-01	I	
1.00E-05	CA	4.00E-03	I	
4.00E-06	I	2.00E-02	I	
		3.00E-04	X	

TABLE C-98

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw (ug/L)	Cia (ug/m ³)	CR	HQ
75-37-6	Difluoroethane, 1,1-		--	--	--
94-58-6	Dihydrosafrole		--	--	--
108-20-3	Diisopropyl Ether		--	--	--
513-37-1	Dimethylvinylchloride		--	--	--
106-89-8	Epichlorohydrin		--	--	--
106-88-7	Epoxybutane, 1,2-		--	--	--
141-78-6	Ethyl Acetate		--	--	--
75-00-3	Ethyl Chloride (Chloroethane)	3.7E-01	1.24E-01	No IUR	2.8E-06
97-63-2	Ethyl Methacrylate		--	--	--
100-41-4	Ethylbenzene		--	--	--
75-21-8	Ethylene Oxide		--	--	--
151-56-4	Ethyleneimine		--	--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--
110-54-3	Hexane, N-		--	--	--
591-78-6	Hexanone, 2-		--	--	--
74-90-8	Hydrogen Cyanide		--	--	--
7439-97-6	Mercury (elemental)		--	--	--
126-98-7	Methacrylonitrile		--	--	--
96-33-3	Methyl Acrylate		--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)	1.0E+00	1.50E-03	No IUR	6.8E-08
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--
624-83-9	Methyl Isocyanate		--	--	--
80-62-6	Methyl Methacrylate		--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--
75-09-2	Methylene Chloride		--	--	--
91-20-3	Naphthalene	3.3E+00	3.02E-02	8.4E-08	2.3E-03
98-95-3	Nitrobenzene		--	--	--
75-52-5	Nitromethane		--	--	--
79-46-9	Nitropropane, 2-		--	--	--
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--
111-84-2	Nonane, n-		--	--	--
109-66-0	Pentane, n-		--	--	--
75-44-5	Phosgene		--	--	--
123-38-6	Propionaldehyde		--	--	--
103-65-1	Propyl benzene		--	--	--
115-07-1	Propylene		--	--	--
75-56-9	Propylene Oxide		--	--	--
100-42-5	Styrene		--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--
x 79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--
x 127-18-4	Tetrachloroethylene		--	--	--
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--
109-99-9	Tetrahydrofuran		--	--	--
x 108-88-3	Toluene	3.2E-01	5.39E-02	No IUR	2.5E-06
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--
x 71-55-6	Trichloroethane, 1,1,1-	5.7E+01	2.66E+01	No IUR	1.2E-03
x 79-00-5	Trichloroethane, 1,1,2-		--	--	--
x 79-01-6	Trichloroethylene		--	--	--
75-69-4	Trichlorofluoromethane		--	--	--
96-18-4	Trichloropropane, 1,2,3-		--	--	--
96-19-5	Trichloropropene, 1,2,3-		--	--	--
121-44-8	Triethylamine		--	--	--

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RFC		
(ug/m ³) ⁻¹		(mg/m ³)		i
1.30E-05	CA	4.00E+01	I	
		7.00E-01	P	
1.30E-05	CA			
1.20E-06	I	1.00E-03	I	
		2.00E-02	I	
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	

TABLE C-98

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
x 75-01-4	Vinyl Chloride		--	--	--
108-38-3	Xylene, m-		--	--	--
x 95-47-6	Xylene, o-		--	--	--
x 106-42-3	Xylene, p-		--	--	--
x 1330-20-7	Xylenes		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

Notes:

(1) Inhalation Pathway Exposure Parameters (RME):

Exposure Scenario

Averaging time for carcinogens (yrs)
Averaging time for non-carcinogens (yrs)
Exposure duration (yrs)
Exposure frequency (days/yr)
Exposure time (hr/day)

Units

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
ATnc_R_GW	26	ATnc_C_GW	25	ATnc_GW	25
ED_R_GW	26	ED_C_GW	25	ED_GW	25
EF_R_GW	350	EF_C_GW	250	EF_GW	250
ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) Generic Attenuation Factors:

Source Medium of Vapors

Groundwater (-)
Sub-Slab and Exterior Soil Gas (-)

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
AFss_R_GW	0.1	AFss_C_GW	0.1	AFss_GW	0.1

(3) Formulas

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) Special Case Chemicals

Trichloroethylene

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
mlURTCE_R_GW	1.00E-06	lURTCE_C_GW	0.00E+00	mlURTCE_GW	0.00E+00
lURTCE_R_GW	3.10E-06	lURTCE_C_GW	4.10E-06	lURTCE_GW	4.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMAO) adjustment factor

25

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

TABLE C-98

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RfC		
(ug/m ³) ⁻¹		(mg/m ³)		

P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhpprtv.ornl.gov/pprtv.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heast.ornl.gov/heast.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

TABLE C-99

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
75-07-0	Acetaldehyde		--	--	--
67-64-1	Acetone		--	--	--
75-86-5	Acetone Cyanohydrin		--	--	--
75-05-8	Acetonitrile		--	--	--
107-02-8	Acrolein		--	--	--
107-13-1	Acrylonitrile		--	--	--
107-05-1	Allyl Chloride		--	--	--
75-85-4	Amyl Alcohol, tert-		--	--	--
11104-28-2	Aroclor 1221		--	--	--
11141-16-5	Aroclor 1232		--	--	--
103-33-3	Azobenzene		--	--	--
x 71-43-2	Benzene		--	--	--
100-44-7	Benzyl Chloride		--	--	--
92-52-4	Biphenyl, 1,1'-		--	--	--
108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--
111-44-4	Bis(2-chloroethyl) ether		--	--	--
542-88-1	Bis(chloromethyl) ether		--	--	--
107-04-0	Bromo-2-chloroethane, 1-		--	--	--
108-86-1	Bromobenzene		--	--	--
74-97-5	Bromochloromethane		--	--	--
75-27-4	Bromodichloromethane		--	--	--
74-83-9	Bromomethane		--	--	--
106-99-0	Butadiene, 1,3-		--	--	--
x 75-15-0	Carbon Disulfide		--	--	--
56-23-5	Carbon Tetrachloride		--	--	--
75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--
126-99-8	Chloro-1,3-butadiene, 2-		--	--	--
108-90-7	Chlorobenzene		--	--	--
98-56-6	Chlorobenzotrifluoride, 4-		--	--	--
75-45-6	Chlorodifluoromethane		--	--	--
67-66-3	Chloroform		--	--	--
x 74-87-3	Chloromethane		--	--	--
107-30-2	Chloromethyl Methyl Ether		--	--	--
76-06-2	Chloropicrin		--	--	--
98-82-8	Cumene		--	--	--
57-12-5	Cyanide (CN-)		--	--	--
110-82-7	Cyclohexane		--	--	--
110-83-8	Cyclohexene		--	--	--
96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--
124-48-1	Dibromochloromethane		--	--	--
106-93-4	Dibromoethane, 1,2-		--	--	--
74-95-3	Dibromomethane (Methylene Bromide)		--	--	--
764-41-0	Dichloro-2-butene, 1,4-		--	--	--
1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--
110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--
95-50-1	Dichlorobenzene, 1,2-		--	--	--
x 106-46-7	Dichlorobenzene, 1,4-		--	--	--
x 75-71-8	Dichlorodifluoromethane		--	--	--
x 75-34-3	Dichloroethane, 1,1-		--	--	--
107-06-2	Dichloroethane, 1,2-		--	--	--
x 75-35-4	Dichloroethylene, 1,1-		--	--	--
78-87-5	Dichloropropane, 1,2-		--	--	--
542-75-6	Dichloropropene, 1,3-		--	--	--
77-73-6	Dicyclopentadiene		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
2.20E-06	I	9.00E-03	I	
		3.10E+01	A	
		2.00E-03	X	
		6.00E-02	I	
		2.00E-05	I	
6.80E-05	I	2.00E-03	I	
6.00E-06	CA	1.00E-03	I	
		3.00E-03	X	
5.70E-04	S			
5.70E-04	S			
3.10E-05	I			
7.80E-06	I	3.00E-02	I	
4.90E-05	CA	1.00E-03	P	
		4.00E-04	X	
1.00E-05	H			
3.30E-04	I			
6.20E-02	I			
6.00E-04	X			
		6.00E-02	I	
		4.00E-02	X	
3.70E-05	CA			
		5.00E-03	I	
3.00E-05	I	2.00E-03	I	
		7.00E-01	I	
6.00E-06	I	1.00E-01	I	
		5.00E+01	I	
3.00E-04	I	2.00E-02	I	
		5.00E-02	P	
		3.00E-01	P	
		5.00E+01	I	
2.30E-05	I	9.80E-02	A	
		9.00E-02	I	
6.90E-04	CA			
		4.00E-04	CA	
		4.00E-01	I	
		8.00E-04	S	
		6.00E+00	I	
		1.00E+00	X	
6.00E-03	P	2.00E-04	I	Mut
2.70E-05	CA			
6.00E-04	I	9.00E-03	I	
		4.00E-03	X	
4.20E-03	P			
4.20E-03	P			
4.20E-03	P			
		2.00E-01	H	
1.10E-05	CA	8.00E-01	I	
		1.00E-01	X	
1.60E-06	CA			
2.60E-05	I	7.00E-03	P	
		2.00E-01	I	
1.00E-05	CA	4.00E-03	I	
4.00E-06	I	2.00E-02	I	
		3.00E-04	X	

TABLE C-99

**GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		
75-37-6	Difluoroethane, 1,1-	--	--	--	--
94-58-6	Dihydrosafrole	--	--	--	--
108-20-3	Diisopropyl Ether	--	--	--	--
513-37-1	Dimethylvinylchloride	--	--	--	--
106-89-8	Epichlorohydrin	--	--	--	--
106-88-7	Epoxybutane, 1,2-	--	--	--	--
141-78-6	Ethyl Acetate	--	--	--	--
75-00-3	Ethyl Chloride (Chloroethane)	--	--	--	--
97-63-2	Ethyl Methacrylate	--	--	--	--
100-41-4	Ethylbenzene	--	--	--	--
75-21-8	Ethylene Oxide	--	--	--	--
151-56-4	Ethyleneimine	--	--	--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-	--	--	--	--
110-54-3	Hexane, N-	--	--	--	--
591-78-6	Hexanone, 2-	--	--	--	--
74-90-8	Hydrogen Cyanide	--	--	--	--
7439-97-6	Mercury (elemental)	--	--	--	--
126-98-7	Methacrylonitrile	--	--	--	--
96-33-3	Methyl Acrylate	--	--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)	--	--	--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	--	--	--	--
624-83-9	Methyl Isocyanate	--	--	--	--
80-62-6	Methyl Methacrylate	--	--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)	--	--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)	--	--	--	--
75-09-2	Methylene Chloride	--	--	--	--
91-20-3	Naphthalene	--	--	--	--
98-95-3	Nitrobenzene	--	--	--	--
75-52-5	Nitromethane	--	--	--	--
79-46-9	Nitropropane, 2-	--	--	--	--
924-16-3	Nitroso-di-N-butylamine, N-	--	--	--	--
111-84-2	Nonane, n-	--	--	--	--
109-66-0	Pentane, n-	--	--	--	--
75-44-5	Phosgene	--	--	--	--
123-38-6	Propionaldehyde	--	--	--	--
103-65-1	Propyl benzene	--	--	--	--
115-07-1	Propylene	--	--	--	--
75-56-9	Propylene Oxide	--	--	--	--
100-42-5	Styrene	--	--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-	--	--	--	--
x 79-34-5	Tetrachloroethane, 1,1,2,2-	--	--	--	--
x 127-18-4	Tetrachloroethylene	8.4E-01	3.70E-01	7.8E-09	2.1E-03
811-97-2	Tetrafluoroethane, 1,1,1,2-	--	--	--	--
109-99-9	Tetrahydrofuran	--	--	--	--
x 108-88-3	Toluene	--	--	--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	--	--	--	--
120-82-1	Trichlorobenzene, 1,2,4-	--	--	--	--
x 71-55-6	Trichloroethane, 1,1,1-	--	--	--	--
x 79-00-5	Trichloroethane, 1,1,2-	--	--	--	--
x 79-01-6	Trichloroethylene	1.1E+01	2.84E+00	9.5E-07	3.2E-01
75-69-4	Trichlorofluoromethane	--	--	--	--
96-18-4	Trichloropropane, 1,2,3-	--	--	--	--
96-19-5	Trichloropropene, 1,2,3-	--	--	--	--
121-44-8	Triethylamine	--	--	--	--

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RFC		
(ug/m ³) ⁻¹		(mg/m ³)		i
1.30E-05	CA	4.00E+01	I	
		7.00E-01	P	
1.30E-05	CA	1.00E-03	I	
1.20E-06	I	2.00E-02	I	
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	

TABLE C-99

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
x 75-01-4	Vinyl Chloride	1.6E+00	1.40E+00	5.0E-07	3.2E-03
x 108-38-3	Xylene, m-		--	--	--
x 95-47-6	Xylene, o-		--	--	--
x 106-42-3	Xylene, p-		--	--	--
x 1330-20-7	Xylenes		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

Notes:

(1) Inhalation Pathway Exposure Parameters (RME):

Exposure Scenario

Averaging time for carcinogens (yrs)
Averaging time for non-carcinogens (yrs)
Exposure duration (yrs)
Exposure frequency (days/yr)
Exposure time (hr/day)

Units

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
ATnc_R_GW	26	ATnc_C_GW	25	ATnc_GW	25
ED_R_GW	26	ED_C_GW	25	ED_GW	25
EF_R_GW	350	EF_C_GW	250	EF_GW	250
ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) Generic Attenuation Factors:

Source Medium of Vapors

Groundwater (-)
Sub-Slab and Exterior Soil Gas (-)

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
AFss_R_GW	0.1	AFss_C_GW	0.1	AFss_GW	0.1

(3) Formulas

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) Special Case Chemicals

Trichloroethylene

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
mlURTCE_R_GW	1.00E-06	lURTCE_C_GW	0.00E+00	mlURTCE_GW	0.00E+00
lURTCE_R_GW	3.10E-06	lURTCE_C_GW	4.10E-06	lURTCE_GW	4.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMAO) adjustment factor

25

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

TABLE C-99

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RfC		i
(ug/m ³) ⁻¹		(mg/m ³)		

P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhpprtv.ornl.gov/pprtv.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heast.ornl.gov/heast.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

TABLE C-100

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		
75-37-6	Difluoroethane, 1,1-	--	--	--	--
94-58-6	Dihydrosafrole	--	--	--	--
108-20-3	Diisopropyl Ether	--	--	--	--
513-37-1	Dimethylvinylchloride	--	--	--	--
106-89-8	Epichlorohydrin	--	--	--	--
106-88-7	Epoxybutane, 1,2-	--	--	--	--
141-78-6	Ethyl Acetate	--	--	--	--
75-00-3	Ethyl Chloride (Chloroethane)	--	--	--	--
97-63-2	Ethyl Methacrylate	--	--	--	--
100-41-4	Ethylbenzene	--	--	--	--
75-21-8	Ethylene Oxide	--	--	--	--
151-56-4	Ethyleneimine	--	--	--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-	--	--	--	--
110-54-3	Hexane, N-	--	--	--	--
591-78-6	Hexanone, 2-	--	--	--	--
74-90-8	Hydrogen Cyanide	--	--	--	--
7439-97-6	Mercury (elemental)	--	--	--	--
126-98-7	Methacrylonitrile	--	--	--	--
96-33-3	Methyl Acrylate	--	--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)	--	--	--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	--	--	--	--
624-83-9	Methyl Isocyanate	--	--	--	--
80-62-6	Methyl Methacrylate	--	--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)	--	--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)	--	--	--	--
75-09-2	Methylene Chloride	--	--	--	--
91-20-3	Naphthalene	--	--	--	--
98-95-3	Nitrobenzene	--	--	--	--
75-52-5	Nitromethane	--	--	--	--
79-46-9	Nitropropane, 2-	--	--	--	--
924-16-3	Nitroso-di-N-butylamine, N-	--	--	--	--
111-84-2	Nonane, n-	--	--	--	--
109-66-0	Pentane, n-	--	--	--	--
75-44-5	Phosgene	--	--	--	--
123-38-6	Propionaldehyde	--	--	--	--
103-65-1	Propyl benzene	--	--	--	--
115-07-1	Propylene	--	--	--	--
75-56-9	Propylene Oxide	--	--	--	--
100-42-5	Styrene	--	--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-	--	--	--	--
x 79-34-5	Tetrachloroethane, 1,1,2,2-	--	--	--	--
x 127-18-4	Tetrachloroethylene	--	--	--	--
811-97-2	Tetrafluoroethane, 1,1,1,2-	--	--	--	--
109-99-9	Tetrahydrofuran	--	--	--	--
x 108-88-3	Toluene	--	--	--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	--	--	--	--
120-82-1	Trichlorobenzene, 1,2,4-	--	--	--	--
x 71-55-6	Trichloroethane, 1,1,1-	--	--	--	--
x 79-00-5	Trichloroethane, 1,1,2-	--	--	--	--
x 79-01-6	Trichloroethylene	--	--	--	--
75-69-4	Trichlorofluoromethane	--	--	--	--
96-18-4	Trichloropropane, 1,2,3-	--	--	--	--
96-19-5	Trichloropropene, 1,2,3-	--	--	--	--
121-44-8	Triethylamine	--	--	--	--

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RFC		
(ug/m ³) ⁻¹		(mg/m ³)		i
1.30E-05	CA	4.00E+01	I	
		7.00E-01	P	
1.30E-05	CA	1.00E-03	I	
1.20E-06	I	2.00E-02	I	
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	

TABLE C-100

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
x 75-01-4	Vinyl Chloride		--	--	--
108-38-3	Xylene, m-		--	--	--
x 95-47-6	Xylene, o-		--	--	--
x 106-42-3	Xylene, p-		--	--	--
x 1330-20-7	Xylenes		--	--	--

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RFC (mg/m ³)	RFC Source*	Mutagenic Indicator i
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

Notes:

(1) Inhalation Pathway Exposure Parameters (RME):

Exposure Scenario

Averaging time for carcinogens (yrs)
Averaging time for non-carcinogens (yrs)
Exposure duration (yrs)
Exposure frequency (days/yr)
Exposure time (hr/day)

Units

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
ATnc_R_GW	26	ATnc_C_GW	25	ATnc_GW	25
ED_R_GW	26	ED_C_GW	25	ED_GW	25
EF_R_GW	350	EF_C_GW	250	EF_GW	250
ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) Generic Attenuation Factors:

Source Medium of Vapors

Groundwater (-)
Sub-Slab and Exterior Soil Gas (-)

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
AFss_R_GW	0.1	AFss_C_GW	0.1	AFss_GW	0.1

(3) Formulas

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RFC x (1000 ug/mg) / (ED x EF x ET)

(4) Special Case Chemicals

Trichloroethylene

Residential

Commercial

Selected (based on scenario)

Symbol	Value	Symbol	Value	Symbol	Value
mlURTCE_R_GW	1.00E-06	lURTCE_C_GW	0.00E+00	mlURTCE_GW	0.00E+00
lURTCE_R_GW	3.10E-06	lURTCE_C_GW	4.10E-06	lURTCE_GW	4.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMAO) adjustment factor

25

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at:

<http://www.epa.gov/iris/subst/index.html>

TABLE C-100

GROUNDWATER TO INDOOR AIR RISKS AND HAZARDS
INDUSTRIAL/COMMERCIAL WORKERS – IA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	16	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cgw	Cia	CR	HQ
		(ug/L)	(ug/m ³)		

Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator
IUR		RfC		i
(ug/m ³) ⁻¹		(mg/m ³)		

P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at:

<http://hhpprtv.ornl.gov/pprtv.shtml>

A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at:

<http://www.atsdr.cdc.gov/mrls/index.html>

CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at:

<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>

H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at:

<http://epa-heast.ornl.gov/heast.shtml>

S = See RSL User Guide, Section 5

X = PPRTV Appendix

Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).

VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).

TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).

Yellow highlighting indicates site-specific parameters that may be edited by the user.

Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT

Indoor Air Concentration to Risk (IAC-Risk) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column E)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column F)

CAS	Chemical Name	Site Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cia (ug/m ³)	CR	HQ
75-07-0	Acetaldehyde		--	--
67-64-1	Acetone		--	--
75-86-5	Acetone Cyanohydrin		--	--
75-05-8	Acetonitrile		--	--
107-02-8	Acrolein		--	--
107-13-1	Acrylonitrile		--	--
107-05-1	Allyl Chloride		--	--
75-85-4	Amyl Alcohol, tert-		--	--
11104-28-2	Aroclor 1221		--	--
11141-16-5	Aroclor 1232		--	--
103-33-3	Azobenzene		--	--
x 71-43-2	Benzene		--	--
100-44-7	Benzyl Chloride		--	--
92-52-4	Biphenyl, 1,1'-		--	--
108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--
111-44-4	Bis(2-chloroethyl)ether		--	--
542-88-1	Bis(chloromethyl)ether		--	--
107-04-0	Bromo-2-chloroethane, 1-		--	--
108-86-1	Bromobenzene		--	--
74-97-5	Bromochloromethane		--	--
75-27-4	Bromodichloromethane		--	--
74-83-9	Bromomethane		--	--
x 106-99-0	Butadiene, 1,3-		--	--
75-15-0	Carbon Disulfide		--	--
56-23-5	Carbon Tetrachloride		--	--
75-68-3	Chloro-1,1-difluoroethane, 1-		--	--
126-99-8	Chloro-1,3-butadiene, 2-		--	--
108-90-7	Chlorobenzene		--	--
98-56-6	Chlorobenzotrifluoride, 4-		--	--
75-45-6	Chlorodifluoromethane		--	--
67-66-3	Chloroform		--	--
x 74-87-3	Chloromethane		--	--
107-30-2	Chloromethyl Methyl Ether		--	--
76-06-2	Chloropicrin		--	--
98-82-8	Cumene		--	--
57-12-5	Cyanide (CN-)		--	--
110-82-7	Cyclohexane		--	--
110-83-8	Cyclohexene		--	--
96-12-8	Dibromo-3-chloropropane, 1,2-		--	--
124-48-1	Dibromochloromethane		--	--
106-93-4	Dibromoethane, 1,2-		--	--
74-95-3	Dibromomethane (Methylene Bromide)		--	--
764-41-0	Dichloro-2-butene, 1,4-		--	--
1476-11-5	Dichloro-2-butene, cis-1,4-		--	--
110-57-6	Dichloro-2-butene, trans-1,4-		--	--
95-50-1	Dichlorobenzene, 1,2-		--	--
x 106-46-7	Dichlorobenzene, 1,4-		--	--
x 75-71-8	Dichlorodifluoromethane		--	--
x 75-34-3	Dichloroethane, 1,1-		--	--
x 107-06-2	Dichloroethane, 1,2-		--	--
75-35-4	Dichloroethylene, 1,1-		--	--
78-87-5	Dichloropropane, 1,2-		--	--
542-75-6	Dichloropropene, 1,3-		--	--
77-73-6	Dicyclopentadiene		--	--
75-37-6	Difluoroethane, 1,1-		--	--
94-58-6	Dihydrosafrole		--	--
108-20-3	Diisopropyl Ether		--	--
513-37-1	Dimethylvinylchloride		--	--
106-89-8	Epichlorohydrin		--	--
106-88-7	Epoxbutane, 1,2-		--	--

Inhalation Unit Risk	IUR Source*	Reference Concentration	RfC Source*	Mutagenic Indicator
IUR (ug/m ³) ⁻¹		RfC (mg/m ³)		i
2.20E-06	I	9.00E-03	I	
		3.10E+01	A	
		2.00E-03	X	
		6.00E-02	I	
		2.00E-05	I	
6.80E-05	I	2.00E-03	I	
6.00E-06	CA	1.00E-03	I	
		3.00E-03	X	
5.70E-04	S			
5.70E-04	S			
3.10E-05	I			
7.80E-06	I	3.00E-02	I	
4.90E-05	CA	1.00E-03	P	
		4.00E-04	X	
1.00E-05	H			
3.30E-04	I			
6.20E-02	I			
6.00E-04	X			
		6.00E-02	I	
		4.00E-02	X	
3.70E-05	CA			
		5.00E-03	I	
3.00E-05	I	2.00E-03	I	
		7.00E-01	I	
6.00E-06	I	1.00E-01	I	
		5.00E+01	I	
3.00E-04	I	2.00E-02	I	
		5.00E-02	P	
		3.00E-01	P	
		5.00E+01	I	
2.30E-05	I	9.80E-02	A	
		9.00E-02	I	
6.90E-04	CA			
		4.00E-04	CA	
		4.00E-01	I	
		8.00E-04	S	
		6.00E+00	I	
		1.00E+00	X	
6.00E-03	P	2.00E-04	I	Mut
2.70E-05	CA			
6.00E-04	I	9.00E-03	I	
		4.00E-03	X	
4.20E-03	P			
4.20E-03	P			
4.20E-03	P			
		2.00E-01	H	
1.10E-05	CA	8.00E-01	I	
		1.00E-01	X	
1.60E-06	CA			
2.60E-05	I	7.00E-03	P	
		2.00E-01	I	
1.00E-05	CA	4.00E-03	I	
4.00E-06	I	2.00E-02	I	
		3.00E-04	X	
		4.00E+01	I	
1.30E-05	CA			
		7.00E-01	P	
1.30E-05	CA			
1.20E-06	I	1.00E-03	I	
		2.00E-02	I	

OSWER VAPOR INTRUSION ASSESSMENT

Indoor Air Concentration to Risk (IAC-Risk) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column E)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column F)

CAS	Chemical Name	Site Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard
		Cia (ug/m ³)	CR	HQ
141-78-6	Ethyl Acetate		--	--
75-00-3	Ethyl Chloride (Chloroethane)		--	--
97-63-2	Ethyl Methacrylate		--	--
100-41-4	Ethylbenzene		--	--
75-21-8	Ethylene Oxide		--	--
151-56-4	Ethyleneimine		--	--
822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--
110-54-3	Hexane, n-		--	--
591-78-6	Hexanone, 2-		--	--
74-90-8	Hydrogen Cyanide		--	--
7439-97-6	Mercury (elemental)		--	--
126-98-7	Methacrylonitrile		--	--
96-33-3	Methyl Acrylate		--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--
624-83-9	Methyl Isocyanate		--	--
80-62-6	Methyl Methacrylate		--	--
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--
75-09-2	Methylene Chloride		--	--
91-20-3	Naphthalene		--	--
98-95-3	Nitrobenzene		--	--
75-52-5	Nitromethane		--	--
79-46-9	Nitropropane, 2-		--	--
924-16-3	Nitroso-di-N-butylamine, N-		--	--
111-84-2	Nonane, n-		--	--
109-66-0	Pentane, n-		--	--
75-44-5	Phosgene		--	--
123-38-6	Propionaldehyde		--	--
103-65-1	Propyl benzene		--	--
115-07-1	Propylene		--	--
75-56-9	Propylene Oxide		--	--
100-42-5	Styrene		--	--
x 630-20-6	Tetrachloroethane, 1,1,1,2-		--	--
x 79-34-5	Tetrachloroethane, 1,1,2,2-		--	--
x 127-18-4	Tetrachloroethylene		--	--
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--
109-99-9	Tetrahydrofuran		--	--
x 108-88-3	Toluene		--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--
120-82-1	Trichlorobenzene, 1,2,4-		--	--
x 71-55-6	Trichloroethane, 1,1,1-		--	--
x 79-00-5	Trichloroethane, 1,1,2-		--	--
x 79-01-6	Trichloroethylene		--	--
75-69-4	Trichlorofluoromethane		--	--
96-18-4	Trichloropropane, 1,2,3-		--	--
96-19-5	Trichloropropene, 1,2,3-		--	--
121-44-8	Triethylamine		--	--
526-73-8	Trimethylbenzene, 1,2,3-		--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--
108-05-4	Vinyl Acetate		--	--
593-60-2	Vinyl Bromide		--	--
x 75-01-4	Vinyl Chloride		--	--
108-38-3	Xylene, m-		--	--
x 95-47-6	Xylene, o-		--	--
x 106-42-3	Xylene, p-		--	--
x 1330-20-7	Xylenes		--	--

Notes:

Inhalation Unit Risk	IUR Source*	Reference Concentration	RfC Source*	Mutagenic Indicator
IUR (ug/m ³) ⁻¹		RfC (mg/m ³)		i
		7.00E-02	P	
		1.00E+01	I	
		3.00E-01	P	
2.50E-06	CA	1.00E+00	I	
8.80E-05	CA	3.00E-02	CA	
1.90E-02	CA			
		1.00E-05	I	
		7.00E-01	I	
		3.00E-02	I	
		8.00E-04	I	
		3.00E-04	I	
		3.00E-02	P	
		2.00E-02	P	
		5.00E+00	I	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
3.40E-05	CA	3.00E-03	I	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.60E-03	I			
		2.00E-02	P	
		1.00E+00	P	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
see note	I	2.00E-03	I	TCE
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	
		5.00E-03	P	
		7.00E-03	P	
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	VC
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	

OSWER VAPOR INTRUSION ASSESSMENT
Indoor Air Concentration to Risk (IAC-Risk) Calculator Version 3.3.1, May 2014 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column E)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column F)

CAS	Chemical Name	Site Indoor Air Concentration Cia (ug/m ³)	VI Carcinogenic Risk CR	VI Hazard HQ

Inhalation Unit Risk IUR (ug/m ³) ⁻¹	IUR Source*	Reference Concentration RfC (mg/m ³)	RfC Source*	Mutagenic Indicator i

(1)	<u>Inhalation Pathway Exposure Parameters (RME):</u>	Units	Residential		Commercial		Selected (based on scenario)	
	Exposure Scenario		Symbol	Value	Symbol	Value	Symbol	Value
	Averaging time for carcinogens	(yrs)	ATc_R_IA	70	ATc_C_IA	70	ATc_IA	70
	Averaging time for non-carcinogens	(yrs)	ATnc_R_IA	26	ATnc_C_IA	25	ATnc_IA	26
	Exposure duration	(yrs)	ED_R_IA	26	ED_C_IA	25	ED_IA	26
	Exposure frequency	(days/yr)	EF_R_IA	350	EF_C_IA	250	EF_IA	350
	Exposure time	(hr/day)	ET_R_IA	24	ET_C_IA	8	ET_IA	24
(2)	<u>Generic Attenuation Factors:</u>		Residential		Commercial		Selected (based on scenario)	
	Source Medium of Vapors		Symbol	Value	Symbol	Value	Symbol	Value
	Groundwater	(-)	AFgw_R_IA	0.001	AFgw_C_IA	0.001	AFgw_IA	0.001
	Sub-Slab and Exterior Soil Gas	(-)	AFss_R_IA	0.1	AFss_C_IA	0.1	AFss_IA	0.1
(3)	<u>Formulas</u>							
	Cia, target = MIN(Cia,c; Cia,nc)							
	Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)							
	Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)							
(4)	<u>Special Case Chemicals</u>		Residential		Commercial		Selected (based on scenario)	
	Trichloroethylene		Symbol	Value	Symbol	Value	Symbol	Value
			mIURTCE_R_IA	1.00E-06	mIURTCE_C_IA	0.00E+00	mIURTCE_IA	1.00E-06
			IURTCE_R_IA	3.10E-06	IURTCE_C_IA	4.10E-06	IURTCE_IA	3.10E-06

Mutagenic Chemicals

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 72

This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: <http://www.epa.gov/iris/subst/index.html>
P = PPRTV: EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: <http://hhpprtv.ornl.gov/pprtv.shtml>
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: <http://www.atsdr.cdc.gov/mrls/index.html>
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: <http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: <http://epa-heast.ornl.gov/heast.shtml>
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.
Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

Chemical Properties for Supporting the VISL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
			Molecular Weight MW	source	Vapor Pressure VP	source	Pure Component Water Solubility S	source	MCL (ug/L)	Henry's Law Constant @25°C Hc25	source	Henry's Law Constant @25°C ⁹ H ₂₅	Henry's Law Constant @ T _{gw} ⁹ H _{Tgw}	Henry's Law Constant Used in Calcs HLC
3	CAS	Alphabetized List of Compounds	(g/mole)		(mm Hg)		(mg/L)			(atm-m ³ /mol)		(unitless)	(unitless)	(unitless)
4														
6	75-07-0	Acetaldehyde	44.05	a	9.02E+02	b	1.00E+06	a		6.67E-05	a	2.73E-03	2.73E-03	2.73E-03
7	67-64-1	Acetone	58.08	a	2.32E+02	b	1.00E+06	a		3.50E-05	a	1.43E-03	1.43E-03	1.43E-03
8	75-86-5	Acetone Cyanohydrin	85.11	a	3.41E-01	e	1.00E+06	a		1.30E-05	a	5.31E-04		5.31E-04
9	75-05-8	Acetonitrile	41.05	a	8.88E+01	b	1.00E+06	a		3.45E-05	a	1.41E-03	1.41E-03	1.41E-03
10	107-02-8	Acrolein	56.06	a	2.74E+02	b	2.12E+05	a		1.22E-04	a	4.99E-03	4.99E-03	4.99E-03
11	107-13-1	Acrylonitrile	53.06	a	1.09E+02	b	7.45E+04	a		1.38E-04	a	5.64E-03	5.64E-03	5.64E-03
12	107-05-1	Allyl Chloride	76.53	a	3.68E+02	e	3.37E+03	a		1.10E-02	a	4.50E-01	4.50E-01	4.50E-01
13	75-85-4	Amyl Alcohol, tert-	88.15	a	1.67E+01	b	1.10E+05	a		1.38E-05	a	5.64E-04	5.64E-04	5.64E-04
14	11104-28-2	Aroclor 1221	188.66	a	6.70E-03	e	1.50E+01	a		7.36E-04	a	3.01E-02		3.01E-02
15	11141-16-5	Aroclor 1232	188.66	a	4.06E-03	e	1.45E+00	a		7.36E-04	a	3.01E-02		3.01E-02
16	103-33-3	Azobenzene	182.23	a	3.61E-04	e	6.40E+00	a		1.35E-05	a	5.52E-04		5.52E-04
17	71-43-2	Benzene	78.11	a	9.48E+01	b	1.79E+03	a	5	5.55E-03	a	2.27E-01	2.27E-01	2.27E-01
18	100-44-7	Benzyl Chloride	126.59	a	1.23E+00	b	5.25E+02	a		4.12E-04	a	1.68E-02	1.68E-02	1.68E-02
19	92-52-4	Biphenyl, 1,1'-	154.21	a	8.93E-03	b	6.94E+00	a		3.08E-04	a	1.26E-02	1.26E-02	1.26E-02
20	108-60-1	Bis(2-chloro-1-methylethyl) ether	171.07	a	5.60E-01	b	1.70E+03	a		7.42E-05	a	3.03E-03	3.03E-03	3.03E-03
21	111-44-4	Bis(2-chloroethyl) ether	143.01	a	1.55E+00	b	1.72E+04	a		1.70E-05	a	6.95E-04	6.95E-04	6.95E-04
22	542-88-1	Bis(chloromethyl) ether	114.96	a	2.94E+01	b	2.20E+04	a		4.36E-03	a	1.78E-01		1.78E-01
23	107-04-0	Bromo-2-chloroethane, 1-	143.41	a	3.31E+01	e	6.90E+03	a		9.09E-04	a	3.72E-02	3.72E-02	3.72E-02
24	108-96-1	Bromobenzene	157.01	a	4.18E+00	e	4.46E+02	a		2.47E-03	a	1.01E-01	1.01E-01	1.01E-01
25	74-97-5	Bromochloromethane	129.38	a	1.43E+02	e	1.67E+04	a		1.46E-03	a	5.97E-02	5.97E-02	5.97E-02
26	75-27-4	Bromodichloromethane	163.83	a	5.92E+01	d	3.03E+03	a	80	2.12E-03	a	8.67E-02	8.67E-02	8.67E-02
27	74-83-9	Bromomethane	94.94	a	1.62E+03	b	1.52E+04	a		7.34E-03	a	3.00E-01	3.00E-01	3.00E-01
28	106-99-0	Butadiene, 1,3-	54.09	a	2.11E+03	b	7.35E+02	a		7.36E-02	a	3.01E+00	3.01E+00	3.01E+00
29	75-15-0	Carbon Disulfide	76.13	a	3.59E+02	b	2.16E+03	a		1.44E-02	a	5.89E-01	5.89E-01	5.89E-01
30	56-23-5	Carbon Tetrachloride	153.82	a	1.15E+02	b	7.93E+02	a	5	2.76E-02	a	1.13E+00	1.13E+00	1.13E+00
31	75-68-3	Chloro-1,1-difluoroethane, 1-	100.5	a	2.54E+03	e	1.40E+03	a		5.88E-02	a	2.40E+00	2.40E+00	2.40E+00
32	126-99-8	Chloro-1,3-butadiene, 2-	88.54	a	2.16E+02	b	8.37E+02	a		5.61E-02	a	2.29E+00	2.29E+00	2.29E+00
33	108-90-7	Chlorobenzene	112.56	a	1.20E+01	b	4.98E+02	a	100	3.11E-03	a	1.27E-01	1.27E-01	1.27E-01
34	98-56-6	Chlorobenzotrifluoride, 4-	180.56	a	7.63E+00	e	1.17E+01	a		3.47E-02	a	1.42E+00		1.42E+00
35	75-45-6	Chlorodifluoromethane	86.47	a	7.25E+03	b	2.77E+03	a		4.06E-02	a	1.66E+00	1.66E+00	1.66E+00
36	67-66-3	Chloroform	119.38	a	1.97E+02	b	7.95E+03	a	80	3.67E-03	a	1.50E-01	1.50E-01	1.50E-01
37	74-87-3	Chloromethane	50.49	a	4.30E+03	b	5.32E+03	a		8.82E-03	a	3.61E-01	3.61E-01	3.61E-01
38	107-30-2	Chloromethyl Methyl Ether	80.51	a	3.00E+01	e	1.92E+05	a		3.04E-04	a	1.24E-02		1.24E-02
39	76-06-2	Chloropicrin	164.38	a	2.38E+01	e	1.62E+03	a		2.05E-03	a	8.38E-02		8.38E-02
40	98-82-8	Cumene	120.2	a	4.50E+00	b	6.13E+01	a		1.15E-02	a	4.70E-01	4.70E-01	4.70E-01
41	57-12-5	Cyanide (CN-)	26.018	a	3.08E+02	e	1.00E+06	a	200	1.33E-04	a	5.44E-03		5.44E-03
42	110-82-7	Cyclohexane	84.16	a	9.69E+01	e	5.50E+01	a		1.50E-01	a	6.13E+00	6.13E+00	6.13E+00
43	110-83-8	Cyclohexene	82.15	a	8.90E+01	b	2.13E+02	a		4.55E-02	a	1.86E+00	1.86E+00	1.86E+00
44	96-12-8	Dibromo-3-chloropropane, 1,2-	236.33	a	5.80E-01	b	1.23E+03	a	0.2	1.47E-04	a	6.01E-03	6.01E-03	6.01E-03
45	124-48-1	Dibromochloromethane	208.28	a	1.50E+01	d	2.70E+03	a	80	7.83E-04	a	3.20E-02	3.20E-02	3.20E-02
46	106-93-4	Dibromoethane, 1,2-	187.86	a	1.12E+01	b	3.91E+03	a	0.05	6.50E-04	a	2.66E-02	2.66E-02	2.66E-02
47	74-95-3	Dibromomethane (Methylene Bromide)	173.84	a	4.44E+01	b	1.19E+04	a		8.22E-04	a	3.36E-02	3.36E-02	3.36E-02
48	764-41-0	Dichloro-2-butene, 1,4-	125	a	3.00E+00	n	5.80E+02	a		6.64E-04	a	2.71E-02		2.71E-02
49	1476-11-5	Dichloro-2-butene, cis-1,4-	125	a	4.09E+00	e	5.80E+02	a		6.64E-04	a	2.71E-02	2.71E-02	2.71E-02
50	110-57-6	Dichloro-2-butene, trans-1,4-	125	a	3.43E+00	e	8.50E+02	a		6.64E-04	a	2.71E-02	2.71E-02	2.71E-02
51	95-50-1	Dichlorobenzene, 1,2-	147	a	1.47E+00	b	1.56E+02	a	600	1.92E-03	a	7.85E-02	7.85E-02	7.85E-02
52	106-46-7	Dichlorobenzene, 1,4-	147	a	1.74E+00	b	8.13E+01	a	75	2.41E-03	a	9.85E-02	9.85E-02	9.85E-02
53	75-71-8	Dichlorodifluoromethane	120.91	a	4.85E+03	b	2.80E+02	a		3.43E-01	a	1.40E+01	1.40E+01	1.40E+01
54	75-34-3	Dichloroethane, 1,1-	98.96	a	2.72E+02	b	5.04E+03	a		5.62E-03	a	2.30E-01	2.30E-01	2.30E-01
55	107-06-2	Dichloroethane, 1,2-	98.96	a	7.89E+01	b	8.60E+03	a	5	1.18E-03	a	4.82E-02	4.82E-02	4.82E-02
56	75-35-4	Dichloroethylene, 1,1-	96.94	a	6.34E+02	b	2.42E+03	a	7	2.61E-02	a	1.07E+00	1.07E+00	1.07E+00
57	78-87-5	Dichloropropane, 1,2-	112.99	a	5.33E+01	b	2.80E+03	a	5	2.82E-03	a	1.15E-01	1.15E-01	1.15E-01
58	542-75-6	Dichloropropene, 1,3-	110.97	a	3.40E+01	b	2.80E+03	a		3.55E-03	a	1.45E-01	1.45E-01	1.45E-01
59	77-73-6	Dicyclopentadiene	132.21	a	2.29E+00	e	1.37E+01	a		6.25E-02	a	2.55E+00	2.55E+00	2.55E+00
60	75-37-6	Difluoroethane, 1,1-	66.05	a	4.55E+03	e	3.20E+03	a		2.03E-02	a	8.30E-01	8.30E-01	8.30E-01
61	94-58-6	Dihydrosafrole	164.21	a	5.60E-02	n	5.77E+00	a		1.65E-01	a	6.74E+00		6.74E+00
62	108-20-3	Diisopropyl Ether	102.18	a	1.49E+02	e	8.80E+03	a		2.56E-03	a	1.05E-01		1.05E-01
63	513-37-1	Dimethylvinylchloride	90.55	a	1.59E+02	n	1.00E+03	a		8.10E-02	a	3.31E+00		3.31E+00
64	106-89-8	Epichlorohydrin	92.53	a	1.64E+01	b	6.59E+04	a		3.04E-05	a	1.24E-03	1.24E-03	1.24E-03
65	106-88-7	Epoxybutane, 1,2-	72.11	a	1.80E+02	e	9.50E+04	a		1.80E-04	a	7.36E-03	7.36E-03	7.36E-03
66	141-78-6	Ethyl Acetate	88.11	a	9.32E+01	b	8.00E+04	a		1.34E-04	a	5.48E-03	5.48E-03	5.48E-03
67	75-00-3	Ethyl Chloride (Chloroethane)	64.52	a	1.01E+03	b	6.71E+03	a		1.11E-02	a	4.54E-01	4.54E-01	4.54E-01
68	97-63-2	Ethyl Methacrylate	114.15	a	2.06E+01	b	5.40E+03	a		5.73E-04	a	2.34E-02	2.34E-02	2.34E-02
69	100-41-4	Ethylbenzene	106.17	a	9.60E+00	b	1.69E+02	a	700	7.88E-03	a	3.22E-01	3.22E-01	3.22E-01
70	75-21-8	Ethylene Oxide	44.05	a	1.31E+03	b	1.00E+06	a		1.48E-04	a	6.05E-03	6.05E-03	6.05E-03
71	151-56-4	Ethyleneimine	43.07	a	2.13E+02	n	1.00E+06	a		1.21E-05	a	4.95E-04		4.95E-04
72	822-06-0	Hexamethylene Diisocyanate, 1,6-	168.2	a	3.00E-02	e	1.79E+02	a		4.80E-05	a	1.96E-03		1.96E-03

Chemical Properties for Supporting the VISL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
			Molecular Weight MW	source	Vapor Pressure VP	source	Pure Component Water Solubility S	source	MCL (ug/L)	Henry's Law Constant @25°C Hc25	source	Henry's Law Constant @25°C ⁹ H25	Henry's Law Constant @ Tgw ⁹ HTgw	Henry's Law Constant Used in Calcs HLC
3	CAS	Alphabetized List of Compounds	(g/mole)		(mm Hg)		(mg/L)			(atm-m ³ /mol)		(unitless)	(unitless)	(unitless)
4														
73	110-54-3	Hexane, N-	86.18	a	1.51E+02	b	9.50E+00	a		1.80E+00	a	7.36E+01	7.36E+01	7.36E+01
74	591-78-6	Hexanone, 2-	100.16	a	1.16E+01	e	1.72E+04	a		9.32E-05	a	3.81E-03	3.81E-03	3.81E-03
75	74-90-8	Hydrogen Cyanide	27.03	a	7.42E+02	b	1.00E+06	a		1.33E-04	a	5.44E-03	5.44E-03	5.44E-03
76	7439-97-6	Mercury (elemental)	200.59	a	1.96E-03	e	6.00E-02	a	2	1.14E-02	a	4.67E-01	4.67E-01	4.67E-01
77	126-98-7	Methacrylonitrile	67.09	a	7.12E+01	b	2.54E+04	a		2.47E-04	a	1.01E-02	1.01E-02	1.01E-02
78	96-33-3	Methyl Acrylate	86.09	a	8.66E+01	b	4.94E+04	a		1.99E-04	a	8.13E-03	8.13E-03	8.13E-03
79	78-93-3	Methyl Ethyl Ketone (2-Butanone)	72.11	a	9.06E+01	b	2.23E+05	a		5.69E-05	a	2.33E-03	2.33E-03	2.33E-03
80	108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	100.16	a	1.99E+01	b	1.90E+04	a		1.38E-04	a	5.64E-03	5.64E-03	5.64E-03
81	624-83-9	Methyl Isocyanate	57.05	a	3.48E+02	n	4.83E+04	a		9.26E-04	a	3.78E-02	3.78E-02	3.78E-02
82	80-62-6	Methyl Methacrylate	100.12	a	3.85E+01	b	1.50E+04	a		3.19E-04	a	1.30E-02	1.30E-02	1.30E-02
83	25013-15-4	Methyl Styrene (Mixed Isomers)	118.18	a	1.50E+00	e	8.90E+01	a		3.01E-03	a	1.23E-01	1.23E-01	1.23E-01
84	1634-04-4	Methyl tert-Butyl Ether (MTBE)	88.15	a	2.50E+02	b	5.10E+04	a		5.87E-04	a	2.40E-02	2.40E-02	2.40E-02
85	75-09-2	Methylene Chloride	84.93	a	4.35E+02	b	1.30E+04	a	5	3.25E-03	a	1.33E-01	1.33E-01	1.33E-01
86	91-20-3	Naphthalene	128.18	a	8.50E-02	b	3.10E+01	a		4.40E-04	a	1.80E-02	1.80E-02	1.80E-02
87	98-95-3	Nitrobenzene	123.11	a	2.45E-01	b	2.09E+03	a		2.40E-05	a	9.81E-04	9.81E-04	9.81E-04
88	75-52-5	Nitromethane	61.04	a	3.58E+01	e	1.11E+05	a		2.86E-05	a	1.17E-03	1.17E-03	1.17E-03
89	79-46-9	Nitropropane, 2-	89.09	a	1.72E+01	b	1.70E+04	a		1.19E-04	a	4.86E-03	4.86E-03	4.86E-03
90	924-16-3	Nitroso-di-N-butylamine, N-	158.25	a	4.69E-02	b	1.27E+03	a		1.32E-05	a	5.40E-04	5.40E-04	5.40E-04
91	111-84-2	Nonane, n-	128.26	a	4.45E+00	e	2.20E-01	a		3.40E+00	a	1.39E+02	1.39E+02	1.39E+02
92	109-66-0	Pentane, n-	72.15	a	5.14E+02	e	3.80E+01	a		1.25E+00	a	5.11E+01	5.11E+01	5.11E+01
93	75-44-5	Phosgene	98.92	a	1.42E+03	e	6.83E+03	a		1.67E-02	a	6.83E-01	6.83E-01	6.83E-01
94	123-38-6	Propionaldehyde	58.08	a	3.17E+02	e	3.06E+05	a		7.34E-05	a	3.00E-03	3.00E-03	3.00E-03
95	103-65-1	Propyl benzene	120.2	a	3.42E+00	b	5.22E+01	a		1.05E-02	a	4.29E-01	4.29E-01	4.29E-01
96	115-07-1	Propylene	42.08	a	8.69E+03	n	2.00E+02	a		1.96E-01	a	8.01E+00	8.01E+00	8.01E+00
97	75-56-9	Propylene Oxide	58.08	a	5.38E+02	e	5.90E+05	a		6.96E-05	a	2.84E-03	2.84E-03	2.84E-03
98	100-42-5	Styrene	104.15	a	6.40E+00	b	3.10E+02	a	100	2.75E-03	a	1.12E-01	1.12E-01	1.12E-01
99	630-20-6	Tetrachloroethane, 1,1,1,2-	167.85	a	1.20E+01	b	1.07E+03	a		2.50E-03	a	1.02E-01	1.02E-01	1.02E-01
100	79-34-5	Tetrachloroethane, 1,1,2,2-	167.85	a	1.33E+01	b	2.83E+03	a		3.67E-04	a	1.50E-02	1.50E-02	1.50E-02
101	127-18-4	Tetrachloroethylene	165.83	a	1.85E+01	b	2.06E+02	a	5	1.77E-02	a	7.23E-01	7.23E-01	7.23E-01
102	811-97-2	Tetrafluoroethane, 1,1,1,2-	102.03	a	4.73E+03	n	1.09E+03	a		5.00E-02	a	2.04E+00	2.04E+00	2.04E+00
103	109-99-9	Tetrahydrofuran	72.11	a	1.62E+02	n	1.00E+06	a		7.05E-05	a	2.88E-03	2.88E-03	2.88E-03
104	108-88-3	Toluene	92.14	a	2.84E+01	b	5.26E+02	a	1000	6.64E-03	a	2.71E-01	2.71E-01	2.71E-01
105	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	187.38	a	3.63E+02	b	1.70E+02	a		5.26E-01	a	2.15E+01	2.15E+01	2.15E+01
106	120-82-1	Trichlorobenzene, 1,2,4-	181.45	a	4.60E-01	b	4.90E+01	a	70	1.42E-03	a	5.80E-02	5.80E-02	5.80E-02
107	71-55-6	Trichloroethane, 1,1,1-	133.41	a	1.24E+02	b	1.29E+03	a	200	1.72E-02	a	7.03E-01	7.03E-01	7.03E-01
108	79-00-5	Trichloroethane, 1,1,2-	133.41	a	2.30E+01	b	4.59E+03	a	5	8.24E-04	a	3.37E-02	3.37E-02	3.37E-02
109	79-01-6	Trichloroethylene	131.39	a	6.90E+01	b	1.28E+03	a	5	9.85E-03	a	4.03E-01	4.03E-01	4.03E-01
110	75-69-4	Trichlorofluoromethane	137.37	a	8.03E+02	b	1.10E+03	a		9.70E-02	a	3.96E+00	3.96E+00	3.96E+00
111	96-18-4	Trichloropropane, 1,2,3-	147.43	a	3.69E+00	b	1.75E+03	a		3.43E-04	a	1.40E-02	1.40E-02	1.40E-02
112	96-19-5	Trichloropropene, 1,2,3-	145.42	a	4.40E+00	e	4.84E+02	a		1.76E-02	a	7.19E-01	7.19E-01	7.19E-01
113	121-44-8	Triethylamine	101.19	a	5.71E+01	e	6.86E+04	a		1.49E-04	a	6.09E-03	6.09E-03	6.09E-03
114	526-73-8	Trimethylbenzene, 1,2,3-	120.19	g	1.69E+00	e	7.52E+01	e		4.36E-03	n	1.78E-01	1.78E-01	1.78E-01
115	95-63-6	Trimethylbenzene, 1,2,4-	120.2	a	2.10E+00	b	5.70E+01	a		6.16E-03	a	2.52E-01	2.52E-01	2.52E-01
116	108-05-4	Vinyl Acetate	86.09	a	9.02E+01	b	2.00E+04	a		5.11E-04	a	2.09E-02	2.09E-02	2.09E-02
117	593-60-2	Vinyl Bromide	106.95	a	1.03E+03	e	1.04E+04	a		1.23E-02	a	5.03E-01	5.03E-01	5.03E-01
118	75-01-4	Vinyl Chloride	62.5	a	2.98E+03	b	8.80E+03	a	2	2.78E-02	a	1.14E+00	1.14E+00	1.14E+00
119	108-38-3	Xylene, m-	106.17	a	8.29E+00	b	1.61E+02	a		7.18E-03	a	2.93E-01	2.93E-01	2.93E-01
120	95-47-6	Xylene, o-	106.17	a	7.99E+00	b	1.78E+02	a		5.18E-03	a	2.12E-01	2.12E-01	2.12E-01
121	106-42-3	Xylene, p-	106.17	a	8.84E+00	b	1.62E+02	a		6.90E-03	a	2.82E-01	2.82E-01	2.82E-01
122	1330-20-7	Xylenes	106.17	a	8.37E+00	s	1.06E+02	a	10000	5.18E-03	a	2.12E-01	2.12E-01	2.12E-01
123														
124		NOTE:	Values not currently included in the chemical parameter Regional screening table (see footnote a) were derived following the hierarchy outlined in the Regional Screening Tables User's Guide.											
125			Available online at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm											
126														
127		a	Based on values reported in the U.S. EPA Regional Screening Tables. May 2014.											
128			Available online at: www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm											
129		b	Experimental values. USEPA 2009. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.00. United States Environmental Protection Agency, Washington, DC, USA.											
130			Available online at: http://www.epa.gov/opptintr/exposure/pubs/episuite.htm											
131		c	USEPA 1996. Soil Screening Guidance. Attachment C: Chemical Properties for SSL Development. EPA540/R-96/018. July, 1996.											
132		d	USEPA 2001. USEPA WATERS, Version 2.0. United States Environmental Protection Agency, Research Triangle Park, NC, USA.											
133			Available online at: http://www.epa.gov/ttn/chief/software/water/index.html											
134		e	Syracuse Research Corporation (SRC). 2005. PHYSPROP Database. SRC. Syracuse, NY.											
135			Available online at: http://www.syrres.com/what-we-do/databaseforms.aspx?id=386											
136		f	CRC Handbook of Chemistry and Physics, 76th Edition											
137		g	National Institute of Standards and Technology (NIST). Chemistry WebBook.											
138			Available online at: http://webbook.nist.gov/chemistry/											
139		h	USEPA, 2001. FACT SHEET Correcting the Henry's Law Constant for Soil Temperature. Attachment.											

Chemical Properties for Supporting the VISL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
3														
4														
5	CAS	Alphabetized List of Compounds	Molecular Weight MW (g/mole)	source	Vapor Pressure VP (mm Hg)	source	Pure Component Water Solubility S (mg/L)	source	MCL (ug/L)	Henry's Law Constant @25°C Hc25 (atm-m ³ /mol)	source	Henry's Law Constant @25°C ⁹ H'25 (unitless)	Henry's Law Constant @ Tgw ⁹ H'Tgw (unitless)	Henry's Law Constant Used in Calcs HLC (unitless)
140		j	Weast, Robert C. CRC Handbook of Chemistry and Physics 1984-1985, 65th edition. Pages F-62 through F-64.											
141		k	McKay, D., et al. Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals. Second Edition.											
142		kk	Chemical-specific MSDS											
143		m	These properties are not used for any calculations in the spreadsheet, but are included to maintain consistency with other spreadsheet tools that do use these properties.											
144		mm	The Merck Index, 10th Edition											
145		n	United States National Library of Medicine. National Institutes of Health. TOXNET Toxicology Data Network.											
146			Available online at: http://toxnet.nlm.nih.gov/											
147		nn	Weiss, G. Hazardous Chemicals Data Book, Second Edition, Noyes Data Corporation, 1986.											
148		p	DECHEMA Web Database, March 2003.											
149		q	No chemical property information available for this chemical, although toxicity data are available.											
150		r	California Environmental Protection Agency. Consumer Products Solvents Database. Entry for "Aromatic 150". 2004.											
151			Available online at: http://www.arb.ca.gov/db/solvents/solvents.htm											
152		s	Calculated as average of m-xylene, o-xylene, and p-xylene isomers.											
153		v	Approximated using Tcrit = 1.5 x Tboil.											
154			Note the "c" at the end of some sources indicates that the value presented in the table is converted from the value included in the reference source.											

Chemical Properties for Supporting the VISL

	A	B	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
			Henry's Law Constant @ T _{gw} , GW ⁹ H ¹⁰ T _{gw} , GW	Henry's Law Constant Used in Calcs for GW- IA, calc HLC_GW	Vapor Pressure @ T _{gw} ⁹ VPT _{gw}	Diffusivity in air ^m D _a		Diffusivity in water ^m D _w		Normal Boiling Point T _{boil}		Critical Temperature T _{crit}		Enthalpy of vaporization at the normal boiling point ΔH _{v,b}		Organic Carbon Partition Coefficient ^m K _{oc}	
3	CAS	Alphabetized List of Compounds	(unitless)	(unitless)	(μg/m ³)	(cm ² /s)	source	(cm ² /s)	source	(°K)	source	(°K)	source	(cal/mol)	source	(cm ³ /g)	source
4																	
5	75-07-0	Acetaldehyde	1.97E-03	1.97E-03	2.14E+09	1.28E-01	a	1.35E-05	a	2.93E+02	b	4.66E+02	f	6.16E+03	f	1.00E+00	a
6	67-64-1	Acetone	9.66E-04	9.66E-04	7.25E+08	1.06E-01	a	1.15E-05	a	3.29E+02	b	5.08E+02	h	6.96E+03	h	2.36E+00	a
7	75-86-5	Acetone Cyanohydrin		5.31E-04		8.59E-02	a	1.01E-05	a	4.44E+02	ec	6.66E+02	v	No DHv,b		1.00E+00	a
8	75-05-8	Acetonitrile	9.47E-04	9.47E-04	1.96E+08	1.34E-01	a	1.41E-05	a	3.33E+02	b	5.46E+02	f	7.11E+03	f	4.67E+00	a
9	107-02-8	Acrolein	3.42E-03	3.42E-03	8.27E+08	1.12E-01	a	1.22E-05	a	3.26E+02	b	5.06E+02	p	6.73E+03	n	1.00E+00	a
10	107-13-1	Acrylonitrile	3.56E-03	3.56E-03	3.11E+08	1.14E-01	a	1.23E-05	a	3.50E+02	b	5.19E+02	n	7.79E+03	p	8.51E+00	a
11	107-05-1	Allyl Chloride	3.07E-01	3.07E-01	1.52E+09	9.36E-02	a	1.08E-05	a	3.18E+02	ec	5.14E+02	nc	6.94E+03	nc	3.96E+01	a
12	75-85-4	Amyl Alcohol, tert-	3.12E-04	3.12E-04	7.92E+07	7.85E-02	a	9.10E-06	a	3.76E+02	b	5.45E+02	n	9.59E+03	nc	4.14E+00	a
13	11104-28-2	Aroclor 1221		3.01E-02		5.78E-02	a	6.75E-06	a	5.63E+02	n	8.45E+02	v	No DHv,b	q	8.40E+03	a
14	11141-16-5	Aroclor 1232		3.01E-02		5.78E-02	a	6.75E-06	a	5.63E+02	n	8.45E+02	v	No DHv,b	q	8.40E+03	a
15	103-33-3	Azobenzene		5.52E-04		3.59E-02	a	7.47E-06	a	5.66E+02	e	8.49E+02	v	No DHv,b	q	3.76E+03	a
16	71-43-2	Benzene	1.48E-01	1.48E-01	3.98E+08	8.95E-02	a	1.03E-05	a	3.53E+02	b	5.62E+02	h	7.34E+03	h	1.46E+02	a
17	100-44-7	Benzyl Chloride	9.60E-03	9.60E-03	8.38E+06	6.34E-02	a	8.81E-06	a	4.52E+02	b	6.85E+02	p	8.77E+03	n	4.46E+02	a
18	92-52-4	Biphenyl, 1,1'-	6.04E-03	6.04E-03	7.41E+04	4.71E-02	a	7.56E-06	a	5.29E+02	b	7.89E+02	f	1.09E+04	p	5.13E+03	a
19	108-60-1	Bis(2-chloro-1-methylethyl) ether	1.62E-03	1.62E-03	5.15E+06	3.99E-02	a	7.36E-06	a	4.60E+02	b	6.90E+02	v	9.69E+03	kkc	8.29E+01	a
20	111-44-4	Bis(2-chloroethyl) ether	3.41E-04	3.41E-04	1.19E+07	5.67E-02	a	8.71E-06	a	4.52E+02	b	6.60E+02	h	1.08E+04	h	3.22E+01	a
21	542-88-1	Bis(chloromethyl) ether		1.78E-01		7.63E-02	a	1.04E-05	a	3.79E+02	b	5.69E+02	v	No DHv,b	q	9.70E+00	a
22	77-04-0	Bromo-2-chloroethane, 1-	2.13E-02	2.13E-02	2.55E+08	6.59E-02	a	1.08E-05	a	3.80E+02	ec	5.70E+02	v	9.11E+03	hhc	3.96E+01	a
23	108-96-1	Bromobenzene	5.23E-02	5.23E-02	3.53E+07	5.37E-02	a	9.30E-06	a	4.29E+02	ec	6.70E+02	nc	1.06E+04	nc	2.34E+02	a
24	74-97-5	Bromochloromethane	3.93E-02	3.93E-02	9.96E+08	7.87E-02	a	1.22E-05	a	3.41E+02	ec	5.12E+02	v	7.17E+03	nc	2.17E+01	a
25	75-27-4	Bromodichloromethane	5.51E-02	5.51E-02	5.22E+08	5.63E-02	a	1.07E-05	a	3.63E+02	b	5.86E+02	h	7.80E+03	h	3.18E+01	a
26	74-83-9	Bromomethane	2.24E-01	2.24E-01	8.28E+09	1.00E-01	a	1.35E-05	a	2.77E+02	b	4.67E+02	h	5.71E+03	h	1.32E+01	a
27	106-99-0	Butadiene, 1,3-	2.30E+00	2.30E+00	6.14E+09	1.00E-01	a	1.03E-05	a	2.69E+02	b	4.25E+02	f	5.37E+03	f	3.96E+01	a
28	75-15-0	Carbon Disulfide	4.15E-01	4.15E-01	1.47E+09	1.06E-01	a	1.30E-05	a	3.19E+02	b	5.52E+02	h	6.39E+03	h	2.17E+01	a
29	56-23-5	Carbon Tetrachloride	7.49E-01	7.49E-01	9.52E+08	5.71E-02	a	9.78E-06	a	3.50E+02	b	5.57E+02	h	7.13E+03	h	4.39E+01	a
30	75-68-3	Chloro-1,1-difluoroethane, 1-	1.76E-01	1.76E-01	1.37E+10	8.04E-02	a	1.01E-05	a	2.63E+02	ec	4.10E+02	nc	5.33E+04	nc	4.39E+01	a
31	126-99-8	Chloro-1,3-butadiene, 2-	1.45E+00	1.45E+00	1.03E+09	8.41E-02	a	1.00E-05	a	3.32E+02	b	5.25E+02	p	8.07E+03	nn	6.07E+01	a
32	108-90-7	Chlorobenzene	7.62E-02	7.62E-02	7.27E+07	7.21E-02	a	9.48E-06	a	4.05E+02	b	6.32E+02	h	8.41E+03	h	2.34E+02	a
33	98-56-6	Chlorobenzotrifluoride, 4-		1.42E+00		3.85E-02	a	7.99E-06	a	4.12E+02	ec	6.17E+02	v	No DHv,b	q	1.61E+03	a
34	75-45-6	Chlorodifluoromethane	1.34E+00	1.34E+00	3.37E+10	1.03E-01	a	1.33E-05	a	2.32E+02	b	3.69E+02	f	4.84E+03	n	3.18E+01	a
35	67-66-3	Chloroform	1.01E-01	1.01E-01	1.27E+09	7.69E-02	a	1.09E-05	a	3.34E+02	b	5.36E+02	h	6.99E+03	h	3.18E+01	a
36	74-87-3	Chloromethane	2.82E-01	2.82E-01	1.17E+10	1.24E-01	a	1.36E-05	a	2.49E+02	b	4.16E+02	f	5.11E+03	f	1.32E+01	a
37	107-30-2	Chloromethyl Methyl Ether		1.24E-02		9.50E-02	a	1.13E-05	a	3.33E+02	ec	4.99E+02	v	No DHv,b	q	5.32E+00	a
38	76-06-2	Chloropicrin		8.38E-02		5.18E-02	a	9.62E-06	a	3.85E+02	ec	5.78E+02	v	No DHv,b	q	4.42E+01	a
39	98-82-8	Cumene	2.43E-01	2.43E-01	2.91E+07	6.03E-02	a	7.86E-06	a	4.25E+02	b	6.31E+02	f	1.03E+04	n	6.98E+02	a
40	57-12-5	Cyanide (CN-)		5.44E-03		2.11E-01	a	2.46E-05	a	No Tboil	q	No Tcrit	q	No DHv,b	q	No Koc	
41	110-82-7	Cyclohexane	4.05E+00	4.05E+00	4.39E+08	8.00E-02	a	9.11E-06	a	3.54E+02	ec	5.53E+02	nc	7.15E+03	nc	1.46E+02	a
42	110-83-8	Cyclohexene	1.22E+00	1.22E+00	3.93E+08	1.01E-01	a	1.17E-05	a	3.56E+02	n	5.61E+02	n	7.28E+03	nc	1.46E+02	a
43	96-12-8	Dibromo-3-chloropropane, 1,2-	3.14E-03	3.14E-03	7.38E+06	3.21E-02	a	8.90E-06	a	4.69E+02	b	7.04E+02	v	9.96E+03	kkc	1.16E+02	a
44	124-48-1	Dibromochloromethane	2.27E-02	2.27E-02	1.68E+08	3.66E-02	a	1.06E-05	a	3.93E+02	b	6.78E+02	h	5.90E+03	h	3.18E+01	a
45	106-93-4	Dibromomethane, 1,2-	1.56E-02	1.56E-02	1.13E+08	4.30E-02	a	1.04E-05	a	4.05E+02	b	5.83E+02	f	8.31E+03	f	3.96E+01	a
46	74-95-3	Dibromomethane (Methylene Bromide)	2.11E-02	2.11E-02	4.15E+08	5.51E-02	a	1.19E-05	a	3.70E+02	b	5.83E+02	n	7.87E+03	f	2.17E+01	a
47	764-41-0	Dichloro-2-butene, 1,4-		2.71E-02		6.65E-02	a	9.29E-06	a	4.31E+02	nc	6.47E+02	v	No DHv,b	q	1.32E+02	a
48	1476-11-5	Dichloro-2-butene, cis-1,4-	1.52E-02	1.52E-02	2.75E+07	6.65E-02	a	9.29E-06	a	4.26E+02	ec	6.40E+02	n	9.13E+03	nc	1.32E+02	a
49	110-57-6	Dichloro-2-butene, trans-1,4-	1.52E-02	1.52E-02	2.31E+07	6.64E-02	a	9.27E-06	a	4.28E+02	ec	6.46E+02	n	9.13E+03	nc	1.32E+02	a
50	95-50-1	Dichlorobenzene, 1,2-	4.26E-02	4.26E-02	1.16E+07	5.62E-02	a	8.92E-06	a	4.53E+02	b	7.05E+02	h	9.70E+03	h	3.83E+02	a
51	106-46-7	Dichlorobenzene, 1,4-	5.47E-02	5.47E-02	1.38E+07	5.50E-02	a	8.68E-06	a	4.47E+02	b	6.85E+02	h	9.27E+03	h	3.75E+02	a
52	75-71-8	Dichlorodifluoromethane	9.10E+00	9.10E+00	3.16E+10	7.60E-02	a	1.08E-05	a	2.43E+02	b	3.85E+02	f	9.42E+03	n	4.39E+01	a
53	75-34-3	Dichloroethane, 1,1-	1.56E-01	1.56E-01	1.45E+09	8.36E-02	a	1.06E-05	a	3.30E+02	b	5.23E+02	h	6.90E+03	h	3.18E+01	a
54	107-06-2	Dichloroethane, 1,2-	3.09E-02	3.09E-02	4.20E+08	8.57E-02	a	1.10E-05	a	3.57E+02	b	5.61E+02	h	7.64E+03	h	3.96E+01	a
55	75-35-4	Dichloroethylene, 1,1-	7.64E-01	7.64E-01	3.31E+09	8.63E-02	a	1.10E-05	a	3.05E+02	b	5.76E+02	h	6.25E+03	h	3.18E+01	a
56	78-87-5	Dichloropropane, 1,2-	7.35E-02	7.35E-02	3.24E+08	7.33E-02	a	9.73E-06	a	3.69E+02	b	5.72E+02	h	7.59E+03	h	6.07E+01	a
57	542-75-6	Dichloropropene, 1,3-	8.98E-02	8.98E-02	2.03E+08	7.63E-02	a	1.01E-05	a	3.85E+02	b	5.87E+02	h	7.90E+03	h	7.22E+01	a
58	77-73-6	Dicyclopentadiene	2.22E+00	2.22E+00	1.63E+07	5.57E-02	a	7.76E-06	a	4.43E+02	ec	6.65E+02	v	2.20E+03	nc	1.51E+03	a
59	75-37-6	Difluoroethane, 1,1-	6.57E-01	6.57E-01	1.62E+10	1.02E-01	a	1.15E-05	a	2.48E+02	ec	3.72E+02	v	5.15E+03	nc	3.18E+01	a
60	94-58-6	Dihydrosafrole		6.74E+00		6.34E-02	a	7.40E-06	a	3.88E+02	g	7.51E+02	kk	No DHv,b	q	2.07E+02	a
61	108-20-3	Diisopropyl Ether		1.05E-01		6.54E-02	a	7.76E-06	a	3.42E+02	ec	5.00E+02	nc	No DHv,b	q	2.28E+01	a
62	513-37-1	Dimethylvinylchloride		3.31E+00		8.12E-02	a	9.66E-06	a	3.41E+02	g	5.18E+02	kk	No DHv,b	q	6.77E+01	a
63	106-89-8	Epichlorohydrin	1.24E-03	1.24E-03	8.17E+07	8.89E-02	a	1.11E-05	a	3.90E+02	b	6.00E+02	kk	1.01E+01	kk	9.91E+00	a
64	106-88-7	Epoxybutane, 1,2-	4.87E-03	4.87E-03	6.98E+08	9.29E-02	a	1.04E-05	a	3.36E+02	ec	5.16E+02	jc	7.21E+03	nc	9.91E+00	a
65	141-78-6	Ethyl Acetate	3.49E-03	3.49E-03	4.42E+08	8.23E-02	a	9.70E-06	a	3.50E+02	b	5.23E+02	f	7.63E+03	f	5.58E+00	a
66	75-00-3	Ethyl Chloride (Chloroethane)	3.34E-01	3.34E-01	3.51E+09	1.04E-01	a	1.16E-05	a	2.85E+02	b	4.60E+02	f	5.88E+03	f	2.17E+01	a
67	97-63-2	Ethyl Methacrylate	1.18E-02	1.18E-02	1.27E+08	6.53E-02	a	8.38E-06	a	3.90E+02	b	5.71E+02	p	1.10E+04	n	1.67E+01	a
68	100-41-4	Ethylbenzene	1.90E-01	1.90E-01	5.48E+07	6.85E-02	a	8.46E-06	a	4.09E+02	b	6.17E+02	h	8.50E+03	h	4.46E+02	a
69	75-21-8	Ethylene Oxide	4.40E-03	4.40E-03	3.11E+09	1.34E-01	a	1.45E-05	a	2.84E+02	b						

Chemical Properties for Supporting the VISL

	A	B	O	P	Q	R	S	T	U	V	W	X	Y	AA	AB	AC
			Henry's Law Constant @ T _{gw} , GW ^a H _{Tgw} , GW	Henry's Law Constant Used in Calcs for GW- IA, calc HLC_GW	Vapor Pressure @ T _{gw} ^a VPT _{gw}	Diffusivity in air ^m D _a		Diffusivity in water ^m D _w		Normal Boiling Point T _{boil}		Critical Temperature T _{crit}		Enthalpy of vaporization at the normal boiling point DH _{v,b}	Organic Carbon Partition Coefficient ^m K _{oc}	
3	CAS	Alphabetized List of Compounds	(unitless)	(unitless)	(ug/m3)	(cm ² /s)	source	(cm ² /s)	source	(°K)	source	(°K)	source	(cal/mol)	source	(cm ³ /g)
4																
5																
73	110-54-3	Hexane, N-	4.92E+01	4.92E+01	7.00E+08	7.31E-02	a	8.17E-06	a	3.42E+02	b	5.08E+02	f	6.90E+03	f	1.32E+02
74	591-78-6	Hexanone, 2-	2.23E-03	2.23E-03	6.25E+07	7.04E-02	a	8.44E-06	a	4.01E+02	ec	6.01E+02	v	8.61E+03	nc	1.50E+01
75	74-90-8	Hydrogen Cyanide	3.80E-03	3.80E-03	1.08E+09	1.68E-01	a	1.68E-05	a	2.99E+02	b	4.57E+02	f	6.68E+03	nn	No Koc
76	7439-97-6	Mercury (elemental)	2.20E-01	2.20E-01	2.11E+04	3.07E-02	a	6.30E-06	a	3.57E+02	e	1.75E+03	h	1.41E+04	h	No Koc
77	126-98-7	Methacrylonitrile	6.43E-03	6.43E-03	2.57E+08	9.64E-02	a	1.06E-05	a	3.63E+02	b	5.54E+02	p	7.60E+03	n	1.31E+01
78	96-33-3	Methyl Acrylate	5.16E-03	5.16E-03	4.01E+08	8.60E-02	a	1.02E-05	a	3.53E+02	b	5.36E+02	nn	7.75E+03	nn	5.84E+00
79	78-93-3	Methyl Ethyl Ketone (2-Butanone)	1.50E-03	1.50E-03	3.52E+08	9.14E-02	a	1.02E-05	a	3.53E+02	b	5.37E+02	f	7.48E+03	f	4.51E+00
80	106-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	3.37E-03	3.37E-03	1.07E+08	6.98E-02	a	8.35E-06	a	3.90E+02	b	5.71E+02	f	8.24E+03	f	1.26E+01
81	624-83-9	Methyl Isocyanate		3.78E-02		1.17E-01	a	1.31E-05	a	3.12E+02	g	4.91E+02	kk	No DH _{v,b}	q	3.96E+01
82	80-62-6	Methyl Methacrylate	7.60E-03	7.60E-03	2.07E+08	7.50E-02	a	9.21E-06	a	3.74E+02	b	5.67E+02	n	8.97E+03	n	9.14E+00
83	25013-15-4	Methyl Styrene (Mixed Isomers)	5.69E-02	5.69E-02	9.54E+06	7.89E-02	a	9.22E-06	a	4.38E+02	n	6.55E+02	nc	1.20E+04	nc	7.16E+02
84	1634-04-4	Methyl tert-Butyl Ether (MTBE)	1.64E-02	1.64E-02	1.19E+09	7.53E-02	a	8.59E-06	a	3.28E+02	b	4.97E+02	f	6.68E+03	f	1.16E+01
85	75-09-2	Methylene Chloride	9.21E-02	9.21E-02	1.99E+09	9.99E-02	a	1.25E-05	a	3.13E+02	b	5.10E+02	h	6.71E+03	h	2.17E+01
86	91-20-3	Naphthalene	9.15E-03	9.15E-03	5.86E+05	6.05E-02	a	8.38E-06	a	4.91E+02	h	7.48E+02	h	1.04E+04	h	1.54E+03
87	98-95-3	Nitrobenzene	4.87E-04	4.87E-04	1.62E+06	6.81E-02	a	9.45E-06	a	4.84E+02	b	7.19E+02	h	1.06E+04	h	2.26E+02
88	75-52-5	Nitromethane	6.80E-04	6.80E-04	1.18E+08	1.19E-01	a	1.39E-05	a	3.74E+02	ec	5.88E+02	nc	9.14E+03	nc	1.03E+01
89	79-46-9	Nitropropane, 2-	2.91E-03	2.91E-03	8.25E+07	8.47E-02	a	1.02E-05	a	3.93E+02	b	5.94E+02	p	8.38E+03	p	3.08E+01
90	924-16-3	Nitroso-di-N-butylamine, N-		5.40E-04		6.49E-02	a	7.59E-06	a	3.89E+02	e	5.84E+02	v	No DH _{v,b}	q	9.15E+02
91	111-84-2	Nonane, n-	6.63E+01	6.63E+01	3.07E+07	5.14E-02	a	6.77E-06	a	4.24E+02	ec	5.94E+02	nc	1.11E+04	nc	7.96E+02
92	109-66-0	Pentane, n-	3.64E+01	3.64E+01	2.00E+09	8.21E-02	a	8.80E-06	a	3.09E+02	ec	4.70E+02	n	6.16E+03	nc	7.22E+01
93	75-44-5	Phosgene	4.67E-01	4.67E-01	7.56E+09	8.93E-02	a	1.17E-05	a	2.81E+02	ec	4.55E+02	n	7.35E+03	nc	1.00E+00
94	123-38-6	Propionaldehyde	2.02E-03	2.02E-03	9.91E+08	1.10E-01	a	1.22E-05	a	3.21E+02	ec	4.96E+02	n	7.07E+03	nc	1.00E+00
95	103-65-1	Propyl benzene	2.37E-01	2.37E-01	2.21E+07	6.02E-02	a	7.83E-06	a	4.32E+02	b	6.30E+02	f	9.12E+03	p	8.13E+02
96	115-07-1	Propylene	6.64E+00	6.64E+00	1.97E+10	1.10E-01	a	1.07E-05	a	2.26E+02	g	3.65E+02	n	4.40E+03	nc	2.17E+01
97	75-56-9	Propylene Oxide	1.98E-03	1.98E-03	1.68E+09	1.09E-01	a	1.19E-05	a	3.08E+02	ec	4.82E+02	nc	6.62E+03	nc	5.19E+00
98	100-42-5	Styrene	6.51E-02	6.51E-02	3.59E+07	7.11E-02	a	8.78E-06	a	4.18E+02	b	6.36E+02	h	8.74E+03	h	4.46E+02
99	630-20-6	Tetrachloroethane, 1,1,1,2-	5.62E-02	5.62E-02	1.08E+08	4.82E-02	a	9.10E-06	a	4.04E+02	b	6.24E+02	n	9.77E+03	n	8.60E+01
100	79-34-5	Tetrachloroethane, 1,1,2,2-	8.65E-03	8.65E-03	1.20E+08	4.89E-02	a	9.29E-06	a	4.20E+02	b	6.61E+02	h	9.00E+03	h	9.49E+01
101	127-18-4	Tetrachloroethylene	4.39E-01	4.39E-01	1.65E+08	5.05E-02	a	9.46E-06	a	3.94E+02	b	6.20E+02	h	8.29E+03	h	9.49E+01
102	811-97-2	Tetrafluoroethane, 1,1,1,2-	1.42E+00	1.42E+00	2.60E+10	8.23E-02	a	1.06E-05	a	4.04E+02	ec	6.24E+02	n	5.93E+03	nc	8.60E+01
103	109-99-9	Tetrahydrofuran	1.93E-03	1.93E-03	6.29E+08	9.54E-02	a	1.08E-05	a	3.39E+02	g	5.41E+02	n	7.07E+03	nc	1.08E+01
104	108-88-3	Toluene	1.68E-01	1.68E-01	1.41E+08	7.78E-02	a	9.20E-06	a	3.84E+02	b	5.92E+02	h	7.93E+03	h	2.34E+02
105	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1.50E+01	1.50E+01	3.66E+09	3.76E-02	a	8.59E-06	a	3.21E+02	b	4.87E+02	f	6.46E+03	f	1.97E+02
106	120-82-1	Trichlorobenzene, 1,2,4-	2.90E-02	2.90E-02	4.49E+06	3.96E-02	a	8.40E-06	a	4.87E+02	b	7.25E+02	h	1.05E+04	h	1.36E+03
107	71-55-6	Trichloroethane, 1,1,1-	4.66E-01	4.66E-01	8.90E+08	6.48E-02	a	9.60E-06	a	3.47E+02	b	5.45E+02	h	7.14E+03	h	4.39E+01
108	79-00-5	Trichloroethane, 1,1,2-	2.04E-02	2.04E-02	1.65E+08	6.69E-02	a	1.00E-05	a	3.87E+02	b	6.02E+02	h	8.32E+03	h	6.07E+01
109	79-01-6	Trichloroethylene	2.58E-01	2.58E-01	4.88E+08	6.87E-02	a	1.02E-05	a	3.60E+02	b	5.44E+02	h	7.51E+03	h	6.07E+01
110	75-69-4	Trichlorofluoromethane	2.88E+00	2.88E+00	5.94E+09	6.54E-02	a	1.00E-05	a	2.97E+02	b	4.71E+02	n	6.00E+03	n	4.39E+01
111	96-18-4	Trichloropropane, 1,2,3-	7.86E-03	7.86E-03	2.93E+07	5.75E-02	a	9.24E-06	a	4.30E+02	b	6.52E+02	n	9.17E+03	p	1.16E+02
112	96-19-5	Trichloropropene, 1,2,3-		7.19E-01		5.91E-02	a	9.41E-06	a	4.15E+02	ec	6.23E+02	v	No DH _{v,b}	q	1.16E+02
113	121-44-8	Triethylamine	3.74E-03	3.74E-03	3.11E+08	6.84E-02	a	7.86E-06	a	3.82E+02	ec	5.36E+02	n	8.10E+03	nc	5.08E+01
114	526-73-8	Trimethylbenzene, 1,2,3-	8.31E-02	8.31E-02	1.09E+07	6.13E-02	a	8.02E-06	a	4.49E+02	ec	6.85E+02	n	1.17E+04	nc	8.27E+02
115	95-63-6	Trimethylbenzene, 1,2,4-	1.37E-01	1.37E-01	1.36E+07	6.07E-02	a	7.92E-06	a	4.42E+02	b	6.49E+02	f	9.37E+03	n	6.14E+02
116	108-05-4	Vinyl Acetate	1.32E-02	1.32E-02	4.18E+08	8.49E-02	a	1.00E-05	a	3.46E+02	b	5.19E+02	h	7.80E+03	h	5.58E+00
117	593-60-2	Vinyl Bromide	3.79E-01	3.79E-01	5.93E+09	8.62E-02	a	1.17E-05	a	2.89E+02	ec	4.64E+02	n	5.40E+03	nc	2.17E+01
118	75-01-4	Vinyl Chloride	8.76E-01	8.76E-01	1.00E+10	1.07E-01	a	1.20E-05	a	2.60E+02	b	4.32E+02	h	5.25E+03	h	2.17E+01
119	108-38-3	Xylene, m-	1.72E-01	1.72E-01	4.74E+07	6.84E-02	a	8.44E-06	a	4.12E+02	b	6.17E+02	h	8.52E+03	h	3.75E+02
120	95-47-6	Xylene, o-	1.24E-01	1.24E-01	4.56E+07	6.89E-02	a	8.53E-06	a	4.12E+02	b	6.30E+02	h	8.66E+03	h	3.83E+02
121	106-42-3	Xylene, p-	1.65E-01	1.65E-01	5.05E+07	6.82E-02	a	8.42E-06	a	4.11E+02	b	6.16E+02	h	8.53E+03	h	3.75E+02
122	1330-20-7	Xylenes	1.24E-01	1.24E-01	4.78E+07	8.47E-02	a	9.90E-06	a	4.11E+02	b	6.16E+02	h	8.52E+03	h	3.83E+02
123																
124																
125																
126																
127																
128																
129																
130																
131																
132																
133																
134																
135																
136																
137																
138																
139																

NOTE:

Values not currently included in the chemical parameter Regional screening table (see footnote a) were derived following the hierarchy outlined below:

Available online at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm

Based on values reported in the U.S. EPA Regional Screening Tables. May 2014.

Available online at: www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

Experimental values. USEPA 2009. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.00. United States Environmental Protection Agency.

Available online at: <http://www.epa.gov/opptintr/exposure/pubs/episuite.htm>

USEPA 1996. Soil Screening Guidance. Attachment C: Chemical Properties for SSL Development. EPA540/R-96/018. July, 1996.

USEPA 2001. USEPA WATER9, Version 2.0. United States Environmental Protection Agency, Research Triangle Park, NC, USA.

Available online at: <http://www.epa.gov/ttn/chief/software/water/index.html>

Syracuse Research Corporation (SRC). 2005. PHYSPROP Database. SRC, Syracuse, NY.

Available online at: <http://www.svres.com/what-we-do/databaseforms.aspx?id=386>

CRC Handbook of Chemistry and Physics, 76th Edition

National Institute of Standards and Technology (NIST). Chemistry WebBook.

Available online at: <http://webbook.nist.gov/chemistry/>

USEPA. 2001. FACT SHEET Correcting the Henry's Law Constant for Soil Temperature. Attachment.

Chemical Properties for Supporting the VISL

	A	B	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
			Henry's Law Constant @ Tgw_GW ^a HTgw_GW (unitless)	Henry's Law Constant Used in Calcs for GW- IA_calc HLC_GW (unitless)	Vapor Pressure @ Tgw ^a VPTgw (ug/m3)	Diffusivity in air ^m Da (cm ² /s) source	Diffusivity in water ^m Dw (cm ² /s) source	Normal Boiling Point Tboil (°K) source	Critical Temperature Tcrit (°K) source	Enthalpy of vaporization at the normal boiling point DH _{v,b} (cal/mol) source	Organic Carbon Partition Coefficient ^m Koc (cm ³ /g) source						
3																	
4																	
5	CAS	Alphabetized List of Compounds															
140		j				Weast, Robert C. CRC Handbook of Chemistry and Physics 1984-1985, 65th edition. Pages F-62 through F-64. McKay, D., et al. Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals. Second Edition. Chemical-specific MSDS These properties are not used for any calculations in the spreadsheet, but are included to maintain consistency with other spreadsheet tools t The Merck Index, 10th Edition United States National Library of Medicine. National Institutes of Health. TOXNET Toxicology Data Network. Available online at: http://toxnet.nlm.nih.gov/ Weiss, G. Hazardous Chemicals Data Book, Second Edition, Noyes Data Corporation, 1986. DECHEMA Web Database, March 2003. No chemical property information available for this chemical, although toxicity data are available. California Environmental Protection Agency. Consumer Products Solvents Database. Entry for "Aromatic 150". 2004. Available online at: http://www.arb.ca.gov/db/solvents/solvents.htm Calculated as average of m-xylene, o-xylene, and p-xylene isomers. Approximated using Tcrit = 1.5 x Tboil. Note the "c" at the end of some sources indicates that the value presented in the table is converted from the value included in the reference s											
141		k															
142		kk															
143		m															
144		mm															
145		n															
146																	
147		nn															
148		p															
149		q															
150		r															
151																	
152		s															
153		v															
154																	

Chemical Properties for Supporting the VISL

	A	B	AD	AE	AF	AG
3			Lower Explosive Limit LEL			
4						
5	CAS	Alphabetized List of Compounds	(% by vol) source			Alternative Chemical Name 1
6	75-07-0	Acetaldehyde	4	E		
7	67-64-1	Acetone	2.6	E		
8	75-86-5	Acetone Cyanohydrin				
9	75-05-8	Acetonitrile	3	N		
10	107-02-8	Acrolein	2.8	N		
11	107-13-1	Acrylonitrile	3	N		
12	107-05-1	Allyl Chloride				
13	75-85-4	Amyl Alcohol, tert-	1.3	M		
14	11104-28-2	Aroclor 1221				
15	11141-16-5	Aroclor 1232				
16	103-33-3	Azobenzene				
17	71-43-2	Benzene	1.2	N		
18	100-44-7	Benzyl Chloride	1.1	N		Benzylchloride
19	92-52-4	Biphenyl, 1,1'-	0.6	N		Biphenyl
20	108-60-1	Bis(2-chloro-1-methylethyl) ether				Bis(2-chloroisopropyl)ether
21	111-44-4	Bis(2-chloroethyl) ether	2.7	N		
22	542-88-1	Bis(chloromethyl) ether				
23	107-04-0	Bromo-2-chloroethane, 1-				1-Bromo-2-chloroethane
24	108-96-1	Bromobenzene				
25	74-97-5	Bromochloromethane				
26	75-27-4	Bromodichloromethane				
27	74-83-9	Bromomethane	10	N		Methyl bromide
28	106-99-0	Butadiene, 1,3-	2	N		1,3-Butadiene
29	75-15-0	Carbon Disulfide	1.3	N		
30	56-23-5	Carbon Tetrachloride				
31	75-68-3	Chloro-1,1-difluoroethane, 1-				1-Chloro-1,1-difluoroethane
32	126-99-8	Chloro-1,3-butadiene, 2-	1.9	N		2-Chloro-1,3-butadiene
33	108-90-7	Chlorobenzene	1.3	N		
34	98-56-6	Chlorobenzotrifluoride, 4-				4-Chlorobenzotrifluoride
35	75-45-6	Chlorodifluoromethane				
36	67-66-3	Chloroform				
37	74-87-3	Chloromethane	8.1	N		Methyl chloride
38	107-30-2	Chloromethyl Methyl Ether				
39	76-06-2	Chloropicrin				
40	98-82-8	Cumene	0.9	N		
41	57-12-5	Cyanide (CN-)				
42	110-82-7	Cyclohexane				
43	110-83-8	Cyclohexene				
44	96-12-8	Dibromo-3-chloropropane, 1,2-				1,2-Dibromo-3-chloropropane
45	124-48-1	Dibromochloromethane				Chlorodibromomethane
46	106-93-4	Dibromoethane, 1,2-				1,2-Dibromoethane
47	74-95-3	Dibromomethane (Methylene Bromide)				Methylene bromide
48	764-41-0	Dichloro-2-butene, 1,4-				1,4-Dichloro-2-butene
49	1476-11-5	Dichloro-2-butene, cis-1,4-				cis-1,4-Dichloro-2-butene
50	110-57-6	Dichloro-2-butene, trans-1,4-				trans-1,4-Dichloro-2-butene
51	95-50-1	Dichlorobenzene, 1,2-	2.2	N		1,2-Dichlorobenzene
52	106-46-7	Dichlorobenzene, 1,4-	2.5	N		1,4-Dichlorobenzene
53	75-71-8	Dichlorodifluoromethane				
54	75-34-3	Dichloroethane, 1,1-	5.4	N		1,1-Dichloroethane
55	107-06-2	Dichloroethane, 1,2-	6.2	N		1,2-Dichloroethane
56	75-35-4	Dichloroethylene, 1,1-	6.5	N		1,1-Dichloroethylene
57	78-87-5	Dichloropropane, 1,2-	3.4	N		1,2-Dichloropropane
58	542-75-6	Dichloropropene, 1,3-	5.3	N		1,3-Dichloropropene
59	77-73-6	Dicyclopentadiene				
60	75-37-6	Difluoroethane, 1,1-				1,1-Difluoroethane
61	94-58-6	Dihydrosafrole				
62	108-20-3	Diisopropyl Ether				
63	513-37-1	Dimethylvinylchloride				
64	106-89-8	Epichlorohydrin	3.8	N		
65	106-88-7	Epoxybutane, 1,2-				1,2-Epoxybutane
66	141-78-6	Ethyl Acetate	2	N		Ethylacetate
67	75-00-3	Ethyl Chloride (Chloroethane)	3.8	N		Chloroethane
68	97-63-2	Ethyl Methacrylate	1.8	M		Ethylmethacrylate
69	100-41-4	Ethylbenzene	0.8	N		
70	75-21-8	Ethylene Oxide	3	N		
71	151-56-4	Ethyleneimine	3.3	N		
72	822-06-0	Hexamethylene Diisocyanate, 1,6-				1,6-Hexamethylene Diisocyanate

Chemical Properties for Supporting the VISL

	A	B	AD	AE	AF	AG
3			Lower Explosive Limit LEL			
4						
5	CAS	Alphabetized List of Compounds	(% by vol)	source		Alternative Chemical Name 1
73	110-54-3	Hexane, N-	1.1	N		Hexane
74	591-78-6	Hexanone, 2-				2-Hexanone
75	74-90-8	Hydrogen Cyanide	5.6	N		
76	7439-97-6	Mercury (elemental)				
77	126-98-7	Methacrylonitrile	2	N		
78	96-33-3	Methyl Acrylate	2.8	N		
79	78-93-3	Methyl Ethyl Ketone (2-Butanone)	1.4	N		2-Butanone
80	108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	1.2	N		4-Methyl-2-pentanone
81	624-83-9	Methyl Isocyanate	5.3	N		
82	80-62-6	Methyl Methacrylate	1.7	N		Methylmethacrylate
83	25013-15-4	Methyl Styrene (Mixed Isomers)				
84	1634-04-4	Methyl tert-Butyl Ether (MTBE)	1.6	M		MTBE
85	75-09-2	Methylene Chloride	13	N		
86	91-20-3	Naphthalene	0.9	N		
87	98-95-3	Nitrobenzene	1.8	N		
88	75-52-5	Nitromethane				
89	79-46-9	Nitropropane, 2-	2.6	N		2-Nitropropane
90	924-16-3	Nitroso-di-N-butylamine, N-				N-Nitroso-di-n-butylamine
91	111-84-2	Nonane, n-				
92	109-66-0	Pentane, n-				
93	75-44-5	Phosgene				
94	123-38-6	Propionaldehyde				
95	103-65-1	Propyl benzene	0.8	M		n-Propylbenzene
96	115-07-1	Propylene	2	E		
97	75-56-9	Propylene Oxide				
98	100-42-5	Styrene	1.1	E		
99	630-20-6	Tetrachloroethane, 1,1,1,2-				1,1,1,2-Tetrachloroethane
100	79-34-5	Tetrachloroethane, 1,1,2,2-				1,1,2,2-Tetrachloroethane
101	127-18-4	Tetrachloroethylene				
102	811-97-2	Tetrafluoroethane, 1,1,1,2-				
103	109-99-9	Tetrahydrofuran	2	N		
104	108-88-3	Toluene	1.1	N		
105	76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-				1,1,2-Trichloro-1,2,2-trifluoroethane
106	120-82-1	Trichlorobenzene, 1,2,4-	2.5	N		1,2,4-Trichlorobenzene
107	71-55-6	Trichloroethane, 1,1,1-	7.5	N		1,1,1-Trichloroethane
108	79-00-5	Trichloroethane, 1,1,2-	6	N		1,1,2-Trichloroethane
109	79-01-6	Trichloroethylene	8	N		
110	75-69-4	Trichlorofluoromethane				
111	96-18-4	Trichloropropane, 1,2,3-	3.2	N		1,2,3-Trichloropropane
112	96-19-5	Trichloropropene, 1,2,3-				
113	121-44-8	Triethylamine				
114	626-73-8	Trimethylbenzene, 1,2,3-				
115	95-63-6	Trimethylbenzene, 1,2,4-	0.9	N		1,2,4-Trimethylbenzene
116	108-05-4	Vinyl Acetate	2.6	N		
117	593-60-2	Vinyl Bromide				
118	75-01-4	Vinyl Chloride	3.6	N		Chloroethene
119	108-38-3	Xylene, m-	1.1	N		m-Xylene
120	95-47-6	Xylene, o-	0.9	N		o-Xylene
121	106-42-3	Xylene, p-	1	N		p-Xylene
122	1330-20-7	Xylenes				Xylene, Mixture
123						
124		NOTE:				outlined in the Regional Screening Tables User's C
125						
126						
127		a				
128						
129		b				rotection Agency, Washington, DC, USA.
130						
131		c				
132		d				
133						
134		e				
135						
136		f				
137		g				
138						
139		h				

Chemical Properties for Supporting the VISL

	A	B	AD	AE	AF	AG
3			Lower Explosive			
4			Limit			
			LEL			
5	CAS	Alphabetized List of Compounds	(% by vol)	source		Alternative Chemical Name 1
140		j				
141		k				
142		kk				
143		m	tools that do use these prop			
144		mm				
145		n				
146						
147		nn				
148		p				
149		q				
150		r				
151						
152		s				
153		v				
154			ence s			

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) : c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																												
Toxicity and Chemical-specific Information														Screening Levels										Protection of Ground Water SSLs				
SFO (mg/kg-day) ¹	key	IUR (ug/m ³) ²	key	RfD _a (mg/kg-day)	key	RfC _a (mg/m ³)	key	muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (ug/m ³)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)	
1.8E-02	C	5.1E-06	C	1.5E-01	I					1	0.1	ALAR	1596-84-5	3.0E+01	c	1.3E+02	c	5.5E-01	c	2.4E+00	c	4.3E+00	c		9.5E-04	c		
8.7E-03	I		I	4.0E-03	I					1	0.1	Acophate	30560-19-1	6.1E+01	c**	2.7E+02	c*					8.9E+00	c**		2.0E-03	c**		
		2.2E-06	I			9.0E-03	I	V		1		1.1E+05	Acetaldehyde	75-07-0	1.1E+01	c**	4.9E+01	c**	1.3E+00	c**	5.6E+00	c**	2.6E+00	c**		5.2E-04	c**	
				2.0E-02	I					1	0.1	Acetochlor	34256-82-1	1.2E+03	n	1.6E+04	n					3.5E+02	n		2.8E-01	n		
				9.0E-01	I	3.1E+01	A	V		1		1.1E+05	Acetolone	67-64-1	6.1E+04	n	6.7E+05	n	3.2E+04	n	1.4E+05	n	1.4E+04	n		2.9E+00	n	
				2.0E-03	X	V				1		1.1E+05	Acetone Cyanohydrin	75-96-5	5.0E+01	n	2.1E+02	n	2.1E+00	n	8.8E+00	n	4.2E+00	n		8.4E-04	n	
						6.0E-02	I	V		1		1.3E+05	Acetonitrile	75-05-8	8.1E+02	n	3.4E+03	n	6.3E+01	n	2.6E+02	n	1.3E+02	n		2.6E-02	n	
3.8E+00	C	1.3E-03	C			1.0E-01	I	V		1		2.5E+03	Acetophenone	98-86-2	7.8E+03	ns	1.2E+05	nms					1.9E+03	n		5.8E-01	n	
										1	0.1	Acetylaminofluorene, 2-	53-96-3	1.4E-01	c	6.1E-01	c	2.2E-03	c	9.4E-03	c	1.6E-02	c		7.2E-05	c		
				5.0E-04	I	2.0E-05	I	V		1		2.3E+04	Acrolein	107-02-8	1.4E-01	n	6.0E-01	n	2.1E-02	n	8.8E-02	n	4.2E-02	n		8.4E-06	n	
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M	1	0.1	Acrylamide	79-06-1	2.4E-01	c	4.6E+00	c	1.0E-02	c	1.2E-01	c	5.0E-02	c		1.1E-05	c		
				5.0E-01	I	1.0E-03	I			1	0.1	Acrylic Acid	79-10-7	3.0E+04	n	3.9E+05	nm	1.0E+00	n	4.4E+00	n	9.9E+03	n		2.0E+00	n		
5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V		1		1.1E+04	Acrylonitrile	107-13-1	2.5E-01	c*	1.1E+00	c*	4.1E-02	c*	1.8E-01	c*	5.2E-02	c*		1.1E-05	c*	
5.6E-02	C					6.0E-03	P			1	0.1	Adiponitrile	111-69-3	8.5E+06	nm	3.6E+07	nm	6.3E+00	n	2.6E+01	n							
				1.0E-02	I					1	0.1	Alachlor	15972-60-8	9.5E+00	c*	4.1E+01	c					1.0E+00	c		2.0E+00	8.6E-04	c	
				1.0E-03	I					1	0.1	Aldicarb	116-06-3	6.2E+01	n	8.2E+02	n					2.0E+01	n		3.0E+00	4.9E-03	n	
				1.0E-03	I					1	0.1	Aldicarb Sulfone	1646-88-4	6.2E+01	n	8.2E+02	n					2.0E+01	n		2.0E+00	4.4E-03	n	
										1	0.1	Aldicarb sulfoxide	1646-87-3											4.0E+00	4.4E-03	n		
1.7E+01	I	4.9E-03	I	3.0E-05	I					1	0.1	Aldrin	309-00-2	3.1E-02	c*	1.4E-01	c	5.7E-04	c	2.5E-03	c	4.6E-03	c		7.5E-04	c		
				2.5E-01	I					1	0.1	Allyl	74223-64-6	1.5E+04	n	2.1E+05	nm					4.9E+03	n		1.9E+00	n		
				5.0E-03	I	1.0E-04	X			1	0.1	Allyl Alcohol	107-18-6	3.1E+02	n	4.1E+03	n	1.0E-01	n	4.4E-01	n	1.0E+02	n		2.0E-02	n		
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1		1.4E+03	Allyl Chloride	107-05-1	7.2E-01	c**	3.2E+00	c**	4.7E-01	c**	2.0E+00	c**	7.3E-01	c**		2.3E-04	c**	
				1.0E+00	P	5.0E-03	P			1			Aluminum	7429-90-5	7.7E+04	n	1.1E+06	nm	5.2E+00	n	2.2E+01	n	2.0E+04	n		3.0E+04	n	
				4.0E-04	I					1			Aluminum Phosphide	20859-73-8	3.1E+01	n	4.7E+02	n					8.0E+00	n				
				3.0E-04	I					1	0.1	Amroco	57485-29-4	1.8E+01	n	2.5E+02	n					5.9E+00	n		2.1E+03	n		
				9.0E-03	I					1	0.1	Amphetamine	834-12-8	5.5E+02	n	7.4E+03	n					1.5E+02	n		1.6E-01	n		
2.1E+01	C	6.0E-03	C							1	0.1	Ammonobiphenyl 4-	92-67-1	2.5E-02	c	1.1E-01	c	4.7E-04	c	2.0E-03	c	3.0E-03	c		1.5E-05	c		
				8.0E-02	P					1	0.1	Aminophenol, m-	591-27-5	4.9E+03	n	6.6E+04	n					1.6E+03	n		6.1E-01	n		
				2.0E-02	P					1	0.1	Aminophenol, p-	123-30-8	1.2E+03	n	1.6E+04	n					4.0E+02	n		1.5E-01	n		
				2.5E-03	I					1	0.1	Amtraz	33089-61-1	1.5E+02	n	2.1E+03	n					8.2E+00	n		4.2E+00	n		
						1.0E-01	I			1		Ammonia	7664-41-7					1.0E+02	n	4.4E+02	n							
				2.0E-01	I					1		Ammonium Sulfamate	7773-06-0	1.6E+04	n	2.3E+05	nm					4.0E+03	n					
						3.0E-03	X	V		1		1.4E+04	Amyl Alcohol, tert-	75-85-4	8.2E+01	n	3.4E+02	n	3.1E+00	n	1.3E+01	n	6.3E+00	n		1.3E-03	n	
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I			1	0.1	Aniline	62-53-3	9.3E-01	c**	4.1E+02	c*	1.0E+00	n	4.4E+00	n	1.3E+01	c*		4.6E-03	c*		
4.0E-02	P			2.0E-03	X					1	0.1	Anthraquinone, 9,10-	84-65-1	1.3E+01	c**	5.8E+01	c*					1.4E+00	c*		1.4E-02	c*		
				4.0E-04	I				0.15			Antimony (metallic)	7440-36-0	3.1E+01	n	4.7E+02	n					7.8E+00	n	6.0E+00	3.5E-01	n		
				5.0E-04	H			0.15				Antimony Pentoxide	1314-60-9	3.9E+01	n	5.8E+02	n					9.7E+00	n					
				9.0E-04	H			0.15				Antimony Potassium Tartrate	11071-15-1	7.0E+01	n	1.1E+03	n					1.8E+01	n					
				4.0E-04	H			0.15				Antimony Tetrahydride	1332-81-6	3.1E+01	n	4.7E+02	n					7.8E+00	n					
						2.0E-04	I		0.15			Antimony Trioxide	1309-64-4	2.8E+05	nm	1.2E+06	nm	2.1E-01	n	8.8E-01	n							
2.5E-02	I	7.1E-06	I	1.3E-02	I					1	0.1	Apollo	74115-24-5	9.0E+02	n	1.1E+04	n					2.3E+02	n		1.4E+01	n		
				5.0E-02	H					1	0.1	Aramite	140-57-8	2.1E+01	c	9.2E+01	c	4.0E-01	c	1.7E+00	c	1.3E+00	c		1.5E-02	c		
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C			1	0.03	Arsenic, Inorganic	7440-38-2	6.7E-01	c	3.0E+00	c	6.5E-04	c*	2.9E+03	c*	5.2E-02	c	1.0E+01	1.5E-03	c		
				3.5E-06	C	5.0E-05	I			1		Arsine	7784-42-1	2.7E-01	n	4.1E+00	n	5.2E-02	n	2.2E-01	n	7.0E-02	n					
				9.0E-03	I					1	0.1	Assure	76578-14-8	5.5E+02	n	7.4E+03	n					1.2E+02	n		1.9E+00	n		
				5.0E-02	I					1	0.1	Asulam	3337-71-1	3.1E+03	n	4.1E+04	n					1.0E+03	n		2.6E-01	n		
2.3E-01	C			3.5E-02	I					1	0.1	Atrazine	1912-24-9	2.3E+00	c	1.0E+01	c					3.0E-01	c	3.0E+00	1.9E-04	c		
8.8E-01	C	2.5E-04	C							1	0.1	Auramine	492-80-8	6.1E-01	c	2.6E+00	c	1.1E-02	c	4.9E-02	c	6.6E-02	c		6.0E-04	c		
				4.0E-04	I					1	0.1	Avermectin B1	65195-55-3	2.5E+01	n	3.3E+02	n					8.0E+00	n		1.4E+01	n		
1.1E-01	I	3.1E-05	I	1.0E+00	P	7.0E-06	P			1	0.1	Azobenzene	103-33-3	6.0E+00	c	2.6E+01	c	9.1E-02	c	4.0E-01	c	1.2E-01</						

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																																		
Toxicity and Chemical-specific Information													Contaminant										Screening Levels										Protection of Ground Water SSLs	
SFO (mg/kg-day) ^a	K _e (y)	IUR (ug/m ³) ¹	K _e (y)	RfD _h (mg/kg-day)	K _e (y)	RfC ₁ (mg/m ³)	K _e (y)	o c	muta- gen	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)						
				5.0E-03	H						1	0.1	Bromophos	2104-96-3	3.1E+02	n	4.1E+03	n								1.5E-01	n							
				2.0E-02	I						1	0.1	Bromoxynil	1689-84-5	1.2E+03	n	1.6E+04	n								3.3E+02	n	2.8E-01						
				2.0E-02	I						1	0.1	Bromoxynil Octanoate	1689-99-2	1.2E+03	n	1.6E+04	n								1.4E+02	n	1.2E+00						
3.4E+00	C	3.0E-05	I			2.0E-03	I	V			1	0.1	6.7E+02	Butadiene, 1,3- Butanol, N- Butyl Benzyl Phthalate	106-99-0 71-36-3 85-68-7	5.8E+02 6.2E+03 2.8E+02	c* n c*	2.6E-01 8.2E+04 1.2E+03	c* n c	9.4E-02	c*	4.1E-01	c*	1.8E-02	c		9.9E-06	c						
1.9E-03	P			2.0E+00	P	3.0E+01	P				1	0.1	Butyl alcohol, sec. Butylate Butylated hydroxyanisole	78-92-2 2008-41-5 25013-16-5	1.2E+05 3.1E+03 2.7E+03	nm n c	1.6E+06 4.1E+04 1.2E+04	nm n c	3.1E+04	n	1.3E+05	n	4.0E+04	n		8.1E+00	n							
2.0E-04	C	5.7E-08	C								1	0.1	Butylated hydroxytoluene Butylbenzene, n- Butylbenzene, sec-	128-37-0 104-51-8 135-98-8	1.5E+02 3.9E+03 7.8E+03	c ns ns	6.4E+02 5.8E+04 1.2E+05	c ns nms						3.3E+00 1.0E+03 2.0E+03	c n n		9.7E-02 3.2E+00 5.9E+00	c n n						
3.6E-03	P			3.0E-01	P						1	0.1	1.8E+02	Butylbenzene, tert- Calcium (Diet) Calcium (Water)	98-06-6 75-60-5 7440-43-9	7.8E+03 1.2E+03 7.0E+01	ns n n	1.2E+05 1.6E+04 9.8E+02	nms n n						6.9E+02 4.0E+02	n n		1.6E+00 1.2E+00	n n					
				1.0E-01	X						1	0.1	1.8E+02	Butylbenzene, tert- Calcium (Diet) Calcium (Water)	98-06-6 75-60-5 7440-43-9	7.8E+03 1.2E+03 7.0E+01	ns n n	1.2E+05 1.6E+04 9.8E+02	nms n n						6.9E+02 4.0E+02	n n		1.6E+00 1.2E+00	n n					
				1.8E-03	I			1.0E-05	A		0.025	0.001		Cadmium (Diet) Cadmium (Water)	7440-43-9 7440-43-9	7.0E+01 7.0E+01	n n	9.8E+02 9.8E+02	n n	1.6E-03	c**	6.8E-03	c**	9.2E+00	n	5.0E+00	6.9E-01	n	3.8E-01					
				5.0E-04	I	1.0E-05	A			0.05	0.001		Cadmium (Water)	7440-43-9	7.0E+01	n	9.8E+02	n	1.6E-03	c**	6.8E-03	c**	9.2E+00	n	5.0E+00	6.9E-01	n	3.8E-01						
				5.0E-01	I	2.2E-03	C				1	0.1	1.5E-01	Captopril	105-60-2	3.1E+04	n	4.0E+05	nm	2.3E+00	n	9.6E+00	n		2.9E+00	n								
				3.0E-03	I						1	0.1	1.5E-01	Captopril	2425-06-1	3.6E+00	c*	1.5E+01	c	6.5E-02	c	2.9E-01	c	4.0E-01	c*		7.1E-04	c*						
2.3E-03	C	6.6E-07	C	1.3E-01	I						1	0.1		Captan Carbaryl Carbaryl	133-06-2 63-25-2 1563-66-2	2.3E+02 6.2E+03 3.1E+02	c* n n	1.0E+03 8.2E+04 4.1E+03	c n n	4.3E+00	c	1.9E+01	c	3.1E+01	c*		2.2E-02	c*						
				1.0E-01	I						1	0.1	7.4E+02	Carbon Disulfide	75-15-0	7.7E+02	ns	3.5E+03	ns	7.3E+02	n	3.1E+03	n	8.1E+02	n		2.4E-01	n						
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V			1	0.1	4.6E+02	Carbon Tetrachloride Carbosulfan	56-23-5 55285-14-8	5.9E+01 6.2E+02	c n	2.9E+00 8.2E+03	c n	4.7E-01	c	2.0E+00	c	4.5E-01	c	5.0E+00	1.8E-04	c	1.9E-03					
				1.0E-01	I						1	0.1		Carboxin	5234-68-4	6.2E+03	n	8.2E+04	n							1.9E+03	n	1.0E+00						
				9.0E-04	I						1	0.1		Cerlic oxide	1306-38-3	1.3E+06	nm	5.4E+06	nm	9.4E-01	n	3.9E+00	n					n						
				1.0E-01	I						1	0.1		Chloral Hydrate	302-17-0	6.2E+03	n	8.2E+04	n							2.0E+03	n	4.0E-01						
				1.5E-02	I						1	0.1		Chloramben	133-90-4	9.2E+02	n	1.2E+04	n							2.9E+02	n	7.0E-02						
4.0E-01	H			1.3E+00	c	5.7E+00	c				1	0.1		Chloranil	118-75-2	1.3E+00	c	5.7E+00	c							1.8E-01	c	1.5E-04						
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I				1	0.04		Chlorane	12789-03-6	1.8E+00	c*	8.0E+00	c*	2.8E-02	c*	1.2E-01	c*	2.2E-01	c*	2.0E+00	1.5E-02	c*	1.4E-01					
1.0E+01	I	4.6E-03	C	3.0E-04	I						1	0.1		Chloroacene (Kepone)	143-50-0	5.3E-02	c	2.3E-01	c	6.1E-04	c	2.7E-03	c	3.5E-03	c		1.2E-04	c						
				7.0E-04	A						1	0.1		Chlorofeniphos	470-90-6	4.3E+01	n	5.8E+02	n							1.1E+01	n	3.1E-02	n					
				2.0E-02	I						1	0.1		Chlorimuron, Ethyl-	90982-32-4	1.2E+03	n	1.6E+04	n							3.9E+02	n	1.3E-01	n					
				1.0E-01	I	1.5E-04	A				1			Chlorine	7782-50-5	7.5E+03	n	1.0E+05	nm	1.5E-01	n	6.4E-01	n	2.0E+03	n		9.0E-01	n						
				3.0E-02	I	2.0E-04	I				1			Chlorine Dioxide	10049-04-4	2.3E+03	n	3.4E+04	n	2.1E-01	n	8.8E-01	n	6.0E+02	n			n						
				3.0E-02	I						1			Chlorite (Sodium Salt)	7758-19-2	2.3E+03	n	3.5E+04	n							6.0E+02	n		1.0E+03					
4.6E-01	H			3.0E-04	I	2.0E-02	H	2.0E-02	I	V		1	1.2E+03	Chloro-1,1-difluoroethane, 1-	75-68-3	5.4E+04	ns	2.3E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		5.2E+01	n						
				5.0E-01	I						1	7.5E+02		Chloro-1,3-butadiene, 2-	126-99-8	1.0E-02	c	4.4E-02	c	9.4E-03	c	4.1E-02	c	1.9E-02	c		9.8E-06	c						
				2.0E-03	H						1	0.1		Chloro-2-methylaniline HCl, 4-	3165-93-3	1.2E+00	c	5.0E+00	c							1.7E-01	c		1.5E-04	c				
1.0E-01	P	7.7E-05	C	3.0E-03	X						1	0.1		Chloro-2-methylaniline, 4-	95-69-2	5.3E+00	c*	2.3E-01	c	3.6E-02	c	1.6E-01	c	6.9E-01	c*		3.9E-04	c*						
2.7E-01	X			2.0E-03	H						1	0.1	2.8E+04	Chloroacetalddehyde, 2-	107-20-0	2.0E+00	c	8.6E+00	c							2.9E-01	c	5.8E-05	c					
				3.0E-05	I						1	0.1		Chloroacetic Acid	79-11-8	1.2E+02	n	1.6E+03	n							4.0E+01	n	1.2E-02	n					
2.0E-01	P			4.0E-03	I						1	0.1		Chloroacetophenone, 2-	532-27-4	4.3E+04	n	1.8E+05	nm	3.1E-02	n	1.3E-01	n					n						
				2.0E-02	I	5.0E-02	P	V			1	0.1	7.6E+02	Chloroaniline, p-	106-47-8	2.7E+00	c*	1.2E+01	c							3.6E-01	c	1.6E-04	c	6.8E-02				
1.1E-01	C	3.1E-05	C	2.0E-02	I						1	0.1		Chlorobenzene	108-90-7	2.8E+02	n	1.3E+03	n	5.2E+01	n	2.2E+02	n			1.0E+02	5.3E-02	n						
				3.0E-02	X						1	0.1		Chlorobenzilate	510-15-6	4.8E+00	c	2.1E+01	c	9.1E-02	c	4.0E-01	c	3.1E-01	c		1.0E-03	c						
				3.0E-03	P	3.0E-01	P	V			1	1.2E+02		Chlorobenzoic Acid, p-	74-11-3	1.8E+03	n	2.5E+04	n							5.1E+02	n	1.3E-01	n					
				4.0E-02	P						1	0.1	1.7E+02	Chlorobenzotrifluoride, 4-	98-56-6	2.1E+02	ns	2.5E+03	ns	3.1E+02	n	1.3E+03	n	3.5E+01	n		1.2E-01	n						
				5.0E+01	I						1	7.3E+02		Chlorobutane, 1-	109-69-3	3.1E+03	ns	4.7E+04	ns							6.4E+02	n	2.6E-01	n					
				2.0E-02	P						1	0.1	1.7E+03	Chlorodifluoromethane	75-45-6	4.9E+04	ns	2.1E+05	nms	5.2E+04	n	2.2E+05	n	1.0E+05	n		4.3E+01	n						
				3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V	1	2.5E+03	Chloroethanol, 2-	105-07-3	1.6E+03	n									8.1E-02	n						

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																																	
Toxicity and Chemical-specific Information													Screening Levels													Protection of Ground Water SSLs							
SFO (mg/kg-day) ¹	K _e y	IUR (ug/m ³) ²	K _e y	RfD _a (mg/kg-day)	K _e y	RfC ₁ (mg/m ³)	K _e y	muta- gen	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)	Toxic?	Volatile?	In VISL?			
4.5E-02	C	1.3E-05	C	8.0E-05	X	2.0E-03	I	1	0.1	1.1E+03		Dimethylvinylchloride	513-37-1	2.1E-01	c	9.3E-01	c	2.2E-01	c	9.4E-01	c	3.3E-01	c		2.0E-04	c							
				2.0E-03	I	2.0E-03	I	1	0.1			Dinitro-o-cresol, 4,6-	534-52-1	4.9E+00	n	6.6E+01	n					1.5E+00	n		2.6E-03	n							
				1.0E-04	P	1.0E-04	P	1	0.1			Dinitro-cyclohexyl Phenol, 4,6-	131-89-5	1.2E+02	n	1.6E+03	n					2.3E-01	n		7.7E-01	n							
				1.0E-04	I	1.0E-04	I	1	0.1			Dinitrobenzene, 1,2-	528-29-0	6.2E+00	n	8.2E+01	n					1.9E+00	n		1.8E-03	n							
				1.0E-04	P	1.0E-04	P	1	0.1			Dinitrobenzene, 1,3-	99-65-0	6.2E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n							
				2.0E-03	I	2.0E-03	I	1	0.1			Dinitrobenzene, 1,4-	100-25-4	6.2E+00	n	8.2E+01	n					2.0E+00	n		1.8E-03	n							
6.8E-01	I			2.0E-03	I	2.0E-03	I	1	0.1			Dinitrophenol, 2,4-	51-28-5	1.2E+02	n	1.6E+03	n					3.9E+01	n		4.4E-02	n							
3.1E-01	C	8.9E-05	C	2.0E-03	I	2.0E-03	I	1	0.1	1.012		Dinitrotoluene Mixture, 2,4/2,6-	NA	7.8E-01	c	3.4E+00	c					1.1E-01	c		1.5E-04	c							
				2.0E-03	I	2.0E-03	I	1	0.1			Dinitrotoluene, 2,4-	121-14-2	1.7E+00	c*	7.4E+00	c	3.2E-02	c	1.4E-01	c	2.4E-01	c		3.2E-04	c							
1.5E+00	P			3.0E-04	X	2.0E-03	S	1	0.099			Dinitrotoluene, 2,6-	606-20-2	3.6E-01	c*	1.5E+00	c					4.8E-02	c		6.7E-05	c							
				2.0E-03	S	2.0E-03	S	1	0.006			Dinitrotoluene, 2-Amino-4,6-	35572-78-2	1.5E+02	n	2.3E+03	n					3.9E+01	n		3.0E-02	n							
				2.0E-03	S	2.0E-03	S	1	0.009			Dinitrotoluene, 4-Amino-2,6-	19406-51-0	1.5E+02	n	2.3E+03	n					3.9E+01	n		3.0E-02	n							
4.5E-01	X			9.0E-04	X	3.0E-02	I	1	0.1			Dinitrotoluene, Technical grade	25321-14-6	1.2E+00	c*	5.1E+00	c					1.6E-01	c		2.2E-04	c							
				1.0E-03	I	1.0E-03	I	1	0.1			Dinoseb	88-85-7	6.2E+01	n	8.2E+02	n					1.5E+01	n		1.3E-01	n							
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	1	0.1			Dioxane, 1,4-	123-91-1	5.3E+00	c	2.3E+01	c	5.6E-01	c*	2.5E+00	c*	7.8E-01	c	7.0E+00	1.6E-04	c	6.2E-02						
6.2E+03	I	1.3E+00	I	7.0E-10	I	4.0E-08	C	1	0.03			Dioxins	NA	1.0E-04	c	4.7E-04	c	2.2E-06	c	9.4E-06	c	1.3E-05	c		1.7E-05	c							
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	1	0.03			-TCDD, 2,3,7,8-	1748-01-6	4.9E-06	c*	2.2E-05	c*	7.4E-08	c	3.2E-07	c	6.0E-07	c*	3.0E-05	3.0E-07	c*	1.5E-05						
				3.0E-02	I	3.0E-02	I	1	0.1			Diphenamid	957-51-7	1.8E+03	n	2.5E+04	n					5.3E+02	n		5.2E+00	n							
				8.0E-04	X	2.5E-02	I	1	0.1			Diphenyl Sulfone	127-63-9	4.9E+01	n	6.6E+02	n					1.5E+01	n		3.6E-02	n							
				2.5E-02	I	2.5E-02	I	1	0.1			Diphenylamine	122-39-4	1.5E+03	n	2.1E+04	n					3.1E+02	n		5.8E-01	n							
8.0E-01	I	2.2E-04	I	2.2E-03	I	2.2E-03	I	1	0.1			Diphenylhydrazine, 1,2-	122-66-7	6.7E-01	c	2.9E+00	c	1.3E-02	c	5.6E-02	c	7.7E-02	c	2.0E+01	2.5E-04	c							
7.4E+00	C	2.1E-03	C	2.2E-03	I	2.2E-03	I	1	0.1			Diquat	85-00-7	1.4E+02	n	1.8E+03	n					4.4E+01	n		8.3E-01	n							
7.4E+00	C	2.1E-03	C	2.2E-03	I	2.2E-03	I	1	0.1			Direct Black 38	1937-37-3	7.2E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		5.1E+00	c							
6.7E+00	C	1.9E-03	C	4.0E-05	I	4.0E-05	I	1	0.1			Direct Blue 6	2602-46-2	7.2E-02	c	3.1E-01	c	1.3E-03	c	5.8E-03	c	1.1E-02	c		1.7E+01	c							
				1.0E-02	I	1.0E-02	I	1	0.1			Direct Brown 95	16071-86-6	7.9E-02	c	3.4E-01	c	1.5E-03	c	6.5E-03	c	1.2E-02	c		9.4E-04	c							
				2.0E-03	I	2.0E-03	I	1	0.1			Disulfoton	298-04-4	2.5E+00	n	3.3E+01	n					5.0E-01	n		9.4E-04	c							
				1.0E-02	I	1.0E-02	I	1	0.1			Dithiane, 1,4-	505-29-3	6.2E+02	n	8.2E+03	n					2.0E+02	n		9.7E-02	n							
				2.0E-03	I	2.0E-03	I	1	0.1			Duron	330-54-1	1.2E+02	n	1.6E+03	n					3.6E+01	n		1.5E-02	n							
				4.0E-03	I	4.0E-03	I	1	0.1			Podine	2439-10-3	2.5E+02	n	3.3E+03	n					8.0E+01	n		4.1E-01	n							
				2.5E-02	I	2.5E-02	I	1	0.1			EPTC	759-94-4	2.0E+03	n	2.9E+04	n					3.8E+02	n		2.0E-01	n							
				6.0E-03	I	6.0E-03	I	1	0.1			Endosulfan	115-29-7	3.7E+02	n	4.9E+03	n					1.0E+02	n		1.4E+00	n							
				2.0E-02	I	2.0E-02	I	1	0.1			Endothal	145-73-3	1.2E+03	n	1.6E+04	n					3.8E+02	n	1.0E+02	9.1E-02	n	2.4E-02						
9.9E-03	I	1.2E-06	I	3.0E-04	I	3.0E-04	I	1	0.1			Endrin	72-20-8	1.8E+01	n	2.5E+02	n					2.3E+00	n	2.0E+00	9.2E-02	n	8.1E-02						
				6.0E-03	P	1.0E-03	I	1	0.1	1.1E+04		Epichlorohydrin	106-89-8	1.9E+01	n	8.2E+01	n	1.0E+00	n	4.4E+00	n	2.0E+00	n		4.5E-04	n							
				2.0E-02	I	2.0E-02	I	1	0.1	1.5E+04		Epoxybutane, 1,2-	106-88-7	1.6E+02	n	6.7E+02	n	2.1E+01	n	8.8E+01	n	4.2E+01	n		9.2E-03	n							
				5.0E-03	I	5.0E-03	I	1	0.1			Ethephon	16672-87-0	3.1E+02	n	4.1E+03	n					1.0E+02	n		2.1E-02	n							
				5.0E-04	I	5.0E-04	I	1	0.1			Ethion	563-12-2	3.1E+01	n	4.1E+02	n					4.3E+00	n		8.5E-03	n							
				1.0E-01	P	6.0E-02	P	1	0.1			Ethoxyethanol Acetate, 2-	111-15-9	6.2E+03	n	8.2E+04	n	6.3E+01	n	2.6E+02	n	2.0E+03	n		4.2E-01	n							
				9.0E-02	P	2.0E-01	I	1	0.1			Ethoxyethanol, 2-	110-80-5	5.5E+03	n	7.4E+04	n	2.1E+02	n	8.8E+02	n	1.8E+03	n		3.6E-01	n							
4.8E-02	H			9.0E-01	I	7.0E-02	P	1	0.1	1.1E+04		Ethyl Acetate	141-78-6	6.2E+02	n	2.6E+03	n	7.3E+01	n	3.1E+02	n	1.4E+02	n		3.1E-02	n							
				1.0E+01	I	1.0E+01	I	1	0.1	2.5E+03		Ethyl Acrylate	140-88-5	1.4E+01	c	6.8E+01	c					1.6E+00	c		3.5E-04	c							
				2.0E-01	I	2.0E-01	I	1	0.1	2.1E+03		Ethyl Chloride (Chloroethane)	75-00-3	1.4E+04	ns	5.7E+04	ns	1.0E+04	n	4.4E+04	n	2.1E+04	n		5.9E+00	n							
				1.0E-02	H	3.0E-01	P																										

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice); c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																													
Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Ground Water SSLs				
SFO (mg/kg-day) ^a	K _e y	IUR (ug/m ³) ²	K _e y	RfD _a (mg/kg-day)	K _e y	RfC ₁ (mg/m ³)	K _e y	muta- gen	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)		
4.5E+00	I	1.3E-03	I	5.0E-05	I	1.3E-02	I	1	1	0.1	1	Haloxypol, Methyl	69806-40-2	3.1E+00	n	4.1E+01	n					7.6E-01	n			8.4E-03	n		
				1.3E-02								Harmony	79277-27-3	8.0E+02	n	1.1E+04	n					2.6E+02	n			7.8E-02	n		
				5.0E-04								Heptachlor	76-44-8	1.2E-01	c	5.1E-01	c	2.2E-03	c	9.4E-03	c	2.0E-03	c	4.0E-01	1.6E-04	c	3.3E-02		
9.1E+00	I	2.6E-03	I	1.3E-05	I	1.3E-05	I	1	1	0.1	1	Heptachlor Epoxide	1024-57-3	5.9E-02	c*	2.5E-01	c*	1.1E-03	c	4.7E-03	c	3.3E-03	c*	2.0E-01	7.8E-05	c*	4.1E-03		
				2.0E-03								Hexabromobenzene	87-82-1	1.2E+02	n	1.6E+03	n					4.0E+01	n			2.3E-01	n		
				2.0E-04								Hexabromodiphenyl ether, 2,2',4,4',5,5' (BDE-153)	69631-49-2	1.2E+01	n	1.6E+02	n					4.0E+02	n				n		
1.6E+00	I	4.6E-04	I	8.0E-04	I	1.3E-04	I	1	1	0.1	1	Hexachlorobenzene	118-74-1	3.3E-01	c	1.4E+00	c	6.1E-03	c	2.7E-02	c	4.9E-02	c	1.0E+00	6.1E-04	c	1.3E-02		
				7.8E-02								Hexachlorobutadiene	87-68-3	6.8E+00	c**	3.0E+01	c*	1.3E-01	c	5.6E-01	c	3.0E-01	c*			5.7E-04	c*		
				6.3E+00								Hexachlorocyclohexane, Alpha	319-84-6	8.5E-02	c	3.7E-01	c	1.6E-03	c	6.8E-03	c	7.1E-03	c			4.1E-05	c		
1.8E+00	I	5.3E-04	I	3.0E-04	I	1.3E-04	I	1	1	0.1	1	Hexachlorocyclopentadiene, Beta	319-85-7	3.0E-01	c	1.3E+00	c	5.3E-03	c	2.3E-02	c	2.5E-02	c	2.0E-01	1.4E-04	c			
				1.1E+00								Hexachlorocyclohexane, Gamma (Lindane)	58-89-9	5.6E-01	c*	2.5E+00	c	9.1E-03	c	4.0E-02	c	4.1E-02	c*			2.4E-04	c*	1.2E-03	
				1.8E+00								Hexachlorocyclohexane, Technical	608-73-1	3.0E-01	c	1.3E+00	c	5.5E-03	c	2.4E-02	c	2.5E-02	c			1.4E-04	c		
4.0E-02	I	1.1E-05	C	6.0E-03	I	2.0E-04	I	1	1	0.1	1	Hexachlorocyclopentadiene	77-47-4	3.7E+02	n	4.9E+03	n	2.1E-01	n	8.8E-01	n	3.1E+01	n	5.0E+01	9.6E-02	n	1.6E-01		
				7.0E-04		Hexachloroethane						67-72-1	1.3E+01	c**	5.8E+01	c*	2.6E-01	c	1.1E+00	c	9.0E-01	c**	5.5E-04	5.5E-04	c**				
				3.0E-04		Hexachlorophene						70-30-4	1.8E+01	n	2.5E+02	n	2.6E-01	c	1.1E+00	c	6.0E+00	n	8.0E+00	8.0E+00	n				
1.1E-01	I	3.0E-03	I	1.0E-05	I	1.0E-05	I	V	1	0.015	5.2E+03	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	6.0E+00	c*	2.8E+01	c	1.0E-02	n	4.4E-02	n	7.0E-01	c*	2.7E-04	2.7E-04	c*			
				4.0E-04								Hexamethylene Diisocyanate, 1,6	822-06-0	3.1E+00	n	1.3E+01	n	1.0E-02	n	4.4E-02	n	2.1E-04	n	2.1E-04	2.1E-04	n			
				4.0E-04								Hexamethylphosphoramide	680-31-9	2.5E+01	n	3.3E+02	n					8.0E+00	n	1.8E-03	1.8E-03	n			
3.0E+00	I	4.9E-03	I	3.3E-02	I	3.0E-05	P	1	1	0.1	1	Hexane, N	110-54-3	5.4E+02	ns	2.5E+03	ns	7.3E+02	n	3.1E+03	n	3.2E+02	n		2.3E+00	n			
				2.0E+00		Hexanedioic Acid						124-04-9	1.2E+05	nm	1.6E+06	nm	3.1E+01	n	1.3E+02	n	4.0E+04	n	9.9E+00	9.9E+00	n				
				5.0E-03		Hexanone, 2-						591-78-6	2.0E+02	n	1.3E+03	n	3.1E+01	n	1.3E+02	n	3.8E+01	n	8.8E-03	8.8E-03	n				
3.0E+00	I	4.9E-03	I	3.3E-02	I	3.0E-05	P	1	1	0.1	1	Hexazone	51235-04-2	2.0E+03	n	2.7E+04	n					6.4E+02	n		3.0E-01	n			
				3.0E+00		Hydrazine						30021-01-2	2.3E-01	c	1.1E+00	c	5.7E-04	c*	2.5E-03	c*	2.6E-02	c							
				3.0E+00		Hydrazine Sulfate						10334-93-2	2.3E-01	c	1.1E+00	c	5.7E-04	c*	2.5E-03	c*	2.6E-02	c							
6.0E-02	P	4.0E-02	P	2.0E-02	I	1.4E-02	C	1	1	0.1	1	Hydrogen Chloride	7647-01-0	2.8E+07	nm	1.2E+08	nm	2.1E+01	n	8.8E+01	n								
				1.3E-02								Hydrogen Fluoride	7664-39-3	3.1E+03	n	4.7E+04	n	1.5E+01	n	6.1E+01	n								
				2.5E-01								Hydrogen Sulfide	7783-06-4	2.8E+06	nm	1.2E+07	nm	2.1E+00	n	8.8E+00	n	8.0E+02	n						
9.5E-04	I	2.0E-01	I	2.0E+00	C	7.0E+00	C	1	1	0.1	1	Isobutyl Alcohol	78-83-1	1.8E+04	n	2.5E+05	nm					5.9E+03	n		1.2E+00	n			
				1.5E-02		Isophorone						78-59-1	5.6E+01	c*	2.4E+03	c*	2.1E+03	n	8.8E+03	n	7.8E+01	c*	2.6E-02	2.6E-02	c*				
				1.5E-02		Isopropalin						33820-53-0	9.2E+02	n	1.2E+04	n					4.0E+01	n	9.2E-01	9.2E-01	n				
2.8E-01	C	8.0E-05	C	1.0E-01	I	1.0E-02	I	1	1	0.1	1	Isopropanol	67-63-0	9.9E+09	nm	4.2E+10	nm	7.3E+03	n	3.1E+04	n				4.3E-01	n			
				5.0E-02								Isopropyl Methyl Phosphonic Acid	1832-54-8	6.2E+03	n	8.2E+04	n	3.1E+03	n	4.1E+04	n	7.3E+02	n	2.0E+00	2.0E+00	n			
				5.0E-02								Isosabene	82558-50-7	3.1E+03	n	4.1E+04	n	3.1E+03	n	4.1E+04	n	7.3E+02	n	2.0E+00	2.0E+00	n			
3.8E-02	C	1.1E-05	C	7.5E-02	I	1.4E-02	C	1	1	0.1	1	JP-7	NA	4.3E+08	nm	1.8E+09	nm	3.1E+02	n	1.3E+03	n	6.3E+02	n						
				2.0E-03								Kerb	23950-58-5	4.6E+03	n	6.2E+04	n					1.2E+03	n		1.2E+00	n			
				2.0E-03								Lactofen	77501-63-4	1.6E+02	n	1.6E+03	n					2.5E+01	n		1.2E+00	n			
2.8E-01	C	8.0E-05	C	3.0E-01	A	3.0E-01	A	V	1	1	0.1	Lead Compounds																	
				3.0E-01								Lead acetate	301-04-2	1.9E+00	c	8.2E+00	c	3.5E-02	c	1.5E-01	c	2.8E-01	c	1.5E+01					
				3.0E-01								Lead and Compounds	7439-92-1	4.0E+02	L	1.5E-01	L												
3.8E-02	C	1.1E-05	C	1.0E-07	I	2.0E-05	X	1	1	0.1	1	Lead subacetate	1335-32-6	1.4E+01	c	6.1E+01	c	2.6E-01	c	1.1E+00	c	2.1E+00	c						
				2.0E-03								Tetraethyl Lead	78-00-2	6.2E-03	n	8.2E-02	n					1.3E-03	n		4.7E-06	n			
				2.0E-03								Linuron	330-55-2	1.2E+02	n	1.6E+03	n					3.3E-01	n		2.9E-02	n			
2.0E-03	P	2.0E-01	I	2.0E+00	C	7.0E+00	C	1	1	0.1	1	Lithium	7439-93-2	1.6E+02	n	2.3E+03	n					4.0E+01	n		1.2E+01	n			
				2.0E-01								Londax	83055-99-6	1.2E+04	n	1.6E+05	nm					3.9E+03	n		1.0E+00	n			
				5.0E-04								MCPA	94-74-6	3.1E+01	n	4.1E+02	n					7.5E+00	n		2.0E-03	n			
1.0E-02	I	1.0E-03	I	1.0E-02	I	1.0E-03	I	1	1	0.1	1	MCPB	94-81-5	6.2E+02	n	8.2E+03	n					1.5E+02	n		5.8E-02	n			
				1.0E-03								MCPP	93-85-2	6.2E+01	n	8.2E+02	n					1.6E+01	n		4.6E-03	n			
				2.0E-02								Malathion	121-75-5	1.2E+03	n	1.6E+04	n					3.9E+02	n		1.0E+00	n			
1.0E-01	I	7.0E-04	C	1.0E-01	I	1.0E-01	I	1	1	0.1	1	Maleic Anhydride	108-31-6	6.1E+03	n	8.1E+04	n	7.3E-01	n	3.1E+00	n	1.9E+02	n		3.8E-01	n			
				5.0E-01								Maleic Hydrazide	123-33-1	3.1E+04	n	4.1E+05	nm					1.0E+04	n		2.1E+00	n			
				1.0E-04								Malononitrile	109-77-3	6.2E+00	n	8.2E+01	n					2.0E+00	n		4.1E-04	n			
3.0E-02	H	5.0E-03	I	1.4E-01	I	5.0E-05	I	1	1	0.1	1	Mancozeb	8018-01-7	1.8E+03	n	2.5E+04	n					5.9E+02	n		8.4E-01	n			
				5.0E-03		Maneb						12427-38-2	3.1E+02	n	4.1E+03	n					9.9E+01	n		1.4E-01	n				
				1.4E-01		Manganese (Diet)						7439-96-5																	
2.4E-02	S	5.0E-05	I	1.4E-01	I	5.0E-05	I	1	1	0.1	1	Manganese (Non-diet)	7439-96-5	1.8E+03	n	2.6E+04	n	5.2E-02	n	2.2E-01	n	4.3E+02	n		2.8E+01	n			
				9.0E-05		Mephosfolan						950-10-7	5.5E+00	n	7.4E+01	n					1.8E+00	n		2.6E-03	n				
				3.0E-02		Mepiquat Chloride						24307-26-4	1.8E+03	n	2.5E+04	n					6.0E+02	n		2.0E-01	n				
3.0E-04	I	3.0E-04	S	3.0E-04	I	3.0E-04	I	V	1	0.07	3.1E+00	Mercury Compounds																	
				3.0E-04								Mercury Chloride (and other Mercury salts)	7487-94-7	2.3E+01	n	3.5E+02	n	3.1E-01	n	1.3E+00	n	5.7E+00	n	2.0E+00					
				3.0E-04								Mercury (elemental)	7439-97-6	9.4E+00	ns	4.0E+01	ns	3.1E-01	n	1.3E+00	n	6.3E-01	n	2.0E+00					
1.0E-04	I	8.0E-05	I	3.0E-05	I	1.0E-05	I	1	1	0.1	1	Methyl Mercury	22967-92-6	7.8E+00	n	1.2E+02	n					2.0E+00	n		2.3E-02	n			
				8.0E-05								Phenylmercuric Acetate	62-38-4	4.9E+00	n	6.6E+01	n					1.6E+00	n		5.0E-04	n			
				3.0E-05								Merphos	150-50-5	1.8E+00	n	2.5E+01	n					6.0E-01	n		5.9E-02	n			
1.0E-04	I	3.0E-02	P	6.0E-02	I	1.0E-02	I	1	1	0.1	1	Merphos Oxide	78-48-8	1.8E+00	n	2.5E+01	n					8.5E-02	n		4.2E-04	n			

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																																				
Toxicity and Chemical-specific Information													Contaminant										Screening Levels										Protection of Ground Water SSLs			
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ¹	K _e (y)	RfD _o (mg/kg-day)	K _e (y)	RfC _o (mg/m ³)	K _e (y)	muta- gen	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)	Toxic?	Volatile?	In VLS?						
				7.0E-04	I					1		Perchlorates																								
				7.0E-04	I					1		~Ammonium Perchlorate	7790-98-9	5.5E+01	n	8.2E+02	n							1.4E+01	n		n									
												~Lithium Perchlorate	7791-03-9	5.5E+01	n	8.2E+02	n							1.4E+01	n		n									
				7.0E-04	I					1		~Perchlorate and Perchlorate Salts	14797-73-0	5.5E+01	n	8.2E+02	n							1.4E+01	n	1.5E+01(F)	n									
				7.0E-04	I					1		~Potassium Perchlorate	7778-74-7	5.5E+01	n	8.2E+02	n							1.4E+01	n		n									
				7.0E-04	I					1		~Sodium Perchlorate	7601-89-0	5.5E+01	n	8.2E+02	n							1.4E+01	n		n									
2.2E-03	C	6.3E-07	C	5.0E-02	I					1	0.1	Permethrin	52645-53-1	3.1E+03	n	4.1E+04	n							1.0E+03	n		2.4E+02	n								
				2.5E-01	I					1	0.1	Phenacetin	62-44-2	2.4E+02	c	1.0E+03	c	4.5E+00	c	1.9E+01	c			3.4E+01	c		9.7E-03	c								
										1	0.1	Phenmedipham	13684-63-4	1.5E+04	n	2.1E+05	nm							4.0E+03	n		2.1E+01	n								
				3.0E-01	I	2.0E-01	C			1	0.1	Phenol	108-95-2	1.8E+04	n	2.5E+05	nm	2.1E+02	n	8.8E+02	n			5.8E+03	n		3.3E+00	n								
				5.0E-04	X					1	0.1	Phenothiazine	92-84-2	3.1E+01	n	4.1E+02	n							4.3E+00	n		1.4E-02	n								
				6.0E-03	I					1	0.1	Phenylenediamine, m-	108-45-2	3.7E+02	n	4.9E+03	n							1.2E+02	n		3.2E-02	n								
4.7E-02	H									1	0.1	Phenylenediamine, o-	95-54-5	1.1E+01	c	4.9E+01	c							1.6E+00	c		4.4E-04	c								
1.9E-03	H			1.9E-01	H					1	0.1	Phenylenediamine, p-	106-50-3	1.2E+04	n	1.6E+05	nm							3.8E+03	n		1.0E+00	n								
										1	0.1	Phenylphenol, 2-	90-43-7	2.7E+02	c	1.2E+03	c							3.0E+01	c		4.0E-01	c								
				2.0E-04	H					1	0.1	Phorate	298-02-2	1.2E+01	n	1.6E+02	n							3.0E+00	n		3.4E-03	n								
						3.0E-04	I	V			1.6E+03	Phosgene	75-44-5	3.1E-01	n	1.3E+00	n	3.1E-01	n	1.3E+00	n															
				2.0E-02	I					1	0.1	Phosmet	732-11-6	1.2E+03	n	1.6E+04	n							3.7E+02	n		8.2E-02	n								
				4.9E+01	P					1		Phosphates, Inorganic																								
				4.9E+01	P					1		~Aluminum metaphosphate	13776-88-0	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
										1		~Ammonium polyphosphate	68333-79-9	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Calcium pyrophosphate	7790-76-3	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Diammonium phosphate	7783-28-0	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Dicalcium phosphate	7757-93-9	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Dimagnesium phosphate	7782-75-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Dipotassium phosphate	7758-11-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Disodium phosphate	7558-79-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monoaluminum phosphate	13530-50-2	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monoammonium phosphate	7722-76-1	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monocalcium phosphate	7758-23-8	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monomagnesium phosphate	7757-86-0	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monopotassium phosphate	7778-77-0	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Monosodium phosphate	1558-80-7	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Polyphosphoric acid	8017-16-1	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Potassium tripolyphosphate	13845-36-8	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium acid pyrophosphate	7758-16-9	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium aluminum phosphate (acidic)	7785-88-8	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium aluminum phosphate (anhydrous)	10279-59-1	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium aluminum phosphate (tetrahydrate)	10305-76-7	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium hexametaphosphate	10124-56-8	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium polyphosphate	68915-31-1	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium trimetaphosphate	7785-84-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Sodium tripolyphosphate	7758-29-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Tetrapotassium phosphate	7320-34-5	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Tetrasodium pyrophosphate	7722-88-5	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Tricalcium phosphate	7758-87-4	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Trimagnesium phosphate	7757-87-1	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Tripotassium phosphate	7778-53-2	3.8E+06	nm	5.7E+07	nm							9.7E+05	n		n									
				4.9E+01	P					1		~Trisodium phosphate	7601-54-9	3.8E+06	nm	5.7E+07	nm							9.7E+05												

Regional Screening Level (RSL) Summary Table May 2014

Toxicity and Chemical-specific Information													Contaminant		Screening Levels												Protection of Ground Water SSLs			
SFO (mg/kg-day) ¹	K _e (y)	IUR (ug/m ³) ²	K _e (y)	RfD _h (mg/kg-day)	K _e (y)	RfC _h (mg/m ³)	K _e (y)	V _o muta-	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (ug/mg)	key	Industrial Soil (ug/mg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)			
7.0E-02	I	2.0E-05	I								0.14	~Polychlorinated Biphenyls (lowest risk)	1336-36-3					1.4E-01	c	6.1E-01	c				9.4E-04	c*				
1.3E+01	E	3.8E-03	E	7.0E-06	E	4.0E-04	E				0.14	~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	3.7E-02	c*	1.6E-01	c*	7.4E-04	c	3.2E-03	c	6.0E-03	c*		9.4E-04	c*				
3.9E+01	E	1.1E-02	E	2.3E-06	E	1.3E-04	E				0.14	~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.2E-02	c*	5.3E-02	c*	2.5E-04	c	1.1E-03	c	2.0E-03	c*		3.1E-04	c*				
				6.0E-04	I						0.1	Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	8.5E+05	nm	3.6E+06	nm	6.3E-01	n	2.6E+00	n									
				6.0E-02	I			V			0.13	Polynuclear Aromatic Hydrocarbons (PAHs)																		
				3.0E-01	I			V			0.13	~Acenaphthene	83-32-9	3.5E+03	n	4.5E+04	n					5.3E+02	n		5.5E+00	n				
7.3E-01	E	1.1E-04	C						M		0.13	~Anthracene	120-12-7	1.7E+04	n	2.3E+05	nm					1.8E+03	n		5.8E+01	n				
1.2E+00	C	1.1E-04	C								0.13	~Benz[a]anthracene	56-55-3	1.5E-01	c	2.9E+00	c	9.2E-03	c	1.1E-01	c	3.4E-02	c		1.2E-02	c				
											0.13	~Benzo[a]fluoranthene	205-82-3	4.1E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	6.5E-02	c		7.8E-02	c				
7.3E+00	I	1.1E-03	C						M		0.13	~Benzo[a]pyrene	50-32-8	1.5E-02	c	2.9E-01	c	9.2E-04	c	1.1E-02	c	3.4E-03	c	2.0E-01	4.0E-03	c	2.4E-01			
7.3E-01	E	1.1E-04	C						M		0.13	~Benzo[b]fluoranthene	205-99-2	1.5E-01	c	2.9E+00	c	9.2E-03	c	1.1E-01	c	3.4E-02	c		4.1E-02	c				
7.3E-02	E	1.1E-04	C						M		0.13	~Benzo[k]fluoranthene	207-08-9	1.5E+00	c	2.9E+01	c	9.2E-03	c	1.1E-01	c	3.4E-01	c		4.0E-01	c				
7.3E-03	E	1.1E-05	C	8.0E-02	I			V			0.13	~Chloronaphthalene, Beta-	91-58-7	6.3E+03	n	9.3E+04	n					7.5E+02	n		3.8E+00	n				
7.3E-00	E	1.2E-03	C						M		0.13	~Chrysene	218-01-9	1.5E+01	c	2.9E+02	c	9.2E-02	c	1.1E+00	c	3.4E+00	c		1.2E+00	c				
1.2E+01	C	1.1E-03	C								0.13	~Dibenz[a,h]anthracene	53-70-3	1.5E-02	c	2.9E-01	c	8.4E-04	c	1.0E-02	c	3.4E-03	c		1.3E-02	c				
2.5E+02	C	7.1E-02	C						M		0.13	~Dibenz[a,c]pyrene	192-65-4	4.1E-02	c	1.8E-01	c	2.6E-03	c	1.1E-02	c	6.5E-03	c		8.4E-02	c				
				4.0E-02	I						0.13	~Dimethylbenz[a]anthracene, 7,12-	57-97-6	4.5E-04	c	8.5E-03	c	1.4E-05	c	1.7E-04	c	1.0E-04	c		9.9E-05	c				
											0.13	~Fluoranthene	206-44-0	2.3E+03	n	3.0E+04	n					8.0E+02	n		8.9E+01	n				
7.3E-01	E	1.1E-04	C					V			0.13	~Fluorene	86-73-7	2.3E+03	n	3.0E+04	n					2.9E+02	n		5.4E+00	n				
2.9E-02	P			7.0E-02	A			V			0.13	~Indeno[1,2,3-cd]pyrene	193-39-5	1.5E-01	c	2.9E+00	c	9.2E-03	c	1.1E-01	c	3.4E-02	c		2.4E-01	c				
											0.13	~Methylnaphthalene, 1-	90-12-0	1.7E+01	c	7.3E+01	c					1.1E+00	c		5.8E-03	c				
				4.0E-03	I			V			0.13	~Methylnaphthalene, 2-	91-57-6	2.3E+02	n	3.0E+03	n					3.6E+01	n		1.9E-01	n				
		3.4E-05	C	2.0E-02	I	3.0E-03	I	V			0.13	~Naphthalene	91-20-3	3.8E+00	c*	1.7E+01	c*	8.3E-02	c*	3.6E-01	c*	1.7E-01	c*		5.4E-04	c*				
1.2E+00	C	1.1E-04	C								0.13	~Nitrofluorene, 4-	57835-92-4	4.1E-01	c	1.8E+00	c	2.6E-02	c	1.1E-01	c	1.9E-02	c		3.2E-03	c				
1.5E-01	I			3.0E-02	I			V			0.13	~Pyrene	129-00-0	1.7E+03	n	2.3E+04	n					1.2E+02	n		1.3E+01	n				
				9.0E-03	I						0.1	~Prochloraz	67747-09-5	3.6E+00	c	1.5E+01	c					3.7E-01	c		1.9E-03	c				
				6.0E-03	H						0.1	~Profluralin	26399-36-0	3.7E+02	n	4.9E+03	n					2.6E+01	n		1.6E+00	n				
				1.5E-02	I						0.1	~Prometon	1610-18-0	9.2E+02	n	1.2E+04	n					2.5E+02	n		1.2E-01	n				
				4.0E-03	I						0.1	~Prometryn	7287-19-6	2.5E+02	n	3.3E+03	n					6.0E+01	n		9.0E-02	n				
				1.3E-02	I						0.1	~Propachlor	1918-16-7	8.0E+02	n	1.1E+04	n					2.5E+02	n		1.5E-01	n				
				5.0E-03	I						0.1	~Propanil	709-98-8	3.1E+02	n	4.1E+03	n					8.2E+01	n		4.5E-02	n				
				2.0E-02	I						0.1	~Propargite	2312-35-8	1.2E+03	n	1.6E+04	n					1.6E+02	n		1.2E+01	n				
				2.0E-03	I						0.1	~Propargyl Alcohol	107-19-7	1.2E+02	n	1.6E+03	n					4.0E+01	n		8.1E-03	n				
				2.0E-02	I						0.1	~Propazine	139-40-2	1.2E+03	n	1.6E+04	n					3.4E+02	n		3.0E-01	n				
				2.0E-02	I						0.1	~Propion	122-42-9	1.2E+03	n	1.6E+04	n					3.5E+02	n		2.2E-01	n				
				1.3E-02	I						0.1	~Propiconazole	60207-90-1	8.0E+02	n	1.1E+04	n					2.1E+02	n		6.9E-01	n				
				8.0E-03	I	V					3.3E+04	~Propionaldehyde	123-38-6	7.5E+01	n	3.1E+02	n	8.3E+00	n	3.5E+01	n	1.7E+01	n		3.4E-03	n				
				1.0E+01	X	1.0E+00	X	V			0.1	~Propyl benzene	103-65-1	3.3E+03	ns	2.2E+04	ns	1.0E+03	n	4.4E+03	n	6.6E+02	n		1.2E+00	n				
				3.0E+00	C	V					3.5E+02	~Propylene	115-07-1	2.2E+03	ns	9.3E+03	ns	3.1E+03	n	1.3E+04	n	6.3E+03	n		6.0E+00	n				
				2.0E+01	P						0.1	~Propylene Glycol	57-55-6	1.2E+06	nm	1.6E+07	nm					4.0E+05	n		8.1E+01	n				
				7.0E-01	H	2.7E-04	A				0.1	~Propylene Glycol Dinitrate	6423-43-4	3.9E+05	nm	1.6E+06	nm	2.8E-01	n	1.2E+00	n				2.9E+00	n				
				2.0E-01	H						0.1	~Propylene Glycol Monoethyl Ether	1569-02-4	4.3E+04	n	5.8E+05	nm					1.4E+04	n		2.8E+00	n				
2.4E-01	I	3.7E-06	I								0.1	~Propylene Glycol Monomethyl Ether	107-98-2	4.3E+04	n	5.8E+05	nm	2.1E+03	n	8.8E+03	n	1.4E+04	n		2.8E+00	n				
				2.5E-01	I	3.0E-02	I	V			0.1	~Propylene Oxide	75-56-9	2.1E+00	c	9.7E+00	c	7.6E-01	c*	3.3E+00	c*	2.7E-01	c		5.6E-05	c				
				2.5E-01	I						0.1	~Pursuit	81335-77-5	1.5E+04	n	2.1E+05	nm					4.7E+03	n		4.1E+00	n				
				2.5E-02	I						0.1	~Pyridin	51630-58-1	1.5E+03	n	2.1E+04	n					5.0E+02	n		3.4E-02	n				
				1.0E-03	I			V			5.3E+05	~Pyridine	110-86-1	7.8E+01	n	1.2E+03	n					2.0E+01	n		6.8E-03	n				
				5.0E-04	I						0.1	~Quinalphos	13593-03-8	3.1E+01	n	4.1E+02	n					5.1E+00	n		4.3E-02	n				
3.0E+00	I										0.1	~Quinolone	91-22-5	1.8E-01	c	7.7E-01	c					2.4E-02	c		7.8E-05	c				
				3.0E-02	I						0.1	~Refractory Ceramic Fibers	NA	4.3E+07	nm	1.8E+08	nm	3.1E+01	n	1.3E+02	n				4.2E+01	n				
											0.1	~Resmethrin	10453-83-																	

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRVT; A = ATSDR; C = Cal EPA; X = APPENDIX PPRVT SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																													
Toxicity and Chemical-specific Information													Screening Levels										Protection of Ground Water SSLs						
SFO (mg/kg-day) ¹	K _e y	IUR (ug/m ³) ²	K _e y	RfD _c (mg/kg-day)	K _e y	RfC _c (mg/m ³)	K _e y	muta- gen	GI/ABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)		
2.0E+01	H			3.0E-02	I					1	0.1	Tetrachlorophenol, 2,3,4,6-	58-90-2	1.8E+03	n	2.5E+04	n					2.4E+02	n	1.5E+00	n				
				5.0E-04	I					1	0.1	Tetrachlorotoluene, p- alpha, alpha, alpha- Tetraethyl Dithiopyrophosphate	5216-25-1 3689-24-5	2.7E-02 3.1E+01	c n	1.2E-01 4.1E+02	c n					1.3E-03 7.1E+00	c n	4.4E-06 5.2E-03	c n				
				2.0E-03	P	8.0E+01	I	V		1	1.1E+03	Tetrafluoroethane, 1,1,1,2- Tetryl (Trinitrophenylmethyl)nitramine	811-97-2 479-45-8	1.0E+05 1.2E+02	nms n	4.3E+05 1.6E+03	nms n	8.3E+04 n	3.5E+05 n	1.7E+05 3.9E+01	n n	1.7E+05 3.7E-01	n n						
				7.0E-06	X					1	0.1	Thallium (I) Nitrate	10102-45-1	5.5E-01	n	8.2E+00	n					1.4E-01	n						
				1.0E-05	X					1		Thallium (Soluble Salts)	7440-28-0	7.8E-01	n	1.2E+01	n					2.0E-01	n	2.0E+00	n	1.4E-02	n	1.4E-01	
				6.0E-06	X					1		Thallium Acetate	563-68-8	4.7E-01	n	7.0E+00	n					1.2E-01	n						
				2.0E-05	X					1		Thallium Carbonate	6533-73-9	1.6E+00	n	2.3E+01	n					4.0E-01	n						
				6.0E-06	X					1		Thallium Chloride	7791-12-0	4.7E-01	n	7.0E+00	n					1.2E-01	n						
				2.0E-05	X					1		Thallium Sulfate	7446-18-6	1.6E+00	n	2.3E+01	n					4.0E-01	n						
				1.0E-02	I					1	0.1	Thiobencarb	28249-77-6	6.2E+02	n	8.2E+03	n					1.6E+02	n						
1.8E-01	X	P		7.0E-02	X					1	0.008	Thiodiglycol	111-48-8	5.4E+03	n	7.9E+04	n					1.4E+03	n	2.8E-01	n				
				3.0E-04	H					1	0.1	Thiofanox	39196-18-4	1.8E+01	n	2.5E+02	n					5.3E+00	n	1.8E-03	n				
				8.0E-02	I					1	0.1	Thiophanate, Methyl	23564-05-8	4.9E+03	n	6.6E+04	n					1.6E+03	n	1.4E+00	n				
				5.0E-03	I					1	0.1	Thiram	137-26-8	3.1E+02	n	4.1E+03	n					9.8E+01	n	1.4E-01	n				
				6.0E-01	H					1		Tin	7440-31-5	4.7E+04	n	7.0E+05	nm					1.2E+04	n	3.0E+03	n				
						1.0E-04	A			1		Titanium Tetrachloride	7550-45-0	1.4E+05	nm	6.0E+05	nm	1.0E-01	n	4.4E-01	n								
				8.0E-02	I	5.0E+00	I	V		1	8.2E+02	Toluene	108-88-3	4.9E+03	ns	4.7E+04	ns	5.2E+03	n	2.2E+04	n	1.1E+03	n	1.0E+03	n	7.6E-01	n	6.9E-01	
				2.0E-04	X					1	0.1	Toluene-2,5-diamine	95-70-5	3.0E+00	c**	1.3E+01	c*					4.3E-01	c**	1.3E-04	c**				
				3.0E-02	P	4.0E-03	X			1	0.1	Toluidine, p-	106-49-0	1.8E+01	c*	7.7E+01	c*					2.5E+00	c*	1.1E-03	c*				
				1.1E+00	I	3.2E-04	I	3.0E+00	P					1	3.4E-01	Total Petroleum Hydrocarbons (Aliphatic High)	NA	2.3E+05	nms	3.5E+06	nms					6.0E+04	n	2.4E+03	n
1.4E+02	P	6.0E-01	P					V		1	6.9E+00	Total Petroleum Hydrocarbons (Aliphatic Low)	NA	5.2E+02	ns	2.2E+03	ns	6.3E+02	n	2.6E+03	n	1.3E+03	n	8.8E+00	n				
1.0E-02	P	1.0E-01	P					V		1		Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	9.6E+01	ns	4.4E+02	ns	1.0E+02	n	4.4E+02	n	1.0E+02	n	1.5E+00	n				
4.0E-02	P									1	0.1	Total Petroleum Hydrocarbons (Aromatic High)	NA	2.5E+03	n	3.3E+04	n					8.0E+02	n	8.9E+01	n				
4.0E-03	P	3.0E-02	P					V		1	1.8E+03	Total Petroleum Hydrocarbons (Aromatic Low)	NA	8.2E+01	n	4.2E+02	n	3.1E+01	n	1.3E+02	n	3.3E+01	n	1.7E-02	n				
4.0E-03	P	3.0E-03	P					V		1		Total Petroleum Hydrocarbons (Aromatic Medium)	NA	1.1E+02	n	6.0E+02	n	3.1E+00	n	1.3E+01	n	5.5E+00	n	2.3E-02	n				
7.5E-03	I									1	0.1	Toxaphene	8001-35-2	4.8E-01	c	2.1E+00	c	8.8E-03	c	3.8E-02	c	1.5E-02	c	3.0E+00	n	2.4E-03	c	4.6E-01	
3.0E-04	A									1	0.1	Tralometrin	66841-25-6	4.6E+02	n	6.2E+03	n					1.5E+02	n	5.8E+01	n				
8.0E+01	X									1	0.1	Tri-n-butyltin	688-73-3	1.8E+01	n	2.5E+02	n					3.7E+00	n	8.2E-02	n				
1.3E-02	I									1	0.1	Triacetin	102-76-1	4.9E+06	nm	6.6E+07	nm					1.8E+06	n	4.5E+02	n				
9.0E-03	P			1.0E-02	I					1	0.1	Triallate	2303-17-5	2.0E+02	n	1.1E+04	n					1.2E+02	n	2.6E-01	n				
				1.0E-02	I					1	0.1	Triasulfuron	82097-50-6	6.2E+02	n	8.2E+03	n					2.0E+02	n	2.1E-01	n				
				5.0E-03	I					1	0.1	Tribromobenzene, 1,2,4-	615-54-3	3.1E+02	n	4.1E+03	n					4.5E+01	n	6.4E-02	n				
				1.0E-02	P					1	0.1	Tributyl Phosphate	126-73-8	5.9E+01	c*	2.6E+02	c*					5.1E+00	c*	2.5E-02	c*				
				3.0E-04	P					1	0.1	Tributyltin Compounds	NA	1.8E+01	n	2.5E+02	n					6.0E+00	n						
				3.0E-04	I					1	0.1	Tributyltin Oxide	56-35-9	1.8E+01	n	2.5E+02	n					5.7E+00	n	2.9E+02	n				
				3.0E+01	I	3.0E+01	H	V		1	9.1E+02	Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	4.0E+04	ns	1.7E+05	nms	3.1E+04	n	1.3E+05	n	5.5E+04	n	1.4E+02	n				
				2.0E-02	I					1	0.1	Trichloroacetic Acid	76-03-9	7.6E+00	c	3.3E+01	c					1.1E+00	c	6.0E+01	c	1.2E-02			
				2.9E-02	H					1	0.1	Trichloroaniline HCl, 2,4,6-	33663-50-2	1.8E+01	c	8.0E+01	c					2.7E+00	c	7.4E-03	c				
				7.0E-03	X					1	0.1	Trichloroaniline, 2,4,6-	634-93-5	1.8E+00	n	2.5E+01	n					4.0E-01	n	3.6E-03	n				
2.9E-02	P			8.0E-04	X					1	0.1	Trichlorobenzene, 1,2,3-	87-61-6	4.9E+01	n	6.6E+02	n					7.0E+00	n	2.1E-02	n				
				1.0E-02	I	2.0E-03	P	V		1	4.0E+02	Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01	c**	1.1E+02	c**	2.1E+00	n	8.8E+00	n	1.1E+00	c**	7.0E+01	n	3.3E-03	c**	2.0E-01	
				2.0E+00	I	5.0E+00	I	V		1	6.4E+02	Trichloroethane, 1,1,1-	71-55-6	8.1E+03	ns	3.6E+04	ns	5.2E+03	n	2.2E+04	n	8.0E+03	n	2.0E+02	n	2.8E+00	n	7.0E-02	
				5.7E-02	I	1.6E-05	I			1	2.2E+03	Trichloroethane, 1,1,2-	79-00-5	1.1E+00	c**	5.0E+00	c**	1.8E-01	c**	7.7E-01	c**	2.8E-01	c**	5.0E+00	n	8.9E-05	c**	1.6E-03	
				4.6E-02	I	4.1E-06	I			1	6.9E+02	Trichloroethylene	79-01-6	9.4E-01	c**	6.0E+00	c**	4.8E-01	c**	3.0E+00	c**	4.9E-01	c**	5.0E+00	n	1.8E-04	c**	1.8E-03	
				3.0E-01	I	7.0E-01	H	V		1	1.2E+03	Trichlorofluoromethane	75-69-4	7.3E+02	n	3.1E+03	ns	7.3E+02	n	3.1E+03	n	1.1E+03	n	7.3E-01	n				
				1.0E-01	I					1	0.1	Trichlorophenol, 2,4,5-	95-95-4	6.2E+03	n	8.2E+04	n					1.2E+03	n	4.4E+00	n				
				1.1E-02	I	3.1E-06	I			1	0.1	Trichlorophenol, 2,4,6-	88-06-2	4.8E+01	c**	2.1E+02	c**	9.1E-01	c	4.0E+00	c	4.0E+00	c**	1.5E-02	c**				
				1.0E-02	I					1	0.1	Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	6.2E+02	n	8.2E+03	n					1.6E+02	n	6.7E-02	n				
				8.0E-03	I					1	0.1	Trichlorophenylpropanoic acid, 2,4,5-	93-72-1	4.9E+02	n	6.6E+03	n					1.1E+02	n	6.1E-02	n	2.8E-02			
3.0E+01	I			5.0E-03	I					1	1.3E+03	Trichloropropane, 1,1,2-	598-77-6	3.9E+02	n	5.8E+03	ns					8.8E+01	n	3.5E-02	n				
				4.0E-03	I	3.0E-04	I	V	M	1	1.4E+03	Trichloropropane, 1,1,2-	96-18-4	5.1E-03	c	1.1E-01	c	3.1E-01	n	1.3E+00	n	7.5E-04	c	3.2E-07	c				
				3.0E-03	X	3.0E-04	P	V		1	4.5E+02	Trichloropropane, 1,2,3-	736-19-5	7.3E-01	n	3.1E+00	n	3.1E-01	n	1.3E+00	n	6.2E-01	n	3.1E+00	n				
				2.0E-02	A					1	0.1	Tricresyl Phosphate (TCP)	1330-78-5	5.8E+03	n	5.6E+04	n					1.8E+02	n	1.5E+01	n				
				3.0E-03	I					1	0.1	Triphenyl Phosphate (TFP)	58138-08-2	1.8E+02	n	2.5E+03	n					1.8E+01	n	1.3E-01	n				
						7.0E-03	I	V		1	2.8E+04	Triethylamine	121-44-8	1.2E+02	n	4.8E+02	n	7.3E+00	n	3.1E+01	n	1.5E+01	n	4.4E-03	n				
				7.7E-03	I	7.5E-03	I			1	0.1	Trifluralin	1582-09-8	6.9E+01	c**	3.0E+02	c*					2.5E+00	c*	8.2E-02	c*				
				2.0E-02	P	1.0E-02	P			1	0.1	Trimethyl Phosphate	512-56-1	2.7E+01	c*	1.2E+02	c*					3.9E+00	c*	8.6E-04	c*				
						5.0E-03	P	V		1	2.9E+02	Trimethylbenzene, 1,2,3-	526-73-8	4.9E+01	n	2.1E+02	n	5.2E+00	n	2.2E+01	n	1.0E+01	n	1.5E-02	n				
						7.0E-03	P	V		1	2.2E+02	Trimethylbenzene, 1,2,4-	95-63-6	5.8E+01	n	2.4E+02	ns	7.3E+00	n	3.1E+01	</								

Regional Screening Level (RSL) Summary Table May 2014

Key: I = IRIS; P = PPRTV; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; J = New Jersey; O = EPA Office of Water; F = See FAQ; E = Environmental Criteria and Assessment Office; S = see user guide Section 5; L = see user guide on lead; M = mutagen; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); SSL values are based on DAF=1																											
Toxicity and Chemical-specific Information													Contaminant		Screening Levels										Protection of Ground Water SSLs		
SFO (mg/kg-day) ¹	key	IUR (ug/m ³) ²	key	RfD _o (mg/kg-day)	key	RfC _i (mg/m ³)	key	vo muta- gen	GIABS	ABS	C _{sat} (mg/kg)	Analyte	CAS No.	Resident Soil (mg/kg)	key	Industrial Soil (mg/kg)	key	Resident Air (ug/m ³)	key	Industrial Air (ug/m ³)	key	Tapwater (ug/L)	key	MCL (ug/L)	Risk-based SSL (mg/kg)	key	MCL-based SSL (mg/kg)

NOTE - The parameters summary table was last updated from the EPA May 2014 RSL Table.
Note that not all parameters in this table are used in the VISL

Toxic? Volatile? In VISL?

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Acephate	30560-19-1	183.16	EPI	2.048E-11	5.01E-13	EPI	1.35	CRC89	0.037354	WATER9	7.9758E-06	WATER9	10	EPI	818000	EPI	0.00004	EPI
Acetaldehyde	75-07-0	44.05	EPI	0.0027269	0.0000667	EPI	0.7834	CRC89	0.12771	WATER9	0.0000135	WATER9	1	EPI	1000000	EPI	0.000527	EPI
Acetochlor	34256-82-1	269.77	EPI	9.1169E-07	2.23E-08	EPI			0.045508	WATER9	5.3173E-06	WATER9	298.4	EPI	223	EPI	0.00495	EPI
Acetone	67-64-1	58.08	EPI	0.0014309	0.000035	EPI	0.7845	CRC89	0.105923	WATER9	0.0000115	WATER9	2.364	EPI	1000000	EPI	0.000512	EPI
Acetone Cyanohydrin	75-86-5	85.11	EPI	0.0005315	0.000013	EPI	0.932	CRC89	0.085946	WATER9	0.0000101	WATER9	1	EPI	1000000	EPI	0.000495	EPI
Acetonitrile	75-05-8	41.05	EPI	0.0014105	0.0000345	EPI	0.7857	CRC89	0.134	WATER9	0.0000141	WATER9	4.67	EPI	1000000	EPI	0.000548	EPI
Acetophenone	98-86-2	120.15	EPI	0.0004252	0.0000104	EPI	1.0281	CRC89	0.065222	WATER9	8.7229E-06	WATER9	51.85	EPI	6130	EPI	0.00372	EPI
Acetylaminofluorene, 2-	53-96-3	223.28	EPI	7.8496E-09	1.92E-10	EPI			0.051624	WATER9	6.0319E-06	WATER9	2206	EPI	8.4607	EPI	0.0124959	RAGSE
Acrolein	107-02-8	56.06	EPI	0.0049877	0.000122	EPI	0.84	CRC89	0.111693	WATER9	0.0000122	WATER9	1	EPI	212000	EPI	0.000748	EPI
Acrylamide	79-06-1	71.08	EPI	6.9501E-08	1.7E-09	EPI	1.222	LANGE	0.110399	WATER9	0.0000133	WATER9	5.694	EPI	390000	EPI	0.000224	EPI
Acrylic Acid	79-10-7	72.06	EPI	0.0000151	0.00000037	EPI	1.0511	CRC89	0.102722	WATER9	0.000012	WATER9	1.44	EPI	1000000	EPI	0.00105	EPI
Acrylonitrile	107-13-1	53.06	EPI	0.0056419	0.000138	EPI	0.8007	CRC89	0.11369	WATER9	0.0000123	WATER9	8.511	EPI	74500	EPI	0.00116	EPI
Adiponitrile	111-69-3	108.14	EPI	4.9469E-08	1.21E-09	EPI	0.9676	CRC89	0.070778	WATER9	8.9598E-06	WATER9	20.18	EPI	80000	EPI	0.000237	EPI
Alachlor	15972-60-8	269.77	EPI	3.4015E-07	8.32E-09	EPI	1.133	CRC89	0.022641	WATER9	5.6913E-06	WATER9	312.3	EPI	240	EPI	0.0105	EPI
Aldicarb	116-06-3	190.26	EPI	5.8872E-08	1.44E-09	EPI	1.195	CRC89	0.031868	WATER9	7.2458E-06	WATER9	24.64	EPI	6030	EPI	0.000755	EPI
Aldicarb Sulfone	1646-88-4	222.26	EPI	1.3778E-07	3.37E-09	EPI	0.051782	WATER9	0.051782	WATER9	6.0503E-06	WATER9	10	EPI	10000	EPI	0.0000371	EPI
Aldicarb sulfoxide	1646-87-3	206.26	EPI	3.9616E-08	9.69E-10	EPI	0.054427	WATER9	0.054427	WATER9	6.3593E-06	WATER9	10	EPI	28000	EPI	0.0000329	EPI
Aldrin	309-00-2	364.92	EPI	0.0017989	0.000044	EPI			0.037207	WATER9	4.3473E-06	WATER9	82020	EPI	0.017	EPI	0.293	EPI
Allyl	74223-64-6	381.37	EPI	5.397E-15	1.32E-16	EPI	0.036129	WATER9	0.036129	WATER9	4.2214E-06	WATER9	92.5	EPI	9500	EPI	0.000329	EPI
Allyl Alcohol	107-18-6	58.08	EPI	0.000204	0.00000499	EPI	0.854	CRC89	0.109755	WATER9	0.0000121	WATER9	1.904	EPI	1000000	EPI	0.000959	EPI
Allyl Chloride	107-05-1	76.53	EPI	0.4497138	0.011	EPI	0.9376	CRC89	0.093607	WATER9	0.0000108	WATER9	39.6	EPI	3370	EPI	0.0112	EPI
Aluminum	7429-90-5	26.982	CRC89				2.7	CRC89									0.001	RAGSE
Aluminum Phosphide	20859-73-8	57.96	EPI				2.4	CRC89									0.001	RAGSE
Amdro	67485-29-4	494.49	EPI	0.0000899	0.0000022	EPI			0.030384	WATER9	3.5502E-06	WATER9	179700000	EPI	0.006	EPI	0.0000902	EPI
Ametryn	834-12-8	227.33	EPI	9.9346E-08	2.43E-09	EPI	0.051009	WATER9	0.051009	WATER9	0.00000596	WATER9	428.2	EPI	209	EPI	0.00794	EPI
Aminobiphenyl, 4-	92-67-1	169.23	EPI	7.0728E-06	0.00000173	EPI	0.062102	WATER9	0.062102	WATER9	7.2561E-06	WATER9	2471	EPI	128.81	EPI	0.014	EPI
Aminophenol, m-	591-27-5	109.13	EPI	1.0957E-08	2.68E-10	EPI	0.0832	WATER9	0.0832	WATER9	9.7213E-06	WATER9	90.2	EPI	27000	EPI	0.000527	EPI
Aminophenol, p-	123-30-8	109.13	EPI	1.4677E-08	3.59E-10	EPI	0.0832	WATER9	0.0832	WATER9	9.7213E-06	WATER9	90.2	EPI	16000	EPI	0.000407	EPI
Amtriaz	33089-61-1	293.42	EPI	0.0004035	0.00000987	EPI	1.128	CRC89	0.021614	WATER9	5.3971E-06	WATER9	257300	EPI	1	EPI	0.16	EPI
Ammonia	7664-41-7	17.03	EPI	0.0006582	0.0000161	PHYSPROP	0.696	CRC89							899000	PERRY	0.001	RAGSE
Ammonium Sulfamate	7773-06-0	114.12	CRC89												147000	EPI	0.001	RAGSE
Amyl Alcohol, tert-	75-85-4	88.15	EPI	0.000564	0.0000138	EPI	0.8096	CRC89	0.078545	WATER9	9.1012E-06	WATER9	4.138	EPI	110000	EPI	0.00196	EPI
Aniline	62-53-3	93.13	EPI	0.0000826	0.00000202	EPI	1.0217	CRC89	0.083011	WATER9	0.0000101	WATER9	70.23	EPI	36000	EPI	0.00186	EPI
Anthraquinone, 9,10-	84-65-1	208.22	EPI	9.61E-07	2.35E-08	EPI	6.68	CRC89	0.054084	WATER9	6.3193E-06	WATER9	5012	EPI	1.35	EPI	0.019	EPI
Antimony (metallic)	7440-36-0	121.76	CRC89														0.001	RAGSE
Antimony Pentoxide	1314-60-9	323.52	CRC89				3.78	CRC89							3000	CRC89	0.001	RAGSE
Antimony Potassium Tartrate	11071-15-1	614.84	EPI												52600	EPI	0.001	RAGSE
Antimony Tetroxide	1332-81-6	307.52	EPI				6.64	CRC89									0.001	RAGSE
Antimony Trioxide	1309-64-4	291.52	EPI				5.58	CRC89									0.001	RAGSE
Apollo	74115-24-5	303.15	EPI	1.5944E-08	3.9E-10	EPI	0.042103	WATER9	0.042103	WATER9	4.9194E-06	WATER9	30210	EPI	1	EPI	0.00358	EPI
Aramite	140-57-8	334.86	EPI	7.7678E-06	0.00000019	EPI	0.02029	WATER9	0.02029	WATER9	5.0255E-06	WATER9	5550	EPI	2.5922	EPI	0.0328	EPI
Arsenic, Inorganic	7440-38-2	74.922	CRC89				5.75	CRC89									0.001	RAGSE
Arsine	7784-42-1	77.95	EPI				3.186	CRC89							200000	PERRY	0.001	RAGSE
Assure	76578-14-8	372.81	EPI	4.3336E-07	1.06E-08	EPI	0.03668	WATER9	0.03668	WATER9	4.2858E-06	WATER9	7736	EPI	0.3	EPI	0.00886	EPI
Asulam	3337-71-1	230.24	EPI	6.991E-11	1.71E-12	EPI	0.050579	WATER9	0.050579	WATER9	5.9097E-06	WATER9	27.8	EPI	5000	EPI	0.0000529	EPI
Atrazine	1912-24-9	215.69	EPI	9.6484E-08	2.36E-09	EPI	0.052828	WATER9	0.052828	WATER9	6.1726E-06	WATER9	224.5	EPI	34.7	EPI	0.00524	EPI
Auramine	492-80-8	267.38	EPI	1.4881E-07	3.64E-09	EPI	0.045779	WATER9	0.045779	WATER9	5.3489E-06	WATER9	4456	EPI	10000	EPI	0.0111424	RAGSE
Avermectin B1	65195-55-3	875.12	EPI	5.397E-26	1.32E-27	EPI	0.020767	WATER9	0.020767	WATER9	2.4265E-06	WATER9	876700	EPI	1.4194	EPI	0.0000181	EPI
Azobenzene	103-33-3	182.23	EPI	0.0005519	0.0000135	EPI	1.203	PERRY	0.035909	WATER9	7.4655E-06	WATER9	3759	EPI	6.4	EPI	0.0514	EPI
Azodicarbonamide	123-77-3	116.08	EPI	3.352E-11	8.2E-13	EPI	1.65	GuideChem	0.079845	WATER9	9.3293E-06	WATER9	69.58	EPI	35	EPI	0.0000259	EPI
Barium	7440-39-3	137.33	EPI				3.62	CRC89									0.001	RAGSE
Baygon	114-26-1	209.25	EPI	5.8463E-08	1.43E-09	EPI	1.12	CRC89	0.025745	WATER9	6.5827E-06	WATER9	59.95	EPI	1860	EPI	0.00107	EPI
Bayleton	43121-43-3	293.76	EPI	3.3156E-09	8.11E-11	EPI	1.22	CRC89	0.022429	WATER9	5.6532E-06	WATER9	298.5	EPI	71.5	EPI	0.00244	EPI
Baythroid	68359-37-5	434.3	EPI	1.1856E-06	0.000000029	EPI	0.03313	WATER9	0.03313	WATER9	3.871E-06	WATER9	130600	EPI	0.003	EPI	0.0515	EPI
Benefin	1861-40-1	335.29	EPI	0.011897	0.000291	EPI	0.039368	WATER9	0.039368	WATER9	4.5998E-06	WATER9	16390	EPI	0.1	EPI	0.0675	EPI
Benomyl	17804-35-2	290.32	EPI	2.016E-10	4.93E-12	EPI	0.043335	WATER9	0.043335	WATER9	5.0633E-06	WATER9	336.9	EPI	3.8	EPI	0.000943	EPI
Bentazon	25057-89-0	240.28	EPI	8.9125E-08	2.18E-09	EPI	0.04916	WATER9	0.04916	WATER9	5.7439E-06	WATER9	10	EPI	500	EPI	0.00252	EPI
Benzaldehyde	100-52-7	106.13	EPI	0.0010916	0.0000267	EPI	1.0401	CRC89	0.074393	WATER9	9.4627E-06	WATER9	11.09	EPI	6950	EPI	0.00383	EPI
Benzene	71-43-2	78.11	EPI	0.2269011	0.00555	EPI	0.8765	CRC89	0.089538	WATER9	0.0000103	WATER9	145.8	EPI	1790	EPI	0.0149	EPI
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	220.24	EPI	8.86E-22	2.17E-23	EPI	0.052098	WATER9	0.052098	WATER9	6.0873E-06	WATER9	38.38	EPI	1000000	EPI	3.04E-07	EPI
Benzenethiol	108-98-5	110.17	EPI	0.0136958	0.0000335	EPI	1.0775	CRC89	0.072863	WATER9	9.4511E-06	WATER9	233.9	EPI	835	EPI	0.0178	EPI
Benzidine	92-87-5	184.24	EPI	2.8823E-09	7.05E-11	EPI	1.219	Yaws 2008	0.058681	WATER9	6.8564E-06	WATER9	1190	EPI	322	EPI	0.00113	EPI
Benzoic Acid	65-85-0	122.12	EPI	1.5576E-06	3.81E-08	EPI	1.2659	CRC89	0.070194	WATER9	9.7868E-06	WATER9	16.55	EPI	3400	EPI	0.00565	EPI
Benzotrithloride	98-07-7	195.48	EPI	0.0106296	0.00026	EPI	1.3723	CRC89	0.031256	WATER9	7.746E-06	WATER9	1001	EPI	53	EPI	0.0487	EPI
Benzyl Alcohol	100-51-6	108.14	EPI	0.0000138	0.000000337	EPI	1.0419	CRC89	0.073119	WATER9	9.3665E-06	WATER9	21.46	EPI	42900	EPI	0.00209	EPI
Benzyl Chloride	100-44-7	126.59	EPI	0.0168438	0.00													

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Bis(2-chloro-1-methylethyl) ether	108-60-1	171.07	EPI	0.0030335	0.0000742	EPI	1.103	CRC89	0.039889	WATER9	7.3606E-06	WATER9	82.92	EPI	1700	EPI	0.00764	EPI
Bis(2-chloroethoxy)methane	111-91-1	173.04	EPI	0.0001574	0.0000385	EPI			0.061187	WATER9	7.1492E-06	WATER9	14.38	EPI	7800	EPI	0.00122	EPI
Bis(2-chloroethyl)ether	111-44-4	143.01	EPI	0.000695	0.000017	EPI	1.22	CRC89	0.056719	WATER9	8.707E-06	WATER9	32.21	EPI	17200	EPI	0.00178	EPI
Bis(chloromethyl)ether	542-88-1	114.96	EPI	0.1782502	0.00436	EPI	1.323	CRC89	0.0763	WATER9	0.0000104	WATER9	9.699	EPI	22000	EPI	0.000855	EPI
Bisphenol A	80-05-7	228.29	EPI	3.745E-10	9.16E-12	EPI			0.050866	WATER9	5.9433E-06	WATER9	37670	EPI	120	EPI	0.0132	EPI
Boron And Borates Only	7440-42-8	13.84	EPI				2.34	CRC89									0.001	RAGSE
Boron Trichloride	10294-34-5	117.17	CRC89				4.789	CRC89									0.001	RAGSE
Boron Trifluoride	7637-07-2	67.81	EPI				2.772	CRC89							3320000	EPI	0.001	RAGSE
Bromate	15541-45-4	79.9	EPI														0.001	RAGSE
Bromo-2-chloroethane, 1-	107-04-0	143.41	EPI	0.0371627	0.000909	EPI	1.7392	CRC89	0.065925	WATER9	0.0000108	WATER9	39.6	EPI	6900	PERRY	0.00464	EPI
Bromobenzene	108-86-1	157.01	EPI	0.1009812	0.00247	EPI	1.495	CRC89	0.053713	WATER9	9.3004E-06	WATER9	233.9	EPI	446	EPI	0.02	EPI
Bromochloromethane	74-97-5	129.38	EPI	0.0596893	0.00146	EPI	1.9344	CRC89	0.078692	WATER9	0.0000122	WATER9	21.73	EPI	16700	EPI	0.00255	EPI
Bromodichloromethane	75-27-4	163.83	EPI	0.0866721	0.00212	EPI	1.98	CRC89	0.056263	WATER9	0.0000107	WATER9	31.82	EPI	3030	EPI	0.00402	EPI
Bromoform	75-25-2	252.73	EPI	0.0218724	0.000535	EPI	2.8788	CRC89	0.035732	WATER9	0.0000104	WATER9	31.82	EPI	3100	EPI	0.00235	EPI
Bromomethane	74-83-9	94.94	EPI	0.3000818	0.00734	EPI	1.6755	CRC89	0.100497	WATER9	0.0000135	WATER9	13.22	EPI	15200	EPI	0.00284	EPI
Bromophos	2104-96-3	365.99	EPI	0.008381	0.000205	EPI			0.037134	WATER9	4.3388E-06	WATER9	2019	EPI	0.3	EPI	0.0401	EPI
Bromoxynil	1689-84-5	276.92	EPI	5.3966E-09	1.32E-10	EPI			0.044722	WATER9	5.2254E-06	WATER9	330.1	EPI	130	EPI	0.00783	EPI
Bromoxynil Octanoate	1689-99-2	403.12	EPI	0.0013042	0.0000319	EPI			0.034818	WATER9	4.0681E-06	WATER9	4252	EPI	0.08	EPI	0.0332	EPI
Butadiene, 1,3-	106-99-0	54.09	EPI	3.0089943	0.0736	EPI	0.6149	CRC89	0.100351	WATER9	0.0000103	WATER9	39.6	EPI	735	EPI	0.0164	EPI
Butanol, N-	71-36-3	74.12	EPI	0.0003602	0.0000881	EPI	0.8095	CRC89	0.090042	WATER9	0.0000101	WATER9	3.471	EPI	63200	EPI	0.00231	EPI
Butyl Benzyl Phthlate	85-68-7	312.37	EPI	0.0000515	0.00000126	EPI	1.119	CRC89	0.020832	WATER9	5.1733E-06	WATER9	7155	EPI	2.69	EPI	0.0385	EPI
Butyl alcohol, sec-	78-92-2	74.12	EPI	0.0003704	0.00000906	EPI	0.8063	CRC89	0.089889	WATER9	0.0000101	WATER9	2.919	EPI	181000	EPI	0.00153	EPI
Butylate	2008-41-5	217.37	EPI	0.0034546	0.0000845	EPI	0.9402	CRC89	0.023231	WATER9	5.7927E-06	WATER9	385.7	EPI	45	EPI	0.0541	EPI
Butylated hydroxyanisole	25013-16-5	180.25	EPI	0.0000478	0.00000117	EPI			0.059544	WATER9	6.9572E-06	WATER9	840.7	EPI	742.97	EPI	0.0325	EPI
Butylated hydroxytoluene	128-37-0	220.36	EPI	0.000138	0.00000338	EPI	0.8937	CRC89	0.022509	WATER9	5.5732E-06	WATER9	14750	EPI	0.6	EPI	0.223	EPI
Butylbenzene, n-	104-51-8	134.22	EPI	0.6500409	0.0159	EPI	0.8601	CRC89	0.052773	WATER9	7.3335E-06	WATER9	1482	EPI	11.8	EPI	0.225	EPI
Butylbenzene, sec-	135-98-8	134.22	EPI	0.7195421	0.0176	EPI	0.8608	LANGE	0.052793	WATER9	7.3371E-06	WATER9	1331	EPI	17.6	EPI	0.301	EPI
Butylbenzene, tert-	98-06-6	134.22	EPI	0.5396566	0.0132	EPI	0.8665	CRC89	0.052953	WATER9	7.3662E-06	WATER9	1001	EPI	29.5	EPI	0.149	EPI
Cacodylic Acid	75-60-5	138	EPI						0.071149	WATER9	8.3132E-06	WATER9	43.89	EPI	2000000	EPI	0.0046	EPI
Cadmium (Diet)	7440-43-9	112.41	EPI				8.69	CRC89									0.001	RAGSE
Cadmium (Water)	7440-43-9	112.41	EPI				8.69	CRC89									0.001	RAGSE
Caprolactam	105-60-2	113.16	EPI	1.0343E-06	2.53E-08	EPI	1.02	LANGE	0.069242	WATER9	8.9995E-06	WATER9	24.5	EPI	772000	EPI	0.001	EPI
Captafol	2425-06-1	349.06	EPI	2.0114E-07	4.92E-09	EPI			0.038325	WATER9	4.478E-06	WATER9	782.7	EPI	1.4	EPI	0.00577	EPI
Captan	133-06-2	300.59	EPI	2.8618E-07	0.000000007	EPI	1.74	CRC89	0.026194	WATER9	6.8995E-06	WATER9	252.2	EPI	5.1	EPI	0.00234	EPI
Carbaryl	63-25-2	201.23	EPI	1.3369E-07	3.27E-09	EPI	1.228	CRC89	0.027424	WATER9	7.1216E-06	WATER9	354.8	EPI	110	EPI	0.00431	EPI
Carbofuran	1563-66-2	221.26	EPI	1.2633E-07	3.09E-09	EPI	1.18	CRC89	0.025615	WATER9	6.5684E-06	WATER9	95.25	EPI	320	EPI	0.00313	EPI
Carbon Disulfide	75-15-0	76.13	EPI	0.5887163	0.0144	EPI	1.2632	CRC89	0.106447	WATER9	0.000013	WATER9	21.73	EPI	2160	EPI	0.0114	EPI
Carbon Tetrachloride	56-23-5	153.82	EPI	1.1283729	0.0276	EPI	1.594	CRC89	0.057144	WATER9	9.7849E-06	WATER9	43.89	EPI	793	EPI	0.0163	EPI
Carbosulfan	55285-14-8	380.55	EPI	0.0000209	0.000000512	EPI	1.056	CRC89	0.018239	WATER9	4.4384E-06	WATER9	11960	EPI	0.3	EPI	0.0579	EPI
Carboxin	5234-68-4	235.3	EPI	1.3083E-08	3.2E-10	EPI			0.049851	WATER9	5.8247E-06	WATER9	169.4	EPI	147	EPI	0.00198	EPI
Ceric oxide	1306-38-3	172.11	EPI				7.216	CRC89							107000	EPI	0.001	RAGSE
Chloral Hydrate	302-17-0	165.4	EPI	4.4563E-09	1.09E-10	EPI	1.9081	CRC89	0.054399	WATER9	0.0000104	WATER9	1	EPI	793000	EPI	0.000841	EPI
Chloramben	133-90-4	206.03	EPI	1.5822E-09	3.87E-11	EPI			0.054467	WATER9	6.364E-06	WATER9	21.37	EPI	700	EPI	0.00201	EPI
Chloranil	118-75-2	245.88	EPI	1.3369E-08	3.27E-10	EPI	0.04841	WATER9	0.04841	WATER9	5.6564E-06	WATER9	308.1	EPI	250	EPI	0.00194	EPI
Chlordane	12789-03-6	409.78	EPI	0.0019869	0.0000486	EPI	0.034439	WATER9	0.034439	WATER9	4.0238E-06	WATER9	33780	EPI	0.056	EPI	0.107	EPI
Chlordecone (Kepone)	143-50-0	490.64	EPI	2.1995E-06	5.38E-08	EPI	1.61	CRC89	0.019647	WATER9	4.9081E-06	WATER9	17500	EPI	2.7	EPI	0.0109	EPI
Chlorfenvinphos	470-90-6	359.58	EPI	1.1815E-06	2.89E-08	EPI			0.037574	WATER9	4.3903E-06	WATER9	1264	EPI	124	EPI	0.00512	EPI
Chlorimuron, Ethyl-	90982-32-4	414.82	EPI	7.441E-14	1.82E-15	EPI	0.03416	WATER9	0.03416	WATER9	3.9913E-06	WATER9	71.79	EPI	1200	EPI	0.000338	EPI
Chlorine	7782-50-5	70.91	EPI	0.4783	0.0117	PHYSPROP	2.898	CRC89							6300	EPI	0.001	RAGSE
Chlorine Dioxide	10049-04-4	67.45	EPI				2.757	CRC89									0.001	RAGSE
Chlorite (Sodium Salt)	7758-19-2	90.44	EPI												640000	CRC89	0.001	RAGSE
Chloro-1,1-difluoroethane, 1-	75-68-3	100.5	EPI	2.4039248	0.0588	EPI	1.107	CRC89	0.080393	WATER9	0.0000101	WATER9	43.89	EPI	1400	EPI	0.00989	EPI
Chloro-1,3-butadiene, 2-	126-99-8	88.54	EPI	2.29	0.0561	EPI	0.956	CRC89	0.084147	WATER9	0.00001	WATER9	60.7	EPI	836.92	EPI	0.0238	EPI
Chloro-2-methylaniline HCl, 4-	3165-93-3	178.06	EPI	5.887E-12	1.44E-13	EPI			0.060031	WATER9	7.0142E-06	WATER9	351.9	EPI	115.68	EPI	0.000018	EPI
Chloro-2-methylaniline, 4-	95-69-2	141.6	EPI	0.0000814	0.00000199	EPI			0.069938	WATER9	8.1717E-06	WATER9	184.5	EPI	1732.4	EPI	0.00808	EPI
Chloroacetaldehyde, 2-	107-20-0	78.5	EPI	0.00074	0.0000181	EPI	1.19	CRC89	0.101505	WATER9	0.0000123	WATER9	1	EPI	266780	EPI	0.00065	EPI
Chloroacetic Acid	79-11-8	94.5	EPI	3.7858E-07	9.26E-09	EPI	1.4043	CRC89	0.093821	WATER9	0.0000121	WATER9	1.44	EPI	858000	EPI	0.000647	EPI
Chloroacetophenone, 2-	532-27-4	154.6	EPI	0.0001349	0.0000033	EPI	1.324	CRC89	0.052239	WATER9	8.7273E-06	WATER9	98.9	EPI	1100	PERRY	0.00406	EPI
Chloroaniline, p-	106-47-8	127.57	EPI	0.0000474	0.00000116	EPI	1.429	CRC89	0.070385	WATER9	0.0000103	WATER9	112.7	EPI	3900	EPI	0.00496	EPI
Chlorobenzene	108-90-7	112.56	EPI	0.1271464	0.00311	EPI	1.1058	CRC89	0.072131	WATER9	9.4765E-06	WATER9	233.9	EPI	498	EPI	0.0282	EPI
Chlorobenzilate	510-15-6	325.19	EPI	2.9599E-06	7.24E-08	EPI	1.2816	CRC89	0.021777	WATER9	5.4782E-06	WATER9	1539	EPI	13	EPI	0.0331	EPI
Chlorobenzoic Acid, p-	74-11-3	156.57	EPI	1.5863E-06	3.88E-08	EPI	1.541	PERRY	0.054689	WATER9	9.487E-06	WATER9	26.56	EPI	72	EPI	0.012	EPI
Chlorobenzotrifluoride, 4-	98-56-6	180.56	EPI	1.4186427	0.0347	EPI	1.334	CRC89	0.0385	WATER9	7.9872E-06	WATER9	1606	EPI	11.723	EPI	0.0375	EPI
Chlorobutane, 1-	109-69-3	92.57	EPI	0.6827473	0.0167	EPI	0.8857	CRC89	0.078413	WATER9	9.3274E-06	WATER9	72.17	EPI	1100	EPI	0.0269	EPI
Chlorodifluoromethane	75-45-6	86.47	EPI	1.6598528	0.0406	EPI	1.4909	CRC89	0.103378	WATER9	0.0000133	WATER9	31.82	EPI	2770	EPI	0.00268	EPI
Chloroethanol, 2-	107-07-3	80.51	EPI	0.0000311	0.000000761</													

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Chlorophenol, 2-	95-57-8	128.56	EPI	0.0004579	0.0000112	EPI	1.2634	CRC89	0.066118	WATER9	9.4784E-06	WATER9	306.5	EPI	11300	EPI	0.00799	EPI
Chloropicrin	76-06-2	164.38	EPI	0.0838103	0.00205	EPI	1.6558	CRC89	0.051764	WATER9	9.6198E-06	WATER9	44.19	EPI	1620	EPI	0.00459	EPI
Chlorothalonil	1897-45-6	265.91	EPI	0.0000818	0.000002	EPI	1.7	CRC89	0.027579	WATER9	7.3232E-06	WATER9	1041	EPI	0.81	EPI	0.00537	EPI
Chlorotoluene, o-	95-49-8	126.59	EPI	0.1459526	0.00357	EPI	1.0825	CRC89	0.062903	WATER9	8.7194E-06	WATER9	382.9	EPI	374	EPI	0.0572	EPI
Chlorotoluene, p-	106-43-4	126.59	EPI	0.1790679	0.00438	EPI	1.0697	CRC89	0.062571	WATER9	8.6574E-06	WATER9	375.3	EPI	106	EPI	0.0498	EPI
Chlorozotocin	54749-90-5	313.7	EPI	1.5E-20	3.67E-22	EPI			0.041154	WATER9	4.8085E-06	WATER9	10	EPI	1000000	EPI	0.0000991	EPI
Chlorpropham	101-21-3	213.67	EPI	0.0000233	0.000000569	EPI	1.18	CRC89	0.026089	WATER9	6.7074E-06	WATER9	350.7	EPI	89	EPI	0.0213	EPI
Chlorpyrifos	2921-88-2	350.59	EPI	0.0001198	0.00000293	EPI			0.038214	WATER9	4.465E-06	WATER9	7283	EPI	1.12	EPI	0.0334	EPI
Chlorpyrifos Methyl	5598-13-0	322.53	EPI	0.0001533	0.00000375	EPI			0.040399	WATER9	4.7203E-06	WATER9	2193	EPI	4.76	EPI	0.0178	EPI
Chlorsulfuron	64902-72-3	357.77	EPI	1.398E-14	3.42E-16	EPI			0.037701	WATER9	4.405E-06	WATER9	322	EPI	31000	EPI	0.000328	EPI
Chlorthiophos	60238-56-4	361.24	EPI	0.0000491	0.0000012	EPI			0.037459	WATER9	4.3768E-06	WATER9	12790	EPI	0.3	EPI	0.106	EPI
Chromium(III), Insoluble Salts	16065-83-1	52	EPI				5.22	CRC89									0.001	RAGSE
Chromium(VI)	18540-29-9	52	EPI												1690000	CRC89	0.002	RAGSE
Chromium, Total	7440-47-3	52	EPI				7.15	CRC89									0.001	RAGSE
Cobalt	7440-48-4	58.93	EPI				8.86	CRC89									0.004	RAGSE
Coke Oven Emissions	8007-45-2	78.11	EPI	0.2269011	0.00555	EPI			0.10398	WATER9	0.0000121	WATER9	145.8	EPI	1790	EPI	0.0149	EPI
Copper	7440-50-8	63.55	EPI				8.96	CRC89									0.001	RAGSE
Cresol, m-	108-39-4	108.14	EPI	0.000035	0.000000856	EPI	1.0339	CRC89	0.072872	WATER9	9.3232E-06	WATER9	300.4	EPI	22700	EPI	0.00777	EPI
Cresol, o-	95-48-7	108.14	EPI	0.0000491	0.0000012	EPI	1.0327	CRC89	0.072835	WATER9	9.3168E-06	WATER9	306.5	EPI	25900	EPI	0.00766	EPI
Cresol, p-	106-44-5	108.14	EPI	0.0000409	0.000001	EPI	1.0185	CRC89	0.072394	WATER9	9.2397E-06	WATER9	300.4	EPI	21500	EPI	0.00754	EPI
Cresol, p-chloro-m-	59-50-7	142.59	EPI	0.0001002	0.00000245	EPI			0.069614	WATER9	8.1338E-06	WATER9	491.8	EPI	3830	EPI	0.0285	EPI
Cresols	1319-77-3	108.14	EPI	0.0000491	0.0000012	EPI			0.083707	WATER9	9.7805E-06	WATER9	306.5	EPI	25900	EPI	0.00766	EPI
Crotonaldehyde, trans-	123-73-9	70.09	EPI	0.0007931	0.0000194	EPI	0.8516	CRC89	0.095926	WATER9	0.0000108	WATER9	1.793	EPI	150000	EPI	0.00159	EPI
Cumene	98-82-2	120.2	EPI	0.4701554	0.0115	EPI	0.864	CRC89	0.060304	WATER9	7.8566E-06	WATER9	697.8	EPI	61.3	EPI	0.0897	EPI
Cupferron	135-20-6	155.16	EPI	8.667E-16	2.12E-17	EPI			0.065801	WATER9	7.6883E-06	WATER9	762.4	EPI	204310	EPI	0.00000167	EPI
Cyanazine	21725-46-2	240.7	EPI	1.051E-10	2.57E-12	EPI			0.049102	WATER9	5.7372E-06	WATER9	134.1	EPI	170	EPI	0.00209	EPI
Cyanides																		
-Calcium Cyanide	592-01-8	92.11	EPI														0.001	RAGSE
-Copper Cyanide	544-92-3	89.56	EPI				2.9	CRC89							23	EPI	0.001	RAGSE
-Cyanide (CN-)	57-12-5	26.018	EPI	0.0054374	0.000133	EPI	0.695	CHEM GUIDE	0.210955	WATER9	0.0000246	WATER9			1000000	EPI	0.001	RAGSE
-Cyanogen	460-19-5	52.04	EPI	0.2207686	0.0054	EPI	0.9537	CRC89	0.123753	WATER9	0.0000138	WATER9			9487	YAWS	0.00089	RAGSE
-Cyanogen Bromide	506-68-3	105.92	EPI	1	0.0245	EPI	2.015	CRC89	0.098407	WATER9	0.0000141	WATER9					0.000255	RAGSE
-Cyanogen Chloride	506-77-4	61.47	EPI	0.0787186	0.0019412	YAWS	1.186	CRC89	0.120745	WATER9	0.0000142	WATER9			30000	YAWS	0.000394	RAGSE
-Hydrogen Cyanide	74-90-8	27.03	EPI	0.0054374	0.000133	EPI	0.6876	CRC89	0.167804	WATER9	0.0000168	WATER9			1000000	EPI	0.001	RAGSE
-Potassium Cyanide	151-50-8	65.12	EPI				1.55	CRC89							720000	EPI	0.002	RAGSE
-Potassium Silver Cyanide	506-61-6	199	EPI														0.002	RAGSE
-Silver Cyanide	506-64-9	133.89	EPI				3.95	CRC89							23	EPI	0.001	RAGSE
-Sodium Cyanide	143-33-9	49.01	EPI				1.6	CRC89							582000	CRC89	0.001	RAGSE
-Thiocyanates	NA																0.001	RAGSE
-Thiocyanic Acid	463-56-9	59.09	EPI				1.126	PPRTV									0.001	RAGSE
-Zinc Cyanide	557-21-1	117.43	EPI				1.852	CRC89							17100	EPI	0.0006	RAGSE
Cyclohexane	110-82-7	84.16	EPI	6.1324612	0.15	EPI	0.7739	CRC89	0.079975	WATER9	9.1079E-06	WATER9	145.8	EPI	55	EPI	0.102	EPI
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	513.09	EPI	4.374E-10	1.07E-11	EPI			0.029645	WATER9	3.4638E-06	WATER9	2807	EPI	0.45388	EPI	0.00283	EPI
Cyclohexanone	108-94-1	98.15	EPI	0.0003679	0.000009	EPI	0.9478	CRC89	0.076757	WATER9	9.3792E-06	WATER9	17.38	EPI	25000	EPI	0.00152	EPI
Cyclohexene	110-83-8	82.15	EPI	1.8601799	0.0455	EPI			0.100542	WATER9	0.0000117	WATER9	145.8	EPI	213	EPI	0.0431	EPI
Cyclohexylamine	108-91-8	99.18	EPI	0.0001701	0.00000416	EPI	0.8191	CRC89	0.071293	WATER9	8.5392E-06	WATER9	32.17	EPI	1000000	EPI	0.00425	EPI
Cyhalothrin/karate	68085-85-8	449.86	EPI	0.0000605	0.00000148	EPI			0.032362	WATER9	3.7812E-06	WATER9	341300	EPI	0.005	EPI	0.21	EPI
Cypermethrin	52315-07-8	416.31	EPI	0.0000172	0.00000042	EPI	1.25	CRC89	0.018905	WATER9	4.6534E-06	WATER9	79750	EPI	0.004	EPI	0.0769	EPI
Cyromazine	66215-27-8	166.19	EPI	2.31E-12	5.65E-14	EPI			0.062857	WATER9	7.3443E-06	WATER9	28.73	EPI	13000	EPI	0.000797	EPI
DDD	72-54-8	320.05	EPI	0.0002698	0.0000066	EPI			0.040608	WATER9	4.7447E-06	WATER9	117500	EPI	0.09	EPI	0.251	EPI
DDE, p,p'-	72-55-9	318.03	EPI	0.0017007	0.0000416	EPI			0.04078	WATER9	4.7648E-06	WATER9	117500	EPI	0.04	EPI	0.545	EPI
DDT	50-29-3	354.49	EPI	0.0003401	0.00000832	EPI			0.037933	WATER9	4.4322E-06	WATER9	168600	EPI	0.0055	EPI	0.628	EPI
Dacthal	1861-32-1	331.97	EPI	0.0000891	0.00000218	EPI			0.03963	WATER9	4.6304E-06	WATER9	511.1	EPI	0.5	EPI	0.015	EPI
Dalapon	75-99-0	142.97	EPI	2.314E-06	5.66E-08	EPI	1.389	CRC89	0.060081	WATER9	9.4134E-06	WATER9	3.231	EPI	502000	EPI	0.000815	EPI
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	959.17	EPI	1.8193E-06	4.45E-08	EPI	3	IRIS	0.019535	WATER9	2.2826E-06	WATER9	276200	EPI	0.0001	EPI	0.725	EPI
Demeton	8065-48-3	258.33	EPI						0.046842	WATER9	5.4731E-06	WATER9	837.9	EPI	60	EPI	0.00761	EPI
Di(2-ethylhexyl)adipate	103-23-1	370.58	EPI	0.0000177	0.000000434	EPI	0.922	CRC89	0.017291	WATER9	4.157E-06	WATER9	36000	EPI	0.78	EPI	3.23	EPI
Diallate	2303-16-4	270.22	EPI	0.0001554	0.0000038	EPI			0.045458	WATER9	5.3114E-06	WATER9	644.3	EPI	14	EPI	0.046	EPI
Diazinon	333-41-5	304.35	EPI	4.6198E-06	0.000000113	EPI	1.1088	CRC89	0.021026	WATER9	5.2259E-06	WATER9	3034	EPI	40	EPI	0.0104	EPI
Dibenzothiophene	132-65-0	184.26	EPI	0.0013818	0.0000338	EPI			0.058677	WATER9	6.8559E-06	WATER9	9161	EPI	1.47	EPI	0.118	EPI
Dibromo-3-chloropropane, 1,2-	96-12-8	236.33	EPI	0.0060098	0.000147	EPI	2.093	CRC89	0.032135	WATER9	8.9048E-06	WATER9	115.8	EPI	1230	EPI	0.00685	EPI
Dibromobenzene, 1,4-	106-37-6	235.91	EPI	0.0365086	0.000893	EPI	2.261	CRC89	0.033276	WATER9	9.3369E-06	WATER9	375.3	EPI	20	EPI	0.0245	EPI
Dibromochloromethane	124-48-1	208.28	EPI	0.0320114	0.000783	EPI	2.451	CRC89	0.036636	WATER9	0.0000106	WATER9	31.82	EPI	2700	EPI	0.00289	EPI
Dibromoethane, 1,2-	106-93-4	187.86	EPI	0.026574	0.00065	EPI	2.1683	CRC89	0.043035	WATER9	0.0000104	WATER9	39.6	EPI	3910	EPI	0.00278	EPI
Dibromomethane (Methylene Bromide)	74-95-3	173.84	EPI	0.0336059	0.000822	EPI	2.4969	CRC89	0.055137	WATER9	0.0000119	WATER9	21.73	EPI	11900	EPI	0.00223	EPI
Dibutyltin Compounds	NA																	
Dicamba	1918-00-9	221.04	EPI	8.9125E-08	2.18E-09	EPI	1.57	CRC89	0.029224	WATER9	7.8006E-06	WATER9	29.01	EPI	8310	EPI	0.00265	EPI
Dichloro-2-butene, 1,4-	764-41-0	125	EPI	0.0271464	0.000664	EPI	1.188	LANGE	0.066505	WATER9	0.00000929	WATER9	131.5	EPI	580	EPI	0.0166	EPI
Dichloro-2-butene, cis-1,4-	1476-11-5	125	EPI	0.0271464	0.000664	EPI	1.188	CRC89	0.066505	WATER9	0.00000929							

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Dichlorobenzene, 1,2-	95-50-1	147	EPI	0.0784955	0.00192	EPI	1.3059	CRC89	0.05617	WATER9	8.9213E-06	WATER9	382.9	EPI	156	EPI	0.0446	EPI
Dichlorobenzene, 1,4-	106-46-7	147	EPI	0.0985282	0.00241	EPI	1.2475	CRC89	0.055043	WATER9	8.6797E-06	WATER9	375.3	EPI	81.3	EPI	0.0453	EPI
Dichlorobenzidine, 3,3'-	91-94-1	253.13	EPI	1.64E-07	4.0114E-09	SSL			0.047482	WATER9	5.5478E-06	WATER9	3190	EPI	3.1	EPI	0.0128	EPI
Dichlorobenzophenone, 4,4'-	90-98-2	251.11	EPI	0.0000437	0.00000107	SSL	1.45	CRC89	0.026393	WATER9	6.8893E-06	WATER9	2927	EPI	7.802	EPI	0.0542	EPI
Dichlorodifluoromethane	75-71-8	120.91	EPI	14.022895	0.343	EPI	1.486	PERRY	0.076029	WATER9	0.0000108	WATER9	43.89	EPI	280	EPI	0.00895	EPI
Dichloroethane, 1,1-	75-34-3	98.96	EPI	0.2297629	0.00562	EPI	1.1757	CRC89	0.083645	WATER9	0.0000106	WATER9	31.82	EPI	5040	EPI	0.00675	EPI
Dichloroethane, 1,2-	107-06-2	98.96	EPI	0.048242	0.00118	EPI	1.2454	CRC89	0.085722	WATER9	0.000011	WATER9	39.6	EPI	8600	EPI	0.0042	EPI
Dichloroethylene, 1,1-	75-35-4	96.94	EPI	1.0670482	0.0261	EPI	1.213	CRC89	0.086314	WATER9	0.000011	WATER9	31.82	EPI	2420	EPI	0.0117	EPI
Dichloroethylene, 1,2-cis-	156-59-2	96.94	EPI	0.1668029	0.00408	EPI	1.2837	CRC89	0.088409	WATER9	0.0000113	WATER9	39.6	EPI	6410	EPI	0.011	EPI
Dichloroethylene, 1,2-trans-	156-60-5	96.94	EPI	0.1668029	0.00408	EPI	1.2565	CRC89	0.087613	WATER9	0.0000112	WATER9	39.6	EPI	4520	EPI	0.011	EPI
Dichlorophenol, 2,4-	120-83-2	163	EPI	0.0001754	0.00000429	EPI	1.383	PERRY	0.048577	WATER9	8.6787E-06	WATER9	491.8	EPI	4500	EPI	0.0206	EPI
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	221.04	EPI	1.4473E-06	3.54E-08	EPI			0.051972	WATER9	6.0726E-06	WATER9	29.63	EPI	677	EPI	0.00664	EPI
Dichlorophenoxybutyric Acid, 4-(2,4-	94-82-6	249.1	EPI	2.3998E-07	5.87E-09	EPI			0.047992	WATER9	5.6075E-06	WATER9	98.4	EPI	46	EPI	0.0139	EPI
Dichloropropane, 1,2-	78-87-5	112.99	EPI	0.1152903	0.00282	EPI	1.159	PERRY	0.07334	WATER9	9.7252E-06	WATER9	60.7	EPI	2800	EPI	0.00753	EPI
Dichloropropane, 1,3-	142-28-9	112.99	EPI	0.0399019	0.000976	EPI	1.1785	CRC89	0.073874	WATER9	9.823E-06	WATER9	72.17	EPI	2750	EPI	0.00776	EPI
Dichloropropanol, 2,3-	616-23-9	128.99	EPI	1.48E-07	3.62E-09	EPI	1.3607	CRC89	0.068017	WATER9	0.00000989	WATER9	5.568	EPI	60820	EPI	0.000983	EPI
Dichloropropene, 1,3-	542-75-6	110.97	EPI	0.1451349	0.00355	EPI	1.217	LANGE	0.076273	WATER9	0.0000101	WATER9	72.17	EPI	2800	EPI	0.00834	EPI
Dichlorvos	62-73-7	220.98	EPI	0.0000235	0.000000574	EPI	1.415	CRC89	0.027877	WATER9	7.3302E-06	WATER9	53.96	EPI	8000	EPI	0.000804	EPI
Dicyclopentadiene	77-73-6	132.21	EPI	2.5551922	0.0625	EPI	0.93	LANGE	0.055746	WATER9	7.7554E-06	WATER9	1513	EPI	13.687	EPI	0.036	EPI
Dieldrin	60-57-1	380.91	EPI	0.0004088	0.00001	EPI	1.75	CRC89	0.023287	WATER9	6.0062E-06	WATER9	20090	EPI	0.195	EPI	0.0326	EPI
Diesel Engine Exhaust	NA																	
Diethanolamine	111-42-2	105.14	EPI	1.5822E-09	3.87E-11	EPI	1.0966	CRC89	0.076805	WATER9	9.8229E-06	WATER9	1	EPI	1000000	EPI	0.0000451	EPI
Diethylene Glycol Monobutyl Ether	112-34-5	162.23	EPI	2.9436E-07	7.2E-09	EPI	0.9553	CRC89	0.041438	WATER9	6.9707E-06	WATER9	10	EPI	1000000	EPI	0.000454	EPI
Diethylene Glycol Monoethyl Ether	111-90-0	134.18	EPI	9.1169E-07	2.23E-08	EPI	0.9885	CRC89	0.056241	WATER9	7.9734E-06	WATER9	1	EPI	1000000	EPI	0.000121	EPI
Diethylformamide	617-84-5	101.15	EPI	5.3148E-06	0.00000013	EPI	0.908	CRC89	0.073301	WATER9	8.9773E-06	WATER9	2.06	EPI	1000000	EPI	0.000457	EPI
Diethylstilbestrol	56-53-1	268.36	EPI	2.371E-10	5.8E-12	EPI			0.045668	WATER9	5.3359E-06	WATER9	274100	EPI	12	EPI	0.114	EPI
Difenzoquat	43222-48-6	360.43	EPI						0.037515	WATER9	4.3833E-06	WATER9	78380	EPI	817000	EPI	0.0000402	EPI
Diffubenzuron	35367-38-5	310.69	EPI	1.8806E-07	4.6E-09	EPI			0.041419	WATER9	4.8395E-06	WATER9	463.2	EPI	0.08	EPI	0.0107	EPI
Difluoroethane, 1,1-	75-37-6	66.05	EPI	0.8299264	0.0203	EPI	0.896	CRC89	0.102316	WATER9	0.0000115	WATER9	31.82	EPI	3200	EPI	0.0021	EPI
Dihydrosafrole	94-58-6	164.21	EPI	6.7457073	0.165	EPI			0.063361	WATER9	7.4032E-06	WATER9	207.2	EPI	5.7727	EPI	0.0452	EPI
Diisopropyl Ether	108-20-3	102.18	EPI	0.1046607	0.00256	EPI	0.7192	CRC89	0.065423	WATER9	7.7582E-06	WATER9	22.79	EPI	8800	EPI	0.00428	EPI
Diisopropyl Methylphosphonate	1445-75-6	180.19	EPI	0.0017907	0.0000438	EPI			0.059557	WATER9	6.9588E-06	WATER9	42.2	EPI	1500	EPI	0.000738	EPI
Dimethipin	55290-64-7	210.26	EPI	9.403E-10	2.3E-11	EPI			0.053734	WATER9	6.2784E-06	WATER9	10	EPI	4600	EPI	0.0000798	EPI
Dimethoate	60-51-5	229.25	EPI	9.9346E-09	2.43E-10	EPI	1.277	CRC89	0.026086	WATER9	6.7422E-06	WATER9	12.77	EPI	23300	EPI	0.000267	EPI
Dimethoxybenzidine, 3,3'-	119-90-4	244.3	EPI	1.9052E-11	4.66E-11	EPI			0.048619	WATER9	5.6807E-06	WATER9	508.8	EPI	60	EPI	0.00106	EPI
Dimethyl methylphosphonate	756-79-6	124.08	EPI	0.0000511	0.00000125	EPI	1.1684	CRC89	0.06658	WATER9	9.2386E-06	WATER9	5.407	EPI	1000000	EPI	0.000124	EPI
Dimethylamino azobenzene [p-]	60-11-7	225.3	EPI	9.5666E-06	0.000000234	EPI			0.051315	WATER9	5.9958E-06	WATER9	2028	EPI	0.23	EPI	0.0943	EPI
Dimethylaniline HCl, 2,4-	21436-96-4	157.64	EPI	8.79E-12	2.15E-13	EPI			0.065109	WATER9	7.6075E-06	WATER9	351.9	EPI	150.28	EPI	0.0000202	EPI
Dimethylaniline, 2,4-	95-68-1	121.18	EPI	0.0001022	0.00000025	EPI	0.9723	CRC89	0.063025	WATER9	8.3925E-06	WATER9	184.5	EPI	2175.5	EPI	0.00428	EPI
Dimethylaniline, N,N-	121-69-7	121.18	EPI	0.0023222	0.0000568	EPI	0.9557	CRC89	0.062541	WATER9	8.3063E-06	WATER9	78.67	EPI	1450	EPI	0.0112	EPI
Dimethylbenzidine, 3,3'-	119-93-7	212.3	EPI	3.3115E-09	8.1E-11	EPI			0.053389	WATER9	6.2381E-06	WATER9	3190	EPI	1300	EPI	0.00362	EPI
Dimethylformamide	68-12-2	73.1	EPI	3.0213E-06	7.39E-08	EPI	0.9445	CRC89	0.09718	WATER9	0.0000112	WATER9	1	EPI	1000000	EPI	0.00013	EPI
Dimethylhydrazine, 1,1-	57-14-7	60.1	EPI	2.8414E-06	6.95E-08	EPI	0.791	CRC89	0.103785	WATER9	0.0000113	WATER9	11.95	EPI	1000000	EPI	0.0000727	RAGSE
Dimethylhydrazine, 1,2-	540-73-8	60.1	EPI	2.8414E-06	6.95E-08	EPI	0.8274	CRC89	0.105769	WATER9	0.0000116	WATER9	14.87	EPI	1000000	EPI	0.000317	EPI
Dimethylphenol, 2,4-	105-67-9	122.17	EPI	0.0000389	0.000000951	EPI	0.965	CRC89	0.062245	WATER9	8.314E-06	WATER9	491.8	EPI	7870	EPI	0.0109	EPI
Dimethylphenol, 2,6-	576-26-1	122.17	EPI	0.0002719	0.00000665	EPI			0.077169	WATER9	9.0166E-06	WATER9	501.9	EPI	6050	EPI	0.012	EPI
Dimethylphenol, 3,4-	95-65-8	122.17	EPI	0.000017	0.000000415	EPI	0.983	CRC89	0.062762	WATER9	8.4067E-06	WATER9	491.8	EPI	4760	EPI	0.0098	EPI
Dimethylvinylchloride	513-37-1	90.55	EPI	3.311529	0.081	EPI	0.9186	CRC89	0.081174	WATER9	9.6608E-06	WATER9	60.7	EPI	1000	EPI	0.0253	EPI
Dinitro-o-cresol, 4,6-	534-52-1	198.14	EPI	0.0000572	0.0000014	EPI			0.055904	WATER9	6.5319E-06	WATER9	754.4	EPI	198	EPI	0.00315	EPI
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	266.26	EPI	1.3818E-09	3.38E-11	EPI			0.045907	WATER9	5.3639E-06	WATER9	16540	EPI	15	EPI	0.0275	EPI
Dinitrobenzene, 1,2-	528-29-0	168.11	EPI	2.1791E-06	5.33E-08	EPI	1.3119	CRC89	0.044718	WATER9	8.2538E-06	WATER9	358.8	EPI	133	EPI	0.00237	EPI
Dinitrobenzene, 1,3-	99-65-0	168.11	EPI	2.0033E-06	0.000000049	EPI	1.5751	CRC89	0.048499	WATER9	9.2109E-06	WATER9	351.6	EPI	533	EPI	0.00174	EPI
Dinitrobenzene, 1,4-	100-25-4	168.11	EPI	0.0000151	0.000000037	EPI	1.625	CRC89	0.049167	WATER9	9.3849E-06	WATER9	351.6	EPI	69	EPI	0.00167	EPI
Dinitrophenol, 2,4-	51-28-5	184.11	EPI	3.5159E-06	0.000000086	EPI	1.683	CRC89	0.04067	WATER9	9.0756E-06	WATER9	460.8	EPI	2790	EPI	0.00187	EPI
Dinitrotoluene Mixture, 2,4/2,6-	NA	182.14	EPI	0.0000162	0.000000397	EPI			0.059131	WATER9	6.909E-06	WATER9	587.4	EPI	270	EPI	0.00416	EPI
Dinitrotoluene, 2,4-	121-14-2	182.14	EPI	2.2077E-06	0.000000054	EPI	1.3208	CRC89	0.037512	WATER9	7.8982E-06	WATER9	575.6	EPI	200	EPI	0.00308	EPI
Dinitrotoluene, 2,6-	606-20-2	182.14	EPI	0.0000305	0.000000747	EPI	1.2833	CRC89	0.037026	WATER9	7.7629E-06	WATER9	587.4	EPI	182	SSL	0.0037	EPI
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	197.15	EPI	6.6231E-09	1.62E-10	EPI			0.056091	WATER9	6.5537E-06	WATER9	283	EPI	319.49	EPI	0.00204	EPI
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	197.15	EPI	6.6231E-09	1.62E-10	EPI			0.056091	WATER9	6.5537E-06	WATER9	283	EPI	319.49	EPI	0.00204	EPI
Dinitrotoluene, Technical grade	25321-14-6	182.14	EPI	0.0000162	0.000000397	EPI			0.059131	WATER9	6.909E-06	WATER9	587.4	EPI	270	EPI	0.00416	EPI
Dinoseb	88-85-7	240.22	EPI	0.0000186	0.000000456	EPI	1.265	CRC89	0.025346	WATER9	6.5187E-06	WATER9	4294	EPI	52	EPI	0.0163	EPI
Dioxane, 1,4-	123-91-1	88.11	EPI	0.0001962	0.00000048	EPI	1.0337	CRC89	0.087372	WATER9	0.0000105	WATER9	2.633	EPI	1000000	EPI	0.000332	EPI
Dioxins		</																

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Direct Blue 6	2602-46-2	821.67	EPI	6.705E-42	1.64E-43	EPI			0.021658	WATER9	2.5306E-06	WATER9	790800000	EPI	8.2167E-07	EPI	1.73E-09	EPI
Direct Brown 95	16071-86-6	760.11	EPI						0.022812	WATER9	2.6654E-06	WATER9	6985000	EPI	9.7133E-07	EPI	3.87E-12	EPI
Disulfoton	298-04-4	274.39	EPI	0.0000883	0.00000216	EPI	1.144	CRC89	0.022543	WATER9	5.6664E-06	WATER9	837.9	EPI	16.3	EPI	0.0212	EPI
Dithiane, 1,4-	505-29-3	120.23	EPI	0.0017171	0.000042	EPI			0.077997	WATER9	9.1133E-06	WATER9	145.8	EPI	3000	EPI	0.00108	EPI
Diuron	330-54-1	233.1	EPI	2.0605E-08	5.04E-10	EPI			0.050164	WATER9	5.8613E-06	WATER9	109.1	EPI	42	EPI	0.00466	EPI
Dodine	2439-10-3	287.45	EPI	3.6836E-09	9.01E-11	EPI			0.043623	WATER9	5.097E-06	WATER9	2482	EPI	630	EPI	0.000222	EPI
EPTC	759-94-4	189.32	EPI	0.00065	0.0000159	EPI	0.9546	CRC89	0.029126	WATER9	6.3511E-06	WATER9	164.1	EPI	375	EPI	0.0184	EPI
Endosulfan	115-29-7	406.92	EPI	0.0026574	0.000065	EPI	1.745	CRC89	0.022485	WATER9	5.7629E-06	WATER9	6761	EPI	0.325	EPI	0.00286	EPI
Endothall	145-73-3	186.17	EPI	1.574E-14	3.85E-16	EPI	1.431	CRC89	0.036747	WATER9	8.1792E-06	WATER9	19.41	EPI	100000	EPI	0.00263	EPI
Endrin	72-20-8	380.91	EPI	0.0004088	0.00001	EPI			0.036158	WATER9	4.2248E-06	WATER9	20090	EPI	0.25	EPI	0.0326	EPI
Epichlorohydrin	106-89-8	92.53	EPI	0.0012428	0.0000304	EPI	1.183	PERRY	0.088865	WATER9	0.0000111	WATER9	9.907	EPI	65900	EPI	0.000944	EPI
Epoxybutane, 1,2-	106-88-7	72.11	EPI	0.007359	0.00018	EPI	0.8297	CRC89	0.092894	WATER9	0.0000104	WATER9	9.907	EPI	95000	EPI	0.00231	EPI
Ethephon	16672-87-0	144.5	EPI	2.33E-10	5.7E-12	EPI	1.2	CRC89	0.055477	WATER9	8.5676E-06	WATER9	5.028	EPI	1000000	EPI	0.000173	EPI
Ethion	563-12-2	384.46	EPI	0.0000155	0.00000379	EPI	1.22	CRC89	0.019478	WATER9	4.8104E-06	WATER9	882	EPI	2	EPI	0.0255	EPI
Ethoxyethanol Acetate, 2-	111-15-9	132.16	EPI	0.0001308	0.0000032	EPI	0.974	CRC89	0.05695	WATER9	7.9753E-06	WATER9	4.542	EPI	247000	EPI	0.0007	EPI
Ethoxyethanol, 2-	110-80-5	90.12	EPI	0.0000192	0.00000047	EPI	0.9253	CRC89	0.081756	WATER9	9.7308E-06	WATER9	1	EPI	1000000	EPI	0.0003	EPI
Ethyl Acetate	141-78-6	88.11	EPI	0.0054783	0.000134	EPI	0.9003	CRC89	0.082314	WATER9	9.7026E-06	WATER9	5.583	EPI	80000	EPI	0.00153	EPI
Ethyl Acrylate	140-88-5	100.12	EPI	0.0138594	0.000339	EPI	0.9234	CRC89	0.074539	WATER9	9.1242E-06	WATER9	10.65	EPI	15000	EPI	0.00324	EPI
Ethyl Chloride (Chloroethane)	75-00-3	64.52	EPI	0.4538021	0.0111	EPI	0.8902	CRC89	0.103754	WATER9	0.0000116	WATER9	21.73	EPI	6710	EPI	0.00607	EPI
Ethyl Ether	60-29-7	74.12	EPI	0.0502862	0.00123	EPI	0.7138	CRC89	0.085248	WATER9	9.3639E-06	WATER9	9.699	EPI	60400	EPI	0.00235	EPI
Ethyl Methacrylate	97-63-2	114.15	EPI	0.023426	0.000573	EPI	0.9135	CRC89	0.065344	WATER9	8.3794E-06	WATER9	16.66	EPI	5400	EPI	0.00698	EPI
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	323.31	EPI	0.0000182	0.000000444	EPI	1.27	CRC89	0.021748	WATER9	5.4674E-06	WATER9	15470	EPI	3.11	EPI	0.0361	EPI
Ethylbenzene	100-41-4	106.17	EPI	0.3221586	0.00788	EPI	0.8626	CRC89	0.068465	WATER9	8.4558E-06	WATER9	446.1	EPI	169	EPI	0.0493	EPI
Ethylene Cyanohydrin	109-78-4	71.08	EPI	3.0662E-07	7.5E-09	EPI	1.0404	CRC89	0.10331	WATER9	0.000012	WATER9	1	EPI	1000000	EPI	0.000148	EPI
Ethylene Diamine	107-15-3	60.1	EPI	7.0728E-08	1.73E-09	EPI	0.8979	CRC89	0.109445	WATER9	0.0000122	WATER9	14.87	EPI	1000000	EPI	0.0000318	EPI
Ethylene Glycol	107-21-1	62.07	EPI	2.453E-06	0.00000006	EPI	1.1135	CRC89	0.116924	WATER9	0.0000136	WATER9	1	EPI	1000000	EPI	0.0000877	EPI
Ethylene Glycol Monobutyl Ether	111-76-2	118.18	EPI	0.0000654	0.0000016	EPI	0.9015	CRC89	0.062619	WATER9	8.1419E-06	WATER9	2.823	EPI	1000000	EPI	0.00121	EPI
Ethylene Oxide	75-21-8	44.05	EPI	0.0060507	0.000148	EPI	0.8821	CRC89	0.133972	WATER9	0.0000145	WATER9	3.237	EPI	1000000	EPI	0.00056	EPI
Ethylene Thiourea	96-45-7	102.15	EPI	0.0000137	0.000000336	EPI			0.086948	WATER9	0.0000102	WATER9	12.97	EPI	20000	EPI	0.000152	EPI
Ethyleneimine	151-56-4	43.07	EPI	0.0004947	0.0000121	EPI	0.832	CRC89	0.132827	WATER9	0.0000142	WATER9	9.043	EPI	1000000	EPI	0.000581	EPI
Ethylphthalyl Ethyl Glycolate	84-72-0	280.28	EPI	3.1603E-08	7.73E-10	EPI			0.044364	WATER9	5.1835E-06	WATER9	1019	EPI	992.56	EPI	0.00119	EPI
Express	101200-48-0	395.39	EPI	4.17E-12	1.02E-13	EPI			0.03527	WATER9	4.121E-06	WATER9	94.69	EPI	50	EPI	0.000468	EPI
Fenamiphos	22224-92-6	303.36	EPI	4.9469E-08	1.21E-09	EPI	1.15	CRC89	0.021437	WATER9	5.352E-06	WATER9	398	EPI	329	EPI	0.00436	EPI
Fenpropathrin	39515-41-8	349.43	EPI	0.0003123	0.00000764	EPI			0.038298	WATER9	4.4749E-06	WATER9	22490	EPI	0.33	EPI	0.167	EPI
Fluometuron	2164-17-2	232.21	EPI	1.067E-07	2.61E-09	EPI			0.050292	WATER9	5.8762E-06	WATER9	285.3	EPI	110	EPI	0.00316	EPI
Fluoride	16984-48-8	38	EPI											EPI	1.69	EPI	0.001	RAGSE
Fluorine (Soluble Fluoride)	7782-41-4	38	EPI				1.553	CRC89						EPI	1.69	EPI	0.001	RAGSE
Fluridone	59756-60-4	329.32	EPI	3.3115E-07	8.1E-09	EPI			0.039842	WATER9	4.6552E-06	WATER9	56770	EPI	12	EPI	0.0028	EPI
Flurprimidol	56425-91-3	312.29	EPI	5.3557E-08	1.31E-09	EPI			0.041278	WATER9	4.823E-06	WATER9	2189	EPI	114	EPI	0.00459	EPI
Flutolanil	66332-96-5	323.32	EPI	1.3001E-07	3.18E-09	EPI			0.040333	WATER9	4.7126E-06	WATER9	2558	EPI	6.53	EPI	0.00691	EPI
Fluvalinate	69409-94-5	502.92	EPI	5.928E-07	1.45E-08	EPI			0.030044	WATER9	3.5104E-06	WATER9	730000	EPI	0.005	EPI	0.0792	EPI
Folpet	133-07-3	296.56	EPI	3.1316E-06	7.66E-08	EPI			0.042725	WATER9	4.992E-06	WATER9	17.7	EPI	0.8	EPI	0.00266	EPI
Fomesafen	72178-02-0	438.76	EPI	3.078E-11	7.53E-13	EPI	1.28	CRC89	0.018607	WATER9	4.5736E-06	WATER9	1546	EPI	50	EPI	0.000457	EPI
Fonofos	944-22-9	246.32	EPI	0.0002854	0.00000698	EPI	1.16	CRC89	0.024017	WATER9	6.096E-06	WATER9	855.8	EPI	15.7	EPI	0.027	EPI
Formaldehyde	50-00-0	30.03	EPI	0.0000138	0.000000337	EPI	0.815	CRC89	0.167073	WATER9	0.0000174	WATER9	1	EPI	400000	EPI	0.00182	EPI
Formic Acid	64-18-6	46.03	EPI	6.8275E-06	0.000000167	EPI	1.22	CRC89	0.147862	WATER9	0.0000172	WATER9	1	EPI	1000000	EPI	0.000378	EPI
Fosetyl-AL	39148-24-8	354.11	EPI						0.03796	WATER9	4.4353E-06	WATER9	6485	EPI	111000	EPI	0.00000041	EPI
Furans																		
~Dibenzofuran	132-64-9	168.2	EPI	0.0087081	0.000213	EPI	1.0886	CRC89	0.04105	WATER9	7.3773E-06	WATER9	9161	EPI	3.1	EPI	0.0975	EPI
~Furan	110-00-9	68.08	EPI	0.2207686	0.0054	EPI	0.9514	CRC89	0.102673	WATER9	0.0000117	WATER9	79.99	EPI	10000	EPI	0.00505	EPI
~Tetrahydrofuran	109-99-9	72.11	EPI	0.0028823	0.0000705	EPI	0.8833	CRC89	0.095413	WATER9	0.0000108	WATER9	10.75	EPI	1000000	EPI	0.00125	EPI
Furazolidone	67-45-8	225.16	EPI	1.3328E-09	3.26E-11	EPI			0.051337	WATER9	5.9983E-06	WATER9	858.4	EPI	40	EPI	0.0000803	EPI
Furfural	98-01-1	96.09	EPI	0.0001541	0.00000377	EPI	1.1594	CRC89	0.085318	WATER9	0.0000107	WATER9	6.083	EPI	74100	EPI	0.000848	EPI
Furium	531-82-8	253.23	EPI	5.437E-14	1.33E-15	EPI			0.047469	WATER9	5.5464E-06	WATER9	577.6	EPI	4205.3	EPI	0.000935	EPI
Furmecycloz	60568-05-0	251.33	EPI	2.8168E-07	6.89E-09	EPI			0.047708	WATER9	5.5743E-06	WATER9	429	EPI	0.3	EPI	0.0499	EPI
Glufosinate, Ammonium	77182-82-2	198.16	EPI	1.034E-22	2.53E-24	EPI			0.0559	WATER9	6.5314E-06	WATER9	10	EPI	1370000	EPI	3.42E-08	EPI
Glycidaldehyde	111-30-8	100.12	EPI	9.7711E-07	2.39E-08	EPI			0.08812	WATER9	0.0000103	WATER9	1	EPI	709980	EPI	0.000325	EPI
Glycidyl	765-34-4	72.06	EPI	0.0000321	0.000000784	EPI	1.1403	CRC89	0.106251	WATER9	0.0000126	WATER9	1	EPI	1000000	EPI	0.000516	EPI
Glyphosate	1071-83-6	169.07	EPI	8.585E-11	2.1E-12	EPI			0.062141	WATER9	7.2606E-06	WATER9	2100	USDA ARS	10500	EPI	4.54E-08	EPI
Goal	42874-03-3	361.71	EPI	0.0000335	0.00000082	EPI	1.35	CRC89	0.021124	WATER9	5.3022E-06	WATER9	39900	EPI	0.116	EPI	0.0204	EPI
Guanidine	113-00-8	59.07	EPI	9.56E-10	2.34E-11	EPI	1.55	GuideChem	0.125269	WATER9	0.0000146	WATER9	11.95	EPI	1840	EPI	0.0000603	EPI
Guanidine Chloride	50-01-1	95.53	EPI	7.31E-17	1.79E-18	EPI	1.354	CRC89	0.091558	WATER9	0.0000118	WATER9		EPI	1000000	EPI	3.86E-08	EPI
Guthion	86-50-0	317.32	EPI	9.7711E-07	2.39E-08	EPI	1.44	CRC89	0.023317	WATER9	5.962E-06	WATER9	51.93	EPI	20.9	EPI	0.00175	EPI
Haloxyp, Methyl	69806-40-2	375.73	EPI	0.000013	0.000000319	EPI			0.03649	WATER9	4.2635E-06	WATER9	5454	EPI	9.3	EPI	0.006	EPI
Harmony	79277-27-																	

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (mg/L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Hexachlorocyclohexane, Alpha-	319-84-6	290.83	EPI	0.0002101	0.00000514	EPI			0.043284	WATER9	5.0574E-06	WATER9	2807	EPI	2	EPI	0.0206	EPI
Hexachlorocyclohexane, Beta-	319-85-7	290.83	EPI	0.0002101	0.00000514	EPI	1.89	CRC89	0.027667	WATER9	7.3955E-06	WATER9	2807	EPI	0.24	EPI	0.0206	EPI
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	290.83	EPI	0.0002101	0.00000514	EPI			0.043284	WATER9	5.0574E-06	WATER9	2807	EPI	7.3	EPI	0.0206	EPI
Hexachlorocyclohexane, Technical	608-73-1	290.83	EPI	0.0002101	0.00000514	EPI			0.043284	WATER9	5.0574E-06	WATER9	2807	EPI	8	EPI	0.0206	EPI
Hexachlorocyclopentadiene	77-47-4	272.77	EPI	1.103843	0.027	EPI	1.7019	CRC89	0.027238	WATER9	7.217E-06	WATER9	1404	EPI	1.8	EPI	0.103	EPI
Hexachloroethane	67-72-1	236.74	EPI	0.1590352	0.00389	EPI	2.091	CRC89	0.032094	WATER9	8.8904E-06	WATER9	196.8	EPI	50	EPI	0.0415	EPI
Hexachlorophene	70-30-4	406.91	EPI	2.24E-11	5.48E-13	EPI			0.034601	WATER9	4.0428E-06	WATER9	668600	EPI	140	EPI	0.836	EPI
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	222.12	EPI	8.217E-10	2.01E-11	EPI	1.82	CRC89	0.031154	WATER9	8.4989E-06	WATER9	89.07	EPI	59.7	EPI	0.000336	EPI
Hexamethylene Diisocyanate, 1,6-	822-06-0	168.2	EPI	0.0019624	0.000048	EPI	1.0528	CRC89	0.040426	WATER9	7.2308E-06	WATER9	4818	EPI	179.03	EPI	0.0237	EPI
Hexamethylphosphoramide	680-31-9	179.2	EPI	2.92E-10	7.13E-12	EPI	1.03	CRC89	0.034837	WATER9	6.8702E-06	WATER9	10	EPI	1000000	EPI	0.000237	EPI
Hexane, N-	110-54-3	86.18	EPI	73.589534	1.8	EPI	0.6606	CRC89	0.073106	WATER9	8.1657E-06	WATER9	131.5	EPI	9.5	EPI	0.201	EPI
Hexanedioic Acid	124-04-9	146.14	EPI	1.926E-10	4.71E-12	EPI	1.36	CRC89	0.057682	WATER9	9.1735E-06	WATER9	24.34	EPI	30800	EPI	0.000268	EPI
Hexanone, 2-	591-78-6	100.16	EPI	0.0038103	0.0000932	EPI	0.8113	CRC89	0.070356	WATER9	8.4404E-06	WATER9	14.98	EPI	17200	EPI	0.00355	EPI
Hexazinone	51235-04-2	252.32	EPI	9.24E-11	2.26E-12	EPI	1.25	CRC89	0.024566	WATER9	6.2842E-06	WATER9	129.4	EPI	33000	EPI	0.00102	EPI
Hydrazine	302-01-2	32.05	EPI				1.0036	CRC89							1000000	EPI	0.0000436	RAGSE
Hydrazine Sulfate	10034-93-2	128.1	EPI				1.378	CRC89							30550	PERRY	0.001	RAGSE
Hydrogen Chloride	7647-01-0	35.45	EPI				1.49	CRC89									0.001	RAGSE
Hydrogen Fluoride	7664-39-3	20.01	EPI				0.818	CRC89									0.001	RAGSE
Hydrogen Sulfide	7783-06-4	34.08	EPI				1.393	CRC89							4370000	PERRY	0.001	RAGSE
Hydroquinone	123-31-9	110.11	EPI	1.9338E-09	4.73E-11	EPI	1.33	CRC89	0.079843	WATER9	0.0000107	WATER9	240.5	EPI	72000	EPI	0.000931	EPI
Imazalil	35554-44-0	297.19	EPI	1.0589E-07	2.59E-09	EPI	1.243	CRC89	0.022493	WATER9	5.6772E-06	WATER9	8495	EPI	180	EPI	0.0116	EPI
Imazaquin	81335-37-7	311.34	EPI	2.825E-16	6.91E-18	EPI			0.041362	WATER9	4.8328E-06	WATER9	2386	EPI	90	EPI	0.000483	EPI
Iodine	7553-56-2	253.81	EPI				4.933	CRC89							330	EPI	0.001	RAGSE
Iprodione	36734-19-7	330.17	EPI	1.2756E-07	3.12E-09	EPI			0.039774	WATER9	4.6472E-06	WATER9	52.52	EPI	13.9	EPI	0.00217	EPI
Iron	7439-89-6	55.85	EPI				7.87	CRC89									0.001	RAGSE
Isobutyl Alcohol	78-83-1	74.12	EPI	0.0003998	0.00000978	EPI	0.8018	CRC89	0.089671	WATER9	0.00001	WATER9	2.919	EPI	85000	EPI	0.00192	EPI
Isophorone	78-59-1	138.21	EPI	0.0002715	0.00000664	EPI	0.9255	CRC89	0.052505	WATER9	7.5296E-06	WATER9	65.15	EPI	12000	EPI	0.00354	EPI
Isopropalin	33820-53-0	309.37	EPI	0.004538	0.000111	EPI			0.041537	WATER9	4.8533E-06	WATER9	11430	EPI	0.11	EPI	0.207	EPI
Isopropanol	67-63-0	60.1	EPI	0.0003312	0.0000081	EPI	0.7809	CRC89	0.103223	WATER9	0.0000112	WATER9	1.53	EPI	1000000	EPI	0.000778	EPI
Isopropyl Methyl Phosphonic Acid	1832-54-8	138.1	EPI	2.8128E-07	6.88E-09	EPI			0.071114	WATER9	8.3092E-06	WATER9	7.707	EPI	1000000	EPI	0.000396	EPI
Isoxaben	82558-50-7	332.4	EPI	5.1922E-08	1.27E-09	EPI			0.039596	WATER9	4.6264E-06	WATER9	1262	EPI	1.42	EPI	0.00887	EPI
JP-7	NA																	
Kerb	23950-58-5	256.13	EPI	3.9943E-07	9.77E-09	EPI			0.04711	WATER9	5.5044E-06	WATER9	404.9	EPI	15	EPI	0.0109	EPI
Lactofen	77501-63-4	461.78	EPI	0.0000193	0.000000472	EPI			0.031803	WATER9	3.7159E-06	WATER9	23030	EPI	0.1	EPI	0.00631	EPI
Lead Compounds							3.25	CRC89	0.033366	WATER9	9.5728E-06	WATER9	1	EPI	443000	CRC89	0.0000208	EPI
~Lead acetate	301-04-2	325.29	EPI				11.3	CRC89									0.0001	RAGSE
~Lead and Compounds	7439-92-1	207.2	EPI															
~Lead subacetate	1335-32-6	805.7	EPI						0.021943	WATER9	2.5639E-06	WATER9	10.37	EPI	63000	CRC89	1.03E-10	EPI
~Tetraethyl Lead	78-00-2	323.45	EPI	23.221586	0.568	EPI	1.653	CRC89	0.02464	WATER9	6.4025E-06	WATER9	647.9	EPI	0.29	EPI	0.0137	EPI
Linuron	330-55-2	249.1	EPI	2.5552E-07	6.25E-09	EPI			0.047992	WATER9	5.6075E-06	WATER9	339.8	EPI	75	EPI	0.00839	EPI
Lithium	7439-93-2	6.94	EPI				0.534	CRC89									0.001	RAGSE
Londax	83055-99-6	410.4	EPI	1.545E-13	3.78E-15	EPI			0.034405	WATER9	4.0199E-06	WATER9	27.76	EPI	120	EPI	0.000219	EPI
MCPA	94-74-6	200.62	EPI	5.4374E-08	1.33E-09	EPI			0.055442	WATER9	6.4779E-06	WATER9	29.63	EPI	630	EPI	0.0169	EPI
MCPB	94-81-5	228.68	EPI	1.1079E-07	2.71E-09	EPI			0.050808	WATER9	5.9366E-06	WATER9	98.4	EPI	48	EPI	0.0173	EPI
MCPP	93-65-2	214.65	EPI	3.6631E-08	8.96E-10	EPI			0.052999	WATER9	6.1925E-06	WATER9	48.51	EPI	620	EPI	0.0131	EPI
Malathion	121-75-5	330.35	EPI	1.9992E-07	4.89E-09	EPI	1.2076	CRC89	0.020988	WATER9	5.2365E-06	WATER9	31.27	EPI	143	EPI	0.000812	EPI
Maleic Anhydride	108-31-6	98.06	EPI	0.0001607	0.00000393	EPI	1.314	CRC89	0.088395	WATER9	0.0000114	WATER9	1	EPI	163000	PERRY	0.00525	EPI
Maleic Hydrazide	123-33-1	112.09	EPI	1.0834E-09	2.65E-11	EPI			0.081729	WATER9	9.5494E-06	WATER9	3.303	EPI	4510	EPI	0.000102	EPI
Malononitrile	109-77-3	66.06	EPI	5.3557E-06	0.000000131	EPI	1.191	CRC89	0.115073	WATER9	0.0000136	WATER9	3.334	EPI	133000	EPI	0.000266	EPI
Mancozeb	8018-01-7	212.36	EPI	0.0000231	0.000000564	EPI			0.053379	WATER9	6.2369E-06	WATER9	607.6	EPI	1000000	EPI	0.000771	EPI
Maneb	12427-38-2	212.36	EPI	0.0000231	0.000000564	EPI			0.053379	WATER9	6.2369E-06	WATER9	607.6	EPI	1000000	EPI	0.000771	EPI
Manganese (Diet)	7439-96-5	54.94	EPI				7.3	CRC89									0.001	RAGSE
Manganese (Non-diet)	7439-96-5	54.94	EPI															
Mephosfolan	950-10-7	269.32	EPI	4.8651E-09	1.19E-10	EPI			0.045559	WATER9	5.3232E-06	WATER9	636.3	EPI	57	EPI	0.000237	EPI
Mepiquat Chloride	24307-26-4	149.67	EPI	1.762E-10	4.31E-12	EPI			0.067401	WATER9	7.8752E-06	WATER9	66.16	EPI	500000	EPI	0.00000303	EPI
Mercury Compounds																		
~Mercuric Chloride (and other Mercury salts)	7487-94-7	271.5	EPI				5.6	CRC89							69000	EPI	0.001	RAGSE
~Mercury (elemental)	7439-97-6	200.59	EPI	0.467	0.0114228	SSL	13.534	CRC89	0.0307	SSL	0.0000063	SSL			0.06	EPI	0.001	RAGSE
~Methyl Mercury	22967-92-6	215.63	EPI														0.001	RAGSE
~Phenylmercuric Acetate	62-38-4	336.74	EPI	2.314E-08	5.66E-10	EPI			0.039255	WATER9	4.5866E-06	WATER9	56.44	EPI	4370	EPI	0.0000599	EPI
Merphos	150-50-5	298.5	EPI	0.000928	0.0000227	EPI	1.02	CRC89	0.0204	WATER9	5.0288E-06	WATER9	48970	EPI	0.0009971	EPI	4.15	EPI
Merphos Oxide	78-48-8	314.5	EPI	0.000012	0.000000294	EPI	1.057	CRC89	0.02019	WATER9	4.979E-06	WATER9	2350	EPI	2.3	EPI	0.165	EPI
Metalaxyl	57837-19-1	279.34	EPI	1.2061E-07	2.95E-09	EPI			0.044463	WATER9	5.1951E-06	WATER9	38.57	EPI	8400	EPI	0.00058	EPI
Methacrylonitrile	126-98-7	67.09	EPI	0.0100981	0.000247	EPI	0.8001	CRC89	0.096431	WATER9	0.0000106	WATER9	13.05	EPI	25400	EPI	0.00186	EPI
Methamidophos	10265-92-6	141.13	EPI	3.5487E-08	8.68E-10	EPI	1.31	CRC89	0.059623	WATER9	9.1593E-06	WATER9	5.407	EPI	1000000	EPI	0.0000744	EPI
Methanol	67-56-1	32.04	EPI	0.000186	0.00000455	EPI	0.7914	CRC89	0.158281	WATER9	0.0000165	WATER9	1	EPI	1000000	EPI	0.000319	EPI
Methidathion	950-37-8	302.32	EPI	2.9313E-07	7.17E-09	EPI			0.04218	WATER9	4.9284E-06	WATER9	21.24	EPI	187	EPI	0.000913	EPI
Methomyl	16752-77-5	162.21	EPI	8.054E-10	1.97E-11	EPI	1.2946	CRC89	0.04759	WATER9	8.3658E-06	WATER9	10	EPI	58000	EPI	0.000482	EPI
Methoxy-5-nitroaniline, 2-	99-59-2	168.15	EPI	6.0098E-07	1.47E-08	EPI	1.2068	CRC89	0.043046	WATER9	7.8494E-06	WATER9	71.31	EPI	115			

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Methoxyethanol, 2-	109-86-4	76.1	EPI	0.0000135	0.00000033	EPI	0.9647	CRC89	0.095152	WATER9	0.000011	WATER9	1	EPI	1000000	EPI	0.00018	EPI
Methyl Acetate	79-20-9	74.08	EPI	0.0047016	0.000115	EPI	0.9342	CRC89	0.095776	WATER9	0.000011	WATER9	3.064	EPI	243000	EPI	0.000792	EPI
Methyl Acrylate	96-33-3	86.09	EPI	0.0081357	0.000199	EPI	0.9535	CRC89	0.085998	WATER9	0.0000102	WATER9	5.844	EPI	49400	EPI	0.00175	EPI
Methyl Ethyl Ketone (2-Butanone)	78-93-3	72.11	EPI	0.0023262	0.0000569	EPI	0.7999	CRC89	0.091444	WATER9	0.0000102	WATER9	4.51	EPI	223000	EPI	0.000962	EPI
Methyl Hydrazine	60-34-4	46.07	EPI	1.2919E-06	3.16E-08	EPI	0.866	LANGE	0.129093	WATER9	0.000014	WATER9	13.31	EPI	1000000	EPI	0.000173	EPI
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	100.16	EPI	0.0056419	0.000138	EPI	0.7965	CRC89	0.06978	WATER9	8.3477E-06	WATER9	12.6	EPI	19000	EPI	0.00319	EPI
Methyl Isocyanate	624-83-9	57.05	EPI	0.0378577	0.000926	EPI	0.9588	CRC89	0.116552	WATER9	0.0000131	WATER9	39.6	EPI	48330	EPI	0.0025	EPI
Methyl Methacrylate	80-62-6	100.12	EPI	0.0130417	0.000319	EPI	0.9377	CRC89	0.075045	WATER9	9.2087E-06	WATER9	9.14	EPI	15000	EPI	0.00355	EPI
Methyl Parathion	298-00-0	263.21	EPI	4.0883E-06	0.0000001	EPI	1.358	CRC89	0.024985	WATER9	6.4392E-06	WATER9	729.3	EPI	37.7	EPI	0.00416	EPI
Methyl Phosphonic Acid	993-13-5	96.02	EPI	4.988E-10	1.22E-11	EPI	0.90611	WATER9	0.090611	WATER9	0.0000106	WATER9	1.407	EPI	20000	EPI	0.000984	EPI
Methyl Styrene (Mixed Isomers)	25013-15-4	118.18	EPI	0.1230581	0.00301	EPI	0.78897	WATER9	0.078897	WATER9	9.2184E-06	WATER9	715.8	EPI	89	EPI	0.066	EPI
Methyl methanesulfonate	66-27-3	110.13	EPI	0.0001648	0.00000403	EPI	1.2943	CRC89	0.078906	WATER9	0.0000106	WATER9	4.332	EPI	200000	LANGE	0.000138	EPI
Methyl tert-Butyl Ether (MTBE)	1634-04-4	88.15	EPI	0.0239984	0.000587	EPI	0.7353	CRC89	0.075268	WATER9	8.5905E-06	WATER9	11.56	EPI	51000	EPI	0.00211	EPI
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	195.09	EPI	2.61E-16	6.38E-18	EPI			0.056485	WATER9	6.5998E-06	WATER9	201.5	EPI	389.71	EPI	0.00000539	EPI
Methyl-5-Nitroaniline, 2-	99-55-8	152.15	EPI	7.9313E-07	1.94E-08	EPI			0.066666	WATER9	7.7894E-06	WATER9	178.6	EPI	613.11	EPI	0.00384	EPI
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	147.09	EPI	4.988E-11	1.22E-12	EPI			0.068187	WATER9	7.967E-06	WATER9	72.02	EPI	1000000	EPI	0.0000572	EPI
Methylaniline Hydrochloride, 2-	636-21-5	143.62	EPI	0.0000809	0.00000198	EPI			0.06928	WATER9	8.0949E-06	WATER9	115	EPI	16600	EPI	0.00296	EPI
Methylarsonic acid	124-58-3	139.97	EPI						0.07048	WATER9	8.235E-06	WATER9	43.89	EPI	256000	EPI	0.0000419	EPI
Methylbenzene, 1,4-diamine monohydrochloride, 2-	74612-12-7																	
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9																	
Methylcholanthrene, 3-	56-49-5	268.36	EPI	0.0002142	0.00000524	EPI	1.28	CRC89	0.024056	WATER9	6.1428E-06	WATER9	961600	EPI	0.0029	EPI	0.903	EPI
Methylene Chloride	75-09-2	84.93	EPI	0.13287	0.00325	EPI	1.3266	CRC89	0.099939	WATER9	0.0000125	WATER9	21.73	EPI	13000	EPI	0.00354	EPI
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	267.16	EPI	4.661E-10	1.14E-11	EPI			0.045804	WATER9	5.3519E-06	WATER9	5698	EPI	13.9	EPI	0.0197	EPI
Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	254.38	EPI	4.9469E-06	0.000000121	EPI			0.047326	WATER9	5.5297E-06	WATER9	2667	EPI	5.4926	EPI	0.0843967	RAGSE
Methylenedisbenzenamine, 4,4'-	101-77-9	198.27	EPI	6.46E-10	1.58E-11	EPI			0.055879	WATER9	6.529E-06	WATER9	2126	EPI	1000	EPI	0.00138	EPI
Methylenediphenyl Diisocyanate	101-68-8	250.26	EPI	0.0000366	0.000000895	EPI	1.197	CRC89	0.024174	WATER9	6.1531E-06	WATER9	284900	EPI	1.836	EPI	0.181	EPI
Methylstyrene, Alpha-	98-83-9	118.18	EPI	0.1042518	0.00255	EPI	0.9106	CRC89	0.062902	WATER9	8.1911E-06	WATER9	697.8	EPI	116	EPI	0.0699	EPI
Metolachlor	51218-45-2	283.8	EPI	3.6795E-07	0.000000009	EPI	1.12	CRC89	0.021922	WATER9	5.4827E-06	WATER9	488.5	EPI	530	EPI	0.00339	EPI
Metribuzin	21087-64-9	214.29	EPI	4.7833E-09	1.17E-10	EPI	1.31	CRC89	0.02734	WATER9	7.1291E-06	WATER9	53.13	EPI	1050	EPI	0.00132	EPI
Mineral oils	8012-95-1	170.34	EPI	334.42355	8.18	EPI			0.061831	WATER9	7.2245E-06	WATER9	4818	EPI	0.0037	EPI	1.96	EPI
Mirex	2385-85-5	545.55	EPI	0.0331562	0.000811	EPI			0.028458	WATER9	3.325E-06	WATER9	356600	EPI	0.085	EPI	0.0516	EPI
Molinate	2212-67-1	187.3	EPI	0.0001676	0.0000041	EPI	1.063	CRC89	0.031561	WATER9	6.8182E-06	WATER9	181.9	EPI	970	EPI	0.0189	EPI
Molybdenum	7439-98-7	95.94	EPI				10.2	CRC89									0.001	RAGSE
Monochloramine	10599-90-3	51.48	EPI						0.0721	WATER9	9.1284E-06	WATER9	82.08	EPI	5620	EPI	0.00498	EPI
Monomethylaniline	100-61-8	107.16	EPI	0.000363	0.00000888	EPI	0.9891	CRC89	0.046601	WATER9	5.4449E-06	WATER9	51890	EPI	1.5867	EPI	0.0262	EPI
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	260.34	EPI	8.381E-09	2.05E-10	EPI			0.024567	WATER9	0.00000643	WATER9	126.7	EPI	1.5	EPI	0.0000944	EPI
Naled	300-76-5	380.79	EPI	0.0026615	0.0000651	EPI	1.96	CRC89										
Naphtha, High Flash Aromatic (HFAN)	64724-95-6																	
Naphthylamine, 2-	91-59-8	143.19	EPI	3.3115E-06	0.000000081	EPI	1.6414	CRC89	0.064451	WATER9	0.0000104	WATER9	2478	EPI	189	EPI	0.00807	EPI
Napropamide	15299-99-7	271.36	EPI	3.4383E-08	8.41E-10	EPI			0.04533	WATER9	5.2965E-06	WATER9	3218	EPI	73	EPI	0.00804	EPI
Nickel Carbonyl	13463-39-3	170.73	CRC89				1.31	CRC89							180	PERRY	0.001	RAGSE
Nickel Oxide	1313-99-1	74.69	EPI				6.72	CRC89									0.001	RAGSE
Nickel Refinery Dust	NA																0.0002	RAGSE
Nickel Soluble Salts	7440-02-0	58.69	EPI				8.9	CRC89									0.0002	RAGSE
Nickel Subulfide	12035-72-2	240.21	CRC89				5.87	CRC89									0.0002	RAGSE
Nitrate	14797-55-8	62	EPI														0.001	RAGSE
Nitrate + Nitrite (as N)	NA																0.001	RAGSE
Nitrite	14797-65-0	47.01	EPI														0.001	RAGSE
Nitroaniline, 2-	88-74-4	138.13	EPI	2.4121E-06	0.000000059	EPI	0.9015	CRC89	0.051919	WATER9	7.4144E-06	WATER9	111.3	EPI	1470	EPI	0.00446	EPI
Nitroaniline, 4-	100-01-6	138.13	EPI	5.1513E-08	1.26E-09	EPI	1.424	CRC89	0.06366	WATER9	9.7545E-06	WATER9	109.1	EPI	728	EPI	0.00221	EPI
Nitrobenzene	98-95-3	123.11	EPI	0.0009812	0.000024	EPI	1.2037	CRC89	0.068054	WATER9	9.4495E-06	WATER9	226.4	EPI	2090	EPI	0.00541	EPI
Nitrocellulose	9004-70-0	387.3	EPI	1.345E-21	3.29E-23	EPI			0.035759	WATER9	4.1782E-06	WATER9	10	EPI	1000000	EPI	9.86E-09	EPI
Nitrofurantoin	67-20-9	238.16	EPI	5.437E-11	1.33E-12	EPI			0.049451	WATER9	5.7779E-06	WATER9	116.8	EPI	79.5	EPI	0.0000352	EPI
Nitrofurazone	59-87-0	198.14	EPI	1.267E-11	3.1E-13	EPI			0.055904	WATER9	6.5319E-06	WATER9	349.7	EPI	210	EPI	0.000172	EPI
Nitroglycerin	55-63-0	227.09	EPI	3.5405E-06	8.66E-08	EPI	1.5931	CRC89	0.029015	WATER9	7.7428E-06	WATER9	115.8	EPI	1380	EPI	0.000994	EPI
Nitroguanidine	556-88-7	104.07	EPI	1.836E-10	4.49E-12	EPI			0.085876	WATER9	0.00001	WATER9	20.65	EPI	4400	EPI	0.000105	EPI
Nitromethane	75-52-5	61.04	EPI	0.0011693	0.0000286	EPI	1.1371	CRC89	0.119285	WATER9	0.0000139	WATER9	10.32	EPI	111000	EPI	0.000417	EPI
Nitropropane, 2-	79-46-9	89.09	EPI	0.0048651	0.000119	EPI	0.9821	CRC89	0.084697	WATER9	0.0000102	WATER9	30.8	EPI	17000	EPI	0.00206	EPI
Nitroso-N-ethylurea, N-	759-73-9	117.11	EPI	5.3966E-09	1.32E-10	EPI			0.079376	WATER9	9.2745E-06	WATER9	20.98	EPI	13000	EPI	0.00049	EPI
Nitroso-N-methylurea, N-	684-93-5	103.08	EPI	4.0515E-09	9.91E-11	EPI			0.086425	WATER9	0.0000101	WATER9	11	EPI	14400	EPI	0.000395	EPI
Nitroso-di-N-butylamine, N-	924-16-3	158.25	EPI	0.0005397	0.0000132	EPI			0.064942	WATER9	7.5879E-06	WATER9	914.6	EPI	1270	EPI	0.0113	EPI
Nitroso-di-N-propylamine, N-	621-64-7	130.19	EPI	0.00022	0.00000538	EPI	0.9163	CRC89	0.05644	WATER9	7.758E-06	WATER9	275.4	EPI	13000	EPI	0.00233	EPI
Nitrosodiethanolamine, N-	1116-54-7	134.14	EPI	9.321E-15	2.28E-16	EPI			0.072507	WATER9	8.4719E-06	WATER9	1	EPI	1000000	EPI	0.0000247	RAGSE
Nitrosodiethylamine, N-	55-18-5	102.14	EPI	0.0001484	0.00000363	EPI	0.9422	CRC89	0.073841	WATER9	9.1252E-06	WATER9	82.92	EPI	106000	EPI	0.000872	EPI
Nitrosodimethylamine, N-	62-75-9	74.08	EPI	0.0000744	0.00000182	EPI	1.0048	CRC89	0.09877	WATER9	0.0000115	WATER9	22.79	EPI	1000000	EPI	0.000251	EPI
Nitrosodiphenylamine, N-	86-30-6	198.23	EPI	0.000205	5.0143E-06	SSL			0.055887	WATER9	6.5299E-06	WATER9	2632	EPI	35	EPI	0.0145	EPI
Nitrosomethylthylamine, N-	10595-95-6	88.11	EPI	0.0000589	0.00000144	EPI			0.095956	WATER9	0.0000112	WATER9	43.47	EPI	300000	EPI	0.000533	EPI

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm·m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.0000199	EPI
Nitrotoluene, o-	88-72-2	137.14	EPI	0.000511	0.0000125	EPI	1.1611	CRC89	0.058754	WATER9	8.6675E-06	WATER9	370.6	EPI	650	EPI	0.00899	EPI
Nitrotoluene, p-	99-99-0	137.14	EPI	0.0002302	0.00000563	EPI	1.1038	CRC89	0.057443	WATER9	8.4083E-06	WATER9	363.2	EPI	442	EPI	0.01	EPI
Nonane, n-	111-84-2	128.26	EPI	139.00245	3.4	EPI	0.7192	CRC89	0.051432	WATER9	6.769E-06	WATER9	796	EPI	0.22	EPI	1.7	EPI
Norflurazon	27314-13-2	303.67	EPI	1.4023E-08	3.43E-10	EPI			0.042055	WATER9	4.9138E-06	WATER9	3118	EPI	33.7	EPI	0.00105	EPI
Nustar	85509-19-9	315.4	EPI	0.0000207	0.000000506	EPI			0.041006	WATER9	4.7912E-06	WATER9	81060	EPI	54	EPI	0.00766	EPI
Octabromodiphenyl Ether	32536-52-0	801.38	EPI	0.0000105	0.000000256	EPI			0.022022	WATER9	2.5731E-06	WATER9	98980	EPI	0.0000743	EPI	0.0306	EPI
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	296.16	EPI	3.5446E-08	8.67E-10	EPI			0.042763	WATER9	4.9965E-06	WATER9	531.6	EPI	5	EPI	0.0000436	EPI
Octamethylpyrophosphoramide	152-16-9	286.25	EPI	2.58E-15	6.31E-17	EPI	1.09	CRC89	0.02154	WATER9	5.3664E-06	WATER9	20.12	EPI	1000000	EPI	0.0000083	EPI
Oxazalin	19044-88-3	346.36	EPI	7.8087E-08	1.91E-09	EPI			0.038524	WATER9	4.5013E-06	WATER9	825.4	EPI	2.5	EPI	0.00537	EPI
Oxadiazon	19666-30-9	345.23	EPI	2.9722E-06	7.27E-08	EPI			0.038608	WATER9	4.5111E-06	WATER9	4996	EPI	0.7	EPI	0.028	EPI
Oxamyl	23135-22-0	219.26	EPI	9.6893E-09	2.37E-10	EPI	0.97	CRC89	0.02347	WATER9	5.8716E-06	WATER9	10	EPI	280000	EPI	0.0000449	EPI
Paclobutrazol	76738-62-0	293.8	EPI	3.3851E-09	8.28E-11	EPI	1.22	CRC89	0.022428	WATER9	5.6527E-06	WATER9	922.9	EPI	26	EPI	0.00471	EPI
Paraquat Dichloride	1910-42-5	257.16	EPI	1.316E-11	3.22E-13	EPI			0.046984	WATER9	5.4897E-06	WATER9	6780	EPI	700000	EPI	5.77E-08	EPI
Parathion	56-38-2	291.26	EPI	0.0000122	0.000000298	EPI	1.2681	CRC89	0.022949	WATER9	5.8156E-06	WATER9	2422	EPI	11	EPI	0.0128	EPI
Pebulate	1114-71-2	203.35	EPI	0.0096893	0.000237	EPI	0.9458	CRC89	0.024144	WATER9	6.0507E-06	WATER9	299.1	EPI	100	EPI	0.0397	EPI
Pendimethalin	40487-42-1	281.31	EPI	0.000035	0.000000856	EPI	1.19	CRC89	0.022673	WATER9	5.716E-06	WATER9	5615	EPI	0.3	EPI	0.115	EPI
Pentabromodiphenyl Ether	32534-81-9	564.69	EPI	0.0001447	0.00000354	EPI			0.027811	WATER9	3.2495E-06	WATER9	21660	EPI	0.0000009	EPI	0.0373	EPI
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	564.69	EPI	0.0001447	0.00000354	EPI	2.28	IRIS	0.027811	WATER9	3.2495E-06	WATER9	21660	EPI	0.0000009	EPI	0.0373	EPI
Pentachlorobenzene	608-93-5	250.34	EPI	0.0287408	0.000703	EPI	1.8342	CRC89	0.029433	WATER9	7.9473E-06	WATER9	3708	EPI	0.831	EPI	0.168	EPI
Pentachloroethane	76-01-7	202.3	EPI															

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H' (unitless)	HLC (atm-m ³ /mole)	H' and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI												
~Trimagnesium phosphate	7757-87-1	262.86	CRC89						0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
~Tripotassium phosphate	7778-53-2	212.27	EPI														0.001	RAGSE
~Trisodium phosphate	7601-54-9	163.94	EPI														0.001	RAGSE
Phosphine	7803-51-2	34	EPI				1.39	CRC89							3.3	EPI	0.001	RAGSE
Phosphoric Acid	7664-38-2	98	EPI				1.834	PERRY							5480000	CRC89	0.001	RAGSE
Phosphorus, White	7723-14-0	30.974	CRC89				2.69	CRC89							3.3	EPI	0.001	RAGSE
Phthalates																		
~Bis(2-ethylhexyl)phthalate	117-81-7	390.57	EPI	0.000011	0.00000027	EPI	0.981	CRC89	0.01734	WATER9	4.1807E-06	WATER9	119600	EPI	0.27	EPI	1.13	EPI
~Butylphthalyl Butylglycolate	85-70-1	336.39	EPI	1.2592E-07	3.08E-09	EPI	1.1	LANGE	0.019866	WATER9	4.8978E-06	WATER9	11240	EPI	8.4709	EPI	0.0116	EPI
~Dibutyl Phthalate	84-74-2	278.35	EPI	0.000074	0.00000181	EPI	1.0465	CRC89	0.021436	WATER9	5.3255E-06	WATER9	1157	EPI	11.2	EPI	0.042	EPI
~Diethyl Phthalate	84-66-2	222.24	EPI	0.0000249	0.00000061	EPI	1.232	CRC89	0.026074	WATER9	6.7227E-06	WATER9	104.9	EPI	1080	EPI	0.0036	EPI
~Dimethylterephthalate	120-61-6	194.19	EPI	0.0054783	0.000134	EPI	1.075	CRC89	0.028533	WATER9	6.7171E-06	WATER9	30.96	EPI	19	EPI	0.00399	EPI
~Octyl Phthalate, di-N-	117-84-0	390.57	EPI	0.0001051	0.00000257	EPI			0.035559	WATER9	4.1548E-06	WATER9	140800	EPI	0.022	EPI	2.43	EPI
~Phthalic Acid, P-	100-21-0	166.13	EPI	1.586E-11	3.88E-13	EPI	1.51	PERRY	0.048723	WATER9	9.0446E-06	WATER9	79.24	EPI	15	EPI	0.00391	EPI
~Phthalic Anhydride	85-44-9	148.12	EPI	6.6639E-07	1.63E-08	EPI	1.527	CRC89	0.05948	WATER9	9.7545E-06	WATER9	10	EPI	6200	EPI	0.00267	EPI
Picloram	1918-02-1	241.46	EPI	2.179E-12	5.33E-14	EPI			0.048999	WATER9	5.7252E-06	WATER9	38.77	EPI	430	EPI	0.00127	EPI
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	199.12	EPI	7.604E-13	1.86E-14	EPI			0.05572	WATER9	6.5104E-06	WATER9	226.5	EPI	1400	EPI	0.000496	EPI
Pirimiphos, Methyl	29232-93-7	305.33	EPI	0.0000287	0.000000701	EPI	1.17	CRC89	0.021542	WATER9	5.3867E-06	WATER9	374.7	EPI	8.6	EPI	0.0187	EPI
Polybrominated Biphenyls	59536-65-1																	
Polychlorinated Biphenyls (PCBs)																		
~Aroclor 1016	12674-11-2	257.55	EPI	0.0081766	0.0002	EPI			0.046937	WATER9	5.4842E-06	WATER9	47700	EPI	0.42	EPI	0.305	EPI
~Aroclor 1221	11104-28-2	188.66	EPI	0.0300899	0.000736	EPI			0.057761	WATER9	6.7489E-06	WATER9	8397	EPI	15	EPI	0.168	EPI
~Aroclor 1232	11141-16-5	188.66	EPI	0.0300899	0.000736	EPI			0.057761	WATER9	6.7489E-06	WATER9	8397	EPI	1.45	EPI	0.188	EPI
~Aroclor 1242	53469-21-9	291.99	EPI	0.0077678	0.00019	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.277	EPI	0.545	EPI
~Aroclor 1248	12672-29-6	291.99	EPI	0.0179886	0.00044	EPI			0.043169	WATER9	5.044E-06	WATER9	76530	EPI	0.1	EPI	0.475	EPI
~Aroclor 1254	11097-69-1	326.44	EPI	0.0115699	0.000283	EPI			0.040076	WATER9	4.6826E-06	WATER9	130500	EPI	0.043	EPI	0.751	EPI
~Aroclor 1260	11096-82-5	395.33	EPI	0.0137367	0.000336	EPI			0.035273	WATER9	4.1214E-06	WATER9	349700	EPI	0.0144	EPI	0.986	EPI
~Aroclor 5460	11126-42-4	291.99	EPI	0.00912	0.000223	EPI			0.043169	WATER9	5.044E-06	WATER9	81320	EPI	0.146	EPI	0.584	EPI
~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	395.33	EPI	0.0056419	0.000138	EPI			0.035273	WATER9	4.1214E-06	WATER9	349700	EPI	0.000753	EPI	2.96	EPI
~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	360.88	EPI	0.0066231	0.000162	EPI			0.037484	WATER9	4.3797E-06	WATER9	209300	EPI	0.00223	EPI	1.43	EPI
~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	360.88	EPI	0.0066231	0.000162	EPI			0.037484	WATER9	4.3797E-06	WATER9	213600	EPI	0.0016469	EPI	1.66	EPI
~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 156)	38380-08-4	360.88	EPI	0.0058463	0.000143	EPI			0.037484	WATER9	4.3797E-06	WATER9	213600	EPI	0.00533	EPI	1.66	EPI
~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	360.88	EPI	0.0066231	0.000162	EPI			0.037484	WATER9	4.3797E-06	WATER9	209300	EPI	0.00051	EPI	1.24	EPI
~Pentachlorobiphenyl, 2',3,4,4',5'- (PCB 123)	65510-44-3	326.44	EPI	0.0077678	0.00019	EPI			0.040076	WATER9	4.6826E-06	WATER9	130500	EPI	0.016	EPI	1	EPI
~Pentachlorobiphenyl, 2,3',4,4',5'- (PCB 118)	31508-00-6	326.44	EPI	0.0117743	0.000288	EPI			0.040076	WATER9	4.6826E-06	WATER9	127900	EPI	0.0134	EPI	1.24	EPI
~Pentachlorobiphenyl, 2,3,3',4,4',5'- (PCB 105)	32598-14-4	326.44	EPI	0.0115699	0.000283	EPI			0.040076	WATER9	4.6826E-06	WATER9	130500	EPI	0.0034	EPI	0.751	EPI
~Pentachlorobiphenyl, 2,3,4,4',5'- (PCB 114)	74472-37-0	326.44	EPI	0.0077678	0.00019	EPI			0.040076	WATER9	4.6826E-06	WATER9	130500	EPI	0.016	EPI	1	EPI
~Pentachlorobiphenyl, 3,3',4,4',5'- (PCB 126)	57465-28-8	326.44	EPI	0.0077678	0.00019	EPI			0.040076	WATER9	4.6826E-06	WATER9	127900	EPI	0.0073282	EPI	1	EPI
~Polychlorinated Biphenyls (high risk)	1336-36-3	291.99	EPI	0.0077678	0.00019	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.7	SSL	0.545	EPI
~Polychlorinated Biphenyls (low risk)	1336-36-3	291.99	EPI	0.0077678	0.00019	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.7	SSL	0.545	EPI
~Polychlorinated Biphenyls (lowest risk)	1336-36-3	291.99	EPI	0.0077678	0.00019	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.7	SSL	0.545	EPI
~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	291.99	EPI	0.0003843	0.0000094	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.000569	EPI	0.917	EPI
~Tetrachlorobiphenyl, 3,4,4',5'- (PCB 81)	70362-50-4	291.99	EPI	0.0091169	0.000223	EPI			0.043169	WATER9	5.044E-06	WATER9	78100	EPI	0.032245	EPI	0.584	EPI
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	512.53	EPI	5.397E-10	1.32E-11	EPI			0.029667	WATER9	3.4664E-06	WATER9	1000000000	EPI	1.763E-06	EPI	18.6	EPI
Polynuclear Aromatic Hydrocarbons (PAHs)																		
~Acenaphthene	83-32-9	154.21	EPI	0.0075225	0.000184	EPI	1.222	CRC89	0.050614	WATER9	0.00000833	WATER9	5027	EPI	3.9	EPI	0.086	EPI
~Anthracene	120-12-7	178.24	EPI	0.0022731	0.0000556	EPI	1.28	CRC89	0.038973	WATER9	7.8523E-06	WATER9	16360	EPI	0.0434	EPI	0.142	EPI
~Benz[a]anthracene	56-55-3	228.3	EPI	0.0004906	0.000012	EPI			0.050865	WATER9	5.9431E-06	WATER9	176900	EPI	0.0094	EPI	0.552	EPI
~Benzo[j]fluoranthene	205-82-3	252.32	EPI	8.2993E-06	0.000000203	EPI			0.047583	WATER9	5.5597E-06	WATER9	599400	EPI	0.0025	EPI	0.69	EPI
~Benzo[a]pyrene	50-32-8	252.32	EPI	0.0000187	0.000000457	EPI			0.047583	WATER9	5.5597E-06	WATER9	587400	EPI	0.00162	EPI	0.713	EPI
~Benzo[b]fluoranthene	205-99-2	252.32	EPI	0.0000269	0.000000657	EPI			0.047583	WATER9	5.5597E-06	WATER9	599400	EPI	0.0015	EPI	0.417	EPI
~Benzo[k]fluoranthene	207-08-9	252.32	EPI	0.0000239	0.000000584	EPI			0.047583	WATER9	5.5597E-06	WATER9	587400	EPI	0.0008	EPI	0.691	EPI
~Chloronaphthalene, Beta-	91-58-7	162.62	EPI	0.0130826	0.00032	EPI	1.1377	CRC89	0.044691	WATER9	7.7301E-06	WATER9	2478	EPI	11.7	EPI	0.0749	EPI
~Chrysene	218-01-9	228.3	EPI	0.0002138	0.00000523	EPI	1.274	CRC89	0.026114	WATER9	6.7495E-06	WATER9	180500	EPI	0.002	EPI	0.596	EPI
~Dibenz[a,h]anthracene	53-70-3	278.36	EPI	5.7645E-06	0.000000141	EPI			0.044567	WATER9	5.2073E-06	WATER9	1912000	EPI	0.00249	EPI	0.953	EPI
~Dibenz[a,e]pyrene	192-65-4	302.38	EPI	5.7645E-07	1.41E-08	EPI			0.042175	WATER9	4.9278E-06	WATER9	6479000	EPI	0.0000425	EPI	4.19	EPI
~Dimethylbenz[a]anthracene, 7,12-	57-97-6	256.35	EPI	0.0001537	0.00000376	EPI			0.047083	WATER9	5.5013E-06	WATER9	493600	EPI	0.061	EPI	0.408	EPI
~Fluoranthene	206-44-0	202.26	EPI	0.0003622	0.00000886	EPI	1.252	CRC89	0.027596	WATER9	7.1827E-06	WATER9	55450	EPI	0.26	EPI	0.308	EPI
~Fluorene	86-73-7	166.22	EPI	0.003933	0.0000962	EPI	1.203	CRC89	0.043974	WATER9	7.889E-06	WATER9	9160	EPI	1.69	EPI	0.11	EPI
~Indeno[1,2,3-cd]pyrene	193-39-5	276.34	EPI	0.0000656	1.6046E-06	SSL			0.044784	WATER9	5.2327E-06	WATER9	3470000	SSL	0.000022	SSL	1.0408205	RAGSE
~Methylnaphthalene, 1-	90-12-0	142.2	EPI	0.0210139	0.000514	EPI	1.0202	CRC89	0.052771	WATER9	7.8477E-06	WATER9	2528	EPI	25.8	EPI	0.0931	EPI
~Methylnaphthalene, 2-	91-57-6	142.2	EPI	0.0211774	0.000518	EPI	1.0058	CRC89	0.052432	WATER9	7.7811E-06	WATER9	2478	EPI	24.6	EPI	0.0917	EPI
~Naphthalene	91-20-3	128.18	EPI	0.0179886	0.00044	EPI	1.0253	CRC89	0.060499	WATER9	8.377E-06	WATER9	1544	EPI	31	EPI	0.0466	EPI
~Nitropyrene, 4-	57835-92-4	247.26	EPI	1.0016E-06	2.45E-08	EPI			0.04823	WATER9	5.6353E-06	WATER9	86110	EPI	0.044505	EPI	0.0922	EPI
~Pyrene	129-00-0	202.26	EPI	0.0004865	0.00000119	EPI	1.271	CRC89	0.027787	WATER9	7.2479E-06	WATER9	54340	EPI	0.135	EPI	0.201	EPI
Prochloraz	67747-09-5																	

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Propargite	2312-35-8	350.48	EPI	0.0000262	0.00000064	EPI	1.1	CRC89	0.01944	WATER9	4.7787E-06	WATER9	36650	EPI	0.215	EPI	0.0356	EPI
Propargyl Alcohol	107-19-7	56.06	EPI	0.000047	0.0000115	EPI	0.9478	CRC89	0.117395	WATER9	0.0000131	WATER9	1.904	EPI	1000000	EPI	0.000424	EPI
Propazine	139-40-2	229.71	EPI	1.8806E-07	4.6E-09	EPI	1.162	CRC89	0.024935	WATER9	6.3634E-06	WATER9	344.1	EPI	8.6	EPI	0.00713	EPI
Propam	122-42-9	179.22	EPI	7.5225E-06	0.000000184	EPI	1.09	CRC89	0.03575	WATER9	7.1072E-06	WATER9	218.6	EPI	179	EPI	0.00826	EPI
Propiconazole	60207-90-1	342.23	EPI	7.0319E-08	1.72E-09	EPI	1.27	CRC89	0.021111	WATER9	5.284E-06	WATER9	1556	EPI	110	EPI	0.00558	EPI
Propionaldehyde	123-38-6	58.08	EPI	0.0030008	0.0000734	EPI	0.8657	CRC89	0.110378	WATER9	0.0000122	WATER9	1	EPI	306000	EPI	0.00182	EPI
Propyl benzene	103-65-1	120.2	EPI	0.4292723	0.0105	EPI	0.8593	CRC89	0.060156	WATER9	7.831E-06	WATER9	813.1	EPI	52.2	EPI	0.0939	EPI
Propylene	115-07-1	42.08	EPI	8.0130826	0.196	EPI	0.505	CRC89	0.109699	WATER9	0.0000107	WATER9	21.73	EPI	200	EPI	0.0136	EPI
Propylene Glycol	57-55-6	76.1	EPI	5.2739E-07	1.29E-08	EPI	1.0361	CRC89	0.098065	WATER9	0.0000115	WATER9	1	EPI	1000000	EPI	0.000143	EPI
Propylene Glycol Dinitrate	6423-43-4	166.09	EPI	0.0000385	0.000000942	EPI			0.062882	WATER9	7.3472E-06	WATER9	60.7	EPI	3261.9	EPI	0.00208	EPI
Propylene Glycol Monoethyl Ether	1569-02-4	104.15	EPI	1.0016E-06	2.45E-08	EPI			0.058532	WATER9	0.00001	WATER9	1.303	EPI	789970	EPI	0.000409	EPI
Propylene Glycol Monomethyl Ether	107-98-2	90.12	EPI	0.0000376	0.000000092	EPI	0.962	CRC89	0.083147	WATER9	9.9606E-06	WATER9	1	EPI	1000000	EPI	0.0003717	RAGSE
Propylene Oxide	75-56-9	58.08	EPI	0.0028455	0.0000696	EPI	0.831	PERRY	0.108512	WATER9	0.0000119	WATER9	5.194	EPI	590000	EPI	0.000774	EPI
Pursuit	81335-77-5	289.34	EPI	4.252E-15	1.04E-16	EPI			0.043433	WATER9	5.0747E-06	WATER9	339.1	EPI	1400	EPI	0.002	EPI
Pydrin	51630-58-1	419.91	EPI	1.4105E-06	3.45E-08	EPI	1.15	CRC89	0.018059	WATER9	4.4035E-06	WATER9	317000	EPI	0.024	EPI	0.0938	EPI
Pyridine	110-86-1	79.1	EPI	0.0004497	0.000011	EPI	0.9819	CRC89	0.09309	WATER9	0.0000109	WATER9	71.72	EPI	1000000	EPI	0.00152	EPI
Quinalphos	13593-03-8	298.3	EPI	1.897E-06	4.64E-08	EPI			0.042558	WATER9	4.9726E-06	WATER9	4185	EPI	22	EPI	0.0296	EPI
Quinoline	91-22-5	129.16	EPI	0.0000683	0.00000167	EPI	1.0977	CRC89	0.0618	WATER9	8.6873E-06	WATER9	1544	EPI	6110	EPI	0.00659	EPI
Refractory Ceramic Fibers	NA																	
Resmethrin	10453-86-8	338.45	EPI	5.4374E-06	0.000000133	EPI			0.039122	WATER9	4.5711E-06	WATER9	311400	EPI	0.0379	EPI	0.001	RAGSE
Ronnel	299-84-3	321.54	EPI	0.0013083	0.000032	EPI	1.44	CRC89	0.023158	WATER9	5.9149E-06	WATER9	4457	EPI	1	EPI	0.043	EPI
Rotenone	83-79-4	394.43	EPI	4.579E-12	1.12E-13	EPI			0.035327	WATER9	4.1277E-06	WATER9	261100	EPI	0.2	EPI	0.00509	EPI
Safrole	94-59-7	162.19	EPI	0.0003708	0.00000907	EPI	1.1	CRC89	0.044227	WATER9	7.5874E-06	WATER9	207.2	EPI	5.8996	EPI	0.011285	RAGSE
Savey	78587-05-0	352.88	EPI	9.6893E-07	2.37E-08	EPI			0.038048	WATER9	4.4456E-06	WATER9	2120	EPI	0.5	EPI	0.0828	EPI
Selenious Acid	7783-00-8	128.97	EPI				3	CRC89							900000	PERRY	0.001	RAGSE
Selenium	7782-49-2	78.96	CRC89				4.809	CRC89									0.001	RAGSE
Selenium Sulfide	7446-34-6	111.02	EPI														0.001	RAGSE
Sethoxydim	74051-80-2	327.49	EPI	8.831E-10	2.16E-11	EPI	1.043	CRC89	0.019633	WATER9	4.8208E-06	WATER9	4374	EPI	25	EPI	0.0185	EPI
Silica (crystalline, respirable)	7631-86-9	60.08	EPI				2.32	PERRY									0.001	RAGSE
Silver	7440-22-4	107.87	EPI				10.5	CRC89									0.0006	RAGSE
Simazine	122-34-9	201.66	EPI	3.8512E-08	9.42E-10	EPI	1.302	CRC89	0.028139	WATER9	7.3666E-06	WATER9	146.5	EPI	6.2	EPI	0.00325	EPI
Sodium Acifluorfen	62476-59-9	383.65	EPI	2.4734E-09	6.05E-11	EPI			0.035986	WATER9	4.2046E-06	WATER9	3880	EPI	250000	EPI	0.000195	EPI
Sodium Azide	26628-22-8	65.01	EPI				1.846	CRC89									0.001	RAGSE
Sodium Diethyldithiocarbamate	148-18-5	171.25	EPI				2.78	CRC89	0.061612	WATER9	7.1989E-06	WATER9	204.5	EPI	408000	CRC89	0.000192	EPI
Sodium Fluoride	7681-49-4	41.99	EPI												427890	EPI	0.001	RAGSE
Sodium Fluoroacetate	62-74-8	100.03	EPI	0.0000446	0.00000109	EPI			0.088173	WATER9	0.0000103	WATER9	1.44	EPI	1110000	EPI	0.00000132	EPI
Sodium Metavanadate	13718-26-8	121.93	CRC89												210000	CRC89	0.001	RAGSE
Stirofos (Tetrachlorovinphos)	961-11-5	365.97	EPI	7.5225E-08	1.84E-09	EPI			0.037136	WATER9	4.339E-06	WATER9	1375	EPI	11	EPI	0.00307	EPI
Strontium, Stable	7440-24-6	87.62	EPI				2.64	CRC89									0.001	RAGSE
Strychnine	57-24-9	334.42	EPI	2.437E-12	5.96E-14	EPI	1.36	CRC89	0.022082	WATER9	5.5824E-06	WATER9	5403	EPI	160	EPI	0.000399	EPI
Styrene	100-42-5	104.15	EPI	0.1124285	0.00275	EPI	0.9016	CRC89	0.071114	WATER9	8.7838E-06	WATER9	446.1	EPI	310	EPI	0.0372	EPI
Sulfolane	126-33-0	120.17	EPI	0.000198	0.000000485	EPI	1.2723	CRC89	0.0716	WATER9	9.9117E-06	WATER9	9.079	EPI	292860	EPI	0.000102	EPI
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	287.16	EPI	5.601E-06	0.000000137	EPI			0.043652	WATER9	5.1004E-06	WATER9	2855	EPI	0.51209	EPI	0.0149	EPI
Sulfuric Acid	7664-93-9	98.07	EPI				1.8302	CRC89							1000000	EPI	0.001	RAGSE
Systhane	88671-89-0	288.78	EPI	1.7498E-07	4.28E-09	EPI			0.043489	WATER9	5.0813E-06	WATER9	6075	EPI	142	EPI	0.00337	EPI
TCMTB	21564-17-0	238.34	EPI	2.653E-10	6.49E-12	EPI			0.049426	WATER9	5.775E-06	WATER9	3374	EPI	125	EPI	0.0112	EPI
Tebuthiuron	34014-18-1	228.31	EPI	4.906E-09	1.2E-10	EPI			0.050863	WATER9	5.943E-06	WATER9	42.35	EPI	2500	EPI	0.00127	EPI
Temephos	3383-96-8	466.46	EPI	8.0131E-08	1.96E-09	EPI	1.32	CRC89	0.018295	WATER9	4.4908E-06	WATER9	95060	EPI	0.27	EPI	0.0345	EPI
Terbacil	5902-51-2	216.67	EPI	4.906E-09	1.2E-10	EPI	1.34	CRC89	0.027468	WATER9	7.1789E-06	WATER9	50.1	EPI	710	EPI	0.00172	EPI
Terbufos	13071-79-9	288.42	EPI	0.0009812	0.000024	EPI	1.105	CRC89	0.021596	WATER9	5.3861E-06	WATER9	998.9	EPI	5.07	EPI	0.0358	EPI
Terbutryn	886-50-0	241.36	EPI	8.7899E-07	2.15E-08	EPI	1.115	CRC89	0.023826	WATER9	6.0261E-06	WATER9	607	EPI	25	EPI	0.0212	EPI
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	485.8	EPI	0.0003467	0.00000848	EPI			0.030746	WATER9	3.5924E-06	WATER9	13230	EPI	0.054234	EPI	0.0929	EPI
Tetrachlorobenzene, 1,2,4,5-	95-94-3	215.89	EPI	0.0408831	0.001	EPI	1.858	CRC89	0.031896	WATER9	8.7531E-06	WATER9	2220	EPI	0.595	EPI	0.117	EPI
Tetrachloroethane, 1,1,1,2-	630-20-6	167.85	EPI	0.1022077	0.0025	EPI	1.5406	CRC89	0.048176	WATER9	9.0977E-06	WATER9	86.03	EPI	1070	EPI	0.0159	EPI
Tetrachloroethane, 1,1,2,2-	79-34-5	167.85	EPI	0.0150041	0.000367	EPI	1.5953	CRC89	0.048921	WATER9	9.2902E-06	WATER9	94.94	EPI	2830	EPI	0.00694	EPI
Tetrachloroethylene	127-18-4	165.83	EPI	0.7236304	0.0177	EPI	1.623	CRC89	0.050466	WATER9	9.4551E-06	WATER9	94.94	EPI	206	EPI	0.0334	EPI
Tetrachlorophenol, 2,3,4,6-	58-90-2	231.89	EPI	0.0003614	0.00000884	EPI			0.050338	WATER9	5.8816E-06	WATER9	2969	EPI	23	EPI	0.071	EPI
Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	229.92	EPI	0.0078904	0.000193	EPI	1.4463	CRC89	0.027587	WATER9	7.2524E-06	WATER9	1606	EPI	6.1149	EPI	0.0836	EPI
Tetraethyl Dithiopyrophosphate	3689-24-5	322.31	EPI	0.0001819	0.00000445	EPI	1.196	CRC89	0.021162	WATER9	5.2838E-06	WATER9	265.6	EPI	30	EPI	0.0109	EPI
Tetrafluoroethane, 1,1,1,2-	811-97-2	102.03	EPI	2.0441537	0.05	EPI	1.2072	CRC89	0.082307	WATER9	0.0000106	WATER9	86.03	EPI	1089.7	EPI	0.00548	EPI
Tetryl (Trinitrophenylmethylnitramine)	479-45-8	287.15	EPI	1.1079E-07	2.71E-09	EPI	1.57	CRC89	0.025563	WATER9	6.6672E-06	WATER9	4605	EPI	74	EPI	0.000474	EPI
Thallium (I) Nitrate	10102-45-1	266.39	EPI				5.55	CRC89							95500	EPI	0.001	RAGSE
Thallium (Soluble Salts)	7440-28-0	204.38	EPI				11.8	CRC89									0.001	RAGSE
Thallium Acetate	563-68-8	263.43	EPI				3.68	CRC89							10000	EPI	0.001	RAGSE
Thallium Carbonate	6533-73-9	468.78	EPI				7.11	CRC89							52000	EPI	0.001	RAGSE
Thallium Chloride	7791-12-0	239.84	EPI				7	CRC89							2900	EPI	0.001	RAGSE
Thallium Sulfate	7446-18-6	504.82	EPI				6.77	CRC89							54700	CRC89	0.001	RAGSE
Thiobencarb	28249-77-6	257.78	EPI	0.0000109	0.000000267	EPI	1.16	CRC89	0.02345	WATER9	5.9319E-06	WATER9	1628	EPI				

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI			0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.000199	EPI
Thiram	137-26-8	240.42	EPI	7.4407E-06	0.000000182	EPI	1.29	PERRY	0.025567	WATER9	6.5924E-06	WATER9	611.4	EPI	30	EPI	0.00099	EPI
Tin	7440-31-5	118.71	CRC89				7.287	CRC89									0.001	RAGSE
Titanium Tetrachloride	7550-45-0	189.68	EPI				1.73	CRC89									0.001	RAGSE
Toluene	108-88-3	92.14	EPI	0.2714636	0.00664	EPI	0.8623	CRC89	0.077805	WATER9	9.2045E-06	WATER9	233.9	EPI	526	EPI	0.0311	EPI
Toluene-2,5-diamine	95-70-5	122.17	EPI	3.8921E-08	9.52E-10	EPI			0.077169	WATER9	9.0166E-06	WATER9	55.39	EPI	13847	EPI	0.00041	EPI
Toluidine, p-	106-49-0	107.16	EPI	0.0000826	0.0000202	EPI	0.9619	CRC89	0.071219	WATER9	8.977E-06	WATER9	112.7	EPI	6500	EPI	0.00329	EPI
Total Petroleum Hydrocarbons (Aliphatic High)	NA	170.34	EPI	334.42355	8.18	EPI			0.061831	WATER9	7.2245E-06	WATER9	4818	EPI	0.0037	EPI	1.96	EPI
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	86.18	EPI	73.589534	1.8	EPI	0.6606	CRC89	0.073106	WATER9	8.1657E-06	WATER9	131.5	EPI	9.5	EPI	0.201	EPI
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	128.26	EPI	139.00245	3.4	EPI	0.719	CRC89	0.051425	WATER9	6.7679E-06	WATER9	796	EPI	0.22	EPI	1.7	EPI
Total Petroleum Hydrocarbons (Aromatic High)	NA	202.26	EPI	0.0003622	0.00000886	EPI	1.252	CRC89	0.027596	WATER9	7.1827E-06	WATER9	55450	EPI	0.26	EPI	0.308	EPI
Total Petroleum Hydrocarbons (Aromatic Low)	NA	78.11	EPI	0.2269011	0.00555	EPI	0.8765	CRC89	0.089538	WATER9	0.0000103	WATER9	145.8	EPI	1790	EPI	0.0149	EPI
Total Petroleum Hydrocarbons (Aromatic Medium)	NA	135.19	EPI	0.019583	0.000479	EPI	1.0156	CRC89	0.056382	WATER9	8.0673E-06	WATER9	2011	EPI	27.8	EPI	0.06915	EPI
Toxaphene	8001-35-2	413.82	EPI	0.0002453	0.000006	EPI			0.034215	WATER9	3.9977E-06	WATER9	77200	EPI	0.74	SSL	0.0518	EPI
Tralomehrin	66841-25-6	665.02	EPI	1.6108E-08	3.94E-10	EPI			0.024938	WATER9	2.9138E-06	WATER9	191100	EPI	0.08	EPI	0.0305	EPI
Tri-n-butyltin	688-73-3	291.07	EPI	62.142273	1.52	EPI	1.103	CRC89	0.021473	WATER9	5.3508E-06	WATER9	8091	EPI	0.82457	EPI	0.0193	EPI
Triacetin	102-76-1	218.21	EPI	5.03E-07	1.23E-08	EPI	1.1583	CRC89	0.02558	WATER9	0.00000655	WATER9	40.73	EPI	58000	EPI	0.000137	EPI
Triallate	2303-17-5	304.66	EPI	0.0004906	0.000012	EPI	1.273	CRC89	0.022458	WATER9	5.6739E-06	WATER9	1008	EPI	4	EPI	0.0349	EPI
Triasulfuron	82097-50-5	401.83	EPI	1.321E-11	3.23E-13	EPI			0.034892	WATER9	4.0769E-06	WATER9	427.2	EPI	32	EPI	0.0000469	EPI
Tribromobenzene, 1,2,4-	615-54-3	314.8	EPI	0.0158626	0.000388	EPI			0.041058	WATER9	4.7973E-06	WATER9	614.3	EPI	4.9	EPI	0.0337	EPI
Tributyl Phosphate	126-73-8	266.32	EPI	0.0000576	0.00000141	EPI	0.9727	CRC89	0.021184	WATER9	5.2338E-06	WATER9	2350	EPI	280	EPI	0.0228	EPI
Tributyltin Oxide	56-35-9	596.12	EPI	0.0000123	0.000000302	EPI	1.17	CRC89	0.015124	WATER9	3.6056E-06	WATER9	25930000	EPI	19.5	EPI	0.000252	EPI
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	187.38	EPI	21.504497	0.526	EPI	1.5635	CRC89	0.037566	WATER9	8.592E-06	WATER9	196.8	EPI	170	EPI	0.0175	EPI
Trichloroacetic Acid	76-03-9	163.39	EPI	5.5192E-07	1.35E-08	EPI	1.6126	CRC89	0.051749	WATER9	9.5028E-06	WATER9	3.231	EPI	54600	EPI	0.00145	EPI
Trichloroaniline HCl, 2,4,6-	33663-50-2	232.93	EPI	2.935E-12	7.18E-14	EPI			0.050188	WATER9	5.8641E-06	WATER9	1271	EPI	20.964	EPI	0.0000276	EPI
Trichloroaniline, 2,4,6-	634-93-5	196.46	EPI	0.0000548	0.00000134	EPI			0.056222	WATER9	6.5691E-06	WATER9	4440	EPI	40	EPI	0.027	EPI
Trichlorobenzene, 1,2,3-	87-61-6	181.45	EPI	0.0511038	0.00125	EPI	1.4533	CRC89	0.03953	WATER9	8.3836E-06	WATER9	1383	EPI	18	EPI	0.0738	EPI
Trichlorobenzene, 1,2,4-	120-82-1	181.45	EPI	0.058054	0.00142	EPI	1.459	CRC89	0.039599	WATER9	8.4033E-06	WATER9	1356	EPI	49	EPI	0.0705	EPI
Trichloroethane, 1,1,1-	71-55-6	133.41	EPI	0.7031889	0.0172	EPI	1.339	CRC89	0.064817	WATER9	9.599E-06	WATER9	43.89	EPI	1290	EPI	0.0126	EPI
Trichloroethane, 1,1,2-	79-00-5	133.41	EPI	0.0336877	0.000824	EPI	1.4397	CRC89	0.06689	WATER9	0.00001	WATER9	60.7	EPI	4590	EPI	0.00504	EPI
Trichloroethylene	79-01-6	131.39	EPI	0.4026983	0.00985	EPI	1.4642	CRC89	0.068662	WATER9	0.0000102	WATER9	60.7	EPI	1280	EPI	0.0116	EPI
Trichlorofluoromethane	75-69-4	137.37	EPI	3.9656582	0.097	EPI	1.4879	CRC89	0.065356	WATER9	0.00001	WATER9	43.89	EPI	1100	EPI	0.0127	EPI
Trichlorophenol, 2,4,5-	95-95-4	197.45	EPI	0.0000662	0.0000162	EPI	1.49	PERRY	0.031394	WATER9	8.0893E-06	WATER9	1777	EPI	1200	EPI	0.0362	EPI
Trichlorophenol, 2,4,6-	88-06-2	197.45	EPI	0.0001063	0.0000026	EPI	1.4901	CRC89	0.031395	WATER9	8.0896E-06	WATER9	1777	EPI	800	EPI	0.0346	EPI
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	255.49	EPI	1.9052E-06	4.66E-08	EPI			0.047189	WATER9	5.5136E-06	WATER9	107	EPI	278	EPI	0.00914	EPI
Trichlorophenoxypropionic acid, -2,4,5	93-72-1	269.51	EPI	3.704E-07	9.06E-09	EPI			0.045538	WATER9	5.3207E-06	WATER9	175.3	EPI	71	EPI	0.0161	EPI
Trichloropropane, 1,1,2-	598-77-6	147.43	EPI	0.0129599	0.000317	EPI	1.372	CRC89	0.057158	WATER9	9.1735E-06	WATER9	94.94	EPI	1900	EPI	0.0096	EPI
Trichloropropane, 1,2,3-	96-18-4	147.43	EPI	0.0140229	0.000343	EPI	1.3889	CRC89	0.057466	WATER9	9.2411E-06	WATER9	115.8	EPI	1750	EPI	0.00752	EPI
Trichloropropane, 1,2,3-	96-19-5	145.42	EPI	0.7195421	0.0176	EPI	1.412	CRC89	0.059063	WATER9	9.4102E-06	WATER9	115.8	EPI	484.19	EPI	0.0169	EPI
Tricresyl Phosphate (TCP)	1330-78-5	368.37	EPI	0.000033	0.000000808	EPI	1.152	Yaws	0.036974	WATER9	4.3201E-06	WATER9	47110	EPI	0.36	EPI	0.0334	EPI
Tridiphane	58138-09-2	320.43	EPI	0.0000168	0.00000041	EPI			0.040576	WATER9	4.7409E-06	WATER9	3447	EPI	1.1696	EPI	0.0689	EPI
Triethylamine	121-44-8	101.19	EPI	0.0060916	0.000149	EPI	0.7275	CRC89	0.066363	WATER9	7.8576E-06	WATER9	50.81	EPI	68600	EPI	0.0039	EPI
Trifluralin	1582-09-8	335.29	EPI	0.004211	0.000103	EPI			0.039368	WATER9	4.5998E-06	WATER9	16390	EPI	0.184	EPI	0.0728	EPI
Trimethyl Phosphate	512-56-1	140.08	EPI	2.9436E-07	7.2E-09	EPI	1.2144	CRC89	0.058255	WATER9	8.7915E-06	WATER9	10.6	EPI	500000	EPI	0.0000948	EPI
Trimethylbenzene, 1,2,3-	526-73-8	120.2	EPI	0.178	0.00436	EPI	0.8944	CRC89	0.061254	WATER9	8.0214E-06	WATER9	626.9	EPI	75.2	EPI	0.0897	EPI
Trimethylbenzene, 1,2,4-	95-63-6	120.2	EPI	0.2518397	0.00616	EPI	0.8758	CRC89	0.060675	WATER9	7.9209E-06	WATER9	614.3	EPI	57	EPI	0.0857	EPI
Trimethylbenzene, 1,3,5-	108-67-8	120.2	EPI	0.3585446	0.00877	EPI	0.8615	CRC89	0.060225	WATER9	7.843E-06	WATER9	602.1	EPI	48.2	EPI	0.0621	EPI
Trinitrobenzene, 1,3,5-	99-35-4	213.11	EPI	2.6574E-07	6.5E-09	EPI	1.4775	CRC89	0.028969	WATER9	7.6882E-06	WATER9	1683	EPI	278	EPI	0.000607	EPI
Trinitrotoluene, 2,4,6-	118-96-7	227.13	EPI	8.5037E-07	2.08E-08	EPI	1.654	CRC89	0.029509	WATER9	7.9182E-06	WATER9	2812	EPI	115	EPI	0.000963	EPI
Triphenylphosphine Oxide	791-28-6	278.29	EPI	2.1504E-08	5.26E-10	EPI	1.2124	CRC89	0.023005	WATER9	5.8178E-06	WATER9	1954	EPI	204.51	EPI	0.00327	EPI
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	430.91	EPI	1.067E-07	2.61E-09	EPI			0.033304	WATER9	3.8913E-06	WATER9	11130	EPI	7	EPI	0.00159	EPI
Tris(1-chloro-2-propyl)phosphate	13674-84-5	327.57	EPI	0.00000244	5.96E-08	EPI			0.039984	WATER9	4.6718E-06	WATER9	1604	EPI	1200	EPI	0.0012	EPI
Tris(2-chloroethyl)phosphate	115-96-8	285.49	EPI	0.0001345	0.00000329	EPI	1.39	CRC89	0.024218	WATER9	6.2191E-06	WATER9	388.3	EPI	7000	EPI	0.000355	EPI
Tris(2-ethylhexyl)phosphate	78-42-2	434.65	EPI	3.2134E-06	7.86E-08	EPI	0.99	CRC89	0.016451	WATER9	3.9425E-06	WATER9	2468000	EPI	0.6	EPI	11.6	EPI
Uranium (Soluble Salts)	NA	238.03	CRC89				19.1	CRC89									0.001	RAGSE
Urethane	51-79-6	89.09	EPI				0.9862	CRC89	0.08485	WATER9	0.0000102	WATER9	12.13	EPI	480000	EPI	0.000394	EPI
Vanadium Pentoxide	1314-62-1	181.88	EPI				3.35	CRC89									0.001	RAGSE
Vanadium and Compounds	7440-62-2	50.94	EPI				6	CRC89									0.001	RAGSE
Vernolate	1929-77-7	203.35	EPI	0.0012633	0.0000309	EPI	0.952	CRC89	0.024219	WATER9	6.0745E-06	WATER9	299.1	EPI	90	EPI	0.0403	EPI
Vinclozolin	50471-44-8	286.12	EPI	7.1137E-07	1.74E-08	EPI	1.51	CRC89	0.025149	WATER9	6.5272E-06	WATER9	283.6	EPI	2.6	EPI	0.00446	EPI
Vinyl Acetate	108-05-4	86.09	EPI	0.0208913	0.000511	EPI	0.9256	CRC89	0.084902	WATER9	0.00001	WATER9	5.583	EPI	20000	EPI	0.00157	EPI
Vinyl Bromide	593-60-2	106.95	EPI	0.5028618	0.0123	EPI	1.4933	CRC89	0.086224	WATER9	0.0000117	WATER9	21.73	EPI	10358	EPI	0.00435	EPI
Vinyl Chloride	75-01-4	62.5	EPI	1.1365495	0.0278	EPI	0.9106	CRC89	0.107119	WATER9	0.000012	WATER9	21.73	EPI	8800	EPI	0.00838	EPI
Warfarin	81-81-2	308.34	EPI	1.1325E-07	2.77E-09	EPI			0.041629	WATER9	4.8641E-06	WATER9	426.1	EPI	17	EPI	0.00182	EPI
Xylene, P-	106-42-3	106.17	EPI	0.2820932	0.0069	EPI	0.8565	CRC89	0.068249	WATER9	8.4199							

Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table May 2014

Contaminant		Molecular Weight		Henry's Law Constants			Density		Diffusivity in Air		Diffusivity in Water		Organic Carbon Partition		Water Solubility		Permeability	
Analyte	CAS No.	MW	MW Ref	H ⁺ (unitless)	HLC (atm-m ³ /mole)	H ⁺ and HLC Ref	Density (g/cm ³)	Density Ref	Dia (cm ² /s)	Dia Ref	Diw (cm ² /s)	Diw Ref	Koc (L/kg)	Koc Ref	S (mg/L)	S Ref	K _p (cm/hr)	KPREF
ALAR	1596-84-5	160.17	EPI	1.7294E-08	4.23E-10	EPI	6.52	CRC89	0.064422	WATER9	7.5272E-06	WATER9	10	EPI	100000	EPI	0.0000199	EPI
Zirconium	7440-67-7	91.22	EPI														0.001	RAGSE

NOTE - The parameters summary table was last updated from the EPA May 2014 RSL Table.

Note that not all parameters in this table are used in the VISL.

Version	Date	Changes
1.0	3/14/2012	Original Version
1.1	4/12/2012	In the column where target groundwater concentration is calculated, a unit consistency error was corrected in the comparison of target groundwater concentration to solubility.
2.0	7/19/2012	Updated to May 2012 RSL toxicity and chemical parameter values. Forward risk calculation worksheets (SG-IA_calc, GW-IA_calc, and IA-risk_calc) were added. Erroneous values in the LEL column of the VISL worksheet were corrected. Nine new chemicals identified as volatile in the RSL tables were added (2-Chloroacetaldehyde, Dihydrosafrole, Dimethylvinylchloride, 1,4-Dithiane, Ethyleneimine, Methyl Isocyanate, Mineral Oils, Propylene, and Tetrahydrofuran). Three chemicals formerly identified as volatile in the RSL tables were removed (Cresols, Isobutyl Alcohol, and Propylene Glycol Dinirate). All chemicals were reordered alphabetically.
3.0	3/7/2013	The AF_{SS} and AF_{GW} terms were removed from the calculation of whether the chemical is volatile and toxic enough to pose an inhalation risk or hazard via vapor intrusion. Updated to November 2012 RSL toxicity and chemical parameter values. One new chemical added (cyclohexene), and one chemical deleted (thiocyanate). Toxicological parameters were updated for acetone cyanohydrin and methacrylonitrile.
3.1	5/15/2013	Updated to May 2013 RSL toxicity and chemical parameter values. Two new chemicals identified as volatile in the RSL tables were added (sec-Butylbenzene and tert-Butylbenzene).
3.2	12/10/2013	Updated to November 2013 RSL toxicity and chemical parameter values. Six new chemicals identified as volatile in the RSL tables were added (tert-Amyl Alcohol, Dibenzothiophene, Total Petroleum Hydrocarbons (Aliphatic Low), Total Petroleum Hydrocarbons (Aliphatic Medium), Total Petroleum Hydrocarbons Aromatic Low), and Total Petroleum Hydrocarbons Aromatic Medium)). The User's Guide was updated to discuss the representative compounds used for chemical data for the Total Petroleum Hydrocarbon chemicals.
3.2.1	2/5/2014	Change to worksheet protection to re-enable the use of Autofilters on the VISL, SG_IA_calc, GW_IA_calc, and IA_risk_calc worksheets. Minor editorial changes to the Column A descriptions for all four worksheets on the Navigation Guide.
3.3	5/29/2014	Updated to May 2014 RSL toxicity and chemical parameter values. Removed chemicals with no reference concentration and no inhalation unit risk. Removed TPH analytes, including JP-7 and HFAN. Corrected a bug on the SG_IA_calc worksheet that displayed the attenuation factor for groundwater incorrectly for the commercial scenario (note that this value is not used on that worksheet, so no modeled results were affected in previous version). Because the reference concentration for trans-1,2-dichloroethylene was removed from the RSL table, that chemical was also removed from the VISL. Toxicological parameters were updated for dicyclopentadiene. Residential exposure duration changed from 30 year to 26 years to agree with updates to the RSL User Guide.
3.3.1	6/24/2014	Reinstated 6 chemicals that were inadvertently deleted from the SG_IA_calc worksheet during the version 3.3 update.

APPENDIX D

RECEPTOR-SPECIFIC EXPOSURE, RISK, AND HAZARD CALCULATIONS

**TABLE D10.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER- INVESTIGATION AREA 14**

PROPERTY-SPECIFIC RISK ASSESSMENT

FORMER GM STAMPING PLANT

ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Groundwater	Vapor Intrusion	Trench Air	Inhalation	Benzo[b]fluoranthene	1.8E-05	µg/m³	1.4E-08	µg/m³	1.6E-12	1.0E-09	mg/m³	--
				C20-C34	--	µg/m³	--	µg/m³	--	mg/m³	--	
				Chrysene	1.9E-05	µg/m³	1.4E-08	µg/m³	2E-13	1.0E-09	mg/m³	--
				Fluoranthene	6.1E-06	µg/m³	4.8E-09	µg/m³	--	3.4E-10	mg/m³	--
				Phenanthrene	6.5E-06	µg/m³	5.1E-09	µg/m³	--	3.6E-10	mg/m³	--
				Pyrene	3.4E-06	µg/m³	2.6E-09	µg/m³	--	1.8E-10	mg/m³	--
		Exposure Route Total						1.7E-12			0.0E+00	
		Exposure Point Total						1.7E-12			0.0E+00	
	Exposure Medium Total						1.7E-12			0.0E+00		
	Groundwater Medium Total								Total Risk	2E-12	Total Hazard	0E+00

Abbreviations:

--	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

= Intake/Reference Doses_{Oral or Inhalation}

Cancer Risk

= Intake/Oral Slope Factor or Inhalation Unit Risk

Exposure Route Total

=ΣChemical of Potential Concern Cancer Risk or Hazard Quotient

Exposure Point Total

=ΣExposure Route Total

Exposure Medium Total

=ΣExposure Point Total

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

=Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

APPENDIX E

MEDIUM-SPECIFIC ANALYTICAL SAMPLING RESULTS

ANALYTICAL TABLE E-1
SUMMARY OF PAHS IN IA-4 SOIL (mg/kg)
MANSFIELD STAMPING PLANT

Sample Location			IA-4-11	IA-4-11	IA-4-12	IA-4-12	IA-4-13	IA-4-13	IA-4-14	IA-4-14	IA-4-15	IA-4-15	IA-4-16	IA-4-16	IA-4-17	IA-4-17	IA-4-18	IA-4-18	IA-4-19	IA-4-19	IA-4-20	IA-4-20																				
Sample ID			SB1	SB1	SB2	SB2	SB3	SB3	SB4	SB4	SB5	SB5	SB6	SB6	SB7	SB7	SB8	SB8	SB9	SB9	SB10	SB10																				
Depth (feet)			0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'																				
Sample Date			12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/5/2011																				
Sample Time			1120	1120	1130	1130	1145	1145	1300	1300	1315	1315	1320	1320	1330	1330	1345	1345	1400	1400	1415	1415																				
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-4 Former Waste Water Treatment Plant																																							
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																										
Acenaphthene	780,000	90,000	0.21100		0.00338		26.9		0.00344		0.89700		1.24000		0.74600		0.05650		0.20600		0.00671		0.31000		0.00272	U	21.40000		0.01540		13.70000		0.48900		0.62900		0.00266	U	0.04570		0.00270	U
Acenaphthylene	780,000	90,000	0.01540		0.00264	U	0.78100		0.00270	U	0.03880		0.01720		0.02660		0.00150	J	0.00896	J	0.00269	U	0.00573	J	0.00272	U	0.66300		0.00273	U	0.36100		0.02110		0.02120		0.00266	U	0.00372		0.00270	U
Anthracene	1,000,000	450,000	0.69300		0.01220		51.7		0.01200		1.98000		4.33000		1.63000		0.16500		0.72000		0.02510		0.86900		0.00327		46.00000		0.04740		32.00000		1.29000		1.69000		0.00282		0.18100		0.01640	
Benzo(a)anthracene	1,200	58	1.65000		0.03050		121.0		0.03170		7.95000		8.59000		5.88000		0.48800		1.64000		0.05670		2.14000		0.00745		108.0		0.11200		62.10000		3.61000		4.74000		0.00742		0.48700		0.00234	J
Benzo(a)pyrene	120	5.8	1.39000		0.02590		93.2		0.02690		6.43000		6.89000		4.76000		0.36900		1.34000		0.04410		1.68000		0.00584		87.1		0.08990		46.70000		2.41000		3.84000		0.00552		0.38500		0.00270	U
Benzo(b)fluoranthene	1,200	58	1.38000		0.02540		100.0		0.02770		6.25000		6.13000		4.92000		0.36700		1.29000		0.03990		1.42000		0.00863		89.2		0.09320		49.00000		2.38000		3.99000		0.00735		0.37700		0.00270	U
Benzo(ghi)perylene	390,000	45,000	1.02000		0.01770		57.7		0.01880		3.26000		3.29000		2.17000		0.21300		0.79800		0.02820		0.93400		0.00592		52.70000		0.05570		27.40000		1.30000		2.00000		0.00485		0.21600		0.00543	
Benzo(k)fluoranthene	12,000	580	1.22000		0.02410		82.4		0.02560		6.74000		6.56000		4.64000		0.30800		1.22000		0.04340		1.15000		0.00502		79.80000		0.08560		43.40000		2.34000		2.33000		0.00562		0.33600		0.00270	U
Chrysene	120,000	5,800	1.47000		0.03040		111.0		0.03400		7.52000		7.27000		5.56000		0.41700		1.51000		0.05280		2.02000		0.01330		102		0.10700		58.70000		3.48000		4.44000		0.00952		0.43100		0.00736	
Dibenz(a,h)anthracene	120	5.8	0.34000		0.00534		20.9		0.00566		1.09000		1.50000		0.81300		0.07840		0.27800		0.00858		0.33600		0.00138	J	19.0		0.01860		7.98000		0.50000		0.72600		0.00176	J	0.07780		0.00270	U
Fluoranthene	160,000	60,000	2.98000		0.05950		234.0		0.07480		17.00000		15.30000		12.80000		1.08000		4.26000		0.11200		4.92000		0.02000		312		0.24800		134		8.60000		10.90000		0.01750		1.13000		0.00538	
Fluorene	520,000	60,000	0.25200		0.00316		23.1		0.00327		0.82800		1.22000		0.78800		0.05450		0.25900		0.00728		0.45000		0.00272	U	18.30000		0.01530		11.20000		0.59600		0.73800		0.00266	U	0.05800		0.00270	U
Indeno(1,2,3-cd)pyrene	1,200	58	0.99300		0.01590		59.4		0.01640		3.47000		3.56000		2.25000		0.22100		0.79900		0.02500		0.91800		0.01690		54.70000		0.05400		28.20000		1.40000		2.04000		0.00362		0.22400		0.00270	U
1-Methylnaphthalene	31,000	1,500	0.03040		0.00498		3.65		0.00205	J	0.16000		0.09180		0.26100		0.00693		0.07950		0.00619		0.06560		0.00272	U	2.76000		0.00435		2.05000		0.13100		0.12200		0.00266	U	0.06900		0.00498	
2-Methylnaphthalene	5,200	6,000	0.03090		0.00621		4.88		0.00250	J	0.18200		0.13000		0.33000		0.00697		0.10100		0.00512		0.08800		0.00142	J	3.50000		0.00590		2.84000		0.18000		0.16000		0.00266	U	0.08790		0.00437	
Naphthalene	560	450	0.02760		0.00458		4.45		0.00142	J	0.13400		0.23200		0.24000		0.00761		0.07040		0.00293		0.06590		0.00272	U	3.12000		0.00481		2.85000		0.15300		0.19600		0.00266	U	0.05510		0.00270	U
Phenanthrene	1,000,000	450,000	2.17000		0.03790		216		0.04980		12.00000		12.20000		9.55000		0.65600		2.54000		0.08060		4.46000		0.01550		236		0.18200		123		6.97000		8.87000		0.01140		0.77700		0.01690	
Pyrene	390,000	45,000	2.56000		0.04960		197		0.05860		13.70000		12.40000		10.10000		0.84700		2.56000		0.09040		3.84000		0.01350		242		0.19100		107		6.61000		8.61000		0.01360		0.89400		0.00609	

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
Highlighted values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C
VOC = volatile organic compounds

ANALYTICAL TABLE E-1 (CONTINUED)
SUMMARY OF PAHS IN 1A-4 SOIL (mg/kg)
MANSFIELD STAMPING PLANT

Sample Location			IA-4-21	IA-4-21	IA-4-22	IA-4-22	IA-4-23	IA-4-23	IA-4-24	IA-4-24	IA-4-25	IA-4-25	IA-4-26	IA-4-26	IA-4-27	IA-4-27	IA-4-28	IA-4-28	IA-4-29	IA-4-29	IA-4-30	IA-4-30	DUPLICATE	DUPLICATE																						
Sample ID			SB11	SB11	SB12	SB12	SB13	SB13	SB14	SB14	SB15	SB15	SB16	SB16	SB17	SB17	SB18	SB18	SB19	SB19	SB20	SB20	DUP 1	DUP 2																						
Depth (feet)			0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	0'-2'																						
Sample Date			12/5/2011	12/5/2011	12/5/2011	12/5/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011	12/6/2011																						
Sample Time			1430	1430	1440	1440	925	925	935	935	950	950	1010	1010	1030	1030	1100	1100	1110	1110	1125	1125		--																						
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-4 Former Waste Water Treatment Plant																																											
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																														
Acenaphthene	780,000	90,000	0.05500		0.04060		0.12100		0.00161	J	0.24400		0.00298		0.01290		0.00293	U	1.20000		0.00175	J	0.03170		0.00314	U	0.06670		0.00280	J	0.00917		0.00302	U	0.57800		0.00196	J	5.46000		0.00252	J	0.04760		0.00484	
Acenaphthylene	780,000	90,000	0.00795	J	0.00170	J	0.00781		0.00276	U	0.01560		0.00288		0.00215	J	0.00293	U	0.05710		0.00313	U	0.00154	J	0.00308	U	0.00779		0.00161	J	0.00308	U	0.02960		0.00316	U	0.24200		0.00290	U	0.00154	J	0.00313	J		
Anthracene	1,000,000	450,000	0.24100		0.13200		0.28200		0.00276	U	0.57800		0.00772		0.03840		0.00214	J	2.39000		0.00450		0.07720		0.00314	U	0.22700		0.00446		0.04660		0.00302	U	1.17000		0.02090		0.00405		0.13100		0.00847			
Benzo(a)anthracene	1,200	58	0.78800		0.23300		1.03000		0.00334		2.16000		0.02120		0.14700		0.00300		8.41000		0.00928		0.27600		0.00374		0.83100		0.00703		0.12600		0.00249	J	3.98000		0.00292	J	37.90000		0.01130		0.34600		0.00708	
Benzo(a)pyrene	120	5.8	0.68300		0.17400		0.86400		0.00276	U	1.85000		0.01700		0.12400		0.00218		7.26000		0.00750		0.22400		0.00277	J	0.75600		0.00685		0.11000		0.00154	J	3.29000		0.00236	J	31.70000		0.00981		0.27900		0.00589	
Benzo(b)fluoranthene	1,200	58	0.74500		0.17200		0.87300		0.00276	U	1.98000		0.01970		0.12800		0.00293	U	7.47000		0.00973		0.21300		0.00415		0.80400		0.00866		0.11100		0.00352		3.48000		0.00316	U	33.50000		0.01340		0.26500		0.00848	
Benzo(ghi)perylene	390,000	45,000	0.40500		0.09720		0.34800		0.00901		0.80100		0.01180		0.06760		0.00373		3.45000		0.00662		0.14200		0.00398		0.48500		0.00900		0.07340		0.00251	J	1.59000		0.00677		18.90000		0.01500		0.16300		0.00727	
Benzo(k)fluoranthene	12,000	580	0.64500		0.15600		0.82900		0.00276	U	1.74000		0.01440		0.11900		0.00293	U	4.89000		0.00669		0.21900		0.00262	J	0.68200		0.00641		0.11000		0.00560	J	3.35000		0.00316	U	30.10000		0.00732		0.24500		0.00654	
Chrysene	120,000	5,800	0.78200		0.20700		1.02000		0.00998		2.09000		0.02290		0.14300		0.00703		8.51000		0.01250		0.26000		0.00533		0.78400		0.01160		0.12400		0.00740		3.93000		0.00888		36.70000		0.01920		0.30000		0.01030	
Dibenz(a,h)anthracene	120	5.8	0.13900		0.04380		0.13400		0.00276	U	0.30500		0.00471		0.02280		0.00293	U	1.32000		0.00260	J	0.04540		0.00314	U	0.16300		0.00316		0.02300		0.00302	U	0.61000		0.00316	U	5.76000		0.00333		0.05550		0.00232	J
Fluoranthene	160,000	60,000	1.61000		0.47800		2.37000		0.00844		4.91000		0.04110		0.27400		0.00966		19.70000		0.02000		0.52600		0.00706		1.99000		0.01410		0.26800		0.00439		9.92000		0.01000		82.80000		0.03030		0.77400		0.01440	
Fluorene	520,000	60,000	0.07360		0.04530		0.13500		0.00276	U	0.23600		0.00215	J	0.01600		0.00293	U	1.12000		0.00313	U	0.03240		0.00314	U	0.06610		0.00305	J	0.01260		0.00302	U	0.57400		0.00316	U	4.61000		0.00290	U	0.05060		0.00640	
Indeno(1,2,3-cd)pyrene	1,200	58	0.40800		0.09790		0.37600		0.00171	J	0.85900		0.00917		0.06790		0.00293	U	3.68000		0.02330		0.13200		0.00213	J	0.48500		0.00515		0.06930		0.00302	U	1.68000		0.00174	J	19.10000		0.00649		0.16100		0.00474	
1-Methylnaphthalene	31,000	1,500	0.02390		0.00568		0.13000		0.01770		0.08790		0.00978		0.02600		0.00276		0.23200		0.00253	J	0.00967		0.00406		0.01910		0.00487		0.00557		0.00302	U	0.12200		0.00646		0.92200		0.01420		0.00849		0.00597	
2-Methylnaphthalene	5,200	6,000	0.02800		0.00606		0.17600		0.01630		0.11400		0.01130		0.03440		0.00287		0.26100		0.00278	J	0.01040		0.00337		0.02320		0.00526		0.00543		0.00302	U	0.15200		0.00548		1.02000		0.01100		0.00767		0.00595	
Naphthalene	560	450	0.01790		0.00453		0.12200		0.00276	U	0.08600		0.00450		0.02190		0.00175		0.18600		0.00406		0.00619		0.00314	U	0.01890		0.00365		0.00258	J	0.00302	U	0.13600		0.00315	J	0.73600		0.00517		0.00963		0.00421	
Phenanthrene	1,000,000	450,000	0.96400		0.42100		1.85000		0.03550		3.46000		0.03590		0.17300		0.01750		14.00000		0.02140		0.36400		0.00891		0.93500		0.01680		0.17300		0.00588		8.30000		0.02160		58.50000		0.04320		0.46800		0.01660	
Pyrene	390,000	45,000	1.29000		0.37300		1.82000		0.01020		3.88000		0.03410		0.22300		0.00955		15.40000		0.01830		0.44800		0.00609		1.55000		0.01330		0.21200		0.00301	J	7.39000		0.00892		66.50000		0.02780		0.49700		0.01220	

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
Highlighted values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C
VOC = volatile organic compounds

ANALYTICAL TABLE E-1 (CONTINUED)
SUMMARY OF PAHS IN 1A-4 SOIL (mg/kg)
MANSFIELD STAMPING PLANT

Sample Location			IA-4-31	IA-4-31	IA-4-32	IA-4-32	IA-4-33	IA-4-33	IA-4-34	IA-4-34	IA-4-35	IA-4-35	IA-4-36	IA-4-36	IA-4-37	IA-4-37	IA-4-38	IA-4-38	DUPLICATE																	
Sample ID			SB21	SB21	SB22	SB22	SB23	SB23	SB24	SB24	SB25	SB25	SB26	SB26	SB27	SB27	SB28	SB28	DUP 1 (SB26)																	
Depth (feet)			0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'	2'-4'	0'-2'																	
Sample Date			11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012																	
Sample Time			1038	1038	1044	1044	1055	1055	1059	1059	1102	1102	1106	1106	1111	1111	1114	1114	1106																	
Ohio VAP DC Construction/Excavation Ohio VAP Generic DC Standard--Industrial Soil			IA-4 Former Waste Water Treatment Plant																																	
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																				
2-Methylnaphthalene	5,200	6,000	5.7		0.0510		0.0840		0.0710	U	0.0730	U	0.0290	U	0.0920		0.0080		0.0440		0.0210		0.0420		0.1200		0.0880	U	0.0290	U	0.0410		0.0490		0.0140	
Acenaphthene	780,000	90,000	34.0		0.0730		0.2900		0.3200		0.3600		0.0540	U	0.1400		0.0075	U	0.1300		0.0660		0.1200		0.9900		0.5000		0.0290	U	0.0480		0.0190	U	0.0260	
Acenaphthylene	780,000	90,000	1.8	U	0.0072	U	0.0520	U	0.0710	U	0.0730	U	0.0290	U	0.0290	U	0.0075	U	0.0300	U	0.0072	U	0.0290	U	0.0940		0.0290	U	0.0140	U	0.0190	U	0.0073	U		
Anthracene	1,000,000	450,000	62.0		0.1300		0.6900		1.0000		0.9000		0.1300		0.3300		0.0160		0.3000		0.1500		0.2800		1.9000		1.3000		0.0290	U	0.1100		0.0310		0.0630	
Benzo[a]anthracene	1,200	58	200.0		0.3300		4.1000		3.6000		5.4000		0.4600		0.7400		0.0440		1.3000		0.5600		1.1000		3.2000		7.3000		0.0740		0.6000		0.0790		0.1900	
Benzo[a]pyrene	120	5.8	160.0		0.2500		4.0000		4.3000		5.5000		0.4500		0.6300		0.0360		1.2000		0.4400		1.2000		2.4000		7.8000		0.0750		0.5400		0.0780		0.1500	
Benzo[g,h,i]perylene	390,000	45,000	78.0		0.1500		2.7000		2.5000		3.4000		0.2200		0.2800		0.0270		0.6800		0.2900		0.5700		1.3000		5.0000		0.0430		0.3600		0.0440		0.1000	
Benzo[k]fluoranthene	12,000	580.0	74.0		0.1800		2.9000		1.6000		3.9000		0.2600		0.3200		0.0240		0.7500		0.1800		0.5100		1.7000		4.1000		0.0630		0.4200		0.0300		0.0690	
Chrysene	120,000	5,800	230.0		0.3300		4.0000		4.8000		5.2000		0.5800		0.8000		0.0500		1.4000		0.6000		1.4000		3.1000		8.0000		0.1100		0.6500		0.1100		0.2100	
Dibenz(a,h)anthracene	120	5.8	15.0		0.0430		0.6900		0.7300		0.8300		0.0290	U	0.0290	U	0.0075	U	0.1800		0.0770		0.2100		0.3900		1.2000		0.0290	U	0.0890		0.0190	U	0.0250	
Fluoranthene	160,000	60,000	360.0		0.7000		8.1000		8.3000		11.0000		1.2000		1.7000		0.0830		2.9000		1.4000		2.6000		8.1000		15.0000		0.1900		1.4000		0.1700		0.3900	
Fluorene	520,000	60,000	30.0		0.0540		0.2400		0.2600		0.2900		0.0460		0.1500		0.0075	U	0.1200		0.0590		0.1200		1.4000		0.4500		0.0290	U	0.0400		0.0190	U	0.0220	
Indeno[1,2,3-cd]pyrene	1,200	58	72.0		0.1300		2.5000		1.9000		3.2000		0.1800		0.2400		0.0200		0.5800		0.2800		0.5800		1.2000		4.4000		0.0330		0.0340		0.0340		0.0840	
Naphthalene	560	450	5.1		0.0280		0.0620		0.0710	U	0.0730	U	0.0290	U	0.0600		0.0075	U	0.0310		0.0120		0.0290		0.0980		0.0880	U	0.0290	U	0.0250		0.0260		0.0090	
Phenanthrene	1,000,000	450,000	360.0		0.5600		3.6000		3.6000		4.2000		0.6600		1.4000		0.0670		1.6000		0.8000		1.4000		8.7000		5.9000		0.0970		0.6500		0.1300		0.2800	
Pyrene	390,000	45,000	400.0		0.5000		6.7000		6.7000		9.0000		0.9000		1.3000		0.0680		2.2000		1.0000		2.0000		6.3000		12.0000		0.1700		1.0000		0.1400		0.3100	

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels
Highlighted values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C
VOC = volatile organic compounds

ANALYTICAL TABLE E-2
SUMMARY OF VOCs IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-1-1	IA-1-1	IA-1-2	IA-1-2	IA-1-3	IA-1-3	IA-1-4	IA-1-4	IA-1-5	IA-1-5	IA-1-6	IA-2-1	IA-2-2	Duplicate	IA-2-2	IA-2-3	IA-2-3							
Sample ID			SB11-SSA-2-0411	SB11-SSA-4-0411	SB12-SSA-2-0411	SB12-SSA-4-0411	SB13-SSA-2-0411	SB13-SSA-4-0411	SB14-SSA-2-0411	SB14-SSA-4-0411	SB15-SSA-2-0411	SB15-SSA-4-0411	SB16-SSA-15-0411	SB21-FTF-20-0411	SB22-FTF-1520-0411	SBDUP2	SB22-FTF-2022-0411	SB23-FTF-7510-0411	SB23-FTF-1012-0411							
Depth (feet)			0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	15'	20'	15' - 20'	15' - 20'	20' - 22.5'	7.5' - 10'	10' - 12.5'							
Sample Date			4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/7/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011							
Sample Time			1015	1015	1040	1040	1140	1140	1105	1105	1127	1127	0900	1558	1000	1000	1012	1105	1115							
			Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil	IA-1 SNOW STAGING AREA									IA-2 FORMER TANK FARM												
VOCs - mg/kg																										
Acetone	110,000	110,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.022	J,B	0.029	B	0.066	B	0.069	B	0.019	J,B	0.031	B	0.0160	J,B
Benzene	1,200	140	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00082	J	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Bromodichloromethane	300	35	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Bromoform	130,000	6,200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Bromomethane	550	82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0120	U	0.0120	U	0.0120	U
2-Butanone	28,000	28,000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0230	U	0.0220	U	0.0094	J	0.0079	J	0.0230	U	0.0030	J	0.0240	U
Carbon disulfide	740	740	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0015	J	0.0008	J	0.0015		0.0062	U	0.0010	J	0.0058	U	0.0059	U
Carbon tetrachloride	460	79	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Chlorobenzene	760	760	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Dibromochloromethane	770	84	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Chloroethane	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0120	U	0.0120	U	0.0120	U
Chloroform	320	38	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Chloromethane	1,300	1,300	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	J	0.0110	U	0.0110	U	0.0120	U	0.0120	U	0.0120	U	0.0120	U
1,2-Dibromo-3-chloro-propane	15	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.1100	U	0.0110	U	0.1100	U	0.0120	U	0.1200	U	0.0580	U	0.0120	U
1,2-Dibromoethane	38	4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,2-Dichlorobenzene	380	380	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0580	U	0.0290	U	0.0059	U
1,3-Dichlorobenzene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0580	U	0.0290	U	0.0059	U
1,4-Dichlorobenzene	2,600	310	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0580	U	0.0290	U	0.0059	U
Dichlorodifluoromethane	850	850	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0011	U	0.0110	U	0.0110	U	0.0120	U	0.0120	U	0.0120	U	0.0120	U
1,1-Dichloroethane	1,700	420	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,2-Dichloroethane	480	56	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
cis-1,2-Dichloroethene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0028	U	0.0028	U	0.0028	U	0.0031	U	0.0029	U	0.0029	U	0.0030	U
trans-1,2-Dichloroethene	1,700	1,700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0028	U	0.0028	U	0.0028	U	0.0031	U	0.0029	U	0.0029	U	0.0030	U
1,1-Dichloroethene	360	1,200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,2-Dichloropropane	180	120	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
cis-1,3-Dichloropropene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
trans-1,3-Dichloropropene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Ethylbenzene	480	480	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
n-Hexane	140	140	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
2-Hexanone	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.23	U	0.0220	U	0.0230	U	0.0010	J,B	0.0230	U	0.0230	U	0.0240	U
Isopropylbenzene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Methylene chloride	3,300	3,300	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0071	B	0.0092	B	0.0074	B	0.0044	J,B	0.0039	J,B	0.0056	J,B	0.0044	J
4-Methyl-2-pentanone	3,400	3,400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.23	U	0.022	U	0.023	U	0.025	U	0.023	U	0.023	U	0.0240	U
Methyl tert-butyl ether	8,900	5,700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.023	U	0.022	U	0.023	U	0.025	U	0.023	U	0.023	U	0.0240	U
Styrene	870	870	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,1,2,2-Tetrachloroethane	670	75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.058	U	0.029	U	0.0059	U
Tetrachloroethene	170	170	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Toluene	820	820	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,2,4-Trichloro-benzene	400	400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.00051	J,B	0.058	U	0.029	U	0.0059	U
1,1,1-Trichloroethane	640	640	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
1,1,2-Trichloroethane	1,200	140	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Trichloroethene	17	51	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0057	U	0.0056	U	0.0057	U	0.0062	U	0.0058	U	0.0058	U	0.0059	U
Trichlorofluoromethane	1,200	1,200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.011	U	0.011	U	0.011	U	0.012	U	0.					

Notes:

NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

TABLE E2 (CONTINUED)
SUMMARY OF VOCs IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-3-1	IA-3-1	IA-3-2	IA-4-1	IA-4-1	IA-4-2	IA-4-2	IA-4-3	IA-4-3	IA-4-3	IA-4-3	IA-4-4	IA-4-5	IA-4-5	IA-4-5	IA-4-6	IA-4-7	IA-4-8	IA-4-8	IA-4-9	IA-4-9	IA-4-10																								
Sample ID	S831-UST-2730-0411	S831-UST-3032-0411	S832-UST-1720-0411	S841-OLD-255-0411	S841-OLD-1215-0411	S842-OLD-0710-0411	S842-OLD-1720-0411	S843-OLD-025-0411	S843-OLD-1725-0411	S843A-255-0511	S843A-0510-0511	S844-OLD-1720-0411	S845-OLD-255-0411	S845-OLD-1012-0411	S845-OLD-2730-0411	S846-OLD-1215-0411	S847-OLD-1720-0411	S848-255-0511	S848-510-0511	S849-05-0511	S849-510-0511	S8410-2527-0511																										
Depth (feet)	27.5' - 30'	30' - 32.5'	17.5' - 20'	2.5' - 5'	12.5' - 15'	7.5' - 10'	14.5' - 20'	2.5' - 5'	17.5' - 20'	5' - 10'	5' - 10'	17.5' - 20'	2.5' - 5'	10' - 12.5'	27.5' - 30'	12.5' - 15'	17.5' - 20'	2.5' - 5'	5' - 10'	0' - 5'	25' - 27.5'																											
Sample Date	4/12/2011	4/12/2011	4/12/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	5/12/2011	5/12/2011	4/8/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	4/12/2011	4/12/2011	5/12/2011	5/12/2011	5/12/2011	5/12/2011	5/12/2011																									
Sample Time	1318	1336	1133	1407	1416	1520	1533	1148	1205	1154	1203	1452	1029	1046	1107	1002	0901	10135	1040	1115	1120	1345																										
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard-Industrial Soil	IA-3 SUSPECTED FORMER UST						IA-4 FORMER WASTE WATER TREATMENT PLANT																																							
VOCs - mg/kg																																																
Acetone	110,000	110,000	0.0220	U	0.0087	J,B	0.0200	J,B	0.0640	B	0.0210	J,B	0.1700	B	0.0110	J,B	0.0530	B	0.0290	B	0.0230	U	0.0200	J	0.1200	B	0.0690	B	0.0490	B	0.0160	J,B	0.0210	J,B	0.0120	J,B	0.0570	U	0.0570	U	0.0220	U	0.1000	U	0.0057	U	0.0210	J
Benzene	1,200	140	0.0055	U	0.0057	U	0.0006	J	0.0003	J	0.0058	U	0.0071	U	0.0057	U	0.0004	J	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0003	J	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0056	U		
Bromodichloromethane	300	35	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0056	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U		
Bromoflorm	130,000	6,200	0.0055	U	0.0057	U	0.0290	U	0.0056	U	0.2900	U	0.0071	U	0.0057	U	0.0063	U	0.2800	U	0.0057	U	0.0061	U	0.0006	U	0.0057	U	0.0056	U	0.0058	U	0.0056	U	0.0058	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
Bromomethane	550	82	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0140	U	0.0110	U	0.0130	U	0.0110	U	0.0120	U	0.0110	U	0.0120	U	0.0120	U	0.0110	U	0.0110	U	0.0120	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U
2-Butanone	28,000	28,000	0.0220	U	0.0230	U	0.0230	U	0.0230	U	0.0230	U	0.0360	U	0.0230	U	0.0250	U	0.0220	U	0.0230	U	0.0240	U	0.0100	J	0.0082	J	0.0097	J	0.0230	U	0.0230	U	0.0230	U	0.0220	U	0.0230	U	0.0220	U	0.0160	J	0.0220	U		
Carbon disulfide	740	740	0.0055	U	0.0057	U	0.0017	J	0.0013	J	0.0009	J	0.0071	U	0.0057	U	0.0063	U	0.0026	J	0.0057	U	0.0061	U	0.0058	U	0.0013	J	0.0013	J	0.0058	U	0.0013	J	0.0057	U	0.0076	U	0.0006	J	0.0055	U	0.0057	U	0.0009	J		
Carbon tetrachloride	460	79	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U		
Chlorobenzene	760	760	0.0055	U	0.0057	U	0.0290	U	0.0056	U	0.2900	U	0.0071	U	0.0057	U	0.0063	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
Dibromochloromethane	770	84	0.0055	U	0.0057	U	0.0290	U	0.0056	U	0.2900	U	0.0071	U	0.0057	U	0.0063	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
Chloroethane	NE	NE	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0140	U	0.0110	U	0.0130	U	0.0110	U	0.0120	U	0.0110	U	0.0120	U	0.0120	U	0.0110	U	0.0110	U	0.0120	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U
Chloroform	320	38	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0007	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U		
Chloromethane	1,300	1,300	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0140	U	0.0110	U	0.0130	U	0.0110	U	0.0120	U	0.0110	U	0.0120	U	0.0120	U	0.0110	U	0.0110	U	0.0120	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U
1,2-Dibromo-3-chloro-propane	15	2	0.0110	U	0.0570	U	0.0570	U	0.0056	U	0.5700	U	0.0140	U	0.0570	U	0.0630	U	0.5500	U	0.0110	U	0.0120	U	0.0120	U	0.0120	U	0.0570	U	0.0560	U	0.1200	U	0.1100	U	0.5600	U	0.5400	U	0.0110	U	0.0110	U	0.0110	U	0.0560	U
1,2-Dibromomethane	38	4	0.0055	U	0.0057	U	0.0290	U	0.0056	U	0.2900	U	0.0071	U	0.0057	U	0.0063	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
1,2-Dichlorobenzene	380	380	0.0055	U	0.0290	U	0.0290	U	0.0280	U	0.2900	U	0.0071	U	0.0290	U	0.0310	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0290	U	0.0280	U	0.0580	U	0.0560	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0280	U		
1,3-Dichlorobenzene	NE	NE	0.0055	U	0.0290	U	0.0290	U	0.0280	U	0.2900	U	0.0071	U	0.0290	U	0.0310	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0290	U	0.0280	U	0.0580	U	0.0560	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0280	U		
1,4-Dichlorobenzene	2,600	310	0.0055	U	0.0290	U	0.0290	U	0.0280	U	0.2900	U	0.0071	U	0.0290	U	0.0310	U	0.2800	U	0.0057	U	0.0061	U	0.0058	U	0.0290	U	0.0280	U	0.0580	U	0.0560	U	0.2800	U	0.2700	U	0.0057	U	0.0055	U	0.0057	U	0.0280	U		
Dichlorodifluoromethane	850	850	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0120	U	0.0140	U	0.0110	U	0.0130	U	0.0110	U	0.0120	U	0.0110	U	0.0120	U	0.0120	U	0.0110	U	0.0110	U	0.0120	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U	0.0110	U
1,1-Dichloroethane	1,700	420	0.0055	U	0.0057	U	0.0057	U	0.0120	U	0.0240	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
1,2-Dichloroethane	480	56	0.0055	U	0.0057	U	0.0057	U	0.0007	J	0.0058	U	0.0071	U	0.0057	U	0.0006	J	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0058	U	0.0056	U	0.0055	U	0.0057	U	0.0056	U		
cis-1,2-Dichloroethene	NE	NE	0.0027	U	0.0029	U	0.0029	U	0.0028	U	0.0029	U	0.0035	U	0.0029	U	0.0031	U	0.0028	U	0.0029	U	0.0031	U	0.0029	U	0.0029	U	0.0029	U	0.0029	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U
trans-1,2-Dichloroethene	1,700	1,700	0.0027	U	0.0029	U	0.0029	U	0.0028	U	0.0029	U	0.0035	U	0.0029	U	0.0031	U	0.0028	U	0.0029	U	0.0031	U	0.0029	U	0.0029	U	0.0029	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U	0.0029	U	0.0028	U		
1,1,2-Trichloroethene	360	1,200	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
1,2-Dichloropropane	180	120	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U
cis-1,3-Dichloropropene	NE	NE	0.0055	U	0.0057	U	0.0057	U	0.0056	U	0.0058	U	0.0071	U	0.0057	U	0.0063	U	0.0056	U	0.0057	U	0.0061	U	0.0058	U	0.0057	U	0.0056	U	0.0058	U	0.0058	U	0.0056	U	0.0057	U	0.0055	U	0.0057	U	0.0055	U	0.0057	U	0.0056	U</

Notes:
 NS = Not sampled
 U = indicates analyte not detected at indicated reporting limit (RL)
 NE = No screening level concentration established
 mg/ kg = milligrams per kilogram
 All laboratory data provided by Test America Laboratories
 * = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
 B - value qualified due to detection of analyte in one or more associated laboratory blanks
 VAP - Ohio Voluntary Action Program
 VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
 Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

TABLE E2 (CONTINUED)
SUMMARY OF VOCS IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

[illegible]

Notes:
 NS = Not sampled
 U = indicates analyte not detected at indicated reporting limit (RL)
 NE = No screening level concentration established
 mg/ kg = milligrams per kilogram
 All laboratory data provided by Test America Laboratories
 * = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control list SVOC - semivolatile organic compounds
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

TABLE E2 (CONTINUED)
SUMMARY OF VOCs IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-10-1		IA-10-2		IA-10-3		IA-10-3		IA-10-4		-		-		IA-1
Sample ID			SB101-HAZ-20-0411		SB102-HAZ-30-0411		SB103-HAZ-5-0411		SB103-HAZ-10-0411		SB104-HAZ-15-0411		BACKGROUND-13-0422		BACKGROUND-23-0422		SB91-NEW
Depth (feet)			20'		30'		5'		10'		15'		13'		23'		25' -
Sample Date			4/5/2011		4/5/2011		4/7/2011		4/7/2011		4/7/2011		4/22/2011		4/22/2011		4/13/
Sample Time			1355		1612		931		940		1112		1000		1010		90
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-10 HAZARDOUS WASTE STORAGE PAD										Background Samples				
VOCs - mg/kg																	
Acetone	110,000	110,000	0.0092	J,B	0.2	B	0.029	B	0.043	B	0.036	B	NS	NS			0.018
Benzene	1,200	140	0.0058	U	0.0058	U	0.006	U	0.00032	J	0.0061	U	NS	NS			0.0057
Bromodichloromethane	300	35	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Bromoform	130,000	6,200	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Bromomethane	550	82	0.012	U	0.012	U	0.012	U	0.011	U	0.012	U	NS	NS			0.0028
2-Butanone	28,000	28,000	0.023	U	0.032		0.024	U	0.0033	J	0.0031	J	NS	NS			0.0026
Carbon disulfide	740	740	0.0058	U	0.0058	U	0.006	U	0.0021	J	0.0061	U	NS	NS			0.0023
Carbon tetrachloride	460	79	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Chlorobenzene	760	760	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Dibromochloromethane	770	84	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Chloroethane	NE	NE	0.0018	J	0.012	U	0.012	U	0.011	U	0.012	U	NS	NS			0.011
Chloroform	320	38	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Chloromethane	1,300	1,300	0.012	U	0.012	U	0.012	U	0.011	U	0.012	U	NS	NS			0.011
1,2-Dibromo-3-chloro-propane	15	2	0.0012	U	0.0012	U	0.012	U	0.11	U	0.012	U	NS	NS			0.11
1,2-Dibromoethane	38	4	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
1,2-Dichlorobenzene	380	380	0.0058	U	0.0058	U	0.006	U	0.056	U	0.0061	U	NS	NS			0.057
1,3-Dichlorobenzene	NE	NE	0.0058	U	0.0058	U	0.006	U	0.056	U	0.0061	U	NS	NS			0.057
1,4-Dichlorobenzene	2,600	310	0.0058	U	0.0058	U	0.006	U	0.056	U	0.0061	U	NS	NS			0.057
Dichlorodifluoromethane	850	850	0.012	U	0.012	U	0.012	U	0.011	U	0.012	U	NS	NS			0.011
1,1-Dichloroethane	1,700	420	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
1,2-Dichloroethane	480	56	0.0058	U	0.00043	J	0.00048	J	0.00067	J	0.00049	J	NS	NS			0.0057
cis-1,2-Dichloroethene	NE	NE	0.0029	U	0.0029	U	0.003	U	0.0028	U	0.003	U	NS	NS			0.0029
trans-1,2-Dichloroethene	1,700	1,700	0.0029	U	0.0029	U	0.003	U	0.0028	U	0.003	U	NS	NS			0.0029
1,1-Dichloroethene	360	1,200	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
1,2-Dichloropropane	180	120	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
cis-1,3-Dichloropropene	NE	NE	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
trans-1,3-Dichloropropene	NE	NE	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Ethylbenzene	480	480	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
n-Hexane	140	140	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
2-Hexanone	NE	NE	0.023	U	0.023	U	0.024	U	0.022	U	0.024	U	NS	NS			0.023
Isopropylbenzene	NE	NE	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Methylene chloride	3,300	3,300	0.0055	J,B	0.0065	B	0.0098	B	0.046	B	0.011	B	NS	NS			0.0048
4-Methyl-2-pentanone	3,400	3,400	0.023	U	0.023	U	0.024	U	0.022	U	0.024	U	NS	NS			0.023
Methyl tert-butyl ether	8,900	5,700	0.023	U	0.023	U	0.024	U	0.022	U	0.024	U	NS	NS			0.023
Styrene	870	870	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
1,1,2,2-Tetrachloroethane	670	75	0.0058	U	0.0058	U	0.006	U	0.056	U	0.0061	U	NS	NS			0.057
Tetrachloroethene	170	170	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Toluene	820	820	0.0058	U	0.00037	J	0.006	U	0.00035	J	0.0061	U	NS	NS			0.00045
1,2,4-Trichloro-benzene	400	400	0.0058	U	0.0058	U	0.006	U	0.056	U	0.0061	U	NS	NS			0.057
1,1,1-Trichloroethane	640	640	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
1,1,2-Trichloroethane	1,200	140	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Trichloroethene	17	51	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057
Trichlorofluoromethane	1,200	1,200	0.012	U	0.012	U	0.012	U	0.011	U	0.012	U	NS	NS			0.011
Vinyl chloride	280	50	0.0023	U	0.0023	U	0.0024	U	0.0022	U	0.0024	U	NS	NS			0.0023
Xylenes (total)	260	260	0.0058	U	0.0058	U	0.006	U	0.0056	U	0.0061	U	NS	NS			0.0057

Notes:
NS = Not sampled
U = the analyte was not detected above the listed reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels
J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C
SVOC - semivolatile organic compounds

TABLE E2 (CONTINUED)
SUMMARY OF VOCs IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-13-1		IA-13-2		IA-13-3		IA-13-4		IA-13-4		IA-13-5		IA-13-6		IA-13-7		IA-13-8		IA-13-9		IA-13-10		IA-13-11		IA-13-12		IA-13-13	
Sample ID			SB1-4-0613		SB2-4-0613		SB3-4-0613		SB4-3-0613		SB4-8-0613		SB5-3-0613		SB6-4-0613		SB7-4-0613		SB8-4-0613		SB9-6-0613		SB10-4-0613		SB11-3-0613		SB12-3-0613		SB13-4-0613	
Depth (feet)			4'		4'		4'		3'		8'		3'		4'		4'		4'		6'		4'		3'		3'		4'	
Sample Date			6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013		6/13/2013	
Sample Time			1015		1040		1105		1130		1135		1155		1255		1315		1345		1410		1450		1510		1530		1555	
			Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil	IA-13 SOUTH TERRACE																									
VOCs - mg/kg																														
Acetone	110,000	110,000	0.046		0.098		0.049		0.092		0.062		0.095		0.1		0.048		0.29		0.1		0.78		0.024	U	0.064	U	0.069	
Benzene	1,200	140	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.037		0.0057	U
Bromodichloromethane	300	35	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Bromoform	130,000	6,200	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Bromomethane	550	82	0.0011	U	0.012	U	0.013	U	0.012	U	0.012	U	0.011	U	0.012	U	0.012	U	0.011	U	0.013	U	0.024	U	0.012	U	0.032	U	0.011	U
2-Butanone	28,000	28,000	0.022	U	0.023	U	0.025	U	0.024	U	0.024	U	0.022	U	0.024	U	0.023	U	0.041		0.025	U	0.048	U	0.024	U	0.016	U	0.023	U
Carbon disulfide	740	740	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.064	U	0.0057	U
Carbon tetrachloride	460	79	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Chlorobenzene	760	760	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Dibromochloromethane	770	84	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Chloroethane	NE	NE	0.011	U	0.012	U	0.013	U	0.012	U	0.012	U	0.011	U	0.012	U	0.012	U	0.011	U	0.013	U	0.024	U	0.012	U	0.032	U	0.011	U
Chloroform	320	38	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Chloromethane	1,300	1,300	0.011	U	0.012	U	0.013	U	0.012	U	0.012	U	0.011	U	0.012	U	0.012	U	0.011	U	0.013	U	0.024	U	0.012	U	0.032	U	0.011	U
1,1-Dichloroethane	1,700	420	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
1,2-Dichloroethane	480	56	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
cis-1,2-Dichloroethene	NE	NE	0.0028	U	0.0029	U	0.0031	U	0.0029	U	0.003	U	0.0028	U	0.0031	U	0.0029	U	0.0029	U	0.031	U	0.006	U	0.003	U	0.008	U	0.0028	U
trans-1,2-Dichloroethene	1,700	1,700	0.0028	U	0.0029	U	0.0031	U	0.0029	U	0.003	U	0.0028	U	0.0031	U	0.0029	U	0.0029	U	0.031	U	0.006	U	0.003	U	0.008	U	0.0028	U
1,1-Dichloroethene	360	1,200	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
1,2-Dichloropropane	180	120	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
cis-1,3-Dichloropropene	NE	NE	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
trans-1,3-Dichloropropene	NE	NE	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
2-Hexanone	NE	NE	0.022	U	0.023	U	0.025	U	0.024	U	0.024	U	0.022	U	0.024	U	0.023	U	0.023	U	0.025	U	0.048	U	0.024	U	0.064	U	0.023	U
Methylene chloride	3,300	3,300	0.0055	U	0.011		0.0063	U	0.0072		0.006	U	0.0056	U	0.0089		0.0058	U	0.009		0.0063	U	0.021		0.0059		0.016	U	0.0057	U
4-Methyl-2-pentanone	3,400	3,400	0.022	U	0.023	U	0.025	U	0.024	U	0.024	U	0.022	U	0.024	U	0.023	U	0.023	U	0.025	U	0.048	U	0.024	U	0.064	U	0.023	U
Methyl tert-butyl ether	8,900	5,700	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Styrene	870	870	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
1,1,2,2-Tetrachloroethane	670	75	0.0055	U	0.057	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.062	U	0.0058	U	0.0057	U	0.0063	U	0.061	U	0.0059U		0.016	U	0.0057	U
Tetrachloroethene	170	170	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Toluene	820	820	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
1,1,1-Trichloroethane	640	640	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
1,1,2-Trichloroethane	1,200	140	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Trichloroethene	17	51	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.0059	U	0.016	U	0.0057	U
Vinyl chloride	280	50	0.011	U	0.012	U	0.013	U	0.012	U	0.012	U	0.011	U	0.012	U	0.012	U	0.011	U	0.013	U	0.024	U	0.012	U	0.032	U	0.011	U
Xylenes (total)	260	260	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.01		0.049		0.0057	U
Ethylbenzene	480	480	0.0055	U	0.0058	U	0.0063	U	0.0059	U	0.006	U	0.0056	U	0.0061	U	0.0058	U	0.0057	U	0.0063	U	0.012	U	0.006	U	0.031		0.0057	U

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

SVOC - semivolatile organic compounds

TABLE E2 (CONTINUED)
SUMMARY OF VOCs IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-13-14		IA-13-15		IA-13-16		IA-13-17		IA-13-18		IA-13-19		IA-13-20		IA-13-21		IA-13-22		IA-13-23		IA-13-24		IA-13-25		IA-13-26		IA-13-27			
Sample ID			SB14-3-0613		SB15-4-0613		SB16-3-0613		SB17-3-0613		SB18-4-0613		SB19-5-0613		SB20-2-0613		SB21-3-0613		SB22-3-0613		SB23-4-0613		SB24-4-0613		SB25-3-0613		SB26-3-0613		SB27-1-0613			
Depth (feet)			3'		4'		3'		3'		4'		5'		2'		3'		3'		4'		4'		3'		3'		1'			
Sample Date			6/13/2013		6/13/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013			
Sample Time			1615		1645		735		750		805		820		840		855		910		925		935		955		1030		1040			
			Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil	IA-13 SOUTH TERRACE																											
VOCs - mg/kg																																
Acetone	110,000	110,000	0.077		0.18		0.027	U	0.028	U	0.026	U	0.024	U	0.025	U	0.026	U	0.037		0.32		0.31		0.026	U	0.029		0.023	U		
Benzene	1,200	140	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Bromodichloromethane	300	35	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Bromoform	130,000	6,200	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Bromomethane	550	82	0.011	U	0.014	U	0.014	U	0.014	U	0.013	U	0.012	U	0.012	U	0.013	U	0	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U		
2-Butanone	28,000	28,000	0.023	U	0.028		0.027	U	0.028	U	0.026	U	0.024	U	0.025	U	0.026	U	0.023	U	0.034		0.051		0.026	U	0.023	U	0.023	U		
Carbon disulfide	740	740	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Carbon tetrachloride	460	79	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Chlorobenzene	760	760	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Dibromochloromethane	770	84	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Chloroethane	NE	NE	0.011	U	0.014	U	0.014	U	0.014	U	0.013	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U		
Chloroform	320	38	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Chloromethane	1,300	1,300	0.011	U	0.014	U	0.014	U	0.014	U	0.013	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U		
1,1-Dichloroethane	1,700	420	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
1,2-Dichloroethane	480	56	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
cis-1,2-Dichloroethene	NE	NE	0.0029	U	0.0034	U	0.0034	U	0.0036	U	0.0032	U	0.003	U	0.0031	U	0.0032	U	0.0028	U	0.0031	U	0.0029	U	0.0032	U	0.0029	U	0.0029	U		
trans-1,2-Dichloroethene	1,700	1,700	0.0029	U	0.0034	U	0.0034	U	0.0036	U	0.0032	U	0.003	U	0.0031	U	0.0032	U	0.0028	U	0.0031	U	0.0029	U	0.0032	U	0.0029	U	0.0029	U		
1,1-Dichloroethene	360	1,200	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
1,2-Dichloropropane	180	120	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
cis-1,3-Dichloropropene	NE	NE	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
trans-1,3-Dichloropropene	NE	NE	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
2-Hexanone	NE	NE	0.023	U	0.027	U	0.027	U	0.028	U	0.026	U	0.024	U	0.025	U	0.026	U	0.023	U	0.025	U	0.023	U	0.026	U	0.023	U	0.023	U		
Methylene chloride	3,300	3,300	0.0057	U	0.0068	U	0.016		0.0089		0.0064	U	0.006	U	0.014		0.012		0.0056	U	0.017		0.018		0.0079		0.0093		0.020			
4-Methyl-2-pentanone	3,400	3,400	0.023	U	0.027	U	0.027	U	0.028	U	0.026	U	0.024	U	0.025	U	0.026	U	0.023	U	0.025	U	0.023	U	0.026	U	0.023	U	0.023	U		
Methyl tert-butyl ether	8,900	5,700	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Styrene	870	870	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
1,1,2,2-Tetrachloroethane	670	75	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Tetrachloroethene	170	170	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Toluene	820	820	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
1,1,1-Trichloroethane	640	640	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
1,1,2-Trichloroethane	1,200	140	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Trichloroethene	17	51	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.0064	U	0.0057	U	0.0058	U		
Vinyl chloride	280	50	0.011	U	0.014	U	0.014	U	0.014	U	0.013	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U	0.012	U	0.013	U	0.011	U	0.012	U		
Xylenes (total)	260	260	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.023		0.006	U	0.0057	U	0.0058	U		
Ethylbenzene	480	480	0.0057	U	0.0068	U	0.0068	U	0.0071	U	0.0064	U	0.006	U	0.0062	U	0.0065	U	0.0056	U	0.0062	U	0.0058	U	0.064	U	0.0057	U	0.0058	U		

Notes:

NS = Not sampled

U = indicates analyte not detected at indicated reporting limit (RL)

NE = No screening level concentration established

mg/ kg = milligrams per kilogram

All laboratory data provided by Test America Laboratories

* = Ohio BUSTR Tier 1 Action Levels

Highlight values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits SVOC - semivolatile organic compounds

B - value qualified due to detection of analyte in one or more associated laboratory blanks

VAP - Ohio Voluntary Action Program

VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D

Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

TABLE E2 (CONTINUED)
SUMMARY OF VOCS IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-13-28		IA-13-15		IA-13-30		IA-13-30		IA-13-31		IA-13-32	
Sample ID			SB28-3-0613		SB29-3-0613		SB30-3-0613		SB30-9-0613		SB31-4-0613		SB32-1-0613	
Depth (feet)			3'		3'		3'		9'		4'		1'	
Sample Date			6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013		6/14/2013	
Sample Time			1050		1105		1120		1120		1105		1145	
	Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil	IA-13 SOUTH TERRACE											
VOCs - mg/kg														
Acetone	110,000	110,000	0.023	U	0.073		0.021	U	0.047		0.023	U	0.022	U
Benzene	1,200	140	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Bromodichloromethane	300	35	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Bromoform	130,000	6,200	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Bromomethane	550	82	0.012	U	0.011	U	0.01	U	0.012	U	0.011	U	0.011	U
2-Butanone	28,000	28,000	0.023	U	0.022	U	0.021	U	0.024	U	0.023	U	0.022	U
Carbon disulfide	740	740	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Carbon tetrachloride	460	79	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Chlorobenzene	760	760	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Dibromochloromethane	770	84	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Chloroethane	NE	NE	0.012	U	0.011	U	0.01	U	0.012	U	0.011	U	0.011	U
Chloroform	320	38	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Chloromethane	1,300	1,300	0.012	U	0.011	U	0.01	U	0.012	U	0.011	U	0.011	U
1,1-Dichloroethane	1,700	420	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
1,2-Dichloroethane	480	56	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
cis-1,2-Dichloroethene	NE	NE	0.0029	U	0.0027	U	0.026	U	0.003	U	0.0051		0.0028	U
trans-1,2-Dichloroethene	1,700	1,700	0.0029	U	0.0027	U	0.026	U	0.003	U	0.0028	U	0.0028	U
1,1-Dichloroethene	360	1,200	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
1,2-Dichloropropane	180	120	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
cis-1,3-Dichloropropene	NE	NE	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
trans-1,3-Dichloropropene	NE	NE	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
2-Hexanone	NE	NE	0.023	U	0.022	U	0.021	U	0.024	U	0.023	U	0.022	U
Methylene chloride	3,300	3,300	0.011		0.0055		0.0081		0.0066		0.013		0.01	
4-Methyl-2-pentanone	3,400	3,400	0.023	U	0.022	U	0.021	U	0.024	U	0.023	U	0.022	U
Methyl tert-butyl ether	8,900	5,700	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Styrene	870	870	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
1,1,2,2-Tetrachloroethane	670	75	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Tetrachloroethene	170	170	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Toluene	820	820	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
1,1,1-Trichloroethane	640	640	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
1,1,2-Trichloroethane	1,200	140	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Trichloroethene	17	51	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.1		0.0056	U
Vinyl chloride	280	50	0.012	U	0.011	U	0.01	U	0.012	U	0.011	U	0.011	U
Xylenes (total)	260	260	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U
Ethylbenzene	480	480	0.0058	U	0.0054	U	0.0052	U	0.006	U	0.0057	U	0.0056	U

Notes:

NS = Not sampled

U = indicates analyte not detected at indicated reporting limit (RL) J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits

NE = No screening level concentration established

B - value qualified due to detection of analyte in one or more associated laboratory blanks

mg/ kg = milligrams per kilogram

VAP - Ohio Voluntary Action Program

All laboratory data provided by Test America Laboratories

VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D

* = Ohio BUSTR Tier 1 Action Levels

Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

Highlight values exceed one or more screening level concentrations

TABLE E3
SUMMARY OF PAHS, PCBS, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS AND ETHYLENE GYLCOL IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-1-1		IA-1-1		IA-1-2		IA-1-2		IA-1-3		IA-1-3		IA-1-4		IA-1-4		IA-1-5		IA-1-5		IA-1-6		IA-2-1		IA-2-2		Duplicate		IA-2-2		IA-2-3		IA-2-3	
Sample ID			SB11-SSA-2-0411		SB11-SSA-4-0411		SB12-SSA-2-0411		SB12-SSA-4-0411		SB13-SSA-2-0411		SB13-SSA-4-0411		SB14-SSA-2-0411		SB14-SSA-4-0411		SB15-SSA-2-0411		SB15-SSA-4-0411		SB16-SSA-15-0411		SB21-FTF-20-0411		SB22-FTF-1520-0411		SBDUP2		SB22-FTF-2022-0411		SB23-FTF-7510-0411		SB23-FTF-1012-0411	
Depth (feet)			0' - 2.5'		2.5' - 5'		0' - 2.5'		2.5' - 5-		0' - 2.5'		2.5' - 5-		0' - 2.5'		2.5' - 5-		0' - 2.5'		2.5' - 5'		15'		20'		15' - 20'		15' - 20'		20' - 22.5'		7.5' - 10'		10' - 12.5'	
Sample Date			4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/5/2011		4/7/2011		4/8/2011		4/8/2011		4/8/2011		4/8/2011		4/8/2011	
Sample Time			1015		1015		1040		1040		1140		1140		1105		1105		1127		1127		0900		1558		1000		1000		1012		1105		1115	
			Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard-Industrial Soil	IA-1 SNOW STAGING AREA																		IA-2 FORMER TANK FARM													
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																				
Acenaphthene			780,000	90,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Acenaphthylene			780,000	90,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Anthracene			1,000,000	450,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Benzo(a)anthracene			1,200	58	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Benzo(a)pyrene			120	5.8	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Benzo(b)fluoranthene			1,200	58	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Benzo(ghi)perylene			390,000	45,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0220		0.0078	U	0.0079	U
Benzo(k)fluoranthene			12,000	580	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Chrysene			120,000	5,800	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0910		0.0083	U	0.0200		0.0110		0.0180	
Dibenz(a,h)anthracene			120	5.8	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Fluoranthene			160,000	60,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0220		0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Fluorene			520,000	60,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
Indeno(1,2,3-cd)pyrene			1,200	58	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0077	U	0.0078	U	0.0079	U
1-Methylnaphthalene			31,000	1,500	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0650		0.0480		0.0190		0.0160		0.0370		0.0250		0.0220	
2-Methylnaphthalene			5,200	6,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0460		0.0520		0.0160		0.0120		0.0540		0.0220		0.0230	
Naphthalene			560	450	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0075	U	0.0075	U	0.0075	U	0.0083	U	0.0093		0.0078	U	0.0079	U
Phenanthrene			1,000,000	450,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0670		0.0430		0.0180		0.0110		0.0300		0.0270		0.0250	
Pyrene			390,000	45,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0260		0.0075	U	0.0087		0.0083	U	0.0140		0.0078	U	0.0110	
Polychlorinated Biphenyls (PCB) - mg/kg																																				
Arochlor 1016			260	100	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1221			210	14	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1232			73	14	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1242			440	20	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1248			440	20	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1254			75	20	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
Arochlor 1260			440	20	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.0370	U	NS		NS		NS		NS		NS		NS	
RCRA Metals - mg/kg																																				
Arsenic			690	77	NS		NS		NS		NS		NS		NS		NS		NS		NS		11.00		NS		NS		NS		NS		NS		NS	
Lead			400	800	NS		NS		NS		NS		NS		NS		NS		NS		NS		8.60		NS		NS		NS		NS		NS		NS	
Barium			NE	NE	NS		NS		NS		NS		NS		NS		NS		NS		NS		33.40	B	NS		NS		NS		NS		NS		NS	
Selenium			11,000	20,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.53	U	NS		NS		NS		NS		NS		NS	
Cadmium			1,000	2,600	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.53	U	NS		NS		NS		NS		NS		NS	
Chromium			1,200	210	NS		NS		NS		NS		NS		NS		NS		NS		NS		12.60		NS		NS		NS		NS		NS		NS	
Silver			11,000	20,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		1.10	U	NS		NS		NS		NS		NS		NS	
Mercury			3.1	3.1	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.10	U	NS		NS		NS		NS		NS		NS	
Extractable Petroleum Hydrocarbons - mg/kg																																				
C6-C12			5,000*	5,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		0.1100	U	0.1100	U	0.1100	U	0.1200	U	0.1200	U	0.0550	J	0.1200	U
C20 - C34			20,000*	20,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		150		210		160		53		110		120		170	
C10 - C20			10,000*	10,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		130		170		100		17	J	79		67		140	
Ethylene glycol - mg/kg			1,000,000	1,000,000	1.15	U	1.14	U	1.1	U	1.1	U	1.11	U	1.18	U	1.14	U	1.14	U	1.16	U	1.08	U	1.0500		NS		NS		NS		NS		NS	

TABLE E3 (CONTINUED)
SUMMARY OF PAHS, PCBS, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS AND ETHYLENE GYLCOL IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-3-1	IA-3-1	IA-3-2	IA-4-1	IA-4-1	IA-4-2	IA-4-2	IA-4-3	IA-4-3	IA-4-3A	IA-4-3A	IA-4-4	IA-4-5	IA-4-5	IA-4-5	IA-4-6	IA-4-7	IA-4-8	IA-4-8	IA-4-9	IA-4-9	IA-4-10																						
Sample ID			SB31-UST-2730-0411	SB31-UST-3032-0411	SB32-UST-1720-0411	SB41-OLD-255-0411	SB41-OLD-1215-0411	SB42-OLD-0710-0411	SB42-OLD-1720-0411	SB43-OLD-025-0411	SB43-OLD-1725-0411	SB43A-255-0511	SB43A-0510-0511	SB44-OLD-1720-0411	SB45-OLD-255-0411	SB45-OLD-1012-0411	SB45-OLD-2730-0411	SB46-OLD-1215-0411	SB47-OLD-1720-0411	SB48-255-0511	SB48-510-0511	SB49-05-0511	SB49-510-0511	SB410-2527-0511																						
Depth (feet)			27.5' - 30'	30' - 32.5'	17.5' - 20'	2.5' - 5'	12.5' - 15'	7.5' - 10'	14.5' - 20'	2.5' - 5'	17.5' - 20'	2.5' - 5'	5' - 10'	17.5' - 20'	2.5' - 5'	10' - 12.5'	27.5' - 30'	12.5' - 15'	17.5' - 20'	2.5' - 5'	5' - 10'	0' - 5'	5' - 10'	25' - 27.5'																						
Sample Date			4/12/2011	4/12/2011	4/12/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	4/11/2011	5/12/2011	5/12/2011	4/8/2011	4/11/2011	4/11/2011	4/11/2011	4/12/2011	4/12/2011	5/12/2011	5/12/2011	5/12/2011	5/12/2011	5/12/2011																						
Sample Time			1318	1336	1133	1407	1416	1520	1533	1148	1205	1154	1203	1452	1029	1046	1107	1002	0901	10135	1040	1115	1120	1345																						
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-3 SUSPECTED FORMER UST										IA-4 FORMER WASTE WATER TREATMENT PLANT																																	
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																														
Acenaphthene	780,000	90,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	62.0		0.0190	U	0.1200		0.0082	U	0.0077	U	1.1000		0.0074	U	0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0076	U	0.0074	U
Acenaphthylene	780,000	90,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	4.2	U	0.0190	U	0.0077	U	0.0082	U	0.0077	U	0.1500	U	0.0074	U	0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0076	U	0.0074	U
Anthracene	1,000,000	450,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	120.0		0.0190	U	0.2000		0.0082	U	0.0077	U	2.7000		0.0150		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0076	U	0.0074	U
Benzo(a)anthracene	1,200	58	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	230.0		0.0190	U	0.4300		0.0180		0.0077	U	7.5000		0.0330		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0240		0.0074	U
Benzo(a)pyrene	120	5.8	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	190.0		0.0190	U	0.3600		0.0140		0.0077	U	7.0000		0.0390		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0270		0.0074	U
Benzo(b)fluoranthene	1,200	58	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	210.0		0.0190	U	0.4700		0.0200		0.0077	U	8.2000		0.0490		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0350		0.0074	U
Benzo(ghi)perylene	390,000	45,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0087		98.0		0.0190	U	0.2200		0.0082	U	0.0077	U	4.1000		0.0380		0.0110		0.0230		0.0076	U	0.0290	U	0.0076	U	0.0140		0.0240		0.0170	U
Benzo(k)fluoranthene	12,000	580	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	170.0		0.0190	U	0.2400		0.0090		0.0077	U	4.7000		0.0240		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0420	J	0.0073	U	0.0210		0.0074	U
Chrysene	120,000	5,800	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0120		250.0		0.0190	U	0.4400		0.0170		0.0077	U	8.2000		0.0470		0.0300		0.0140		0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0360		0.0074	U
Dibenz(a,h)anthracene	120	5.8	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	34.0		0.0190	U	0.0077	U	0.0082	U	0.0077	U	1.6000		0.0070		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0076	U	0.0074	U
Fluoranthene	160,000	60,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	650.0		0.0190	U	0.1300		0.0410		0.0077	U	18.0		0.0770		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0150		0.0450		0.0074	U
Fluorene	520,000	60,000	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	51.0		0.0190	U	0.9700		0.0082	U	0.0077	U	0.8500		0.0074	U	0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0076	U	0.0074	U
Indeno(1,2,3-cd)pyrene	1,200	58	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	93.0		0.0190	U	0.1800		0.0082	U	0.0077	U	3.3000		0.0210		0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0073	U	0.0170		0.0074	U
1-Methylnaphthalene	31,000	1,500	NS		NS		NS		0.0110		0.0310	U	0.0094	U	0.0076	U	8.5000		0.0630		0.0220		0.0082	U	0.0077	U	0.1500	U	0.0074	U	0.0078	U	0.0088		9.8000		0.0290	U	0.0076	U	0.0080		0.0076	U	0.0170	
2-Methylnaphthalene	5,200	6,000	NS		NS		NS		0.0100		0.0310	U	0.0094	U	0.0076	U	13.0		0.0630		0.0330		0.0082	U	0.0077	U	0.2200		0.0083		0.0078	U	0.0087		0.0130		0.0290	U	0.0076	U	0.0097		0.0076	U	0.0260	
Naphthalene	560	450	NS		NS		NS		0.0075	U	0.0310	U	0.0094	U	0.0076	U	11.0		0.0190	U	0.0530		0.0110		0.0077	U	0.1500	U	0.0074	U	0.0078	U	0.0075	U	0.0076	U	0.0290	U	0.0076	U	0.0110		0.0140		0.0430	
Phenanthrene	1,000,000	450,000	NS		NS		NS		0.0200		0.0490		0.0094	U	0.0076	U	510.0		0.0600		1.1000		0.0300		0.0077	U	8.8000		0.0540		0.0440		0.0170		0.0076	U	0.0290	U	0.0190		0.0320		0.0320			
Pyrene	390,000	45,000	NS		NS		NS		0.0110		0.0310	U	0.0094	U	0.0076	U	450.0		0.0220		0.8800		0.0310		0.0077	U	13.0		0.0800		0.0078	U	0.0180		0.0076	U	0.0290	U	0.0076	U	0.0140		0.0380		0.0074	U
Polychlorinated Biphenyls (PCB) - mg/kg																																														
Arochlor 1016	260	100	NS		NS		NS		0.0370	U	0.0380	U	0.0470	U	0.0380	U	0.0410	U	0.0370	U	0.0380	U	0.0400	U	0.0380	U	0.0380	U	0.0037	U	0.0038	U	0.0370	U	0.0380	U	0.0360	U	0.0380	U	0.0360	U	0.0380	U	0.0370	U
Arochlor 1221	210	14	NS		NS		NS		0.0370	U	0.0380	U	0.0470	U	0.0380	U	0.0410	U	0.0370	U	0.0380	U	0.0400	U	0.0380	U	0.0380	U	0.0037	U	0.0038	U	0.0370	U	0.0380	U	0.0360	U	0.0380	U	0.0360	U	0.0380	U	0.0370	U
Arochlor 1232	73	14	NS		NS		NS		0.0370	U	0.0380	U	0.0470	U	0.0380	U	0.0410	U	0.0370	U	0.0380	U	0.0400	U	0.0380	U	0.0380	U	0.0037	U	0.0038	U	0.0370	U	0.0380	U	0.0360	U	0.0380	U	0.0360	U	0.0380	U	0.0370	U
Arochlor 1242	440	20	NS		NS		NS		0.0370	U	0.0380	U	0.0470	U	0.0380	U	0.0410	U	0.0370	U	0.0380	U	0.0400	U	0.0380	U	0.0380	U	0.0037	U	0.0038	U	0.0370	U	0.0380	U	0.0360	U	0.0380	U	0.0360	U	0.0380	U	0.0370	U
Arochlor 1248	440	20	NS		NS		NS		0.0370	U	0.0380	U	0.0470	U	0.0380	U	0.0410	U	0.0370	U	0.0380	U	0.0400	U	0.0380	U	0.0380	U	0.0037	U	0.0038	U	0.0370	U	0.0380	U	0.0360	U	0.0380	U	0.0360	U	0.0380	U	0.0370	U
Arochlor 1254	75	20	NS		NS		NS		0.0370	U	0.0380																																			

TABLE E3 (CONTINUED)
SUMMARY OF PAHS, PCBs, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS AND ETHYLENE GLYCOL IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-5-1	IA-5-2	IA-5-3	IA-5-4	-	LF-1	LF-2	LF-3	LF-4	IA-6-1	Duplicate	IA-6-2	IA-6-2	IA-6-3	IA-6-3	IA-6-4	Duplicate	IA-6-5	IA-6-5	IA-6-6	IA-6-6	IA-6-7	IA-6-8	IA-6-8	IA-6-9	IA-6-9																										
Sample ID			SB51-LAN-25-0411	SB52-LAN-25-0411	SB53-LAN-22-0411	SB54-LAN-5-0411	LANDFILL BORING	LANDFILL-1	LANDFILL-2	LANDFILL-3	LANDFILL-4	SB61-CSA-2225-0411	SB61-DUP412	SB62-CSA-02-0411	SB62-CSA-04-0411	SB63-CSA-02-0411	SB63-CSA-04-0411	SB64-CSA-04-0411	DUP0413	SB65-CSA-02-0411	SB65-CSA-04-0411	SB66-CSA-02-0411	SB66-CSA-04-0411	SB67-CSA-04-0411	SB68-CSA-02-0411	SB68-CSA-04-0411	SB69-CSA-02-0411	SB69-CSA-04-0411																										
Depth (feet)			25'	25'	22'	5'	-	-	-	-	-	22.5' - 25'	22.5' - 25'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	2.5' - 5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'	0' - 2.5'	2.5' - 5'																											
Sample Date			4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/13/2011	5/16/2011	5/16/2011	5/16/2011	5/16/2011	4/12/2011	4/12/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011	4/13/2011																											
Sample Time			1058	1212	1430	1515	1458	0930	934	938	943	1441	1441	1304	1304	1310	1310	1316	1316	1321	1321	1325	1325	1340	1336	1336	1331	1331																										
	Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-5 SOIL PILE/SLOPE FILL AREA										IA-6 FORMER COAL STORAGE AREA																																									
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																																																						
Acenaphthene	780,000	90,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0078	U	0.0060	J	0.0078	U	0.0077	U	0.0059	J	0.0075	U	0.0075	U	0.0310	U	0.0560		0.0360		0.0400	U	0.0077	U	0.0081	U	0.0250		0.0080	U	0.0410	U	0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Acenaphthylene	780,000	90,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0078	U	0.0081	U	0.0078	U	0.0077	U	0.0081	U	0.0075	U	0.0075	U	0.0310	U	0.0390	U	0.0310	U	0.0400	U	0.0077	U	0.0081	U	0.0200	U	0.0080	U	0.0410	U	0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Anthracene	1,000,000	450,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0100		0.0089		0.0078	U	0.0077	U	0.0099		0.0075	U	0.0075	U	0.0420		0.1600		0.0840		0.1100		0.0077	U	0.0081	U	0.0550		0.0080	U	0.5700		0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.2100		0.0080	U
Benzo(a)anthracene	1,200	58	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0370		0.0310		0.0091		0.0059	J	0.0360		0.0075	U	0.0075	U	0.0870		0.2400		0.1200		0.1500		0.0077	U	0.0081	U	0.0860		0.0080	U	0.0720		0.0081	U	0.0400		0.0079	U	0.0079	U	0.1700		0.0076	J
Benzo(a)pyrene	120	5.8	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0280		0.0240		0.0072	J	0.0044	J	0.0300		0.0075	U	0.0075	U	0.0720		0.1900		0.0820		0.1100		0.0077	U	0.0081	U	0.0740		0.0080	U	0.0500		0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.1300		0.0080	U
Benzo(b)fluoranthene	1,200	58	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0450		0.0310		0.0120		0.0058	J	0.0430		0.0075	U	0.0075	U	0.0400		0.2600		0.1100		0.1400		0.0077	U	0.0081	U	0.0750		0.0080	U	0.0450		0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.1000		0.0120	
Benzo(ghi)perylene	390,000	45,000	0.0080	U	0.0079	U	0.0190		0.0083	U	0.0240		0.0160		0.0071	J	0.0052	J	0.0210		0.0075	U	0.0075	U	0.0590		0.1500		0.0700		0.0880		0.0077	U	0.0081	U	0.0610		0.0080	U	0.0820		0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Benzo(k)fluoranthene	12,000	580	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0200		0.0190		0.0049	J	0.0077	U	0.0210		0.0075	U	0.0075	U	0.0660		0.1100		0.0550		0.0690		0.0077	U	0.0081	U	0.0470		0.0080	U	0.0410	U	0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Chrysene	120,000	5,800	0.0080	U	0.0079	U	0.0130		0.0083	U	0.0450		0.0330		0.0130		0.0075	J	0.0400		0.0075	U	0.0075	U	0.1100		0.2800		0.1400		0.1800		0.0077	U	0.0081	U	0.0940		0.0080	U	0.0920		0.0081	U	0.0390	U	0.0096		0.0110		0.1800		0.0110	
Dibenz(a,h)anthracene	120	5.8	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0078		0.0081		0.0078	U	0.0077	U	0.0081	U	0.0075	U	0.0075	U	0.0310	U	0.0390	U	0.0310	U	0.0400	U	0.0077	U	0.0081	U	0.0200	U	0.0080	U	0.0410	U	0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Fluoranthene	160,000	60,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0890		0.0720	U	0.0210		0.0110		0.0970		0.0075	U	0.0075	U	0.1300		0.5200	U	0.2300		0.2900		0.0077	U	0.0081	U	0.1300		0.0080	U	0.0910		0.0081	U	0.0520	U	0.0079	U	0.0110		0.0190			
Fluorene	520,000	60,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0078		0.0040	J	0.0078	U	0.0077	U	0.0081	U	0.0075	U	0.0075	U	0.0310	U	0.0660		0.0400		0.0410		0.0077	U	0.0081	U	0.0270		0.0080	U	0.0530		0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
Indeno(1,2,3-cd)pyrene	1,200	58	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0160		0.0130		0.0046	J	0.0077	U	0.0180		0.0075	U	0.0075	U	0.0320		0.0950		0.0440		0.0590		0.0077	U	0.0081	U	0.0320		0.0080	U	0.0410	U	0.0081	U	0.0390	U	0.0079	U	0.0077	U	0.0800	U	0.0080	U
1-Methylnaphthalene	31,000	1,500	0.0280		0.0079	U	0.0610		0.0083	U	0.0078	U	0.0051	J	0.0062	J	0.0065	J	0.0081	U	0.0110		0.0240		0.9700		0.7700		1.0000		0.9000		0.0190		0.0380		0.7400		0.0690		1.8000		0.0650		0.5500		0.0400		0.1200		2.4000		0.0540	
2-Methylnaphthalene	5,200	6,000	0.0310		0.0079	U	0.0740		0.0083	U	0.0078	U	0.0059	J	0.0120		0.0078		0.0041	J	0.0075	U	0.0360		1.5000		1.2000		1.5000		0.0260		0.0630		1.2000		0.1100		2.6000		0.1000		0.7900		0.0600		0.0077	U	3.8000		0.0081			
Naphthalene	560	450	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0078	U	0.0081	U	0.0078	U	0.0077	U	0.0081	U	0.0075	U	0.0075	U	0.8200		0.6200		0.7900		0.9200		0.0160		0.0380		0.6300		0.0690		1.4000		0.0630		0.4300		0.0350		0.1200		2.2000		0.0520	
Phenanthrene	1,000,000	450,000	0.0350		0.0079	U	0.0450		0.0083	U	0.0530		0.0480		0.0190		0.0140		0.0640		0.0110		0.0170		0.4100		0.6900		0.4800		0.4900		0.0079		0.0160		0.3400		0.0280		0.5800		0.0300		0.1900		0.0220		0.0470		0.9600		0.0260	
Pyrene	390,000	45,000	0.0080	U	0.0079	U	0.0076	U	0.0083	U	0.0650		0.0540		0.0160		0.0095		0.0660		0.0075	U	0.0880		0.1400		0.4100		0.2000		0.2700		0.0077	U	0.0081	U	0.1300		0.0082		0.1300		0.0081	U	0.0770		0.0079	U	0.0140		0.2000		0.0140	
Polychlorinated Biphenyls (PCB) - mg/kg																																																						
Arochlor 1016	260	100	0.0400	U	0.0390	U	0.0380	U	0.0410	U	0.0380	U	0.0400	U	0.0390	U	0.0380	U	0.4000	U	0.0370	U	0.0370	U	0.0390	U	0.0390	U	0.0390	U	0.0390	U	0.0400	U	0.0390	U	0.0390	U	0.0400	U	0.0400	U	0.0390	U	0.0390	U	0.0380	U	0.0400	U	0.0390	U		
Arochlor 1221	210	14	0.0400	U	0.0390	U	0.0380	U	0.0410	U	0.0380	U	0.0400	U	0.0390	U	0.0380	U	0.4000	U	0.0370	U	0.0370	U	0.0390	U	0.0390	U	0.0390	U	0.0390	U	0.0400	U	0.0390	U	0.0390	U	0.0400	U	0.0400	U	0.0390	U	0.0390	U	0.0380	U	0.0400	U	0.0390	U		

TABLE E3 (CONTINUED)
SUMMARY OF PAHS, PCBs, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS AND ETHYLENE GYLCOL IN SOIL (mg/kg)
FORMER GM ONTARIO STAMPING PLANT

Sample Location			IA-10-1		IA-10-2		IA-10-3		IA-10-3		IA-10-4		IA-14-1		IA-14-2		IA-14-3		-		-	
Sample ID			SB101-HAZ-20-0411		SB102-HAZ-30-0411		SB103-HAZ-5-0411		SB103-HAZ-10-0411		SB104-HAZ-15-0411		SB91-NEW-2527-0411		SB92-NEW-2530-0411		SB93-NEW-2730-0411		BACKGROUND-13-0422		BACKGROUND-23-0422	
Depth (feet)			20'		30'		5'		10'		15'		25' - 27.5'		25' - 30'		27.5' - 30'		13'		23'	
Sample Date			4/5/2011		4/5/2011		4/7/2011		4/7/2011		4/7/2011		4/13/2011		4/13/2011		4/13/2011		4/22/2011		4/22/2011	
Sample Time			1355		1612		931		940		1112		908		1014		1138		1000		1010	
			Ohio VAP DC Construction/Excavation	Ohio VAP Generic DC Standard--Industrial Soil	IA-10 HAZARDOUS WASTE STORAGE PAD								IA-14 EASTERN STORAGE YARD						Background Samples			
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																						
Acenaphthene	780,000	90,000	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Acenaphthylene	780,000	90,000	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Anthracene	1,000,000	450,000	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Benzo(a)anthracene	1,200	58	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Benzo(a)pyrene	120	5.8	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076		0.0099		0.019 U		NS		NS	
Benzo(b)fluoranthene	1,200	58	0.0077 U		0.0077 U		0.0360		0.0074 U		0.0081 U		0.0099		0.0150		0.019 U		NS		NS	
Benzo(ghi)perylene	390,000	45,000	0.0077 U		0.0077 U		0.0080 U		0.0180		0.0081 U		0.0340		0.0390		0.019 U		NS		NS	
Benzo(k)fluoranthene	12,000	580	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Chrysene	120,000	5,800	0.0077 U		0.0077 U		0.0130		0.0160		0.0081 U		0.0120		0.0160		0.019 U		NS		NS	
Dibenz(a,h)anthracene	120	5.8	0.0077 U		0.0077 U		0.0080 U		0.0074 U		0.0081 U		0.0076	U	0.0074 U		0.019 U		NS		NS	
Fluoranthene	160,000	60,000	0.0077	U	0.0077	U	0.0180		0.0074	U	0.0081	U	0.0100		0.0130		0.0190	U	NS		NS	
Fluorene	520,000	60,000	0.0077	U	0.0077	U	0.0080	U	0.0074	U	0.0081	U	0.0096		0.0074	U	0.0190	U	NS		NS	
Indeno(1,2,3-cd)pyrene	1,200	58	0.0077	U	0.0077	U	0.0080	U	0.0074	U	0.0081	U	0.0076	U	0.0074	U	0.0190	U	NS		NS	
1-Methylnaphthalene	31,000	1,500	0.0077	U	0.0077	U	0.0080	U	0.0410		0.0081	U	0.0270		0.0130		0.0500		NS		NS	
2-Methylnaphthalene	5,200	6,000	0.0077	U	0.0077	U	0.0080	U	0.0390		0.0081	U	0.0230		0.0200		0.0770		NS		NS	
Naphthalene	560	450	0.0077	U	0.0077	U	0.0080	U	0.0074	U	0.0081	U	0.0076	U	0.0074	U	0.0260		NS		NS	
Phenanthrene	1,000,000	450,000	0.0077	U	0.0077	U	0.0080	U	0.0360		0.0081	U	0.0300		0.0190		0.0430		NS		NS	
Pyrene	390,000	45,000	0.0077	U	0.0077	U	0.0150		0.0074	U	0.0081	U	0.0180		0.0200		0.0190	U	NS		NS	
Polychlorinated Biphenyls (PCB) - mg/kg																						
Arochlor 1016	260	100	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1221	210	14	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1232	73	14	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1242	440	20	0.0380	U	0.0380	U	0.0240	J	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1248	440	20	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1254	75	20	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
Arochlor 1260	440	20	0.0380	U	0.0380	U	0.0400	U	0.0370	U	0.0400	U	0.0380	U	0.0370	U	0.0370	U	NS		NS	
RCRA Metals - mg/kg																						
Arsenic	690	77	19.1		16.6		17.6		15.4		17.6		13.0		12.0		12.4		14.0		13.8	
Lead	400	800	15.0		14.7		15.5		11.3		15.5		11.3		9.9		9.8		12.8		12.4	
Barium	NE	NE	40.1	J	47.5	J	54.8	J	46.8	J	68.8	J	42.1	B	33.7	B	56.9	B	28.8	B	63.1	B
Selenium	11,000	20,000	0.81		0.76		0.50	U	0.53	B	0.58	U	0.48	U	0.51	U	0.42	U	0.49	U	0.47	U
Cadmium	1,000	2,600	0.46	U	0.55	U	0.05	U	0.55	U	0.58	U	0.48	U	0.51	U	0.25	J	0.30	J	0.41	J
Chromium	1,200	210	12.9		12.7		10.9		10.1		13.6		12.9		16.7		10.2		11.6		10.3	
Silver	11,000	20,000	0.91	U	1.10	U	0.99	U	1.10	U	1.20	U	0.96	U	1.00	U	0.84	U	0.99	U	0.93	U
Mercury	3.1	3.1	0.022	B	0.030	B	0.120	U	0.024	B	0.110	U	0.110	U	0.095	U	0.085	U	0.019	J	0.096	U
Extractable Petroleum Hydrocarbons - mg/kg																						
C6-C12	5,000*	5,000*	NS		NS		NS		NS		NS		0.11	U	0.11	U	0.11	U	NS		NS	
C20 - C34	20,000*	20,000*	NS		NS		NS		NS		NS		34.0		41.0		82.0		NS		NS	
C10 - C20	10,000*	10,000*	NS		NS		NS		NS		NS		27.0		28.0		79.0		NS		NS	
Ethylene glycol - mg/kg	1,000,000	1,000,000	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS	

Notes:

NS = Not sampled

U = indicates analyte not detected at indicated reporting limit (RL)

NE = No screening level concentration established

mg/ kg = milligrams per kilogram

All laboratory data provided by Test America Laboratories

* = Ohio BUSTR Tier 1 Action Levels

* = Landfill sample CF-1, CF-2, LF-3, and LF-4 are composites of varied depths within each boring.

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits

B - value qualified due to detection of analyte in one or more associated laboratory blanks

VAP - Ohio Voluntary Action Program

VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D

Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

ANALYTICAL TABLE E-4
SUMMARY OF VOCs IN MONITORING WELL GROUND WATER SAMPLES (mg/L)
MANSFIELD STAMPING PLANT

		MW2-1	MW2-1	MW2-2	DUPLICATE		MW2-2	MW4-7	MW4-7	MW5-1	MW5-1	MW5-2S	MW5-2S	MW5-2D	MW5-2D	MW5-4	MW5-4	MW10-2	MW10-2	MW14-1	DUPLICATE										
Sample ID		4/27/2011	6/2/2011	4/29/2011	4/29/2011		6/2/2011	4/28/2011	6/2/2011	4/27/2011	6/2/2011	4/28/2011	6/2/2011	4/28/2011	6/2/2011	4/28/2011	6/2/2011	4/27/2011	6/2/2011	4/28/2011	6/2/2011										
Sample Date		1742	1506	1100	1100		1600	0917	1715	1955	1326	1215	0825	1332	0952	1550	1125	1541	1350	1330	1350										
Sample Time																															
	Ohio VAP Generic Unrestricted Potable Use Standards																														
VOCs - mg/L																															
Acetone	12.0000	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	NS	0.010	U	0.010	U	0.010	U	0.010	U	
Benzene	0.0050	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Bromodichloromethane	0.0800	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Bromoform	0.0800	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Bromomethane	0.0070	0.002	U	NS	0.002	U	0.002	U	NS	0.002	U	0.010	U	0.002	U	NS	0.002	U	NS	0.002	U	NS	0.002	U	0.010	U	0.002	U	0.010	U	
2-Butanone	4.9000	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	NS	0.010	U	0.010	U	0.010	U	0.010	U	
Carbon disulfide	0.7200	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.00028	J	0.005	U	0.001	U	
Carbon tetrachloride	0.0050	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Chlorobenzene	0.1000	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Dibromochloromethane	0.0800	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Chloroethane	0.5500	0.002	U	NS	0.002	U	0.002	U	NS	0.002	U	0.010	U	0.002	U	NS	0.002	U	NS	0.002	U	NS	0.002	U	0.010	U	0.002	U	0.010	U	
Chloroform	0.0800	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Chloromethane	0.1900	0.002	U	NS	0.002	U	0.002	U	NS	0.002	U	0.010	U	0.002	U	NS	0.002	U	NS	0.002	U	NS	0.002	U	0.010	U	0.002	U	0.010	U	
1,2-Dibromo-3-chloro-propane	0.0002	0.002	U	NS	0.002	U	0.002	U	NS	0.002	U	0.005	U	0.002	U	NS	0.002	U	NS	0.002	U	NS	0.002	U	0.005	U	0.002	U	0.005	U	
1,2-Dibromoethane	0.00005	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
1,2-Dichlorobenzene	0.6000	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
1,3-Dichlorobenzene	-	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
1,4-Dichlorobenzene	0.0750	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Dichlorodifluoromethane	2.8000	0.002	U	NS	0.002	U	0.002	U	NS	0.002	U	0.010	U	0.002	U	NS	0.002	U	NS	0.002	U	NS	0.002	U	0.010	U	0.002	U	0.010	U	
1,1-Dichloroethane	0.2400	0.001	U	NS	0.001	U	0.001	U	NS	0.012		0.022		0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
1,2-Dichloroethane	0.0050	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
cis-1,2-Dichloroethene	0.0700	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.007		0.004	J	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U
trans-1,2-Dichloroethene	0.1000	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001		0.001	J	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U
1,1-Dichloroethene	0.0070	0.001	U	NS	0.001	U	0.001	U	NS	0.002		0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
1,2-Dichloropropane	0.0050	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
cis-1,3-Dichloropropene	-	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
trans-1,3-Dichloropropene	-	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Ethylbenzene	0.7000	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
n-Hexane	0.2500	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
2-Hexanone	-	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	0.010	U	NS	0.010	U	NS	0.010	U	NS	0.010	U	0.010	U	0.010	U	0.010	U	
Isopropylbenzene	-	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
Methylene chloride	0.0050	0.001	U	NS	0.001	U	0.001	U	NS	0.001	U	0.005	U	0.001	U	NS	0.001	U	NS	0.001	U	NS	0.001	U	0.005	U	0.001	U	0.005	U	
4-Methyl-2-pentanone	1.0000	0.010	U	NS	0.010	U	0.010	U	NS	0.010	U	0.010	U	0.010	U	NS	0.010	U	NS	0.010	U	NS	0.010	U	0.010	U	0.010	U	0.010	U	
Methyl tert-butyl ether	0.120																														

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
Highlighted values exceed one or more screening level concentrations
mg/L = milligrams per liter
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program

ANALYTICAL TABLE E-5
SUMMARY OF PAH, PCBS, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS, GASOLINE ORGANICS AND ETHYLENE GYLCOL IN MONIOTORING WELL GROUND WATER SAMPLES (mg/L)
MANSFIELD STAMPING PLANT

Sample ID		MW2-1	MW2-1	MW2-2	DUPLICATE		MW2-2	MW4-7	MW4-7	MW5-1	MW5-1	MW5-2S	MW5-2S	MW5-2D	MW5-2D	MW5-4	MW5-4	MW10-1	MW10-2	MW14-1	DUPLICATE												
Sample Type (Grab/Composite)		4/27/2011	6/2/2011	4/29/2011	4/29/2011		6/2/2011	4/28/2011	6/2/2011	4/27/2011	6/2/2011	4/28/2011	6/2/2011	4/28/2011	6/2/2011	4/28/2011	6/2/2011	4/27/2011	6/2/2011	4/28/2011	6/2/2011												
Sample Time		1742	1506	1100	1100		1600	0917	1715	1955	1326	1215	0825	1332	0952	1550	1125	1541	1350	1330	1350												
Ohio VAP Generic Unrestricted Potable Use Standards																																	
Polynuclear Aromatic Hydrocarbons (PAH) - mg/L																																	
Acenaphthene	0.40	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Acenaphthylene	0.40	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Anthracene	1.30	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Benzo(a)anthracene	0.00092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Benzo(a)pyrene	0.00020	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Benzo(b)fluoranthene	0.00092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Benzo(ghi)perylene	0.087	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Benzo(k)fluoranthene	0.0092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Chrysene	0.092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Dibenz(a,h)anthracene	0.000092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Fluoranthene	0.63	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Fluorene	0.22	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Indeno(1,2,3-cd)pyrene	0.00092	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
1-Methylnaphthalene	0.01	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
2-Methylnaphthalene	0.027	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Naphthalene	0.001	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Phenanthrene	1.30	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
Pyrene	0.087	0.0002	U	NS	0.0002	U	NS		NS	0.0002	U	NS		0.0002	U	NS	0.0002	U	NS	0.0002	U	NS		0.0002	U	NS							
RCRA Metals - mg/L																																	
Arsenic	0.01	0.0333		0.0383	0.0079	J	0.0127		0.0294	0.0100	U	0.0091	J	0.0160		0.0207	0.0100	U	0.0112	0.0145		0.0188	0.0387		0.0465	0.0100	U	0.0100	U	0.0100	U	0.0058	
Lead	0.015	0.0030	U	NS	0.0030	U	0.0030	U	NS	0.0030	U	NS		0.0030	U	NS	0.0030	U	NS	0.0030	U	NS	0.0024	J	0.0148		0.0029	J	0.0135				
Barium	NE	0.4520	J	NS	0.1420	J,B	0.1380	J,B	NS	0.0798	J,B	NS		0.0362	J,B	NS	0.0270	J,B	NS	0.1410	J,B	NS	0.0482	J,B	NS	0.1760	J,B	0.0629		0.0282	J,B	0.0692	
Selenium	0.050	0.0050	U	NS	0.0050	U	0.0050	U	NS	0.0050	U	NS		0.0050	U	NS	0.0050	U	NS	0.0050	U	NS	0.0050	U	0.1050		0.0050	U	0.0909				
Cadmium	0.005	0.0040	U	NS	0.0040	U	0.0040	U	NS	0.0040	U	NS		0.0040	U	NS	0.0040	U	NS	0.0040	U	NS	0.0040	U	0.0040	U	0.0040	U	0.0040	U			
Chromium	0.10	0.0100	U	NS	0.0100	U	0.0100	U	NS	0.0100	U	NS		0.0100	U	NS	0.0100	U	NS	0.0100	U	NS	0.0100	U	NS	0.0210	U	0.0210	U	0.0043	J	0.0210	U
Silver	0.079	0.0100	U	NS	0.0100	U	0.0100	U	NS	0.0100	U	NS		0.0100	U	NS	0.0100	U	NS	0.0100	U	NS	0.0100	U	NS	0.0100	U	0.0064		0.0100	U	0.0060	
Mercury	0.002	0.0002	U	NS	0.0002	U	0.0002	J	NS	0.0020	U	NS		0.0020	U	NS	0.0002	U	NS	0.0002	U	NS	0.0002	U	NS	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Extractable Petroleum Hydrocarbons - mg/L																																	
C20 - C34	--	0.5000	U	NS	0.5000		NS		NS	0.2500	J	NS		0.5000	U	NS	0.5000	U	NS	0.5000	U	NS	0.5000	U	NS	0.5000	U	NS		0.6500		NS	
C10 - C20	--	0.5000	U	NS	0.2600	J	NS		NS	0.5000	U	NS		0.5000	U	NS	0.5000	U	NS	0.5000	U	NS	0.5000	U	NS	0.5000	U	NS		0.5000	U	NS	
Volatile organics - mg/L																																	
Gasoline Range Organics (C6 - C12	--	0.0260	J	NS	0.0250	J	0.0260	J	NS	0.0430	J	N		0.0290	J	NS	0.0360	J	NS	0.1000	U	NS	0.1000	U	NS	0.1000	U	NS		0.1000	U	NS	

Notes:

NS = Not sampled

U = indicates analyte not detected at indicated reporting limit (RL)

NE = No screening level concentration established

mg/ kg = milligrams per kilogram

All laboratory data provided by Test America Laboratories

* = Ohio BUSTR Tier 1 Action Levels

Highlighted values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits

B - value qualified due to detection of analyte in one or more associated laboratory blanks

VAP - Ohio Voluntary Action Program

VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D

Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

ANALYTICAL TABLE E-6
SUMMARY OF VOCs IN SEDIMENT (mg/kg)
MANFIELD STAMPING PLANT

Sample ID			SD01-SSA-0411	SD02-SSA-0411	SDDUPO1	SD03-SSA-0411	SD04-SSA-0411	SD05-SSA-0411	SD06-LAN-0411	SD07-LAN-0411	SD08-LAN-0411	SD11-LAN-0411	SD12-LAN-0411	SD13-CSA-0411											
Sample Type (Grab/Composite)			Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab											
Sample Date			4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/14/2011	4/14/2011	4/14/2011	4/14/2011	4/14/2011	4/14/2011	4/14/2011	4/14/2011											
Sample Time			1403	1420	1420	1438	1040	1428	1230	1210	1100	1150	1415	1535											
	Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil																							
VOCs - mg/kg																									
Acetone	110,000	110,000	0.025	J,B	0.063	B	0.029	J,B	0.019	J,B	0.014	J,B	0.027	J,B	0.021	J,B	0.028	U	0.011	J,B	0.012	J,B	0.017	J,B	NS
Benzene	1,200	140	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Bromodichloromethane	300	35	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Bromoform	130,000	6,200	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Bromomethane	550	82	0.019	U	0.015	U	0.016	U	0.014	U	0.013	U	0.0046	J	0.015	U	0.014	U	0.013	U	0.018	U	0.014	U	NS
2-Butanone	28,000	28,000	0.004	J	0.01	J	0.0057	J	0.0033	J	0.0043	J	0.0059	J	0.0051	J	0.028	U	0.026	U	0.035	U	0.003	J,B	NS
Carbon disulfide	740	740	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.00086	J	0.01	U	0.00087	J	0.0069	U	0.0066	U	0.0088	U	0.007	U	NS
Carbon tetrachloride	460	79.0	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.007	U	NS
Chlorobenzene	760	760	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.007	U	NS
Dibromochloromethane	770	84	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.007	U	NS
Chloroethane	NE	NE	0.019	U	0.015	U	0.016	U	0.014	U	0.013	U	0.021	U	0.015	U	0.014	U	0.013	U	0.018	U	0.014	U	NS
Chloroform	320	38	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.007	U	NS
Chloromethane	1,300	1,300	0.019	U	0.015	U	0.016	U	0.014	U	0.013	U	0.021	U	0.015	U	0.014	U	0.013	U	0.018	U	0.014	U	NS
1,2-Dibromo-3-chloro-propane	15	1.7	0.019	U	0.015	U	0.016	U	0.014	U	0.13	U	0.1	U	0.015	U	0.14	U	0.013	U	0.088	U	0.014	U	NS
1,2-Dibromoethane	38	4.4	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,2-Dichlorobenzene	380	380	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.052	U	0.0073	U	0.069	U	0.0066	U	0.044	U	0.0069	U	NS
1,3-Dichlorobenzene	NE	NE	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.052	U	0.0073	U	0.069	U	0.0066	U	0.044	U	0.0069	U	NS
1,4-Dichlorobenzene	2,600	310	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.052	U	0.0073	U	0.069	U	0.0066	U	0.044	U	0.0069	U	NS
Dichlorodifluoromethane	850	850	0.019	U	0.015	U	0.016	U	0.014	U	0.013	U	0.021	U	0.015	U	0.014	U	0.013	U	0.018	U	0.014	U	NS
1,1-Dichloroethane	1,700	420	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,2-Dichloroethane	480	56	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0076	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
cis-1,2-Dichloroethene	NE	NE	0.0048	U	0.0038	U	0.004	U	0.0036	U	0.0033	U	0.0052	U	0.0037	U	0.0035	U	0.0033	U	0.0044	U	0.0035	U	NS
trans-1,2-Dichloroethene	1,700	1,700	0.0048	U	0.00038	U	0.004	U	0.0036	U	0.0033	U	0.0052	U	0.0037	U	0.0035	U	0.0033	U	0.0044	U	0.0035	U	NS
1,1-Dichloroethene	360	1,200	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,2-Dichloropropane	180	120	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
cis-1,3-Dichloropropene	NE	NE	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
trans-1,3-Dichloropropene	NE	NE	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Ethylbenzene	480	480	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
n-Hexane	140	140	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
2-Hexanone	NE	NE	0.039	U	0.031	U	0.032	U	0.029	U	0.27	U	0.042	U	0.029	U	0.028	U	0.026	U	0.035	U	0.028	U	NS
Isopropylbenzene	NE	NE	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Methylene chloride	3,300	3,300	0.0086	J,B	0.0052	J,B	0.0067	J,B	0.0072	B	0.0055	J,B	0.0061	J,B	0.0045	J,B	0.0022	J,B	0.0032	J,B	0.0023	J,B	0.0023	J,B	NS
4-Methyl-2-pentanone	3,400	3,400	0.039	U	0.031	U	0.032	U	0.029	U	NS	NS	0.042	U	0.029	U	0.028	U	0.026	U	0.035	U	0.028	U	NS
Methyl tert-butyl ether	8,900	5,700	0.0097	U	0.031	U	0.032	U	0.029	U	0.027	U	0.042	U	0.029	U	0.028	U	0.026	U	0.035	U	0.028	U	NS
Styrene	870	870	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,1,2,2-Tetrachloroethane	670	75	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.052	U	0.0073	U	0.069	U	0.0066	U	0.044	U	0.0069	U	NS
Tetrachloroethene	170	170	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Toluene	820	820	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,2,4-Trichloro-benzene	400	400	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.052	U	0.0073	U	0.069	U	0.0066	U	0.044	U	0.0069	U	NS
1,1,1-Trichloroethane	640	640	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
1,1,2-Trichloroethane	1,200	140	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Trichloroethene	17	51	0.0097	U	0.0077	U	0.0079	U	0.0072	U	0.0067	U	0.01	U	0.0073	U	0.0069	U	0.0066	U	0.0088	U	0.0069	U	NS
Trichlorofluoromethane	1,200	1,200	0.019	U	0.015	U	0.016	U	0.014	U	0.013	U	0.021	U	0.015	U	0.014	U	0.013	U	0.018	U	0.014	U	NS
Vinyl chloride	280	50	0.0039	U																					

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
NE = No screening level concentration established
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to ÇSVOC - semivolatile organic compounds
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

ANALYTICAL TABLE E-7
SUMMARY OF PAHS, PCBs, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS AND ETHYLENE GYLCOL IN SEDIMENT (mg/kg)
MANSFIELD STAMPING PLANT

Sample ID			SD01-SSA-0411		SD02-SSA-0411		SDDUPO1		SD03-SSA-0411		SD04-SSA-0411		SD05-SSA-0411		SD06-LAN-0411		SD07-LAN-0411		SD08-LAN-0411		SD11-LAN-0411		SD12-LAN-0411		SD13-CSA-0411		
Sample Location			SD-1		SD-2		SD-2		SD-3		SD-4		SD-5		SD-6		SD-7		SD-8		SD-11		SD-12		SD-13		
Sample Date			4/7/2011		4/7/2011		4/7/2011		4/7/2011		4/14/2011		4/14/2011		4/14/2011		4/14/2011		4/14/2011		4/14/2011		4/14/2011		4/14/2011		
Sample Time			1403		1420		1420		1438		1040		1428		1230		1210		1100		1150		1415		1535		
	Ohio VAP DC Construction/ Excavation	Ohio VAP Generic DC Standard-- Industrial Soil																									
Polynuclear Aromatic Hydrocarbons (PAH) - mg/kg																											
Acenaphthene	780,000	90,000	0.01	U	1.20		0.33		0.20		2.80		0.04	U	0.034		0.0092	U	0.17		0.065		0.015		0.026		
Acenaphthylene	780,000	90,000	0.01	U	0.20	U	0.21	U	0.04	U	0.45	U	0.04	U	0.02	U	0.0092	U	0.04	U	0.02	U	0.01	U	0.01	U	
Anthracene	1,000,000	450,000	0.035		2.70		0.86		0.30		7.00		0.18		0.11		0.0092	U	0.36		0.18		0.047		0.062		
Benzo(a)anthracene	1,200	58	0.29		10.00		6.40		1.40		18.00		1.30		0.72		0.0092	U	0.97		0.84		0.18		0.37		
Benzo(a)pyrene	120	5.8	0.40		10.00		8.20		1.50		17.00		1.70		0.95		0.0092	U	0.95		0.90		0.17		0.38		
Benzo(b)fluoranthene	1,200	58	0.89		15.00		12.00		2.50		21.00		2.70		1.40		0.0092	U	1.30		1.20		0.29		0.54		
Benzo(ghi)perylene	390,000	45,000	0.55		7.50		7.30		1.10		11.00		1.30		0.85		0.0092	U	0.64		0.62		0.12		0.28		
Benzo(k)fluoranthene	12,000	580	0.31		7.90		5.40		0.96		12.00		1.40		0.68		0.0092	U	0.64		0.66		0.15		0.22		
Chrysene	120,000	5,800	0.52		12.00		9.40		1.80		24.00		1.90		1.10		0.0092	U	1.10		1.00		0.25		0.42		
Dibenz(a,h)anthracene	120	5.8	0.01	U	0.20	U	0.21	U	0.04	U	2.70		0.04	U	0.02	U	0.0092	U	0.04	U	0.02	U	0.01	U	0.01	U	
Fluoranthene	160,000	60,000	0.72		28.00		18.00		3.90		61.00		3.00		2.20		0.0092	U	2.60		2.10		0.59		0.81		
Fluorene	520,000	60,000	0.01	U	1.20		0.30		0.18		2.70		0.04		0.037		0.0092	U	0.16		0.063		0.017		0.023		
Indeno(1,2,3-cd)pyrene	1,200	58	0.46		6.40		6.20		0.95		9.80		1.10		0.72		0.0092	U	0.54		0.54		0.11		0.23		
1-Methylnaphthalene	31,000	1,500	0.01	U	0.20	U	0.21	U	0.04	U	0.45	U	0.04	U	0.02	U	0.0092	U	0.04	U	0.02	U	0.01	U	0.016		
2-Methylnaphthalene	5,200	6,000	0.014		0.22		0.21	U	0.04	U	0.67		0.04	U	0.02	U	0.0092	U	0.054		0.02	U	0.01	U	0.022		
Naphthalene	560	450	0.01	U	0.26		0.21	U	0.054		1.20		0.04	U	0.02	U	0.0092	U	0.055		0.02	U	0.01	U	0.015		
Phenanthrene	1,000,000	450,000	0.18		16.00		6.00		1.70		35.00		0.80		0.74		0.0092	U	1.80		0.93		0.20		0.34		
Pyrene	390,000	45,000	0.54		20.00		13.00		2.80		40.00		2.70		1.70		0.0092	U	1.90		1.60		0.44		0.64		
Polychlorinated Biphenyls (PCB) - mg/kg																											
Arochlor 1016	260	100	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1221	210	14	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1232	73	14	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1242	440	20	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1248	440	20	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1254	75	20	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
Arochlor 1260	440	20	NS		NS		NS		NS		NS		NS		NS		0.046	U	0.043	U	NS		NS		0.043	U	
RCRA Metals - mg/kg																											
Arsenic	690	77	NS		NS		NS		NS		NS		NS		NS		10.80		22.20		16.30		9.30		19.10		
Lead	400	800	NS		NS		NS		NS		NS		NS		NS		13.20		24.40		26.60		17.30		19.20		
Barium	-	-	NS		NS		NS		NS		NS		NS		NS		66.20	B	51.00	J	74.50	B	89.70	B	67.30	B	
Selenium	11,000	20,000	NS		NS		NS		NS		NS		NS		NS		0.69	U	0.63	U	0.73	U	0.67		0.64		
Cadmium	1,000	2,600	NS		NS		NS		NS		NS		NS		NS		0.14	J	0.03	J	0.26	J	0.11	J	0.18	J	
Chromium	1,200	210	NS		NS		NS		NS		NS		NS		NS		15.50		11.80		15.60		13.70		11.80		
Silver	11,000	20,000	NS		NS		NS		NS		NS		NS		NS		1.40	U	1.30	U	1.50	U	1.30	U	0.91	U	
Mercury	3.1	3.1	NS		NS		NS		NS		NS		NS		NS		0.1	U	0.02	J	0.029	J	0.029	J	0.031	J	
Extractable Petroleum Hydrocarbons - mg/kg																											
C6-C12	5,000*	5,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		0.13	U	
C20 - C34	20,000*	20,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		72		
C10 - C20	10,000*	10,000*	NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		NS		17	J	
Ethylene glycol - mg/kg	1,000,000	1,000,000	1.79	U	1.48	U	1.17	U	1.19	U	1.63		1.57	U	1.71	U	NS		NS		1.89	U	1.23	U	NS		

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
Highlighted values exceed one or more screening level concentrations
mg/ kg = milligrams per kilogram
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
SVOC - semivolatile organic compounds
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
VAP Construction - Ohio VAP generic risk based standard for direct contact exposure by a construction worker specified in OAC 3745-300-08-D
Direct Contact Ind. - Ohio VAP generic risk based standard for direct contact exposure via an industrial use scenario specified in OAC 3745-300-08-C

ANALYTICAL TABLE E-8
SUMMARY OF SVOCs IN SURFACE WATER AND BORING GROUND WATER SAMPLES (mg/L)
MANSFIELD STAMPING PLANT

Sample Location	-	-	-	-	-	IA-2-2	IA-4-3	IA-4-7	IA-5-1	IA-5-2	IA-5-3	IA-5-4	IA-6-1	IA-10-1	Blank	Blank	Blank	Blank	Blank	Blank	
Sample ID	SW01-LAN-0411	SWDUP0414	SW02-LAN-0411	SW01-SWH-0411	SWDUP1	GW22-FTF-0411	GW43-OLD-0411	GW47-OLD-0411	GW51-LAN-0411	GW52-LAN-0411	GW53-LAN-0411	GW54-LAN-0411	GW61-CSA-0411	GW103-HAZ-0411	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	
Sample Date	4/14/2011	4/14/2011	4/14/2011	4/6/2011	4/6/2011	4/8/2011	4/11/2011	4/12/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/13/2011	4/7/2011	4/6/2011	4/7/2011	4/8/2011	4/11/2011	4/12/2011	4/14/2011	
Sample Time	1135	1135	1400	933	933	1418	1350	1103	1328	1407	1513	1635	1250	1257	1747	1721	1453	1810	-	1716	
	Ohio VAP Generic Unrestricted Potable Use Standards																				
VOC - mg/L																					
Acetone	12.000	0.01000	U	0.01000	U	0.01000	U	NS	NS	0.00180	J	0.00720	J	0.00150	J,B	0.01000	U	0.01000	U	0.01000	J
Benzene	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Bromodichloromethane	0.080	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00017	J	0.00100	U	0.00100	U	0.00100	U	0.00100	B
Bromoform	0.080	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Bromomethane	0.007	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
2-Butanone	4.900	0.01000	U	0.01000	U	0.01000	U	NS	NS	0.01000	U	0.00100	J	0.01000	U	0.01000	U	0.01000	U	0.01000	J
Carbon disulfide	0.720	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00043	J	0.01000	U	0.00100	U	0.00100	U	0.00100	J
Carbon tetrachloride	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.01000	U	0.00100	U	0.00100	U	0.00100	J
Chlorobenzene	0.100	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.01000	U	0.00100	U	0.00100	U	0.00100	J
Dibromochloromethane	0.080	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.01000	U	0.00100	U	0.00100	U	0.00100	J
Chloroethane	-	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00037	J	0.00200	U	0.00200	U	0.00200	U	0.00200	J
Chloroform	0.080	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00050	J	0.00100	U	0.00100	U	0.00810	U	0.00830	J
Chloromethane	0.190	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
1,2-Dibromo-3-chloro-propane	0.0002	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
1,2-Dibromoethane	0.00005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,2-Dichlorobenzene	0.600	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,3-Dichlorobenzene	-	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,4-Dichlorobenzene	0.075	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Dichlorodifluoromethane	2.800	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
1,1-Dichloroethane	0.240	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.01400		0.00100	U	0.00100	U	0.00100	J
1,2-Dichloroethane	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
cis-1,2-Dichloroethene	-	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
trans-1,2-Dichloroethene	0.100	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,1-Dichloroethene	0.007	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00089	J	0.00100	U	0.00100	U	0.00100	J
1,2-Dichloropropane	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
cis-1,3-Dichloropropene	-	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
trans-1,3-Dichloropropene	-	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Ethylbenzene	0.700	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
n-Hexane	0.250	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
2-Hexanone	-	0.01000	U	0.01000	U	0.01000	U	NS	NS	0.01000	U	0.01000	U	0.01000	U	0.01000	U	0.01000	U	0.01000	J
Isopropylbenzene	-	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Methylene chloride	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
4-Methyl-2-pentanone	1.000	0.01000	U	0.01000	U	0.01000	U	NS	NS	0.01000	U	0.01000	U	0.01000	U	0.01000	U	0.01000	U	0.01000	J
Methyl tert-butyl ether	0.120	0.00500	U	0.00500	U	0.00500	U	NS	NS	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	J
Styrene	0.100	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,1,2,2-Tetrachloroethane	0.00066	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Tetrachloroethene	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Toluene	1.000	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00032	J	0.00100	U	0.00100	U	0.00083	J	0.00092	J
1,2,4-Trichloro-benzene	0.070	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
1,1,1-Trichloroethane	0.200	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.01400		0.00100	U	0.00100	U	0.00100	J
1,1,2-Trichloroethane	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Trichloroethene	0.005	0.00100	U	0.00100	U	0.00100	U	NS	NS	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	U	0.00100	J
Trichlorofluoromethane	1.100	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
Vinyl chloride	0.002	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J
Xylenes (total)	10.000	0.00200	U	0.00200	U	0.00200	U	NS	NS	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	U	0.00200	J

Notes:

NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
mg/L = milligrams per liter
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels
Highlighted values exceed one or more screening level concentrations

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
SVOC - semivolatile organic compounds

ANALYTICAL TABLE E-9
SUMMARY OF PAH, PCBS, RCRA METALS, EXTRACTABLE PETROLEUM HYDROCARBONS, GASOLINE ORGANICS AND ETHYLENE GYLCOL IN SURFACE WATER AND BORING GROUND WATER SAMPLES(mg/L)
MANSFIELD STAMPING PLANT

Sample Locations		-	-	-	-	-	IA-2-2	IA-4-3	IA-4-7	IA-5-1	IA-5-2	IA-5-3	IA-5-4	IA-6-1	IA-10-1	-	-	-	-	-	-												
Sample ID		SW01-LAN-0411	SWDUP0414	SW02-LAN-0411	SW01-SWH-0411	SWDUP1	GW22-FTF-0411	GW43-OLD-0411	GW47-OLD-0411	GW51-LAN-0411	GW52-LAN-0411	GW53-LAN-0411	GW54-LAN-0411	GW61-CSA-0411	GW103-HAZ-0411	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK												
Sample Date		4/14/2011	4/14/2011	4/14/2011	4/6/2011	4/6/2011	4/8/2011	4/11/2011	4/12/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/13/2011	4/7/2011	4/6/2011	4/7/2011	4/8/2011	4/11/2011	4/12/2011	4/14/2011												
Sample Time		1135	1135	1400	933	933	1418	1350	1103	1328	1407	1513	1635	1250	1257	1747	1721	1453	1810	-	1716												
	Ohio VAP Generic Unrestricted Potable Use Standards																																
Polynuclear Aromatic Hydrocarbons (PAH) - mg/L																																	
Acenaphthene	0.40000	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.012		0.00081		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Acenaphthylene	0.40000	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Anthracene	1.30000	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0002	U	0.0011		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Benzo(a)anthracene	0.00092	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.028		0.0016		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Benzo(a)pyrene	0.00020	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.022		0.0012		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Benzo(b)fluoranthene	0.00092	0.0002	U	0.0002	U	0.00067		NS		NS		NS	0.029		0.0017		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Benzo(ghi)perylene	0.08700	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.012		0.00077		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Benzo(k)fluoranthene	0.00920	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.012		0.00074		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Chrysene	0.09200	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.029		0.0018		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Dibenz(a,h)anthracene	0.000092	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0036		0.00022		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Fluoranthene	0.63000	0.0002	U	0.0002	U	0.00024		NS		NS		NS	0.074	E	0.0061		0.0002	U	0.0002		0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Fluorene	0.22000	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0093		0.00063		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Indeno(1,2,3-cd)pyrene	0.00092	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.012		0.00067		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
1-Methylnaphthalene	0.00970	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.023		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
2-Methylnaphthalene	0.02700	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0033		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Naphthalene	0.00140	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.0033		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Phenanthrene	1.30000	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.066	E	0.0056		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Pyrene	0.08700	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	0.06	E	0.0044		0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	NS	NS	NS	NS	NS	NS	
Polychlorinated Biphenyls (PCB) - mg/L																																	
Arochlor 1016	0.0011	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
Arochlor 1221	0.000041	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
Arochlor 1232	0.000041	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
Arochlor 1242	0.00034	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
Arochlor 1248	0.00034	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0011		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0001	J	NS	NS	NS	NS	NS	NS	
Arochlor 1254	0.00031	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
Arochlor 1260	0.00034	NS		NS		NS		0.0005	U	0.0005	U	NS	NS		0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	NS	NS	NS	NS	NS	NS	
RCRA Metals - mg/L																																	
Arsenic	0.010	0.0100	U	0.0100	U	0.01000	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Lead	0.015	0.0030	U	0.0030	U	0.00300	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Barium	-	0.0474	J,B	0.0460	J,B	0.04690	J,B	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Selenium	0.050	0.0050	U	0.0050	U	0.00500	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Cadmium	0.005	0.0040	U	0.0040	U	0.00400	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Chromium	0.100	0.0100	U	0.0100	U	0.01000	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Silver	0.071	0.0100	U	0.0100	U	0.01000	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Mercury	0.002	0.0002	U	0.0002	U	0.00020	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	NS	
Gasoline Range Organics- mg/L		NS		NS		NS		NS		NS		NS	NS		0.048	J	NS		NS		NS		NS		0.0500	J	NS		NS	NS	NS	NS	
Extractable Petroleum Hydrocarbons - mg/L																																	
C20 - C34	-	NS		NS		NS		NS		NS		NS	2.1		NS		NS		NS		NS		0.3700	J	NS		NS	NS	NS	NS	NS	NS	
C10 - C20	-	NS		NS		NS		NS		NS		NS	0.65		NS		NS		NS		NS		0.5000	U	NS		NS	NS	NS	NS	NS	NS	
Ethylene glycol - mg/L		31	0.2710	U	0.2710	U	0.27100	U	NS		NS		NS	NS		NS		NS		NS		NS		NS		NS		NS	NS	NS	NS	NS	

Notes:
NS = Not sampled
U = indicates analyte not detected at indicated reporting limit (RL)
Highlighted values exceed one or more screening level concentrations
mg/L = milligrams per liter
All laboratory data provided by Test America Laboratories
* = Ohio BUSTR Tier 1 Action Levels

J - value qualified due to concentration being below quantitation limit, or due to QA/QC data outside of control limits
B - value qualified due to detection of analyte in one or more associated laboratory blanks
VAP - Ohio Voluntary Action Program
SVOC - semivolatile organic compounds

APPENDIX F
OFF-PROPERTY MODELING RESULTS

TABLE F-1: SUMMARY OF MODEL INPUT - SOURCE RELEASE PARAMETERS

FORMER GM ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Monitoring Well Representing Source	Analyte Exceeding Ohio VAP Standard ^a in Groundwater at Source	Maximum Concentration Detected (µg/L)	Source Width ^{b,c} (feet)	Source Thickness ^d (feet)
MW5-2S	Trichloroethene	11.0	30	5
	Arsenic	11.2	30	5
MW5-2D	Arsenic	18.8	30	10
MW2-1	Arsenic	38.3	30	10
MW5-1	Arsenic	20.7	30	10
MW2-2	Arsenic	29.4	30	10
MW5-4	Arsenic	46.5	30	10

Notes:

- a Ohio VAP Generic Unrestricted Potable Use Standard
 - b Width of area of concern is perpendicular to direction of transport.
 - c The contaminant concentration in the source zone is set equal to the maximum concentration detected in the well.
 - d The thickness of the source zone is assumed equal to the well screen length.
- µg/L Micrograms per liter

TABLE F-2: SUMMARY OF MODEL INPUT - TRANSPORT PARAMETERS

FORMER GM ONTARIO STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

Monitoring Well Representing Source	Analyte Exceeding Ohio VAP Standard ^a in Groundwater at Source	Distance to Receptor (feet)	Hydraulic Gradient (feet/feet)	Hydraulic Conductivity		Average Linear Velocity ^b of Groundwater (feet/year)	Longitudinal Dispersivity ^c (feet)	Transverse Dispersivity ^d (feet)	Vertical Dispersivity ^e (feet)
				(feet/day)	(cm/sec)				
MW5-2S	Trichloroethene Arsenic	1510, SE	0.0299	0.020	7.06E-06	1.1	59.5	6.0	0.0
MW5-2D	Arsenic	1510, SW	0.0111	0.020	7.06E-06	0.4	59.5	6.0	0.0
MW2-1	Arsenic	2056, SW	0.0111	0.020	7.06E-06	0.4	59.5	6.0	0.0
MW5-1	Arsenic	1397, SW	0.0111	0.020	7.06E-06	0.4	59.5	6.0	0.0
MW2-2	Arsenic	662, SE	0.0281	0.020	7.06E-06	1.0	59.5	6.0	0.0
MW5-4	Arsenic	595, SE	0.0281	0.020	7.06E-06	1.0	59.5	6.0	0.0

Notes:

- a Ohio VAP Generic Unrestricted Potable Use Standard
- b Assumes an upper-bound effective porosity value for silty, sandy clay of 0.20 (Domenico and Schwartz 1990).
- c Estimated as 0.1 of the shortest distance to the off-site receptor.
- d Estimated as 0.1 of the longitudinal dispersivity.
- e Assumed negligibly small.
- cm Centimeter
- µg/L Micrograms per liter
- sec Second
- SE Southeast
- SW Southwest

Source: Domenico, P.A. and F.W. Schwartz. 1990. Physical and Chemical Hydrogeology. Wiley, New York. 824 pp.

TABLE F-3: MODEL SIMULATED CONCENTRATIONS AT OFF-PROPERTY RECEPTOR LOCATIONS

FORMER GM ONTARIO STAMPING PLANT

ONTARIO, RICHLAND COUNTY, OHIO

Monitoring Well Representing Source	Analyte Exceeding Ohio VAP Standard ^a in Groundwater at Source	Distance to Receptor (feet)	Ohio VAP Standard ^a (µg/L)	Source Concentration (µg/L)	Simulated Concentration at Receptor Location (µg/L)	Ohio VAP Standard ^a Exceeded at Receptor Location?
MW5-2S	Trichloroethene	1510, SE	5	11.0	<0.1	No
	Arsenic		10	11.2	1.0	No
MW5-2D	Arsenic	1510, SW	10	18.8	1.7	No
MW2-1	Arsenic	2056, SW	10	38.3	2.9	No
MW5-1	Arsenic	1397, SW	10	20.7	1.9	No
MW2-2	Arsenic	662, SE	10	29.4	3.9	No
MW5-4	Arsenic	595, SE	10	46.5	6.6	No

Notes:

- a Ohio VAP Generic Unrestricted Potable Use Standard
- µg/L Micrograms per liter
- ND Not detected