

**Appendix G**

Risk Assessment Supporting  
Information

## **Appendix G - Human Health Risk Assessment**

### **Revitalizing Auto Communities Environmental Response Trust (RACER Trust)**

Former Delphi Harrison Thermal Systems Moraine Plant  
Former General Motors Powertrain Group, Moraine Engine Plant  
Former General Motors Truck Group, Moraine Assembly Plant

Moraine, Ohio

December 31, 2012

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**List of Acronyms**

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
ABS	dermal absorption fraction
ALM	Adult Lead Model
AOC	Administrative Order on Consent
AOI	Area of Interest
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BUSTR	Bureau of Underground Storage Tank Regulations
CDC	Centers for Disease Control and Prevention
cis-1,2-DCE	cis-1,2-dichloroethene
COPC	constituent of potential concern
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
$DA_{event}$	absorbed dermal dose
DAF	dilution attenuation factor
DOCC	Description of Current Conditions
ERD	enhanced reductive dechlorination
ESL	U.S. EPA Region 5 Ecological Screening Levels

GM	General Motors Corporation
GSI	Groundwater-Surface Water Interaction
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
Kp	dermal permeability coefficient
LOAEL	Lowest Observed Adverse Effect Level
MCL	U.S. EPA Maximum Contaminant Levels
mg/kg-day	milligrams per kilogram of body weight per day
mg/m <sup>3</sup>	milligrams per cubic meter
MLC	Motors Liquidation Company
MF	modifying factor
MRL	minimal risk level
NOAEL	No Observed Adverse Effect Level
ODNR	Ohio Department of Natural Resources
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
RACER Trust	Revitalizing Auto Communities Environmental Response Trust
RCRA	Resource Conservation and Recovery Act

RfC	reference concentration
RfD	reference dose
RFI	Resource Conservation and Recovery Act Facility Investigation
RME	Reasonable Maximum Exposure
RSL	U.S. EPA Regional Screening Level
SF	slope factor
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TCE	trichloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
UCL	upper confidence limit
UF	uncertainty factor
µg/L	micrograms per liter
URF	unit risk factor
VISL	U.S. EPA Vapor Intrusion Screening Levels
VOC	volatile organic compound
WLA	Waste Load Allocation
WPSA	Waste Pile/Staging Area

## **1. Introduction**

This Human Health Risk Assessment (HHRA) (Appendix G to the Corrective Measures Proposal) addresses several areas of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) Moraine Facilities (the Site) located in Moraine, Ohio. Specifically, this HHRA focuses on Solid Waste Management Units (SWMUs) and Areas of Interest (AOIs) that were not previously evaluated for potential human health risks and those areas for which recent data were collected (e.g., 2011, 2012). These areas include Landfill L1, the West Tank Farm, the Box Sewer, the Process Sump Area, the Historic Fill Area, and former Building 21. Investigation summary reports for these areas are presented in Appendix E and Appendix F to the Corrective Measures Proposal, respectively. Site-wide groundwater and off-site private groundwater wells are also evaluated as part of this HHRA.

### **1.1 Site Description and History**

The RACER Trust Moraine Facilities have been used for industrial purposes since the property was acquired in the mid-1920s by former General Motors Corporation (former GM Corporation). The former General Motors Powertrain Group, Moraine Engine Plant (former Moraine Engine), and former General Motors Truck Group, Moraine Assembly Plant (former Moraine Assembly) occupy approximately 239 acres, while the adjacent former Delphi Harrison Thermal Systems Moraine Plant (former Delphi Thermal Moraine) occupies approximately 124 acres. The facilities are located in the City of Moraine in Montgomery County in southwestern Ohio. A small portion of the Moraine Assembly facility is located in the City of Kettering. Figure G-1 shows the location of each facility, property boundaries, and site features.

Frigidaire (a former division of former GM Corporation) produced appliances at the Site from the late 1920's until GM announced the shutdown of all Frigidaire operations in January 1979. During 1980 and 1981, the majority of the former Frigidaire Plant 2 was converted to the former Moraine Engine facility, and the former Frigidaire Plant 3 and the northeast corner of former Frigidaire Plant 2 were converted to the Moraine Assembly facility. Since 1981, former Moraine Engine operations have included the machining, painting (this operation was discontinued in September 1995), and assembly of diesel truck engines. Operations at the former Moraine Engine facility ceased in the fall of 2000. The plant building has been decommissioned and demolished, and the majority of this Site has been covered with a parking surface. Former GM Corporation operated a regional haulaway at the

location of the former Moraine Engine Plant, which was referred to as the Vehicle Distribution Center until December 2008 when operations ceased.

Since 1981, Moraine Assembly operations included the manufacture, assembly, and painting of small trucks and later sport utility vehicles. Operations at the former Moraine Assembly ceased in December 2008.

Former Delphi Thermal Moraine's major operations, which began in 1941, included the machining and assembly of automotive air conditioning compressors, accumulator dehydrators, and miscellaneous air conditioning valves. Operations at the former Delphi Thermal Moraine Building 14 ceased in September 2003 and the building was decommissioned. Demolition of Building 14 was completed in 2005.

On June 1, 2009, former GM Corporation and certain subsidiaries filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code. An order was entered approving the sale of substantially all of former GM Corporation's assets to a new and independent company (now known as General Motors Company, LLC) under Section 363 of the Bankruptcy Code on June 5, 2009. The sale closed on July 10, 2009. At that time, former GM Corporation changed its name to Motors Liquidation Company (MLC). RACER Trust was established on March 31, 2011 by a federal bankruptcy court to own, manage, remediate and revitalize the properties from the 2009 former GM Corporation bankruptcy.

On June 30, 2011, RACER Trust sold former Delphi Thermal Moraine, former Moraine Engine Plant, and former Moraine Assembly Plant to IRG Moraine, LLC. As part of the property transfer, RACER Trust retained environmental liability for these properties.

The closed South Settling Lagoon was not included in this property transaction. The closed South Settling Lagoon was retained by RACER Properties, LLC.

On September 29, 2011, the Administrative Order on Consent (AOC) for the Site was fully executed proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended, 42 U.S. C. Section 6928(h), USEPA Docket No: RCRA-05-2011-0016. The performance-based AOC covers corrective action for past releases of hazardous contaminants at or from the Site.

## 1.2 Overview

Table G-1 presents a conceptual site model (CSM) for the HHRA and identifies general sources, release and transport mechanisms, pathways and exposure media, exposure routes, and receptor groups that form the basis of this HHRA. The following presents a brief overview of investigations for those areas of the Site that are the focus of this HHRA.

### 1.2.1 Landfill L1

Surface soil (i.e., waste material) and groundwater data were collected between 1992 and 1994, and these data were presented in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and associated baseline HHRA (ENVIRON 2000a). Soil, groundwater, and soil gas data were recently collected in 2011 and 2012.

### 1.2.2 West Tank Farm

Soil and groundwater data were collected between 1992 and 1994, and these data were presented in the RFI and associated baseline HHRA (ENVIRON 2000a). Soil and groundwater data were recently collected in 2012.

### 1.2.3 Box Sewer

Soil data were collected in 2001, and these data were presented in the Box Sewer Investigation Summary Report and associated HHRA (ARCADIS, Inc. 2002). Soil and groundwater data were recently collected in 2012.

### 1.2.4 Secondary Source Areas

Soil and groundwater data were collected from the Process Sump Area, the Historic Fill Area, and former Building 21 in 2012. Historic groundwater data were collected from the Process Sump Area and the Historic Fill Area, but no risk evaluation was previously completed for these areas of the Site.

### 1.2.5 Site-Wide Groundwater

Site-wide groundwater data have been collected on an annual basis from 1999 through 2012. Data for 1999 and 2000 were presented in the Interim Measures/Corrective Measures Report (ARCADIS Geraghty & Miller, Inc. 2001). Data from 2001 through

2012 are presented in annual reports and submitted to the USEPA by March 1<sup>st</sup> of the following year. Interim measures for site-wide groundwater have included upper aquifer hydraulic control with pump and treat technologies, which has operated from 1996 through July 2012. Lower aquifer hydraulic control has been in place from 1990 to the present. There have also been multiple upper aquifer in-situ reactive zones applying enhanced reductive dechlorination (ERD) from 1999 to the present.

#### 1.2.6 Off-site Private Groundwater Wells

A previous evaluation of off-site private groundwater wells (i.e., 3571/3573 Dryden Road, 2651 Blanchard Avenue, and 4000 Miller Valentine Court) was conducted in previous risk assessments for the Site. However, these results are presented again in this HHRA for sake of completeness.

### 1.3 Background

Several previous risk evaluations were conducted for the Site, which are briefly discussed below.

#### 1.3.1 RFI Baseline Risk Assessment (2000)

A baseline HHRA was conducted for the former Delphi Thermal Moraine (ENVIRON 2000a), which focused on 14 SWMUs investigated in the RFI including SWMUs undergoing closure under Ohio EPA's RCRA program (i.e., closed North and South Settling Lagoons). Potential exposures to constituents in soil and waste at the SWMUs via direct contact and airborne transport to ambient air and groundwater transport were evaluated to identify whether soil/waste at the SWMUs (and transport to groundwater) posed a human health risk that warranted corrective measures. The HHRA concluded:

- No unacceptable risks for all soil- and air-related pathways.
- No unacceptable risks for groundwater under current use conditions.
- No unacceptable risks for surface water/sediment.

This RFI Baseline Risk Assessment was approved by the USEPA in 2000.

### 1.3.2 Supplemental RFI Baseline Risk Assessment (2000)

A supplemental HHRA was conducted for the former Moraine Engine and former Moraine Assembly facilities (ENVIRON 2000b), which focused on six AOIs and evaluated potential exposures to soil via direct contact, airborne transport to ambient air, and groundwater transport. The HHRA concluded:

- No unacceptable risks associated with soil- and air-related exposure pathways
- No unacceptable risks associated with soil to groundwater transport based on the 10 groundwater scenarios evaluated.
- Groundwater constituents at the former Oil House Area were found to have the potential to migrate to the extent that future use of the lower aquifer may be affected.

This Supplemental RFI Baseline Risk Assessment was approved by USEPA in 2000.

### 1.3.3 Box Sewer Investigation (2001)

The Box Sewer Investigation (ARCADIS, Inc. 2002) focused on soils and groundwater transport in the immediate vicinity of the Box Sewer to evaluate whether there were unacceptable risks associated with these media. The risk evaluation concluded no unacceptable risks for soil and groundwater pathways.

### 1.3.4 Waste Pile/Staging Area Investigation (2004)

Soil and groundwater investigations were conducted as part of the Waste Pile/Staging Area (WPSA) Investigation (ARCADIS, Inc. 2004). The risk evaluation concluded:

- No current exposure pathways for soil because the site was inactive at the time.
- If pavement were removed within the WPSA, there could be potentially significant soil exposures for a future industrial/commercial scenario if the site were redeveloped.
- Soil to groundwater transport was not identified as a significant pathway. With the removal of impacted soils (interim measure completed in 2005), no significant risks

were identified for soil and groundwater pathways under a future industrial/commercial scenario.

Limited soil removal was conducted at the WPSA during September/October 2005 (ARCADIS, Inc. 2006). As part of the remedy, an institutional control was recommended to be part of the final site-wide remedy to limit future subsurface activities and mitigate potential exposures (e.g., maintenance of existing pavement).

#### 1.3.5 Building 14 Supplemental Investigation (2005)

Soil and groundwater were collected as part of this investigation (ARCADIS, Inc. 2005). These data were compared to human health-based screening criteria and the evaluation concluded no unacceptable risks because concentrations were below screening criteria.

#### 1.3.6 Updated Risk Evaluation (2008)

A supplemental risk evaluation was conducted for the former GM Corporation Moraine Facility (ENVIRON 2008), which built upon the RFI HHRA (ENVIRON 2000a), the Supplemental RFI HHRA (ENVIRON 2000b), the Box Sewer Investigation (ARCADIS, Inc. 2002), the Waste Pile/Staging Area Investigation (ARCADIS, Inc. 2004; 2006), and the Building 14 Investigation (ARCADIS, Inc. 2005). Specifically, the risk analysis included an updated evaluation of potential risks and hazards associated with onsite and offsite groundwater exposures based on data collected since the RFI/Supplemental RFI and evaluation of potential soil and groundwater exposure pathways and receptors identified since the completion of the RFI/Supplemental RFI. This supplemental HHRA was presented as Appendix G to the 2008 Corrective Measures Proposal (ENVIRON 2008).

#### 1.3.7 Sediment and Surface Water Assessment

A Groundwater-Surface Water Interaction (GSI) and Human Health Screening Assessment were previously conducted for the Site (Appendix K to the Corrective Measures Proposal). This assessment presents information for the following facilities located in Moraine, Ohio: former Delphi Thermal Moraine, former Moraine Engine, and former Moraine Assembly (collectively referred to as the Site).

The Screening Assessment concluded that groundwater concentrations from monitoring wells adjacent to the Great Miami River and Holes Creek are below

associated Waste Load Allocation values (WLAs), which are derived using both ecological and human health benchmarks (i.e., Ohio Surface Water Criteria, USEPA Region 5 Ecological Screening Levels [ESLs], and USEPA Maximum Contaminant Levels [MCLs]). Therefore, even under a conservative scenario, site groundwater concentrations are not expected to result in surface water or pore-water concentrations in the Great Miami River or Holes Creek that would pose a risk to human health or the environment. Additionally, the fish consumption pathway was concluded to not be of significant concern in the Great Miami River or Holes Creek because the site-specific constituents (primarily tetrachloroethene [PCE] and trichloroethene [TCE] were detected) in groundwater are not expected to bioaccumulate. Similarly, there were no data to suggest that either of these constituents would accumulate in sediment over time. Further, fish consumption in these water bodies is not expected to be a significant pathway because a subsistence fishing population likely does not exist in the City of Moraine, Ohio and the current fish consumption advisory would be expected to mitigate potential fish consumption in the area.

#### 1.3.8 Off-Site Vapor Intrusion Investigation and Mitigation

An off-site field investigation was completed in October and November 2010 and March 2011 to evaluate the potential for a complete vapor intrusion pathway using a phased approach. During the field investigation, soil-gas and groundwater table samples were collected near potential off-site receptors (residential and commercial structures) located in proximity to the Site. The areas of the investigation were the areas located to the east and southwest (the Riverview Plat neighborhood) of the Site. The groundwater and soil-gas data were used as part of the overall weight of evidence for evaluating the vapor intrusion pathway. Based on the results of this vapor intrusion verification investigation, the following conclusions were made:

- PCE and TCE were the primary chemicals of concern identified in soil-gas.
- Concentrations of PCE and TCE in soil-gas increased with depth which indicated that groundwater was the primary source of the PCE and TCE detected in soil-gas.
- Based on the concentrations of PCE and TCE in soil-gas, indoor air and sub-slab sampling at properties in the Riverview Plat neighborhood was completed.

Based on the lack of a site-specific VOC source in soil or groundwater and confirmation that VOCs were not detected above the soil-gas Action Levels in the

samples collected, a future phase of investigation to the east of the Site was not warranted.

Beginning in March 2011, sub-slab and indoor air sampling was completed at properties where an access agreement was signed by the property owner. Since concentrations of PCE, TCE, and 1,1-dichloroethane (1,1-DCA) were detected in the sub-slab and indoor air samples collected from the properties in the Riverview Plat neighborhood at concentrations that were greater than or equal to the Action Levels, mitigation systems were offered to the property owners. Beginning in September 2011, mitigation systems were installed at properties where an access agreement was signed by the property owner. A summary of the off-site vapor intrusion investigation and mitigation are presented in Appendix D of the Corrective Measures Proposal.

#### **1.4 Objectives**

The objective of this HHRA is to evaluate potential carcinogenic risks and noncarcinogenic hazards associated with hypothetical future exposures of industrial receptors to environmental media (i.e., soil, groundwater, and soil gas) in areas of the Site where recent data have been collected and in areas of the Site where previous risk evaluations have not been conducted. For Landfill L1, the West Tank Farm, and the Box Sewer, this HHRA uses recently collected data to supplement risk evaluations that were previously conducted for these areas of the Site. The Process Sump Area, the Historic Fill Area, and former Building 21 represent areas of the Site that were not previously characterized and evaluated in historic risk assessments.

#### **1.5 General Approach**

The general approach for this HHRA follows the standard USEPA (1989) *Risk Assessment Guidance for Superfund (RAGS)*, which includes a step-wise process:

- Step 1 – Data Evaluation. This step identifies constituents of potential concern (COPCs) by comparing maximum Site concentrations to appropriate human health-based screening criteria.
- Step 2 – Exposure Assessment. This step identifies potentially complete exposure pathways for environmental media (i.e., soil, groundwater, and soil gas) based on reasonably anticipated future land use.

- Step 3 – Toxicity Assessment. This step identifies toxicity values that are used to quantify potential carcinogenic risks and noncarcinogenic hazards.
- Step 4 – Risk Characterization. This step uses the information from the exposure assessment and toxicity assessment to quantify potential risks and hazards for identified receptors and/or receptor groups.
- Step 5 – Uncertainty Analysis. This step identifies key components of the risk assessment that may lend uncertainty to the risk results and puts estimated risks and hazards into perspective.

## **2. Site Setting and Land Use**

This section discusses the Site and its physical characteristics, relevant to the selection of exposure scenarios, potential receptors and assumptions that are used in this HHRA.

The Site is located in Moraine, Ohio (Figure G-1). Six areas are the focus of this HHRA, including Landfill L1, the West Tank Farm, the Box Sewer, Process Sump Area, Historic Fill Area, and former Building 21, which are shown on Figure G-2. Site-wide groundwater is also evaluated in this HHRA, which includes both the upper and lower aquifers. The physical setting of the Site (i.e., current land use) and Site hydrology (e.g., local groundwater use) are described in Section 2.7 of the Corrective Measures Proposal and are not repeated here. Briefly, the Site is currently inactive and Site groundwater is not currently used as either an industrial source or as a potable source.

### **2.1 Site Description**

The Site has been used for industrial purposes since the property was acquired in the mid-1920s. The former Moraine Engine and Moraine Assembly facilities occupy approximately 239 acres, while the adjacent former Delphi Thermal Moraine facility occupies approximately 124 acres. The facilities are located in the City of Moraine in Montgomery County in southwestern Ohio. A small portion of the Moraine Assembly facility is located in the City of Kettering. Figure G-1 presents the location of each facility, property boundaries, and site features. The following presents brief descriptions of the areas that are the focus of this HHRA.

#### **2.1.1 Landfill L1**

Landfill L1 is one of three landfills on the Site that are pre-RCRA, unlined disposal areas. Landfill L1 is located at the southern end of the facility and covers an area of approximately 7.8 acres; it was used for the collection and disposal of wastes generated by the previous plant operator, Frigidaire, for more than 20 years.

#### **2.1.2 West Tank Farm**

The former West Tank Farm area was located inside former Delphi Thermal Moraine Building 14 and contained RCRA-regulated tanks which were part of the solvent recovery process. Investigations and soil removal were conducted at this area under

the Ohio EPA RCRA closure, Bureau of Underground Storage Tank Regulations (BUSTR) closure and it was identified as a SWMU and investigated in the former Delphi Thermal Moraine RFI. As part of the closure activities, all of the RCRA tanks formerly containing PCE were excavated and removed from the West Tank Farm and all of the excavations were backfilled with clean soil in the early 1990's. Sheet piling was installed surrounding the perimeter of the primary West Tank Farm excavation. The primary excavation extent is approximately 21 by 21 feet. The still room was connected to the West Tank Farm via underground piping. As part of the closure completed in 1990, one 3,000-gallon PCE product storage tank and one 1,500-gallon waste PCE tank was removed. Concentrations of PCE remained within the underlying soils related to the still room.

### 2.1.3 Box Sewer

The Box Sewer runs parallel to the former east wall of Plants 2 and 3 and is approximately 2,300 linear feet in length, 9 feet in width, and 10 feet high. The top of the Box Sewer is at grade and the bottom of the Box Sewer is 10 feet below grade. The Box Sewer was used by Frigidaire to convey process water before former GM Corporation converted Frigidaire Plants 2 and 3 into the Moraine Engine and Moraine Assembly facilities in 1979-80. Prior to and as part of the conversion, all process waste connections to the Box Sewer were terminated. Subsequently, only storm water runoff from paved areas and roof drains and non-contact cooling water entered the Box Sewer. Currently, only storm water runoff enters the Box Sewer. Flow exiting the Box Sewer enters a 54-inch diameter storm sewer that flows west to a storm water retention basin located at the former Delphi Thermal Moraine facility, which is part of the Storm Water Management System for the site. The Moraine Engine plant ceased operations in the fall of 2000, with subsequent decommissioning and demolition completed in early summer of 2001.

In December 2000 and February 2001, the sediment in the Box Sewer was assessed for removal as part of the site decommissioning activities conducted by former GM Corporation. The Box Sewer was sectioned into 27 quadrants and a sediment sample was collected from each quadrant. Former GM Corporation conducted the Box Sewer cleaning between June and July 2001. The average depth of the sediment in the Box Sewer prior to cleaning was two feet. After cleaning, the Box Sewer was inspected on August 9, 2001. As a result of the inspection, several areas were identified as potential locations where historic releases from the Box Sewer may have occurred.

#### 2.1.4 Process Sump Area

The Process Sump Area is located in the former Moraine Assembly Plant 1; north of West Stroop Road and east of Springboro Road. The former Moraine Assembly Paint Building is located directly across Stroop Road to the south. The former Moraine Assembly Plant was initially constructed in 1952 (as part of Frigidaire) with expansions to the General Assembly in 1979, 1997/1998, and 2000/2001. A concrete lined below-grade Process Sump Area is located in the southwest corner of the former Moraine Assembly Plant.

The current Process Sump Area was constructed in 1980 as part of the improvements to the Moraine Assembly Plant. The area was identified during the Supplemental Description of Current Conditions (DOCC; Geraghty & Miller, Inc. 1997) and referred to as AOI 26. Small sumps have been in use since the construction of the building in 1952 and subsequent additions to the Moraine Assembly Plant. The small sumps are located throughout the Moraine Assembly Plant and were formerly used to collect and process wastewater. The collected wastewater drained to a final transfer sump (underground) at the south/southwest end of the Moraine Assembly Plant.

#### 2.1.5 Historic Fill Area

The Historic Fill Area is located north of the historic extension of Stroop Road between Springboro Road and the current railroad tracks operated by Norfolk Southern. This area was undeveloped prior to the expansion of the former Frigidaire Plant 2 in the 1940's. This expansion cut off Stroop Road at Springboro Road. In 1979, the former Frigidaire Plant 2 was decommissioned and converted from 1980 to 1981 to the General Motors Powertrain Group Moraine Engine Plant 2 and 3. In 2001, Building 2 was demolished, repaved, and was most recently part of the Vehicle Distribution Center until December 2008. A small historic building, possibly a pole-barn, was located northeast of the intersection of the railroad spur and Stroop Road and south of the Historic Fill Area. It is currently unknown what materials may have been managed in the fill area as the historic photograph does not provide sufficient detail to determine materials being managed.

#### 2.1.6 Former Building 21

Former Building 21 was located south of former Building 14. Based on a review of historic aerial photographs, Building 21 was present during the time period from approximately the late 1940's to the mid 1990's. The building was demolished in 1996.

No releases were documented or environmental investigations completed at the former Building 21 Area. The WPSA, located east of the former Building 21, was identified as a SWMU and multiple phases of soil and groundwater investigations were conducted both pre- and post- RFI. Several borings and groundwater monitoring wells were installed as part of these investigations. Borings WPSA-BH08, WPSA-BH27, and WPSA-BH28 were installed northeast of the footprint of the former Building 21 Area during the WPSA investigation in April 2001 and August 2002 (ARCADIS, Inc. 2004).

#### 2.1.7 Off-Site Private Wells

##### 2.1.7.1 3571/3573 Dryden Road

The property located at 3571/3573 Dryden Road was identified during the previous off-site well survey. According to Montgomery County Water Department, this address does not have public water service provided. Field verification confirmed the location of the well at the north end of the building located at the above referenced address. The well water is used for the restroom facilities and bottled water is used for potable purposes.

##### 2.1.7.2 2651 Blanchard Avenue

A known well exists at the property located at 2651 Blanchard Avenue which was identified during a previous off-site well survey. According to Montgomery County Water Department, this address has received public water service in the past, but disconnected service in 1996.

##### 2.1.7.3 4000 Miller Valentine Court

The property located at 4000 Miller Valentine Court, which is west of Dryden Road, was identified during a previous off-site well survey. According to Montgomery County Water Department, this address has public water service. The well on Miller Valentine property is screened in the lower aquifer and is used on a seasonal basis to water the lawn.

### **3. Data Evaluation**

The data evaluation discusses the available data for the Site and the methodology for identifying COPCs.

#### **3.1 Summary of Available Data**

The following presents the analytical data available for each area of the Site. Generally, more recent data collected in 2011 and 2012 are the focus of this HHRA as these data represent current conditions at the Site. However, in some instances, historical data are considered in the HHRA when there is a more robust analyte list. Also, it is important to note that soil and groundwater data used in this HHRA for evaluation of direct contact exposures constitutes a conservative evaluation because the majority of the soil samples were collected at depths (i.e., greater than 15 feet below ground surface [bgs]) that would not normally be encountered, even during intrusive activities or future Site development activities. Likewise, the groundwater table in most areas of the Site is deeper than 15 feet bgs, and as such, direct contact groundwater exposures are unlikely. However, to be consistent with previous risk evaluations, these soils and groundwater data are considered in this HHRA and quantitatively evaluated to estimate potential human health risks.

##### **3.1.1 Landfill L1**

The following analytical data for Landfill L1 are considered in this HHRA:

- Historical soil (waste) data for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), metals, and cyanide collected between 1992 and 1994.
- Soils data (native soil and waste) for VOCs collected in 2011/2012.
- Historical groundwater data for VOCs, dissolved metals, and cyanide collected between 1992 and 1994.
- Groundwater data for VOCs and methane collected in 2011/2012.

### 3.1.2 Site-Wide Groundwater

Direct contact exposures for groundwater (i.e., ingestion, dermal contact, and inhalation of volatiles during industrial use of Site groundwater) are evaluated on an area-specific basis (e.g., Landfill L1, West Tank Farm) using groundwater data collected from monitoring wells on a site-wide basis and/or profiling events within each investigation area.

Evaluations for site-wide groundwater include several pumping scenarios for offsite wells (i.e., Dryden North Well [DN-13], Miami Shores Wellfield, and West Carrollton Wellfield), assuming these wells could be affected by onsite sources and that water from these wells would be used as a potable source. To facilitate this evaluation, onsite wells were assigned to individual investigation areas for purposes of estimating source concentrations.

Investigation Area	Well ID
Landfill L1	LF-01, LF-02, LF-03, LF-05, LF-07, LF-19, LF-29A, LF-35, LF-36, LF-37
West Tank Farm	WTANKF-1, WTANKF-2, WTANKF-3, WTANKF-4
Box Sewer	BOX-1, BOX-2, BOX-4
Process Sump Area	PSA-1 through PSA-10
Historic Fill Area	HFA-1, HFA-2, HFA-3
Former Building 21	BLDG21-1, BLDG21-2, BLDG21-3, BLDG21-4

Groundwater modeling was used to develop dilution attenuation factors (DAFs) (discussed in Section 2.7 of the Corrective Measures Proposal), which were then used to estimate exposure point concentrations at offsite wells based on source concentrations from the above onsite wells and different pumping scenarios (discussed further in Section 4 below). Four pumping scenarios were evaluated:

- Pumping scenario #1: Dryden North Well – OFF; Miami Shores Wellfield – OFF; West Carrollton Wellfield – ON
- Pumping scenario #2: Dryden North Well – OFF; Miami Shores Wellfield – ON; West Carrollton Wellfield – ON

- Pumping scenario #3: Dryden North Well – ON; Miami Shores Wellfield – OFF; West Carrollton Wellfield – ON
- Pumping scenario #4: Dryden North Well – ON; Miami Shores Wellfield – ON; West Carrollton Wellfield – ON

A site-wide evaluation of the vapor intrusion pathway was also conducted using site-wide groundwater data, specifically those groundwater data that were collected from the uppermost stratum of the upper aquifer and within Site boundaries.

### 3.1.3 West Tank Farm

The following analytical data for the West Tank Farm are considered in this HHRA:

- Historical soils data for VOCs, metals, PCBs, and pesticides collected between 1988 and 1992.
- Soils data for VOCs collected in 2012.
- Groundwater data for VOCs collected in 2010 and 2012.

### 3.1.4 Box Sewer

The following analytical data for the Box Sewer are considered in this HHRA:

- Historical soils data for VOCs and PCBs collected in 2001.
- Soils data for VOCs collected in 2012.
- Groundwater data for VOCs collected in 2007 and 2012.

### 3.1.5 Process Sump Area

The following analytical data for the Process Sump Area are considered in this HHRA:

- Soils data for VOCs collected in 2012.
- Historical groundwater data for VOCs collected in 2007, 2008, and 2009.

- Groundwater data for VOCs collected in 2012.

#### 3.1.6 Historic Fill Area

The following analytical data for the Historic Fill Area are considered in this HHRA:

- Soils data for VOCs collected in 2012.
- Historical groundwater data for VOCs collected in 2007.
- Groundwater data for VOCs collected in 2012.

#### 3.1.7 Former Building 21

The following analytical data for former Building 21 are considered in this HHRA:

- Soils data for VOCs collected in 2012.
- Groundwater data for VOCs collected in 2012.

#### 3.1.8 Off-Site Private Groundwater Wells

An off-site private well survey was conducted in 2007 to obtain updated information from previous surveys and to obtain information from a new area east of the Site. A located well is defined as a well that the Ohio Department of Natural Resources (ODNR) has record of a well log and can confirm its location on a map. An unlocated well is defined as a well that the ODNR has record of a well log but cannot confirm its location on a map.

##### 3.1.8.1 3571/3573 Dryden Road

The analytical data for the property located at 3571/3573 Dryden Road includes groundwater collected in 2002 and 2003. Samples were analyzed for VOCs.

##### 3.1.8.2 2651 Blanchard Avenue

The analytical data for the property located at 2651 Blanchard Avenue includes groundwater data collected in 2004. Samples were analyzed for VOCs.

### 3.1.8.2 4000 Miller Valentine Court

The analytical data for the property located at 4000 Miller Valentine Court includes groundwater data collected in 2002. Samples were analyzed for VOCs.

## 3.2 Identification of Constituents of Potential Concern

### 3.2.1 Screening Process

The following screening criteria were used to identify COPCs for purposes of this HHRA:

- Soil – USEPA Regional Screening Levels (RSLs) for Industrial Soil (May 2012).
- Groundwater – USEPA MCLs. (Although MCLs are generally not risk-based, these values are used as screening criteria to be consistent with previous risk assessments for the Site and because these values represent promulgated standards. If MCLs are unavailable for a particular constituent, the USEPA RSL for tap water is used as a screening criterion.)
- Soil gas – USEPA Vapor Intrusion Screening Levels (VISLs) for commercial receptors.

### 3.2.2 Screening Results

The following COPCs were identified for each investigation area:

#### 3.2.2.1 Landfill L1

Soil COPCs for waste material include ethylbenzene, PCE, TCE, xylenes, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, Aroclor 1254, arsenic, chromium, cobalt, and lead (Table G-2).

Soil COPCs for native soils include ethylbenzene (Table G-3).

Groundwater COPCs include benzene, 1,1-DCA, cis-1,2-dichloroethene (cis-1,2-DCE), PCE, TCE, vinyl chloride, arsenic, and cobalt (Table G-4).

Soil gas COPCs include 1,1-DCA, 1,1-dichloroethene (1,1-DCE), benzene, ethylbenzene, PCE, toluene, trans-1,2-dichloroethene (trans-1,2-DCE), TCE, vinyl chloride, and xylenes (Table G-5).

#### *3.2.2.2 Box Sewer*

No soil COPCs were identified (Table G-6).

Groundwater COPCs include PCE and TCE (Table G-7).

#### *3.2.2.3 West Tank Farm*

Soil COPCs include benzene and arsenic. Table G-8 presents the historical and recent soils data separately. Table G-9 presents the COPCs that result from combining these datasets.

Groundwater COPCs include 1,1-DCA, PCE, and TCE (Table G-10).

#### *3.2.2.4 Process Sump Area*

Soil COPCs include PCE and TCE (Table G-11).

Groundwater COPCs include cis-1,2-DCE, PCE, and TCE (Table G-12).

#### *3.2.2.5 Historic Fill Area*

No soil COPCs were identified (Table G-13).

Groundwater COPCs include cis-1,2-DCE, PCE, TCE, and vinyl chloride (Table G-14).

#### *3.2.2.6 Former Building 21*

No soil COPCs were identified (Table G-15).

Groundwater COPCs include cis-1,2-DCE, PCE, and TCE (Table G-16).

### 3.2.2.7 *Off-Site Private Groundwater Wells*

#### 3.2.2.7.1 4000 Miller Valentine Court

VOCs detected in groundwater samples from 4000 Miller Valentine Court's well included cis-1,2-DCE and vinyl chloride. The results for cis-1,2-DCE (0.65 µg/L) and vinyl chloride (1.5 µg/L) were below the respective MCLs (Table G-17).

#### 3.2.2.7.2 3571/3573 Dryden Road

VOCs detected in groundwater samples from the well at 3571/3573 Dryden Road included 1,2-DCA, cis-1,2-DCE, and vinyl chloride. The results for 1,2-DCA and cis-1,2-DCE were below MCLs while the vinyl chloride results (2.4 micrograms per liter [µg/L]) slightly exceeded the MCL of 2.0 ug/L (Table G-18).

#### 3.2.2.7.3 2651 Blanchard Avenue

Three groundwater samples were collected from the following areas at 2651 Blanchard Avenue: from a spigot located outside the building, in the basement prior to the pressure tank and from a spigot. VOCs detected in these samples included chloroethane, 1,1-DCA, and cis-1,2-DCE. Cis-1,2-DCE was below the MCL; chloroethane and 1,1-DCA do not have corresponding MCLs (Table G-19). Carbon vessels used for water treatment at this property are operated by the current owner.

### 3.2.2.8 *West Carrollton Wellfield*

No groundwater COPCs were identified for the data collected directly from the West Carrollton Wellfield (Table G-20).

### 3.2.2.9 *Miami Shores Wellfield*

No groundwater COPCs were identified for the data collected directly from the Miami Shores Wellfield (Table G-21).

### 3.2.2.10 *Site-Wide Groundwater (On-Site Vapor Intrusion)*

Groundwater COPCs for the on-site vapor intrusion pathway include PCE, TCE, and vinyl chloride (Table G-22).

#### 3.2.2.11 Site-Wide Groundwater (Off-Site Wells)

Table G-23 presents the groundwater wells assigned to each SWMU/AOI to evaluate the off-site groundwater pathway. Tables G-24 through G-27 present the DAFs for each pumping scenario. Tables G-28 through G-31 present the exposure point concentrations (EPCs) for each well based on each pumping scenario and the associated DAFs. Specifically, EPCs were calculated by multiplying the groundwater concentrations at the source by the DAFs for each individual well. Tables G-32 through G-35 compares these EPCs to USEPA MCLs to identify COPCs for this groundwater pathway.

TCE and PCE were identified as COPCs for all four pumping scenarios (Tables G-32 through G-35).

## **4. Exposure Assessment**

Potential exposure scenarios to be evaluated were selected based on the current and reasonably anticipated future uses of the Site. The Site is currently inactive and future uses are anticipated to be of an industrial/commercial nature. Future human receptors may include on-site routine workers, on-site maintenance workers, on-site construction workers, off-site residents, and off-site routine workers.

The following sections discuss the receptor groups which are the focus of this HHRA, the calculation of exposure point concentrations for soil and groundwater, and the selection of exposure factors used to quantify potential risks and hazards.

### **4.1 Receptors and Exposure Scenarios**

The receptors and exposure scenarios are based on hypothetical future land use, which is expected to be of an industrial/commercial nature. The receptors which are the focus of this HHRA are modeled after the receptors identified in previous HHRAs for the Site (ENVIRON 2000a and b, 2008). Both a Reasonable Maximum Exposure (RME) scenario and a Central Tendency Exposure (CTE) scenario were evaluated as part of this HHRA. The following presents a brief description of each receptor and their associated exposure pathways.

#### **4.1.1 On-Site Routine Worker**

The on-site routine worker represents an adult individual who primarily works indoors either as an office worker or someone who conducts industrial activities. The on-site routine worker is assumed to be exposed to soil and groundwater via direct contact, inhalation of vapors in indoor air, and inhalation of particulates and vapors emanating from soil to ambient air.

#### **4.1.2 On-Site Maintenance Worker**

The on-site maintenance worker represents an adult individual who primarily works outdoors performing typical maintenance activities such as lawn mowing, utility repair, and/or removal or repair of pavement. The on-site maintenance worker is assumed to be exposed to soil and groundwater via direct contact and inhalation of particulates and vapors emanating from soil to ambient air.

#### 4.1.3 On-Site Construction Worker

The on-site construction worker represents an adult individual who would primarily be involved in decommissioning work or future Site development. The on-site construction worker is assumed to be exposed to soil and groundwater via direct contact and inhalation of particulates and vapors emanating from soil to ambient air.

#### 4.1.4 Off-Site Resident

The off-site resident represents individuals (adults and children) who live off-site, but may be exposed to COPCs in potable groundwater at off-site wells (i.e., Dryden North Well, Miami Shores Wellfield, and West Carrollton Wellfield) through a hydraulic connection to the onsite groundwater plume. To evaluate this scenario, four pumping scenarios were evaluated:

- Pumping Scenario #1: Dryden North Well – OFF; Miami Shores Wellfield – OFF; West Carrollton Wellfield – ON
- Pumping Scenario #2: Dryden North Well – OFF; Miami Shores Wellfield – ON; West Carrollton Wellfield – ON
- Pumping Scenario #3: Dryden North Well – ON; Miami Shores Wellfield – OFF; West Carrollton Wellfield – ON
- Pumping Scenario #4: Dryden North Well – ON; Miami Shores Wellfield – ON; West Carrollton Wellfield – ON

#### 4.1.5 Off-Site Routine Worker

The off-site routine worker represents an individual who works at one of the private properties located at 3571/3573 Dryden Road, 2651 Blanchard Avenue, or 4000 Miller Valentine Court where a private groundwater well is located. These private wells may be affected by the on-site plume and as such, these individuals may be exposed to COPCs in groundwater. However, none of these private wells are used as a drinking source, with the exception of 2651 Blanchard Avenue.

#### 4.2 Calculation of Exposure Point Concentrations

EPCs were derived using relevant site-specific analytical data. The 95% Upper Confidence Limit on the arithmetic mean (95% UCL) was calculated using USEPA ProUCL software (Version 4.1.00; USEPA 2011). The rationale for calculating the 95% UCL followed the draft ProUCL Version 4.1.00 Technical Guide (USEPA 2010).

95% UCLs were calculated for those datasets that included a minimum of six samples and at least five detected concentrations. The maximum detected concentration is the default EPC for datasets that do not meet these criteria or where the 95% UCL exceeds the maximum concentration (USEPA 1992).

The 95% UCLs were used in this HHRA as EPCs for both the RME and CTE scenarios and are presented in Tables G-36 and G-37 for soil and groundwater direct contact exposures, respectively. Table G-38 presents the 95% UCLs for the groundwater pumping scenarios (i.e., ingestion of potable groundwater by off-site residents).

#### 4.3 Calculation of Intakes

Intakes (i.e., average daily doses) for the ingestion and dermal contact exposure pathways are expressed in milligrams per kilogram of body weight per day (mg/kg-day) and are calculated using the EPCs and the exposure factors presented in Tables G-39 through G-44. Intakes for the inhalation exposure pathways are expressed in milligrams per cubic meter (mg/m<sup>3</sup>) and are calculated using the EPCs and exposure factors presented in Tables G-39 through G-44. Equations used to calculate intakes and associated cancer risks and non-cancer hazards are also presented in Tables G-39 through G-44.

#### 4.4 Exposure Factors

Exposure factors used to calculate potential risks and hazards for potable groundwater, direct contact with Site groundwater, and direct contact with Site soils are presented in Tables G-39 through G-44. In many cases, the exposure factors represent USEPA default values and/or values that were used in previous risk assessments for the Site (ENVIRON 2000a and b, 2008). Table G-45 presents the sources used in the selection of exposure factors.

#### 4.5 Chemical-Specific Factors

Table G-46 presents the dermal factors that were used in the HHRA, including dermal absorption fractions (ABSs) for dermal exposures associated with soil and dermal factors related to the evaluation of water exposures (e.g., permeability coefficients [Kp]) and absorbed dermal doses ( $DA_{\text{event}}$ ) for groundwater exposures. Table G-46 also presents the volatilization factors (VFs) for the evaluation of inhalation of groundwater vapors.

ABS values were taken from USEPA (2004) RAGS, Part E, Supplemental Guidance for Dermal Risk Assessment. These values reflect the amount of a chemical that is absorbed through the skin following dermal exposure. Consistent with USEPA (2004) guidance in RAGS Part E, the dermal exposure route for soil was not quantitatively evaluated if a metal COPC lacked an ABS value because the speciation of the compound is critical to the dermal absorption and there are too little data to extrapolate a reasonable default value for inorganics. Dermal values for groundwater exposure were also taken from USEPA (2004) RAGS Part E. Default VFs were taken from the May 2012 RSL tables.

## 5. Toxicity Assessment

The toxicity assessment describes the relationship between administered and/or the absorbed dose of a chemical and the magnitude of likelihood of adverse health effects (USEPA 1989). The USEPA characterizes adverse health effects as carcinogenic or noncarcinogenic. For chemicals that are known or suspected to cause cancer, the toxicity assessment defines the relationship between the dose of the chemical or agent and the probability of induction of carcinogenic effects in humans or animal species of interest. For systemic toxicants, or chemicals that give rise to toxic endpoints other than cancer and gene mutations (noncarcinogenic effects), the toxicity assessment process determines a threshold value below which adverse noncarcinogenic effects are not expected in the general population, including sensitive subgroups. Results of the toxicity assessment, when combined with the dose estimated in the exposure assessment, are used to estimate potential health risks in the HHRA.

Toxicity values are developed by the USEPA, state regulatory agencies and other entities after a comprehensive scientific review of available toxicological literature and dose-response information for a constituent. The selection of toxicity values that are presented in this HHRA for each COPC follows the USEPA-recommended hierarchy (USEPA 2003):

- Tier 1 – USEPA’s Integrated Risk Information System (IRIS; USEPA 2012a).
- Tier 2 – USEPA’s Provisional Peer-Reviewed Toxicity Values (PPRTVs; USEPA 2012b).
- Tier 3 – Includes sources such as California Environmental Protection Agency (CalEPA 2007), Office of Environmental Health Hazard Assessment, toxicity criteria database, Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), and USEPA (1997) Health Effects Assessment Summary Tables (HEAST).

### 5.1 Noncarcinogenic Effects

For many non-carcinogenic effects, protective mechanisms must be overcome before an effect is manifested. Therefore, a finite dose (threshold), below which adverse effects will not occur, exists for non-carcinogens. To quantify noncarcinogenic effects, the USEPA has derived oral reference doses (RfDs) in units of mg/kg-day and reference concentrations (RfCs) in units of mg/m<sup>3</sup> that represent a threshold of toxicity.

RfDs and RfCs are intended to represent “an estimate (with uncertainty spanning perhaps one order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime” (USEPA 1989). RfCs and RfDs are calculated by determining the highest dose at which there are no observed adverse health effects (NOAEL) and by adjusting this dose using a series of uncertainty factors (UFs) and modifying factors (MFs). The UFs are intended to conservatively account for the variation in sensitivity within the human population, uncertainty in extrapolating from animals to humans, uncertainty in extrapolating from short-term animal studies to chronic exposures in humans, and/or the inability of the toxicological database to address all possible adverse outcomes in humans. The MFs may be applied to address specific scientific uncertainties or overall database quality. For studies in which a NOAEL cannot be identified, the lowest dose associated with an observed adverse effect (LOAEL) is used and an additional UF is applied to account for the uncertainty of using LOAEL data rather than NOAEL data.

Table G-47 presents noncancer toxicity data for the oral/dermal pathways and Table G-48 presents noncancer toxicity data for the inhalation pathway. Because most oral toxicity values are based on an administered dose, these toxicity values were sometimes adjusted (expressed as an absorbed dose) when evaluating dermal exposure scenarios. The USEPA requires this adjustment only when the gastrointestinal absorption of a compound is less than 50 percent (USEPA 2004).

## 5.2 Carcinogenic Effects

To quantify carcinogenic effects, the USEPA has derived slope factors (SFs) and unit risk factors (URFs) for those chemicals believed to cause a dose-related, statistically significant increase in tumor incidence in an exposed population relative to the incidence of tumors observed in an unexposed population. These dose-related incidence rates are usually determined in a laboratory study. SFs are typically developed based on oral toxicity studies and are reported as risk per dose in units of  $(\text{mg}/\text{kg}\text{-day})^{-1}$ . Likewise, URFs are typically developed based on inhalation toxicity studies and are reported as risk per dose in units of  $(\mu\text{g}/\text{m}^3)^{-1}$ . The SFs and URFs are used to quantify the potential risk of cancer associated with a given exposure and usually represent the 95% UCL on the probability of a response per unit dose of a chemical.

Table G-49 presents the weight-of-evidence classifications for carcinogenic COPCs for the oral/dermal pathways. Table G-50 presents the weight-of-evidence classification for

carcinogenic COPCs for the inhalation pathway. Because most oral toxicity values are based on an administered dose, these toxicity values were sometimes adjusted (expressed as an absorbed dose) when evaluating dermal exposure scenarios. The USEPA requires this adjustment only when the gastrointestinal absorption of a compound is less than 50 percent (USEPA 2004).

Constituents are classified as known, probable, or possible human carcinogens based on a USEPA weight-of-evidence scheme in which they are systematically evaluated for their ability to cause cancer in humans and laboratory animals. The USEPA classification scheme (USEPA 2005) contains five classes based on the weight of available evidence:

- Carcinogenic to humans
- Likely to be carcinogenic to humans
- Suggestive evidence of carcinogenic potential
- Inadequate information to assess carcinogenic potential
- Not likely to be carcinogenic to humans

## 6. Risk Characterization

The risk characterization integrates the results of the data evaluation, exposure assessment and toxicity assessment to evaluate potential risks associated with exposure to site-related constituents in Site soil, ambient air, indoor air, and groundwater. Consistent with the USEPA (1989) guidance, the potential for carcinogenic risks and non-carcinogenic health hazards are evaluated separately.

Tables G-51 through G-112 present the EPCs, intakes, toxicity values, and associated cancer risks and non-cancer hazards for each receptor, including target-organ-specific hazard quotients (HQs).

### 6.1 Non-Carcinogenic Health Hazards

The hazard index (HI) is used to characterize potential non-carcinogenic health hazards associated with exposure to multiple chemicals. This approach assumes that sub-threshold chronic exposures to multiple chemicals are additive. However, HQs should only be summed for constituents with the same target organ. The HI is calculated as follows:

$$HI = E1/RfD1 + E2/RfD2 + \dots + Ei/RfDi$$

where:

HI = Hazard Index

E/RfD = HQ

E<sub>i</sub> = Exposure intake for the <sup>i</sup><sup>th</sup> chemical (mg/kg-day)

RfD<sub>i</sub> = RfD for the <sup>i</sup><sup>th</sup> chemical

An HQ value greater than 1 indicates that a calculated exposure is greater than the RfD for a given constituent and that there may be some potential for health concerns. Similarly, an HI greater than 1 indicates that overall exposure to all chemicals of interest may present a concern (USEPA 1989).

Non-cancer hazards for each receptor are presented separately below.

### 6.1.1 Landfill L1

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater via direct contact.

#### 6.1.1.1 Waste Material

##### 6.1.1.1.1 On-Site Routine Worker

The RME HQs for surface/subsurface soil and groundwater are 3 and 0.8, respectively. The CTE HQ for surface/subsurface soil and groundwater are 1 and 0.5, respectively. Tables G-51 and G-52 present the HIs for the on-site routine worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 3 for the RME scenario and 2 for the CTE scenario; direct contact soil exposures are the primary pathway of concern. However, target-organ-specific HQs for both the RME and CTE scenarios are less than the USEPA benchmark of 1, with the exception of the immune system HQ for the RME scenario (HQ = 2).

##### 6.1.1.1.2 On-Site Maintenance Worker

The RME HQs for surface/subsurface soil and groundwater are 0.07 and 0.008, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.02 and 0.004, respectively. Tables G-53 and G-54 present the HIs for the on-site maintenance worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.07 for the RME scenario and 0.03 for the CTE scenario, both of which are below USEPA's benchmark of 1.

##### 6.1.1.1.3 On-Site Construction Worker

The RME HQs for surface/subsurface soil and groundwater are 4 and 0.2, respectively. The CTE HQ for surface/subsurface soil and groundwater are 2 and 0.1, respectively. Tables G-55 and G-56 present the HIs for the on-site construction worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 4 for the RME scenario and 2 for the CTE scenario; direct contact soil exposures are the primary pathway of concern. However, target-organ-specific HQs are less than the USEPA benchmark of 1 for both the RME and CTE scenarios, with the exception of the RME scenario, which has a neurological HQ of 3.

### 6.1.1.2 *Native Soils*

#### 6.1.1.2.1 On-Site Routine Worker

The RME HQs for surface/subsurface soil and groundwater are 0.0002 and 0.8, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.0001 and 0.5, respectively. Tables G-57 and G-58 present the HIs for the on-site routine worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.8 for the RME scenario and 0.5 for the CTE scenario; both of which are below USEPA's benchmark of 1.

#### 6.1.1.2.2 On-Site Maintenance Worker

The RME HQs for surface/subsurface soil and groundwater are 0.000009 and 0.008 respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.000004 and 0.004, respectively. Tables G-59 and G-60 present the HIs for the on-site maintenance worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.008 for the RME scenario and 0.004 for the CTE scenario, both of which are below USEPA's benchmark of 1.

#### 6.1.1.2.3 On-Site Construction Worker

The RME HQs for surface/subsurface soil and groundwater are 0.0006 and 0.2, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.0003 and 0.1, respectively. Tables G-61 and G-62 present the HIs for the on-site construction worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.2 for the RME scenario and 0.1 for the CTE scenario, both of which are below USEPA's benchmark of 1.

### 6.1.2 Box Sewer

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to groundwater via direct contact. No soil COPCs were identified for the Box Sewer.

#### 6.1.2.1 *On-Site Routine Worker*

The HQs (HIs) for RME and CTE groundwater are 10 and 5, respectively, both of which are above USEPA's benchmark of 1. Tables G-63 and G-64 present the HIs for the on-site routine worker as well as the target organ specific HIs.

#### *6.1.2.2 On-Site Maintenance Worker*

The HQs (HIs) for RME and CTE groundwater are 0.07 and 0.03, respectively, both of which are below USEPA's benchmark HI of 1. Tables G-65 and G-66 present the HIs for the on-site routine worker as well as the target organ specific HIs.

#### *6.1.2.3 On-Site Construction Worker*

The HQs (HIs) for RME and CTE groundwater are 2 and 0.8, respectively, the RME scenario is above USEPA's benchmark HI of 1, whereas the CTE scenario is below the USEPA benchmark HI of 1. However, the target-organ-specific HQs for the RME scenario are below 1. Tables G-67 and G-68 present the HIs for the on-site routine worker as well as the target organ specific HIs.

### 6.1.3 West Tank Farm

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater via direct contact.

#### *6.1.3.1 On-Site Routine Worker*

The RME HQs for surface/subsurface soil and groundwater are 0.02 and 4, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.01 and 2, respectively. Tables G-69 and G-70 present the HIs for the on-site routine worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 4 for the RME scenario and 2 for the CTE scenario; direct contact groundwater exposures are the primary pathway of concern.

#### *6.1.3.2 On-Site Maintenance Worker*

The RME HQs for surface/subsurface soil and groundwater are 0.002 and 0.03 respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.0006 and 0.01, respectively. Tables G-71 and G-72 present the HIs for the on-site maintenance worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.02 for the RME scenario and 0.01 for the CTE scenario, both of which are below USEPA's benchmark of 1.

#### 6.1.3.3 *On-Site Construction Worker*

The RME HQs for surface/subsurface soil and groundwater are 0.08 and 0.6, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.04 and 0.3, respectively. Tables G-73 and G-74 present the HIs for the on-site construction worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 0.7 for the RME scenario and 0.3 for the CTE scenario, both of which are below USEPA's benchmark of 1.

#### 6.1.4 Process Sump Area

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater via direct contact.

##### 6.1.4.1 *On-Site Routine Worker*

The RME HQs for surface/subsurface soil and groundwater are 0.7 and 200, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.7 and 100, respectively. Tables G-75 and G-76 present the HIs for the on-site routine worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 200 for an RME scenario and 100 for a CTE scenario, indicating that direct contact groundwater exposures are the primary pathway of concern.

##### 6.1.4.2 *On-Site Maintenance Worker*

The RME HQs for surface/subsurface soil and groundwater are 0.07 and 1 respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.02 and 0.6, respectively. Tables G-77 and G-78 present the HIs for the on-site maintenance worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 1 for an RME scenario and 0.6 for a CTE scenario, both of which are below USEPA's benchmark of 1.

##### 6.1.4.3 *On-Site Construction Worker*

The RME HQs for surface/subsurface soil and groundwater are 2 and 30, respectively. The CTE HQ for surface/subsurface soil and groundwater are 0.6 and 20, respectively. Tables G-79 and G-80 present the HIs for the on-site construction worker as well as the target organ specific HIs. The total HIs across all media for this receptor are 30 for

an RME scenario and 20 for a CTE scenario, indicating that direct contact groundwater exposures are the primary pathway of concern.

#### 6.1.5 Historic Fill Area

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to groundwater via direct contact. No soil COPCs were identified for the Historic Fill Area.

##### 6.1.5.1 On-Site Routine Worker

The RME HQ for groundwater is 4, and the CTE HQ is 0.8. Tables G-81 and G-82 present the HIs for the on-site routine worker as well as the target organ specific HIs.

##### 6.1.5.2 On-Site Maintenance Worker

The RME HQ for groundwater is 0.02, and the CTE HQ is 0.01, both of which are below USEPA's benchmark of 1. Tables G-83 and G-84 present the HIs for the on-site maintenance worker as well as the target organ specific HIs.

##### 6.1.5.3 On-Site Construction Worker

The RME HQ for groundwater is 0.6, and the CTE HQ is 0.3, both of which are below USEPA's benchmark of 1. Tables G-85 and G-86 present the HIs for the on-site construction worker as well as the target organ specific HIs.

#### 6.1.6 Former Building 21

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to groundwater via direct contact. No soil COPCs were identified for former Building 21.

##### 6.1.6.1 On-Site Routine Worker

The RME HQ for groundwater is 3, and the CTE HQ is 0.6. Tables G-87 and G-88 present the HIs for the on-site routine worker as well as the target organ specific HIs.

#### 6.1.6.2 On-Site Maintenance Worker

The RME HQ for groundwater is 0.02, and the CTE HQ is 0.008, both of which are below USEPA's benchmark of 1. Tables G-89 and G-90 present the HIs for the on-site maintenance worker as well as the target organ specific HIs.

#### 6.1.6.3 On-Site Construction Worker

The RME HQ for groundwater is 0.4, and the CTE HQ is 0.2, both of which are below USEPA's benchmark of 1. Tables G-91 and G-92 present the HIs for the on-site construction worker as well as the target organ specific HIs.

#### 6.1.7 Off-Site Resident (Pumping Scenario #1)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water from off-site groundwater wells.

##### 6.1.7.1 Off-Site Adult Resident

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- Miami Shores (MS)-14, 6 and 2
- MS-15, 0.7 and 0.3
- MS-17, 0.07 and 0.03
- MS-18, 1 and 0.4
- MS-19, 6 and 2
- MS-20, 3 and 1

All of these HIs are above USEPA's benchmark of 1, except for RME exposure at MS-15, MS-17, and MS-18, and CTE exposure at MS-15, MS-17, MS-18, and MS-20. Tables G-93 and G-94 present the HIs for the off-site adult resident as well as the target organ specific HIs.

#### 6.1.7.2 Off-Site Child Resident

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- MS-14, 9 and 4
- MS-15, 1 and 0.5
- MS-17, 0.1 and 0.06
- MS-18, 2 and 0.7
- MS-19, 9 and 4
- MS-20, 5 and 2

All of these HIs are above USEPA's benchmark of 1, except for RME exposure at MS-15 and MS-17, and CTE exposure at MS-15, MS-17 and MS-18. Tables G-95 and G-96 present the HIs for the off-site child resident as well as the target organ specific HIs.

#### 6.1.8 Off-Site Resident (Pumping Scenario #2)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water from off-site groundwater wells.

##### 6.1.8.1 Off-Site Adult Resident

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- MS-14, 7 and 3
- MS-15, 0.07 and 0.03
- MS-17, 0.07 and 0.03

- MS-18, 0.7 and 0.3
- MS-19, 10 and 4
- MS-20, 9 and 4

All of these HIs are above USEPA's benchmark of 1, except for exposure at MS-15, MS-17, and MS-18. Tables G-98 and G-99 present the HIs for the off-site adult resident as well as the target organ specific HIs.

#### *6.1.8.2 Off-Site Child Resident*

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are;

- MS-14, 10 and 4
- MS-15, 0.1 and 0.05
- MS-17, 0.1 and 0.05
- MS-18, 1 and 0.5
- MS-19, 20 and 7
- MS-20, 10 and 6

All of these HIs are above USEPA's benchmark of 1, except for RME exposure at MS-15 and MS-17, and CTE exposure at MS-15, MS-17 and MS-18. Tables G-100 and G-101 present the HIs for the off-site child resident as well as the target organ specific HIs.

#### 6.1.9 Off-Site Resident (Pumping Scenario #3)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water from off-site groundwater wells.

#### *6.1.9.1 Off-Site Adult Resident*

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are;

- DN-13, 10 and 6
- MS-14, 20 and 9
- MS-15, 9 and 4
- MS-16, 2 and 0.6
- MS-17, 4 and 2
- MS-18, 6 and 2
- MS-19, 20 and 8
- MS-20, 10 and 6
- MS-21, 1 and 0.6
- MS-22, 0.06 and 0.03

All of these HIs are above USEPA's benchmark of 1, except for RME exposure at MS-21 and MS-22, and CTE exposure at MS-16, MS-21 and MS-22. Tables G-103 and G-104 present the HIs for the off-site adult resident as well as the target organ specific HIs.

#### *6.1.9.2 Off-Site Child Resident*

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- DN-13, 20 and 10
- MS-14, 40 and 20

- MS-15, 10 and 6
- MS-16, 2 and 1
- MS-17, 6 and 3
- MS-18, 9 and 4
- MS-19, 30 and 10
- MS-20, 20 and 10
- MS-21, 2 and 1
- MS-22, 0.1 and 0.04

All of these HIs are above USEPA's benchmark of 1, except for CTE exposure at MS-21, and RME and CTE exposure at MS-22. Tables G-105 and G-106 present the HIs for the off-site adult resident as well as the target organ specific HIs.

#### 6.1.10 Off-Site Resident (Pumping Scenario #4)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water from off-site groundwater wells.

##### 6.1.10.1 Off-Site Adult Resident

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- DN-13, 4 and 2
- MS-14, 20 and 9
- MS-15, 7 and 3
- MS-16, 0.4 and 0.2

- MS-17, 3 and 1
- MS-18, 3 and 1
- MS-19, 20 and 7
- MS-20, 10 and 5
- MS-21, 0.0003 and 0.0001
- MS-22, 0.00004 and 0.00002

All of these HIs are above USEPA's benchmark HI of 1, except for MS-21 and MS-22 exposures. Tables G-108 and G-109 present the HIs for the off-site adult resident as well as the target organ specific HIs.

#### *6.1.10.2 Off-Site Child Resident*

The HQs (HIs) for individual groundwater wells under RME and CTE scenarios, respectively, are:

- DN-13, 6 and 3
- MS-14, 30 and 10
- MS-15, 10 and 5
- MS-16, 0.7 and 0.3
- MS-17, 5 and 2
- MS-18, 5 and 2
- MS-19, 30 and 10
- MS-20, 20 and 8
- MS-21, 0.0005 and 0.0002

- MS-22, 0.00007 and 0.00003

All of these HIs are above USEPA's benchmark of 1, except for MS-21 and MS-22 exposures. Tables G-110 and G-111 present the HIs for the off-site adult resident as well as the target organ specific HIs.

## 6.2 Carcinogenic Risks

### 6.2.1 Landfill L1

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater.

#### 6.2.1.1 Waste Material

##### 6.2.1.1.1 On-Site Routine Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 6.E-05 and 1.E-05, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 7.E-06 and 3.E-06, respectively. Tables G-51 and G-52 present cancer risks for the on-site routine worker. Total risks for this receptor across all media are 7.E-05 for the RME scenario and 1.E-05 for the CTE scenario. Total risks are within USEPA's target risk range of 1.E-04 to 1.E-06.

##### 6.2.1.1.2 On-Site Maintenance Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 4.E-06 and 3.E-07, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 5.E-07 and 6.E-08, respectively. Tables G-53 and G-54 present cancer risks for the on-site maintenance worker. Total risks for this receptor across all media are 4.E-06 for the RME scenario and 5.E-07 for the CTE scenario. Total risks are below, or within USEPA's target risk range of 1.E-04 to 1.E-06.

##### 6.2.1.1.3 On-Site Construction Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 9.E-06 and 3.E-07, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 4.E-06 and 2.E-07, respectively. Tables G-55 and G-56 present cancer risks for the on-site construction worker. Total risks for this receptor across all media are 1.E-05 for the RME scenario and 4.E-06 for the CTE scenario. Total risks are within USEPA's target risk range of 1.E-04 to 1.E-06.

### 6.2.1.2 *Native Soils*

#### 6.2.1.2.1 On-Site Routine Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 1.E-07 and 1.E-05, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 3.E-08 and 3.E-06, respectively. Tables G-57 and G-58 present cancer risks for the on-site routine worker. Total risks for this receptor across all media are 1.E-05 for the RME scenario and 3.E-06 for the CTE scenario. Total risks are below, or within USEPA's target risk range of 1.E-04 to 1.E-06.

#### 6.2.1.2.2 On-Site Maintenance Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 2.E-08 and 3.E-07, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 2.E-09 and 6.E-08, respectively. Tables G-59 and G-60 present cancer risks for the on-site maintenance worker. Total risks for this receptor across all media are 4.E-07 for the RME scenario and 6.E-08 for the CTE scenario. Total risks are below USEPA's target risk range of 1.E-04 to 1.E-06.

#### 6.2.1.2.3 On-Site Construction Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 3.E-08 and 3.E-07, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 9.E-09 and 2.E-07, respectively. Tables G-61 and G-62 present cancer risks for the on-site construction worker. Total risks for this receptor across all media are 4.E-07 for the RME scenario and 2.E-07 for the CTE scenario. Total risks are below USEPA's target risk range of 1.E-04 to 1.E-06.

### 6.2.2 Box Sewer

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater.

#### 6.2.2.1 *On-Site Routine Worker*

Cancer risks for RME and CTE groundwater are 4.E-05 and 8.E-06, respectively, both of which are within USEPA's target risk range of 1.E-04 to 1.E-06. Tables G-63 and G-64 present cancer risks for the on-site routine worker.

#### 6.2.2.2 *On-Site Maintenance Worker*

Cancer risks for RME and CTE groundwater are 9.E-07 and 2.E-07, respectively, both of which are below USEPA's target risk range of 1.E-04 to 1.E-06. Tables G-65 and G-66 present cancer risks for the on-site maintenance worker.

#### 6.2.2.3 *On-Site Construction Worker*

Cancer risks for RME and CTE groundwater are 9.E-07 and 5.E-07, respectively, both of which are below USEPA's target risk range of 1.E-04 to 1.E-06. Tables G-67 and G-68 present cancer risks for the on-site construction worker.

### 6.2.3 West Tank Farm

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater.

#### 6.2.3.1 *On-Site Routine Worker*

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 2.E-06 and 2.E-05, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 5.E-07 and 4.E-06, respectively. Tables G-69 and G-70 present cancer risks for the on-site routine worker. Total risks for this receptor across all media are 2.E-05 for the RME scenario and 4.E-06 for the CTE scenario. Total risks are within USEPA's target risk range of 1.E-04 to 1.E-06.

#### 6.2.3.2 *On-Site Maintenance Worker*

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 3.E-07 and 4.E-07, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 4.E-08 and 7.E-08, respectively. Tables G-71 and G-72 present cancer risks for the on-site maintenance worker. Total risks for this receptor across all media are 7.E-07 for the RME scenario and 1.E-07 for the CTE scenario. Total risks are below USEPA's target risk range of 1.E-04 to 1.E-06.

#### 6.2.3.3 *On-Site Construction Worker*

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 6.E-07 and 4.E-07, respectively. Cancer risks for surface/subsurface soil and

groundwater under a CTE scenario are 2.E-07 and 2.E-07, respectively. Tables G-73 and G-74 present cancer risks for the on-site construction worker. Total risks for this receptor across all media are 1.E-06 for the RME scenario and 4.E-07 for the CTE scenario. Total risks are below USEPA's target risk range of 1.E-04 to 1.E-06.

#### 6.2.4 Process Sump Area

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to surface/subsurface soil and groundwater.

##### 6.2.4.1 On-Site Routine Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 3.E-06 and 8.E-04, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 8.E-07 and 2.E-04, respectively. Tables G-75 and G-76 present cancer risks for the on-site routine worker. Total risks for this receptor across all media are 8.E-04 for the RME scenario and 2.E-04 for the CTE scenario. Soil risks are within USEPA's target risk range of 1.E-04 to 1.E-06, but groundwater risks are above this range.

##### 6.2.4.2 On-Site Maintenance Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 7.E-07 and 2.E-05, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 7.E-08 and 3.E-06, respectively. Tables G-77 and G-78 present cancer risks for the on-site maintenance worker. Total risks for this receptor across all media are 2.E-05 for the RME scenario and 3.E-06 for the CTE scenario. Soil and groundwater risks are within USEPA's target risk range of 1.E-04 to 1.E-06.

##### 6.2.4.3 On-Site Construction Worker

Cancer risks for surface/subsurface soil and groundwater under an RME scenario are 8.E-07 and 2.E-05, respectively. Cancer risks for surface/subsurface soil and groundwater under a CTE scenario are 3.E-07 and 9.E-06, respectively. Tables G-79 and G-80 present cancer risks for the on-site construction worker. Total risks for this receptor across all media are 2.E-05 for the RME scenario and 9.E-06 for the CTE scenario. Soil and groundwater risks are within USEPA's target risk range of 1.E-04 to 1.E-06.

## 6.2.5 Historic Fill Area

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to groundwater. No soil COPCs were identified for the Historic Fill Area.

### 6.2.5.1 On-Site Routine Worker

Cancer risks for groundwater under RME and CTE scenarios are 2.E-05 and 4.E-06, respectively, which are within USEPA's target risk range. Tables G-81 and G-82 present cancer risks for the on-site routine worker.

### 6.2.5.2 On-Site Maintenance Worker

Cancer risks for groundwater under RME and CTE scenarios are 4.E-07 and 7.E-08, respectively, which are below USEPA's target risk range. Tables G-83 and G-84 present cancer risks for the on-site maintenance worker.

### 6.2.5.3 On-Site Construction Worker

Cancer risks for groundwater under RME and CTE scenarios are 4.E-07 and 2.E-07, respectively, which are below USEPA's target risk range. Tables G-85 and G-86 present cancer risks for the on-site construction worker.

## 6.2.6 Former Building 21

On-site routine workers, on-site maintenance workers and on-site construction workers were assumed to be exposed to groundwater. No soil COPCs were identified for former Building 21.

### 6.2.6.1 On-Site Routine Worker

Cancer risks for groundwater under RME and CTE scenarios are 1.E-05 and 2.E-06, respectively, which are within USEPA's target risk range. Tables G-87 and G-88 present cancer risks for the on-site routine worker.

#### 6.2.6.2 *On-Site Maintenance Worker*

Cancer risks for groundwater under RME and CTE scenarios are 3.E-07 and 5.E-08, respectively, which are below USEPA's target risk range. Tables G-89 and G-90 present cancer risks for the on-site maintenance worker.

#### 6.2.6.3 *On-Site Construction Worker*

Cancer risks for groundwater under RME and CTE scenarios are 3.E-07 and 1.E-07, respectively, which are below USEPA's target risk range. Tables G-91 and G-92 present cancer risks for the on-site construction worker.

#### 6.2.7 Off-Site Resident (Pumping Scenario #1)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water at off-site groundwater wells.

##### 6.2.7.1 *Off-Site Adult + Child Resident*

Lifetime cancer risks for individual groundwater wells under RME and CTE scenarios, respectively, are:

- MS-14, 6.E-05 and 1.E-05
- MS-15, 7.E-06 and 2.E-06
- MS-17, 5.E-07 and 1.E-07
- MS-18, 1.E-05 and 2.E-06
- MS-19, 6.E-05 and 1.E-05
- MS-20, 3.E-05 and 7.E-06

Risks for all wells are within or less than USEPA's target risk range of 1.E-04 to 1.E-06. Table G-97 presents cancer risks for the off-site adult + child resident.

#### 6.2.8 Off-Site Resident (Pumping Scenario #2)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water at off-site groundwater wells.

##### 6.2.8.1 Off-Site Adult + Child Resident

Lifetime cancer risks for individual groundwater wells under RME and CTE scenarios, respectively, are:

- MS-14, 7.E-05 and 2.E-05
- MS-15, 4.E-07 and 1.E-07
- MS-17, 4.E-07 and 1.E-07
- MS-18, 7.E-06 and 1.E-06
- MS-19, 1.E-04 and 2.E-05
- MS-20, 9.E-05 and 2.E-05

Cancer risks for all groundwater wells are within or less than USEPA's target risk range of 1.E-04 to 1.E-06. Table G-102 presents cancer risks for the off-site adult + child resident.

#### 6.2.9 Off-Site Resident (Pumping Scenario #3)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water at off-site groundwater wells.

##### 6.2.9.1 Off-Site Adult + Child Resident

Lifetime cancer risks for individual groundwater wells under RME and CTE scenarios, respectively, are:

- DN-13, 1.E-04 and 4.E-05
- MS-14, 2.E-04 and 6.E-05

- MS-15, 9.E-05 and 2.E-05
- MS-16, 2.E-05 and 4.E-06
- MS-17, 4.E-06 and 1.E-06
- MS-18, 6.E-05 and 1.E-05
- MS-19, 2.E-04 and 5.E-05
- MS-20, 1.E-04 and 3.E-05
- MS-21, 1.E-05 and 3.E-06
- MS-22, 7.E-07 and 2.E-07

Cancer risks for most wells are within or less than USEPA's target risk range of 1.E-04 to 1.E-06, except for the MS-14 and MS-19 RME scenarios, which are above the USEPA target risk range. Table G-107 presents cancer risks for the off-site adult + child resident.

#### 6.2.10 Off-Site Resident (Pumping Scenario #4)

Off-site residents were assumed to be exposed to groundwater via direct contact and ingestion of potable water at off-site groundwater wells.

##### 6.2.10.1 Off-Site Adult + Child Resident

Lifetime cancer risks for individual groundwater wells under RME and CTE scenarios, respectively, are:

- DN-13, 4.E-05 and 1.E-05
- MS-14, 2.E-04 and 5.E-05
- MS-15, 7.E-05 and 2.E-05
- MS-16, 4.E-06 and 1.E-06

- MS-17, 3.E-05 and 7.E-06
- MS-18, 3.E-05 and 7.E-06
- MS-19, 2.E-04 and 4.E-05
- MS-20, 1.E-04 and 3.E-05
- MS-21, 3.E-09 and 6.E-10
- MS-22, 4.E-10 and 1.E-10

Cancer risks for most wells are within or less than USEPA's target risk range of 1.E-04 to 1.E-06, except for the MS-14 and MS-19 RME scenarios, which are above the USEPA target risk range. Table G-112 presents cancer risks for the off-site adult + child resident.

### **6.3 Summary of Risks and Hazards**

A summary of cancer risks and non-cancer hazards for RME and CTE scenarios is presented in Table G-113. Tables G-114 through G-117 present a summary of cancer risks and non-cancer hazards for the four off-site groundwater pumping scenarios.

### **6.4 Lead Modeling**

Lead was identified as a COPC for Landfill L1 soils, specifically waste material. Because lead does not have associated toxicity values, the evaluation of lead uses the USEPA Adult Lead Model (ALM). The ALM was used to evaluate potential lead risks for the on-site routine worker, on-site maintenance worker, and on-site construction worker. Table G-118 presents the parameters used in the ALM for each receptor. Tables G-119 and G-120 presents the results of the lead modeling, which show that lead risks are below the current Centers for Disease Control (CDC) benchmark of 5% of the population with a blood lead level above 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ), which is the target level of concern.

## **7. Uncertainty Analysis**

Various sources of uncertainty are inherent in the risk assessment process. These sources include uncertainties associated with exposure factors, analytical data, and toxicity factors. The objective of an uncertainty analysis is to present key information regarding assumptions and uncertainties in the risk assessment process to place the quantitative risk estimates in proper perspective (USEPA 1989).

### **7.1 Analytical Data**

The soil data used to evaluate direct contact exposures were generally collected at depths that would not be expected to be encountered during normal intrusive activities (i.e., 0 – 15 ft bgs). However, in the absence of shallower soils data in some areas, these deeper soils data were used to conservatively evaluate soil exposure pathways, similar to what was done for previous risk assessments (ENVIRON 2000a and b, 2008). Additionally, much of the Site is covered by impervious surfaces (e.g., pavement), which precludes direct contact exposures by receptors such as on-site routine workers. Likewise, for groundwater, the data used to evaluate direct contact exposures were mostly collected at depths that would preclude direct contact; however, these data are used in the evaluation as a conservative measure. Average depth to groundwater across the Site is 23 feet, which is much deeper than would reasonably be encountered even during intrusive activities. Use of these soil and groundwater data may result in an overestimation of potential risks and hazards.

### **7.2 Exposure Factors**

The bulk of the exposure factors used in the quantification of potential risks and hazards represent USEPA default values for industrial/commercial receptors and/or values that were used in previous risk assessments (ENVIRON 2000a and b, 2008). Site-specific exposure frequencies were used for the maintenance worker, assuming that these receptors only conduct Site activities on an intermittent basis. Exposure factors such as soil ingestion rate and exposure frequency have a significant effect on resulting risks and hazards. The selection of these exposure factors for hypothetical future scenarios is difficult when the type of future use (e.g., commercial business, industrial facility) is currently unknown.

### 7.3 Toxicity Factors

As indicated in Section 5, the toxicity factors used in the quantitative evaluation of potential risks and hazards (e.g., RfDs, SFs) were selected from IRIS. For many chemicals, there is a lack of appropriate information on effects in humans (i.e., epidemiologic studies). Therefore, animal studies are generally used to develop toxicity values used in HHRAs.

Specifically, for non-cancer effects, toxicity values based on laboratory animal data are extrapolated with the use of uncertainty factors to account for factors such as:

- variation in sensitivity among members of the human population (i.e., intraspecies variability).
- uncertainty in extrapolating animal data to humans (i.e., interspecies variability).
- uncertainty in extrapolating from less-than-lifetime data to lifetime exposure.
- uncertainty in extrapolating from a LOAEL rather than a NOAEL.
- uncertainty associated with extrapolation from animal data when the database is incomplete (USEPA 2002).

A similar “margin of safety” is built into toxicity values for carcinogenic effects. Specifically, SFs are based on dose-response curves and their derivation includes the use of mathematical models to extrapolate from observed high-dose data to the desired (but unmeasurable) slope at low dose (USEPA 2012c). To account for the uncertainty in this extrapolation process, the USEPA typically chooses to employ the 95% UCL of the slope as the SF; therefore, there is a 95 percent probability that the true cancer potency is lower than the value chosen for the SF (USEPA 2012c). Based on the above information, the toxicity values used in this HHRA are considered to be conservative and may overestimate potential risks and hazards.

## 8. Summary and Conclusions

This HHRA focuses on investigation areas that were not previously evaluated for potential human health risks and those areas for which recent data were collected (e.g., 2011, 2012). These areas include Landfill L1, the West Tank Farm, the Box Sewer, the Process Sump Area, the Historic Fill Area, and former Building 21. Soil and groundwater were the primary focus of this HHRA. The Site is currently inactive and reasonably anticipated future land use is expected to be of an industrial/commercial nature. The selection of receptors for this HHRA mirrored those receptor groups that were evaluated in previous risk assessments and included on-site routine workers, on-site maintenance workers, on-site construction workers, off-site residents exposed to potable groundwater at public wells (i.e., Dryden North Well, Miami Shores Wellfield, and West Carrollton Wellfield), and off-site routine workers at several properties with private wells located at 3571/3573 Dryden Road, 2651 Blanchard Avenue, and 4000 Miller Valentine Court.

COPCs were identified for soil and groundwater by comparing maximum detected concentrations to human health screening criteria, i.e., USEPA RSLs and USEPA MCLs. For the vapor intrusion pathway, soil gas and groundwater concentrations were compared to USEPA vapor screening levels. Identified COPCs for soil and groundwater were carried through a quantitative evaluation of potential carcinogenic risks and non-carcinogenic hazards. The onsite evaluation of the vapor intrusion pathway was a screening level assessment.

Lead was identified as a COPC for Landfill L1 soils, specifically waste material. The ALM was used to evaluate potential lead risks for receptors at Landfill L1 and modeling results indicated that lead concentrations in soil do not pose a significant risk.

The majority of carcinogenic risks were within or less than USEPA's target risk range of 1.E-04 to 1.E-06. Likewise, the majority of non-carcinogenic hazards were less than USEPA's target HI of 1. The following exposure scenarios had cancer risks and/or non-cancer hazards above USEPA benchmarks:

- Direct contact with groundwater at Landfill L1 for on-site construction workers
- Direct contact with groundwater at the Box Sewer for on-site routine workers
- Direct contact with groundwater at the Process Sump Area for on-site routine workers and on-site construction workers

- Ingestion of potable groundwater under Pumping Scenarios #1, #2, #3, and #4

Direct contact with groundwater in these areas of the Site may present a health concern. However, as mentioned previously, depth to groundwater across the Site averages 23 ft bgs, which most likely precludes direct contact exposures. Likewise, although risks associated with ingestion of potable groundwater under Pumping Scenarios #1, #2, #3, and #4 are above USEPA benchmarks, this pathway is based on hypothetical future scenarios which assume inactive wells are turned on in the future; this assumption is very conservative because current groundwater supply wells are adequately serving off-site residents and it is also expected that on-site source control will continue to mitigate the migration of the on-site groundwater plume to these off-site wells (i.e., Dryden North well, Miami Shores Wellfield, and West Carrollton Wellfield).

The evaluation of off-site routine workers at properties with private wells included the comparison of groundwater concentrations to USEPA MCLs. Groundwater concentrations at the property location of 3571/3573 Dryden Road had a slight exceedance of the vinyl chloride MCL; however, well abandonment will be recommended as part of the final remedy. Groundwater concentrations at the 2651 Blanchard Avenue property and the 4000 Miller Valentine Court property were below MCLs.

A screening level vapor intrusion evaluation was conducted for Landfill L1 using available soil gas data. Several VOCs exceeded soil gas screening levels; however, Landfill L1 will not likely be developed in the future and if it is, vapor barriers would be used to mitigate potential exposures. The Site-wide vapor intrusion evaluation was conducted using groundwater data. PCE, TCE, and vinyl chloride exceeded target groundwater concentrations for the protection of indoor air. To address this issue, vapor barriers with engineering controls will be used in future on-site construction to mitigate exposures.

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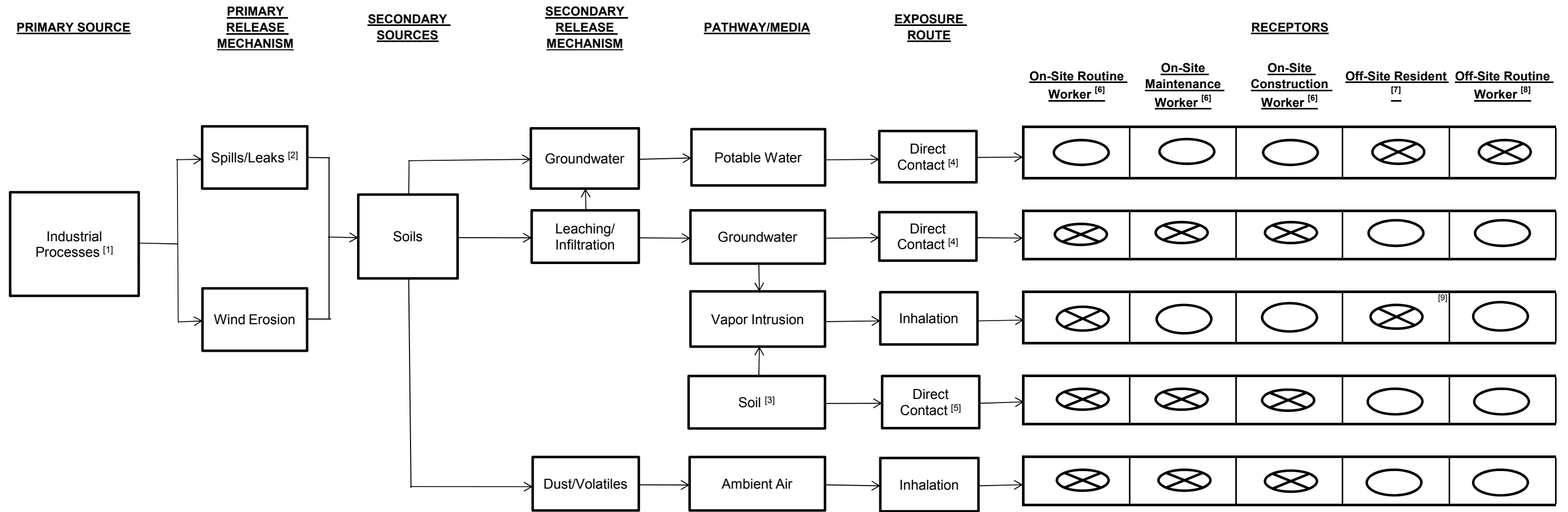
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Table G-1  
 Conceptual Site Model  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio



**LEGEND:**

-  = Potentially complete exposure pathway to be evaluated in the baseline risk assessment.
-  = Exposure pathway is not complete.

**NOTES:**

- [1] Includes historical processes at Solid Waste Management Units (SWMUs), Areas of Interest (AOIs), and additional investigation areas.
- [2] Includes Dense Non-Aqueous Phase Liquid (DNAPL).
- [3] Vapor intrusion pathway from soils is applicable to onsite areas only.
- [4] Direct contact may include dermal contact, inhalation of volatiles, and/or ingestion.
- [5] Direct contact may include dermal contact and/or ingestion.
- [6] Exposure points include Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, and Former Building 21.
- [7] Exposure points for potable water are based on pumping scenarios and include Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.
- [8] Exposure points for groundwater are off-site private wells at The Recording Lab, the Upper Deck Tavern, and the Miller Valentine Group.
- [9] The vapor intrusion pathway for off-site residents was evaluated by collecting indoor air and subslab samples in the Riverview Plat neighborhood. VI mitigation included installation of radon systems between 2011 and 2012.

**Receptor Definitions:**

- An on-site routine worker is defined as a future industrial/commercial worker who primarily works indoors, i.e., inside a building/facility.
- An on-site maintenance worker is defined as a future industrial/commercial worker who performs outdoor maintenance and may be involved in some intrusive activities, e.g., utility repair.
- An on-site construction worker is defined as an individual involved in intrusive activities during future site development.

**Table G-2**  
**Historical Data Comparison and Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil (Waste)
Investigation Area: Landfill L1
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>Historical Sampling</b>												
Tetrachloroethene	mg/kg	4/6	0.019	0.041	0.036	0.033	0.0096	0.041	110	c**	N	BRSL
Total Xylenes	mg/kg	2/6	0.0064	0.013	0.0097	0.0097	0.00467	0.013	2700	ns	N	BRSL
Trichloroethene	mg/kg	4/6	0.016	0.15	0.047	0.065	0.0623	0.15	6.4	c**	N	BRSL
Benzo(a)anthracene	mg/kg	1/6	6.8	6.8	6.8	6.8	2.01	6.8	2.1	c	Y	ARSL
Benzo(a)pyrene	mg/kg	1/6	5.4	5.4	5.4	5.4	2.01	5.4	0.21	c	Y	ARSL
Benzo(b)fluoranthene	mg/kg	2/6	7	11	9	9	2.83	11	2.1	c	Y	ARSL
Chrysene	mg/kg	1/6	6.7	6.7	6.7	6.7	2.01	6.7	210	c	N	BRSL
Fluoranthene	mg/kg	2/6	9.1	14	11.6	11.6	3.46	14	22000	n	N	BRSL
Phenanthrene	mg/kg	2/6	6.5	7.6	7.05	7.05	0.778	7.6	NA	NA	NA	NRSL
Pyrene	mg/kg	2/6	8.4	14	11.2	11.2	3.96	14	17000	n	N	BRSL
Aroclor-1254	mg/kg	5/6	1.4	21.3	13.4	11.4	7.76	21.3	0.74	c*	Y	ARSL
Aluminum	mg/kg	6/6	8330	16000	11800	12000	3010	16000	990000	nm	N	BRSL
Antimony	mg/kg	6/6	14.7	32.6	24.6	24.3	7.11	32.6	410	n	N	BRSL
Arsenic	mg/kg	6/6	9.4	48	19.6	24.4	14.4	48	1.6	c	Y	ARSL
Barium	mg/kg	6/6	359	5860	1750	2430	2030	5860	190000	nm	N	BRSL
Beryllium	mg/kg	3/6	0.25	1.4	0.32	0.657	0.645	1.4	2000	n	N	BRSL
Cadmium	mg/kg	6/6	5.1	31.9	13.8	15.2	9.86	31.9	800	n	N	BRSL
Calcium	mg/kg	6/6	8370	57000	29900	31500	19700	57000	NA	NA	NA	NRSL
Chromium	mg/kg	6/6	20.6	338	90.4	121	118	338	NA	NA	NA	NRSL
Cobalt	mg/kg	6/6	18.6	1030	287	348	362	1030	300	n	Y	ARSL
Copper	mg/kg	6/6	77.6	2600	390	702	946	2600	41000	n	N	BRSL
Iron	mg/kg	6/6	13900	44400	24600	26500	10900	44400	720000	nm	N	BRSL
Lead	mg/kg	6/6	71.7	1220	444	498	433	1220	800	L	Y	ARSL
Magnesium	mg/kg	6/6	1410	26500	9590	12500	9980	26500	NA	NA	NA	NRSL
Manganese	mg/kg	6/6	278	963	765	690	257	963	23000	n	N	BRSL
Mercury	mg/kg	3/6	0.17	1.2	0.22	0.53	0.581	1.2	100	n	N	BRSL
Nickel	mg/kg	6/6	42.8	1210	400	456	415	1210	20000	n	N	BRSL
Potassium	mg/kg	6/6	1600	12200	5520	6350	3820	12200	NA	NA	NA	NRSL
Sodium	mg/kg	6/6	254	23200	6360	8240	8060	23200	NA	NA	NA	NRSL
Thallium	mg/kg	1/6	0.54	0.54	0.54	0.54	2010	0.54	10	n	N	BRSL
Vanadium	mg/kg	6/6	23.8	41.1	29.4	30.8	6.95	41.1	5200	n	N	BRSL
Zinc	mg/kg	6/6	317	3990	1580	1830	1390	3990	310000	nm	N	BRSL
Cyanide	mg/kg	6/6	0.6	2	1.05	1.23	0.582	2	610	n	N	BRSL
<b>2011/2012 Sampling</b>												
1,1-Dichloroethane	mg/kg	4/66	0.0028	1.27	0.0484	0.342	0.62	1.27	17	c	N	BRSL
1,1-Dichloroethene	mg/kg	2/65	0.0021	0.0081	0.0051	0.0051	0.00424	0.0081	1100	n	N	BRSL
Benzene	mg/kg	9/66	0.0014	0.1	0.0093	0.0176	0.0315	0.1	5.4	c*	N	BRSL
cis-1,2-Dichloroethene	mg/kg	26/66	0.0034	41.7	0.684	5.49	10.9	41.7	2000	n	N	BRSL
Ethylbenzene	mg/kg	50/66	0.0029	5010	4.22	172	741	5010	27	c	Y	ARSL
Tetrachloroethene	mg/kg	4/66	0.00062	0.84	0.106	0.263	0.397	0.84	110	c**	N	BRSL
Toluene	mg/kg	53/66	0.0018	15100	3.36	424	2140	15100	45000	ns	N	BRSL
trans-1,2-Dichloroethene	mg/kg	8/66	0.00061	0.947	0.0535	0.2	0.325	0.947	690	n	N	BRSL
Trichloroethene	mg/kg	25/66	0.0023	148	0.32	17	39.3	148	6.4	c**	Y	ARSL
Vinyl chloride	mg/kg	11/66	0.0017	1.58	0.031	0.221	0.461	1.58	1.7	c	N	BRSL
Xylenes	mg/kg	59/66	0.022	17900	18.5	582	2490	17900	2700	ns	Y	ARSL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2011)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL

BRSL = Excluded because screening concentration is below RSL

NRSL = Excluded because there is no available screening concentration

**Table G-3**  
**Historical Data Comparison and Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil (Native)
Investigation Area: Landfill L1
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>2011/2012 Sampling</b>												
Benzene	mg/kg	1/26	0.00067	0.00067	0.00067	0.00067	2.01	0.00067	5.4	c*	N	BRSL
cis-1,2-Dichloroethene	mg/kg	8/26	0.00081	0.21	0.0037	0.0309	0.0725	0.21	2000	n	N	BRSL
Ethylbenzene	mg/kg	9/26	0.002	76.3	0.11	8.75	25.3	76.3	27	c	Y	ARSL
Tetrachloroethene	mg/kg	5/26	0.0013	0.896	0.0062	0.186	0.397	0.896	110	c**	N	BRSL
Toluene	mg/kg	8/26	0.00072	105	0.0075	13.2	37.1	105	45000	ns	N	BRSL
Trichloroethene	mg/kg	10/26	0.00064	0.058	0.00635	0.0138	0.0194	0.058	6.4	c**	N	BRSL
Vinyl chloride	mg/kg	1/26	0.0011	0.0011	0.0011	0.0011	2.01	0.0011	1.7	c	N	BRSL
Xylenes	mg/kg	10/26	0.0012	372	0.3	38.4	117	372	2700	ns	N	BRSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded because screening concentration is below RSL.

**Table G-4**  
**Historical Data Comparison and Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: Landfill L1
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>Historic Sampling</b>														
1,1,1-Trichloroethane	ug/L	5/5	1.9	9.4	6.7	6.26	2.75	9.4	7500	n	200	N	N	BMCL
1,1-Dichloroethane	ug/L	8/8	1.1	218	5.45	54.3	79.7	218	2.4	c	NA	Y	NA	ARSL
1,1-Dichloroethene	ug/L	2/2	1.7	1.8	1.75	1.75	0.0707	1.8	2.4	c	NA	N	NA	BRSL
Benzene	ug/L	2/2	6	14.3	10.2	10.2	5.87	14.3	0.39	c*	5	Y	Y	AMCL
Chloroethane	ug/L	1/1	30.8	30.8	30.8	30.8	NA	30.8	21000	n	NA	N	NA	BRSL
Ethylbenzene	ug/L	3/3	45.9	459	108	204	223	459	1.3	c	700	Y	N	BMCL
Tetrachloroethene	ug/L	2/2	1.1	2.2	1.65	1.65	0.778	2.2	9.7	c**	5	N	N	BMCL
Toluene	ug/L	2/2	1.1	75.2	38.2	38.2	52.4	75.2	860	n	1000	N	N	BMCL
Trichloroethene	ug/L	5/5	4.7	183	134	108	70.7	183	0.44	c**	5	Y	Y	AMCL
Vinyl chloride	ug/L	1/1	28.3	28.3	28.3	28.3	NA	28.3	0.015	c	2	Y	Y	AMCL
Xylenes, total	ug/L	3/3	24	498	70.6	198	261	498	190	n	10000	Y	N	BMCL
trans- 1,2-Dichloroethene	ug/L	2/2	13	22	17.5	17.5	6.36	22	86	n	100	N	N	BMCL
Cyanide	mg/L	2/2	0.014	0.017	0.0155	0.0155	0.00212	0.017	0.014	n	0.2	Y	N	BMCL
Arsenic, dissolved	ug/L	1/1	23.3	23.3	23.3	23.3	NA	23.3	0.045	c	10	Y	Y	AMCL
Barium, dissolved	ug/L	5/5	80.6	237	84.6	123	66.8	237	2900	n	2000	N	N	BMCL
Cobalt, dissolved	ug/L	5/5	9.1	20.8	12.2	13.2	4.52	20.8	4.7	n	NA	Y	NA	ARSL
Copper, dissolved	ug/L	2/2	5.6	10.2	7.9	7.9	3.25	10.2	620	n	1300	N	N	BMCL
Nickel, dissolved	ug/L	1/1	19.5	19.5	19.5	19.5	NA	19.5	300	n	NA	N	NA	BRSL
<b>2011/2012 Sampling</b>														
1,1,1-Trichloroethane	ug/L	1/10	0.28	0.28	0.28	0.28	--	0.28	7500	n	200	N	N	BMCL
1,1-Dichloroethane	ug/L	8/10	0.4	6.5	2.15	2.75	2.5	6.5	2.4	c	NA	Y	NA	ARSL
Benzene	ug/L	5/10	0.15	5.6	0.42	1.75	2.33	5.6	0.39	c*	5	Y	Y	AMCL
cis-1,2-Dichloroethene	ug/L	10/10	0.65	170	2.9	22.6	52.6	170	28	n	70	Y	Y	AMCL
Ethylbenzene	ug/L	2/10	7.8	120	63.9	63.9	79.3	120	1.3	c	700	Y	N	BMCL
Tetrachloroethene	ug/L	6/10	0.61	5.1	2.05	2.24	1.55	5.1	9.7	c**	5	N	Y	AMCL
Toluene	ug/L	7/10	0.17	260	0.31	37.4	98.2	260	860	n	1000	N	N	BMCL
trans-1,2-Dichloroethene	ug/L	5/10	0.44	2.2	0.5	0.852	0.758	2.2	86	n	100	N	N	BMCL
Trichloroethene	ug/L	10/10	0.65	55	10	16.5	17.2	55	0.44	c**	5	Y	Y	AMCL
Vinyl chloride	ug/L	5/10	0.23	4	1	1.52	1.58	4	0.015	c	2	Y	Y	AMCL
Xylenes	ug/L	2/10	9.3	630	320	320	439	630	190	n	10000	Y	N	BMCL
Methane	ug/L	8/8	3.2	8200	765	2710	3450	8200	NA	--	NA	N	N	NSV

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the tap water criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012).

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL.

BMCL = Excluded because screening concentration is below MCL.

ARSL = Retained because no MCL is available and screening concentration is above RSL.

BRSL = Excluded because no MCL is available and screening concentration is below RSL.

NSV = Excluded because no available screening value.

**Table G-5  
Occurrence, Distribution and Selection of Chemicals of Potential Concern  
Human Health Risk Assessment  
RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil Gas
Investigation Area: Landfill L1
Receptor: Routine (Indoor) Worker

Exposure Point	CAS Number	Chemical	Minimum Concentration [1]	Maximum Concentration [1]	Units	Sample with Maximum Concentration	Detection Frequency (Det/N)	Detection Frequency (%)	Range of Detection Limits		Screening Criteria [2]	Screening Criteria Classification [3]	COPC Flag (YES/no) [4]	Rationale for Selection or Deletion [5]
Landfill L1	71-55-6	1,1,1-Trichloroethane	3.3	140	ug/m <sup>3</sup>	LF-SGP-29A	13/16	81.3	88	2200	21900	NC	no	BSV
	75-34-3	1,1-Dichloroethane	10	7200	ug/m <sup>3</sup>	LF-SGP-3A	15/16	93.8	110	110	77	C	YES	ASV
	75-35-4	1,1-Dichloroethene	11	330	ug/m <sup>3</sup>	LF-SGP-1	4/16	25	3.2	1600	876	NC	no	BSV
	71-43-2	Benzene	1.8	6500	ug/m <sup>3</sup>	LF-SGP-15A	14/16	87.5	18	26	16	C	YES	ASV
	156-59-2	cis-1,2-Dichloroethene	8.1	56000	ug/m <sup>3</sup>	LF-SGP-15A	15/16	93.8	110	110	NA	NA	no	NSV
	100-41-4	Ethylbenzene	6.8	67000	ug/m <sup>3</sup>	LF-SGP-15A	5/16	31.3	3.5	70	49	C	YES	ASV
	127-18-4	Tetrachloroethene	98	1400	ug/m <sup>3</sup>	LF-SGP-1	13/16	81.3	130	2800	175	NC	YES	ASV
	108-88-3	Toluene	1.5	360000	ug/m <sup>3</sup>	LF-SGP-15A	13/16	81.3	21	42	21900	NC	YES	ASV
	156-60-5	trans-1,2-Dichloroethene	3.4	3200	ug/m <sup>3</sup>	LF-SGP-19	13/16	81.3	19	1600	263	NC	YES	ASV
	79-01-6	Trichloroethene	330	9200	ug/m <sup>3</sup>	LF-SGP-19	16/16	100	NA	NA	9	NC	YES	ASV
	75-01-4	Vinyl chloride	2.6	27000	ug/m <sup>3</sup>	LF-SGP-15A	13/16	81.3	2	12	28	C	YES	ASV
	1330-20-7	Xylenes (total)	0.81	274000	ug/m <sup>3</sup>	LF-SGP-15A	10/16	62.5	7.4	36	438	NC	YES	ASV
	74-82-8	Methane	0.000097	14	%	LF-SGP-15A	16/16	100	NA	NA	25 [a]	NA	no	BSV

**Abbreviations:**

COPC = chemical of potential concern  
 Det = number of detects  
 N = sample size  
 NA = not available or not applicable

ND = not detected  
 ug/m<sup>3</sup> = micrograms per cubic meter

**Notes:**

- [1] Detected concentrations only.
  - [2] USEPA Vapor Intrusion Screening Levels (VISLs) for Commercial Soil Gas. May 2012.
  - [3] USEPA VISLs are classified as follows:
    - NC - noncarcinogenic hazard index of 0.1
    - C - carcinogenic risk of one in one million (1x10<sup>-6</sup>)
  - [4] Constituents are identified as a COPC if the maximum detected concentration is greater than the USEPA VISL. Constituents without VISLs are retained as COPCs.
  - [5] Rationales codes for COPC selection are as follows:
    - ASV = Above screening value
    - BSV = Below screening value
    - NSV = No screening value due to lack of inhalation toxicity data
- [a] USEPA's Lower Explosive Limit (LEL), which serves as the indoor air action level under RCRA (40 CFR 258 Subpart C).

**Table G-6**  
**Historical Data Comparison and Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Medium: Soil  
 Investigation Area: Box Sewer  
 Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>Historical Sampling</b>												
1,1,1-Trichloroethane	mg/kg	1/14	0.28	0.28	0.28	0.28	NA	0.28	38000	ns	N	BRSL
cis-1,2-Dichloroethene	mg/kg	3/14	0.0028	0.023	0.017	0.014	0.010	0.023	2000	n	N	BRSL
Tetrachloroethene	mg/kg	9/14	0.0066	2.4	0.021	0.43	0.78	2.4	110	c**	N	BRSL
Trichloroethene	mg/kg	4/14	0.0061	0.4	0.011	0.11	0.20	0.4	6.4	c**	N	BRSL
Aroclor-1254 (PCB-1254)	mg/kg	1/14	0.25	0.25	0.25	0.25	NA	0.25	0.74	c*	N	BRSL
<b>2012 Sampling</b>												
Ethylbenzene	mg/kg	3/3	0.00038	0.0025	0.00044	0.00111	0.0012	0.0025	27	c	N	BRSL
Tetrachloroethene	mg/kg	2/3	0.0033	0.013	0.0082	0.0082	0.0069	0.013	110	c**	N	BRSL
Toluene	mg/kg	2/3	0.0006	0.00083	0.00072	0.00072	0.0002	0.00083	45000	ns	N	BRSL
Trichloroethene	mg/kg	1/3	0.0005	0.0005	0.0005	0.0005	NA	0.0005	6.4	c**	N	BRSL
Xylenes	mg/kg	1/3	0.0061	0.0061	0.0061	0.0061	NA	0.0061	2700	ns	N	BRSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

BRSL = Excluded because screening concentration is below RSL.

**Table G-7**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater 2012
Investigation Area: Box Sewer
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
1,1,1-Trichloroethane	ug/L	3/10	0.34	0.73	0.62	0.563	0.2010	0.73	7500	n	200	N	N	BMCL
Benzene	ug/L	1/10	0.13	0.13	0.13	0.13	NA	0.13	0.39	c*	5	N	N	BMCL
cis-1,2-Dichloroethene	ug/L	2/10	1.9	7.8	4.9	4.9	4.2	7.8	28	n	70	N	N	BMCL
Tetrachloroethene	ug/L	10/10	0.32	2100	84.5	310	642	2100	9.7	c**	5	Y	Y	AMCL
Toluene	ug/L	1/10	0.26	0.26	0.26	0.26	NA	0.26	860	n	1000	N	N	BMCL
Trichloroethene	ug/L	9/10	5.7	740	16	122	240	740	0.44	c**	5	Y	Y	AMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012)

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL

BMCL = Excluded because screening concentration is below MCL

**Table G-8**  
**Historical Data Comparison and Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Investigation Area: West Tank Farm
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCs Historical Sampling</b>												
Tetrachloroethene	mg/kg	34/38	0.0018	6.2	0.387	0.719	1.13	6.2	110	c**	N	BRSL
Trichloroethene	mg/kg	7/37	0.00039	1.39	0.021	0.259	0.507	1.39	6.4	c**	N	BRSL
cis-1,2-Dichloroethene	mg/kg	1/34	0.325	0.325	0.325	0.325	2010.00	0.325	2000	n	N	BRSL
trans-1,2-Dichloroethene	mg/kg	1/24	1.321	1.321	1.32	1.32	2010	1.321	690	n	N	BRSL
2-Butanone	mg/kg	1/1	9.94	9.94	9.94	9.94	NA	9.94	200000	nms	N	BRSL
Benzene	mg/kg	7/26	0.00059	112	65	63.9	32.9	112	5.4	c*	Y	ARSL
Toluene	mg/kg	9/26	0.0016	59	51	45.9	18.1	59	45000	ns	N	BRSL
Ethylbenzene	mg/kg	1/26	0.00059	0.00059	0.00059	0.00059	2010	0.00059	27	c	N	BRSL
Xylenes	mg/kg	1/26	0.0011	0.0011	0.0011	0.0011	2010	0.0011	2700	ns	N	BRSL
Methyl cyclohexane	mg/kg	1/2	0.00045	0.00045	0.00045	0.00045	2010	0.00045	NA	NA	NA	NRSL
Styrene	mg/kg	2/2	0.00062	0.0013	0.00096	0.00096	0.000481	0.0013	36000	ns	N	BRSL
<b>Total Petroleum Hydrocarbons Historical Sampling</b>												
Total TPH	mg/kg	13/15	12	412	102	147	147	412	NA	NA	NA	NRSL
TPH-GRO	mg/kg	9/9	39	198	48	85.6	64.3	198	NA	NA	NA	NRSL
TPH-DRO	mg/kg	11/12	15	5590	2110	2210	1960	5590	NA	NA	NA	NRSL
<b>Metals Historical Sampling</b>												
Aluminum	mg/kg	3/3	2150	3600	2720	2820	731	3600	990000	nm	N	BRSL
Arsenic	mg/kg	3/3	2.1	4.6	3.5	3.4	1.25	4.6	1.6	c	Y	ARSL
Barium	mg/kg	24/26	10.1	123	48.1	52.7	28.2	123	190000	nm	N	BRSL
Cadmium	mg/kg	21/26	0.0826	2.7	0.171	0.505	0.764	2.7	800	n	N	BRSL
Calcium	mg/kg	3/3	105000	144000	118000	122000	19900	144000	NA	NA	NA	NRSL
Chromium	mg/kg	26/26	2.6	16.2	7.04	7.57	2.83	16.2	16.2	n	N	BRSL
Cobalt	mg/kg	2/3	2.7	2.8	2.75	2.75	0.0707	2.8	300	n	N	BRSL
Copper	mg/kg	3/3	4.9	12.7	8.8	8.8	3.9	12.7	41000	n	N	BRSL
Iron	mg/kg	3/3	5870	8790	6820	7160	1490	8790	720000	nm	N	BRSL
Lead	mg/kg	26/26	2.2	16.8	5.75	7.04	4.52	16.8	800	L	N	BRSL
Magnesium	mg/kg	3/3	42600	49600	49100	47100	3910	49600	NA	NA	NA	NRSL
Manganese	mg/kg	3/3	169	234	175	193	35.9	234	23000	n	N	BRSL
Nickel	mg/kg	2/3	9.1	11.9	10.5	10.5	1.98	11.9	20000	n	N	BRSL
Potassium	mg/kg	3/3	418	601	490	503	92.2	601	NA	NA	NA	NRSL
Silver	mg/kg	2/3	0.65	1	0.825	0.825	0.247	1	5100	n	N	BRSL
Sodium	mg/kg	3/3	114	146	143	134	17.7	146	NA	NA	NA	NRSL
Vanadium	mg/kg	3/3	6.2	9.7	8	7.97	1.75	9.7	NA	NA	NA	NRSL
Zinc	mg/kg	3/3	18	32.9	30.9	27.3	8.09	32.9	310000	nm	N	BRSL
<b>VOCs 2012 Sampling</b>												
Benzene	mg/kg	3/4	0.00026	0.00051	0.00032	0.00036	0.0001	0.00051	5.4	c*	N	BRSL
Ethylbenzene	mg/kg	4/4	0.00029	0.001	0.00064	0.00064	0.00036	0.001	27	c	N	BRSL
Tetrachloroethene	mg/kg	4/4	0.001	0.087	0.0148	0.029	0.039	0.087	110	c**	N	BRSL
Toluene	mg/kg	2/4	0.00077	0.0024	0.00159	0.0016	0.0012	0.0024	45000	ns	N	BRSL
Trichloroethene	mg/kg	3/4	0.00075	0.0053	0.0042	0.0034	0.0024	0.0053	6.4	c**	N	BRSL
Xylenes	mg/kg	1/4	0.0027	0.0027	0.0027	0.0027	NA	0.0027	2700	ns	N	BRSL

**Notes:**

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded because screening concentration is below RSL.

NRSL = Excluded because there is no available screening concentration.

**Table G-9**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Investigation Area: West Tank Farm
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>1</sup>	RSL <sup>2</sup>	RSL (c/n) <sup>3</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>4</sup>
<b>VOCs</b>												
2-Butanone	mg/kg	1/1	9.94	9.94	9.94	9.94	NA	9.94	200000	nms	N	BRSL
Benzene	mg/kg	10/30	0.00026	112	64.5	44.7	40.9	112	5.4	c*	Y	ARSL
cis-1,2-Dichloroethene	mg/kg	1/38	0.325	0.325	0.325	0.325	2010	0.325	2000	n	N	BRSL
Ethylbenzene	mg/kg	5/30	0.00029	0.001	0.00059	0.000632	0.000316	0.001	27	c	N	BRSL
Methyl cyclohexane	mg/kg	1/2	0.00045	0.00045	0.00045	0.00045	2010	0.00045	NA	NA	NA	NRSL
Styrene	mg/kg	2/2	0.00062	0.0013	0.00096	0.00096	0.000481	0.0013	36000	ns	N	BRSL
Tetrachloroethene	mg/kg	38/42	0.001	6.2	0.319	0.648	1.09	6.2	110	c**	N	BRSL
Toluene	mg/kg	11/30	0.00077	59	50	37.5	24.6	59	45000	ns	N	BRSL
trans-1,2-Dichloroethene	mg/kg	1/28	1.321	1.321	1.32	1.32	2010	1.321	690	n	N	BRSL
Trichloroethene	mg/kg	10/41	0.00039	1.39	0.0122	0.182	0.432	1.39	6.4	c**	N	BRSL
Xylenes	mg/kg	2/30	0.0011	0.0027	0.0019	0.0019	0.00113	0.0027	2700	ns	N	BRSL
<b>Total Petroleum Hydrocarbons</b>												
Total TPH	mg/kg	13/15	12	412	102	147	147	412	NA	NA	NA	NRSL
TPH-GRO	mg/kg	9/9	39	198	48	85.6	64.3	198	NA	NA	NA	NRSL
TPH-DRO	mg/kg	11/12	15	5590	2110	2210	1960	5590	NA	NA	NA	NRSL
<b>Metals</b>												
Aluminum	mg/kg	3/3	2150	3600	2720	2820	731	3600	990000	nm	N	BRSL
Arsenic	mg/kg	3/3	2.1	4.6	3.5	3.4	1.25	4.6	1.6	c	Y	ARSL
Barium	mg/kg	24/26	10.1	123	48.1	52.7	28.2	123	190000	nm	N	BRSL
Cadmium	mg/kg	21/26	0.0826	2.7	0.171	0.505	0.764	2.7	800	n	N	BRSL
Calcium	mg/kg	3/3	105000	144000	118000	122000	19900	144000	NA	NA	NA	NRSL
Chromium	mg/kg	26/26	2.6	16.2	7.04	7.57	2.83	16.2	NA	NA	NA	NRSL
Cobalt	mg/kg	2/3	2.7	2.8	2.75	2.75	0.0707	2.8	300	n	N	BRSL
Copper	mg/kg	3/3	4.9	12.7	8.8	8.8	3.9	12.7	41000	n	N	BRSL
Iron	mg/kg	3/3	5870	8790	6820	7160	1490	8790	720000	nm	N	BRSL
Lead	mg/kg	26/26	2.2	16.8	5.75	7.04	4.52	16.8	800	L	N	BRSL
Magnesium	mg/kg	3/3	42600	49600	49100	47100	3910	49600	NA	NA	NA	NRSL
Manganese	mg/kg	3/3	169	234	175	193	35.9	234	23000	n	N	BRSL
Nickel	mg/kg	2/3	9.1	11.9	10.5	10.5	1.98	11.9	20000	n	N	BRSL
Potassium	mg/kg	3/3	418	601	490	503	92.2	601	NA	NA	NA	NRSL
Silver	mg/kg	2/3	0.65	1	0.825	0.82500	0.2470	1	5100	n	N	BRSL
Sodium	mg/kg	3/3	114	146	143	134.00000	17.70000	146	NA	NA	NA	NRSL
Vanadium	mg/kg	3/3	6.2	9.7	8	9.70	1.750	9.7	NA	NA	NA	NRSL
Zinc	mg/kg	3/3	18	32.9	30.9	27.3000	8.0900	32.9	310000	nm	N	BRSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded because screening concentration is below RSL.

NRSL = Excluded because there is no available screening concentration.

**Table G-10**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: West Tank Farm
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>VOCs</b>														
1,1,1-Trichloroethane	ug/L	4/12	1	3.7	2.3	2.3	1.2	3.7	7500	n	200	N	N	BMCL
1,1-Dichloroethane	ug/L	4/12	2.4	3.2	2.5	2.7	0.4	3.2	2.4	c	NA	Y	NA	ARSL
1,1-Dichloroethene	ug/L	1/12	0.7	0.7	0.7	0.7	2010.0	0.7	260	n	7	N	N	BMCL
cis-1,2-Dichloroethene	ug/L	9/12	4.8	48	26	29.4	15.8000	48	28	n	70	Y	N	BMCL
Tetrachloroethene	ug/L	12/12	63	240	130	142	64	240	9.7	c**	5	Y	Y	AMCL
Toluene	ug/L	1/12	1	1	1	1	2010	1	860	n	1000	N	N	BMCL
trans-1,2-Dichloroethene	ug/L	6/12	1.9	4.4	2.8	2.9	0.9	4.4	86	n	100	N	N	BMCL
Trichloroethene	ug/L	12/12	73	280	185	181.0	60.2	280	0.44	c**	5	Y	Y	AMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012).

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL.

BMCL = Excluded because screening concentration is below MCL.

ARSL = Retained because there is no MCL, and screening concentration is above RSL.

**Table G-11**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Investigation Area: Process Sump Area
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>1,1</sup>	RSL <sup>2</sup>	RSL (c/n) <sup>3</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>4</sup>
<b>VOCS</b>												
1,1,1-Trichloroethane	mg/kg	1/20	0.2	0.2	0.2	0.2	NA	0.2	38000	ns	N	BRSL
1,1-Dichloroethane	mg/kg	1/20	0.009	0.009	0.009	0.009	NA	0.009	17	c	N	BRSL
cis-1,2-Dichloroethene	mg/kg	2/20	0.01	0.2	0.09	0.09	0.1	0.2	2000	n	N	BRSL
Ethylbenzene	mg/kg	6/20	0.0003	0.0008	0.0004	0.0005	0.0002	0.0008	27	c	N	BRSL
Tetrachloroethene	mg/kg	17/20	0.002	2400	0.07	162	580	2400	110	c**	Y	ARSL
Toluene	mg/kg	6/20	0.0004	0.02	0.0005	0.004	0.010	0.02	45000	ns	N	BRSL
Trichloroethene	mg/kg	16/20	0.004	150	7.1	30	49	150	6.4	c**	Y	ARSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded because screening concentration is below RSL.

**Table G-12**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: Process Sump Area
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>VOCs</b>														
1,1,1-Trichloroethane	ug/L	2/26	0.6	3.7	2.2	2.2	2.2	3.7	7500	n	200	N	N	BMCL
1,1-Dichloroethane	ug/L	2/26	0.6	6.7	3.7	3.7	4.3	6.7	2.4	c	NA	Y	NA	ARSL
1,1-Dichloroethene	ug/L	1/26	0.5	0.5	0.5	0.5	NA	0.5	260	n	7	N	N	BMCL
Benzene	ug/L	1/26	0.2	0.2	0.2	0.2	NA	0.2	0.39	c*	5	N	N	BMCL
cis-1,2-Dichloroethene	ug/L	8/26	1.1	340	5.8	88	134	340	28	n	70	Y	Y	AMCL
Tetrachloroethene	ug/L	24/26	0.3	34000	295	3550	8120	34000	9.7	c**	5	Y	Y	AMCL
Toluene	ug/L	5/26	0.3	0.9	0.4	0.5	0.3	0.9	860	n	1000	N	N	BMCL
trans-1,2-Dichloroethene	ug/L	2/26	0.4	0.9	0.6	0.6	0.3	0.9	86	n	100	N	N	BMCL
Trichloroethene	ug/L	25/26	0.4	29000	430	3300	7190	29000	0.44	c**	5	Y	Y	AMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012)

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL

BMCL = Excluded because screening concentration is below MCL

ARSL = Retained because there is no MCL, and screening concentration is above RSL

**Table G-13**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Investigation Area: Historical Fill Area
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCS</b>												
Ethylbenzene	mg/kg	2/3	0.001	0.07	0.04	0.04	0.05	0.07	27	c	N	BRSL
Tetrachloroethene	mg/kg	3/3	0.009	0.04	0.03	0.03	0.02	0.04	110	c**	N	BRSL
Toluene	mg/kg	1/3	0.4	0.4	0.4	0.4	NA	0.4	45000	ns	N	BRSL
Trichloroethene	mg/kg	3/3	0.0005	0.01	0.001	0.004	0.006	0.01	6.4	c**	N	BRSL
Xylenes	mg/kg	1/3	0.3	0.3	0.3	0.3	NA	0.3	2700	ns	N	BRSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded because screening concentration is below RSL.

**Table G-14**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: Historical Fill Area
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>VOCS</b>														
1,1-Dichloroethane	ug/L	4/6	0.5	2.3	2.1	1.7	0.8	2.3	2.4	c	NA	N	NA	BRSL
Benzene	ug/L	2/6	0.2	2.4	1.3	1.3	1.5	2.4	0.39	c*	5	Y	N	BMCL
cis-1,2-Dichloroethene	ug/L	6/6	3	110	28	40	44	110	28	n	70	Y	Y	AMCL
Tetrachloroethene	ug/L	5/6	1.8	32	26	19	15	32	9.7	c**	5	Y	Y	AMCL
Toluene	ug/L	3/6	0.3	1.8	0.5	0.87	0.8	1.8	860	n	1000	N	N	BMCL
trans-1,2-Dichloroethene	ug/L	2/6	0.5	0.6	0.5	0.5	0.04	0.6	86	n	100	N	N	BMCL
Trichloroethene	ug/L	6/6	8.5	290	132	132	109	290	0.44	c**	5	Y	Y	AMCL
Vinyl Chloride	ug/L	2/6	0.9	3.4	2.2	2.2	1.7	3.4	0.015	c	2	Y	Y	AMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012);

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL

BMCL = Excluded because screening concentration is below MCL

BRSL = Excluded because no available MCL and screening concentration is below RSL

**Table G-15**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Investigation Area: Former Building 21
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCs</b>												
1,1,1-Trichloroethane	mg/kg	1/8	0.002	0.002	0.002	0.002	NA	0.002	38000	ns	N	BRSL
1,1-Dichloroethane	mg/kg	3/8	0.001	0.02	0.02	0.006	0.008	0.02	17	c	N	BRSL
Benzene	mg/kg	1/8	0.003	0.003	0.003	0.003	NA	0.003	5.4	c*	N	BRSL
cis-1,2-Dichloroethene	mg/kg	2/8	0.004	0.007	0.005	0.005	0.002	0.007	2000	n	N	BRSL
Ethylbenzene	mg/kg	3/8	0.0007	0.008	0.0007	0.003	0.004	0.008	27	c	N	BRSL
Tetrachloroethene	mg/kg	7/8	0.002	0.02	0.004	0.008	0.009	0.02	110	c**	N	BRSL
Toluene	mg/kg	8/8	0.0005	0.02	0.001	0.003	0.005	0.02	45000	ns	N	BRSL
trans-1,2-Dichloroethene	mg/kg	1/8	0.0008	0.0008	0.0008	0.0008	NA	0.0008	690	n	N	BRSL
Trichloroethene	mg/kg	5/8	0.0007	0.008	0.003	0.003	0.003	0.008	6.4	c**	N	BRSL
Xylenes	mg/kg	1/8	0.01	0.01	0.01	0.01	NA	0.01	2700	ns	N	BRSL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] RSL represents the Industrial soil criteria from USEPA Regional Screening Levels summary table (May 2012).

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Rationale codes:

BRSL = Excluded because screening concentration is below RSL.

**Table G-16**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: Former Building 21
Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>VOCs</b>														
1,1,1-Trichloroethane	ug/L	11/13	0.73	20	4.4	6.4	6.2	20	7500	n	200	N	N	BMCL
1,1-Dichloroethane	ug/L	12/13	1.0	15	4.3	5.9	5.2	15	2.4	c	NA	Y	NA	ARSL
1,1-Dichloroethene	ug/L	3/13	0.21	2.8	1.7	1.6	1.3	2.8	260	n	7	N	N	BMCL
Benzene	ug/L	2/13	0.17	0.36	0.27	0.27	0.13	0.36	0.39	c*	5	N	N	BMCL
cis-1,2-Dichloroethene	ug/L	13/13	0.63	110	21	31	34	110	28	n	70	Y	Y	AMCL
Tetrachloroethene	ug/L	11/13	1.7	75	43	38	25	75	9.7	c**	5	Y	Y	AMCL
Toluene	ug/L	6/13	0.18	0.32	0.23	0.24	0.05	0.32	860	n	1000	N	N	BMCL
trans-1,2-Dichloroethene	ug/L	9/13	0.54	5.8	1	2	1.7	5.8	86	n	100	N	N	BMCL
Trichloroethene	ug/L	13/13	0.24	210	19	62	78	210	0.44	c**	5	Y	Y	AMCL
Vinyl Chloride	ug/L	4/13	0.35	1.9	0.85	0.99	0.75	1.9	0.015	c	2	Y	N	BMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012)

[5] Rationale codes:

AMCL = Retained because screening concentration is above MCL

BMCL = Excluded because screening concentration is below MCL

ARSL = Retained because there is no MCL, and screening concentration is above RSL

**Table G-17**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Medium: Groundwater  
 Investigation Area: 4000 Miller Valentine Court  
 Receptor: Resident

Constituent of Potential Concern	Units	Miller Valentine 7/12/2012	RSL <sup>[1]</sup>	RSL (c/n) <sup>[4]</sup>	MCL <sup>[3]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCS</b>								
Benzene	µg/L	< 1.0	0.39	c*	5	N	N	BMCL
1,1-Dichloroethane	µg/L	< 1.0	2.4	c	NA	N	NA	BRSL
cis-1,2-Dichloroethene	µg/L	0.65	28	n	70	N	N	BMCL
trans-1,2-Dichloroethene	µg/L	< 0.50	86	n	100	N	N	BMCL
1,1-Dichloroethene	µg/L	< 1.0	260	n	7	N	N	BMCL
Ethylbenzene	µg/L	< 1.0	1.3	c	700	N	N	BMCL
Tetrachloroethene	µg/L	< 1.0	9.7	c**	5	N	N	BMCL
Toluene	µg/L	< 1.0	860	n	1000	N	N	BMCL
1,1,1-Trichloroethane	µg/L	< 1.0	7500	n	200	N	N	BMCL
Trichloroethene	µg/L	< 1.0	0.44	c**	5	N	N	BMCL
Vinyl Chloride	µg/L	1.5	0.015	c	2	Y	N	BMCL
Xylenes	µg/L	< 1.0	190	n	10000	N	N	BMCL

Notes:

µg/L - micrograms per liter.

NA = not applicable or not available

[1] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012).

[2] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[3] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012).

[4] Rationale codes:

BRSL = Excluded as a COPC because no available MCL and screening concentration is below RSL.

BMCL = Excluded because screening concentration is below MCL.

**Table G-18**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Medium: Groundwater  
 Investigation Area: 3571/3573 Dryden Road  
 Receptor: Resident

Constituent of Potential Concern	Units	Recording Studio 7/18/2012	Recording Studio 6/6/2003	RSL <sup>[1]</sup>	RSL (c/n) <sup>[2]</sup>	MCL <sup>[3]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCs</b>									
1,2-Dichloroethane	µg/L	NA	1.0	0.15	c*	5	Y	N	BMCL
cis-1,2-Dichloroethene	µg/L	1.1	1.4	28	n	70	N	N	BMCL
Vinyl Chloride	µg/L	2.4	2.4	0.015	c	2	Y	Y	AMCL

Notes:

µg/L - micrograms per liter.

NA = not applicable or not available

[1] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012).

[2] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[3] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012).

[4] Rationale codes:

AMCL = Retained because screening concentration is above MCL.

BMCL = Excluded because screening concentration is below MCL.

**Table G-19**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future Medium: Groundwater Investigation Area: 2651 Blanchard Avenue Receptor: Resident
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Constituent of Potential Concern	Units	Upper Deck Tavern Sample 1 10/22/2004	Upper Deck Tavern Sample 2 10/22/2004	Upper Deck Tavern Sample 3 10/22/2004	RSL <sup>[1]</sup>	RSL (c/n) <sup>[2]</sup>	MCL <sup>[3]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[4]</sup>
<b>VOCs</b>										
Chloroethane	µg/L	0.6	0.6	0.6	21000	n	NA	N	NA	BRSL
1,1-Dichloroethane	µg/L	2.4	2.6	2.2	2.4	c	NA	Y	NA	ARSL
cis-1,2-Dichloroethene	µg/L	1.9	2.5	1.9	28	n	70	N	N	BMCL

Notes:

µg/L - micrograms per liter.

Sample 1 was collected from a spigot located outside the building.

Sample 2 was collected in the basement prior to the pressure tank.

Sample 3 was collected from a spigot in the bar.

Samples analyzed using US EPA Method 524.4.

NA = not applicable or not available

Table contains detected constituents only.

[1] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012).

[2] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[3] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012).

[4] Rationale codes:

ARSL = Retained because screening concentration is above RSL.

BRSL = Excluded as a COPC because no available MCL and screening concentration is below RSL.

BMCL = Excluded because screening concentration is below MCL.

**Table G-20**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: West Carrollton Well
Receptor: Resident

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>West Carrollton</b>														
Arsenic	ug/L	1/9	3.2	3.2	3.2	3.2	NA	3.2	0.045	c	10	Y	N	BMCL
Barium	ug/L	9/9	77	268	124	140	70	268	2900	n	2000	N	N	BMCL
Calcium	ug/L	9/9	78100	116000	86500	89600	11700	116000	NA	NA	NA	NA	NA	NMCL
cis-1,2-Dichloroethene	ug/L	1/9	1.8	1.8	1.8	1.8	NA	1.8	28	n	70	N	N	BMCL
Iron	ug/L	5/9	1.8	1450	234	620	649	1450	11000	n	NA	N	NA	BRSL
Magnesium	ug/L	9/9	25000	42600	26400	28900	5600	42600	NA	NA	NA	NA	NA	NMCL
Manganese	ug/L	5/9	47	192	94	119	60	192	320	n	NA	NA	NA	NMCL
Sodium	ug/L	9/9	25300	99900	52200	56700	21000	99900	NA	NA	NA	NA	NA	NMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012);

[5] Rationale codes:

NMCL = Excluded as a COPC because no available MCL

BMCL = Excluded as a COPC because screening concentration is below MCL

BRSL = Excluded as a COPC because no available MCL and screening concentration is below RSL

**Table G-21**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Investigation Area: Miami Shores
Receptor: Resident

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	RSL <sup>[2]</sup>	RSL (c/n) <sup>[3]</sup>	MCL <sup>[4]</sup>	RSL COPC Flag (Y/N)	MCL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[5]</sup>
<b>Miami Shores</b>														
1,1-Dichloroethane	ug/L	4/9	0.2	0.6	0.4	0.4	0.2	0.6	2.4	c	NA	N	NA	BRSL
cis-1,2-Dichloroethene	ug/L	6/9	0.13	1.3	0.5	0.7	0.5	1.3	28	n	70	N	N	BMCL

Notes:

NA = not applicable or not available

Table contains detected constituents only

[1] Maximum concentration was used as the screening concentration

[2] RSL represents the tapwater criteria from USEPA Regional Screening Levels summary table (May 2012)

[3] RSL is based on cancer risk (c) or noncancer effects (n)

\* = where: n SL < 100X c SL

\*\* = where n SL < 10X c SL

[4] Maximum Contaminant Level (MCL) from USEPA Regional Screening Levels summary table (May 2012)

[5] Rationale codes:

BRSL = Excluded as a COPC because no available MCL and screening concentration is below RSL

BMCL = Excluded because screening concentration is below MCL

**Table G-22**  
**Selection of Constituents of Potential Concern**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Medium: Groundwater - Vapor Intrusion  
 Investigation Area: Site-wide  
 Receptor: Worker

Constituent of Potential Concern	Units	Frequency of Detection	Minimum Detect	Maximum Detect	Median Value	Arithmetic Mean	Standard Deviation	Concentration used for Screening <sup>[1]</sup>	VISL <sup>[2]</sup>	RSL COPC Flag (Y/N)	Rationale for COPC Flag <sup>[3]</sup>
<b>Volatile Organic Compounds</b>											
1,1,1-Trichloroethane	ug/L	20/63	0.23	10	0.8	1.7	2.1	10	31000	N	BVISL
1,1-Dichloroethane	ug/L	26/63	0.54	27	2.65	5.4	6.3	27	33	N	BVISL
1,1-Dichloroethene	ug/L	2/63	0.27	0.7	0.485	0.5	0.3	0.7	820	N	BVISL
Benzene	ug/L	8/63	0.13	3.5	0.295	0.954	1.3000	3.5	6.9	N	BVISL
cis-1,2-Dichloroethene	ug/L	39/63	0.35	580	8.5	62	140	580	NA	N	BVISL
Ethylbenzene	ug/L	1/63	0.21	0.21	0.21	0.21	2010	0.21	15	N	BVISL
Tetrachloroethene	ug/L	45/63	0.32	1500	34.0	143.0	264.0	1500	65	Y	AVISL
Toluene	ug/L	15/63	0.18	1	0.32	0.4	0.3	1	81000	N	BVISL
trans-1,2-Dichloroethene	ug/L	24/63	0.23	21	1.3	3.5	5.7	21	1600	N	BVISL
Trichloroethene	ug/L	55/63	0.26	1700	19	147.0	301.0	1700	7.4	Y	AVISL
Vinyl chloride	ug/L	15/63	0.39	390	2.2	32.0	99.7	390	2.5	Y	AVISL

Notes:

NA = not applicable or not available

Table contains detected constituents only.

[1] Maximum concentration was used as the screening concentration.

[2] VISLs are from USEPA Vapor Intrusion Screening Levels (VISLs) for Commercial Soil Gas. (May 2012).

[5] Rationale codes:

AVISL = Retained because screening concentration is above VISL.

BVISL = Excluded because screening concentration is below VISL.

**Table G-23**  
**Groundwater Monitoring Wells Assigned to SWMUs and AOIs for Estimating Source Concentrations**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

<b>SWMU/AOI</b>	<b>Well ID</b>
Landfill L1	LF-01, LF-02, LF-03, LF-05, LF-07, LF-19, LF-29A, LF-35, LF-36, LF-37
West Tank Farm	WTANKF-1, WTANKF-2, WTANKF-3, WTANKF-4
Box Sewer	BOX-1, BOX-2, BOX-4
Process Sump Area	PSA-1 through PSA-10
Historic Fill Area	HFA-1, HFA-2, HFA-3
Former Building 21	B21-1, B21-2, B21-3, B21-4

**Table G-24  
Pumping Scenarios  
Human Health Risk Assessment  
RACER Trust, Moraine, Ohio**

**Scenario 1: Dryden North Well: OFF; Miami Shores Well Field: OFF; West Carrollton Well Field: ON**

Potential Receptor Points	Well ID	Model Location (row, column, layers)	Potential Source Areas																							
			AOI 7	AOI 13	AOI 17	AOI 34	AOI 35	AOI 36	Landfill 1	Landfill 2	Landfill 3	Liquid Waste Burner	North Settling Lagoon	South Settling Lagoon	Fill Area	South Tank Farm	West Tank Farm	UST T4	UST T5/T6	UST T11	UST T12	Former Building 21	Historic Fill Area	Process Sump Area	Waste Pile / Staging Area	Box Sewer
Dryden North Well	DN-13	(225,117,3-4)	5.5E-03	6.5E-06	4.5E-10	5.6E-04	4.5E-08	1.3E-08	1.7E-03	2.5E-02	4.8E-02	2.0E-05	8.8E-02	6.3E-02	3.2E-02	6.6E-04	1.6E-02	1.6E-03	6.2E-03	4.2E-05	1.4E-02	1.9E-04	1.6E-04	8.8E-05	2.1E-04	4.3E-04
Miami Shores Well Field	MS-14	(252,75,3-5)	3.7E-03	6.9E-03	2.3E-04	4.9E-04	1.5E-05	7.9E-04	1.6E-02	2.6E-02	3.1E-02	6.1E-04	4.8E-02	6.2E-02	2.5E-02	2.7E-03	8.3E-03	1.9E-03	3.1E-03	1.1E-03	6.3E-03	2.9E-03	6.4E-04	4.3E-03	1.2E-02	1.6E-02
	MS-15	(245,79,3-5)	2.6E-03	5.4E-04	6.4E-06	2.6E-04	7.5E-07	4.1E-05	3.1E-03	1.7E-02	2.5E-02	1.2E-04	4.4E-02	1.2E-01	1.4E-02	8.8E-04	6.1E-03	8.9E-04	2.2E-03	2.0E-04	6.3E-03	6.6E-04	1.5E-04	4.8E-04	1.8E-03	1.9E-03
	MS-16	(246,70,3-5)	1.0E-03	8.1E-05	8.6E-07	8.6E-05	1.1E-07	5.7E-06	6.0E-04	8.9E-03	1.3E-02	2.2E-05	2.3E-02	1.3E-01	3.7E-03	1.8E-04	2.0E-03	2.2E-04	7.1E-04	3.6E-05	3.1E-03	1.2E-04	3.5E-05	8.0E-05	3.1E-04	3.2E-04
	MS-17	(250,66,3-5)	1.4E-03	4.0E-04	7.3E-06	1.4E-04	6.4E-07	3.6E-05	1.7E-03	1.1E-02	1.6E-02	6.9E-05	2.7E-02	1.2E-01	6.7E-03	4.5E-04	3.1E-03	4.3E-04	1.1E-03	1.2E-04	3.7E-03	3.6E-04	8.4E-05	3.1E-04	1.1E-03	1.2E-03
	MS-18	(254,62,3-5)	1.7E-03	9.7E-04	2.5E-05	1.8E-04	1.8E-06	1.0E-04	3.1E-03	1.2E-02	1.7E-02	1.3E-04	2.9E-02	1.0E-01	9.0E-03	7.0E-04	3.7E-03	6.1E-04	1.3E-03	2.2E-04	4.0E-03	6.2E-04	1.4E-04	6.8E-04	2.1E-03	2.5E-03
	MS-19	(255,70,3-5)	3.3E-03	7.6E-03	2.9E-04	4.5E-04	1.8E-05	9.2E-04	1.6E-02	2.4E-02	2.8E-02	5.8E-04	4.3E-02	6.1E-02	2.3E-02	2.5E-03	7.3E-03	1.7E-03	2.7E-03	1.1E-03	5.6E-03	2.7E-03	6.1E-04	4.6E-03	1.2E-02	1.6E-02
	MS-20	(257,63,3-5)	2.6E-03	4.2E-03	1.5E-04	3.2E-04	9.8E-06	5.0E-04	9.5E-03	1.9E-02	2.4E-02	3.6E-04	3.7E-02	7.8E-02	1.7E-02	1.6E-03	5.8E-03	1.2E-03	2.2E-03	6.5E-04	5.0E-03	1.7E-03	3.8E-04	2.6E-03	6.9E-03	9.3E-03
	MS-21	(256,54,3-5)	6.2E-04	2.0E-04	4.8E-06	5.7E-05	3.6E-07	2.0E-05	7.5E-04	5.9E-03	9.0E-03	2.9E-05	1.5E-02	8.3E-02	2.7E-03	1.8E-04	1.3E-03	1.7E-04	4.5E-04	5.0E-05	1.8E-03	1.5E-04	3.6E-05	1.5E-04	4.9E-04	5.6E-04
	MS-22	(257,49,3-5)	2.3E-04	4.4E-05	9.5E-07	1.9E-05	7.6E-08	4.2E-06	1.8E-04	3.0E-03	5.2E-03	7.1E-06	8.4E-03	5.2E-02	7.9E-04	4.7E-05	4.1E-04	4.8E-05	1.4E-04	1.2E-05	8.4E-04	3.7E-05	9.4E-06	3.4E-05	1.1E-04	1.3E-04
West Carrollton Well Field	WC-1	(282,27,3-5)	8.6E-06	1.3E-06	3.2E-08	5.5E-07	2.4E-09	1.3E-07	5.1E-06	3.7E-04	1.4E-03	2.0E-07	2.7E-03	3.9E-03	2.2E-05	1.3E-06	1.1E-05	1.3E-06	3.9E-06	3.3E-07	7.1E-05	1.0E-06	2.6E-07	9.5E-07	3.2E-06	3.6E-06
	WC-3	(280,31,3-5)	4.2E-05	8.9E-06	2.2E-07	3.1E-06	1.6E-08	8.9E-07	3.4E-05	8.8E-04	2.2E-03	1.3E-06	3.8E-03	1.3E-02	1.4E-04	8.2E-06	6.8E-05	8.2E-06	2.4E-05	2.2E-06	2.1E-04	6.7E-06	1.7E-06	6.4E-06	2.1E-05	2.4E-05
	WC-4	(281,29,3-5)	2.3E-05	4.1E-06	9.9E-08	1.6E-06	7.4E-09	4.1E-07	1.6E-05	6.4E-04	1.9E-03	6.1E-07	3.4E-03	8.5E-03	6.6E-05	3.9E-06	3.4E-05	4.0E-06	1.2E-05	1.0E-06	1.4E-04	3.1E-06	7.9E-07	3.0E-06	9.9E-06	1.1E-05

Dilution factors reported for the Miami River are mass loading factors to the river [  $\frac{lb}{day} / \frac{mg}{L}$  ].

**Table G-25  
Pumping Scenarios  
Human Health Risk Assessment  
RACER Trust, Moraine, Ohio**

**Scenario 2:** Dryden North Well: OFF; Miami Shores Well Field: ON; West Carrollton Well Field: ON

Potential Receptor Points	Well ID	Model Location (row, column, layers)	Potential Source Areas																							
			AOI 7	AOI 13	AOI 17	AOI 34	AOI 35	AOI 36	Landfill 1	Landfill 2	Landfill 3	Liquid Waste Burner	North Settling Lagoon	South Settling Lagoon	Fill Area	South Tank Farm	West Tank Farm	UST T4	UST T5/T6	UST T11	UST T12	Former Building 21	Historic Fill Area	Process Sump Area	Waste Pile / Staging Area	Box Sewer
Dryden North Well	DN-13	(225,117,3-4)	1.2E-03	4.5E-07	3.3E-11	5.4E-05	1.5E-10	1.5E-09	5.4E-04	2.1E-02	2.3E-02	3.2E-06	3.9E-02	8.5E-02	1.2E-02	1.1E-04	4.9E-03	3.0E-04	2.2E-03	3.6E-06	7.0E-03	2.9E-05	2.8E-05	1.7E-06	2.7E-05	9.8E-06
Miami Shores Well Field	MS-14	(252,75,3-5)	2.5E-03	1.4E-02	7.5E-04	3.5E-04	1.6E-05	1.9E-03	2.5E-02	2.1E-02	2.1E-02	8.3E-04	3.0E-02	3.8E-02	1.8E-02	2.4E-03	4.6E-03	1.4E-03	1.7E-03	1.5E-03	3.4E-03	3.4E-03	6.2E-04	5.2E-03	1.9E-02	2.0E-02
	MS-15	(245,79,3-5)	8.1E-04	7.3E-04	1.4E-05	6.9E-05	2.4E-07	7.1E-05	3.6E-03	1.0E-02	1.4E-02	1.4E-04	2.4E-02	1.1E-01	8.9E-03	6.7E-04	2.7E-03	5.3E-04	1.1E-03	1.9E-04	3.1E-03	6.3E-04	7.5E-05	2.8E-04	2.2E-03	1.2E-03
	MS-16	(246,70,3-5)	6.4E-05	6.5E-05	1.6E-06	5.1E-06	2.8E-08	6.9E-06	2.6E-04	1.3E-03	3.0E-03	1.0E-05	5.4E-03	4.7E-02	6.4E-04	4.6E-05	2.1E-04	3.7E-05	8.3E-05	1.4E-05	3.8E-04	4.5E-05	5.8E-06	2.5E-05	1.7E-04	1.0E-04
	MS-17	(250,66,3-5)	3.4E-04	7.7E-04	2.6E-05	3.6E-05	4.6E-07	9.2E-05	2.2E-03	3.5E-03	5.0E-03	8.7E-05	8.3E-03	3.6E-02	3.2E-03	3.3E-04	9.1E-04	2.2E-04	3.5E-04	1.4E-04	9.0E-04	3.7E-04	5.1E-05	2.9E-04	1.6E-03	1.2E-03
	MS-18	(254,62,3-5)	3.9E-04	1.4E-03	6.5E-05	4.7E-05	1.4E-06	1.8E-04	3.1E-03	3.6E-03	4.4E-03	1.1E-04	7.1E-03	2.0E-02	3.3E-03	3.8E-04	9.1E-04	2.4E-04	3.5E-04	1.9E-04	7.9E-04	4.7E-04	7.3E-05	5.2E-04	2.3E-03	2.0E-03
	MS-19	(255,70,3-5)	2.1E-03	2.1E-02	1.7E-03	3.5E-04	4.7E-05	3.2E-03	2.7E-02	1.7E-02	1.4E-02	7.0E-04	1.9E-02	3.7E-02	1.2E-02	1.7E-03	2.6E-03	8.7E-04	1.0E-03	1.5E-03	2.0E-03	2.8E-03	6.9E-04	7.9E-03	2.0E-02	2.8E-02
	MS-20	(257,63,3-5)	1.5E-03	1.9E-02	2.0E-03	2.6E-04	6.5E-05	3.1E-03	2.3E-02	1.2E-02	9.9E-03	4.8E-04	1.4E-02	3.9E-02	8.9E-03	1.1E-03	1.8E-03	5.6E-04	7.7E-04	1.1E-03	1.5E-03	1.9E-03	5.3E-04	7.2E-03	1.5E-02	2.5E-02
	MS-21	(256,54,3-5)	4.0E-07	2.1E-06	1.4E-07	5.1E-08	3.7E-09	3.1E-07	3.7E-06	2.6E-05	2.7E-04	1.2E-07	8.1E-04	1.3E-03	3.1E-06	3.6E-07	8.1E-07	2.2E-07	3.1E-07	2.1E-07	8.0E-06	4.9E-07	8.9E-08	8.0E-07	2.7E-06	2.9E-06
	MS-22	(257,49,3-5)	8.3E-08	1.2E-06	1.3E-07	1.5E-08	4.6E-09	2.0E-07	1.3E-06	1.2E-05	1.6E-04	2.6E-08	5.6E-04	4.0E-04	4.7E-07	5.2E-08	8.9E-08	2.7E-08	3.9E-08	5.9E-08	3.3E-06	9.7E-08	3.0E-08	4.4E-07	8.7E-07	1.5E-06
West Carrollton Well Field	WC-1	(282,27,3-5)	6.7E-11	1.1E-10	1.3E-11	1.6E-12	4.9E-13	1.9E-11	1.2E-10	3.6E-07	7.8E-06	2.1E-12	3.3E-05	4.9E-06	3.6E-11	3.8E-12	6.7E-12	1.9E-12	2.8E-12	5.1E-12	8.6E-08	7.8E-12	2.8E-12	4.2E-11	7.6E-11	1.4E-10
	WC-3	(280,31,3-5)	5.7E-10	4.8E-09	5.6E-10	5.5E-11	2.1E-11	7.9E-10	5.0E-09	1.5E-06	2.9E-05	8.7E-11	1.2E-04	2.7E-05	1.5E-09	1.6E-10	2.5E-10	7.9E-11	1.2E-10	2.1E-10	3.8E-07	3.3E-10	1.1E-10	1.7E-09	3.2E-09	5.9E-09
	WC-4	(281,29,3-5)	2.3E-10	1.2E-09	1.3E-10	1.4E-11	5.0E-12	1.9E-10	1.2E-09	9.0E-07	1.8E-05	2.1E-11	7.6E-05	1.5E-05	3.6E-10	3.8E-11	6.3E-11	1.9E-11	2.8E-11	5.1E-11	2.2E-07	7.9E-11	2.7E-11	4.2E-10	7.6E-10	1.4E-09

Dilution factors reported for the Miami River are mass loading factors to the river [  $\frac{lb}{day} / \frac{mg}{L}$  ].

**Table G-26**  
**Pumping Scenarios**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

**Scenario 3: Dryden North Well: ON; Miami Shores Well Field: OFF; West Carrollton Well Field: ON**

Potential Receptor Points	Well ID	Model Location (row, column, layers)	Potential Source Areas																							
			AOI 7	AOI 13	AOI 17	AOI 34	AOI 35	AOI 36	Landfill 1	Landfill 2	Landfill 3	Liquid Waste Burner	North Settling Lagoon	South Settling Lagoon	Fill Area	South Tank Farm	West Tank Farm	UST T4	UST T5/T6	UST T11	UST T12	Former Building 21	Historic Fill Area	Process Sump Area	Waste Pile / Staging Area	Box Sewer
Dryden North Well	DN-13	(225,117,3-4)	4.1E-03	2.1E-02	5.3E-04	6.0E-04	3.7E-05	2.3E-03	3.6E-02	3.5E-02	3.6E-02	1.2E-03	5.3E-02	1.3E-01	2.9E-02	3.7E-03	7.6E-03	2.1E-03	2.9E-03	2.4E-03	6.3E-03	5.1E-03	1.2E-03	1.1E-02	2.9E-02	4.0E-02
Miami Shores Well Field	MS-14	(252,75,3-5)	7.6E-04	5.0E-02	7.1E-03	2.4E-04	4.4E-04	8.9E-03	3.1E-02	4.3E-03	2.5E-03	1.2E-04	4.7E-03	1.9E-02	4.7E-03	1.3E-04	6.4E-04	1.1E-04	4.0E-04	5.3E-04	7.4E-04	4.0E-04	5.0E-04	2.0E-02	1.2E-02	5.7E-02
	MS-15	(245,79,3-5)	3.7E-04	1.8E-02	1.8E-03	1.1E-04	1.0E-04	3.1E-03	1.3E-02	2.2E-03	1.9E-03	5.9E-05	3.6E-03	1.3E-02	1.7E-03	6.0E-05	2.4E-04	4.2E-05	1.5E-04	2.7E-04	3.0E-04	2.0E-04	2.4E-04	7.7E-03	5.4E-03	2.2E-02
	MS-16	(246,70,3-5)	6.5E-05	2.9E-03	2.8E-04	1.8E-05	1.6E-05	5.2E-04	2.2E-03	4.8E-04	9.5E-04	1.0E-05	2.1E-03	6.2E-03	2.9E-04	1.1E-05	4.0E-05	7.1E-06	2.5E-05	4.7E-05	6.9E-05	3.6E-05	4.1E-05	1.3E-03	9.4E-04	3.8E-03
	MS-17	(250,66,3-5)	1.5E-04	7.7E-03	8.4E-04	4.5E-05	4.9E-05	1.4E-03	5.4E-03	9.7E-04	1.1E-03	2.4E-05	2.3E-03	7.6E-03	7.6E-04	2.5E-05	1.0E-04	1.8E-05	6.5E-05	1.1E-04	1.4E-04	8.4E-05	9.8E-05	3.3E-03	2.3E-03	9.6E-03
	MS-18	(254,62,3-5)	2.2E-04	1.2E-02	1.4E-03	6.5E-05	8.5E-05	2.1E-03	8.1E-03	1.3E-03	1.2E-03	3.4E-05	2.5E-03	8.4E-03	1.2E-03	3.6E-05	1.6E-04	2.7E-05	9.9E-05	1.5E-04	2.0E-04	1.2E-04	1.4E-04	5.0E-03	3.3E-03	1.4E-02
	MS-19	(255,70,3-5)	6.5E-04	4.4E-02	6.4E-03	2.0E-04	4.1E-04	7.8E-03	2.7E-02	3.7E-03	2.2E-03	1.0E-04	4.2E-03	1.8E-02	4.2E-03	1.1E-04	5.7E-04	9.4E-05	3.6E-04	4.5E-04	6.6E-04	3.4E-04	4.3E-04	1.8E-02	1.0E-02	4.9E-02
	MS-20	(257,63,3-5)	4.5E-04	2.8E-02	3.9E-03	1.4E-04	2.4E-04	5.1E-03	1.8E-02	2.6E-03	1.8E-03	7.1E-05	3.4E-03	1.3E-02	2.7E-03	7.8E-05	3.7E-04	6.2E-05	2.3E-04	3.2E-04	4.4E-04	2.4E-04	3.0E-04	1.2E-02	7.0E-03	3.3E-02
	MS-21	(256,54,3-5)	5.2E-05	2.7E-03	3.1E-04	1.5E-05	1.8E-05	4.8E-04	1.9E-03	3.6E-04	6.7E-04	8.3E-06	1.5E-03	3.8E-03	2.7E-04	8.6E-06	3.6E-05	6.3E-06	2.3E-05	3.7E-05	5.5E-05	2.8E-05	3.3E-05	1.2E-03	7.8E-04	3.3E-03
	MS-22	(257,49,3-5)	1.3E-05	6.4E-04	7.0E-05	3.7E-06	4.1E-06	1.1E-04	4.5E-04	1.2E-04	4.5E-04	2.0E-06	1.1E-03	1.9E-03	6.3E-05	2.1E-06	8.7E-06	1.5E-06	5.4E-06	9.1E-06	1.9E-05	7.0E-06	8.1E-06	2.7E-04	1.9E-04	8.0E-04
West Carrollton Well Field	WC-1	(282,27,3-5)	1.9E-07	9.2E-06	1.0E-06	5.2E-08	5.8E-08	1.6E-06	6.5E-06	9.8E-06	1.2E-04	3.0E-08	3.8E-04	1.2E-04	9.4E-07	3.1E-08	1.3E-07	2.2E-08	8.0E-08	1.3E-07	1.5E-06	1.0E-07	1.2E-07	3.9E-06	2.7E-06	1.1E-05
	WC-3	(280,31,3-5)	1.4E-06	7.3E-05	8.0E-06	4.1E-07	4.6E-07	1.3E-05	5.1E-05	2.6E-05	2.1E-04	2.3E-07	5.9E-04	4.0E-04	7.3E-06	2.4E-07	1.0E-06	1.7E-07	6.2E-07	1.0E-06	4.2E-06	7.9E-07	9.1E-07	3.1E-05	2.1E-05	9.0E-05
	WC-4	(281,29,3-5)	6.4E-07	3.3E-05	3.6E-06	1.8E-07	2.0E-07	5.8E-06	2.3E-05	1.8E-05	1.8E-04	1.0E-07	5.3E-04	2.5E-04	3.3E-06	1.1E-07	4.5E-07	7.8E-08	2.8E-07	4.6E-07	2.8E-06	3.6E-07	4.1E-07	1.4E-05	9.6E-06	4.0E-05

Dilution factors reported for the Miami River are mass loading factors to the river [  $\frac{lb}{day} / \frac{mg}{L}$  ].

**Table G-27  
Pumping Scenarios  
Human Health Risk Assessment  
RACER Trust, Moraine, Ohio**

**Scenario 4:** Dryden North Well: ON; Miami Shores Well Field: ON; West Carrollton Well Field: ON

Potential Receptor Points	Well ID	Model Location (row, column, layers)	Potential Source Areas																							
			AOI 7	AOI 13	AOI 17	AOI 34	AOI 35	AOI 36	Landfill 1	Landfill 2	Landfill 3	Liquid Waste Burner	North Settling Lagoon	South Settling Lagoon	Fill Area	South Tank Farm	West Tank Farm	UST T4	UST T5/T6	UST T11	UST T12	Former Building 21	Historic Fill Area	Process Sump Area	Waste Pile / Staging Area	Box Sewer
Dryden North Well	DN-13	(225,117,3-4)	2.8E-03	8.1E-03	7.0E-05	3.4E-04	1.5E-06	5.9E-04	2.7E-02	2.9E-02	3.3E-02	1.2E-03	5.0E-02	1.4E-01	2.8E-02	3.8E-03	6.8E-03	2.1E-03	2.6E-03	1.9E-03	5.6E-03	5.1E-03	5.7E-04	2.8E-03	2.3E-02	1.2E-02
Miami Shores Well Field	MS-14	(252,75,3-5)	1.6E-03	4.7E-02	6.3E-03	4.3E-04	2.7E-04	7.9E-03	3.5E-02	1.2E-02	5.1E-03	3.4E-04	4.3E-03	2.0E-02	4.0E-03	3.0E-04	3.1E-04	1.1E-04	2.3E-04	1.2E-03	3.0E-04	1.2E-03	8.2E-04	1.8E-02	1.9E-02	5.5E-02
	MS-15	(245,79,3-5)	1.0E-03	1.6E-02	1.1E-03	2.2E-04	2.6E-05	2.5E-03	1.7E-02	8.1E-03	4.1E-03	2.7E-04	3.8E-03	1.0E-02	2.0E-03	2.8E-04	2.0E-04	9.4E-05	1.1E-04	8.5E-04	1.6E-04	9.6E-04	4.5E-04	6.0E-03	1.2E-02	2.1E-02
	MS-16	(246,70,3-5)	5.8E-05	9.9E-04	7.1E-05	1.3E-05	1.9E-06	1.5E-04	1.0E-03	4.7E-04	2.7E-04	1.5E-05	3.8E-04	1.4E-03	1.2E-04	1.6E-05	1.2E-05	5.3E-06	6.7E-06	4.8E-05	1.0E-05	5.4E-05	2.6E-05	3.6E-04	7.0E-04	1.3E-03
	MS-17	(250,66,3-5)	3.1E-04	6.4E-03	5.9E-04	7.4E-05	1.8E-05	1.0E-03	5.8E-03	2.4E-03	1.1E-03	7.4E-05	1.1E-03	3.1E-03	6.4E-04	7.2E-05	5.8E-05	2.5E-05	3.7E-05	2.5E-04	5.0E-05	2.6E-04	1.5E-04	2.4E-03	3.7E-03	8.0E-03
	MS-18	(254,62,3-5)	2.9E-04	6.8E-03	7.3E-04	7.2E-05	2.6E-05	1.1E-03	5.8E-03	2.3E-03	1.0E-03	6.7E-05	9.3E-04	3.1E-03	6.4E-04	6.3E-05	5.5E-05	2.2E-05	3.7E-05	2.3E-04	5.0E-05	2.4E-04	1.4E-04	2.5E-03	3.5E-03	8.3E-03
	MS-19	(255,70,3-5)	1.0E-03	3.8E-02	6.3E-03	2.8E-04	3.5E-04	6.4E-03	2.7E-02	7.6E-03	3.2E-03	2.3E-04	2.9E-03	2.7E-02	4.2E-03	1.9E-04	2.8E-04	7.7E-05	2.4E-04	7.6E-04	3.0E-04	7.7E-04	5.4E-04	1.4E-02	1.3E-02	4.1E-02
	MS-20	(257,63,3-5)	7.7E-04	2.9E-02	4.8E-03	2.1E-04	3.0E-04	4.9E-03	2.2E-02	6.1E-03	2.7E-03	2.0E-04	2.6E-03	2.4E-02	4.2E-03	1.6E-04	2.7E-04	7.1E-05	2.4E-04	6.3E-04	3.0E-04	6.6E-04	4.2E-04	1.0E-02	1.1E-02	3.1E-02
	MS-21	(256,54,3-5)	2.5E-08	6.4E-07	7.7E-08	6.2E-09	3.2E-09	1.1E-07	5.3E-07	4.4E-07	1.0E-05	5.9E-09	5.9E-05	3.9E-05	6.7E-08	5.4E-09	5.3E-09	1.9E-09	3.9E-09	1.9E-08	9.7E-08	2.0E-08	1.2E-08	2.4E-07	3.1E-07	7.5E-07
MS-22	(257,49,3-5)	1.2E-08	5.7E-07	1.0E-07	3.4E-09	7.3E-09	9.5E-08	4.3E-07	2.2E-07	5.4E-06	3.7E-09	3.4E-05	1.1E-05	9.9E-08	2.7E-09	6.0E-09	1.3E-09	5.7E-09	1.1E-08	4.6E-08	1.2E-08	7.2E-09	1.9E-07	2.0E-07	5.8E-07	
West Carrollton Well Field	WC-1	(282,27,3-5)	2.0E-13	8.1E-12	1.5E-12	4.8E-14	1.1E-13	1.4E-12	6.1E-12	2.3E-09	1.3E-07	5.2E-14	9.4E-07	7.3E-08	1.4E-12	3.8E-14	8.6E-14	1.9E-14	8.2E-14	1.5E-13	5.8E-10	1.6E-13	1.0E-13	2.8E-12	2.8E-12	8.2E-12
	WC-3	(280,31,3-5)	1.1E-11	5.5E-10	1.0E-10	3.2E-12	7.4E-12	9.2E-11	4.1E-10	1.2E-08	6.1E-07	3.5E-12	4.3E-06	5.0E-07	9.6E-11	2.6E-12	5.8E-12	1.3E-12	5.5E-12	9.9E-12	3.2E-09	1.1E-11	6.8E-12	1.9E-10	1.9E-10	5.5E-10
	WC-4	(281,29,3-5)	2.3E-12	1.1E-10	2.1E-11	6.6E-13	1.5E-12	1.9E-11	8.3E-11	6.4E-09	3.5E-07	7.1E-13	2.5E-06	2.4E-07	2.0E-11	5.2E-13	1.2E-12	2.6E-13	1.1E-12	2.0E-12	1.7E-09	2.2E-12	1.4E-12	3.8E-11	3.9E-11	1.1E-10

Dilution factors reported for the Miami River are mass loading factors to the river [  $\frac{\text{lb}}{\text{day}} \frac{\text{mg}}{\text{L}}$  ].

**Table G-28**  
**Groundwater Exposure Point Concentrations for Pumping Scenario #1<sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	Exposure Point Concentration at Source (ug/L) <sup>[3]</sup>	DAF <sup>[4]</sup>	Estimated Concentration at POC (ug/L) <sup>[5]</sup>												
			Dryden North Well	Miami Shores Wellfield									West Carrollton Well Field		
				DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3
<b>Landfill L1</b>															
			1.7E-03	1.6E-02	3.1E-03	6.0E-04	1.7E-03	1.7E-02	1.6E-02	9.5E-03	7.5E-04	1.8E-04	5.1E-06	3.4E-05	1.6E-05
Benzene	2.1		3.6E-03	3.4E-02	6.5E-03	1.3E-03	3.6E-03	3.6E-02	3.4E-02	2.0E-02	1.6E-03	3.8E-04	1.1E-05	7.1E-05	3.4E-05
1,1-Dichloroethane	4		6.8E-03	6.4E-02	1.2E-02	2.4E-03	6.8E-03	6.8E-02	6.4E-02	3.8E-02	3.0E-03	7.2E-04	2.0E-05	1.4E-04	6.4E-05
cis-1,2-Dichloroethene	95		1.6E-01	1.5E+00	2.9E-01	5.7E-02	1.6E-01	1.6E+00	1.5E+00	9.0E-01	7.1E-02	1.7E-02	4.8E-04	3.2E-03	1.5E-03
Tetrachloroethene	2.7		4.6E-03	4.3E-02	8.4E-03	1.6E-03	4.6E-03	4.6E-02	4.3E-02	2.6E-02	2.0E-03	4.9E-04	1.4E-05	9.2E-05	4.3E-05
Trichloroethene	36		6.1E-02	5.8E-01	1.1E-01	2.2E-02	6.1E-02	6.1E-01	5.8E-01	3.4E-01	2.7E-02	6.5E-03	1.8E-04	1.2E-03	5.8E-04
Vinyl Chloride	1.7		2.9E-03	2.7E-02	5.3E-03	1.0E-03	2.9E-03	2.9E-02	2.7E-02	1.6E-02	1.3E-03	3.1E-04	8.7E-06	5.8E-05	2.7E-05
Arsenic	23		3.9E-02	3.7E-01	7.1E-02	1.4E-02	3.9E-02	3.9E-01	3.7E-01	2.2E-01	1.7E-02	4.1E-03	1.2E-04	7.8E-04	3.7E-04
Cobalt	21		3.6E-02	3.4E-01	6.5E-02	1.3E-02	3.6E-02	3.6E-01	3.4E-01	2.0E-01	1.6E-02	3.8E-03	1.1E-04	7.1E-04	3.4E-04
<b>West Tank Farm</b>															
			1.60E-02	8.30E-03	6.10E-03	2.00E-03	3.10E-03	3.70E-03	7.30E-03	5.80E-03	1.30E-03	4.10E-04	1.10E-05	6.80E-05	3.40E-05
1,1-Dichloroethane	3.2		5.1E-02	2.7E-02	2.0E-02	6.4E-03	9.9E-03	1.2E-02	2.3E-02	1.9E-02	4.2E-03	1.3E-03	3.5E-05	2.2E-04	1.1E-04
Tetrachloroethene	175		2.8E+00	1.5E+00	1.1E+00	3.5E-01	5.4E-01	6.5E-01	1.3E+00	1.0E+00	2.3E-01	7.2E-02	1.9E-03	1.2E-02	6.0E-03
Trichloroethene	212		3.4E+00	1.8E+00	1.3E+00	4.2E-01	6.6E-01	7.8E-01	1.5E+00	1.2E+00	2.8E-01	8.7E-02	2.3E-03	1.4E-02	7.2E-03
<b>Box Sewer</b>															
			4.30E-04	1.60E-02	1.90E-03	3.20E-04	1.20E-03	2.50E-03	1.60E-02	9.30E-03	5.60E-04	1.30E-04	3.60E-06	2.40E-05	1.10E-05
Tetrachloroethene	1306		5.6E-01	2.1E+01	2.5E+00	4.2E-01	1.6E+00	3.3E+00	2.1E+01	1.2E+01	7.3E-01	1.7E-01	4.7E-03	3.1E-02	1.4E-02
Trichloroethene	429		1.8E-01	6.9E+00	8.2E-01	1.4E-01	5.1E-01	1.1E+00	6.9E+00	4.0E+00	2.4E-01	5.6E-02	1.5E-03	1.0E-02	4.7E-03
<b>Process Sump Area</b>															
			8.80E-05	4.30E-03	4.80E-04	8.00E-05	3.10E-04	6.80E-04	4.60E-03	2.60E-03	1.50E-04	3.40E-05	9.50E-07	6.40E-06	3.00E-06
1,1-Dichloroethane	6.7		5.9E-04	2.9E-02	3.2E-03	5.4E-04	2.1E-03	4.6E-03	3.1E-02	1.7E-02	1.0E-03	2.3E-04	6.4E-06	4.3E-05	2.0E-05
cis-1,2-Dichloroethene	64		5.6E-03	2.8E-01	3.1E-02	5.1E-03	2.0E-02	4.4E-02	2.9E-01	1.7E-01	9.6E-03	2.2E-03	6.1E-05	4.1E-04	1.9E-04
Tetrachloroethene	18627		1.6E+00	8.0E+01	8.9E+00	1.5E+00	5.8E+00	1.3E+01	8.6E+01	4.8E+01	2.8E+00	6.3E-01	1.8E-02	1.2E-01	5.6E-02
Trichloroethene	9227		8.1E-01	4.0E+01	4.4E+00	7.4E-01	2.9E+00	6.3E+00	4.2E+01	2.4E+01	1.4E+00	3.1E-01	8.8E-03	5.9E-02	2.8E-02
<b>Historic Fill Area</b>															
			1.60E-04	6.40E-04	1.50E-04	3.50E-05	8.40E-05	1.40E-04	6.10E-04	3.80E-04	3.60E-05	9.40E-06	2.60E-07	1.70E-06	7.90E-07
cis-1,2-Dichloroethene	110		1.8E-02	7.0E-02	1.7E-02	3.9E-03	9.2E-03	1.5E-02	6.7E-02	4.2E-02	4.0E-03	1.0E-03	2.9E-05	1.9E-04	8.7E-05
Tetrachloroethene	32		5.1E-03	2.0E-02	4.8E-03	1.1E-03	2.7E-03	4.5E-03	2.0E-02	1.2E-02	1.2E-03	3.0E-04	8.3E-06	5.4E-05	2.5E-05
Trichloroethene	290		4.6E-02	1.9E-01	4.4E-02	1.0E-02	2.4E-02	4.1E-02	1.8E-01	1.1E-01	1.0E-02	2.7E-03	7.5E-05	4.9E-04	2.3E-04
Vinyl Chloride	3.4		5.4E-04	2.2E-03	5.1E-04	1.2E-04	2.9E-04	4.8E-04	2.1E-03	1.3E-03	1.2E-04	3.2E-05	8.8E-07	5.8E-06	2.7E-06
<b>Former Building 21</b>															
			1.90E-04	2.90E-03	6.60E-04	1.20E-04	3.60E-04	6.20E-04	2.70E-03	1.70E-03	1.50E-04	3.70E-05	1.00E-06	6.70E-06	3.10E-06
1,1-Dichloroethane	12		2.3E-03	3.5E-02	7.9E-03	1.4E-03	4.3E-03	7.4E-03	3.2E-02	2.0E-02	1.8E-03	4.4E-04	1.2E-05	8.0E-05	3.7E-05
cis-1,2-Dichloroethene	62		1.2E-02	1.8E-01	4.1E-02	7.4E-03	2.2E-02	3.8E-02	1.7E-01	1.1E-01	9.3E-03	2.3E-03	6.2E-05	4.2E-04	1.9E-04
Tetrachloroethene	45		8.6E-03	1.3E-01	3.0E-02	5.4E-03	1.6E-02	2.8E-02	1.2E-01	7.7E-02	6.8E-03	1.7E-03	4.5E-05	3.0E-04	1.4E-04
Trichloroethene	143		2.7E-02	4.1E-01	9.4E-02	1.7E-02	5.1E-02	8.9E-02	3.9E-01	2.4E-01	2.1E-02	5.3E-03	1.4E-04	9.6E-04	4.4E-04

Notes:  
[1] Dryden North - OFF; Miami Shores - OFF; West Carrollton - ON  
[2] Identified in screening process through comparison to MCLs.  
[3] Represents exposure point concentration (i.e., maximum or 95% upper confidence limit) of all wells associated with SWMU/AOI.  
[4] Modeled dilution attenuation factor (DAF).  
[5] Calculated: maximum concentration x DAF.  
DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact

Table G-29  
Groundwater Exposure Point Concentrations for Pumping Scenario #2<sup>[1]</sup>  
Human Health Risk Assessment  
RACER Trust, Moraine, Ohio

Constituent of Potential Concern <sup>[2]</sup>	Exposure Point Concentration at Source (ug/L) <sup>[3]</sup>	DAF <sup>[4]</sup>	Estimated Concentration at POC (ug/L) <sup>[5]</sup>												
			Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field	
			DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>															
			5.4E-04	2.5E-02	3.6E-03	2.8E-04	2.2E-03	3.1E-03	2.7E-02	2.3E-02	3.7E-06	1.3E-06	1.2E-10	5.0E-09	1.2E-09
Benzene	2.1		1.1E-03	9.3E-02	7.6E-03	5.5E-04	4.6E-03	6.5E-03	5.7E-02	4.8E-02	7.8E-06	2.7E-06	2.5E-10	1.1E-08	2.5E-09
1,1-Dichloroethane	4		2.2E-03	1.0E-01	1.4E-02	1.0E-03	8.8E-03	1.2E-02	1.1E-01	9.2E-02	1.5E-05	5.2E-06	4.8E-10	2.0E-08	4.8E-09
cis-1,2-Dichloroethene	95		5.1E-02	2.4E+00	3.4E-01	2.5E-02	2.1E-01	2.9E-01	2.6E+00	2.2E+00	3.5E-04	1.2E-04	1.1E-08	4.8E-07	1.1E-07
Tetrachloroethene	2.7		1.5E-03	6.8E-02	9.7E-03	7.0E-04	5.9E-03	8.4E-03	7.3E-02	6.2E-02	1.0E-05	3.5E-06	3.2E-10	1.4E-08	3.2E-09
Trichloroethene	36		1.9E-02	9.0E-01	1.3E-01	9.4E-03	7.9E-02	1.1E-01	9.7E-01	8.3E-01	1.3E-04	4.7E-05	4.3E-09	1.8E-07	4.3E-08
Vinyl Chloride	1.7		9.2E-04	4.3E-02	6.1E-03	4.4E-04	3.7E-03	5.3E-03	4.6E-02	3.9E-02	6.3E-06	2.2E-06	2.0E-10	8.5E-09	2.0E-09
Arsenic	23		1.2E-02	5.8E-01	8.3E-02	6.0E-03	5.1E-02	7.1E-02	6.2E-01	5.3E-01	8.5E-05	3.0E-05	2.8E-09	1.2E-07	2.8E-08
Cobalt	21		1.1E-02	9.3E-01	7.6E-02	5.5E-03	4.6E-02	6.5E-02	5.7E-01	4.8E-01	7.8E-05	2.7E-05	2.5E-09	1.1E-07	2.5E-08
<b>West Tank Farm</b>															
			4.90E-03	4.60E-03	2.70E-03	2.10E-04	9.10E-04	9.10E-04	2.60E-03	1.80E-03	8.10E-07	8.90E-08	6.70E-12	2.50E-10	6.30E-11
1,1-Dichloroethane	3.2		1.6E-02	1.5E-02	8.6E-03	6.7E-04	2.9E-03	2.9E-03	8.3E-03	5.8E-03	2.6E-06	2.8E-07	2.1E-11	8.0E-10	2.0E-10
Tetrachloroethene	175		8.6E-01	8.1E-01	4.7E-01	3.7E-02	1.6E-01	1.6E-01	4.6E-01	3.2E-01	1.4E-04	1.6E-05	1.2E-09	4.4E-08	1.1E-08
Trichloroethene	212		1.0E+00	9.8E-01	5.7E-01	4.5E-02	1.9E-01	1.9E-01	5.5E-01	3.8E-01	1.7E-04	1.9E-05	1.4E-09	5.3E-08	1.3E-08
<b>Box Sewer</b>															
			9.80E-06	2.00E-02	1.20E-03	1.00E-04	1.20E-03	2.00E-03	2.80E-02	2.50E-02	2.90E-06	1.50E-06	1.40E-10	5.90E-09	1.40E-09
Tetrachloroethene	1306		1.3E-02	2.6E+01	1.6E+00	1.3E-01	1.6E+00	2.6E+00	3.7E+01	3.3E+01	3.8E-03	2.0E-03	1.8E-07	7.7E-06	1.8E-06
Trichloroethene	429		4.2E-03	8.6E+00	5.1E-01	4.3E-02	5.1E-01	8.6E-01	1.2E+01	1.1E+01	1.2E-03	6.4E-04	6.0E-08	2.5E-06	6.0E-07
<b>Process Sump Area</b>															
			1.70E-06	5.20E-03	2.80E-04	2.50E-05	2.90E-04	5.20E-04	7.90E-03	7.20E-03	8.00E-07	4.40E-07	4.20E-11	1.70E-09	4.20E-10
1,1-Dichloroethane	6.7		1.1E-05	3.5E-02	1.9E-03	1.7E-04	1.9E-03	3.5E-03	5.3E-02	4.8E-02	5.4E-06	2.9E-06	2.8E-10	1.1E-08	2.8E-09
cis-1,2-Dichloroethene	64		1.1E-04	3.3E-01	1.8E-02	1.6E-03	1.9E-02	3.3E-02	5.1E-01	4.6E-01	5.1E-05	2.8E-05	2.7E-09	1.1E-07	2.7E-08
Tetrachloroethene	18627		3.2E-02	9.7E+01	5.2E+00	4.7E-01	5.4E+00	9.7E+00	1.5E+02	1.3E+02	1.5E-02	8.2E-03	7.8E-07	3.2E-05	7.8E-06
Trichloroethene	9227		1.6E-02	4.8E+01	2.6E+00	2.3E-01	2.7E+00	4.8E+00	7.3E+01	6.6E+01	7.4E-03	4.1E-03	3.9E-07	1.6E-05	3.9E-06
<b>Historic Fill Area</b>															
			2.80E-05	6.20E-04	7.60E-05	5.80E-06	5.10E-05	7.30E-05	6.90E-04	5.30E-04	8.90E-08	3.00E-08	2.80E-12	1.10E-10	2.70E-11
cis-1,2-Dichloroethene	110		3.1E-03	6.8E-02	8.3E-03	6.4E-04	5.6E-03	8.0E-03	7.6E-02	5.8E-02	9.8E-06	3.3E-06	3.1E-10	1.2E-08	3.0E-09
Tetrachloroethene	32		9.0E-04	2.0E-02	2.4E-03	1.9E-04	1.6E-03	2.3E-03	2.2E-02	1.7E-02	2.8E-06	9.6E-07	9.0E-11	3.5E-09	8.6E-10
Trichloroethene	290		8.1E-03	1.8E-01	2.2E-02	1.7E-03	1.5E-02	2.1E-02	2.0E-01	1.5E-01	2.6E-05	8.7E-06	8.1E-10	3.2E-08	7.8E-09
Vinyl Chloride	3.4		9.5E-05	2.1E-03	2.6E-04	2.0E-05	1.7E-04	2.5E-04	2.3E-03	1.8E-03	3.0E-07	1.0E-07	9.5E-12	3.7E-10	9.2E-11
<b>Former Building Z1</b>															
			2.90E-05	3.40E-03	6.30E-04	4.50E-05	3.70E-04	4.70E-04	2.80E-03	1.90E-03	4.90E-07	9.70E-08	7.80E-12	3.30E-10	7.90E-11
1,1-Dichloroethane	12		3.5E-04	4.1E-02	7.6E-03	5.4E-04	4.4E-03	5.6E-03	3.4E-02	2.3E-02	5.9E-06	1.2E-06	9.4E-11	4.0E-09	9.5E-10
cis-1,2-Dichloroethene	62		1.8E-03	2.1E-01	3.9E-02	2.8E-03	2.3E-02	2.9E-02	1.7E-01	1.2E-01	3.0E-05	6.0E-06	4.8E-10	2.0E-08	4.9E-09
Tetrachloroethene	45		1.3E-03	1.5E-01	2.8E-02	2.0E-03	1.7E-02	2.1E-02	1.3E-01	8.6E-02	2.2E-05	4.4E-06	3.5E-10	1.5E-08	3.6E-09
Trichloroethene	143		4.1E-03	4.9E-01	9.0E-02	6.4E-03	5.3E-02	6.7E-02	4.0E-01	2.7E-01	7.0E-05	1.4E-05	1.1E-09	4.7E-08	1.1E-08

Notes:

- [1] Dryden North - OFF; Miami Shores - ON; West Carrollton - OI
  - [2] Identified in screening process through comparison to MCL
  - [3] Represents exposure point concentration (i.e., maximum or 95% upper confidence limit) of all wells associated with SWMU/
  - [4] Modeled dilution attenuation factor (DAF)
  - [5] Calculated: maximum concentration x DAF
- DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact

**Table G-30**  
**Groundwater Exposure Point Concentrations for Pumping Scenario #3** <sup>[1]</sup>  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	Exposure Point Concentration at Source (ug/L) <sup>[3]</sup>	DAF <sup>[4]</sup>	Estimated Concentration at POC (ug/L) <sup>[5]</sup>												
			Dryden North Well	Miami Shores Wellfield									West Carrollton Well Field		
				DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3
<b>Landfill L1</b>															
			3.6E-02	3.1E-02	1.3E-02	2.2E-03	5.4E-03	8.1E-03	2.7E-02	1.8E-02	1.9E-03	4.5E-04	6.5E-06	5.1E-05	2.3E-05
Benzene	2.1		7.6E-02	6.5E-02	2.7E-02	4.6E-03	1.1E-02	1.7E-02	5.7E-02	3.8E-02	4.0E-03	9.5E-04	1.4E-05	1.1E-04	4.8E-05
1,1-Dichloroethane	4		1.4E-01	1.2E-01	5.2E-02	8.8E-03	2.2E-02	3.2E-02	1.1E-01	7.2E-02	7.6E-03	1.8E-03	2.6E-05	2.0E-04	9.2E-05
cis-1,2-Dichloroethene	95		3.4E+00	2.9E+00	1.2E+00	2.1E-01	5.1E-01	7.7E-01	2.6E+00	1.7E+00	1.8E-01	4.3E-02	6.2E-04	4.8E-03	2.2E-03
Tetrachloroethene	2.7		9.7E-02	8.4E-02	3.5E-02	5.9E-03	1.5E-02	2.2E-02	7.3E-02	4.9E-02	5.1E-03	1.2E-03	1.8E-05	1.4E-04	6.2E-05
Trichloroethene	36		1.3E+00	1.1E+00	4.7E-01	7.9E-02	1.9E-01	2.9E-01	9.7E-01	6.5E-01	6.8E-02	1.6E-02	2.3E-04	1.8E-03	8.3E-04
Vinyl Chloride	1.7		6.1E-02	5.3E-02	2.2E-02	3.7E-03	9.2E-03	1.4E-02	4.6E-02	3.1E-02	3.2E-03	7.7E-04	1.1E-05	8.7E-05	3.9E-05
Arsenic	23		8.3E-01	7.1E-01	3.0E-01	5.1E-02	1.2E-01	1.9E-01	6.2E-01	4.1E-01	4.4E-02	1.0E-02	1.5E-04	1.2E-03	5.3E-04
Cobalt	21		7.6E-01	6.5E-01	2.7E-01	4.6E-02	1.1E-01	1.7E-01	5.7E-01	3.8E-01	4.0E-02	9.5E-03	1.4E-04	1.1E-03	4.8E-04
<b>West Tank Farm</b>															
			7.60E-03	6.40E-04	2.40E-04	4.00E-05	1.00E-04	1.60E-04	5.70E-04	3.70E-04	3.60E-05	8.70E-06	1.30E-07	1.00E-06	4.50E-07
1,1-Dichloroethane	3.2		2.4E-02	2.0E-03	7.7E-04	1.3E-04	3.2E-04	5.1E-04	1.8E-03	1.2E-03	1.2E-04	2.8E-05	4.2E-07	3.2E-06	1.4E-06
Tetrachloroethene	175		1.3E+00	1.1E-01	4.2E-02	7.0E-03	1.8E-02	2.8E-02	1.0E-01	6.5E-02	6.3E-03	1.5E-03	2.3E-05	1.8E-04	7.9E-05
Trichloroethene	212		1.6E+00	1.4E-01	5.1E-02	8.5E-03	2.1E-02	3.4E-02	1.2E-01	7.8E-02	7.6E-03	1.8E-03	2.8E-05	2.1E-04	9.5E-05
<b>Box Sewer</b>															
			4.00E-02	5.70E-02	2.20E-02	3.80E-03	9.60E-03	1.40E-02	4.90E-02	3.30E-02	3.30E-03	8.00E-04	1.10E-05	9.00E-05	4.00E-05
Tetrachloroethene	1306		5.2E+01	7.4E+01	2.9E+01	5.0E+00	1.3E+01	1.8E+01	6.4E+01	4.3E+01	4.3E+00	1.0E+00	1.4E-02	1.2E-01	5.2E-02
Trichloroethene	429		1.7E+01	2.4E+01	9.4E+00	1.6E+00	4.1E+00	6.0E+00	2.1E+01	1.4E+01	1.4E+00	3.4E-01	4.7E-03	3.9E-02	1.7E-02
<b>Process Sump Area</b>															
			1.10E-02	2.00E-02	7.70E-03	1.30E-03	3.30E-03	5.00E-03	1.80E-02	1.20E-02	1.20E-03	2.70E-04	3.90E-06	3.10E-05	1.40E-05
1,1-Dichloroethane	6.7		7.4E-02	1.3E-01	5.2E-02	8.7E-03	2.2E-02	3.4E-02	1.2E-01	8.0E-02	8.0E-03	1.8E-03	2.6E-05	2.1E-04	9.4E-05
cis-1,2-Dichloroethene	64		7.0E-01	1.3E+00	4.9E-01	8.3E-02	2.1E-01	3.2E-01	1.2E+00	7.7E-01	7.7E-02	1.7E-02	2.5E-04	2.0E-03	9.0E-04
Tetrachloroethene	18627		2.0E+02	3.7E+02	1.4E+02	2.4E+01	6.1E+01	9.3E+01	3.4E+02	2.2E+02	2.2E+01	5.0E+00	7.3E-02	5.8E-01	2.6E-01
Trichloroethene	9227		1.0E+02	1.8E+02	7.1E+01	1.2E+01	3.0E+01	4.6E+01	1.7E+02	1.1E+02	1.1E+01	2.5E+00	3.6E-02	2.9E-01	1.3E-01
<b>Historic Fill Area</b>															
			1.20E-03	5.00E-04	2.40E-04	4.10E-05	9.80E-05	1.40E-04	4.30E-04	3.00E-04	3.30E-05	8.10E-06	1.20E-07	9.10E-07	4.10E-07
cis-1,2-Dichloroethene	110		1.3E-01	5.5E-02	2.6E-02	4.5E-03	1.1E-02	1.5E-02	4.7E-02	3.3E-02	3.6E-03	8.9E-04	1.3E-05	1.0E-04	4.5E-05
Tetrachloroethene	32		3.8E-02	1.6E-02	7.7E-03	1.3E-03	3.1E-03	4.5E-03	1.4E-02	9.6E-03	1.1E-03	2.6E-04	3.8E-06	2.9E-05	1.3E-05
Trichloroethene	290		3.5E-01	1.5E-01	7.0E-02	1.2E-02	2.8E-02	4.1E-02	1.2E-01	8.7E-02	9.6E-03	2.3E-03	3.5E-05	2.6E-04	1.2E-04
Vinyl Chloride	3.4		4.1E-03	1.7E-03	8.2E-04	1.4E-04	3.3E-04	4.8E-04	1.5E-03	1.0E-03	1.1E-04	2.8E-05	4.1E-07	3.1E-06	1.4E-06
<b>Former Building 21</b>															
			5.10E-03	4.00E-04	2.00E-04	3.60E-05	8.40E-05	1.20E-04	3.40E-04	2.40E-04	2.80E-05	7.00E-06	1.00E-07	7.90E-07	3.60E-07
1,1-Dichloroethane	12		6.1E-02	4.8E-03	2.4E-03	4.3E-04	1.0E-03	1.4E-03	4.1E-03	2.9E-03	3.4E-04	8.4E-05	1.2E-06	9.5E-06	4.3E-06
cis-1,2-Dichloroethene	62		3.2E-01	2.5E-02	1.2E-02	2.2E-03	5.2E-03	7.4E-03	2.1E-02	1.5E-02	1.7E-03	4.3E-04	6.2E-06	4.9E-05	2.2E-05
Tetrachloroethene	45		2.3E-01	1.8E-02	9.0E-03	1.6E-03	3.8E-03	5.4E-03	1.5E-02	1.1E-02	1.3E-03	3.2E-04	4.5E-06	3.6E-05	1.6E-05
Trichloroethene	143		7.3E-01	5.7E-02	2.9E-02	5.1E-03	1.2E-02	1.7E-02	4.9E-02	3.4E-02	4.0E-03	1.0E-03	1.4E-05	1.1E-04	5.1E-05

Notes:  
[1] Dryden North - ON; Miami Shores - OFF; West Carrollton - ON  
[2] Identified in screening process through comparison to MCLs.  
[3] Represents exposure point concentration (i.e., maximum or 95% upper confidence limit) of all wells associated with SWMU/AOI.  
[4] Modeled dilution attenuation factor (DAF).  
[5] Calculated: maximum concentration x DAF.  
DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact

**Table G-31**  
**Groundwater Exposure Point Concentrations for Pumping Scenario #4<sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	Exposure Point Concentration at Source (ug/L) <sup>[3]</sup>	DAF <sup>[4]</sup>	Estimated Concentration at POC (ug/L) <sup>[5]</sup>													
			Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field		
				DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>																
			2.70E-02	3.50E-02	1.70E-02	1.00E-03	5.80E-03	5.80E-03	2.70E-02	2.20E-02	5.30E-07	4.30E-07	6.10E-12	4.10E-10	8.30E-11	
Benzene	2.1		5.7E-02	7.4E-02	3.6E-02	2.1E-03	1.2E-02	1.2E-02	5.7E-02	4.6E-02	1.1E-06	9.0E-07	1.3E-11	8.6E-10	1.7E-10	
1,1-Dichloroethane	4		1.1E-01	1.4E-01	6.8E-02	4.0E-03	2.3E-02	2.3E-02	1.1E-01	8.8E-02	2.1E-06	1.7E-06	2.4E-11	1.6E-09	3.3E-10	
cis-1,2-Dichloroethene	95		2.6E+00	3.3E+00	1.6E+00	9.5E-02	5.5E-01	5.5E-01	2.6E+00	2.1E+00	5.0E-05	4.1E-05	5.8E-10	3.9E-08	7.9E-09	
Tetrachloroethene	2.7		7.3E-02	9.5E-02	4.6E-02	2.7E-03	1.6E-02	1.6E-02	7.3E-02	5.9E-02	1.4E-06	1.2E-06	1.6E-11	1.1E-09	2.2E-10	
Trichloroethene	3.6		9.7E-01	1.3E+00	6.1E-01	3.6E-02	2.1E-01	2.1E-01	9.7E-01	7.9E-01	1.9E-05	1.5E-05	2.2E-10	1.5E-08	3.0E-09	
Vinyl Chloride	1.7		4.6E-02	6.0E-02	2.9E-02	1.7E-03	9.9E-03	9.9E-03	4.6E-02	3.7E-02	9.0E-07	7.3E-07	1.0E-11	7.0E-10	1.4E-10	
Arsenic	23		6.2E-01	8.1E-01	3.9E-01	2.3E-02	1.3E-01	1.3E-01	6.2E-01	5.1E-01	1.2E-05	9.9E-06	1.4E-10	9.4E-09	1.9E-09	
Cobalt	21		5.7E-01	7.4E-01	3.6E-01	2.1E-02	1.2E-01	1.2E-01	5.7E-01	4.6E-01	1.1E-05	9.0E-06	1.3E-10	8.6E-09	1.7E-09	
<b>West Tank Farm</b>																
			6.80E-03	3.10E-04	2.00E-04	1.20E-05	5.80E-05	5.50E-05	2.80E-04	2.70E-04	5.30E-09	6.00E-09	8.60E-14	5.80E-12	1.20E-12	
1,1-Dichloroethane	3.2		2.2E-02	9.9E-04	6.4E-04	3.8E-05	1.9E-04	1.8E-04	9.0E-04	8.6E-04	1.7E-08	1.9E-08	2.8E-13	1.9E-11	3.8E-12	
Tetrachloroethene	175		1.2E+00	5.4E-02	3.5E-02	2.1E-03	1.0E-02	9.6E-03	4.9E-02	4.7E-02	9.3E-07	1.1E-06	1.6E-11	1.0E-09	2.1E-10	
Trichloroethene	212		1.4E+00	6.6E-02	4.2E-02	2.5E-03	1.2E-02	1.2E-02	5.9E-02	5.7E-02	1.1E-06	1.3E-06	1.8E-11	1.2E-09	2.5E-10	
<b>Box Sewer</b>																
			1.20E-02	5.50E-02	2.10E-02	1.30E-03	8.00E-03	8.30E-03	4.10E-02	3.10E-02	7.50E-07	5.80E-07	8.20E-12	5.50E-10	1.10E-10	
Tetrachloroethene	1306		1.6E+01	7.2E+01	2.7E+01	1.7E+00	1.0E+01	1.1E+01	5.4E+01	4.0E+01	9.8E-04	7.6E-04	1.1E-08	7.2E-07	1.4E-07	
Trichloroethene	429		5.1E+00	2.4E+01	9.0E+00	5.6E-01	3.4E+00	3.6E+00	1.8E+01	1.3E+01	3.2E-04	2.5E-04	3.5E-09	2.4E-07	4.7E-08	
<b>Process Sump Area</b>																
			2.80E-03	1.80E-02	6.00E-03	3.60E-04	2.40E-03	2.50E-03	1.40E-02	1.00E-02	2.40E-07	1.90E-07	2.80E-12	1.90E-10	3.80E-11	
1,1-Dichloroethane	6.7		1.9E-02	1.2E-01	4.0E-02	2.4E-03	1.6E-02	1.7E-02	9.4E-02	6.7E-02	1.6E-06	1.3E-06	1.9E-11	1.3E-09	2.5E-10	
cis-1,2-Dichloroethene	64		1.8E-01	1.2E+00	3.8E-01	2.3E-02	1.5E-01	1.6E-01	9.0E-01	6.4E-01	1.5E-05	1.2E-05	1.8E-10	1.2E-08	2.4E-09	
Tetrachloroethene	18627		5.2E+01	3.4E+02	1.1E+02	6.7E+00	4.5E+01	4.7E+01	2.6E+02	1.9E+02	4.5E-03	3.5E-03	5.2E-08	3.5E-06	7.1E-07	
Trichloroethene	9227		2.6E+01	1.7E+02	5.5E+01	3.3E+00	2.2E+01	2.3E+01	1.3E+02	9.2E+01	2.2E-03	1.8E-03	2.6E-08	1.8E-06	3.5E-07	
<b>Historic Fill Area</b>																
			5.70E-04	8.20E-04	4.50E-04	2.60E-05	1.50E-04	1.40E-04	5.40E-04	4.20E-04	1.20E-08	7.20E-09	1.00E-13	6.80E-12	1.40E-12	
cis-1,2-Dichloroethene	110		6.3E-02	9.0E-02	5.0E-02	2.9E-03	1.7E-02	1.5E-02	5.9E-02	4.6E-02	1.3E-06	7.9E-07	1.1E-11	7.5E-10	1.5E-10	
Tetrachloroethene	32		1.8E-02	2.6E-02	1.4E-02	8.3E-04	4.8E-03	4.5E-03	1.7E-02	1.3E-02	3.8E-07	2.3E-07	3.2E-12	2.2E-10	4.5E-11	
Trichloroethene	290		1.7E-01	2.4E-01	1.3E-01	7.5E-03	4.4E-02	4.1E-02	1.6E-01	1.2E-01	3.5E-06	2.1E-06	2.9E-11	2.0E-09	4.1E-10	
Vinyl Chloride	3.4		1.9E-03	2.8E-03	1.5E-03	8.8E-05	5.1E-04	4.8E-04	1.8E-03	1.4E-03	4.1E-08	2.4E-08	3.4E-13	2.3E-11	4.8E-12	
<b>Former Building 21</b>																
			5.10E-03	1.20E-03	9.60E-04	5.40E-05	2.60E-04	2.40E-04	7.70E-04	6.60E-04	2.00E-08	1.20E-08	1.60E-13	1.10E-11	2.20E-12	
1,1-Dichloroethane	12		6.1E-02	1.4E-02	1.2E-02	6.5E-04	3.1E-03	2.9E-03	9.2E-03	7.9E-03	2.4E-07	1.4E-07	1.9E-12	1.3E-10	2.6E-11	
cis-1,2-Dichloroethene	62		3.2E-01	7.4E-02	6.0E-02	3.3E-03	1.6E-02	1.5E-02	4.8E-02	4.1E-02	1.2E-06	7.4E-07	9.9E-12	6.8E-10	1.4E-10	
Tetrachloroethene	45		2.3E-01	5.4E-02	4.3E-02	2.4E-03	1.2E-02	1.1E-02	3.5E-02	3.0E-02	9.0E-07	5.4E-07	7.2E-12	5.0E-10	9.9E-11	
Trichloroethene	143		7.3E-01	1.7E-01	1.4E-01	7.7E-03	3.7E-02	3.4E-02	1.1E-01	9.4E-02	2.9E-06	1.7E-06	2.3E-11	1.6E-09	3.1E-10	

**Notes:**

[1] Dryden North - ON; Miami Shores - ON; West Carrollton - ON

[2] Identified in screening process through comparison to MCLs.

[3] Represents exposure point concentration (i.e., maximum or 95% upper confidence limit) of all wells associated with SWMU/AOI.

[4] Modeled dilution attenuation factor (DAF).

[5] Calculated: maximum concentration x DAF.

DN = Dryden North; MS = Miami Shores; WC = West Carrollton

POC = Point of Contact

**Table G-32**  
**Comparison of Groundwater Exposure Point Concentrations for Pumping Scenario #1 to MCLs <sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	MCL <sup>[2]</sup>	Estimated Concentration at POC (ug/L) <sup>[3]</sup>													
		Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field		
			DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>															
Benzene	5	3.6E-03	3.4E-02	6.5E-03	1.3E-03	3.6E-03	3.6E-02	3.4E-02	2.0E-02	1.6E-03	3.8E-04	1.1E-05	7.1E-05	3.4E-05	
1,1-Dichloroethane	NA	6.8E-03	6.4E-02	1.2E-02	2.4E-03	6.8E-03	6.8E-02	6.4E-02	3.8E-02	3.0E-03	7.2E-04	2.0E-05	1.4E-04	6.4E-05	
cis-1,2-Dichloroethene	70	1.6E-01	1.5E+00	2.9E-01	5.7E-02	1.6E-01	1.6E+00	1.5E+00	9.0E-01	7.1E-02	1.7E-02	4.8E-04	3.2E-03	1.5E-03	
Tetrachloroethene	5	4.6E-03	4.3E-02	8.4E-03	1.6E-03	4.6E-03	4.6E-02	4.3E-02	2.6E-02	2.0E-03	4.9E-04	1.4E-05	9.2E-05	4.3E-05	
Trichloroethene	5	6.1E-02	5.8E-01	1.1E-01	2.2E-02	6.1E-02	6.1E-01	5.8E-01	3.4E-01	2.7E-02	6.5E-03	1.8E-04	1.2E-03	5.8E-04	
Vinyl Chloride	2	2.9E-03	2.7E-02	5.3E-03	1.0E-03	2.9E-03	2.9E-02	2.7E-02	1.6E-02	1.3E-03	3.1E-04	8.7E-06	5.8E-05	2.7E-05	
Arsenic	10	3.9E-02	3.7E-01	7.1E-02	1.4E-02	3.9E-02	3.9E-01	3.7E-01	2.2E-01	1.7E-02	4.1E-03	1.2E-04	7.8E-04	3.7E-04	
Cobalt	NA	3.6E-02	3.4E-01	6.5E-02	1.3E-02	3.6E-02	3.6E-01	3.4E-01	2.0E-01	1.6E-02	3.8E-03	1.1E-04	7.1E-04	3.4E-04	
<b>West Tank Farm</b>															
1,1-Dichloroethane	NA	5.1E-02	2.7E-02	2.0E-02	6.4E-03	9.9E-03	1.2E-02	2.3E-02	1.9E-02	4.2E-03	1.3E-03	3.5E-05	2.2E-04	1.1E-04	
Tetrachloroethene	5	2.8E+00	1.5E+00	1.1E+00	3.5E-01	5.4E-01	6.5E-01	1.3E+00	1.0E+00	2.3E-01	7.2E-02	1.9E-03	1.2E-02	6.0E-03	
Trichloroethene	5	3.4E+00	1.8E+00	1.3E+00	4.2E-01	6.6E-01	7.8E-01	1.5E+00	1.2E+00	2.8E-01	8.7E-02	2.3E-03	1.4E-02	7.2E-03	
<b>Box Sewer</b>															
Tetrachloroethene	5	5.6E-01	<b>2.1E+01</b>	2.5E+00	4.2E-01	1.6E+00	3.3E+00	<b>2.1E+01</b>	<b>1.2E+01</b>	7.3E-01	1.7E-01	4.7E-03	3.1E-02	1.4E-02	
Trichloroethene	5	1.8E-01	<b>6.9E+00</b>	8.2E-01	1.4E-01	5.1E-01	1.1E+00	<b>6.9E+00</b>	4.0E+00	2.4E-01	5.6E-02	1.5E-03	1.0E-02	4.7E-03	
<b>Process Sump Area</b>															
1,1-Dichloroethane	NA	5.9E-04	2.9E-02	3.2E-03	5.4E-04	2.1E-03	4.6E-03	3.1E-02	1.7E-02	1.0E-03	2.3E-04	6.4E-06	4.3E-05	2.0E-05	
cis-1,2-Dichloroethene	70	5.6E-03	2.8E-01	3.1E-02	5.1E-03	2.0E-02	4.4E-02	2.9E-01	1.7E-01	9.6E-03	2.2E-03	6.1E-05	4.1E-04	1.9E-04	
Tetrachloroethene	5	1.6E+00	<b>8.0E+01</b>	<b>8.9E+00</b>	1.5E+00	<b>5.8E+00</b>	<b>1.3E+01</b>	<b>8.6E+01</b>	<b>4.8E+01</b>	2.8E+00	6.3E-01	1.8E-02	1.2E-01	5.6E-02	
Trichloroethene	5	8.1E-01	<b>4.0E+01</b>	4.4E+00	7.4E-01	2.9E+00	<b>6.3E+00</b>	<b>4.2E+01</b>	<b>2.4E+01</b>	1.4E+00	3.1E-01	8.8E-03	5.9E-02	2.8E-02	
<b>Historic Fill Area</b>															
cis-1,2-Dichloroethene	70	1.8E-02	7.0E-02	1.7E-02	3.9E-03	9.2E-03	1.5E-02	6.7E-02	4.2E-02	4.0E-03	1.0E-03	2.9E-05	1.9E-04	8.7E-05	
Tetrachloroethene	5	5.1E-03	2.0E-02	4.8E-03	1.1E-03	2.7E-03	4.5E-03	2.0E-02	1.2E-02	1.2E-03	3.0E-04	8.3E-06	5.4E-05	2.5E-05	
Trichloroethene	5	4.6E-02	1.9E-01	4.4E-02	1.0E-02	2.4E-02	4.1E-02	1.8E-01	1.1E-01	1.0E-02	2.7E-03	7.5E-05	4.9E-04	2.3E-04	
Vinyl Chloride	2	5.4E-04	2.2E-03	5.1E-04	1.2E-04	2.9E-04	4.8E-04	2.1E-03	1.3E-03	1.2E-04	3.2E-05	8.8E-07	5.8E-06	2.7E-06	
<b>Former Building 21</b>															
1,1-Dichloroethane	NA	2.3E-03	3.5E-02	7.9E-03	1.4E-03	4.3E-03	7.4E-03	3.2E-02	2.0E-02	1.8E-03	4.4E-04	1.2E-05	8.0E-05	3.7E-05	
cis-1,2-Dichloroethene	70	1.2E-02	1.8E-01	4.1E-02	7.4E-03	2.2E-02	3.8E-02	1.7E-01	1.1E-01	9.3E-03	2.3E-03	6.2E-05	4.2E-04	1.9E-04	
Tetrachloroethene	5	8.6E-03	1.3E-01	3.0E-02	5.4E-03	1.6E-02	2.8E-02	1.2E-01	7.7E-02	6.8E-03	1.7E-03	4.5E-05	3.0E-04	1.4E-04	
Trichloroethene	5	2.7E-02	4.1E-01	9.4E-02	1.7E-02	5.1E-02	8.9E-02	3.9E-01	2.4E-01	2.1E-02	5.3E-03	1.4E-04	9.6E-04	4.4E-04	
<b>Total Concentrations from All Sources</b>															
Benzene	5	3.6E-03	3.4E-02	6.5E-03	1.3E-03	3.6E-03	3.6E-02	3.4E-02	2.0E-02	1.6E-03	3.8E-04	1.1E-05	7.1E-05	3.4E-05	
1,1-Dichloroethane	NA	6.1E-02	1.5E-01	4.3E-02	1.1E-02	2.3E-02	9.2E-02	1.5E-01	9.4E-02	1.0E-02	2.7E-03	7.4E-05	4.8E-04	2.3E-04	
cis-1,2-Dichloroethene	70	2.0E-01	2.0E+00	3.8E-01	7.3E-02	2.1E-01	1.7E+00	2.0E+00	1.2E+00	9.4E-02	2.3E-02	6.4E-04	4.2E-03	2.0E-03	
Tetrachloroethene	5	5.0E+00	<b>1.0E+02</b>	<b>1.3E+01</b>	2.3E+00	<b>7.9E+00</b>	<b>1.7E+01</b>	<b>1.1E+02</b>	<b>6.2E+01</b>	3.8E+00	8.8E-01	2.4E-02	1.6E-01	7.6E-02	
Trichloroethene	5	4.5E+00	<b>4.9E+01</b>	<b>6.8E+00</b>	1.3E+00	4.2E+00	<b>8.9E+00</b>	<b>5.2E+01</b>	<b>3.0E+01</b>	2.0E+00	4.7E-01	1.3E-02	8.6E-02	4.1E-02	
Vinyl Chloride	2	3.4E-03	2.9E-02	5.8E-03	1.1E-03	3.2E-03	2.9E-02	2.9E-02	1.7E-02	1.4E-03	3.4E-04	9.6E-06	6.4E-05	3.0E-05	
Arsenic	10	3.9E-02	3.7E-01	7.1E-02	1.4E-02	3.9E-02	3.9E-01	3.7E-01	2.2E-01	1.7E-02	4.1E-03	1.2E-04	7.8E-04	3.7E-04	
Cobalt	NA	3.6E-02	3.4E-01	6.5E-02	1.3E-02	3.6E-02	3.6E-01	3.4E-01	2.0E-01	1.6E-02	3.8E-03	1.1E-04	7.1E-04	3.4E-04	

Notes:  
[1] Dryden North - OFF; Miami Shores - OFF; West Carrollton - ON  
[2] MCL = Maximum Contaminant Level  
[3] DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact  
Bolded and shaded cells indicate concentration exceeds MCL.

**Table G-33**  
**Comparison of Groundwater Exposure Point Concentrations for Pumping Scenario #2 to MCLs <sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	MCL <sup>[2]</sup>	Estimated Concentration at POC (ug/L) <sup>[3]</sup>													
		Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field		
			DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>															
Benzene	5	1.1E-03	5.3E-02	7.6E-03	5.5E-04	4.6E-03	6.5E-03	5.7E-02	4.8E-02	7.8E-06	2.7E-06	2.5E-10	1.1E-08	2.5E-09	
1,1-Dichloroethane	NA	2.2E-03	1.0E-01	1.4E-02	1.0E-03	8.8E-03	1.2E-02	1.1E-01	9.2E-02	1.5E-05	5.2E-06	4.8E-10	2.0E-08	4.8E-09	
cis-1,2-Dichloroethene	70	5.1E-02	2.4E+00	3.4E-01	2.5E-02	2.1E-01	2.9E-01	2.6E+00	2.2E+00	3.5E-04	1.2E-04	1.1E-08	4.8E-07	1.1E-07	
Tetrachloroethene	5	1.5E-03	6.8E-02	9.7E-03	7.0E-04	5.9E-03	8.4E-03	7.3E-02	6.2E-02	1.0E-05	3.5E-06	3.2E-10	1.4E-08	3.2E-09	
Trichloroethene	5	1.9E-02	9.0E-01	1.3E-01	9.4E-03	7.9E-02	1.1E-01	9.7E-01	8.3E-01	1.3E-04	4.7E-05	4.3E-09	1.8E-07	4.3E-08	
Vinyl Chloride	2	9.2E-04	4.3E-02	6.1E-03	4.4E-04	3.7E-03	5.3E-03	4.6E-02	3.9E-02	6.3E-06	2.2E-06	2.0E-10	8.5E-09	2.0E-09	
Arsenic	10	1.2E-02	5.8E-01	8.3E-02	6.0E-03	5.1E-02	7.1E-02	6.2E-01	5.3E-01	8.5E-05	3.0E-05	2.8E-09	1.2E-07	2.8E-08	
Cobalt	NA	1.1E-02	5.3E-01	7.6E-02	5.5E-03	4.6E-02	6.5E-02	5.7E-01	4.8E-01	7.8E-05	2.7E-05	2.5E-09	1.1E-07	2.5E-08	
<b>West Tank Farm</b>															
1,1-Dichloroethane	NA	1.6E-02	1.5E-02	8.6E-03	6.7E-04	2.9E-03	2.9E-03	8.3E-03	5.8E-03	2.6E-06	2.8E-07	2.1E-11	8.0E-10	2.0E-10	
Tetrachloroethene	5	8.6E-01	8.1E-01	4.7E-01	3.7E-02	1.6E-01	1.6E-01	4.6E-01	3.2E-01	1.4E-04	1.6E-05	1.2E-09	4.4E-08	1.1E-08	
Trichloroethene	5	1.0E+00	9.8E-01	5.7E-01	4.5E-02	1.9E-01	1.9E-01	5.5E-01	3.8E-01	1.7E-04	1.9E-05	1.4E-09	5.3E-08	1.3E-08	
<b>Box Sewer</b>															
Tetrachloroethene	5	1.3E-02	<b>2.6E+01</b>	1.6E+00	1.3E-01	1.6E+00	2.6E+00	<b>3.7E+01</b>	<b>3.3E+01</b>	3.8E-03	2.0E-03	1.8E-07	7.7E-06	1.8E-06	
Trichloroethene	5	4.2E-03	<b>8.6E+00</b>	5.1E-01	4.3E-02	5.1E-01	8.6E-01	<b>1.2E+01</b>	<b>1.1E+01</b>	1.2E-03	6.4E-04	6.0E-08	2.5E-06	6.0E-07	
<b>Process Sump Area</b>															
1,1-Dichloroethane	NA	1.1E-05	3.5E-02	1.9E-03	1.7E-04	1.9E-03	3.5E-03	5.3E-02	4.8E-02	5.4E-06	2.9E-06	2.8E-10	1.1E-08	2.8E-09	
cis-1,2-Dichloroethene	70	1.1E-04	3.3E-01	1.8E-02	1.6E-03	1.9E-02	3.3E-02	5.1E-01	4.6E-01	5.1E-05	2.8E-05	2.7E-09	1.1E-07	2.7E-08	
Tetrachloroethene	5	3.2E-02	<b>9.7E+01</b>	<b>5.2E+00</b>	4.7E-01	<b>5.4E+00</b>	<b>9.7E+00</b>	<b>1.5E+02</b>	<b>1.3E+02</b>	1.5E-02	8.2E-03	7.8E-07	3.2E-05	7.8E-06	
Trichloroethene	5	1.6E-02	<b>4.8E+01</b>	2.6E+00	2.3E-01	2.7E+00	4.8E+00	<b>7.3E+01</b>	<b>6.6E+01</b>	7.4E-03	4.1E-03	3.9E-07	1.6E-05	3.9E-06	
<b>Historic Fill Area</b>															
cis-1,2-Dichloroethene	70	3.1E-03	6.8E-02	8.3E-03	6.4E-04	5.6E-03	8.0E-03	7.6E-02	5.8E-02	9.8E-06	3.3E-06	3.1E-10	1.2E-08	3.0E-09	
Tetrachloroethene	5	9.0E-04	2.0E-02	2.4E-03	1.9E-04	1.6E-03	2.3E-03	2.2E-02	1.7E-02	2.8E-06	9.6E-07	9.0E-11	3.5E-09	8.6E-10	
Trichloroethene	5	8.1E-03	1.8E-01	2.2E-02	1.7E-03	1.5E-02	2.1E-02	2.0E-01	1.5E-01	2.6E-05	8.7E-06	8.1E-10	3.2E-08	7.8E-09	
Vinyl Chloride	2	9.5E-05	2.1E-03	2.6E-04	2.0E-05	1.7E-04	2.5E-04	2.3E-03	1.8E-03	3.0E-07	1.0E-07	9.5E-12	3.7E-10	9.2E-11	
<b>Former Building 21</b>															
1,1-Dichloroethane	NA	3.5E-04	4.1E-02	7.6E-03	5.4E-04	4.4E-03	5.6E-03	3.4E-02	2.3E-02	5.9E-06	1.2E-06	9.4E-11	4.0E-09	9.5E-10	
cis-1,2-Dichloroethene	70	1.8E-03	2.1E-01	3.9E-02	2.8E-03	2.3E-02	2.9E-02	1.7E-01	1.2E-01	3.0E-05	6.0E-06	4.8E-10	2.0E-08	4.9E-09	
Tetrachloroethene	5	1.3E-03	1.5E-01	2.8E-02	2.0E-03	1.7E-02	2.1E-02	1.3E-01	8.6E-02	2.2E-05	4.4E-06	3.5E-10	1.5E-08	3.6E-09	
Trichloroethene	5	4.1E-03	4.9E-01	9.0E-02	6.4E-03	5.3E-02	6.7E-02	4.0E-01	2.7E-01	7.0E-05	1.4E-05	1.1E-09	4.7E-08	1.1E-08	
<b>Total Concentrations from All Sources</b>															
Benzene	5	1.1E-03	5.3E-02	7.6E-03	5.5E-04	4.6E-03	6.5E-03	5.7E-02	4.8E-02	7.8E-06	2.7E-06	2.5E-10	1.1E-08	2.5E-09	
1,1-Dichloroethane	NA	1.8E-02	1.9E-01	3.2E-02	2.4E-03	1.8E-02	2.4E-02	2.0E-01	1.7E-01	2.9E-05	9.6E-06	8.8E-10	3.6E-08	8.8E-09	
cis-1,2-Dichloroethene	70	5.6E-02	3.0E+00	4.1E-01	3.0E-02	2.6E-01	3.6E-01	3.3E+00	2.8E+00	4.4E-04	1.6E-04	1.5E-08	6.2E-07	1.5E-07	
Tetrachloroethene	5	9.1E-01	<b>1.2E+02</b>	<b>7.3E+00</b>	6.4E-01	<b>7.2E+00</b>	<b>1.2E+01</b>	<b>1.8E+02</b>	<b>1.7E+02</b>	1.9E-02	1.0E-02	9.7E-07	3.9E-05	9.7E-06	
Trichloroethene	5	1.1E+00	<b>5.9E+01</b>	3.9E+00	3.4E-01	3.5E+00	<b>6.0E+00</b>	<b>8.7E+01</b>	<b>7.9E+01</b>	9.0E-03	4.8E-03	4.6E-07	1.9E-05	4.6E-06	
Vinyl Chloride	2	1.0E-03	4.5E-02	6.4E-03	4.6E-04	3.9E-03	5.6E-03	4.8E-02	4.1E-02	6.6E-06	2.3E-06	2.1E-10	8.9E-09	2.1E-09	
Arsenic	10	1.2E-02	5.8E-01	8.3E-02	6.0E-03	5.1E-02	7.1E-02	6.2E-01	5.3E-01	8.5E-05	3.0E-05	2.8E-09	1.2E-07	2.8E-08	
Cobalt	NA	1.1E-02	5.3E-01	7.6E-02	5.5E-03	4.6E-02	6.5E-02	5.7E-01	4.8E-01	7.8E-05	2.7E-05	2.5E-09	1.1E-07	2.5E-08	

Notes:  
[1] Dryden North - OFF; Miami Shores - ON; West Carrollton - ON  
[2] MCL = Maximum Contaminant Level  
[3] DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact  
Bolded and shaded cells indicate concentration exceeds MCL.

**Table G-34**  
**Comparison of Groundwater Exposure Point Concentrations for Pumping Scenario #3 to MCLs <sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	MCL <sup>[2]</sup>	Estimated Concentration at POC (ug/L) <sup>[3]</sup>													
		Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field		
			DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>															
Benzene	5	7.6E-02	6.5E-02	2.7E-02	4.6E-03	1.1E-02	1.7E-02	5.7E-02	3.8E-02	4.0E-03	9.5E-04	1.4E-05	1.1E-04	4.8E-05	
1,1-Dichloroethane	NA	1.4E-01	1.2E-01	5.2E-02	8.8E-03	2.2E-02	3.2E-02	1.1E-01	7.2E-02	7.6E-03	1.8E-03	2.6E-05	2.0E-04	9.2E-05	
cis-1,2-Dichloroethene	70	3.4E+00	2.9E+00	1.2E+00	2.1E-01	5.1E-01	7.7E-01	2.6E+00	1.7E+00	1.8E-01	4.3E-02	6.2E-04	4.8E-03	2.2E-03	
Tetrachloroethene	5	9.7E-02	8.4E-02	3.5E-02	5.9E-03	1.5E-02	2.2E-02	7.3E-02	4.9E-02	5.1E-03	1.2E-03	1.8E-05	1.4E-04	6.2E-05	
Trichloroethene	5	1.3E+00	1.1E+00	4.7E-01	7.9E-02	1.9E-01	2.9E-01	9.7E-01	6.5E-01	6.8E-02	1.6E-02	2.3E-04	1.8E-03	8.3E-04	
Vinyl Chloride	2	6.1E-02	5.3E-02	2.2E-02	3.7E-03	9.2E-03	1.4E-02	4.6E-02	3.1E-02	3.2E-03	7.7E-04	1.1E-05	8.7E-05	3.9E-05	
Arsenic	10	8.3E-01	7.1E-01	3.0E-01	5.1E-02	1.2E-01	1.9E-01	6.2E-01	4.1E-01	4.4E-02	1.0E-02	1.5E-04	1.2E-03	5.3E-04	
Cobalt	NA	7.6E-01	6.5E-01	2.7E-01	4.6E-02	1.1E-01	1.7E-01	5.7E-01	3.8E-01	4.0E-02	9.5E-03	1.4E-04	1.1E-03	4.8E-04	
<b>West Tank Farm</b>															
1,1-Dichloroethane	NA	2.4E-02	2.0E-03	7.7E-04	1.3E-04	3.2E-04	5.1E-04	1.8E-03	1.2E-03	1.2E-04	2.8E-05	4.2E-07	3.2E-06	1.4E-06	
Tetrachloroethene	5	1.3E+00	1.1E-01	4.2E-02	7.0E-03	1.8E-02	2.8E-02	1.0E-01	6.5E-02	6.3E-03	1.5E-03	2.3E-05	1.8E-04	7.9E-05	
Trichloroethene	5	1.6E+00	1.4E-01	5.1E-02	8.5E-03	2.1E-02	3.4E-02	1.2E-01	7.8E-02	7.6E-03	1.8E-03	2.8E-05	2.1E-04	9.5E-05	
<b>Box Sewer</b>															
Tetrachloroethene	5	<b>5.2E+01</b>	<b>7.4E+01</b>	<b>2.9E+01</b>	5.0E+00	<b>1.3E+01</b>	<b>1.8E+01</b>	<b>6.4E+01</b>	<b>4.3E+01</b>	4.3E+00	1.0E+00	1.4E-02	1.2E-01	5.2E-02	
Trichloroethene	5	<b>1.7E+01</b>	<b>2.4E+01</b>	<b>9.4E+00</b>	1.6E+00	4.1E+00	<b>6.0E+00</b>	<b>2.1E+01</b>	<b>1.4E+01</b>	1.4E+00	3.4E-01	4.7E-03	3.9E-02	1.7E-02	
<b>Process Sump Area</b>															
1,1-Dichloroethane	NA	7.4E-02	1.3E-01	5.2E-02	8.7E-03	2.2E-02	3.4E-02	1.2E-01	8.0E-02	8.0E-03	1.8E-03	2.6E-05	2.1E-04	9.4E-05	
cis-1,2-Dichloroethene	70	7.0E-01	1.3E+00	4.9E-01	8.3E-02	2.1E-01	3.2E-01	1.2E+00	7.7E-01	7.7E-02	1.7E-02	2.5E-04	2.0E-03	9.0E-04	
Tetrachloroethene	5	<b>2.0E+02</b>	<b>3.7E+02</b>	<b>1.4E+02</b>	<b>2.4E+01</b>	<b>6.1E+01</b>	<b>9.3E+01</b>	<b>3.4E+02</b>	<b>2.2E+02</b>	<b>2.2E+01</b>	<b>5.0E+00</b>	7.3E-02	5.8E-01	2.6E-01	
Trichloroethene	5	<b>1.0E+02</b>	<b>1.8E+02</b>	<b>7.1E+01</b>	<b>1.2E+01</b>	<b>3.0E+01</b>	<b>4.6E+01</b>	<b>1.7E+02</b>	<b>1.1E+02</b>	<b>1.1E+01</b>	2.5E+00	3.6E-02	2.9E-01	1.3E-01	
<b>Historic Fill Area</b>															
cis-1,2-Dichloroethene	70	1.3E-01	5.5E-02	2.6E-02	4.5E-03	1.1E-02	1.5E-02	4.7E-02	3.3E-02	3.6E-03	8.9E-04	1.3E-05	1.0E-04	4.5E-05	
Tetrachloroethene	5	3.8E-02	1.6E-02	7.7E-03	1.3E-03	3.1E-03	4.5E-03	1.4E-02	9.6E-03	1.1E-03	2.6E-04	3.8E-06	2.9E-05	1.3E-05	
Trichloroethene	5	3.5E-01	1.5E-01	7.0E-02	1.2E-02	2.8E-02	4.1E-02	1.2E-01	8.7E-02	9.6E-03	2.3E-03	3.5E-05	2.6E-04	1.2E-04	
Vinyl Chloride	2	4.1E-03	1.7E-03	8.2E-04	1.4E-04	3.3E-04	4.8E-04	1.5E-03	1.0E-03	1.1E-04	2.8E-05	4.1E-07	3.1E-06	1.4E-06	
<b>Former Building 21</b>															
1,1-Dichloroethane	NA	6.1E-02	4.8E-03	2.4E-03	4.3E-04	1.0E-03	1.4E-03	4.1E-03	2.9E-03	3.4E-04	8.4E-05	1.2E-06	9.5E-06	4.3E-06	
cis-1,2-Dichloroethene	70	3.2E-01	2.5E-02	1.2E-02	2.2E-03	5.2E-03	7.4E-03	2.1E-02	1.5E-02	1.7E-03	4.3E-04	6.2E-06	4.9E-05	2.2E-05	
Tetrachloroethene	5	2.3E-01	1.8E-02	9.0E-03	1.6E-03	3.8E-03	5.4E-03	1.5E-02	1.1E-02	1.3E-03	3.2E-04	4.5E-06	3.6E-05	1.6E-05	
Trichloroethene	5	7.3E-01	5.7E-02	2.9E-02	5.1E-03	1.2E-02	1.7E-02	4.9E-02	3.4E-02	4.0E-03	1.0E-03	1.4E-05	1.1E-04	5.1E-05	
<b>Total Concentrations from All Sources</b>															
Benzene	5	7.6E-02	6.5E-02	2.7E-02	4.6E-03	1.1E-02	1.7E-02	5.7E-02	3.8E-02	4.0E-03	9.5E-04	1.4E-05	1.1E-04	4.8E-05	
1,1-Dichloroethane	NA	3.0E-01	2.6E-01	1.1E-01	1.8E-02	4.5E-02	6.8E-02	2.3E-01	1.6E-01	1.6E-02	3.7E-03	5.4E-05	4.2E-04	1.9E-04	
cis-1,2-Dichloroethene	70	4.6E+00	4.3E+00	1.8E+00	3.0E-01	7.4E-01	1.1E+00	3.8E+00	2.5E+00	2.6E-01	6.1E-02	8.9E-04	7.0E-03	3.1E-03	
Tetrachloroethene	5	<b>2.6E+02</b>	<b>4.5E+02</b>	<b>1.7E+02</b>	<b>2.9E+01</b>	<b>7.4E+01</b>	<b>1.1E+02</b>	<b>4.0E+02</b>	<b>2.7E+02</b>	<b>2.7E+01</b>	<b>6.1E+00</b>	8.7E-02	7.0E-01	3.1E-01	
Trichloroethene	5	<b>1.2E+02</b>	<b>2.1E+02</b>	<b>8.1E+01</b>	<b>1.4E+01</b>	<b>3.5E+01</b>	<b>5.3E+01</b>	<b>1.9E+02</b>	<b>1.3E+02</b>	<b>1.3E+01</b>	2.9E+00	4.1E-02	3.3E-01	1.5E-01	
Vinyl Chloride	2	6.5E-02	5.4E-02	2.3E-02	3.9E-03	9.5E-03	1.4E-02	4.7E-02	3.2E-02	3.3E-03	7.9E-04	1.1E-05	9.0E-05	4.0E-05	
Arsenic	10	8.3E-01	7.1E-01	3.0E-01	5.1E-02	1.2E-01	1.9E-01	6.2E-01	4.1E-01	4.4E-02	1.0E-02	1.5E-04	1.2E-03	5.3E-04	
Cobalt	NA	7.6E-01	6.5E-01	2.7E-01	4.6E-02	1.1E-01	1.7E-01	5.7E-01	3.8E-01	4.0E-02	9.5E-03	1.4E-04	1.1E-03	4.8E-04	

Notes:  
[1] Dryden North - ON; Miami Shores - OFF; West Carrollton - ON  
[2] MCL = Maximum Contaminant Level  
[3] DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact  
Bolded and shaded cells indicate concentration exceeds MCL.

**Table G-35**  
**Comparison of Groundwater Exposure Point Concentrations for Pumping Scenario #4 to MCLs <sup>[1]</sup>**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent of Potential Concern <sup>[2]</sup>	MCL <sup>[2]</sup>	Estimated Concentration at POC (ug/L) <sup>[3]</sup>													
		Dryden North Well	Miami Shores Wellfield										West Carrollton Well Field		
			DN-13	MS-14	MS-15	MS-16	MS-17	MS-18	MS-19	MS-20	MS-21	MS-22	WC-1	WC-3	WC-4
<b>Landfill L1</b>															
Benzene	5	5.7E-02	7.4E-02	3.6E-02	2.1E-03	1.2E-02	1.2E-02	5.7E-02	4.6E-02	1.1E-06	9.0E-07	1.3E-11	8.6E-10	1.7E-10	
1,1-Dichloroethane	NA	1.1E-01	1.4E-01	6.8E-02	4.0E-03	2.3E-02	2.3E-02	1.1E-01	8.8E-02	2.1E-06	1.7E-06	2.4E-11	1.6E-09	3.3E-10	
cis-1,2-Dichloroethene	70	2.6E+00	3.3E+00	1.6E+00	9.5E-02	5.5E-01	5.5E-01	2.6E+00	2.1E+00	5.0E-05	4.1E-05	5.8E-10	3.9E-08	7.9E-09	
Tetrachloroethene	5	7.3E-02	9.5E-02	4.6E-02	2.7E-03	1.6E-02	1.6E-02	7.3E-02	5.9E-02	1.4E-06	1.2E-06	1.6E-11	1.1E-09	2.2E-10	
Trichloroethene	5	9.7E-01	1.3E+00	6.1E-01	3.6E-02	2.1E-01	2.1E-01	9.7E-01	7.9E-01	1.9E-05	1.5E-05	2.2E-10	1.5E-08	3.0E-09	
Vinyl Chloride	2	4.6E-02	6.0E-02	2.9E-02	1.7E-03	9.9E-03	9.9E-03	4.6E-02	3.7E-02	9.0E-07	7.3E-07	1.0E-11	7.0E-10	1.4E-10	
Arsenic	10	6.2E-01	8.1E-01	3.9E-01	2.3E-02	1.3E-01	1.3E-01	6.2E-01	5.1E-01	1.2E-05	9.9E-06	1.4E-10	9.4E-09	1.9E-09	
Cobalt	NA	5.7E-01	7.4E-01	3.6E-01	2.1E-02	1.2E-01	1.2E-01	5.7E-01	4.6E-01	1.1E-05	9.0E-06	1.3E-10	8.6E-09	1.7E-09	
<b>West Tank Farm</b>															
1,1-Dichloroethane	NA	2.2E-02	9.9E-04	6.4E-04	3.8E-05	1.9E-04	1.8E-04	9.0E-04	8.6E-04	1.7E-08	1.9E-08	2.8E-13	1.9E-11	3.8E-12	
Tetrachloroethene	5	1.2E+00	5.4E-02	3.5E-02	2.1E-03	1.0E-02	9.6E-03	4.7E-02	4.9E-02	9.3E-07	1.1E-06	1.5E-11	1.0E-09	2.1E-10	
Trichloroethene	5	1.4E+00	6.6E-02	4.2E-02	2.5E-03	1.2E-02	1.2E-02	5.9E-02	5.7E-02	1.1E-06	1.3E-06	1.8E-11	1.2E-09	2.5E-10	
<b>Box Sewer</b>															
Tetrachloroethene	5	<b>1.6E+01</b>	<b>7.2E+01</b>	<b>2.7E+01</b>	1.7E+00	<b>1.0E+01</b>	<b>1.1E+01</b>	<b>5.4E+01</b>	<b>4.0E+01</b>	9.8E-04	7.6E-04	1.1E-08	7.2E-07	1.4E-07	
Trichloroethene	5	<b>5.1E+00</b>	<b>2.4E+01</b>	<b>9.0E+00</b>	5.6E-01	3.4E+00	3.6E+00	<b>1.8E+01</b>	<b>1.3E+01</b>	3.2E-04	2.5E-04	3.5E-09	2.4E-07	4.7E-08	
<b>Process Sump Area</b>															
1,1-Dichloroethane	NA	1.9E-02	1.2E-01	4.0E-02	2.4E-03	1.6E-02	1.7E-02	9.4E-02	6.7E-02	1.6E-06	1.3E-06	1.9E-11	1.3E-09	2.5E-10	
cis-1,2-Dichloroethene	70	1.8E-01	1.2E+00	3.8E-01	2.3E-02	1.5E-01	1.6E-01	9.0E-01	6.4E-01	1.5E-05	1.2E-05	1.8E-10	1.2E-08	2.4E-09	
Tetrachloroethene	5	<b>5.2E+01</b>	<b>3.4E+02</b>	<b>1.1E+02</b>	<b>6.7E+00</b>	<b>4.5E+01</b>	<b>4.7E+01</b>	<b>2.6E+02</b>	<b>1.9E+02</b>	4.5E-03	3.5E-03	5.2E-08	3.5E-06	7.1E-07	
Trichloroethene	5	<b>2.6E+01</b>	<b>1.7E+02</b>	<b>5.5E+01</b>	3.3E+00	<b>2.2E+01</b>	<b>2.3E+01</b>	<b>1.3E+02</b>	<b>9.2E+01</b>	2.2E-03	1.8E-03	2.6E-08	1.8E-06	3.5E-07	
<b>Historic Fill Area</b>															
cis-1,2-Dichloroethene	70	6.3E-02	9.0E-02	5.0E-02	2.9E-03	1.7E-02	1.5E-02	5.9E-02	4.6E-02	1.3E-06	7.9E-07	1.1E-11	7.5E-10	1.5E-10	
Tetrachloroethene	5	1.8E-02	2.6E-02	1.4E-02	8.3E-04	4.8E-03	4.5E-03	1.7E-02	1.3E-02	3.8E-07	2.3E-07	3.2E-12	2.2E-10	4.5E-11	
Trichloroethene	5	1.7E-01	2.4E-01	1.3E-01	7.5E-03	4.4E-02	4.1E-02	1.6E-01	1.2E-01	3.5E-06	2.1E-06	2.9E-11	2.0E-09	4.1E-10	
Vinyl Chloride	2	1.9E-03	2.8E-03	1.5E-03	8.8E-05	5.1E-04	4.8E-04	1.8E-03	1.4E-03	4.1E-08	2.4E-08	3.4E-13	2.3E-11	4.8E-12	
<b>Former Building 21</b>															
1,1-Dichloroethane	NA	6.1E-02	1.4E-02	1.2E-02	6.5E-04	3.1E-03	2.9E-03	9.2E-03	7.9E-03	2.4E-07	1.4E-07	1.9E-12	1.3E-10	2.6E-11	
cis-1,2-Dichloroethene	70	3.2E-01	7.4E-02	6.0E-02	3.3E-03	1.6E-02	1.5E-02	4.8E-02	4.1E-02	1.2E-06	7.4E-07	9.9E-12	6.8E-10	1.4E-10	
Tetrachloroethene	5	2.3E-01	5.4E-02	4.3E-02	2.4E-03	1.2E-02	1.1E-02	3.5E-02	3.0E-02	9.0E-07	5.4E-07	7.2E-12	5.0E-10	9.9E-11	
Trichloroethene	5	7.3E-01	1.7E-01	1.4E-01	7.7E-03	3.7E-02	3.4E-02	1.1E-01	9.4E-02	2.9E-06	1.7E-06	2.3E-11	1.6E-09	3.1E-10	
<b>Total Concentrations from All Sources</b>															
Benzene	5	5.7E-02	7.4E-02	3.6E-02	2.1E-03	1.2E-02	1.2E-02	5.7E-02	4.6E-02	1.1E-06	9.0E-07	1.3E-11	8.6E-10	1.7E-10	
1,1-Dichloroethane	NA	2.1E-01	2.8E-01	1.2E-01	7.1E-03	4.3E-02	4.3E-02	2.1E-01	1.6E-01	4.0E-06	3.2E-06	4.5E-11	3.1E-09	6.2E-10	
cis-1,2-Dichloroethene	70	3.1E+00	4.6E+00	2.1E+00	1.2E-01	7.4E-01	7.4E-01	3.6E+00	2.8E+00	6.8E-05	5.5E-05	7.8E-10	5.3E-08	1.1E-08	
Tetrachloroethene	5	<b>6.9E+01</b>	<b>4.1E+02</b>	<b>1.4E+02</b>	<b>8.4E+00</b>	<b>5.5E+01</b>	<b>5.7E+01</b>	<b>3.1E+02</b>	<b>2.3E+02</b>	<b>5.5E-03</b>	<b>4.3E-03</b>	6.3E-08	4.3E-06	8.5E-07	
Trichloroethene	5	<b>3.4E+01</b>	<b>1.9E+02</b>	<b>6.5E+01</b>	<b>3.9E+00</b>	<b>2.6E+01</b>	<b>2.7E+01</b>	<b>1.5E+02</b>	<b>1.1E+02</b>	<b>2.6E-03</b>	2.0E-03	3.0E-08	2.0E-06	4.0E-07	
Vinyl Chloride	2	4.8E-02	6.2E-02	3.0E-02	1.8E-03	1.0E-02	1.0E-02	4.8E-02	3.9E-02	9.4E-07	7.6E-07	1.1E-11	7.2E-10	1.5E-10	
Arsenic	10	6.2E-01	8.1E-01	3.9E-01	2.3E-02	1.3E-01	1.3E-01	6.2E-01	5.1E-01	1.2E-05	9.9E-06	1.4E-10	9.4E-09	1.9E-09	
Cobalt	NA	5.7E-01	7.4E-01	3.6E-01	2.1E-02	1.2E-01	1.2E-01	5.7E-01	4.6E-01	1.1E-05	9.0E-06	1.3E-10	8.6E-09	1.7E-09	

Notes:  
[1] Dryden North - ON; Miami Shores - ON; West Carrollton - ON  
[2] MCL = Maximum Contaminant Level  
[3] DN = Dryden North; MS = Miami Shores; WC = West Carrollton  
POC = Point of Contact  
Bolded and shaded cells indicate concentration exceeds MCL.

**Table G-36**  
**Exposure Point Concentrations - Soil**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Receptor: Worker

Investigation Area COPC	EPC <sup>[1]</sup> Units	Landfill L1 (waste) EPC type <sup>[2]</sup>	Landfill L1 (native) EPC type <sup>[2]</sup>	West Tank Farm EPC type <sup>[2]</sup>	Box Sewer	Process Sump Area EPC type <sup>[2]</sup>	Historic Fill Area	Former Building 21
Benzene	mg/kg	NA	NA	2.9E+01 U	NA	NA	NA	NA
Ethylbenzene	mg/kg	4.8E+02 U	1.6E+01 U	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	NA	NA	NA	NA	6.6E+02 U	NA	NA
Trichloroethene	mg/kg	2.1E+01 U	NA	NA	NA	6.9E+01 U	NA	NA
Xylenes	mg/kg	1.8E+03 U	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/kg	6.8E+00 X	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/kg	5.4E+00 X	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/kg	1.1E+01 X	NA	NA	NA	NA	NA	NA
Aroclor 1254	mg/kg	1.7E+01 U	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	3.6E+01 U	NA	4.6E+00 X	NA	NA	NA	NA
Chromium	mg/kg	2.2E+02 U	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6.5E+02 U	NA	NA	NA	NA	NA	NA
Lead	mg/kg	5.0E+02 M	NA	NA	NA	NA	NA	NA

Notes:

EPC = Exposure Point Concentration

mg/kg = milligrams per kilogram

NA = not applicable or not available

Table contains selected COPCs only.

UCL calculations were performed using ProUCL version 4.1.00 (2010), developed by Lockheed-Martin for USEPA.

[1] The EPC is the ProUCL recommended 95%UCL, or the maximum detected value when a UCL could not be calculated.

[2] EPC type: U = 95% UCL, X = Maximum, M = Mean

**Table G-37**  
**Exposure Point Concentrations - Groundwater**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Receptor: Worker, Resident?

Investigation Area COPC	EPC <sup>[1]</sup> Units	Landfill L1 EPC type <sup>[2]</sup>	West Tank Farm EPC type <sup>[2]</sup>	Box Sewer EPC type <sup>[2]</sup>	Process Sump Area EPC type <sup>[2]</sup>	Historic Fill Area EPC type <sup>[2]</sup>	Former Building 21 EPC type <sup>[2]</sup>
Benzene	ug/L	2.1 U	NA	NA	NA	NA	NA
1,1-Dichloroethane	ug/L	4.0 U	3.2 X	NA	6.7 X	NA	12 U
cis-1,2-Dichloroethene	ug/L	95 U	NA	NA	64 U	75.5 U	62 U
Tetrachloroethene	ug/L	2.7 U	175 U	1306 U	18627 U	28.1 U	45 U
Trichloroethene	ug/L	36 U	212 U	429 U	9227 U	221 U	143 U
Vinyl Chloride	ug/L	1.7 U	NA	NA	NA	3.4 X	NA
Arsenic	ug/L	23 X	NA	NA	NA	NA	NA
Cobalt	ug/L	21 X	NA	NA	NA	NA	NA

Notes:

EPC = Exposure Point Concentration

NA = not applicable or not available

ug/L = micrograms per liter

Table contains selected COPCs only.

UCL calculations were performed using ProUCL version 4.1.00 (2010), developed by Lockheed-Martin for USEPA.

[1] The EPC is the ProUCL recommended 95%UCL, or the maximum detected value when a UCL could not be calculated.

[2] EPC type: U = 95% UCL, X = Maximum, M = Mean

Offsite GW pumping scenario EPCs are presented on a well-specific basis on next table.

**Table G-38**  
**Exposure Point Concentrations: Off-Site Wells - Pumping Scenarios**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Receptor: Off-Site Resident

Well ID	COPC: Pumping Scenario: Units	Tetrachloroethene PS1	Trichloroethene PS1	Tetrachloroethene PS2	Trichloroethene PS2	Tetrachloroethene PS3	Trichloroethene PS3	Tetrachloroethene PS4	Trichloroethene PS4
DN-13	ug/L	NA	NA	NA	NA	259	123	69	34
MS-14	ug/L	103	49	124	59	447	210	407	191
MS-15	ug/L	13	7	7	NA	172	81	139	65
MS-16	ug/L	NA	NA	NA	NA	29	14	8	4
MS-17	ug/L	8	NA	7	NA	74	35	55	26
MS-18	ug/L	17	9	12	6	111	53	57	27
MS-19	ug/L	108	52	184	87	399	188	314	148
MS-20	ug/L	62	30	167	79	267	126	227	107
MS-21	ug/L	NA	NA	NA	NA	27	13	0.005	0.003
MS-22	ug/L	NA	NA	NA	NA	6	NA	0.004	NA

Notes:  
 PS1 = Pumping Scenario 1; PS2 - Pumping Scenario 2; PS3 - Pumping Scenario 3; PS4 - Pumping Scenario 4  
 EPC = Exposure Point Concentration  
 NA = not applicable  
 ug/L = micrograms per liter  
 Table contains selected COPCs only (total modeled concentrations that exceed the MCL for each Pumping Scenario)

**Table G-39**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Potable Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT
		CF		Conversion Factor	1.00E-03	mg/ug	--		
				IRg	Groundwater Ingestion Rate	2.8	L/day	USEPA 2011 [a]	
				EF	Exposure Frequency	350	days/year	USEPA 1989; 1991	
				ED	Exposure Duration	24	years	USEPA 1989; 1991	
				BW	Body Weight	70	kg	USEPA 1989; 1991	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	8,760	days	USEPA 1989; 1991	
		Child	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT
		CF		Conversion Factor	1.00E-03	mg/ug	--		
				IRg	Groundwater Ingestion Rate	0.9	L/day	USEPA 2011 [b]	
				EF	Exposure Frequency	350	days/year	USEPA 1989; 1991	
				ED	Exposure Duration	6	years	USEPA 1989; 1991	
				BW	Body Weight	15	kg	USEPA 1989; 1991	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	2,190	days	USEPA 1989; 1991	
Dermal	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT  Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event)/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> )
				CF1	Conversion Factor	1.00E-03	mg/ug	--	
				CF2	Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--	
				FA	Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004	
				Kp	Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004	
				B	Permeability Ratio	Chemical Specific	unitless	USEPA 2004	
				t*	Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004	
				tau-event	Lag Time per Event	Chemical Specific	hr/event	USEPA 2004	
				ETg	Exposure Time/Event Duration	0.58	hr/event	USEPA 2004	
				EVg	Event Frequency	1	events/day	Professional judgment	

**Table G-39**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Potable Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Off-Site Resident (cont.)	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	EF	Exposure Frequency	350	days/year	USEPA 1989; 1991	For inorganics: DAevent (mg/cm2-event) = Kp x CW x CF1 x CF2 x t-event  and where t-event = ETg
		ED		Exposure Duration	24	years	USEPA 1989; 1991		
		Child	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	SAG	Exposed Skin Surface Area	18,000	cm <sup>2</sup>	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAG x 1/BW x 1/AT  Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi)  For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm2-event) = Kp x CW x CF1 x CF2 x t-event  and where t-event = ETg
		CW		Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	--	
		CF1		Conversion Factor	1.00E-03	mg/ug	--	--	
		CF2		Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--	--	
		FA		Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004	USEPA 2004	
		Kp		Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004	USEPA 2004	
		B		Permeability Ratio	Chemical Specific	unitless	USEPA 2004	USEPA 2004	
		t*		Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004	USEPA 2004	
		tau-event		Lag Time per Event	Chemical Specific	hr/event	USEPA 2004	USEPA 2004	
		ETg		Exposure Time/Event Duration	1	hr/event	USEPA 2004	USEPA 2004	
		EVg		Event Frequency	1	events/day	Professional judgment	USEPA 1989; 1991	
		EF		Exposure Frequency	350	days/year	USEPA 1989; 1991	USEPA 1989; 1991	
		ED		Exposure Duration	6	years	USEPA 1989; 1991	USEPA 1989; 1991	
		SAG	Exposed Skin Surface Area	6,600	cm <sup>2</sup>	USEPA 2004	USEPA 2004		
		BW	Body Weight	15	kg	USEPA 1989; 1991	USEPA 1989; 1991		
		ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	USEPA 1989; 1991		
		ATnc	Averaging Time - Noncancer	2,190	days	USEPA 1989; 1991	USEPA 1989; 1991		
Inhalation of Volatiles <sup>[1]</sup>	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
		CF1		Conversion Factor 1	1.00E-03	mg/ug	--		
CF2	Conversion Factor 2	24		hr/day	by definition				
EF	Exposure Frequency	350		days/year	USEPA 1989; 1991				
ED	Exposure Duration	24		years	USEPA 1989; 1991				
ET	Exposure Time	0.58		hr/day	USEPA 2004				
K	Andelman Volatilization Factor	0.5		L/m <sup>3</sup>	USEPA 1991a				
ATc	Averaging Time - Cancer	25,550		days	USEPA 1989; 1991				
ATnc	Averaging Time - Noncancer	8,760		days	USEPA 1989; 1991				
	Child	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.		CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	
			CF1	Conversion Factor 1	1.00E-03	mg/ug	--		
			CF2	Conversion Factor 2	24	hr/day	by definition		
			EF	Exposure Frequency	350	days/year	USEPA 1989; 1991		
			ED	Exposure Duration	6	years	USEPA 1989; 1991		
			ET	Exposure Time	1	hr/day	USEPA 2004		
			K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a		
			ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991		
			ATnc	Averaging Time - Noncancer	2,190	days	USEPA 1989; 1991		

Notes:  
[1] Refers to inhalation of volatiles during domestic use of potable groundwater, e.g., showering/bathing.  
[a] 95th percentile for consumers only, all ages.  
[b] Average of 95th percentiles for consumers only, ages 1 to 6 years.  
Reference list provided as Table G-45

**Table G-40**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Potable Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name				
Ingestion	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT				
				CF	Conversion Factor	1.00E-03	mg/ug	--					
				IRg	Groundwater Ingestion Rate	1	L/day	USEPA 2011 [a]					
				EF	Exposure Frequency	350	days/year	USEPA 1989; 1991					
				ED	Exposure Duration	9	years	USEPA 1989; 1991					
				BW	Body Weight	70	kg	USEPA 1989; 1991					
	Off-Site Resident	Child	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT				
				CF	Conversion Factor	1.00E-03	mg/ug	--					
				IRg	Groundwater Ingestion Rate	0.35	L/day	USEPA 2011 [b]					
				EF	Exposure Frequency	350	days/year	USEPA 1989; 1991					
				ED	Exposure Duration	6	years	USEPA 1989; 1991					
				BW	Body Weight	15	kg	USEPA 1989; 1991					
Dermal	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT				
				CF1	Conversion Factor	1.00E-03	mg/ug	--					
				CF2	Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--					
				FA	Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004					
				Kp	Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004					
				B	Permeability Ratio	Chemical Specific	unitless	USEPA 2004					
				t*	Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004					
				tau-event	Lag Time per Event	Chemical Specific	hr/event	USEPA 2004					
				ETg	Exposure Time/Event Duration	0.25	hr/event	USEPA 2004					
				EVg	Event Frequency	1	events/day	Professional judgment					
													Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x {(t-event)/(1 + B)} + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> )

**Table G-40**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Potable Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Off-Site Resident (cont.)	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	EF	Exposure Frequency	350	days/year	USEPA 1989; 1991	For inorganics: DAevent (mg/cm2-event) = Kp x CW x CF1 x CF2 x t-event  and where t-event = ETg
		ED		Exposure Duration	9	years	USEPA 1989; 1991		
SAg	Exposed Skin Surface Area	18,000		cm <sup>2</sup>	USEPA 2004				
BW	Body Weight	70		kg	USEPA 1989				
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
		Child	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT  Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi)  For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event)/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> )  For inorganics: DAevent (mg/cm2-event) = Kp x CW x CF1 x CF2 x t-event  and where t-event = ETg
CF1	Conversion Factor	1.00E-03		mg/ug	--				
CF2	Conversion Factor	1.00E-03		L/cm <sup>3</sup>	--				
FA	Fraction Absorbed Water	Chemical Specific		unitless	USEPA 2004				
Kp	Permeability Coefficient	Chemical Specific		cm/hour	USEPA 2004				
B	Permeability Ratio	Chemical Specific		unitless	USEPA 2004				
t*	Time to Reach Steady State			hours	USEPA 2004				
tau-event	Lag Time per Event	Chemical Specific		hr/event	USEPA 2004				
ETg	Exposure Time/Event Duration			hr/event	USEPA 2004				
EVg	Event Frequency			events/day	Professional judgment				
EF	Exposure Frequency	350		days/year	USEPA 1989; 1991				
ED	Exposure Duration	6		years	USEPA 1989; 1991				
SAg	Exposed Skin Surface Area	6,600		cm <sup>2</sup>	USEPA 2004				
BW	Body Weight	15		kg	USEPA 1989				
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	2,190	days	USEPA 1989					
Inhalation of Volatiles [1]	Off-Site Resident	Adult	Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
		CF1		Conversion Factor 1	1.00E-03	mg/ug	--		
CF2	Conversion Factor 2	24		hr/day	by definition				
EF	Exposure Frequency	350		days/year	USEPA 1989; 1991				
ED	Exposure Duration	9		years	USEPA 1989; 1991				
ET	Exposure Time	0.25		hr/day	USEPA 2004				
K	Andelman Volatilization Factor	0.5		L/m <sup>3</sup>	USEPA 1991a				
ATc	Averaging Time - Cancer	25,550		days	USEPA 1989; 1991				
ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989; 1991					
	Child		Dryden North Well, Miami Shores Wellfield, and West Carrollton Well Field.	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
		CF1		Conversion Factor 1	1.00E-03	mg/ug	--		
		CF2		Conversion Factor 2	24	hr/day	by definition		
		EF		Exposure Frequency	350	days/year	USEPA 1989; 1991		
		ED		Exposure Duration	6	years	USEPA 1989; 1991		
		ET		Exposure Time	0.33	hr/day	USEPA 2004		
		K		Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a		
		ATc		Averaging Time - Cancer	25,550	days	USEPA 1989; 1991		
		ATnc	Averaging Time - Noncancer	2,190	days	USEPA 1989; 1991			

Notes:  
[1] Refers to inhalation of volatiles during domestic use of potable groundwater, e.g., showering/bathing.  
[a] Mean value for consumers only, all ages.  
[b] Average of mean values for consumers only, ages 1 to 6 years.  
Reference list provided as Table G-45

**Table G-41**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name				
Ingestion	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT				
				CF	Conversion Factor	1.00E-03	mg/ug	--					
				IRg	Groundwater Incidental Ingestion Rate	0.05	L/day	USEPA 1989					
				EF	Exposure Frequency	250	days/year	USEPA 2002					
				ED	Exposure Duration	25	years	USEPA 2002					
				BW	Body Weight	70	kg	USEPA 1989					
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989					
				On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater		Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT
CF	Conversion Factor	1.00E-03	mg/ug				--						
IRg	Groundwater Incidental Ingestion Rate	0.05	L/day				USEPA 1989						
EF	Exposure Frequency	10	days/year				Professional judgment [a]						
ED	Exposure Duration	25	years				USEPA 2002						
BW	Body Weight	70	kg				USEPA 1989						
ATc	Averaging Time - Cancer	25,550	days				USEPA 1989						
ATnc	Averaging Time - Noncancer	9,125	days				USEPA 1989						
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW				Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT		
			CF	Conversion Factor	1.00E-03	mg/ug	--						
			IRg	Groundwater Incidental Ingestion Rate	0.05	L/day	USEPA 1989						
			EF	Exposure Frequency	250	days/year	USEPA 2002						
			ED	Exposure Duration	1	years	USEPA 2002						
			BW	Body Weight	70	kg	USEPA 1989						
			ATc	Averaging Time - Cancer	25,550	days	USEPA 1989						
			ATnc	Averaging Time - Noncancer	365	days	USEPA 1989						
			Dermal	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L		--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
CF1	Conversion Factor	1.00E-03					mg/ug	--					
CF2	Conversion Factor	1.00E-03					L/cm <sup>3</sup>	--					
FA	Fraction Absorbed Water	Chemical Specific					unitless	USEPA 2004					
Kp	Permeability Coefficient	Chemical Specific					cm/hour	USEPA 2004					
B	Permeability Ratio	Chemical Specific					unitless	USEPA 2004					
t*	Time to Reach Steady State	2.4 x tau-event					hours	USEPA 2004					
tau-event	Lag Time per Event	Chemical Specific					hr/event	USEPA 2004					
ETg	Exposure Time/Event Duration	1					hr/event	Professional judgment					
EVg	Event Frequency	2					events/day	Professional judgment					
$2 \text{ FA} \times \text{Kp} \times \text{CW} \times \text{CF1} \times \text{CF2} \times \text{SQRT}(6 \times \text{tau-event} \times \text{t-event} \times \frac{1}{\text{pi}})$													
$\text{For organics (t-event} \leq \text{t}^*):$ $\text{For organics (t-event} > \text{t}^*):$ $\text{FA} \times \text{Kp} \times \text{CW} \times \text{CF1} \times \text{CF2} \times \left\{ \frac{\text{t-event}}{(1 + \text{B})} + 2 \times \text{tau-event} \times \left( \frac{1 + (3 \times \text{B}) + (3 \times \text{B}^2)}{(1 + \text{B})^2} \right) \right\}$													

**Table G-41**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	On-Site Routine Worker cont.	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	EF	Exposure Frequency	250	days/year	USEPA 2002	For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event  and where t-event = ETg
				ED	Exposure Duration	25	years	USEPA 2002	
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	SAg	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
					BW	Body Weight	70	kg	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989	
	On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
						CF1	Conversion Factor	1.00E-03	
				CF2	Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				FA	Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004	
				Kp	Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
				B	Permeability Ratio	Chemical Specific	unitless	USEPA 2004	
				t*	Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				tau-event	Lag Time per Event	Chemical Specific	hr/event	USEPA 2004	
				ETg	Exposure Time/Event Duration	1	hr/event	Professional judgment	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
				EVg	Event Frequency	1	events/day	Professional judgment	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				ED	Exposure Duration	25	years	USEPA 2002	
				SAg	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> ))  For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989	

**Table G-41**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of Volatiles [1]	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	25	years	USEPA 2002	
				ET	Exposure Time	2	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989; 1991	
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	
				ED	Exposure Duration	25	years	USEPA 2002	
				ET	Exposure Time	1	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989; 1991	
	On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	1	years	Professional judgment	
				ET	Exposure Time	1	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989; 1991	

Notes:  
[1] Refers to inhalation of volatiles during industrial use of groundwater.  
[a] Assumes 10 days per year spent doing outdoor maintenance work.  
Reference list provided as Table G-45

**TABLE CTE G-42**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-03	mg/ug	--	
				IRg	Groundwater Incidental Ingestion Rate	0.05	L/day	USEPA 1989	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				BW	Body Weight	70	kg	USEPA 1989	
	ATc	Averaging Time - Cancer	25,550	days	USEPA 1989				
	ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989				
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	
CF				Conversion Factor	1.00E-03	mg/ug	--		
IRg				Groundwater Incidental Ingestion Rate	0.05	L/day	USEPA 1989		
EF				Exposure Frequency	5	days/year	Professional judgment [a]		
ED				Exposure Duration	9	years	USEPA 1989		
BW				Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989					
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/kg-day) = CW x CF x IRg x EF x ED x 1/BW x 1/AT	
			CF	Conversion Factor	1.00E-03	mg/ug	--		
			IRg	Groundwater Incidental Ingestion Rate	0.05	L/day	USEPA 1989		
			EF	Exposure Frequency	125	days/year	Professional judgment		
			ED	Exposure Duration	1	years	USEPA 2002		
			BW	Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	365	days	USEPA 1989					
Dermal	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
				CF1	Conversion Factor	1.00E-03	mg/ug	--	
				CF2	Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--	
				FA	Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004	
				Kp	Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004	
				B	Permeability Ratio	Chemical Specific	unitless	USEPA 2004	
				t*	Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004	
				tau-event	Lag Time per Event	Chemical Specific	hr/event	USEPA 2004	
				ETg	Exposure Time/Event Duration	1	hr/event	Professional judgment	
				EVg	Event Frequency	1	events/day	Professional judgment	

**TABLE CTE G-42**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	On-Site Routine Worker cont.	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	EF	Exposure Frequency	250	days/year	USEPA 2002	For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				ED	Exposure Duration	9	years	USEPA 1989	
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	SAg	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
					BW	Body Weight	70	kg	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> )
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	
	On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EVg x EF x ED x SAg x 1/BW x 1/AT
						CF1	Conversion Factor	1.00E-03	
				CF2	Conversion Factor	1.00E-03	L/cm <sup>3</sup>	--	Absorbed Dose per Event (DAevent) (mg/cm <sup>2</sup> -event) = For organics (t-event ≤ t*): 2 FA x Kp x CW x CF1 x CF2 x SQRT(6 x tau-event x t-event x 1/pi) For organics (t-event > t*): FA x Kp x CW x CF1 x CF2 x ((t-event/(1 + B)) + 2 x tau-event x ((1 + (3 x B) + (3 B <sup>2</sup> )) / (1 + B) <sup>2</sup> )
				FA	Fraction Absorbed Water	Chemical Specific	unitless	USEPA 2004	
				Kp	Permeability Coefficient	Chemical Specific	cm/hour	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				B	Permeability Ratio	Chemical Specific	unitless	USEPA 2004	
				t*	Time to Reach Steady State	2.4 x tau-event	hours	USEPA 2004	
				tau-event	Lag Time per Event	Chemical Specific	hr/event	USEPA 2004	For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				ETg	Exposure Time/Event Duration	1	hr/event	Professional judgment	
				EVg	Event Frequency	1	events/day	Professional judgment	For inorganics: DAevent (mg/cm <sup>2</sup> -event) = Kp x CW x CF1 x CF2 x t-event and where t-event = ETg
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
				SAg	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989	

**TABLE CTE G-42**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Industrial Use)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of Volatiles [1]	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				ET	Exposure Time	1	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989; 1991	
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
				ET	Exposure Time	1	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989; 1991	
	On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill	CW	Chemical Concentration in Groundwater	Chemical Specific	ug/L	--	Chronic Daily Intake (CDI) (mg/m <sup>3</sup> ) = CW x CF1 x 1/CF2 x EF x ED x ET x K x 1/AT
				CF1	Conversion Factor 1	1.00E-03	mg/ug	--	
				CF2	Conversion Factor 2	24	hr/day	by definition	
				EF	Exposure Frequency	125	days/year	Professional judgment	
				ED	Exposure Duration	1	years	Professional judgment	
				ET	Exposure Time	1	hr/day	Professional judgment	
				K	Andelman Volatilization Factor	0.5	L/m <sup>3</sup>	USEPA 1991a	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989; 1991	
				ATnc	Averaging Time - Noncancer	365	days	USEPA 1989; 1991	

Notes:  
[1] Refers to inhalation of volatiles during industrial use of groundwater.  
[a] Assumes 5 days per year spent doing outdoor maintenance work.  
Reference list provided as Table G-45

**Table G-43**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	50	mg/day	USEPA 2002	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	25	years	USEPA 2002	
				BW	Body Weight	70	kg	USEPA 1989	
	ATc	Averaging Time - Cancer	25,550	days	USEPA 1989				
	ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989				
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
CF				Conversion Factor	1.00E-06	kg/mg	--		
IRs				Soil Ingestion Rate	100	mg/day	USEPA 2002		
EF				Exposure Frequency	10	days/year	Professional judgment [a]		
ED				Exposure Duration	25	years	USEPA 2002		
BW				Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989					
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT	
			CF	Conversion Factor	1.00E-06	kg/mg	--		
			IRs	Soil Ingestion Rate	330	mg/day	USEPA 2002		
			EF	Exposure Frequency	250	days/year	USEPA 2002		
			ED	Exposure Duration	1	years	USEPA 2002		
			BW	Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	365	days	USEPA 1989					

**Table G-43**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.2	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	25	years	USEPA 2002	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989					
On-Site Maintenance Worker	Adult	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.2	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	
				ED	Exposure Duration	25	years	USEPA 2002	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	9,125	days	USEPA 1989					
On-Site Construction Worker	Adult	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.3	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	1	years	USEPA 2002	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	365	days	USEPA 1989					

**Table G-43**  
**Values Used for Daily Intake Equations - Reasonable Maximum Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (dust and volatiles)	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	1	hr/day	Professional judgment [b]	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	25	years	USEPA 2002	
				PEF	Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996	
				VF	Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg		
	ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d				
	ATnc	Averaging Time - Noncancer	219,000	hours	365 d/yr x ED x 24 hr/d				
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	8	hr/day	Typical workday	
				EF	Exposure Frequency	10	days/year	Professional judgment [a]	
				ED	Exposure Duration	25	years	USEPA 2002	
PEF				Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996		
VF				Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg			
ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d					
ATnc	Averaging Time - Noncancer	219,000	hours	365 d/yr x ED x 24 hr/d					
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT	
			ETas_hr	Exposure Time - Soil to Ambient Air	8	hr/day	Typical workday		
			EF	Exposure Frequency	250	days/year	USEPA 2002		
			ED	Exposure Duration	1	years	USEPA 2002		
			PEF	Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996		
			VF	Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg			
ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d					
ATnc	Averaging Time - Noncancer	8,760	hours	365 d/yr x ED x 24 hr/d					

Notes:  
[a] Assumes 10 days per year spent doing outdoor maintenance work.  
[b] Assumes a routine worker would only spend one hour per day outdoors, e.g., during lunch hour.  
Reference list provided as Table G-45

**Table G-44**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				IRs	Soil Ingestion Rate	50	mg/day	USEPA 2002	
				EF	Exposure Frequency	125	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				BW	Body Weight	70	kg	USEPA 1989	
	ATc	Averaging Time - Cancer	25,550	days	USEPA 1989				
	ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989				
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	
CF				Conversion Factor	1.00E-06	kg/mg	--		
IRs				Soil Ingestion Rate	100	mg/day	USEPA 2002		
EF				Exposure Frequency	5	days/year	Professional judgment [a]		
ED				Exposure Duration	9	years	USEPA 1989		
BW				Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989					
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Chronic Daily Intake (CDI) (mg/kg-day) = CS x CF x IRs x EF x ED x 1/BW x 1/AT	
			CF	Conversion Factor	1.00E-06	kg/mg	--		
			IRs	Soil Ingestion Rate	330	mg/day	USEPA 2002		
			EF	Exposure Frequency	125	days/year	Professional judgment		
			ED	Exposure Duration	1	years	USEPA 2002		
			BW	Body Weight	70	kg	USEPA 1989		
ATc	Averaging Time - Cancer	25,550	days	USEPA 1989					
ATnc	Averaging Time - Noncancer	365	days	USEPA 1989					

**Table G-44**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.02	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989					
On-Site Maintenance Worker	Adult	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.02	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	3,285	days	USEPA 1989					
On-Site Construction Worker	Adult	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Dermal Absorbed Dose (DAD) (mg/kg-day) = DAevent x EF x ED x EVs x SAs x 1/BW x 1/AT  DAevent (mg/cm <sup>2</sup> -event) = CS x CF x AFs x ABSd
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				AFs	Skin Adherence Factor	0.1	mg/cm <sup>2</sup> -event	USEPA 2004	
				ABSd	Dermal Absorption Fraction	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	125	days/year	Professional judgment	
				ED	Exposure Duration	1	years	USEPA 2002	
				EVs	Event Frequency	1	events/day	USEPA 2004	
				SAs	Exposed Skin Surface Area	3,300	cm <sup>2</sup>	USEPA 2004	
				BW	Body Weight	70	kg	USEPA 1989	
				ATc	Averaging Time - Cancer	25,550	days	USEPA 1989	
ATnc	Averaging Time - Noncancer	365	days	USEPA 1989					

**Table G-44**  
**Values Used for Daily Intake Equations - Central Tendency Exposure**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (dust and volatiles)	On-Site Routine Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	1	hr/day	Professional judgment [b]	
				EF	Exposure Frequency	250	days/year	USEPA 2002	
				ED	Exposure Duration	9	years	USEPA 1989	
				PEF	Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996	
				VF	Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg		
	ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d				
	ATnc	Averaging Time - Noncancer	78,840	hours	365 d/yr x ED x 24 hr/d				
	On-Site Maintenance Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT
				ETas_hr	Exposure Time - Soil to Ambient Air	4	hr/day	Professional judgment	
				EF	Exposure Frequency	5	days/year	Professional judgment [a]	
				ED	Exposure Duration	9	years	USEPA 1989	
PEF				Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996		
VF				Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg			
ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d					
ATnc	Averaging Time - Noncancer	78,840	hours	365 d/yr x ED x 24 hr/d					
On-Site Construction Worker	Adult	Landfill L1, West Tank Farm, Box Sewer, Process Sump Area, Historic Fill Area, Former Building 21	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Inhaled Dose (mg/m <sup>3</sup> ) = CS x ETas_hr x EF x ED x [1/PEF + 1/VF] x 1/AT	
			ETas_hr	Exposure Time - Soil to Ambient Air	4	hr/day	Professional judgment		
			EF	Exposure Frequency	125	days/year	Professional judgment		
			ED	Exposure Duration	1	years	USEPA 2002		
			PEF	Particulate Emission Factor	1.32E+09	m <sup>3</sup> /kg	USEPA 1996		
			VF	Volatilization Factor	Chemical Specific	m <sup>3</sup> /kg			
ATc	Averaging Time - Cancer	613,200	hours	365 d/yr x 70 yr x 24 hr/d					
ATnc	Averaging Time - Noncancer	8,760	hours	365 d/yr x ED x 24 hr/d					

Notes:  
[a] Assumes 5 days per year spent doing outdoor maintenance work.  
[b] Assumes a routine worker would only spend one hour per day outdoors, e.g., during lunch hour.  
Reference list provided as Table G-45

**Table G-45**  
**References for Exposure Factors**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

- USEPA. 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). EPA/540/1-89-002. Office of Emergency and Remedial Response, Washington, D.C., December, 287 pp
- USEPA. 1991. Risk Assessment Guidance For Superfund, Volume I, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors." Interim Final. OSWER Directive: 9285.6-03. Office of Solid Waste and Emergency Response, Washington, D.C., March, 28 pp.
- USEPA. 1991a. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part B). EPA/540/R-92/003. Office of Emergency and Remedial Response, Washington, D.C. December, 52 pp
- USEPA. 1996. Soil Screening Guidance - Users Guide. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington, D.C., July 39 pp
- USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. Office of Solid Waste and Emergency Response, Washington, D.C., December, 185 pp
- USEPA. 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. EPA/540/R-99/005. Office of Superfund Remediation and Technology Innovation, Washington D.C., July, 181 pp.
- USEPA. 2011. Exposure Factors Handbook: 2011 Edition. EPA/600/R-09/052F. Office of Research and Development, National Center for Environmental Assessment, Washington, D.C., September, 1466 pp.

**Table G-46**  
**Chemical Specific Factors**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Constituent	Is Compound COPC in Soil?	Dermal Absorption Fraction (ABS <sub>d</sub> ) <sup>[1]</sup> (unitless)	Volatilization Factor (VF) <sup>[2]</sup> (m <sup>3</sup> /kg)	Is Compound COPC in Water? <sup>[2]</sup> (Y/N)	Dermal Permeability Coefficient (Kp) <sup>[1]</sup> (cm/hr)	Ratio of Permeability Coefficients Through Stratum Corneum and Viable Epidermis (B) <sup>[1]</sup> (unitless)	Fraction of Absorbed Water (FA) <sup>[1]</sup> (unitless)	Lag Time per Event (tau-event) <sup>[1]</sup> (hr/event)	Time to Reach Steady State (t*) <sup>[1]</sup> (hr)	Absorbed Dose per Event (DA <sub>event</sub> ) Without Concentration in Water <sup>[1]</sup> t-event = 1 hr	Absorbed Dose per Event (DA <sub>event</sub> ) Without Concentration in Water <sup>[1]</sup> t-event = 0.58 hr	Absorbed Dose per Event (DA <sub>event</sub> ) Without Concentration in Water <sup>[1]</sup> t-event = 0.25 hr	Absorbed Dose per Event (DA <sub>event</sub> ) Without Concentration in Water <sup>[1]</sup> t-event = 0.33 hr
1,1-Dichloroethane	N	NA	2240	Y	6.7E-03	0.03	1	0.38	0.92	1.18E-02	8.72E-03	5.73E-03	6.58E-03
Aroclor 1254	Y	0.14	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Y	0.03	NA	Y	1.0E-03	NA	NA	NA	NA	1.00E-03	5.80E-04	2.50E-04	3.30E-04
Benzene	Y	NA	3810	Y	1.5E-02	0.05	1	0.29	0.70	2.35E-02	1.71E-02	1.12E-02	1.29E-02
Benzo(a)anthracene	Y	0.13	NA	Y	4.7E-01	2.73	1	2.03	12.84	1.85E+00	1.41E+00	9.26E-01	1.06E+00
Benzo(a)pyrene	Y	0.13	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Y	0.13	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	Y	NA	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	N	NA	2690	Y	1.1E-02	0.04	1	0.37	0.89	1.91E-02	1.41E-02	9.27E-03	1.07E-02
Cobalt	Y	NA	NA	Y	4.0E-04	NA	NA	NA	NA	4.00E-04	2.32E-04	1.00E-04	1.32E-04
Ethylbenzene	Y	NA	6100	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Y	NA	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Y	NA	2530	N	3.3E-02	0.16	1	0.91	2.18	8.68E-02	6.61E-02	4.34E-02	4.99E-02
Trichloroethene	Y	NA	2380	Y	1.2E-02	0.05	1	0.58	1.39	2.53E-02	1.93E-02	1.26E-02	1.45E-02
Vinyl Chloride	N	NA	1030	Y	5.6E-03	0.02	1	0.24	0.57	8.22E-03	5.91E-03	3.78E-03	4.34E-03
Xylenes	Y	NA	6270	N	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Notes:**

NA = not available or not applicable to this Risk Assessment

[1] Available from, or calculated using equations in, USEPA 2004. Parameters relevant to dermal exposure to chemicals in water are shown only for COPCs or organic COPCs as appropriate

[2] Volatilization factor is from the USEPA May 2012 RSL tables

[3] Dermal exposure to groundwater.

Reference list provided as Table G-4f

**Table G-47**  
**Non-Cancer Toxicity Data - Oral/Dermal**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal [1]	Absorbed RfD for Dermal [2]		Primary Target Organ(s) [3]	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) [4] (MM/DD/YYYY)
1,1-Dichloroethane	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	kidney	3000	PPRTV	12/6/2012
1,1-Dichloroethane	Subchronic	2.0E+00	mg/kg-day	1	2.0E+00	mg/kg-day	kidney	300	PPRTV	12/7/2012
Aroclor 1254	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	immune system	300	IRIS	12/5/2012
Aroclor 1254	Subchronic	3.0E-05	mg/kg-day	1	3.0E-05	mg/kg-day	neurological	300	ATSDR	11/1/2000
Arsenic	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	skin	3	IRIS	12/5/2012
Arsenic	Subchronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	skin	3	HEAST	7/1/1997
Benzene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	immune system	300	IRIS	12/5/2012
Benzene	Subchronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	immune system	100	PPRTV	9/29/2009
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	2.0E-03	mg/kg-day	1	2.0E-03	mg/kg-day	kidney	3000	IRIS	12/5/2012
cis-1,2-Dichloroethene	Subchronic	2.0E-02	mg/kg-day	1	2.0E-02	mg/kg-day	kidney	300	PPRTV	2/3/2011
Chromium	Chronic	1.5E+00	mg/kg-day	1	1.5E+00	mg/kg-day	no effects	1000	IRIS	12/5/2012
Chromium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	thyroid	3000	PPRTV	8/25/2008
Cobalt	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	thyroid	300	PPRTV	8/25/2008
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver and kidney	1000	IRIS	12/5/2012
Ethylbenzene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	neurological	1000	IRIS	11/28/2012
Tetrachloroethene	Subchronic	1.0E-01	mg/kg-day	1	1.0E-01	mg/kg-day	liver	100	HEAST	7/1/1997
Trichloroethene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	heart, immune system	10	IRIS	11/28/2012
Trichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	liver	30	IRIS	11/28/2012
Vinyl Chloride	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	increased mortality, decreased body weight	1000	IRIS	12/5/2012
Xylenes	Subchronic	4.0E-01	mg/kg-day	1	4.0E-01	mg/kg-day	whole body	1000	PPRTV	12/5/2012

**Notes:**

[1] The Oral Absorption Efficiency for Dermal is the adjustment for gastrointestinal absorption efficiency presented in USEPA (2004), Exhibit 4-1.

[2] The absorbed dermal RfD is derived by multiplying the oral RfD by the oral absorption efficiency.

[3] Primary target(s) listed are those associated with the critical effect(s) on which the RfD was based.

[4] Date is the date the database was searched (IRIS) or the document publication date (PPRTV, HEAST, ATSDR).

Chromium values presented are for chromium III (insoluble salts).

**Abbreviations:**

NA = not available

mg/kg-day = milligrams per kilogram per day

RfD = chronic reference dose

IRIS = USEPA Integrated Risk Information System, <http://www.epa.gov/iris/index.html>

ATSDR = Agency for Toxic Substances and Disease Registry

PPRTV = Provisional Peer-Reviewed Toxicity Values, <http://hhpprtv.ornl.gov>

HEAST = Health Effects Assessment Summary Tables

**Table G-48**  
**Non-Cancer Toxicity Data - Inhalation**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RFC		Primary Target Organ(s) [1]	Combined Uncertainty/Modifying Factors	RFC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) [2] (MM/DD/YYYY)
1,1-Dichloroethane	Chronic	NA	NA	NA	1000	NA	NA
1,1-Dichloroethane	Subchronic	NA	NA	NA	100	NA	NA
Aroclor 1254	Chronic	NA	NA	NA	NA	NA	NA
Aroclor 1254	Subchronic	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	1.5E-05	mg/m3	developmental, neurological	30	CALEPA	12/5/2012
Arsenic	Subchronic	NA	NA	NA	NA	NA	NA
Benzene	Chronic	3.0E-02	mg/m3	blood	300	IRIS	12/5/2012
Benzene	Subchronic	8.0E-02	mg/m3	blood	100	PPRTV	9/29/2009
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	Subchronic	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Subchronic	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA
Chromium	Chronic	NA	NA	NA	NA	NA	NA
Chromium	Subchronic	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	6.0E-06	mg/m3	respiratory system	300	PPRTV	8/25/2008
Cobalt	Subchronic	2.0E-05	mg/m3	respiratory system	100	PPRTV	8/25/2008
Ethylbenzene	Chronic	1.0E+00	mg/m3	developmental	300	IRIS	12/5/2012
Ethylbenzene	Subchronic	9.0E+00	mg/m3	ear	100	PPRTV	9/9/2010
Tetrachloroethene	Chronic	4.0E-02	mg/m3	neurological	1000	IRIS	11/28/2012
Tetrachloroethene	Subchronic	NA	NA	NA	NA	NA	NA
Trichloroethene	Chronic	2.0E-03	mg/m3	heart, immune system	10	IRIS	11/28/2012
Trichloroethene	Subchronic	5.4E-01	mg/m3	neurological	30	ATSDR	9/1/1997
Vinyl Chloride	Chronic	1.0E-01	mg/m3	liver	30	IRIS	11/28/2012
Vinyl Chloride	Subchronic	NA	NA	NA	NA	NA	NA
Xylenes	Chronic	1.0E-01	mg/m3	whole body	300	IRIS	12/5/2012
Xylenes	Subchronic	4.0E-01	mg/m3	whole body	100	PPRTV	9/30/2009

**Notes:**

[1] Primary target(s) listed are those associated with the critical effect(s) on which the RFC was based.

[2] Date is the date the database was searched (IRIS, CalEPA) or the document publication date (PPRTV, ATSDR).

Chromium values presented are for chromium III (insoluble salts).

**Abbreviations:**

NA = not available

mg/m3 = milligrams per cubic meter

RFC = chronic reference concentration

IRIS = USEPA Integrated Risk Information System, <http://www.epa.gov/iris/index.html>

CalEPA = California Environmental Protection Agency

PPRTV = Provisional Peer-Reviewed Toxicity Values, <http://hhpprtv.onrl.gov>

ATSDR = Agency for Toxic Substances and Disease Registry

**Table G-49**  
**Cancer Toxicity Data - Oral/Dermal**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Chemical of Potential Concern	M u t a g e n	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal [1]	Absorbed Cancer Slope Factor for Dermal [2]		Weight of Evidence/ Cancer Guideline Description [3]	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s) [4] (MM/DD/YYYY)
1,1-Dichloroethane		5.7E-03	(mg/kg-day) <sup>-1</sup>	1	5.7E-03	(mg/kg-day) <sup>-1</sup>	[c]	CalEPA	12/6/2012
Aroclor 1254		2.0E+00	(mg/kg-day) <sup>-1</sup>	1	2.0E+00	(mg/kg-day) <sup>-1</sup>	[b]	IRIS	12/5/2012
Arsenic		1.5E+00	(mg/kg-day) <sup>-1</sup>	1	1.5E+00	(mg/kg-day) <sup>-1</sup>	[a]	IRIS	12/5/2012
Benzene		5.5E-02	(mg/kg-day) <sup>-1</sup>	1	5.5E-02	(mg/kg-day) <sup>-1</sup>	[a]	IRIS	12/5/2012
Benzo(a)anthracene		7.3E-01	(mg/kg-day) <sup>-1</sup>	1	7.3E-01	(mg/kg-day) <sup>-1</sup>	[b]	IRIS	12/5/2012
Benzo(a)pyrene		7.3E+00	(mg/kg-day) <sup>-1</sup>	1	7.3E+00	(mg/kg-day) <sup>-1</sup>	[b]	IRIS	12/5/2012
Benzo(b)fluoranthene		7.3E-01	(mg/kg-day) <sup>-1</sup>	1	7.3E-01	(mg/kg-day) <sup>-1</sup>	[b]	IRIS	12/5/2012
cis-1,2-Dichloroethene		NA	NA	NA	NA	NA	[d]	NA	NA
Chromium		NA	NA	NA	NA	NA	NA	NA	NA
Cobalt		NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene		1.1E-02	(mg/kg-day) <sup>-1</sup>	1	1.1E-02	(mg/kg-day) <sup>-1</sup>	[d]	CalEPA	12/5/2012
Tetrachloroethene		2.1E-03	(mg/kg-day) <sup>-1</sup>	1	2.1E-03	(mg/kg-day) <sup>-1</sup>	[b]	IRIS	11/28/2012
Trichloroethene	M	4.6E-02	(mg/kg-day) <sup>-1</sup>	1	4.6E-02	(mg/kg-day) <sup>-1</sup>	[a]	IRIS	11/28/2012
Vinyl Chloride (exposure during adulthood)	M	7.2E-01	(mg/kg-day) <sup>-1</sup>	1	7.2E-01	(mg/kg-day) <sup>-1</sup>	[a]	IRIS	11/28/2012
Vinyl Chloride (exposure from birth)	M	1.5E+00	(mg/kg-day) <sup>-1</sup>	1	1.5E+00	(mg/kg-day) <sup>-1</sup>	[a]	IRIS	11/28/2012
Xylenes		NA	NA	NA	NA	NA	NA	NA	NA

**Notes:**

[1] The Oral Absorption Efficiency for Dermal is the adjustment for gastrointestinal absorption efficiency presented in USEPA (2004), Exhibit 4-1.

[2] The absorbed cancer slope factor is derived by dividing the oral CSF by the oral absorption efficiency.

[3] USEPA (2005) hazard identification for carcinogens:

[a] Carcinogenic to humans

[b] Likely to be carcinogenic to humans

[c] Suggestive evidence of carcinogenic potential

[d] Inadequate information to assess carcinogenic potential

[e] Not likely to be carcinogenic to humans

[4] Date is the date the database was searched.

Chromium values presented are for chromium III (insoluble salts).

**Abbreviations:**

NA = not available, not applicable, or not assessed

mg/kg-day = milligrams per kilogram per day

CSF = cancer slope factor

IRIS = USEPA Integrated Risk Information System, <http://www.epa.gov/iris/index.html>

CalEPA = California Environmental Protection Agency

**Table G-50**  
**Cancer Toxicity Data - Inhalation**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Chemical of Potential Concern	M u t a g e n	Unit Risk		Weight of Evidence/ Cancer Guideline Description [1]	Unit Risk	
		Value	Units		Source(s)	Date(s) [2] (MM/DD/YYYY)
1,1-Dichloroethane		1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[c]	CalEPA	12/6/2012
Aroclor 1254		1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	IRIS	12/5/2012
Arsenic		4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	[a]	IRIS	12/5/2012
Benzene		7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[a]	IRIS	12/5/2012
Benzo(a)anthracene		1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	CalEPA	12/5/2012
Benzo(a)pyrene		1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	CalEPA	12/5/2012
Benzo(b)fluoranthene		1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	CalEPA	12/5/2012
cis-1,2-Dichloroethene		NA	NA	[d]	NA	NA
Chromium		NA	NA	NA	NA	NA
Cobalt		9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	PPRTV	8/25/2008
Ethylbenzene		2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[d]	CalEPA	12/5/2012
Tetrachloroethene		2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	[b]	IRIS	11/28/2012
Trichloroethene	M	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[a]	IRIS	11/28/2012
Vinyl Chloride (exposure during adulthood)	M	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[a]	IRIS	11/28/2012
Vinyl Chloride (exposure from birth)	M	8.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	[a]	IRIS	11/28/2012
Xylenes		NA	NA	NA	NA	NA

**Notes:**

[1] USEPA (2005) hazard identification for carcinogens:

- [a] Carcinogenic to humans
- [b] Likely to be carcinogenic to humans
- [c] Possible carcinogen to humans
- [d] Inadequate information to assess carcinogenic potential
- [e] Not likely to be carcinogenic to humans

[2] Date is the date the database was searched (IRIS, CalEPA) or the document publication date (PPRTV). Chromium values presented are for chromium III (insoluble salts).

**Abbreviations:**

- NA = not available
- mg/m<sup>3</sup> = milligrams per cubic meter
- URF = unit risk factor
- IRIS = USEPA Integrated Risk Information System, <http://www.epa.gov/iris/index.html>
- CalEPA = California Environmental Protection Agency
- PPRTV = Provisional Peer-Reviewed Toxicity Values, <http://hhprt.v.ornl.gov>

**Table G-51**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units		target organ	
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	8.4E-05	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	9.E-07	2.3E-04	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	2.E-03	
				Trichloroethene	21	mg/kg	3.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	1.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-02	
				Xylenes	1788	mg/kg	3.1E-04	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	8.7E-04	mg/kg/day	2.0E-01	mg/kg/day	increased mortality, decreased body weight	4.E-03	
				Benzo(a)anthracene	6.8	mg/kg	1.2E-06	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	9.E-07	3.3E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	9.4E-07	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	7.E-06	2.6E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	1.9E-06	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-06	5.4E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Aroclor 1254	17	mg/kg	2.9E-06	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	6.E-06	8.2E-06	mg/kg/day	2.0E-05	mg/kg/day	immune system	4.E-01	
				Arsenic	36	mg/kg	6.3E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	9.E-06	1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	6.E-02	
				Chromium	218	mg/kg	3.8E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.1E-04	mg/kg/day	1.5E+00	mg/kg/day	no effects	7.E-05	
				Cobalt	646	mg/kg	1.1E-04	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.2E-04	mg/kg/day	3.0E-04	mg/kg/day	thyroid	1.E+00	
			Exp. Route Total								3.E-05							2.E+00
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA	
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	2.0E-01	mg/kg/day	increased mortality, decreased body weight	NA	
				Benzo(a)anthracene	6.8	mg/kg	2.0E-06	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-06	5.7E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	1.6E-06	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	1.E-05	4.5E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	3.3E-06	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-06	9.2E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Aroclor 1254	17	mg/kg	5.4E-06	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	1.E-05	1.5E-05	mg/kg/day	2.0E-05	mg/kg/day	immune system	8.E-01	
				Arsenic	36	mg/kg	2.5E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-06	7.0E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-02	
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA	
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	thyroid	NA	
			Exp. Route Total								3.E-05						8.E-01	
			Inhalation	Ethylbenzene	479	mg/kg	8.0E-04	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	2.2E-03	mg/m <sup>3</sup>	1.0E+00	mg/m <sup>3</sup>	developmental	2.E-03	
				Trichloroethene	21	mg/kg	9.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	2.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01	
				Xylenes	1788	mg/kg	2.9E-03	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	8.1E-03	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	whole body	8.E-02	
				Benzo(a)anthracene	6.8	mg/kg	5.3E-11	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-12	1.5E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	4.2E-11	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-11	1.2E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	8.5E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-12	2.4E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Aroclor 1254	17	mg/kg	1.3E-10	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-11	3.6E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Arsenic	36	mg/kg	2.8E-10	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	7.8E-10	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	5.E-05	
				Chromium	218	mg/kg	1.7E-09	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	4.7E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Cobalt	646	mg/kg	5.0E-09	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.4E-08	mg/m <sup>3</sup>	6.0E-06	mg/m <sup>3</sup>	respiratory system	2.E-03	
			Exp. Route Total								2.E-06						2.E-01	
Exposure Point Total								6.E-05						3.E+00				
Exposure Medium Total								6.E-05						3.E+00				
Surface/Subsurface Soil Total								6.E-05						3.E+00				

**Table G-51**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	7.0E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	2.0E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05			
				Benzene	2	ug/L	3.6E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	1.0E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	3.E-04			
				cis-1,2-Dichloroethene	95	ug/L	1.7E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	4.8E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	1.3E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-04			
				Trichloroethene	36	ug/L	6.2E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	2.9E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	4.1E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	6.E-06	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	3.6E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	thyroid	3.E-02			
				<b>Exp. Route Total</b>																<b>1.E-01</b>
				Dermal	1,1-Dichloroethane	4	ug/L	1.1E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	6.E-09	3.1E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	2.E-05		
					Benzene	2	ug/L	1.1E-06	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	6.E-08	3.2E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	8.E-04		
					cis-1,2-Dichloroethene	95	ug/L	4.2E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-04	mg/kg/day	2.0E-03	mg/kg/day	kidney	6.E-02		
			Tetrachloroethene		3	ug/L	5.5E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	1.5E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-03			
			Trichloroethene		36	ug/L	2.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	5.8E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01			
			Vinyl Chloride		2	ug/L	3.1E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	8.8E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
			Arsenic	23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA				
			Cobalt	21	ug/L	1.9E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.4E-07	mg/kg/day	3.0E-04	mg/kg/day	thyroid	2.E-03				
			<b>Exp. Route Total</b>																<b>2.E-01</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	4.1E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	1.1E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	2.1E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.9E-05	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	2.E-03			
				cis-1,2-Dichloroethene	95	ug/L	9.7E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.7E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	2.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-09	7.8E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03			
				Trichloroethene	36	ug/L	3.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	1.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-01			
				Vinyl Chloride	2	ug/L	1.7E-05	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	4.7E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	5.E-04			
<b>Exp. Route Total</b>															<b>5.E-01</b>					
<b>Exposure Point Total</b>																<b>8.E-01</b>				
<b>Exposure Medium Total</b>																<b>8.E-01</b>				
<b>Groundwater Total</b>																<b>8.E-01</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>7.E-05</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>3.E+00</b>				

Notes:

NA = Not available

Total Blood HI Across All Media =	2.E-03
Total Body Weight HI Across All Media =	9.E-02
Total Developmental HI Across All Media =	2.E-03
Total Ear HI Across All Media =	3.E-01
Total Heart HI Across All Media =	8.E-01
Total Immune System HI Across All Media =	2.E+00
Total Kidney HI Across All Media =	8.E-02
Total Liver HI Across All Media =	3.E-03
Total Neurological HI Across All Media =	5.E-03
Total Respiratory System HI Across All Media =	2.E-03
Total Skin HI Across All Media =	1.E-01
Total Thyroid HI Across All Media =	1.E+00
Total Whole Body HI Across All Media =	8.E-02

**Table G-52**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units		target organ	
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	1.5E-05	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	1.2E-04	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	1.E-03	
				Trichloroethene	21	mg/kg	6.6E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-08	5.1E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-02	
				Xylenes	1788	mg/kg	5.6E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.4E-04	mg/kg/day	2.0E-01	mg/kg/day	increased mortality, decreased body weight	2.E-03	
				Benzo(a)anthracene	6.8	mg/kg	2.1E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	1.7E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	1.7E-07	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	1.E-06	1.3E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	3.5E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	3.E-07	2.7E-06	mg/kg/day	NA	mg/kg/day	NA	NA	
				Aroclor 1254	17	mg/kg	5.3E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	1.E-06	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	immune system	2.E-01	
				Arsenic	36	mg/kg	1.1E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-06	8.9E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	3.E-02	
				Chromium	218	mg/kg	6.8E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.3E-05	mg/kg/day	1.5E+00	mg/kg/day	no effects	4.E-05	
				Cobalt	646	mg/kg	2.0E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.6E-04	mg/kg/day	3.0E-04	mg/kg/day	thyroid	5.E-01	
			Exp. Route Total								5.E-06							8.E-01
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA	
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	2.0E-01	mg/kg/day	increased mortality, decreased body weight	NA	
				Benzo(a)anthracene	6.8	mg/kg	7.3E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	5.E-08	5.7E-07	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	5.8E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	4.E-07	4.5E-07	mg/kg/day	NA	mg/kg/day	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	9.E-08	9.2E-07	mg/kg/day	NA	mg/kg/day	NA	NA	
				Aroclor 1254	17	mg/kg	1.9E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	4.E-07	1.5E-06	mg/kg/day	2.0E-05	mg/kg/day	immune system	8.E-02	
				Arsenic	36	mg/kg	9.0E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	7.0E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-03	
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA	
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	thyroid	NA	
			Exp. Route Total								1.E-06						8.E-02	
			Inhalation	Ethylbenzene	479	mg/kg	2.9E-04	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-07	2.2E-03	mg/m <sup>3</sup>	1.0E+00	mg/m <sup>3</sup>	developmental	2.E-03	
				Trichloroethene	21	mg/kg	3.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01	
				Xylenes	1788	mg/kg	1.0E-03	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	8.1E-03	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	whole body	8.E-02	
				Benzo(a)anthracene	6.8	mg/kg	1.9E-11	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-12	1.5E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Benzo(a)pyrene	5.4	mg/kg	1.5E-11	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-11	1.2E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Benzo(b)fluoranthene	11	mg/kg	3.1E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-12	2.4E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Aroclor 1254	17	mg/kg	4.7E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-12	3.6E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Arsenic	36	mg/kg	1.0E-10	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-10	7.8E-10	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	5.E-05	
				Chromium	218	mg/kg	6.0E-10	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	4.7E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Cobalt	646	mg/kg	1.8E-09	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	1.4E-08	mg/m <sup>3</sup>	6.0E-06	mg/m <sup>3</sup>	respiratory system	2.E-03	
			Exp. Route Total								9.E-07						2.E-01	
Exposure Point Total								7.E-06							1.E+00			
Exposure Medium Total								7.E-06							1.E+00			
Surface/Subsurface Soil Total								7.E-06							1.E+00			

**Table G-52**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units		target organ			
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.5E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	2.0E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05			
				Benzene	2	ug/L	1.3E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	7.E-09	1.0E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	3.E-04			
				cis-1,2-Dichloroethene	95	ug/L	6.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	1.7E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	1.3E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-04			
				Trichloroethene	36	ug/L	2.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	1.0E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-08	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	1.5E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-06	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	1.3E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	thyroid	3.E-02			
				<b>Exp. Route Total</b>																
				Dermal	1,1-Dichloroethane	4	ug/L	2.0E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	1.5E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	8.E-06		
			Benzene		2	ug/L	2.0E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.6E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	4.E-04			
			cis-1,2-Dichloroethene		95	ug/L	7.5E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	3.E-02			
			Tetrachloroethene		3	ug/L	9.9E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	7.7E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-03			
			Trichloroethene		36	ug/L	3.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	2.9E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-02			
			Vinyl Chloride		2	ug/L	5.7E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	4.E-08	4.4E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	3.5E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.7E-07	mg/kg/day	3.0E-04	mg/kg/day	thyroid	9.E-04				
			<b>Exp. Route Total</b>																	
			Inhalation	1,1-Dichloroethane	4	ug/L	7.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	5.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	3.8E-06	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	3.0E-05	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	1.E-03			
				cis-1,2-Dichloroethene	95	ug/L	1.7E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.4E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
Tetrachloroethene	3	ug/L		5.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.9E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03						
Trichloroethene	36	ug/L		6.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	5.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01						
Vinyl Chloride	2	ug/L	3.0E-06	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.4E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	2.E-04							
<b>Exp. Route Total</b>																				
<b>Exposure Point Total</b>																				
<b>Exposure Medium Total</b>																				
<b>Groundwater Total</b>																				
<b>Total of Receptor Risks Across All Media</b>										1.E-05	<b>Total of Receptor Hazards Across All Media</b>					2.E+00				

Notes:

NA = Not available

Total Blood HI Across All Media =	1.E-03
Total Body Weight HI Across All Media =	8.E-02
Total Developmental HI Across All Media =	2.E-03
Total Ear HI Across All Media =	2.E-01
Total Heart HI Across All Media =	5.E-01
Total Immune System HI Across All Media =	8.E-01
Total Kidney HI Across All Media =	5.E-02
Total Liver HI Across All Media =	2.E-03
Total Neurological HI Across All Media =	3.E-03
Total Respiratory System HI Across All Media =	2.E-03
Total Skin HI Across All Media =	7.E-02
Total Thyroid HI Across All Media =	6.E-01
Total Whole Body HI Across All Media =	8.E-02

**Table G-53**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units		target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	6.7E-06	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	1.9E-05	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	2.E-04		
				Trichloroethene	21	mg/kg	2.9E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	8.2E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-03		
				Xylenes	1788	mg/kg	2.5E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.0E-05	mg/kg/day	4.0E-01	mg/kg/day	whole body	2.E-04		
				Benzo(a)anthracene	6.8	mg/kg	9.5E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	7.E-08	2.7E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	7.5E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	6.E-07	2.1E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-07	4.3E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	2.3E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	5.E-07	6.5E-07	mg/kg/day	3.0E-05	mg/kg/day	neurological	2.E-02		
				Arsenic	36	mg/kg	5.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	8.E-07	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	5.E-03		
				Chromium	218	mg/kg	3.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	8.5E-06	mg/kg/day	1.5E+00	mg/kg/day	no effects	6.E-06		
				Cobalt	646	mg/kg	9.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.5E-05	mg/kg/day	3.0E-03	mg/kg/day	thyroid	8.E-03		
			<b>Exp. Route Total</b>																<b>4.E-02</b>
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA		
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA		
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	4.0E-01	mg/kg/day	whole body	NA		
				Benzo(a)anthracene	6.8	mg/kg	8.2E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	6.E-08	2.3E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	6.5E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	5.E-07	1.8E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-07	3.7E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	2.2E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	4.E-07	6.1E-07	mg/kg/day	3.0E-05	mg/kg/day	neurological	2.E-02		
				Arsenic	36	mg/kg	1.0E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	2.8E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	9.E-04		
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA		
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	thyroid	NA		
			<b>Exp. Route Total</b>																<b>2.E-02</b>
			Inhalation	Ethylbenzene	479	mg/kg	2.6E-04	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	7.2E-04	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	8.E-05		
				Trichloroethene	21	mg/kg	2.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	8.1E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-04		
				Xylenes	1788	mg/kg	9.3E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.6E-03	mg/m <sup>3</sup>	4.0E-01	mg/m <sup>3</sup>	whole body	7.E-03		
				Benzo(a)anthracene	6.8	mg/kg	1.7E-11	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-12	4.7E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.3E-11	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-11	3.7E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	2.7E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-12	7.6E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Aroclor 1254	17	mg/kg	4.1E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-12	1.2E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Arsenic	36	mg/kg	9.0E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-10	2.5E-10	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	2.E-05		
				Chromium	218	mg/kg	5.4E-10	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.5E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Cobalt	646	mg/kg	1.6E-09	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	4.5E-09	mg/m <sup>3</sup>	2.0E-05	mg/m <sup>3</sup>	respiratory system	2.E-04		
			<b>Exp. Route Total</b>																<b>7.E-03</b>
<b>Exposure Point Total</b>																	<b>7.E-02</b>		
<b>Exposure Medium Total</b>																	<b>7.E-02</b>		
<b>Surface/Subsurface Soil Total</b>																	<b>7.E-02</b>		

**Table G-53**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units		target organ			
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.8E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	7.9E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	4.E-08			
				Benzene	2	ug/L	1.5E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	8.E-10	4.1E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	4.E-06			
				cis-1,2-Dichloroethene	95	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.9E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	9.E-04			
				Tetrachloroethene	3	ug/L	1.9E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	5.4E-08	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-07			
				Trichloroethene	36	ug/L	2.5E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	7.0E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-03			
				Vinyl Chloride	2	ug/L	1.2E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-09	3.2E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-05			
				Arsenic	23	ug/L	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	4.6E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-03			
				Cobalt	21	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	1.E-04			
				<b>Exp. Route Total</b>																<b>4.E-03</b>
				Dermal	1,1-Dichloroethane	4	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	6.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-08		
					Benzene	2	ug/L	2.3E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-09	6.3E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	6.E-06		
					cis-1,2-Dichloroethene	95	ug/L	8.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.3E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-03		
			Tetrachloroethene		3	ug/L	1.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	3.1E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-06			
			Trichloroethene		36	ug/L	4.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-03			
			Vinyl Chloride		2	ug/L	6.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-09	1.8E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-06			
			Arsenic	23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA				
			Cobalt	21	ug/L	3.8E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.1E-08	mg/kg/day	3.0E-03	mg/kg/day	thyroid	4.E-06				
			<b>Exp. Route Total</b>																<b>4.E-03</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	8.2E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	2.3E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	4.2E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	1.2E-06	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	1.E-05			
				cis-1,2-Dichloroethene	95	ug/L	1.9E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	5.4E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	5.6E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-10	1.6E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-05			
				Trichloroethene	36	ug/L	7.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	2.0E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	4.E-05			
				Vinyl Chloride	2	ug/L	3.4E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	9.5E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	9.E-06			
<b>Exp. Route Total</b>															<b>1.E-04</b>					
<b>Exposure Point Total</b>																<b>8.E-03</b>				
<b>Exposure Medium Total</b>																<b>8.E-03</b>				
<b>Groundwater Total</b>																<b>8.E-03</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>4.E-06</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>7.E-02</b>				

**Notes:**

NA = Not available

Total Blood HI Across All Media =	1.E-05
Total Body Weight HI Across All Media =	7.E-03
Total Developmental HI Across All Media =	2.E-05
Total Ear HI Across All Media =	5.E-03
Total Heart HI Across All Media =	5.E-03
Total Immune System HI Across All Media =	5.E-03
Total Kidney HI Across All Media =	2.E-03
Total Liver HI Across All Media =	2.E-04
Total Neurological HI Across All Media =	4.E-02
Total Respiratory System HI Across All Media =	2.E-04
Total Skin HI Across All Media =	7.E-03
Total Thyroid HI Across All Media =	9.E-03
Total Whole Body HI Across All Media =	7.E-03

**Table G-54**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units		target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	1.2E-06	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	9.4E-06	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	9.E-05		
				Trichloroethene	21	mg/kg	5.3E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-09	4.1E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-04		
				Xylenes	1788	mg/kg	4.5E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.5E-05	mg/kg/day	4.0E-01	mg/kg/day	whole body	9.E-05		
				Benzo(a)anthracene	6.8	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-08	1.3E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.4E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	1.1E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	2.8E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-08	2.2E-07	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	4.2E-08	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	8.E-08	3.3E-07	mg/kg/day	3.0E-05	mg/kg/day	neurological	1.E-02		
				Arsenic	36	mg/kg	9.1E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	7.1E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-03		
				Chromium	218	mg/kg	5.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.3E-06	mg/kg/day	1.5E+00	mg/kg/day	no effects	3.E-06		
				Cobalt	646	mg/kg	1.6E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	thyroid	4.E-03		
			<b>Exp. Route Total</b>																<b>2.E-02</b>
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA	
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	4.0E-01	mg/kg/day	whole body	NA	
				Benzo(a)anthracene	6.8	mg/kg	1.5E-09	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-09	1.1E-08	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	9.E-09	9.1E-09	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	2.4E-09	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	1.8E-08	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	3.9E-09	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	8.E-09	3.0E-08	mg/kg/day	3.0E-05	mg/kg/day	neurological	1.E-03		
				Arsenic	36	mg/kg	1.8E-09	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	3.E-09	1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	skin	5.E-05		
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA		
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	thyroid	NA		
			<b>Exp. Route Total</b>																<b>1.E-03</b>
			Inhalation	Ethylbenzene	479	mg/kg	2.3E-05	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.8E-04	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	2.E-05		
				Trichloroethene	21	mg/kg	2.6E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.0E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	4.E-05		
				Xylenes	1788	mg/kg	8.4E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	6.5E-04	mg/m <sup>3</sup>	4.0E-01	mg/m <sup>3</sup>	whole body	2.E-03		
				Benzo(a)anthracene	6.8	mg/kg	1.5E-12	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-13	1.2E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.2E-12	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-12	9.3E-12	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	2.4E-12	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-13	1.9E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Aroclor 1254	17	mg/kg	3.7E-12	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-13	2.9E-11	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Arsenic	36	mg/kg	8.1E-12	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-11	6.3E-11	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	4.E-06		
				Chromium	218	mg/kg	4.8E-11	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	3.8E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Cobalt	646	mg/kg	1.4E-10	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	1.1E-09	mg/m <sup>3</sup>	2.0E-05	mg/m <sup>3</sup>	respiratory system	6.E-05		
			<b>Exp. Route Total</b>																<b>2.E-03</b>
<b>Exposure Point Total</b>																	<b>2.E-02</b>		
<b>Exposure Medium Total</b>																	<b>2.E-02</b>		
<b>Surface/Subsurface Soil Total</b>																	<b>2.E-02</b>		

**Table G-54**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	5.0E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-11	3.9E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08			
				Benzene	2	ug/L	2.6E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-10	2.0E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	2.E-06			
				cis-1,2-Dichloroethene	95	ug/L	1.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	9.3E-07	mg/kg/day	2.0E-03	mg/kg/day	kidney	5.E-04			
				Tetrachloroethene	3	ug/L	3.4E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-12	2.7E-08	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-07			
				Trichloroethene	36	ug/L	4.5E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-09	3.5E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-04			
				Vinyl Chloride	2	ug/L	2.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	1.6E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	5.E-06			
				Arsenic	23	ug/L	2.9E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	8.E-04			
				Cobalt	21	ug/L	2.6E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.0E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	7.E-05			
				<b>Exp. Route Total</b>																
				Dermal	1,1-Dichloroethane	4	ug/L	3.9E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	3.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08		
					Benzene	2	ug/L	4.1E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	2.E-10	3.2E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	3.E-06		
					cis-1,2-Dichloroethene	95	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	6.E-04		
			Tetrachloroethene		3	ug/L	2.0E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	1.5E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-06			
			Trichloroethene		36	ug/L	7.5E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-09	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-03			
			Vinyl Chloride		2	ug/L	1.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-10	8.8E-09	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-06			
			Arsenic	23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA				
			Cobalt	21	ug/L	6.9E-10	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.4E-09	mg/kg/day	3.0E-03	mg/kg/day	thyroid	2.E-06				
			<b>Exp. Route Total</b>																	
			Inhalation	1,1-Dichloroethane	4	ug/L	1.5E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-10	1.1E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	7.6E-08	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-10	5.9E-07	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	7.E-06			
				cis-1,2-Dichloroethene	95	ug/L	3.5E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	1.0E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-11	7.8E-07	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-05			
				Trichloroethene	36	ug/L	1.3E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-09	1.0E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-05			
				Vinyl Chloride	2	ug/L	6.1E-08	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-10	4.7E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	5.E-06			
<b>Exp. Route Total</b>																				
<b>Exposure Point Total</b>																				
<b>Exposure Medium Total</b>																				
<b>Groundwater Total</b>																				
<b>Total of Receptor Risks Across All Media</b>										5.E-07	<b>Total of Receptor Hazards Across All Media</b>						3.E-02			

**Notes:**

NA = Not available

Total Blood HI Across All Media =	7.E-06
Total Body Weight HI Across All Media =	2.E-03
Total Developmental HI Across All Media =	4.E-06
Total Ear HI Across All Media =	3.E-03
Total Heart HI Across All Media =	3.E-03
Total Immune System HI Across All Media =	3.E-03
Total Kidney HI Across All Media =	1.E-03
Total Liver HI Across All Media =	1.E-04
Total Neurological HI Across All Media =	1.E-02
Total Respiratory System HI Across All Media =	6.E-05
Total Skin HI Across All Media =	3.E-03
Total Thyroid HI Across All Media =	4.E-03
Total Whole Body HI Across All Media =	2.E-03

**Table G-55**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units		target organ			
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	2.2E-05	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	1.5E-03	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	2.E-02			
				Trichloroethene	21	mg/kg	9.7E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	6.8E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01			
				Xylenes	1788	mg/kg	8.2E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.8E-03	mg/kg/day	4.0E-01	mg/kg/day	whole body	1.E-02			
				Benzo(a)anthracene	6.8	mg/kg	3.1E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	2.2E-05	mg/kg/day	NA	mg/kg/day	NA	NA			
				Benzo(a)pyrene	5.4	mg/kg	2.5E-07	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	2.E-06	1.7E-05	mg/kg/day	NA	mg/kg/day	NA	NA			
				Benzo(b)fluoranthene	11	mg/kg	5.1E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	4.E-07	3.6E-05	mg/kg/day	NA	mg/kg/day	NA	NA			
				Aroclor 1254	17	mg/kg	7.7E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	2.E-06	5.4E-05	mg/kg/day	3.0E-05	mg/kg/day	neurological	2.E+00			
				Arsenic	36	mg/kg	1.7E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	3.E-06	1.2E-04	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-01			
				Chromium	218	mg/kg	1.0E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.0E-04	mg/kg/day	1.5E+00	mg/kg/day	no effects	5.E-04			
				Cobalt	646	mg/kg	3.0E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.1E-03	mg/kg/day	3.0E-03	mg/kg/day	thyroid	7.E-01			
			<b>Exp. Route Total</b>																	<b>3.E+00</b>
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA		
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA		
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	4.0E-01	mg/kg/day	whole body	NA		
				Benzo(a)anthracene	6.8	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	9.E-08	8.6E-06	mg/kg/day	NA	mg/kg/day	NA	NA			
				Benzo(a)pyrene	5.4	mg/kg	9.7E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	7.E-07	6.8E-06	mg/kg/day	NA	mg/kg/day	NA	NA			
				Benzo(b)fluoranthene	11	mg/kg	2.0E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-07	1.4E-05	mg/kg/day	NA	mg/kg/day	NA	NA			
				Aroclor 1254	17	mg/kg	3.2E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	6.E-07	2.3E-05	mg/kg/day	3.0E-05	mg/kg/day	neurological	8.E-01			
				Arsenic	36	mg/kg	1.5E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA			
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	thyroid	NA			
			<b>Exp. Route Total</b>																	<b>8.E-01</b>
			Inhalation	Ethylbenzene	479	mg/kg	2.6E-04	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.8E-02	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	2.E-03			
				Trichloroethene	21	mg/kg	2.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.0E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	4.E-03			
				Xylenes	1788	mg/kg	9.3E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	6.5E-02	mg/m <sup>3</sup>	4.0E-01	mg/m <sup>3</sup>	whole body	2.E-01			
				Benzo(a)anthracene	6.8	mg/kg	1.7E-11	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-12	1.2E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Benzo(a)pyrene	5.4	mg/kg	1.3E-11	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-11	9.3E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
Benzo(b)fluoranthene	11	mg/kg		2.7E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-12	1.9E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA						
Aroclor 1254	17	mg/kg		4.1E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-12	2.9E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA						
Arsenic	36	mg/kg		9.0E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-10	6.3E-09	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	4.E-04						
Chromium	218	mg/kg		5.4E-10	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	3.8E-08	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA						
Cobalt	646	mg/kg		1.6E-09	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	1.1E-07	mg/m <sup>3</sup>	2.0E-05	mg/m <sup>3</sup>	respiratory system	6.E-03						
<b>Exp. Route Total</b>																	<b>2.E-01</b>			
<b>Exposure Point Total</b>																		<b>4.E+00</b>		
<b>Exposure Medium Total</b>																		<b>4.E+00</b>		
<b>Surface/Subsurface Soil Total</b>																		<b>4.E+00</b>		

**Table G-55**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.8E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.0E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-06			
				Benzene	2	ug/L	1.5E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	8.E-10	1.0E-06	mg/kg/day	1.0E-02	mg/kg/day	immune system	1.E-04			
				cis-1,2-Dichloroethene	95	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	1.9E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	1.3E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-05			
				Trichloroethene	36	ug/L	2.5E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	1.2E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-09	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-03	mg/kg/day	thyroid	3.E-03			
				<b>Exp. Route Total</b>																<b>1.E-01</b>
				Dermal	1,1-Dichloroethane	4	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.5E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	8.E-07		
			Benzene		2	ug/L	2.3E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-09	1.6E-06	mg/kg/day	1.0E-02	mg/kg/day	immune system	2.E-04			
			cis-1,2-Dichloroethene		95	ug/L	8.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	3.E-02			
			Tetrachloroethene		3	ug/L	1.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	7.7E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	8.E-05			
			Trichloroethene		36	ug/L	4.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	2.9E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-02			
			Vinyl Chloride		2	ug/L	6.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-09	4.4E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	3.8E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.7E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	9.E-05				
			<b>Exp. Route Total</b>																<b>9.E-02</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	8.2E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	5.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	4.2E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	3.0E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	4.E-04			
				cis-1,2-Dichloroethene	95	ug/L	1.9E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.4E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
Tetrachloroethene	3	ug/L		5.6E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-10	3.9E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03						
Trichloroethene	36	ug/L		7.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	5.1E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	9.E-04						
Vinyl Chloride	2	ug/L		3.4E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	2.4E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	2.E-04						
<b>Exp. Route Total</b>															<b>3.E-03</b>					
<b>Exposure Point Total</b>																<b>2.E-01</b>				
<b>Exposure Medium Total</b>																<b>2.E-01</b>				
<b>Groundwater Total</b>																<b>2.E-01</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>1.E-05</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>4.E+00</b>				

**Notes:**

NA = Not available

Total Blood HI Across All Media =	4.E-04
Total Body Weight HI Across All Media =	2.E-01
Total Developmental HI Across All Media =	4.E-04
Total Ear HI Across All Media =	2.E-01
Total Heart HI Across All Media =	2.E-01
Total Immune System HI Across All Media =	2.E-01
Total Kidney HI Across All Media =	7.E-02
Total Liver HI Across All Media =	2.E-02
Total Neurological HI Across All Media =	3.E+00
Total Respiratory System HI Across All Media =	6.E-03
Total Skin HI Across All Media =	5.E-01
Total Thyroid HI Across All Media =	7.E-01
Total Whole Body HI Across All Media =	2.E-01

**Table G-56**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units		target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Waste	Ingestion	Ethylbenzene	479	mg/kg	1.1E-05	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	7.7E-04	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	8.E-03		
				Trichloroethene	21	mg/kg	4.8E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	3.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-02		
				Xylenes	1788	mg/kg	4.1E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.9E-03	mg/kg/day	4.0E-01	mg/kg/day	whole body	7.E-03		
				Benzo(a)anthracene	6.8	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-07	1.1E-05	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	9.E-07	8.7E-06	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	2.5E-07	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	1.8E-05	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	3.9E-07	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	8.E-07	2.7E-05	mg/kg/day	3.0E-05	mg/kg/day	neurological	9.E-01		
				Arsenic	36	mg/kg	8.4E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-06	5.9E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-01		
				Chromium	218	mg/kg	5.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.5E-04	mg/kg/day	1.5E+00	mg/kg/day	no effects	2.E-04		
				Cobalt	646	mg/kg	1.5E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-03	mg/kg/day	3.0E-03	mg/kg/day	thyroid	3.E-01		
			<b>Exp. Route Total</b>																<b>2.E+00</b>
			Dermal	Ethylbenzene	479	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
				Trichloroethene	21	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA	
				Xylenes	1788	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	4.0E-01	mg/kg/day	whole body	NA	
				Benzo(a)anthracene	6.8	mg/kg	2.0E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	1.E-08	1.4E-06	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	1.6E-08	mg/kg/day	7.3E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	1.1E-06	mg/kg/day	NA	mg/kg/day	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	3.3E-08	mg/kg/day	7.3E-01	(mg/kg/day) <sup>-1</sup>	2.E-08	2.3E-06	mg/kg/day	NA	mg/kg/day	NA	NA		
				Aroclor 1254	17	mg/kg	5.4E-08	mg/kg/day	2.0E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	3.8E-06	mg/kg/day	3.0E-05	mg/kg/day	neurological	1.E-01		
				Arsenic	36	mg/kg	2.5E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-08	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	6.E-03		
				Chromium	218	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.5E+00	mg/kg/day	no effects	NA		
				Cobalt	646	mg/kg	NA	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	thyroid	NA		
			<b>Exp. Route Total</b>																<b>1.E-01</b>
			Inhalation	Ethylbenzene	479	mg/kg	6.4E-05	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	4.5E-03	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	5.E-04		
				Trichloroethene	21	mg/kg	7.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	5.0E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	9.E-04		
				Xylenes	1788	mg/kg	2.3E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.6E-02	mg/m <sup>3</sup>	4.0E-01	mg/m <sup>3</sup>	whole body	4.E-02		
				Benzo(a)anthracene	6.8	mg/kg	4.2E-12	mg/m <sup>3</sup>	1.1E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-13	2.9E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(a)pyrene	5.4	mg/kg	3.3E-12	mg/m <sup>3</sup>	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-12	2.3E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Benzo(b)fluoranthene	11	mg/kg	6.8E-12	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-13	4.8E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Aroclor 1254	17	mg/kg	1.0E-11	mg/m <sup>3</sup>	1.0E-01	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-12	7.2E-10	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Arsenic	36	mg/kg	2.2E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-10	1.6E-09	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	1.E-04		
				Chromium	218	mg/kg	1.3E-10	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	9.4E-09	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
				Cobalt	646	mg/kg	4.0E-10	mg/m <sup>3</sup>	9.0E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	2.8E-08	mg/m <sup>3</sup>	2.0E-05	mg/m <sup>3</sup>	respiratory system	1.E-03		
			<b>Exp. Route Total</b>																<b>4.E-02</b>
<b>Exposure Point Total</b>																	<b>2.E+00</b>		
<b>Exposure Medium Total</b>																	<b>2.E+00</b>		
<b>Surface/Subsurface Soil Total</b>																	<b>2.E+00</b>		

**Table G-56**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (waste)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	1.4E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	8.E-11	9.8E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	5.E-07			
				Benzene	2	ug/L	7.3E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	4.E-10	5.1E-07	mg/kg/day	1.0E-02	mg/kg/day	immune system	5.E-05			
				cis-1,2-Dichloroethene	95	ug/L	3.3E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.3E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-02			
				Tetrachloroethene	3	ug/L	9.6E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	6.7E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	7.E-06			
				Trichloroethene	36	ug/L	1.2E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-09	8.7E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-02			
				Vinyl Chloride	2	ug/L	5.8E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	4.E-09	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
				Arsenic	23	ug/L	8.1E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	5.7E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-02			
				Cobalt	21	ug/L	7.3E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.1E-06	mg/kg/day	3.0E-03	mg/kg/day	thyroid	2.E-03			
				<b>Exp. Route Total</b>																<b>5.E-02</b>
				Dermal	1,1-Dichloroethane	4	ug/L	1.1E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	6.E-11	7.6E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	4.E-07		
					Benzene	2	ug/L	1.1E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	6.E-10	7.9E-07	mg/kg/day	1.0E-02	mg/kg/day	immune system	8.E-05		
					cis-1,2-Dichloroethene	95	ug/L	4.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-02		
			Tetrachloroethene		3	ug/L	5.5E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	3.8E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-05			
			Trichloroethene		36	ug/L	2.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.5E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
			Vinyl Chloride		2	ug/L	3.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	2.2E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	7.E-05			
			Arsenic	23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA				
			Cobalt	21	ug/L	1.9E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.3E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	4.E-05				
			<b>Exp. Route Total</b>																<b>4.E-02</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	4.1E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	2.9E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	2.1E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	1.5E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	2.E-04			
				cis-1,2-Dichloroethene	95	ug/L	9.7E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	6.8E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	2.8E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-11	2.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-04			
				Trichloroethene	36	ug/L	3.6E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.5E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-04			
				Vinyl Chloride	2	ug/L	1.7E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	1.2E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	1.E-04			
<b>Exp. Route Total</b>															<b>1.E-03</b>					
<b>Exposure Point Total</b>																<b>1.E-01</b>				
<b>Exposure Medium Total</b>																<b>1.E-01</b>				
<b>Groundwater Total</b>																<b>1.E-01</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>4.E-06</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>2.E+00</b>				

**Notes:**

NA = Not available

Total Blood HI Across All Media =	2.E-04
Total Body Weight HI Across All Media =	5.E-02
Total Developmental HI Across All Media =	1.E-04
Total Ear HI Across All Media =	1.E-01
Total Heart HI Across All Media =	1.E-01
Total Immune System HI Across All Media =	1.E-01
Total Kidney HI Across All Media =	3.E-02
Total Liver HI Across All Media =	8.E-03
Total Neurological HI Across All Media =	1.E+00
Total Respiratory System HI Across All Media =	1.E-03
Total Skin HI Across All Media =	2.E-01
Total Thyroid HI Across All Media =	3.E-01
Total Whole Body HI Across All Media =	5.E-02

**Table G-57**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Landfill 1 Soil (native)
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	2.8E-06	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	3.E-08	7.8E-06	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	8.E-05		
			Exp. Route Total																
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	NA	
			Exp. Route Total																
			Inhalation	Ethylbenzene	16	mg/kg	2.7E-05	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	7.5E-05	mg/m <sup>3</sup>	1.0E+00	mg/m <sup>3</sup>	developmental	7.E-05	7.E-05	
			Exp. Route Total																
			Exposure Point Total															1.E-07	2.E-04
			Exposure Medium Total															1.E-07	2.E-04
			Surface/Subsurface Soil Total															1.E-07	2.E-04

**Table G-57**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	7.0E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	2.0E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05			
				Benzene	2	ug/L	3.6E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	1.0E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	3.E-04			
				cis-1,2-Dichloroethene	95	ug/L	1.7E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	4.8E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	1.3E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-04			
				Trichloroethene	36	ug/L	6.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	2.9E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	4.1E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	6.E-06	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	3.6E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	thyroid	3.E-02			
				<b>Exp. Route Total</b>									<b>7.E-06</b>							<b>1.E-01</b>
				Dermal	1,1-Dichloroethane	4	ug/L	1.1E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	6.E-09	3.1E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	2.E-05		
			Benzene		2	ug/L	1.1E-06	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	6.E-08	3.2E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	8.E-04			
			cis-1,2-Dichloroethene		95	ug/L	4.2E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-04	mg/kg/day	2.0E-03	mg/kg/day	kidney	6.E-02			
			Tetrachloroethene		3	ug/L	5.5E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	1.5E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-03			
			Trichloroethene		36	ug/L	2.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	5.8E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01			
			Vinyl Chloride		2	ug/L	3.1E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	8.8E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	1.9E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.4E-07	mg/kg/day	3.0E-04	mg/kg/day	thyroid	2.E-03				
			<b>Exp. Route Total</b>									<b>1.E-06</b>							<b>2.E-01</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	4.1E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	1.1E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	2.1E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.9E-05	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	2.E-03			
				cis-1,2-Dichloroethene	95	ug/L	9.7E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.7E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	2.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-09	7.8E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03			
				Trichloroethene	36	ug/L	3.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	1.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-01			
			Vinyl Chloride	2	ug/L	1.7E-05	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	4.7E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	5.E-04				
<b>Exp. Route Total</b>									<b>2.E-06</b>							<b>5.E-01</b>				
<b>Exposure Point Total</b>									<b>1.E-05</b>							<b>8.E-01</b>				
<b>Exposure Medium Total</b>									<b>1.E-05</b>							<b>8.E-01</b>				
<b>Groundwater Total</b>									<b>1.E-05</b>							<b>8.E-01</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>1.E-05</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>8.E-01</b>				

Notes:  
 NA = Not available

Total Blood HI Across All Media =	2.E-03
Total Developmental HI Across All Media =	7.E-05
Total Ear HI Across All Media =	2.E-01
Total Heart HI Across All Media =	7.E-01
Total Immune System HI Across All Media =	7.E-01
Total Kidney HI Across All Media =	8.E-02
Total Liver HI Across All Media =	1.E-03
Total Neurological HI Across All Media =	5.E-03
Total Skin HI Across All Media =	4.E-02
Total Thyroid HI Across All Media =	4.E-02

**Table G-58**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	5.0E-07	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	6.E-09	3.9E-06	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	4.E-05	
			Exp. Route Total								6.E-09							4.E-05
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
			Exp. Route Total								0.E+00							0.E+00
			Inhalation	Ethylbenzene	16	mg/kg	9.6E-06	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	7.5E-05	mg/m <sup>3</sup>	1.0E+00	mg/m <sup>3</sup>	developmental	7.E-05	
			Exp. Route Total								2.E-08							7.E-05
			Exposure Point Total								3.E-08							1.E-04
			Exposure Medium Total								3.E-08							1.E-04
			Surface/Subsurface Soil Total								3.E-08							1.E-04

**Table G-58**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.5E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	2.0E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05			
				Benzene	2	ug/L	1.3E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	7.E-09	1.0E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	3.E-04			
				cis-1,2-Dichloroethene	95	ug/L	6.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	1.7E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	1.3E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-04			
				Trichloroethene	36	ug/L	2.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	1.0E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-08	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	1.5E-06	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-06	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	1.3E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	thyroid	3.E-02			
				<b>Exp. Route Total</b>																
				Dermal	1,1-Dichloroethane	4	ug/L	2.0E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	1.5E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	8.E-06		
					Benzene	2	ug/L	2.0E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.6E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	4.E-04		
			cis-1,2-Dichloroethene		95	ug/L	7.5E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	3.E-02			
			Tetrachloroethene		3	ug/L	9.9E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	7.7E-06	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-03			
			Trichloroethene		36	ug/L	3.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	2.9E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-02			
			Vinyl Chloride		2	ug/L	5.7E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	4.E-08	4.4E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	3.5E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.7E-07	mg/kg/day	3.0E-04	mg/kg/day	thyroid	9.E-04				
			<b>Exp. Route Total</b>																	
			Inhalation	1,1-Dichloroethane	4	ug/L	7.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	5.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	3.8E-06	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	3.0E-05	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	1.E-03			
				cis-1,2-Dichloroethene	95	ug/L	1.7E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.4E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	5.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.9E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Trichloroethene	36	ug/L	6.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	5.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01			
Vinyl Chloride	2	ug/L	3.0E-06	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.4E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	2.E-04							
<b>Exp. Route Total</b>																				
<b>Exposure Point Total</b>																				
<b>Exposure Medium Total</b>																				
<b>Groundwater Total</b>																				
<b>Total of Receptor Risks Across All Media</b>												<b>Total of Receptor Hazards Across All Media</b>								
										3.E-06										
										3.E-06										
										3.E-06										
										3.E-06										
										3.E-06										

Notes:  
 NA = Not available

Total Blood HI Across All Media =	1.E-03
Total Developmental HI Across All Media =	7.E-05
Total Ear HI Across All Media =	9.E-02
Total Heart HI Across All Media =	3.E-01
Total Immune System HI Across All Media =	3.E-01
Total Kidney HI Across All Media =	5.E-02
Total Liver HI Across All Media =	7.E-04
Total Neurological HI Across All Media =	2.E-03
Total Skin HI Across All Media =	4.E-02
Total Thyroid HI Across All Media =	3.E-02

**Table G-59**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Landfill 1 Soil (native)
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations										
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units	target organ					
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	2.2E-07	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	2.E-09	6.3E-07	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	6.E-06				
			Exp. Route Total																		
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	NA			
			Exp. Route Total																		
			Inhalation	Ethylbenzene	16	mg/kg	8.6E-06	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	2.4E-05	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	3.E-06	3.E-06			
			Exp. Route Total																		
			Exposure Point Total																		
			Exposure Medium Total																		
			Surface/Subsurface Soil Total																		

**Table G-59**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.8E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	7.9E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	4.E-08			
				Benzene	2	ug/L	1.5E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	8.E-10	4.1E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	4.E-06			
				cis-1,2-Dichloroethene	95	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.9E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	9.E-04			
				Tetrachloroethene	3	ug/L	1.9E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	5.4E-08	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-07			
				Trichloroethene	36	ug/L	2.5E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	7.0E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-03			
				Vinyl Chloride	2	ug/L	1.2E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-09	3.2E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-05			
				Arsenic	23	ug/L	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	4.6E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-03			
				Cobalt	21	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	1.E-04			
				<b>Exp. Route Total</b>																<b>4.E-03</b>
				Dermal	1,1-Dichloroethane	4	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	6.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-08		
			Benzene		2	ug/L	2.3E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-09	6.3E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	6.E-06			
			cis-1,2-Dichloroethene		95	ug/L	8.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.3E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-03			
			Tetrachloroethene		3	ug/L	1.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	3.1E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-06			
			Trichloroethene		36	ug/L	4.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-03			
			Vinyl Chloride		2	ug/L	6.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-09	1.8E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-06			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	3.8E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.1E-08	mg/kg/day	3.0E-03	mg/kg/day	thyroid	4.E-06				
			<b>Exp. Route Total</b>																<b>4.E-03</b>	
			Inhalation	1,1-Dichloroethane	4	ug/L	8.2E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	2.3E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	4.2E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	1.2E-06	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	1.E-05			
				cis-1,2-Dichloroethene	95	ug/L	1.9E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	5.4E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	5.6E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-10	1.6E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-05			
				Trichloroethene	36	ug/L	7.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	2.0E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	4.E-05			
				Vinyl Chloride	2	ug/L	3.4E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	9.5E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	9.E-06			
<b>Exp. Route Total</b>															<b>1.E-04</b>					
<b>Exposure Point Total</b>																<b>8.E-03</b>				
<b>Exposure Medium Total</b>																<b>8.E-03</b>				
<b>Groundwater Total</b>																<b>8.E-03</b>				
<b>Total of Receptor Risks Across All Media</b>										<b>4.E-07</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>8.E-03</b>				

Notes:  
 NA = Not available

Total Blood HI Across All Media =	1.E-05
Total Ear HI Across All Media =	4.E-03
Total Heart HI Across All Media =	4.E-03
Total Immune System HI Across All Media =	4.E-03
Total Kidney HI Across All Media =	2.E-03
Total Liver HI Across All Media =	4.E-05
Total Neurological HI Across All Media =	8.E-05
Total Skin HI Across All Media =	2.E-03
Total Thyroid HI Across All Media =	1.E-04

**Table G-60**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Landfill 1 Soil (native)
Receptor: On-site Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations																
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient										
							Value	Units	Value	Units		Value	Units	Value	Units	target organ											
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	4.0E-08	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	4.E-10	3.1E-07	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	3.E-06										
			Exp. Route Total																			4.E-10					3.E-06
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA										
			Exp. Route Total																			0.E+00					0.E+00
			Inhalation	Ethylbenzene	16	mg/kg	7.7E-07	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	6.0E-06	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	7.E-07										
			Exp. Route Total																			2.E-09					7.E-07
			Exposure Point Total											2.E-09					4.E-06								
			Exposure Medium Total															2.E-09					4.E-06				
			Surface/Subsurface Soil Total																			2.E-09					4.E-06

**Table G-60**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	5.0E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-11	3.9E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08			
				Benzene	2	ug/L	2.6E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-10	2.0E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	2.E-06			
				cis-1,2-Dichloroethene	95	ug/L	1.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	9.3E-07	mg/kg/day	2.0E-03	mg/kg/day	kidney	5.E-04			
				Tetrachloroethene	3	ug/L	3.4E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-12	2.7E-08	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-07			
				Trichloroethene	36	ug/L	4.5E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-09	3.5E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-04			
				Vinyl Chloride	2	ug/L	2.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	1.6E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	5.E-06			
				Arsenic	23	ug/L	2.9E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	8.E-04			
				Cobalt	21	ug/L	2.6E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.0E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	7.E-05			
				<b>Exp. Route Total</b>									5.E-08							2.E-03
				Dermal	1,1-Dichloroethane	4	ug/L	3.9E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	3.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08		
			Benzene		2	ug/L	4.1E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	2.E-10	3.2E-08	mg/kg/day	1.0E-02	mg/kg/day	immune system	3.E-06			
			cis-1,2-Dichloroethene		95	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-06	mg/kg/day	2.0E-03	mg/kg/day	kidney	6.E-04			
			Tetrachloroethene		3	ug/L	2.0E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	1.5E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-06			
			Trichloroethene		36	ug/L	7.5E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-09	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-03			
			Vinyl Chloride		2	ug/L	1.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-10	8.8E-09	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-06			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	6.9E-10	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.4E-09	mg/kg/day	3.0E-03	mg/kg/day	thyroid	2.E-06				
			<b>Exp. Route Total</b>									5.E-09							2.E-03	
			Inhalation	1,1-Dichloroethane	4	ug/L	1.5E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-10	1.1E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	7.6E-08	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-10	5.9E-07	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	7.E-06			
				cis-1,2-Dichloroethene	95	ug/L	3.5E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	1.0E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-11	7.8E-07	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-05			
				Trichloroethene	36	ug/L	1.3E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-09	1.0E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-05			
				Vinyl Chloride	2	ug/L	6.1E-08	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-10	4.7E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	5.E-06			
<b>Exp. Route Total</b>									6.E-09							5.E-05				
<b>Exposure Point Total</b>									6.E-08							4.E-03				
<b>Exposure Medium Total</b>									6.E-08							4.E-03				
<b>Groundwater Total</b>									6.E-08							4.E-03				
<b>Total of Receptor Risks Across All Media</b>										6.E-08	<b>Total of Receptor Hazards Across All Media</b>					4.E-03				

Notes:  
 NA = Not available

Total Blood HI Across All Media =	7.E-06
Total Ear HI Across All Media =	2.E-03
Total Heart HI Across All Media =	2.E-03
Total Immune System HI Across All Media =	2.E-03
Total Kidney HI Across All Media =	1.E-03
Total Liver HI Across All Media =	2.E-05
Total Neurological HI Across All Media =	4.E-05
Total Skin HI Across All Media =	8.E-04
Total Thyroid HI Across All Media =	7.E-05

**Table G-61**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Landfill 1 Soil (native)
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations									
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	7.4E-07	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	8.E-09	5.2E-05	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	5.E-04			
			Exp. Route Total																	
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA			
			Exp. Route Total																	
			Inhalation	Ethylbenzene	16	mg/kg	8.6E-06	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	6.0E-04	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	7.E-05			
			Exp. Route Total																	
			Exposure Point Total									3.E-08								
			Exposure Medium Total									3.E-08								
			Surface/Subsurface Soil Total									3.E-08								6.E-04

**Table G-61**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	2.8E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.0E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-06			
				Benzene	2	ug/L	1.5E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	8.E-10	1.0E-06	mg/kg/day	1.0E-02	mg/kg/day	immune system	1.E-04			
				cis-1,2-Dichloroethene	95	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	3	ug/L	1.9E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	1.3E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-05			
				Trichloroethene	36	ug/L	2.5E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	1.2E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-09	8.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				Arsenic	23	ug/L	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-02			
				Cobalt	21	ug/L	1.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.0E-05	mg/kg/day	3.0E-03	mg/kg/day	thyroid	3.E-03			
				<b>Exp. Route Total</b>																
				Dermal	1,1-Dichloroethane	4	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.5E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	8.E-07		
			Benzene		2	ug/L	2.3E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	1.E-09	1.6E-06	mg/kg/day	1.0E-02	mg/kg/day	immune system	2.E-04			
			cis-1,2-Dichloroethene		95	ug/L	8.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	3.E-02			
			Tetrachloroethene		3	ug/L	1.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	7.7E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	8.E-05			
			Trichloroethene		36	ug/L	4.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	2.9E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-02			
			Vinyl Chloride		2	ug/L	6.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-09	4.4E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
			Arsenic		23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
			Cobalt	21	ug/L	3.8E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.7E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	9.E-05				
			<b>Exp. Route Total</b>																	
			Inhalation	1,1-Dichloroethane	4	ug/L	8.2E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	5.7E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	4.2E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	3.0E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	4.E-04			
				cis-1,2-Dichloroethene	95	ug/L	1.9E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.4E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	5.6E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-10	3.9E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Trichloroethene	36	ug/L	7.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	5.1E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	9.E-04			
			Vinyl Chloride	2	ug/L	3.4E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	2.4E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	2.E-04				
<b>Exp. Route Total</b>																				
<b>Exposure Point Total</b>																				
<b>Exposure Medium Total</b>																				
<b>Groundwater Total</b>																				
<b>Total of Receptor Risks Across All Media</b>										4.E-07	<b>Total of Receptor Hazards Across All Media</b>					2.E-01				

Notes:  
 NA = Not available

Total Blood HI Across All Media =	4.E-04
Total Ear HI Across All Media =	9.E-02
Total Heart HI Across All Media =	9.E-02
Total Immune System HI Across All Media =	9.E-02
Total Kidney HI Across All Media =	5.E-02
Total Liver HI Across All Media =	1.E-03
Total Neurological HI Across All Media =	2.E-03
Total Skin HI Across All Media =	4.E-02
Total Thyroid HI Across All Media =	3.E-03

**Table G-62**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Landfill 1 Soil (native)
Receptor: On-site Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units		target organ	
Surface/Subsurface Soil	Surface/Subsurface Soil	Landfill 1 Native	Ingestion	Ethylbenzene	16	mg/kg	3.7E-07	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	4.E-09	2.6E-05	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	3.E-04	
			Exp. Route Total								4.E-09							3.E-04
			Dermal	Ethylbenzene	16	mg/kg	NA	mg/kg/day	1.1E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver and kidney	NA	
			Exp. Route Total								0.E+00							0.E+00
			Inhalation	Ethylbenzene	16	mg/kg	2.1E-06	mg/m <sup>3</sup>	2.5E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-09	1.5E-04	mg/m <sup>3</sup>	9.0E+00	mg/m <sup>3</sup>	ear	2.E-05	
			Exp. Route Total								5.E-09							2.E-05
				Exposure Point Total							9.E-09							3.E-04
				Exposure Medium Total							9.E-09							3.E-04
				Surface/Subsurface Soil Total							9.E-09							3.E-04

**Table G-62**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Landfill 1 Soil (native)  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Landfill 1	Ingestion	1,1-Dichloroethane	4	ug/L	1.4E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	8.E-11	9.8E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	5.E-07			
				Benzene	2	ug/L	7.3E-09	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	4.E-10	5.1E-07	mg/kg/day	1.0E-02	mg/kg/day	immune system	5.E-05			
				cis-1,2-Dichloroethene	95	ug/L	3.3E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.3E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-02			
				Tetrachloroethene	3	ug/L	9.6E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	6.7E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	7.E-06			
				Trichloroethene	36	ug/L	1.2E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-09	8.7E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-02			
				Vinyl Chloride	2	ug/L	5.8E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	4.E-09	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-04			
				Arsenic	23	ug/L	8.1E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	5.7E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-02			
				Cobalt	21	ug/L	7.3E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	5.1E-06	mg/kg/day	3.0E-03	mg/kg/day	thyroid	2.E-03			
				<b>Exp. Route Total</b>																
				<b>1.E-07</b>																
			Dermal	1,1-Dichloroethane	4	ug/L	1.1E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	6.E-11	7.6E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	4.E-07			
				Benzene	2	ug/L	1.1E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	6.E-10	7.9E-07	mg/kg/day	1.0E-02	mg/kg/day	immune system	8.E-05			
				cis-1,2-Dichloroethene	95	ug/L	4.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	1.E-02			
				Tetrachloroethene	3	ug/L	5.5E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	3.8E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-05			
				Trichloroethene	36	ug/L	2.1E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	1.5E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02			
				Vinyl Chloride	2	ug/L	3.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	2.2E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	7.E-05			
				Arsenic	23	ug/L	NA	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	skin	NA			
				Cobalt	21	ug/L	1.9E-09	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.3E-07	mg/kg/day	3.0E-03	mg/kg/day	thyroid	4.E-05			
			<b>Exp. Route Total</b>																	
			<b>1.E-08</b>																	
			Inhalation	1,1-Dichloroethane	4	ug/L	4.1E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	2.9E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Benzene	2	ug/L	2.1E-07	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	1.5E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	2.E-04			
				cis-1,2-Dichloroethene	95	ug/L	9.7E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	6.8E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA			
				Tetrachloroethene	3	ug/L	2.8E-07	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-11	2.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-04			
Trichloroethene	36	ug/L		3.6E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.5E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-04						
Vinyl Chloride	2	ug/L		1.7E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	1.2E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	1.E-04						
<b>Exp. Route Total</b>																				
<b>2.E-08</b>																				
<b>Exposure Point Total</b>																				
<b>2.E-07</b>																				
<b>Exposure Medium Total</b>																				
<b>2.E-07</b>																				
<b>Groundwater Total</b>																				
<b>2.E-07</b>																				
<b>Total of Receptor Risks Across All Media</b>										<b>2.E-07</b>		<b>Total of Receptor Hazards Across All Media</b>					<b>1.E-01</b>			

Notes:  
 NA = Not available

Total Blood HI Across All Media =	2.E-04
Total Ear HI Across All Media =	5.E-02
Total Heart HI Across All Media =	5.E-02
Total Immune System HI Across All Media =	5.E-02
Total Kidney HI Across All Media =	3.E-02
Total Liver HI Across All Media =	6.E-04
Total Neurological HI Across All Media =	1.E-03
Total Skin HI Across All Media =	2.E-02
Total Thyroid HI Across All Media =	2.E-03

**Table G-63**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Box Sewer
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	2.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	6.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01		
				Trichloroethene	429	ug/L	7.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	2.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01		
			Exp. Route Total								4.E-06							5.E-01	
			Dermal	Tetrachloroethene	1306	ug/L	2.6E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	7.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00		
				Trichloroethene	429	ug/L	2.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	7.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00		
			Exp. Route Total								2.E-05							3.E+00	
			Inhalation	Tetrachloroethene	1306	ug/L	1.3E-02	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-06	3.7E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-01		
				Trichloroethene	429	ug/L	4.4E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-05	1.2E-02	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	6.E+00		
			Exp. Route Total								2.E-05							7.E+00	
			Exposure Point Total									4.E-05							1.E+01
			Exposure Medium Total									4.E-05							1.E+01
			Groundwater Total									4.E-05							1.E+01
			Total of Receptor Risks Across All Media										4.E-05	Total of Receptor Hazards Across All Media					1.E+01

Notes:

NA = Not available

Total Ear HI Across All Media =	2.E+00
Total Heart HI Across All Media =	8.E+00
Total Immune System HI Across All Media =	8.E+00
Total Neurological HI Across All Media =	2.E+00

**Table G-64**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Box Sewer  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	8.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	6.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01		
				Trichloroethene	429	ug/L	2.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01		
				Exp. Route Total							1.E-06						5.E-01		
			Dermal	Tetrachloroethene	1306	ug/L	4.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	3.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01		
				Trichloroethene	429	ug/L	4.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01		
				Exp. Route Total							3.E-06						1.E+00		
			Inhalation	Tetrachloroethene	1306	ug/L	2.4E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.9E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-01		
				Trichloroethene	429	ug/L	7.9E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-06	6.1E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E+00		
				Exp. Route Total							4.E-06						4.E+00		
			Exposure Point Total									8.E-06						5.E+00	
			Exposure Medium Total									8.E-06						5.E+00	
			Groundwater Total									8.E-06						5.E+00	
			Total of Receptor Risks Across All Media										8.E-06	Total of Receptor Hazards Across All Media					5.E+00

Notes:

NA = Not available

Total Ear HI Across All Media =	1.E+00
Total Heart HI Across All Media =	4.E+00
Total Immune System HI Across All Media =	4.E+00
Total Neurological HI Across All Media =	1.E+00

**Table G-65**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Box Sewer  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	9.1E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	2.6E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-04		
				Trichloroethene	429	ug/L	3.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	8.4E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-02		
			Exp. Route Total								2.E-07							2.E-02	
			Dermal	Tetrachloroethene	1306	ug/L	5.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	1.5E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-03		
				Trichloroethene	429	ug/L	5.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	1.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-02		
			Exp. Route Total								3.E-07							3.E-02	
			Inhalation	Tetrachloroethene	1306	ug/L	2.7E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	7.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02		
				Trichloroethene	429	ug/L	8.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	2.4E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-04		
			Exp. Route Total								4.E-07							2.E-02	
			Exposure Point Total									9.E-07							7.E-02
			Exposure Medium Total									9.E-07							7.E-02
			Groundwater Total									9.E-07							7.E-02
			Total of Receptor Risks Across All Media										9.E-07	Total of Receptor Hazards Across All Media					7.E-02

Notes:  
 NA = Not available

Total Ear HI Across All Media =	4.E-02
Total Heart HI Across All Media =	4.E-02
Total Immune System HI Across All Media =	4.E-02
Total Liver HI Across All Media =	2.E-03
Total Neurological HI Across All Media =	2.E-02

**Table G-66**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Box Sewer  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	1.6E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	1.3E-05	mg/kg/day	1.0E-01	mg/kg/day	liver heart, immune system	1.E-04		
				Trichloroethene	429	ug/L	5.4E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day		8.E-03		
			Exp. Route Total								3.E-08						9.E-03		
			Dermal	Tetrachloroethene	1306	ug/L	9.4E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	7.3E-05	mg/kg/day	1.0E-01	mg/kg/day	liver heart, immune system	7.E-04		
				Trichloroethene	429	ug/L	9.0E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	7.0E-06	mg/kg/day	5.0E-04	mg/kg/day		1.E-02		
			Exp. Route Total								6.E-08						1.E-02		
			Inhalation	Tetrachloroethene	1306	ug/L	4.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	3.7E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological neurological	9.E-03		
				Trichloroethene	429	ug/L	1.6E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.2E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>		2.E-04		
			Exp. Route Total								8.E-08						1.E-02		
			Exposure Point Total									2.E-07						3.E-02	
			Exposure Medium Total									2.E-07						3.E-02	
			Groundwater Total									2.E-07						3.E-02	
			Total of Receptor Risks Across All Media										2.E-07	Total of Receptor Hazards Across All Media					3.E-02

Notes:  
 NA = Not available

Total Ear HI Across All Media =	2.E-02
Total Heart HI Across All Media =	2.E-02
Total Immune System HI Across All Media =	2.E-02
Total Liver HI Across All Media =	9.E-04
Total Neurological HI Across All Media =	1.E-02

**Table G-67**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Box Sewer  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	9.1E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	6.4E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	6.E-03	
				Trichloroethene	429	ug/L	3.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	2.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01	
			Exp. Route Total								2.E-07						4.E-01	
			Dermal	Tetrachloroethene	1306	ug/L	5.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	3.7E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-02	
				Trichloroethene	429	ug/L	5.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	3.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01	
			Exp. Route Total								3.E-07						7.E-01	
			Inhalation	Tetrachloroethene	1306	ug/L	2.7E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	1.9E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-01	
				Trichloroethene	429	ug/L	8.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	6.1E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-02	
			Exp. Route Total								4.E-07						5.E-01	
			Exposure Point Total									9.E-07						2.E+00
			Exposure Medium Total									9.E-07						2.E+00
			Groundwater Total									9.E-07						2.E+00
Total of Receptor Risks Across All Media										9.E-07	Total of Receptor Hazards Across All Media					2.E+00		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	1.E+00
Total Heart HI Across All Media =	1.E+00
Total Immune System HI Across All Media =	1.E+00
Total Liver HI Across All Media =	4.E-02
Total Neurological HI Across All Media =	5.E-01

**Table G-68**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Box Sewer  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	Box Sewer	Ingestion	Tetrachloroethene	1306	ug/L	4.6E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	3.2E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-03		
				Trichloroethene	429	ug/L	1.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	1.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01		
			Exp. Route Total								8.E-08							2.E-01	
			Dermal	Tetrachloroethene	1306	ug/L	2.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	1.8E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-02		
				Trichloroethene	429	ug/L	2.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01		
			Exp. Route Total								2.E-07							4.E-01	
			Inhalation	Tetrachloroethene	1306	ug/L	1.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	9.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-01		
				Trichloroethene	429	ug/L	4.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.1E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	6.E-03		
			Exp. Route Total								2.E-07							2.E-01	
			Exposure Point Total									5.E-07							8.E-01
			Exposure Medium Total									5.E-07							8.E-01
			Groundwater Total									5.E-07							8.E-01
			Total of Receptor Risks Across All Media										5.E-07	Total of Receptor Hazards Across All Media					8.E-01

Notes:  
 NA = Not available

Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	6.E-01
Total Immune System HI Across All Media =	6.E-01
Total Liver HI Across All Media =	2.E-02
Total Neurological HI Across All Media =	2.E-01

**Table G-69**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	8.0E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-06	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	8.E-03	
				Benzene	29	mg/kg	5.1E-06	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	1.4E-05	mg/kg/day	4.0E-03	mg/kg/day	immune system	4.E-03	
				Exp. Route Total							1.E-06							1.E-02
				Dermal	Arsenic	5	mg/kg	6.9E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	6.E-04
					Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	4.0E-03	mg/kg/day	immune system	NA
					Exp. Route Total							1.E-07						6.E-04
			Inhalation	Arsenic	5	mg/kg	3.6E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-10	9.9E-11	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	7.E-06	
				Benzene	29	mg/kg	7.7E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	2.2E-04	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	7.E-03	
				Exp. Route Total							6.E-07						7.E-03	
			Exp. Point Total								2.E-06						2.E-02	
			Exp. Medium Total								2.E-06						2.E-02	
			Surface/Subsurface Soil Total								2.E-06						2.E-02	
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	3.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	8.6E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				1,1-Dichloroethane	3.2	ug/L	5.6E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	1.6E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	8.E-06	
				Trichloroethene	212	ug/L	3.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				Exp. Route Total							2.E-06						2.E-01	
				Dermal	Tetrachloroethene	175	ug/L	3.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	9.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01
					1,1-Dichloroethane	3.2	ug/L	8.7E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	5.E-09	2.4E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05
			Trichloroethene		212	ug/L	1.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	3.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01	
			Exp. Route Total							6.E-06						9.E-01		
			Inhalation	Tetrachloroethene	175	ug/L	1.8E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	5.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01	
				1,1-Dichloroethane	3.2	ug/L	3.3E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	9.1E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
				Trichloroethene	212	ug/L	2.2E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-06	6.1E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E+00	
			Exp. Route Total							9.E-06						3.E+00		
Exp. Point Total								2.E-05						4.E+00				
Exp. Medium Total								2.E-05						4.E+00				
Groundwater Total								2.E-05						4.E+00				
Total of Receptor Risks Across All Media										2.E-05	Total of Receptor Hazards Across All Media					4.E+00		

Notes:  
 NA = Not available

Total Blood HI Across All Media =	7.E-03
Total Developmental HI Across All Media =	7.E-06
Total Ear HI Across All Media =	9.E-01
Total Heart HI Across All Media =	4.E+00
Total Immune System HI Across All Media =	4.E+00
Total Kidney HI Across All Media =	2.E-05
Total Neurological HI Across All Media =	3.E-01
Total Skin HI Across All Media =	8.E-03

**Table G-70**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	1.4E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	1.1E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	4.E-03	
				Benzene	29	mg/kg	9.1E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	5.E-08	7.1E-06	mg/kg/day	4.0E-03	mg/kg/day	immune system	2.E-03	
			Exp. Route Total															6.E-03
			Dermal	Arsenic	5	mg/kg	2.5E-09	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-09	1.9E-08	mg/kg/day	3.0E-04	mg/kg/day	skin	6.E-05	
				Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	4.0E-03	mg/kg/day	immune system	NA	
			Exp. Route Total															6.E-05
			Inhalation	Arsenic	5	mg/kg	1.3E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-11	9.9E-11	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	7.E-06	
				Benzene	29	mg/kg	2.8E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	2.2E-04	mg/m <sup>3</sup>	3.0E-02	mg/m <sup>3</sup>	blood	7.E-03	
			Exp. Route Total															7.E-03
			Exposure Point Total															
Exposure Medium Total																1.E-02		
Groundwater Total																1.E-02		
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	1.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	8.6E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				1,1-Dichloroethane	3.2	ug/L	2.0E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	1.6E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	8.E-06	
			Trichloroethene	212	ug/L	1.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	1.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01		
			Exp. Route Total															2.E-01
			Dermal	Tetrachloroethene	175	ug/L	6.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	4.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02	
				1,1-Dichloroethane	3.2	ug/L	1.6E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	9.E-10	1.2E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	6.E-06	
			Trichloroethene	212	ug/L	2.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01		
			Exp. Route Total															4.E-01
			Inhalation	Tetrachloroethene	175	ug/L	3.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	2.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-02	
				1,1-Dichloroethane	3.2	ug/L	5.9E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	4.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
Trichloroethene	212	ug/L	3.9E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	3.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E+00					
Exp. Route Total															2.E+00			
Exposure Point Total																2.E+00		
Exposure Medium Total																2.E+00		
Groundwater Total																2.E+00		
Total of Receptor Risks Across All Media										4.E-06	Total of Receptor Hazards Across All Media					2.E+00		

Notes:  
 NA = Not available

Total Blood HI Across All Media =	7.E-03
Total Developmental HI Across All Media =	7.E-06
Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	2.E+00
Total Immune System HI Across All Media =	2.E+00
Total Kidney HI Across All Media =	1.E-05
Total Neurological HI Across All Media =	2.E-01
Total Skin HI Across All Media =	4.E-03

**Table G-71**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	6.4E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-07	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	6.E-04	
				Benzene	29	mg/kg	4.0E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	1.1E-06	mg/kg/day	1.0E-02	mg/kg/day	immune system	1.E-04	
			Exp. Route Total															7.E-04
			Dermal	Arsenic	5	mg/kg	2.8E-09	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	4.E-09	7.7E-09	mg/kg/day	3.0E-04	mg/kg/day	skin	3.E-05	
				Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	immune system	NA	
			Exp. Route Total															3.E-05
			Inhalation	Arsenic	5	mg/kg	1.1E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-11	3.2E-11	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	2.E-06	
				Benzene	29	mg/kg	2.5E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	6.9E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	9.E-04	
			Exp. Route Total															9.E-04
			Exposure Point Total															
Exposure Medium Total																2.E-03		
Groundwater Total																2.E-03		
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	1.2E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	3.4E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-05	
				1,1-Dichloroethane	3.2	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	6.3E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-08	
			Trichloroethene	212	ug/L	1.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-03		
			Exp. Route Total															8.E-03
			Dermal	Tetrachloroethene	175	ug/L	7.0E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	2.0E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-04	
				1,1-Dichloroethane	3.2	ug/L	1.7E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	4.9E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08	
			Trichloroethene	212	ug/L	2.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	6.9E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-02		
			Exp. Route Total															1.E-02
			Inhalation	Tetrachloroethene	175	ug/L	3.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	1.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-03	
				1,1-Dichloroethane	3.2	ug/L	6.5E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	1.8E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	
Trichloroethene	212	ug/L	4.3E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.2E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-04					
Exp. Route Total															3.E-03			
Exposure Point Total																3.E-02		
Exposure Medium Total																3.E-02		
Groundwater Total																3.E-02		
										Total of Receptor Risks Across All Media	7.E-07					Total of Receptor Hazards Across All Media	3.E-02	

Notes:  
 NA = Not available

Total Blood HI Across All Media =	9.E-04
Total Developmental HI Across All Media =	2.E-06
Total Ear HI Across All Media =	2.E-02
Total Heart HI Across All Media =	2.E-02
Total Immune System HI Across All Media =	2.E-02
Total Kidney HI Across All Media =	6.E-08
Total Liver HI Across All Media =	2.E-04
Total Neurological HI Across All Media =	3.E-03
Total Skin HI Across All Media =	6.E-04

**Table G-72**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	1.2E-08	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-08	9.0E-08	mg/kg/day	3.0E-04	mg/kg/day	skin	3.E-04		
				Benzene	29	mg/kg	7.3E-08	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	4.E-09	5.7E-07	mg/kg/day	1.0E-02	mg/kg/day	immune system	6.E-05		
			Exp. Route Total								2.E-08							4.E-04	
			Dermal	Arsenic	5	mg/kg	5.0E-11	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	7.E-11	3.9E-10	mg/kg/day	3.0E-04	mg/kg/day	skin	1.E-06		
				Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	immune system	NA		
			Exp. Route Total								7.E-11							1.E-06	
			Inhalation	Arsenic	5	mg/kg	1.0E-12	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-12	8.0E-12	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	5.E-07		
				Benzene	29	mg/kg	2.2E-06	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	1.7E-05	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	2.E-04		
			Exp. Route Total								2.E-08							2.E-04	
			Exp. Point Total								4.E-08								6.E-04
			Exp. Medium Total								4.E-08								6.E-04
			Groundwater Total								4.E-08								6.E-04
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	2.2E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-10	1.7E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-05		
				1,1-Dichloroethane	3.2	ug/L	4.0E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	3.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-08		
			Trichloroethene	212	ug/L	2.7E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	2.1E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-03			
			Exp. Route Total								1.E-08							4.E-03	
			Dermal	Tetrachloroethene	175	ug/L	1.3E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	9.8E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-04		
				1,1-Dichloroethane	3.2	ug/L	3.1E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	2.4E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-08		
			Trichloroethene	212	ug/L	4.5E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	3.5E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-03			
			Exp. Route Total								2.E-08							7.E-03	
			Inhalation	Tetrachloroethene	175	ug/L	6.4E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	5.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03		
				1,1-Dichloroethane	3.2	ug/L	1.2E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-10	9.1E-07	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
			Trichloroethene	212	ug/L	7.8E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	6.1E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-04			
			Exp. Route Total								3.E-08							1.E-03	
Exp. Point Total								7.E-08								1.E-02			
Exp. Medium Total								7.E-08								1.E-02			
Groundwater Total								7.E-08								1.E-02			
Total of Receptor Risks Across All Media										1.E-07	Total of Receptor Hazards Across All Media					1.E-02			

Notes:  
 NA = Not available

Total Blood HI Across All Media =	2.E-04
Total Developmental HI Across All Media =	5.E-07
Total Ear HI Across All Media =	1.E-02
Total Heart HI Across All Media =	1.E-02
Total Immune System HI Across All Media =	1.E-02
Total Kidney HI Across All Media =	3.E-08
Total Liver HI Across All Media =	1.E-04
Total Neurological HI Across All Media =	1.E-03
Total Skin HI Across All Media =	3.E-04

**Table G-73**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	2.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	3.E-07	1.5E-05	mg/kg/day	3.0E-04	mg/kg/day	skin	5.E-02
				Benzene	29	mg/kg	1.3E-06	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	9.3E-05	mg/kg/day	1.0E-02	mg/kg/day	immune system	9.E-03
				Exp. Route Total							4.E-07						6.E-02
			Dermal	Arsenic	5	mg/kg	4.2E-09	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	6.E-09	2.9E-07	mg/kg/day	3.0E-04	mg/kg/day	skin	1.E-03
				Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	immune system	NA
				Exp. Route Total							6.E-09						1.E-03
			Inhalation	Arsenic	5	mg/kg	1.1E-11	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-11	8.0E-10	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	5.E-05
				Benzene	29	mg/kg	2.5E-05	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.7E-03	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	2.E-02
				Exp. Route Total							2.E-07						2.E-02
			Exposure Point Total								6.E-07						8.E-02
Exposure Medium Total								6.E-07						8.E-02			
Groundwater Total								6.E-07						8.E-02			
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	1.2E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	8.6E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	9.E-04
				1,1-Dichloroethane	3.2	ug/L	2.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.6E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	8.E-07
				Trichloroethene	212	ug/L	1.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	1.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01
			Exp. Route Total							7.E-08						2.E-01	
			Dermal	Tetrachloroethene	175	ug/L	7.0E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	4.9E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-03
				1,1-Dichloroethane	3.2	ug/L	1.7E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.2E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	6.E-07
				Trichloroethene	212	ug/L	2.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01
			Exp. Route Total							1.E-07						4.E-01	
			Inhalation	Tetrachloroethene	175	ug/L	3.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	2.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-02
				1,1-Dichloroethane	3.2	ug/L	6.5E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA
Trichloroethene	212	ug/L		4.3E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.0E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	6.E-03			
Exp. Route Total							2.E-07						7.E-02				
Exposure Point Total								4.E-07						6.E-01			
Exposure Medium Total								4.E-07						6.E-01			
Groundwater Total								4.E-07						6.E-01			
Total of Receptor Risks Across All Media										1.E-06	Total of Receptor Hazards Across All Media					7.E-01	

Notes:

NA = Not available

Total Blood HI Across All Media =	2.E-02
Total Developmental HI Across All Media =	5.E-05
Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	6.E-01
Total Immune System HI Across All Media =	6.E-01
Total Kidney HI Across All Media =	1.E-06
Total Liver HI Across All Media =	6.E-03
Total Neurological HI Across All Media =	7.E-02
Total Skin HI Across All Media =	5.E-02

**Table G-74**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: West Tank Farm  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Surface/Subsurface Soil	Surface/Subsurface Soil	West Tank Farm	Ingestion	Arsenic	5	mg/kg	1.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	2.E-07	7.4E-06	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-02		
				Benzene	29	mg/kg	6.7E-07	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	4.7E-05	mg/kg/day	1.0E-02	mg/kg/day	immune system	5.E-03		
				Exp. Route Total															3.E-02
			Dermal	Arsenic	5	mg/kg	6.9E-10	mg/kg/day	1.5E+00	(mg/kg/day) <sup>-1</sup>	1.E-09	4.8E-08	mg/kg/day	3.0E-04	mg/kg/day	skin	2.E-04		
				Benzene	29	mg/kg	NA	mg/kg/day	5.5E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	immune system	NA		
				Exp. Route Total															2.E-04
			Inhalation	Arsenic	5	mg/kg	2.8E-12	mg/m <sup>3</sup>	4.3E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-11	2.0E-10	mg/m <sup>3</sup>	1.5E-05	mg/m <sup>3</sup>	developmental, neurological	1.E-05		
				Benzene	29	mg/kg	6.2E-06	mg/m <sup>3</sup>	7.8E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	4.3E-04	mg/m <sup>3</sup>	8.0E-02	mg/m <sup>3</sup>	blood	5.E-03		
				Exp. Route Total															5.E-03
			Exposure Point Total																
Exposure Medium Total																	4.E-02		
Groundwater Total																	4.E-02		
Groundwater	Groundwater	West Tank Farm	Ingestion	Tetrachloroethene	175	ug/L	6.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	4.3E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-04		
				1,1-Dichloroethane	3.2	ug/L	1.1E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	6.E-11	7.8E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	4.E-07		
				Trichloroethene	212	ug/L	7.4E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-08	5.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01		
			Exp. Route Total																4.E-08
			Dermal	Tetrachloroethene	175	ug/L	3.5E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-09	2.5E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-03		
				1,1-Dichloroethane	3.2	ug/L	8.7E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	5.E-11	6.1E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-07		
				Trichloroethene	212	ug/L	1.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-08	8.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01		
			Exp. Route Total																6.E-08
			Inhalation	Tetrachloroethene	175	ug/L	1.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-09	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02		
				1,1-Dichloroethane	3.2	ug/L	3.3E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-10	2.3E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA		
Trichloroethene	212	ug/L		2.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-08	1.5E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	3.E-03					
Exp. Route Total																9.E-08			
Exposure Point Total																	2.E-07		
Exposure Medium Total																	3.E-01		
Groundwater Total																	3.E-01		
Total of Receptor Risks Across All Media										4.E-07	Total of Receptor Hazards Across All Media					3.E-01			

**Notes:**

NA = Not available

Total Blood HI Across All Media =	5.E-03
Total Developmental HI Across All Media =	1.E-05
Total Ear HI Across All Media =	3.E-01
Total Heart HI Across All Media =	3.E-01
Total Immune System HI Across All Media =	3.E-01
Total Kidney HI Across All Media =	7.E-07
Total Liver HI Across All Media =	3.E-03
Total Neurological HI Across All Media =	3.E-02
Total Skin HI Across All Media =	2.E-02

**Table G-75**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	1.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	3.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02	
				Trichloroethene	69	mg/kg	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	3.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-02	
			Exp. Route Total							8.E-07							1.E-01	
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	neurological	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA
	Exp. Route Total									0.E+00						0.E+00		
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	2.7E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-07	7.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-01	
				Trichloroethene	69	mg/kg	3.0E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	8.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-01	
			Exp. Route Total									2.E-06						6.E-01
			Exposure Point Total									3.E-06						7.E-01
Exposure Medium Total											3.E-06						7.E-01	
<b>Surface/Subsurface Soil Total</b>																	7.E-01	
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	1.2E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	7.E-09	3.3E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	2.E-05	
				cis-1,2-Dichloroethene	64	ug/L	1.1E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02	
				Tetrachloroethene	18627	ug/L	3.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-06	9.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00	
				Trichloroethene	9227	ug/L	1.6E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-05	4.5E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E+00	
				Exp. Route Total									8.E-05					
			Dermal	1,1-Dichloroethane	7	ug/L	1.8E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	5.1E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	3.E-05	
				cis-1,2-Dichloroethene	64	ug/L	2.8E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	4.E-02	
				Tetrachloroethene	18627	ug/L	3.7E-02	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-05	1.0E-01	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+01	
				Trichloroethene	9227	ug/L	5.4E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-04	1.5E-02	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+01	
			Exp. Route Total									3.E-04						5.E+01
Inhalation	1,1-Dichloroethane	7	ug/L	6.8E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.9E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	cis-1,2-Dichloroethene	64	ug/L	6.5E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.8E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	Tetrachloroethene	18627	ug/L	1.9E-01	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-05	5.3E-01	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E+01				
	Trichloroethene	9227	ug/L	9.4E-02	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-04	2.6E-01	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E+02				
Exp. Route Total									4.E-04						1.E+02			
Exposure Point Total										8.E-04						2.E+02		
Exposure Medium Total										8.E-04						2.E+02		
<b>Groundwater Total</b>																	2.E+02	
<b>Total of Receptor Risks Across All Media</b>										8.E-04	<b>Total of Receptor Hazards Across All Media</b>					2.E+02		

Notes:

NA = Not available

Total Ear HI Across All Media =	4.E+01
Total Heart HI Across All Media =	2.E+02
Total Immune System HI Across All Media =	2.E+02
Total Kidney HI Across All Media =	5.E-02
Total Neurological HI Across All Media =	3.E+01

**Table G-76**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	2.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-08	1.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-02
				Trichloroethene	69	mg/kg	2.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02	
			Exp. Route Total							1.E-07					6.E-02		
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	NA	
			Exp. Route Total							0.E+00						0.E+00	
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	9.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	7.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01
				Trichloroethene	69	mg/kg	1.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	8.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	4.E-01	
			Exp. Route Total							7.E-07						6.E-01	
	Exposure Point Total										8.E-07					7.E-01	
	Exposure Medium Total										8.E-07					7.E-01	
	Surface/Subsurface Soil Total										8.E-07					7.E-01	
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	4.2E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	3.3E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	2.E-05
				cis-1,2-Dichloroethene	64	ug/L	4.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02
			Tetrachloroethene	18627	ug/L	1.2E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00	
			Trichloroethene	9227	ug/L	5.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	4.5E-03	mg/kg/day	5.0E-04	mg/kg/day	9.E+00		
			Exp. Route Total							3.E-05						1.E+01	
			Dermal	1,1-Dichloroethane	7	ug/L	3.3E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	2.6E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	1.E-05
				cis-1,2-Dichloroethene	64	ug/L	5.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.9E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02
				Tetrachloroethene	18627	ug/L	6.7E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-05	5.2E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	9.E+00
				Trichloroethene	9227	ug/L	9.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-05	7.5E-03	mg/kg/day	5.0E-04	mg/kg/day	2.E+01	
			Exp. Route Total							6.E-05						2.E+01	
			Inhalation	1,1-Dichloroethane	7	ug/L	1.2E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	9.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA
				cis-1,2-Dichloroethene	64	ug/L	1.2E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	9.1E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA
Tetrachloroethene	18627	ug/L		3.4E-02	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-06	2.7E-01	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	7.E+00			
Trichloroethene	9227	ug/L		1.7E-02	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-05	1.3E-01	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	7.E+01				
Exp. Route Total							8.E-05						7.E+01				
Exposure Point Total										2.E-04					1.E+02		
Exposure Medium Total										2.E-04					1.E+02		
Groundwater Total										2.E-04					1.E+02		
Total of Receptor Risks Across All Media										2.E-04	Total of Receptor Hazards Across All Media					1.E+02	

Notes:

NA = Not available

Total Ear HI Across All Media = 2.E+01  
 Total Heart HI Across All Media = 9.E+01  
 Total Immune System HI Across All Media = 9.E+01  
 Total Kidney HI Across All Media = 4.E-02  
 Total Neurological HI Across All Media = 2.E+01

**Table G-77**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	9.3E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	2.6E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-04	
				Trichloroethene	69	mg/kg	9.6E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-03	
			Exp. Route Total								6.E-08							6.E-03
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA
			Exp. Route Total									0.E+00						0.E+00
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	8.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	2.4E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-02	
				Trichloroethene	69	mg/kg	9.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	2.6E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-04	
			Exp. Route Total									6.E-07						6.E-02
			Exposure Point Total									7.E-07						7.E-02
Exposure Medium Total										7.E-07						7.E-02		
Surface/Subsurface Soil Total										7.E-07						7.E-02		
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	4.7E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-10	1.3E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	7.E-08	
				cis-1,2-Dichloroethene	64	ug/L	4.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	6.E-05	
			Tetrachloroethene	18627	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	3.6E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-03		
			Trichloroethene	9227	ug/L	6.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01		
			Exp. Route Total									3.E-06						4.E-01
			Dermal	1,1-Dichloroethane	7	ug/L	3.6E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	1.0E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	5.E-08	
				cis-1,2-Dichloroethene	64	ug/L	5.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.6E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	8.E-05	
				Tetrachloroethene	18627	ug/L	7.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.1E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-02	
				Trichloroethene	9227	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	3.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-01	
			Exp. Route Total									7.E-06						6.E-01
Inhalation	1,1-Dichloroethane	7	ug/L	1.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	3.8E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	cis-1,2-Dichloroethene	64	ug/L	1.3E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	3.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	Tetrachloroethene	18627	ug/L	3.8E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	1.1E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-01				
	Trichloroethene	9227	ug/L	1.9E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-06	5.3E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-02				
Exp. Route Total									9.E-06						3.E-01			
Exposure Point Total										2.E-05						1.E+00		
Exposure Medium Total										2.E-05						1.E+00		
Groundwater Total										2.E-05						1.E+00		
										Total of Receptor Risks Across All Media		2.E-05	Total of Receptor Hazards Across All Media			1.E+00		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	1.E+00
Total Heart HI Across All Media =	1.E+00
Total Immune System HI Across All Media =	1.E+00
Total Kidney HI Across All Media =	1.E-04
Total Liver HI Across All Media =	2.E-02
Total Neurological HI Across All Media =	3.E-01

**Table G-78**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	1.7E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	1.3E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-04	
				Trichloroethene	69	mg/kg	1.7E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-09	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-03	
			Exp. Route Total								1.E-08							3.E-03
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA
			Exp. Route Total									0.E+00						0.E+00
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	7.7E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	6.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02	
				Trichloroethene	69	mg/kg	8.5E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	6.6E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-04	
	Exp. Route Total										5.E-08						2.E-02	
	Exposure Point Total										7.E-08						2.E-02	
Exposure Medium Total										7.E-08						2.E-02		
Surface/Subsurface Soil Total										7.E-08						2.E-02		
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	8.4E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	5.E-11	6.6E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-08	
				cis-1,2-Dichloroethene	64	ug/L	8.0E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	6.2E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	3.E-05	
				Tetrachloroethene	18627	ug/L	2.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	1.8E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-03	
				Trichloroethene	9227	ug/L	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				Exp. Route Total									6.E-07					
			Dermal	1,1-Dichloroethane	7	ug/L	6.6E-09	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	5.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-08	
				cis-1,2-Dichloroethene	64	ug/L	1.0E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.9E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	4.E-05	
				Tetrachloroethene	18627	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.0E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-02	
				Trichloroethene	9227	ug/L	1.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-07	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01	
			Exp. Route Total									1.E-06						3.E-01
Inhalation	1,1-Dichloroethane	7	ug/L	2.5E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-10	1.9E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	cis-1,2-Dichloroethene	64	ug/L	2.3E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.8E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	Tetrachloroethene	18627	ug/L	6.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01				
	Trichloroethene	9227	ug/L	3.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	2.6E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-03				
Exp. Route Total									2.E-06						1.E-01			
Exposure Point Total										3.E-06						6.E-01		
Exposure Medium Total										3.E-06						6.E-01		
Groundwater Total										3.E-06						6.E-01		
Total of Receptor Risks Across All Media										3.E-06	Total of Receptor Hazards Across All Media					6.E-01		

Notes:

NA = Not available

Total Ear HI Across All Media =	5.E-01
Total Heart HI Across All Media =	5.E-01
Total Immune System HI Across All Media =	5.E-01
Total Kidney HI Across All Media =	7.E-05
Total Liver HI Across All Media =	1.E-02
Total Neurological HI Across All Media =	2.E-01

**Table G-79**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		target organ
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	3.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	2.1E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-02
				Trichloroethene	69	mg/kg	3.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	2.2E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01
			Exp. Route Total							2.E-07							5.E-01
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA
			Exp. Route Total							0.E+00							0.E+00
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	8.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	6.0E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E+00
				Trichloroethene	69	mg/kg	9.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	6.6E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-02
			Exp. Route Total							6.E-07							2.E+00
			Exposure Point Total							8.E-07							2.E+00
Exposure Medium Total								8.E-07							2.E+00		
Surface/Subsurface Soil Total								8.E-07							2.E+00		
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	4.7E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-10	3.3E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-06
				cis-1,2-Dichloroethene	64	ug/L	4.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03
			Tetrachloroethene	18627	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	9.1E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	9.E-02	
			Trichloroethene	9227	ug/L	6.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	4.5E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E+00	
			Exp. Route Total							3.E-06							9.E+00
			Dermal	1,1-Dichloroethane	7	ug/L	3.6E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.6E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-06
				cis-1,2-Dichloroethene	64	ug/L	5.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.9E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03
				Tetrachloroethene	18627	ug/L	7.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	5.2E-02	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-01
				Trichloroethene	9227	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	7.5E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+01
			Exp. Route Total							7.E-06							2.E+01
Inhalation	1,1-Dichloroethane	7	ug/L	1.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	9.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
	cis-1,2-Dichloroethene	64	ug/L	1.3E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	9.1E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
	Tetrachloroethene	18627	ug/L	3.8E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	2.7E-01	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E+00			
	Trichloroethene	9227	ug/L	1.9E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-06	5.3E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-02			
Exp. Route Total							9.E-06							7.E+00			
Exposure Point Total								2.E-05							3.E+01		
Exposure Medium Total								2.E-05							3.E+01		
Groundwater Total								2.E-05							3.E+01		
Total of Receptor Risks Across All Media										2.E-05	Total of Receptor Hazards Across All Media					3.E+01	

Notes:  
 NA = Not available

Total Ear HI Across All Media =	2.E+01
Total Heart HI Across All Media =	2.E+01
Total Immune System HI Across All Media =	2.E+01
Total Kidney HI Across All Media =	4.E-03
Total Liver HI Across All Media =	6.E-01
Total Neurological HI Across All Media =	8.E+00

**Table G-80**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Process Sump Area  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Surface/Subsurface Soil	Surface/Subsurface Soil	Process Sump Area	Ingestion	Tetrachloroethene	662	mg/kg	1.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.1E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-02	
				Trichloroethene	69	mg/kg	1.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
			Exp. Route Total								1.E-07							2.E-01
			Dermal	Tetrachloroethene	662	mg/kg	NA	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	liver	NA
				Trichloroethene	69	mg/kg	NA	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	NA	NA	NA	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	NA
			Exp. Route Total									0.E+00						0.E+00
	Outdoor Air	Process Sump Area	Inhalation	Tetrachloroethene	662	mg/kg	2.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.5E-02	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-01	
				Trichloroethene	69	mg/kg	2.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.7E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	3.E-03	
			Exp. Route Total									2.E-07						4.E-01
			Exposure Point Total									3.E-07						6.E-01
Exposure Medium Total										3.E-07						6.E-01		
Surface/Subsurface Soil Total										3.E-07						6.E-01		
Groundwater	Groundwater	Process Sump Area	Ingestion	1,1-Dichloroethane	7	ug/L	2.3E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.6E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	8.E-07	
				cis-1,2-Dichloroethene	64	ug/L	2.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.6E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	8.E-04	
			Tetrachloroethene	18627	ug/L	6.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	4.6E-03	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-02		
			Trichloroethene	9227	ug/L	3.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E+00		
			Exp. Route Total									2.E-06						5.E+00
			Dermal	1,1-Dichloroethane	7	ug/L	1.8E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.3E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	6.E-07	
				cis-1,2-Dichloroethene	64	ug/L	2.8E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.0E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	1.E-03	
				Tetrachloroethene	18627	ug/L	3.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	2.6E-02	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-01	
				Trichloroethene	9227	ug/L	5.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E+00	
			Exp. Route Total									3.E-06						8.E+00
Inhalation	1,1-Dichloroethane	7	ug/L	6.8E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.8E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	cis-1,2-Dichloroethene	64	ug/L	6.5E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	4.5E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA			
	Tetrachloroethene	18627	ug/L	1.9E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	1.3E-01	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E+00				
	Trichloroethene	9227	ug/L	9.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-06	2.6E-03	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-03				
Exp. Route Total									4.E-06						3.E+00			
Exposure Point Total										9.E-06						2.E+01		
Exposure Medium Total										9.E-06						2.E+01		
Groundwater Total										9.E-06						2.E+01		
Total of Receptor Risks Across All Media										9.E-06	Total of Receptor Hazards Across All Media					2.E+01		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	1.E+01
Total Heart HI Across All Media =	1.E+01
Total Immune System HI Across All Media =	1.E+01
Total Kidney HI Across All Media =	2.E-03
Total Liver HI Across All Media =	3.E-01
Total Neurological HI Across All Media =	4.E+00

**Table G-81**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Historic Fill Area  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	1.3E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	28.08	ug/L	4.9E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	1.4E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-03			
				Trichloroethene	221.4	ug/L	3.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01			
				Vinyl Chloride	3.4	ug/L	5.9E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	4.E-07	1.7E-06	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-04			
				<b>Exp. Route Total</b>															<b>2.E-01</b>	
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	3.3E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	9.3E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	5.E-02			
				Tetrachloroethene	28.08	ug/L	5.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	1.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
				Trichloroethene	221.4	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	3.6E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01			
				Vinyl Chloride	3.4	ug/L	6.4E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-07	1.8E-06	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-04			
				<b>Exp. Route Total</b>															<b>8.E-01</b>	
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	7.7E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.2E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Tetrachloroethene	28.08	ug/L	2.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	8.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02			
				Trichloroethene	221.4	ug/L	2.3E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-06	6.3E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E+00			
				Vinyl Chloride	3.4	ug/L	3.5E-05	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	9.7E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	1.E-03			
				<b>Exp. Route Total</b>															<b>3.E+00</b>	
			<b>Exposure Point Total</b>																	<b>4.E+00</b>
			<b>Exposure Medium Total</b>																	<b>4.E+00</b>
			<b>Groundwater Total</b>																	<b>4.E+00</b>
			<b>Total of Receptor Risks Across All Media</b>										<b>2.E-05</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>4.E+00</b>	

**Notes:**

NA = Not available

Total Ear HI Across All Media =	9.E-01
Total Heart HI Across All Media =	4.E+00
Total Immune System HI Across All Media =	4.E+00
Total Kidney HI Across All Media =	7.E-02
Total Liver HI Across All Media =	2.E-03
Total Neurological HI Across All Media =	5.E-02

**Table G-82**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Historic Fill Area
Receptor: On-site Routine Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	4.7E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	28.08	ug/L	1.8E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	1.4E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-03			
				Trichloroethene	221.4	ug/L	1.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01			
				Vinyl Chloride	3.4	ug/L	2.1E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-07	1.7E-06	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-04			
				<b>Exp. Route Total</b>															<b>2.E-01</b>	
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	6.0E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02			
				Tetrachloroethene	28.08	ug/L	1.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	7.9E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02			
				Trichloroethene	221.4	ug/L	2.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01			
				Vinyl Chloride	3.4	ug/L	1.2E-07	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	8.E-08	9.0E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04			
				<b>Exp. Route Total</b>															<b>4.E-01</b>	
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	1.4E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.4E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Tetrachloroethene	28.08	ug/L	5.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	5.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Trichloroethene	221.4	ug/L	4.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	4.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-01			
				Vinyl Chloride	3.4	ug/L	6.2E-06	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	6.2E-06	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	6.E-05			
				<b>Exp. Route Total</b>															<b>2.E-01</b>	
					<b>Exposure Point Total</b>															<b>8.E-01</b>
				<b>Exposure Medium Total</b>																<b>8.E-01</b>
			<b>Groundwater Total</b>																	<b>8.E-01</b>
			<b>Total of Receptor Risks Across All Media</b>										<b>4.E-06</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>8.E-01</b>	

**Notes:**

NA = Not available

Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	8.E-01
Total Immune System HI Across All Media =	8.E-01
Total Kidney HI Across All Media =	4.E-02
Total Liver HI Across All Media =	9.E-04
Total Neurological HI Across All Media =	2.E-02

**Table G-83**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Historic Fill Area  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	5.3E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.5E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	7.E-05			
				Tetrachloroethene	28.08	ug/L	2.0E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	5.5E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-06			
				Trichloroethene	221.4	ug/L	1.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	4.3E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E-03			
				Vinyl Chloride	3.4	ug/L	2.4E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-08	6.7E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	2.E-05			
				<b>Exp. Route Total</b>															<b>9.E-03</b>	
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.9E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	9.E-05			
				Tetrachloroethene	28.08	ug/L	1.1E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	3.1E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-05			
				Trichloroethene	221.4	ug/L	2.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	7.2E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-02			
				Vinyl Chloride	3.4	ug/L	1.3E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	9.E-09	3.6E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-05			
				<b>Exp. Route Total</b>															<b>1.E-02</b>	
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	1.5E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.5E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA		
				Tetrachloroethene	28.08	ug/L	5.7E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	5.7E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-04			
				Trichloroethene	221.4	ug/L	4.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	4.5E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	8.E-05			
				Vinyl Chloride	3.4	ug/L	6.9E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	6.9E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	7.E-06			
				<b>Exp. Route Total</b>															<b>2.E-04</b>	
			<b>Exposure Point Total</b>																	<b>4.E-07</b>
			<b>Exposure Medium Total</b>																	<b>2.E-02</b>
			<b>Groundwater Total</b>																	<b>2.E-02</b>
			<b>Total of Receptor Risks Across All Media</b>										<b>4.E-07</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>2.E-02</b>	

Notes:  
 NA = Not available

Total Ear HI Across All Media =	2.E-02
Total Heart HI Across All Media =	2.E-02
Total Immune System HI Across All Media =	2.E-02
Total Kidney HI Across All Media =	2.E-04
Total Liver HI Across All Media =	8.E-05
Total Neurological HI Across All Media =	2.E-04

**Table G-84**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Historic Fill Area  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	9.5E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.4E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	4.E-05	
				Tetrachloroethene	28.08	ug/L	3.5E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-11	2.7E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-06	
				Trichloroethene	221.4	ug/L	2.8E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	2.2E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-03	
				Vinyl Chloride	3.4	ug/L	4.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	3.E-09	3.3E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	1.E-05	
				<b>Exp. Route Total</b>														
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	1.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	9.3E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	5.E-05	
				Tetrachloroethene	28.08	ug/L	2.0E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	1.6E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-05	
				Trichloroethene	221.4	ug/L	4.6E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	3.6E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-03	
				Vinyl Chloride	3.4	ug/L	2.3E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-09	1.8E-08	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-06	
				<b>Exp. Route Total</b>														
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	2.8E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.8E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	28.08	ug/L	1.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-10	1.0E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-05	
				Trichloroethene	221.4	ug/L	8.1E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	8.1E-06	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-05	
				Vinyl Chloride	3.4	ug/L	1.2E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-10	1.2E-07	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	1.E-06	
				<b>Exp. Route Total</b>														
<b>Exposure Point Total</b>																	<b>7.E-08</b>	
<b>Exposure Medium Total</b>																	<b>7.E-08</b>	
<b>Groundwater Total</b>																	<b>7.E-08</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>7.E-08</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>1.E-02</b>		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	1.E-02
Total Heart HI Across All Media =	1.E-02
Total Immune System HI Across All Media =	1.E-02
Total Kidney HI Across All Media =	8.E-05
Total Liver HI Across All Media =	4.E-05
Total Neurological HI Across All Media =	4.E-05

**Table G-85**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Historic Fill Area  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	5.3E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.7E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03	
				Tetrachloroethene	28.08	ug/L	2.0E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-04	
				Trichloroethene	221.4	ug/L	1.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-08	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				Vinyl Chloride	3.4	ug/L	2.4E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	2.E-08	1.7E-06	mg/kg/day	3.0E-03	mg/kg/day	liver	6.E-04	
				<b>Exp. Route Total</b>														
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	6.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	4.7E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03	
				Tetrachloroethene	28.08	ug/L	1.1E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	7.9E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	8.E-04	
				Trichloroethene	221.4	ug/L	2.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01	
				Vinyl Chloride	3.4	ug/L	1.3E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	9.E-09	9.0E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04	
				<b>Exp. Route Total</b>														
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	1.5E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.1E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	28.08	ug/L	5.7E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02	
				Trichloroethene	221.4	ug/L	4.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.3E-04	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-04	
				Vinyl Chloride	3.4	ug/L	6.9E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	4.9E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	5.E-04	
				<b>Exp. Route Total</b>														
<b>Exposure Point Total</b>																	<b>4.E-07</b>	
<b>Exposure Medium Total</b>																	<b>6.E-01</b>	
<b>Groundwater Total</b>																	<b>6.E-01</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>4.E-07</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>6.E-01</b>		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	6.E-01
Total Immune System HI Across All Media =	6.E-01
Total Kidney HI Across All Media =	4.E-03
Total Liver HI Across All Media =	2.E-03
Total Neurological HI Across All Media =	1.E-02

**Table G-86**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Historic Fill Area  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Historic Fill Area	Ingestion	cis-1,2-Dichloroethene	75.5	ug/L	2.6E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.8E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	9.E-04	
				Tetrachloroethene	28.08	ug/L	9.8E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	6.9E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	7.E-05	
				Trichloroethene	221.4	ug/L	7.7E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	5.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
				Vinyl Chloride	3.4	ug/L	1.2E-08	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	9.E-09	8.3E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	3.E-04	
				<b>Exp. Route Total</b>							<b>4.E-08</b>							<b>1.E-01</b>
			Dermal	cis-1,2-Dichloroethene	75.5	ug/L	3.3E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	2.3E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	1.E-03	
				Tetrachloroethene	28.08	ug/L	5.6E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-09	3.9E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-04	
				Trichloroethene	221.4	ug/L	1.3E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-08	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				Vinyl Chloride	3.4	ug/L	6.4E-09	mg/kg/day	7.2E-01	(mg/kg/day) <sup>-1</sup>	5.E-09	4.5E-07	mg/kg/day	3.0E-03	mg/kg/day	liver	2.E-04	
				<b>Exp. Route Total</b>							<b>7.E-08</b>							<b>2.E-01</b>
			Inhalation	cis-1,2-Dichloroethene	75.5	ug/L	7.7E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	5.4E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	28.08	ug/L	2.9E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	2.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-03	
				Trichloroethene	221.4	ug/L	2.3E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-08	6.3E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-04	
				Vinyl Chloride	3.4	ug/L	3.5E-07	mg/m <sup>3</sup>	4.4E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	2.4E-05	mg/m <sup>3</sup>	1.0E-01	mg/m <sup>3</sup>	liver	2.E-04	
				<b>Exp. Route Total</b>							<b>9.E-08</b>							<b>5.E-03</b>
		<b>Exposure Point Total</b>														<b>2.E-07</b>		
	<b>Exposure Medium Total</b>															<b>3.E-01</b>		
<b>Groundwater Total</b>																<b>3.E-01</b>		
<b>Total of Receptor Risks Across All Media</b>										<b>2.E-07</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>3.E-01</b>		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	3.E-01
Total Heart HI Across All Media =	3.E-01
Total Immune System HI Across All Media =	3.E-01
Total Kidney HI Across All Media =	2.E-03
Total Liver HI Across All Media =	1.E-03
Total Neurological HI Across All Media =	5.E-03

**Table G-87**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	2.1E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	1.E-08	5.9E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	3.E-05	
				cis-1,2-Dichloroethene	62	ug/L	1.1E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02	
				Tetrachloroethene	45	ug/L	7.9E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	2.2E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-03	
				Trichloroethene	143	ug/L	2.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	7.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
				<b>Exp. Route Total</b>														
			Dermal	1,1-Dichloroethane	12	ug/L	3.3E-06	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	9.1E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	5.E-05	
				cis-1,2-Dichloroethene	62	ug/L	2.7E-05	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.7E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	4.E-02	
				Tetrachloroethene	45	ug/L	9.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	2.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02	
				Trichloroethene	143	ug/L	8.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	2.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-01	
				<b>Exp. Route Total</b>														
			Inhalation	1,1-Dichloroethane	12	ug/L	1.2E-04	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.4E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	6.4E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.8E-03	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	4.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02	
				Trichloroethene	143	ug/L	1.5E-03	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-06	4.1E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E+00	
				<b>Exp. Route Total</b>														
		<b>Exposure Point Total</b>															<b>2.E+00</b>	
			<b>Exposure Medium Total</b>														<b>3.E+00</b>	
<b>Groundwater Total</b>																	<b>3.E+00</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>1.E-05</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>3.E+00</b>		

**Notes:**

NA = Not available

Total Ear HI Across All Media =	6.E-01
Total Heart HI Across All Media =	3.E+00
Total Immune System HI Across All Media =	3.E+00
Total Kidney HI Across All Media =	5.E-02
Total Neurological HI Across All Media =	8.E-02

**Table G-88**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Routine Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	7.5E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	5.9E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	3.E-05	
				cis-1,2-Dichloroethene	62	ug/L	3.9E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02	
				Tetrachloroethene	45	ug/L	2.8E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-09	2.2E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-03	
				Trichloroethene	143	ug/L	9.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-07	7.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
				<b>Exp. Route Total</b>														
			Dermal	1,1-Dichloroethane	12	ug/L	5.9E-07	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	3.E-09	4.6E-06	mg/kg/day	2.0E-01	mg/kg/day	kidney	2.E-05	
				cis-1,2-Dichloroethene	62	ug/L	4.9E-06	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.8E-05	mg/kg/day	2.0E-03	mg/kg/day	kidney	2.E-02	
				Tetrachloroethene	45	ug/L	1.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Trichloroethene	143	ug/L	1.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-07	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				<b>Exp. Route Total</b>														
			Inhalation	1,1-Dichloroethane	12	ug/L	2.2E-05	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	2.2E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	1.1E-04	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.1E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	8.3E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	8.3E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03	
				Trichloroethene	143	ug/L	2.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	2.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01	
				<b>Exp. Route Total</b>														
<b>Exposure Point Total</b>																	<b>2.E-06</b>	
<b>Exposure Medium Total</b>																	<b>2.E-06</b>	
<b>Groundwater Total</b>																	<b>2.E-06</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>2.E-06</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>6.E-01</b>		

Notes:

NA = Not available

Total Ear HI Across All Media =	4.E-01
Total Heart HI Across All Media =	5.E-01
Total Immune System HI Across All Media =	5.E-01
Total Kidney HI Across All Media =	3.E-02
Total Neurological HI Across All Media =	3.E-02

**Table G-89**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	8.4E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	5.E-10	2.3E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-07	
				cis-1,2-Dichloroethene	62	ug/L	4.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	6.E-05	
				Tetrachloroethene	45	ug/L	3.2E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-10	8.9E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	9.E-06	
				Trichloroethene	143	ug/L	1.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-08	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-03	
				<b>Exp. Route Total</b>														
			Dermal	1,1-Dichloroethane	12	ug/L	6.5E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	1.8E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	9.E-08	
				cis-1,2-Dichloroethene	62	ug/L	5.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.5E-06	mg/kg/day	2.0E-02	mg/kg/day	kidney	8.E-05	
				Tetrachloroethene	45	ug/L	1.8E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	5.1E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	5.E-05	
				Trichloroethene	143	ug/L	1.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-08	4.7E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E-03	
				<b>Exp. Route Total</b>														
			Inhalation	1,1-Dichloroethane	12	ug/L	2.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	2.4E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	1.3E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	1.3E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	9.2E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	9.2E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-04	
				Trichloroethene	143	ug/L	2.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.9E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	5.E-05	
				<b>Exp. Route Total</b>														
		<b>Exposure Point Total</b>															3.E-07	
		<b>Exposure Medium Total</b>															2.E-02	
<b>Groundwater Total</b>																	2.E-02	
<b>Total of Receptor Risks Across All Media</b>																	3.E-07	
<b>Total of Receptor Hazards Across All Media</b>																	2.E-02	

Notes:

NA = Not available

Total Ear HI Across All Media =	1.E-02
Total Heart HI Across All Media =	1.E-02
Total Immune System HI Across All Media =	1.E-02
Total Kidney HI Across All Media =	1.E-04
Total Liver HI Across All Media =	6.E-05
Total Neurological HI Across All Media =	3.E-04

**Table G-90**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Maintenance Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	1.5E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	9.E-11	1.2E-07	mg/kg/day	2.0E+00	mg/kg/day	kidney	6.E-08	
				cis-1,2-Dichloroethene	62	ug/L	7.9E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	6.1E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	3.E-05	
				Tetrachloroethene	45	ug/L	5.7E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	4.4E-07	mg/kg/day	1.0E-01	mg/kg/day	liver	4.E-06	
				Trichloroethene	143	ug/L	1.8E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-09	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-03	
				<b>Exp. Route Total</b>														
			Dermal	1,1-Dichloroethane	12	ug/L	1.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	7.E-11	9.1E-08	mg/kg/day	2.0E+00	mg/kg/day	kidney	5.E-08	
				cis-1,2-Dichloroethene	62	ug/L	9.9E-08	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	7.7E-07	mg/kg/day	2.0E-02	mg/kg/day	kidney	4.E-05	
				Tetrachloroethene	45	ug/L	3.3E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-10	2.5E-06	mg/kg/day	1.0E-01	mg/kg/day	liver	3.E-05	
				Trichloroethene	143	ug/L	3.0E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-08	2.3E-06	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-03	
				<b>Exp. Route Total</b>														
			Inhalation	1,1-Dichloroethane	12	ug/L	4.4E-07	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-10	4.4E-07	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	2.3E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	2.3E-06	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	1.7E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-10	1.7E-06	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-05	
				Trichloroethene	143	ug/L	5.3E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	5.3E-06	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	1.E-05	
				<b>Exp. Route Total</b>														
		<b>Exposure Point Total</b>															<b>5.E-08</b>	
		<b>Exposure Medium Total</b>															<b>8.E-03</b>	
<b>Groundwater Total</b>																<b>8.E-03</b>		
										<b>Total of Receptor Risks Across All Media</b>				<b>Total of Receptor Hazards Across All Media</b>		<b>8.E-03</b>		

Notes:

NA = Not available

Total Ear HI Across All Media =	7.E-03
Total Heart HI Across All Media =	7.E-03
Total Immune System HI Across All Media =	7.E-03
Total Kidney HI Across All Media =	7.E-05
Total Liver HI Across All Media =	3.E-05
Total Neurological HI Across All Media =	5.E-05

**Table G-91**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	8.4E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	5.E-10	5.9E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	3.E-06	
				cis-1,2-Dichloroethene	62	ug/L	4.4E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.1E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03	
				Tetrachloroethene	45	ug/L	3.2E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-10	2.2E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	2.E-04	
				Trichloroethene	143	ug/L	1.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-08	7.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
				Exp. Route Total							5.E-08							1.E-01
			Dermal	1,1-Dichloroethane	12	ug/L	6.5E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	4.E-10	4.6E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	2.E-06	
				cis-1,2-Dichloroethene	62	ug/L	5.5E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	3.8E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	2.E-03	
				Tetrachloroethene	45	ug/L	1.8E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-09	1.3E-04	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-03	
				Trichloroethene	143	ug/L	1.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-08	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
				Exp. Route Total							8.E-08							2.E-01
			Inhalation	1,1-Dichloroethane	12	ug/L	2.4E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.7E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	1.3E-05	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	8.9E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	9.2E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	6.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02	
				Trichloroethene	143	ug/L	2.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	8.2E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	2.E-04	
				Exp. Route Total							1.E-07							2.E-02
Exposure Point Total								3.E-07							4.E-01			
Exposure Medium Total								3.E-07							4.E-01			
Groundwater Total								3.E-07							4.E-01			
Total of Receptor Risks Across All Media										3.E-07	Total of Receptor Hazards Across All Media					4.E-01		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	4.E-01
Total Heart HI Across All Media =	4.E-01
Total Immune System HI Across All Media =	4.E-01
Total Kidney HI Across All Media =	3.E-03
Total Liver HI Across All Media =	1.E-03
Total Neurological HI Across All Media =	2.E-02

**Table G-92**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Former Building 21  
 Receptor: On-site Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	Former Building 21	Ingestion	1,1-Dichloroethane	12	ug/L	4.2E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.9E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-06	
				cis-1,2-Dichloroethene	62	ug/L	2.2E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.5E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	8.E-04	
				Tetrachloroethene	45	ug/L	1.6E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-10	1.1E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	1.E-04	
				Trichloroethene	143	ug/L	5.0E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-08	3.5E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-02	
				<b>Exp. Route Total</b>														
			Dermal	1,1-Dichloroethane	12	ug/L	3.3E-08	mg/kg/day	5.7E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.3E-06	mg/kg/day	2.0E+00	mg/kg/day	kidney	1.E-06	
				cis-1,2-Dichloroethene	62	ug/L	2.7E-07	mg/kg/day	NA	(mg/kg/day) <sup>-1</sup>	NA	1.9E-05	mg/kg/day	2.0E-02	mg/kg/day	kidney	1.E-03	
				Tetrachloroethene	45	ug/L	9.1E-07	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-09	6.4E-05	mg/kg/day	1.0E-01	mg/kg/day	liver	6.E-04	
				Trichloroethene	143	ug/L	8.4E-07	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-08	5.8E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
				<b>Exp. Route Total</b>														
			Inhalation	1,1-Dichloroethane	12	ug/L	1.2E-06	mg/m <sup>3</sup>	1.6E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	8.6E-05	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				cis-1,2-Dichloroethene	62	ug/L	6.4E-06	mg/m <sup>3</sup>	NA	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA	4.5E-04	mg/m <sup>3</sup>	NA	mg/m <sup>3</sup>	NA	NA	NA
				Tetrachloroethene	45	ug/L	4.6E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	8.E-03	
				Trichloroethene	143	ug/L	1.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	4.1E-05	mg/m <sup>3</sup>	5.4E-01	mg/m <sup>3</sup>	neurological	8.E-05	
				<b>Exp. Route Total</b>														
		<b>Exposure Point Total</b>															<b>1.E-07</b>	
			<b>Exposure Medium Total</b>														<b>2.E-01</b>	
<b>Groundwater Total</b>																	<b>2.E-01</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>1.E-07</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>2.E-01</b>		

Notes:

NA = Not available

Total Ear HI Across All Media =	2.E-01
Total Heart HI Across All Media =	2.E-01
Total Immune System HI Across All Media =	2.E-01
Total Kidney HI Across All Media =	2.E-03
Total Liver HI Across All Media =	7.E-04
Total Neurological HI Across All Media =	8.E-03

**Table G-93**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	103	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	3.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01
				Trichloroethene	49	ug/L	6.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	1.9E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E+00
			Exp. Route Total								3.E-05				4.E+00		
			Dermal	Tetrachloroethene	103	ug/L	5.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01
				Trichloroethene	49	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	2.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-01
			Exp. Route Total								6.E-06				7.E-01		
			Inhalation	Tetrachloroethene	103	ug/L	4.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02
				Trichloroethene	49	ug/L	2.0E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-07	5.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01
			Exp. Route Total								9.E-07				3.E-01		
			Exposure Point Total								4.E-05				6.E+00		
Exposure Medium Total								4.E-05				6.E+00					
Groundwater Total MS-14																	
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	13	ug/L	1.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	4.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02
				Trichloroethene	7	ug/L	8.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	2.6E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-01
			Exp. Route Total								4.E-06				6.E-01		
			Dermal	Tetrachloroethene	13	ug/L	7.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	2.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02
				Trichloroethene	7	ug/L	1.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	3.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-02
			Exp. Route Total								7.E-07				1.E-01		
			Inhalation	Tetrachloroethene	13	ug/L	5.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	1.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03
				Trichloroethene	7	ug/L	2.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	7.9E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-02
			Exp. Route Total								1.E-07				4.E-02		
			Exposure Point Total								5.E-06				7.E-01		
Exposure Medium Total								5.E-06				7.E-01					
Groundwater Total MS-15																	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	8	ug/L	1.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	3.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02
				Exp. Route Total								2.E-07				5.E-02	
			Dermal	Tetrachloroethene	8	ug/L	4.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-08	1.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02
				Exp. Route Total								9.E-08				2.E-02	
			Inhalation	Tetrachloroethene	8	ug/L	3.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-09	9.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03
				Exp. Route Total								8.E-09				2.E-03	
Exposure Point Total								3.E-07				7.E-02					
Exposure Medium Total								3.E-07				7.E-02					
Groundwater Total MS-17																	

**Table G-93**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	17	ug/L	2.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	6.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01	
				Trichloroethene	9	ug/L	1.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	3.4E-04	mg/kg/day	5.0E-04	mg/kg/day		7.E-01	
			<b>Exp. Route Total</b>															8.E-01
			Dermal	Tetrachloroethene	17	ug/L	9.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	2.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-02	
				Trichloroethene	9	ug/L	1.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-07	4.2E-05	mg/kg/day	5.0E-04	mg/kg/day		8.E-02	
			<b>Exp. Route Total</b>															1.E-01
			Inhalation	Tetrachloroethene	17	ug/L	6.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	1.9E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-03	
				Trichloroethene	9	ug/L	3.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		5.E-02	
			<b>Exp. Route Total</b>															6.E-02
			<b>Exposure Point Total</b>															7.E-06
<b>Exposure Medium Total</b>															7.E-06			
<b>Groundwater Total MS-18</b>															7.E-06			
<b>Groundwater Total MS-18</b>															1.E+00			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	108	ug/L	1.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	4.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01	
				Trichloroethene	52	ug/L	6.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day		4.E+00	
			<b>Exp. Route Total</b>															5.E+00
			Dermal	Tetrachloroethene	108	ug/L	6.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	1.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01	
				Trichloroethene	52	ug/L	8.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	2.5E-04	mg/kg/day	5.0E-04	mg/kg/day		5.E-01	
			<b>Exp. Route Total</b>															8.E-01
			Inhalation	Tetrachloroethene	108	ug/L	4.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02	
				Trichloroethene	52	ug/L	2.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-07	6.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		3.E-01	
			<b>Exp. Route Total</b>															3.E-01
			<b>Exposure Point Total</b>															4.E-05
<b>Exposure Medium Total</b>															4.E-05			
<b>Groundwater Total MS-19</b>															4.E-05			
<b>Groundwater Total MS-19</b>															6.E+00			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	62	ug/L	8.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01	
				Trichloroethene	30	ug/L	3.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	1.1E-03	mg/kg/day	5.0E-04	mg/kg/day		2.E+00	
			<b>Exp. Route Total</b>															3.E+00
			Dermal	Tetrachloroethene	62	ug/L	3.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	1.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	30	ug/L	4.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.4E-04	mg/kg/day	5.0E-04	mg/kg/day		3.E-01	
			<b>Exp. Route Total</b>															5.E-01
			Inhalation	Tetrachloroethene	62	ug/L	2.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	7.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02	
				Trichloroethene	30	ug/L	1.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	3.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-01	
			<b>Exp. Route Total</b>															2.E-01
			<b>Exposure Point Total</b>															6.E-07
<b>Exposure Medium Total</b>															2.E-05			
<b>Groundwater Total MS-20</b>															2.E-05			
<b>Groundwater Total MS-20</b>															3.E+00			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 1.E+01  
 Total Heart HI Across All Media = 1.E+01  
 Total Immune System HI Across All Media = 1.E+01  
 Total Neurological HI Across All Media = 3.E+00

**Table G-94**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	103	ug/L	1.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	1.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	49	ug/L	8.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	6.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00	
			Exp. Route Total								4.E-06							2.E+00
			Dermal	Tetrachloroethene	103	ug/L	1.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	49	ug/L	4.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01	
			Exp. Route Total								2.E-06							5.E-01
			Inhalation	Tetrachloroethene	103	ug/L	6.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	5.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02	
				Trichloroethene	49	ug/L	3.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01	
			Exp. Route Total								1.E-07							1.E-01
			Exposure Point Total									7.E-06						
Groundwater Total	Groundwater Total MS-14								7.E-06							2.E+00		
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	13	ug/L	2.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	1.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02	
				Trichloroethene	7	ug/L	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	9.3E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
			Exp. Route Total								6.E-07							2.E-01
			Dermal	Tetrachloroethene	13	ug/L	1.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-08	1.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Trichloroethene	7	ug/L	2.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	2.1E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-02	
			Exp. Route Total								2.E-07							6.E-02
			Inhalation	Tetrachloroethene	13	ug/L	8.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	6.3E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03	
				Trichloroethene	7	ug/L	4.4E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	3.4E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-02	
			Exp. Route Total								2.E-08							2.E-02
			Exposure Point Total									8.E-07						
Groundwater Total	Groundwater Total MS-15								8.E-07							3.E-01		
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	8	ug/L	1.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total							3.E-08							2.E-02
			Dermal	Tetrachloroethene	8	ug/L	1.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	8.5E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				Exp. Route Total							2.E-08							1.E-02
			Inhalation	Tetrachloroethene	8	ug/L	5.1E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.9E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03	
				Exp. Route Total							1.E-09							1.E-03
			Exposure Point Total								5.E-08							3.E-02
Groundwater Total	Groundwater Total MS-17								5.E-08							3.E-02		

**Table G-94**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	17	ug/L	2.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	2.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-02	
				Trichloroethene	9	ug/L	1.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-07	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day		2.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			Dermal	Tetrachloroethene	17	ug/L	2.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	1.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-02	
				Trichloroethene	9	ug/L	3.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	2.8E-05	mg/kg/day	5.0E-04	mg/kg/day		6.E-02	
			<b>Exp. Route Total</b>														<b>9.E-02</b>	
			Inhalation	Tetrachloroethene	17	ug/L	1.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	8.3E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-03	
				Trichloroethene	9	ug/L	5.7E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	4.4E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-02	
			<b>Exp. Route Total</b>														<b>2.E-02</b>	
			<b>Exposure Point Total</b>														<b>4.E-01</b>	
<b>Groundwater Total</b>		<b>Groundwater Total MS-18</b>												<b>4.E-01</b>				
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	108	ug/L	1.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	52	ug/L	9.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	7.1E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			<b>Exp. Route Total</b>														<b>2.E+00</b>	
			Dermal	Tetrachloroethene	108	ug/L	1.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	52	ug/L	2.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day		3.E-01	
			<b>Exp. Route Total</b>														<b>5.E-01</b>	
			Inhalation	Tetrachloroethene	108	ug/L	6.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	5.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	1.E-02	
				Trichloroethene	52	ug/L	3.3E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		1.E-01	
			<b>Exp. Route Total</b>														<b>1.E-01</b>	
			<b>Exposure Point Total</b>														<b>2.E+00</b>	
<b>Groundwater Total</b>		<b>Groundwater Total MS-19</b>												<b>2.E+00</b>				
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	62	ug/L	1.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	8.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01	
				Trichloroethene	30	ug/L	5.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	4.1E-04	mg/kg/day	5.0E-04	mg/kg/day		8.E-01	
			<b>Exp. Route Total</b>														<b>1.E+00</b>	
			Dermal	Tetrachloroethene	62	ug/L	8.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	6.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01	
				Trichloroethene	30	ug/L	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	9.3E-05	mg/kg/day	5.0E-04	mg/kg/day		2.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			Inhalation	Tetrachloroethene	62	ug/L	4.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	3.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	8.E-03	
				Trichloroethene	30	ug/L	1.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	1.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		7.E-02	
			<b>Exp. Route Total</b>														<b>8.E-02</b>	
			<b>Exposure Point Total</b>														<b>1.E+00</b>	
<b>Groundwater Total</b>		<b>Groundwater Total MS-20</b>												<b>1.E+00</b>				

Notes:  
NA = Not available

Total Ear HI Across All Media =	5.E+00
Total Heart HI Across All Media =	5.E+00
Total Immune System HI Across All Media =	5.E+00
Total Neurological HI Across All Media =	1.E+00

**Table G-95**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	103	ug/L	5.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	5.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00	
				Trichloroethene	49	ug/L	2.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	2.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E+00	
			Exp. Route Total								1.E-05							7.E+00
			Dermal	Tetrachloroethene	103	ug/L	3.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	3.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01	
				Trichloroethene	49	ug/L	4.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00	
			Exp. Route Total								3.E-06							2.E+00
			Inhalation	Tetrachloroethene	103	ug/L	1.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	2.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-02	
				Trichloroethene	49	ug/L	8.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	9.9E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-01	
			Exp. Route Total								4.E-07							5.E-01
			Exposure Point Total									2.E-05						
Exposure Medium Total									2.E-05							9.E+00		
Groundwater Total MS-14									2.E-05							9.E+00		
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	13	ug/L	6.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	7.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01	
				Trichloroethene	7	ug/L	3.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-01	
			Exp. Route Total								2.E-06							9.E-01
			Dermal	Tetrachloroethene	13	ug/L	3.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	4.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02	
				Trichloroethene	7	ug/L	6.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	7.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01	
			Exp. Route Total								4.E-07							2.E-01
			Inhalation	Tetrachloroethene	13	ug/L	2.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-09	2.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-03	
				Trichloroethene	7	ug/L	1.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	1.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	7.E-02	
			Exp. Route Total								5.E-08							7.E-02
			Exposure Point Total									2.E-06						
Exposure Medium Total									2.E-06							1.E+00		
Groundwater Total MS-15									2.E-06							1.E+00		
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	8	ug/L	3.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	4.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02	
				Exp. Route Total							8.E-08							8.E-02
			Dermal	Tetrachloroethene	8	ug/L	2.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02	
				Exp. Route Total							5.E-08							5.E-02
			Inhalation	Tetrachloroethene	8	ug/L	1.4E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03	
				Exp. Route Total							4.E-09							4.E-03
Exposure Point Total								1.E-07							1.E-01			
Exposure Medium Total									1.E-07							1.E-01		
Groundwater Total MS-17									1.E-07							1.E-01		

**Table G-95**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	17	ug/L	8.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	9.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	9	ug/L	4.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.1E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			<b>Exp. Route Total</b>														<b>1.E+00</b>	
			Dermal	Tetrachloroethene	17	ug/L	5.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	6.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01	
				Trichloroethene	9	ug/L	8.1E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-07	9.5E-05	mg/kg/day	5.0E-04	mg/kg/day		2.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			Inhalation	Tetrachloroethene	17	ug/L	2.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-09	3.3E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	8.E-03	
				Trichloroethene	9	ug/L	1.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.8E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		9.E-02	
			<b>Exp. Route Total</b>														<b>1.E-01</b>	
			<b>Exposure Point Total</b>															<b>2.E+00</b>
<b>Exposure Medium Total</b>															<b>2.E+00</b>			
<b>Groundwater Total MS-18</b>															<b>2.E+00</b>			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	108	ug/L	5.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00	
				Trichloroethene	52	ug/L	2.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	3.0E-03	mg/kg/day	5.0E-04	mg/kg/day		6.E+00	
			<b>Exp. Route Total</b>														<b>7.E+00</b>	
			Dermal	Tetrachloroethene	108	ug/L	3.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	4.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01	
				Trichloroethene	52	ug/L	4.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.5E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			<b>Exp. Route Total</b>														<b>2.E+00</b>	
			Inhalation	Tetrachloroethene	108	ug/L	1.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	2.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-02	
				Trichloroethene	52	ug/L	8.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	1.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		5.E-01	
			<b>Exp. Route Total</b>														<b>6.E-01</b>	
			<b>Exposure Point Total</b>															<b>9.E+00</b>
<b>Exposure Medium Total</b>															<b>9.E+00</b>			
<b>Groundwater Total MS-19</b>															<b>9.E+00</b>			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	62	ug/L	3.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	3.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01	
				Trichloroethene	30	ug/L	1.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	1.7E-03	mg/kg/day	5.0E-04	mg/kg/day		3.E+00	
			<b>Exp. Route Total</b>														<b>4.E+00</b>	
			Dermal	Tetrachloroethene	62	ug/L	1.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01	
				Trichloroethene	30	ug/L	2.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.2E-04	mg/kg/day	5.0E-04	mg/kg/day		6.E-01	
			<b>Exp. Route Total</b>														<b>1.E+00</b>	
			Inhalation	Tetrachloroethene	62	ug/L	1.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02	
				Trichloroethene	30	ug/L	5.1E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	6.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		3.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			<b>Exposure Point Total</b>															<b>5.E+00</b>
<b>Exposure Medium Total</b>															<b>5.E+00</b>			
<b>Groundwater Total MS-20</b>															<b>5.E+00</b>			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 2.E+01  
 Total Heart HI Across All Media = 2.E+01  
 Total Immune System HI Across All Media = 2.E+01  
 Total Neurological HI Across All Media = 5.E+00

**Table G-96**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	103	ug/L	2.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01			
				Trichloroethene	49	ug/L	9.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	1.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00			
				<b>Exp. Route Total</b>																
			Dermal	Tetrachloroethene	103	ug/L	1.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01			
				Trichloroethene	49	ug/L	4.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-01			
				<b>Exp. Route Total</b>																
			Inhalation	Tetrachloroethene	103	ug/L	5.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	6.8E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02			
				Trichloroethene	49	ug/L	2.8E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	3.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-01			
				<b>Exp. Route Total</b>																
				<b>Exposure Point Total</b>																
	<b>Exposure Medium Total</b>																			
<b>Groundwater Total MS-14</b>																				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	13	ug/L	2.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02			
				Trichloroethene	7	ug/L	1.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01			
				<b>Exp. Route Total</b>																
			Dermal	Tetrachloroethene	13	ug/L	2.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02			
				Trichloroethene	7	ug/L	3.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	4.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-02			
				<b>Exp. Route Total</b>																
			Inhalation	Tetrachloroethene	13	ug/L	7.1E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	8.3E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03			
				Trichloroethene	7	ug/L	3.8E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	4.5E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-02			
				<b>Exp. Route Total</b>																
				<b>Exposure Point Total</b>																
	<b>Exposure Medium Total</b>																			
<b>Groundwater Total MS-15</b>																				
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	8	ug/L	1.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
					<b>Exp. Route Total</b>															
			Dermal	Tetrachloroethene	8	ug/L	1.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
					<b>Exp. Route Total</b>															
			Inhalation	Tetrachloroethene	8	ug/L	4.5E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	5.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
					<b>Exp. Route Total</b>															
	<b>Exposure Point Total</b>																			
	<b>Exposure Medium Total</b>																			
<b>Groundwater Total MS-17</b>																				

**Table G-96**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 1  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	17	ug/L	3.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-08	3.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-02	
				Trichloroethene	9	ug/L	1.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-07	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day		4.E-01	
			Exp. Route Total														5.E-01	
			Dermal	Tetrachloroethene	17	ug/L	3.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	3.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-02	
				Trichloroethene	9	ug/L	4.7E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	5.4E-05	mg/kg/day	5.0E-04	mg/kg/day		1.E-01	
			Exp. Route Total														2.E-01	
			Inhalation	Tetrachloroethene	17	ug/L	9.4E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	1.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-03	
				Trichloroethene	9	ug/L	5.0E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	5.8E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		3.E-02	
			Exp. Route Total														3.E-02	
			Exposure Point Total														7.E-01	
Exposure Medium Total														7.E-01				
Groundwater Total MS-18																		
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	108	ug/L	2.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01	
				Trichloroethene	52	ug/L	1.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.2E-03	mg/kg/day	5.0E-04	mg/kg/day		2.E+00	
			Exp. Route Total														3.E+00	
			Dermal	Tetrachloroethene	108	ug/L	1.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01	
				Trichloroethene	52	ug/L	2.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.2E-04	mg/kg/day	5.0E-04	mg/kg/day		6.E-01	
			Exp. Route Total														1.E+00	
			Inhalation	Tetrachloroethene	108	ug/L	6.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	7.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02	
				Trichloroethene	52	ug/L	2.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	3.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-01	
			Exp. Route Total														2.E-01	
			Exposure Point Total														4.E+00	
Exposure Medium Total														4.E+00				
Groundwater Total MS-19																		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	62	ug/L	1.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	30	ug/L	5.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	6.7E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			Exp. Route Total														2.E+00	
			Dermal	Tetrachloroethene	62	ug/L	1.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01	
				Trichloroethene	30	ug/L	1.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-07	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day		4.E-01	
			Exp. Route Total														6.E-01	
			Inhalation	Tetrachloroethene	62	ug/L	3.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	4.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	1.E-02	
				Trichloroethene	30	ug/L	1.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	2.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		1.E-01	
			Exp. Route Total														1.E-01	
			Exposure Point Total														2.E+00	
Exposure Medium Total														2.E+00				
Groundwater Total MS-20																		

Notes:  
 NA = Not available

Total Ear HI Across All Media = 9.E+00  
 Total Heart HI Across All Media = 9.E+00  
 Total Immune System HI Across All Media = 9.E+00  
 Total Neurological HI Across All Media = 2.E+00

**Table G-97**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	4.E-06	8.E-07			
				Trichloroethene	4.E-05	8.E-06			
				Exp. Route Total	5.E-05	9.E-06			
			Dermal	Tetrachloroethene	2.E-06	7.E-07			
				Trichloroethene	7.E-06	4.E-06			
				Exp. Route Total	9.E-06	5.E-06			
			Inhalation	Tetrachloroethene	2.E-07	3.E-08			
				Trichloroethene	1.E-06	2.E-07			
				Exp. Route Total	1.E-06	3.E-07			
			Exposure Point Total					6.E-05	1.E-05
			Exposure Medium Total					6.E-05	1.E-05
			Groundwater Total MS-14					6.E-05	1.E-05
			Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	5.E-07	1.E-07
							Trichloroethene	6.E-06	1.E-06
Exp. Route Total	6.E-06	1.E-06							
Dermal	Tetrachloroethene	2.E-07				8.E-08			
	Trichloroethene	8.E-07				3.E-07			
	Exp. Route Total	1.E-06				4.E-07			
Inhalation	Tetrachloroethene	2.E-08				4.E-09			
	Trichloroethene	2.E-07				3.E-08			
	Exp. Route Total	2.E-07				4.E-08			
Exposure Point Total						7.E-06	2.E-06		
Exposure Medium Total					7.E-06	2.E-06			
Groundwater Total MS-15					7.E-06	2.E-06			
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	3.E-07	6.E-08			
				Exp. Route Total	3.E-07	6.E-08			
			Dermal	Tetrachloroethene	1.E-07	5.E-08			
				Exp. Route Total	1.E-07	5.E-08			
			Inhalation	Tetrachloroethene	1.E-08	2.E-09			
				Exp. Route Total	1.E-08	2.E-09			
			Exposure Point Total					5.E-07	1.E-07
Exposure Medium Total					5.E-07	1.E-07			
Groundwater Total MS-17					5.E-07	1.E-07			

**Table G-97**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk			
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	6.E-07	1.E-07			
				Trichloroethene	7.E-06	2.E-06			
				<b>Exp. Route Total</b>	<b>8.E-06</b>	<b>2.E-06</b>			
			Dermal	Tetrachloroethene	3.E-07	1.E-07			
				Trichloroethene	1.E-06	4.E-07			
				<b>Exp. Route Total</b>	<b>1.E-06</b>	<b>5.E-07</b>			
			Inhalation	Tetrachloroethene	2.E-08	5.E-09			
				Trichloroethene	2.E-07	4.E-08			
				<b>Exp. Route Total</b>	<b>2.E-07</b>	<b>5.E-08</b>			
			<b>Exposure Point Total</b>					<b>1.E-05</b>	<b>2.E-06</b>
			<b>Exposure Medium Total</b>					<b>1.E-05</b>	<b>2.E-06</b>
			<b>Groundwater Total MS-18</b>					<b>1.E-05</b>	<b>2.E-06</b>
			Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	4.E-06	8.E-07
							Trichloroethene	4.E-05	9.E-06
							<b>Exp. Route Total</b>	<b>5.E-05</b>	<b>1.E-05</b>
Dermal	Tetrachloroethene	2.E-06				7.E-07			
	Trichloroethene	6.E-06				2.E-06			
	<b>Exp. Route Total</b>	<b>8.E-06</b>				<b>3.E-06</b>			
Inhalation	Tetrachloroethene	2.E-07				3.E-08			
	Trichloroethene	1.E-06				3.E-07			
	<b>Exp. Route Total</b>	<b>1.E-06</b>				<b>3.E-07</b>			
<b>Exposure Point Total</b>						<b>6.E-05</b>	<b>1.E-05</b>		
<b>Exposure Medium Total</b>					<b>6.E-05</b>	<b>1.E-05</b>			
<b>Groundwater Total MS-19</b>					<b>6.E-05</b>	<b>1.E-05</b>			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	2.E-06	5.E-07			
				Trichloroethene	2.E-05	5.E-06			
				<b>Exp. Route Total</b>	<b>3.E-05</b>	<b>6.E-06</b>			
			Dermal	Tetrachloroethene	1.E-06	4.E-07			
				Trichloroethene	3.E-06	1.E-06			
				<b>Exp. Route Total</b>	<b>5.E-06</b>	<b>2.E-06</b>			
			Inhalation	Tetrachloroethene	9.E-08	2.E-08			
				Trichloroethene	7.E-07	1.E-07			
				<b>Exp. Route Total</b>	<b>8.E-07</b>	<b>2.E-07</b>			
			<b>Exposure Point Total</b>					<b>3.E-05</b>	<b>7.E-06</b>
<b>Exposure Medium Total</b>					<b>3.E-05</b>	<b>7.E-06</b>			
<b>Groundwater Total MS-20</b>					<b>3.E-05</b>	<b>7.E-06</b>			

Notes:

NA = Not available

**Table G-98**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 2
Receptor: Off-site Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	124	ug/L	1.6E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	4.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-01	
				Trichloroethene	59	ug/L	7.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-05	2.3E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	5.E+00	
			Exp. Route Total															
			Dermal	Tetrachloroethene	124	ug/L	6.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	2.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01	
				Trichloroethene	59	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	2.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E-01	
			Exp. Route Total															
			Inhalation	Tetrachloroethene	124	ug/L	4.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.4E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-02	
				Trichloroethene	59	ug/L	2.3E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	6.8E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	3.E-01	
			Exp. Route Total															
			Exposure Point Total															
Exposure Medium Total																		
Groundwater Total MS-14																		
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	7	ug/L	9.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	2.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02	
				Exp. Route Total														
			Dermal	Tetrachloroethene	7	ug/L	4.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-08	1.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total														
			Inhalation	Tetrachloroethene	7	ug/L	2.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-09	8.5E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03	
				Exp. Route Total														
Exposure Point Total																		
Exposure Medium Total																		
Groundwater Total MS-15																		
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	7	ug/L	9.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	2.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02	
				Exp. Route Total														
			Dermal	Tetrachloroethene	7	ug/L	4.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	1.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total														
			Inhalation	Tetrachloroethene	7	ug/L	2.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-09	8.3E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03	
				Exp. Route Total														
Exposure Point Total																		
Exposure Medium Total																		
Groundwater Total MS-17																		

**Table G-98**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	12	ug/L	1.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	4.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	8.E-02	
				Trichloroethene	6	ug/L	8.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	2.3E-04	mg/kg/day	5.0E-04	mg/kg/day		5.E-01	
			<b>Exp. Route Total</b>															5.E-01
			Dermal	Tetrachloroethene	12	ug/L	7.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	2.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-02	
				Trichloroethene	6	ug/L	9.8E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	2.9E-05	mg/kg/day	5.0E-04	mg/kg/day		6.E-02	
			<b>Exp. Route Total</b>															9.E-02
			Inhalation	Tetrachloroethene	12	ug/L	5.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	1.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	4.E-03	
				Trichloroethene	6	ug/L	2.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	7.0E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		4.E-02	
			<b>Exp. Route Total</b>															4.E-02
			<b>Exposure Point Total</b>															4.E-02
<b>Exposure Medium Total</b>															7.E-01			
<b>Groundwater Total MS-18</b>															7.E-01			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	184	ug/L	2.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	7.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00	
				Trichloroethene	87	ug/L	1.1E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-05	3.3E-03	mg/kg/day	5.0E-04	mg/kg/day		7.E+00	
			<b>Exp. Route Total</b>															8.E+00
			Dermal	Tetrachloroethene	184	ug/L	1.0E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	3.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-01	
				Trichloroethene	87	ug/L	1.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	4.1E-04	mg/kg/day	5.0E-04	mg/kg/day		8.E-01	
			<b>Exp. Route Total</b>															1.E+00
			Inhalation	Tetrachloroethene	184	ug/L	7.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	2.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-02	
				Trichloroethene	87	ug/L	3.5E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	1.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		5.E-01	
			<b>Exp. Route Total</b>															6.E-01
			<b>Exposure Point Total</b>															1.E+01
<b>Exposure Medium Total</b>															1.E+01			
<b>Groundwater Total MS-19</b>															1.E+01			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	167	ug/L	2.2E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	6.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00	
				Trichloroethene	79	ug/L	1.0E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-05	3.0E-03	mg/kg/day	5.0E-04	mg/kg/day		6.E+00	
			<b>Exp. Route Total</b>															7.E+00
			Dermal	Tetrachloroethene	167	ug/L	9.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-01	
				Trichloroethene	79	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	3.7E-04	mg/kg/day	5.0E-04	mg/kg/day		7.E-01	
			<b>Exp. Route Total</b>															1.E+00
			Inhalation	Tetrachloroethene	167	ug/L	6.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.9E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-02	
				Trichloroethene	79	ug/L	3.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	9.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		5.E-01	
			<b>Exp. Route Total</b>															5.E-01
			<b>Exposure Point Total</b>															9.E+00
<b>Exposure Medium Total</b>															9.E+00			
<b>Groundwater Total MS-20</b>															9.E+00			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 2.E+01  
 Total Heart HI Across All Media = 2.E+01  
 Total Immune System HI Across All Media = 2.E+01  
 Total Neurological HI Across All Media = 5.E+00

**Table G-99**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	124	ug/L	2.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01	
				Trichloroethene	59	ug/L	1.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	8.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00	
			Exp. Route Total								5.E-06						2.E+00	
			Dermal	Tetrachloroethene	124	ug/L	1.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	1.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	59	ug/L	4.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E-01	
			Exp. Route Total								3.E-06						6.E-01	
			Inhalation	Tetrachloroethene	124	ug/L	8.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	6.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02	
				Trichloroethene	59	ug/L	3.8E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E-01	
			Exp. Route Total								2.E-07						2.E-01	
			Exposure Point Total								8.E-06						3.E+00	
Exposure Medium Total								8.E-06						3.E+00				
Groundwater Total MS-14								8.E-06						3.E+00				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	7	ug/L	1.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total								3.E-08				2.E-02		
			Dermal	Tetrachloroethene	7	ug/L	1.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	7.8E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				Exp. Route Total								2.E-08				1.E-02		
			Inhalation	Tetrachloroethene	7	ug/L	4.7E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.6E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-04	
				Exp. Route Total								1.E-09				9.E-04		
Exposure Point Total								5.E-08						3.E-02				
Exposure Medium Total								5.E-08						3.E-02				
Groundwater Total MS-15								5.E-08						3.E-02				
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	7	ug/L	1.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	9.8E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total								3.E-08				2.E-02		
			Dermal	Tetrachloroethene	7	ug/L	9.8E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	7.7E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				Exp. Route Total								2.E-08				1.E-02		
			Inhalation	Tetrachloroethene	7	ug/L	4.6E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.6E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-04	
				Exp. Route Total								1.E-09				9.E-04		
Exposure Point Total								5.E-08						3.E-02				
Exposure Medium Total								5.E-08						3.E-02				
Groundwater Total MS-17								5.E-08						3.E-02				

**Table G-99**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	12	ug/L	2.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	1.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-02		
				Trichloroethene	6	ug/L	1.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	8.3E-05	mg/kg/day	5.0E-04	mg/kg/day		2.E-01		
			<b>Exp. Route Total</b>															<b>2.E-01</b>	
			Dermal	Tetrachloroethene	12	ug/L	1.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-08	1.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-02		
				Trichloroethene	6	ug/L	2.4E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.9E-05	mg/kg/day	5.0E-04	mg/kg/day		4.E-02		
			<b>Exp. Route Total</b>															<b>6.E-02</b>	
			Inhalation	Tetrachloroethene	12	ug/L	8.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	6.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-03		
				Trichloroethene	6	ug/L	3.9E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	3.0E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-02		
			<b>Exp. Route Total</b>															<b>2.E-02</b>	
			<b>Exposure Point Total</b>															<b>7.E-07</b>	
<b>Exposure Medium Total</b>															<b>7.E-07</b>				
<b>Groundwater Total MS-18</b>															<b>7.E-07</b>				
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	184	ug/L	3.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	2.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01		
				Trichloroethene	87	ug/L	1.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	1.2E-03	mg/kg/day	5.0E-04	mg/kg/day		2.E+00		
			<b>Exp. Route Total</b>															<b>3.E+00</b>	
			Dermal	Tetrachloroethene	184	ug/L	2.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01		
				Trichloroethene	87	ug/L	3.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	2.7E-04	mg/kg/day	5.0E-04	mg/kg/day		5.E-01		
			<b>Exp. Route Total</b>															<b>9.E-01</b>	
			Inhalation	Tetrachloroethene	184	ug/L	1.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	9.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02		
				Trichloroethene	87	ug/L	5.6E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	4.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-01		
			<b>Exp. Route Total</b>															<b>2.E-01</b>	
			<b>Exposure Point Total</b>															<b>1.E-05</b>	
<b>Exposure Medium Total</b>															<b>1.E-05</b>				
<b>Groundwater Total MS-19</b>															<b>1.E-05</b>				
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	167	ug/L	2.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01		
				Trichloroethene	79	ug/L	1.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	1.1E-03	mg/kg/day	5.0E-04	mg/kg/day		2.E+00		
			<b>Exp. Route Total</b>															<b>3.E+00</b>	
			Dermal	Tetrachloroethene	167	ug/L	2.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	1.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01		
				Trichloroethene	79	ug/L	3.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.5E-04	mg/kg/day	5.0E-04	mg/kg/day		5.E-01		
			<b>Exp. Route Total</b>															<b>8.E-01</b>	
			Inhalation	Tetrachloroethene	167	ug/L	1.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	8.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02		
				Trichloroethene	79	ug/L	5.1E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.9E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-01		
			<b>Exp. Route Total</b>															<b>2.E-01</b>	
			<b>Exposure Point Total</b>															<b>9.E-06</b>	
<b>Exposure Medium Total</b>															<b>9.E-06</b>				
<b>Groundwater Total MS-20</b>															<b>9.E-06</b>				

Notes:  
 NA = Not available

Total Ear HI Across All Media = 8.E+00  
 Total Heart HI Across All Media = 8.E+00  
 Total Immune System HI Across All Media = 8.E+00  
 Total Neurological HI Across All Media = 2.E+00

**Table G-100**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	124	ug/L	6.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	7.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00		
				Trichloroethene	59	ug/L	2.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	3.4E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E+00		
			Exp. Route Total								1.E-05								8.E+00
			Dermal	Tetrachloroethene	124	ug/L	3.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	4.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-01		
				Trichloroethene	59	ug/L	5.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	6.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00		
			Exp. Route Total								3.E-06								2.E+00
			Inhalation	Tetrachloroethene	124	ug/L	2.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	2.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-02		
				Trichloroethene	59	ug/L	1.0E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	1.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	6.E-01		
			Exp. Route Total								5.E-07								7.E-01
			Exposure Point Total								2.E-05								1.E+01
Exposure Medium Total								2.E-05								1.E+01			
Groundwater Total MS-14																			
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	7	ug/L	3.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	4.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-02		
				Exp. Route Total								8.E-08							7.E-02
			Dermal	Tetrachloroethene	7	ug/L	2.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02		
				Exp. Route Total								5.E-08							4.E-02
			Inhalation	Tetrachloroethene	7	ug/L	1.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	1.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03		
				Exp. Route Total								3.E-09							4.E-03
			Exposure Point Total								1.E-07								1.E-01
Exposure Medium Total								1.E-07								1.E-01			
Groundwater Total MS-15																			
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	7	ug/L	3.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-08	4.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-02		
				Exp. Route Total								7.E-08							7.E-02
			Dermal	Tetrachloroethene	7	ug/L	2.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02		
				Exp. Route Total								5.E-08							4.E-02
			Inhalation	Tetrachloroethene	7	ug/L	1.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	1.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03		
				Exp. Route Total								3.E-09							4.E-03
			Exposure Point Total								1.E-07								1.E-01
Exposure Medium Total								1.E-07								1.E-01			
Groundwater Total MS-17																			

**Table G-100**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	12	ug/L	6.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	7.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01	
				Trichloroethene	6	ug/L	3.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.5E-04	mg/kg/day	5.0E-04	mg/kg/day		7.E-01	
			<b>Exp. Route Total</b>															8.E-01
			Dermal	Tetrachloroethene	12	ug/L	3.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	4.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	8.E-02	
				Trichloroethene	6	ug/L	5.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	6.5E-05	mg/kg/day	5.0E-04	mg/kg/day		1.E-01	
			<b>Exp. Route Total</b>															2.E-01
			Inhalation	Tetrachloroethene	12	ug/L	2.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-09	2.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	6.E-03	
				Trichloroethene	6	ug/L	1.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.2E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		6.E-02	
			<b>Exp. Route Total</b>															7.E-02
			<b>Exposure Point Total</b>															1.E+00
<b>Exposure Medium Total</b>															1.E+00			
<b>Groundwater Total MS-18</b>															1.E+00			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	184	ug/L	9.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	1.1E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00	
				Trichloroethene	87	ug/L	4.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	5.0E-03	mg/kg/day	5.0E-04	mg/kg/day		1.E+01	
			<b>Exp. Route Total</b>															1.E+01
			Dermal	Tetrachloroethene	184	ug/L	5.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00	
				Trichloroethene	87	ug/L	8.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	9.3E-04	mg/kg/day	5.0E-04	mg/kg/day		2.E+00	
			<b>Exp. Route Total</b>															3.E+00
			Inhalation	Tetrachloroethene	184	ug/L	3.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	3.7E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	9.E-02	
				Trichloroethene	87	ug/L	1.5E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.7E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		9.E-01	
			<b>Exp. Route Total</b>															1.E+00
			<b>Exposure Point Total</b>															2.E+01
<b>Exposure Medium Total</b>															2.E+01			
<b>Groundwater Total MS-19</b>															2.E+01			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	167	ug/L	8.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00	
				Trichloroethene	79	ug/L	3.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	4.5E-03	mg/kg/day	5.0E-04	mg/kg/day		9.E+00	
			<b>Exp. Route Total</b>															1.E+01
			Dermal	Tetrachloroethene	167	ug/L	5.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00	
				Trichloroethene	79	ug/L	7.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	8.4E-04	mg/kg/day	5.0E-04	mg/kg/day		2.E+00	
			<b>Exp. Route Total</b>															3.E+00
			Inhalation	Tetrachloroethene	167	ug/L	2.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	3.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	8.E-02	
				Trichloroethene	79	ug/L	1.3E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.6E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		8.E-01	
			<b>Exp. Route Total</b>															9.E-01
			<b>Exposure Point Total</b>															1.E+01
<b>Exposure Medium Total</b>															1.E+01			
<b>Groundwater Total MS-20</b>															1.E+01			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 3.E+01  
 Total Heart HI Across All Media = 3.E+01  
 Total Immune System HI Across All Media = 3.E+01  
 Total Neurological HI Across All Media = 8.E+00

**Table G-101**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 2
Receptor: Off-site Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	124	ug/L	2.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01			
				Trichloroethene	59	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E+00			
			Exp. Route Total																	3.E+00
			Dermal	Tetrachloroethene	124	ug/L	2.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01			
				Trichloroethene	59	ug/L	5.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	7.E-01			
			Exp. Route Total																	1.E+00
			Inhalation	Tetrachloroethene	124	ug/L	7.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	8.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02			
				Trichloroethene	59	ug/L	3.3E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	3.9E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01			
			Exp. Route Total																	2.E-01
			Exposure Point Total																	2.E-01
Exposure Medium Total																	4.E+00			
Groundwater Total MS-14																	4.E+00			
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	7	ug/L	1.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
				Exp. Route Total															3.E-02	
			Dermal	Tetrachloroethene	7	ug/L	1.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
				Exp. Route Total															3.E-02	
			Inhalation	Tetrachloroethene	7	ug/L	4.1E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.8E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Exp. Route Total															1.E-03	
Exposure Point Total																	5.E-02			
Exposure Medium Total																	5.E-02			
Groundwater Total MS-15																	5.E-02			
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	7	ug/L	1.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
				Exp. Route Total															3.E-02	
			Dermal	Tetrachloroethene	7	ug/L	1.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02			
				Exp. Route Total															3.E-02	
			Inhalation	Tetrachloroethene	7	ug/L	4.0E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.7E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Exp. Route Total															1.E-03	
Exposure Point Total																	5.E-02			
Exposure Medium Total																	5.E-02			
Groundwater Total MS-17																	5.E-02			

**Table G-101**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 2  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	12	ug/L	2.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-02	
				Trichloroethene	6	ug/L	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	1.4E-04	mg/kg/day	5.0E-04	mg/kg/day		3.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			Dermal	Tetrachloroethene	12	ug/L	2.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-08	2.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-02	
				Trichloroethene	6	ug/L	3.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	3.7E-05	mg/kg/day	5.0E-04	mg/kg/day		7.E-02	
			<b>Exp. Route Total</b>														<b>1.E-01</b>	
			Inhalation	Tetrachloroethene	12	ug/L	7.1E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-09	8.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-03	
				Trichloroethene	6	ug/L	3.4E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	4.0E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		2.E-02	
			<b>Exp. Route Total</b>														<b>2.E-02</b>	
			<b>Exposure Point Total</b>															<b>2.E-02</b>
<b>Exposure Medium Total</b>															<b>5.E-01</b>			
<b>Groundwater Total MS-18</b>															<b>5.E-01</b>			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	184	ug/L	3.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	4.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01	
				Trichloroethene	87	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	1.9E-03	mg/kg/day	5.0E-04	mg/kg/day		4.E+00	
			<b>Exp. Route Total</b>														<b>5.E+00</b>	
			Dermal	Tetrachloroethene	184	ug/L	3.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	3.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01	
				Trichloroethene	87	ug/L	4.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.3E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			<b>Exp. Route Total</b>														<b>2.E+00</b>	
			Inhalation	Tetrachloroethene	184	ug/L	1.0E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02	
				Trichloroethene	87	ug/L	4.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		3.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			<b>Exposure Point Total</b>															<b>7.E+00</b>
<b>Exposure Medium Total</b>															<b>7.E+00</b>			
<b>Groundwater Total MS-19</b>															<b>7.E+00</b>			
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	167	ug/L	3.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	3.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01	
				Trichloroethene	79	ug/L	1.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	1.8E-03	mg/kg/day	5.0E-04	mg/kg/day		4.E+00	
			<b>Exp. Route Total</b>														<b>4.E+00</b>	
			Dermal	Tetrachloroethene	167	ug/L	3.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	3.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01	
				Trichloroethene	79	ug/L	4.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	4.8E-04	mg/kg/day	5.0E-04	mg/kg/day		1.E+00	
			<b>Exp. Route Total</b>														<b>2.E+00</b>	
			Inhalation	Tetrachloroethene	167	ug/L	9.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	1.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02	
				Trichloroethene	79	ug/L	4.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.2E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>		3.E-01	
			<b>Exp. Route Total</b>														<b>3.E-01</b>	
			<b>Exposure Point Total</b>															<b>6.E+00</b>
<b>Exposure Medium Total</b>															<b>6.E+00</b>			
<b>Groundwater Total MS-20</b>															<b>6.E+00</b>			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 1.E+01  
 Total Heart HI Across All Media = 1.E+01  
 Total Immune System HI Across All Media = 1.E+01  
 Total Neurological HI Across All Media = 4.E+00

**Table G-102**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	5.E-06	1.E-06			
				Trichloroethene	5.E-05	1.E-05			
				Exp. Route Total	5.E-05	1.E-05			
			Dermal	Tetrachloroethene	2.E-06	8.E-07			
				Trichloroethene	8.E-06	5.E-06			
				Exp. Route Total	1.E-05	5.E-06			
			Inhalation	Tetrachloroethene	2.E-07	4.E-08			
				Trichloroethene	1.E-06	3.E-07			
				Exp. Route Total	2.E-06	3.E-07			
			Exposure Point Total					7.E-05	2.E-05
			Exposure Medium Total					7.E-05	2.E-05
			Groundwater Total MS-14					7.E-05	2.E-05
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	3.E-07	6.E-08			
				Exp. Route Total	3.E-07	6.E-08			
			Dermal	Tetrachloroethene	1.E-07	5.E-08			
				Exp. Route Total	1.E-07	5.E-08			
			Inhalation	Tetrachloroethene	1.E-08	2.E-09			
				Exp. Route Total	1.E-08	2.E-09			
			Exposure Point Total					4.E-07	1.E-07
			Exposure Medium Total					4.E-07	1.E-07
Groundwater Total MS-15					4.E-07	1.E-07			
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	3.E-07	6.E-08			
				Exp. Route Total	3.E-07	6.E-08			
			Dermal	Tetrachloroethene	1.E-07	5.E-08			
				Exp. Route Total	1.E-07	5.E-08			
			Inhalation	Tetrachloroethene	1.E-08	2.E-09			
				Exp. Route Total	1.E-08	2.E-09			
			Exposure Point Total					4.E-07	1.E-07
			Exposure Medium Total					4.E-07	1.E-07
Groundwater Total MS-17					4.E-07	1.E-07			

**Table G-102**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk			
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	5.E-07	1.E-07			
				Trichloroethene	5.E-06	1.E-06			
			Exp. Route Total		6.E-06	1.E-06			
			Dermal	Tetrachloroethene	2.E-07	8.E-08			
				Trichloroethene	7.E-07	3.E-07			
			Exp. Route Total		9.E-07	3.E-07			
			Inhalation	Tetrachloroethene	2.E-08	4.E-09			
				Trichloroethene	1.E-07	3.E-08			
			Exp. Route Total		2.E-07	3.E-08			
			Exposure Point Total					7.E-06	1.E-06
			Exposure Medium Total					7.E-06	1.E-06
			Groundwater Total MS-18					7.E-06	1.E-06
			Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	7.E-06	1.E-06
							Trichloroethene	7.E-05	1.E-05
Exp. Route Total		8.E-05				2.E-05			
Dermal	Tetrachloroethene	3.E-06				1.E-06			
	Trichloroethene	1.E-05				4.E-06			
Exp. Route Total		1.E-05				5.E-06			
Inhalation	Tetrachloroethene	3.E-07				6.E-08			
	Trichloroethene	2.E-06				4.E-07			
Exp. Route Total		2.E-06				5.E-07			
Exposure Point Total						1.E-04	2.E-05		
Exposure Medium Total						1.E-04	2.E-05		
Groundwater Total MS-19						1.E-04	2.E-05		
Groundwater	Groundwater	MS-20				Ingestion	Tetrachloroethene	6.E-06	1.E-06
							Trichloroethene	7.E-05	1.E-05
			Exp. Route Total		7.E-05	1.E-05			
			Dermal	Tetrachloroethene	3.E-06	1.E-06			
				Trichloroethene	9.E-06	3.E-06			
			Exp. Route Total		1.E-05	4.E-06			
			Inhalation	Tetrachloroethene	2.E-07	5.E-08			
				Trichloroethene	2.E-06	4.E-07			
			Exp. Route Total		2.E-06	4.E-07			
			Exposure Point Total					9.E-05	2.E-05
			Exposure Medium Total					9.E-05	2.E-05
			Groundwater Total MS-20					9.E-05	2.E-05

**Notes:**

NA = Not available

Table G-103  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	259	ug/L	3.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-06	9.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00		
				Trichloroethene	123	ug/L	1.6E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-05	4.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	9.E+00		
			Exp. Route Total								8.E-05								1.E+01
			Dermal	Tetrachloroethene	259	ug/L	1.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	4.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01		
				Trichloroethene	123	ug/L	2.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	5.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+00		
			Exp. Route Total								2.E-05								2.E+00
			Inhalation	Tetrachloroethene	259	ug/L	1.0E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	3.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-02		
				Trichloroethene	123	ug/L	4.9E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	1.4E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	7.E-01		
			Exp. Route Total								2.E-06								8.E-01
			Exposure Point Total								1.E-04								1.E+01
Exposure Medium Total								1.E-04								1.E+01			
Groundwater Total DN-13																			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	447	ug/L	5.9E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-05	1.7E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E+00		
				Trichloroethene	210	ug/L	2.8E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-04	8.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	2.E+01		
			Exp. Route Total								1.E-04								2.E+01
			Dermal	Tetrachloroethene	447	ug/L	2.5E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	7.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00		
				Trichloroethene	210	ug/L	4.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	1.0E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	2.E+00		
			Exp. Route Total								3.E-05								3.E+00
			Inhalation	Tetrachloroethene	447	ug/L	1.8E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	5.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01		
				Trichloroethene	210	ug/L	8.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-06	2.4E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	1.E+00		
			Exp. Route Total								4.E-06								1.E+00
			Exposure Point Total								2.E-04								2.E+01
Exposure Medium Total								2.E-04								2.E+01			
Groundwater Total MS-14																			
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	172	ug/L	2.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	6.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00		
				Trichloroethene	81	ug/L	1.1E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-05	3.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	6.E+00		
			Exp. Route Total								5.E-05								7.E+00
			Dermal	Tetrachloroethene	172	ug/L	9.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01		
				Trichloroethene	81	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	3.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	8.E-01		
			Exp. Route Total								1.E-05								1.E+00
			Inhalation	Tetrachloroethene	172	ug/L	6.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	2.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-02		
				Trichloroethene	81	ug/L	3.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	9.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	5.E-01		
			Exp. Route Total								1.E-06								5.E-01
			Exposure Point Total								7.E-05								9.E+00
Exposure Medium Total								7.E-05								9.E+00			
Groundwater Total MS-15																			
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	29	ug/L	3.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01		
				Trichloroethene	14	ug/L	1.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	5.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+00		
			Exp. Route Total								9.E-06								1.E+00
			Dermal	Tetrachloroethene	29	ug/L	1.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	4.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02		
				Trichloroethene	14	ug/L	2.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	6.5E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E-01		
			Exp. Route Total								2.E-06								2.E-01
			Inhalation	Tetrachloroethene	29	ug/L	1.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	3.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	8.E-03		
				Trichloroethene	14	ug/L	5.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	8.E-02		
			Exp. Route Total								3.E-07								9.E-02
			Exposure Point Total								1.E-05								2.E+00
Exposure Medium Total								1.E-05								2.E+00			
Groundwater Total MS-16																			

Table G-103  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	74	ug/L	9.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01	
				Trichloroethene	35	ug/L	4.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	3.E+00	
			Exp. Route Total											2.E-05				3.E+00
			Dermal	Tetrachloroethene	74	ug/L	4.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	35	ug/L	7.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	1.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	3.E-01	
			Exp. Route Total											4.E-06				5.E-01
			Inhalation	Tetrachloroethene	74	ug/L	2.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	8.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02	
				Trichloroethene	35	ug/L	1.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	4.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	2.E-01	
			Exp. Route Total											6.E-07				2.E-01
			Exposure Point Total											3.E-05				4.E+00
			Exposure Medium Total											3.E-05				4.E+00
			Groundwater Total MS-17											3.E-05				4.E+00
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	111	ug/L	1.5E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	4.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01	
				Trichloroethene	53	ug/L	6.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	4.E+00	
			Exp. Route Total											3.E-05				5.E+00
			Dermal	Tetrachloroethene	111	ug/L	6.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	1.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01	
				Trichloroethene	53	ug/L	8.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	2.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	5.E-01	
			Exp. Route Total											5.E-06				8.E-01
			Inhalation	Tetrachloroethene	111	ug/L	4.4E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02	
				Trichloroethene	53	ug/L	2.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-07	6.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	3.E-01	
			Exp. Route Total											1.E-06				3.E-01
			Exposure Point Total											4.E-05				6.E+00
			Exposure Medium Total											4.E-05				6.E+00
			Groundwater Total MS-18											4.E-05				6.E+00
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	399	ug/L	5.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-05	1.5E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E+00	
				Trichloroethene	188	ug/L	2.5E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-04	7.2E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+01	
			Exp. Route Total											1.E-04				2.E+01
			Dermal	Tetrachloroethene	399	ug/L	2.2E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	6.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00	
				Trichloroethene	188	ug/L	3.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	8.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	2.E+00	
			Exp. Route Total											2.E-05				3.E+00
			Inhalation	Tetrachloroethene	399	ug/L	1.6E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	4.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01	
				Trichloroethene	188	ug/L	7.5E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-06	2.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	1.E+00	
			Exp. Route Total											3.E-06				1.E+00
			Exposure Point Total											1.E-04				2.E+01
			Exposure Medium Total											1.E-04				2.E+01
			Groundwater Total MS-19											1.E-04				2.E+01

Table G-103  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	267	ug/L	3.5E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-06	1.0E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00	
				Trichloroethene	126	ug/L	1.7E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-05	4.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+01	
			Exp. Route Total											8.E-05				1.E+01
			Dermal	Tetrachloroethene	267	ug/L	1.5E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	4.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01	
				Trichloroethene	126	ug/L	2.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-06	6.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+00	
			Exp. Route Total											1.E-05				2.E+00
			Inhalation	Tetrachloroethene	267	ug/L	1.1E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	3.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	8.E-02	
				Trichloroethene	126	ug/L	5.0E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	1.5E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	7.E-01	
			Exp. Route Total											2.E-06				8.E-01
			Exposure Point Total											1.E-04				1.E+01
			Exposure Medium Total											1.E-04				1.E+01
			Groundwater Total MS-20											1.E-04				1.E+01
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	27	ug/L	3.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	1.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	13	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	4.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E+00	
			Exp. Route Total											8.E-06				1.E+00
			Dermal	Tetrachloroethene	27	ug/L	1.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	4.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-02	
				Trichloroethene	13	ug/L	2.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-07	6.0E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune	1.E-01	
			Exp. Route Total											1.E-06				2.E-01
			Inhalation	Tetrachloroethene	27	ug/L	1.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	3.1E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	8.E-03	
				Trichloroethene	13	ug/L	5.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	1.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune	7.E-02	
			Exp. Route Total											2.E-07				8.E-02
			Exposure Point Total											1.E-05				1.E+00
			Exposure Medium Total											1.E-05				1.E+00
			Groundwater Total MS-21											1.E-05				1.E+00
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	6	ug/L	8.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	2.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02	
				Exp. Route Total											2.E-07			
			Dermal	Tetrachloroethene	6	ug/L	3.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-08	9.9E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total											7.E-08			
			Inhalation	Tetrachloroethene	6	ug/L	2.4E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-09	7.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-03	
				Exp. Route Total											6.E-09			
Exposure Point Total											2.E-07				6.E-02			
Exposure Medium Total											2.E-07				6.E-02			
Groundwater Total MS-22											2.E-07				6.E-02			

Notes:  
 NA = Not available

Total Ear HI Across All Media = 8.E+01  
 Total Heart HI Across All Media = 8.E+01  
 Total Immune System HI Across All Media = 8.E+01  
 Total Neurological HI Across All Media = 2.E+01

Table G-104  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	259	ug/L	4.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	3.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01
				Trichloroethene	123	ug/L	2.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	1.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00
			Exp. Route Total									1.E-05				4.E+00	
			Dermal	Tetrachloroethene	259	ug/L	5.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	4.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01
				Trichloroethene	123	ug/L	9.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	5.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00
			Exp. Route Total									6.E-06				2.E+00	
			Inhalation	Tetrachloroethene	259	ug/L	1.7E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02
				Trichloroethene	123	ug/L	7.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	6.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01
			Exp. Route Total									4.E-07				3.E-01	
			Exposure Point Total									2.E-05				6.E+00	
Exposure Medium Total									2.E-05				6.E+00				
Groundwater Total DN-13									2.E-05				6.E+00				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	447	ug/L	7.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	6.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00
				Trichloroethene	210	ug/L	3.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	2.9E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E+00
			Exp. Route Total									2.E-05				7.E+00	
			Dermal	Tetrachloroethene	447	ug/L	6.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	4.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-01
				Trichloroethene	210	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	6.6E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00
			Exp. Route Total									9.E-06				2.E+00	
			Inhalation	Tetrachloroethene	447	ug/L	2.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	2.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	6.E-02
				Trichloroethene	210	ug/L	1.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.1E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-01
			Exp. Route Total									6.E-07				6.E-01	
			Exposure Point Total									3.E-05				9.E+00	
Exposure Medium Total									3.E-05				9.E+00				
Groundwater Total MS-14									3.E-05				9.E+00				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	172	ug/L	3.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	2.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01
				Trichloroethene	81	ug/L	1.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	1.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00
			Exp. Route Total									7.E-06				3.E+00	
			Dermal	Tetrachloroethene	172	ug/L	2.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	1.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01
				Trichloroethene	81	ug/L	6.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	2.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-01
			Exp. Route Total									3.E-06				8.E-01	
			Inhalation	Tetrachloroethene	172	ug/L	1.1E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	8.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02
				Trichloroethene	81	ug/L	5.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	4.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-01
			Exp. Route Total									2.E-07				2.E-01	
			Exposure Point Total									1.E-05				4.E+00	
Exposure Medium Total									1.E-05				4.E+00				
Groundwater Total MS-15									1.E-05				4.E+00				
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	29	ug/L	5.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	4.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-02
				Trichloroethene	14	ug/L	2.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01
			Exp. Route Total									1.E-06				4.E-01	
			Dermal	Tetrachloroethene	29	ug/L	4.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	3.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02
				Trichloroethene	14	ug/L	1.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	4.3E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E-02
			Exp. Route Total									6.E-07				1.E-01	
			Inhalation	Tetrachloroethene	29	ug/L	1.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-09	1.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03
				Trichloroethene	14	ug/L	8.8E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	6.9E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-02
			Exp. Route Total									4.E-08				4.E-02	
			Exposure Point Total									2.E-06				6.E-01	
Exposure Medium Total									2.E-06				6.E-01				
Groundwater Total MS-16									2.E-06				6.E-01				

Table G-104  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	74	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	35	ug/L	6.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	4.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									3.E-06				1.E+00	
			Dermal	Tetrachloroethene	74	ug/L	1.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	7.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01
				Trichloroethene	35	ug/L	2.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E-01
			Exp. Route Total									1.E-06				3.E-01	
			Inhalation	Tetrachloroethene	74	ug/L	4.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	3.7E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	9.E-03
				Trichloroethene	35	ug/L	2.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-08	1.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	9.E-02
			Exp. Route Total									1.E-07				1.E-01	
			Exposure Point Total									5.E-06				2.E+00	
Exposure Medium Total									5.E-06				2.E+00				
Groundwater Total MS-17																	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	111	ug/L	2.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01
				Trichloroethene	53	ug/L	9.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	7.2E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									5.E-06				2.E+00	
			Dermal	Tetrachloroethene	111	ug/L	1.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	53	ug/L	2.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01
			Exp. Route Total									1.E-06				5.E-01	
			Inhalation	Tetrachloroethene	111	ug/L	7.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	5.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	1.E-02
				Trichloroethene	53	ug/L	3.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E-01
			Exp. Route Total									2.E-07				1.E-01	
			Exposure Point Total									6.E-06				2.E+00	
Exposure Medium Total									6.E-06				2.E+00				
Groundwater Total MS-18																	
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	399	ug/L	7.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	5.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	9.E-01
				Trichloroethene	188	ug/L	3.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	2.6E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	5.E+00
			Exp. Route Total									2.E-05				6.E+00	
			Dermal	Tetrachloroethene	399	ug/L	5.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	4.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01
				Trichloroethene	188	ug/L	7.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	5.9E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									5.E-06				2.E+00	
			Inhalation	Tetrachloroethene	399	ug/L	2.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	2.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-02
				Trichloroethene	188	ug/L	1.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	9.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	5.E-01
			Exp. Route Total									6.E-07				5.E-01	
			Exposure Point Total									2.E-05				8.E+00	
Exposure Medium Total									2.E-05				8.E+00				
Groundwater Total MS-19																	

**Table G-104**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	267	ug/L	4.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	3.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01	
				Trichloroethene	126	ug/L	2.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	1.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00	
			Exp. Route Total									1.E-05						4.E+00
			Dermal	Tetrachloroethene	267	ug/L	3.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	2.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01	
				Trichloroethene	126	ug/L	5.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-01	
			Exp. Route Total									3.E-06						1.E+00
			Inhalation	Tetrachloroethene	267	ug/L	1.7E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02	
				Trichloroethene	126	ug/L	8.1E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	6.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01	
			Exp. Route Total									4.E-07						3.E-01
			Exposure Point Total									1.E-05						6.E+00
Exposure Medium Total									1.E-05						6.E+00			
Groundwater Total MS-20																		
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	27	ug/L	4.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	3.7E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-02	
				Trichloroethene	13	ug/L	2.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01	
			Exp. Route Total									1.E-06						4.E-01
			Dermal	Tetrachloroethene	27	ug/L	3.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-08	2.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02	
				Trichloroethene	13	ug/L	5.0E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	3.9E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-02	
			Exp. Route Total									3.E-07						1.E-01
			Inhalation	Tetrachloroethene	27	ug/L	1.7E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.3E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-03	
				Trichloroethene	13	ug/L	8.1E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	6.3E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-02	
			Exp. Route Total									4.E-08						3.E-02
			Exposure Point Total									1.E-06						6.E-01
Exposure Medium Total									1.E-06						6.E-01			
Groundwater Total MS-21																		
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	6	ug/L	1.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	8.3E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				Exp. Route Total									2.E-08					
			Dermal	Tetrachloroethene	6	ug/L	8.4E-06	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	6.5E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-02	
				Exp. Route Total									2.E-08					
			Inhalation	Tetrachloroethene	6	ug/L	3.9E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	3.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	8.E-04	
				Exp. Route Total									1.E-09					
Exposure Point Total									4.E-08						3.E-02			
Exposure Medium Total									4.E-08						3.E-02			
Groundwater Total MS-22																		

Notes:  
 NA = Not available

Total Ear HI Across All Media =	3.E+01
Total Heart HI Across All Media =	3.E+01
Total Immune System HI Across All Media =	3.E+01
Total Neurological HI Across All Media =	8.E+00

Table G-105  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	259	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.5E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00
				Trichloroethene	123	ug/L	6.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	7.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+01
			Exp. Route Total									3.E-05				2.E+01	
			Dermal	Tetrachloroethene	259	ug/L	8.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00
				Trichloroethene	123	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00
			Exp. Route Total									7.E-06				4.E+00	
			Inhalation	Tetrachloroethene	259	ug/L	4.4E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	5.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01
				Trichloroethene	123	ug/L	2.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-07	2.5E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E+00
			Exp. Route Total									1.E-06				1.E+00	
			Exposure Point Total									4.E-05				2.E+01	
Exposure Medium Total									4.E-05				2.E+01				
Groundwater Total DN-13									4.E-05				2.E+01				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	447	ug/L	2.2E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	2.6E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E+00
				Trichloroethene	210	ug/L	1.0E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-05	1.2E-02	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+01
			Exp. Route Total									5.E-05				3.E+01	
			Dermal	Tetrachloroethene	447	ug/L	1.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.6E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E+00
				Trichloroethene	210	ug/L	1.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-06	2.2E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E+00
			Exp. Route Total									1.E-05				7.E+00	
			Inhalation	Tetrachloroethene	447	ug/L	7.7E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	8.9E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-01
				Trichloroethene	210	ug/L	3.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	4.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E+00
			Exp. Route Total									2.E-06				2.E+00	
			Exposure Point Total									7.E-05				4.E+01	
Exposure Medium Total									7.E-05				4.E+01				
Groundwater Total MS-14									7.E-05				4.E+01				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	172	ug/L	8.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00
				Trichloroethene	81	ug/L	4.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	4.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E+00
			Exp. Route Total									2.E-05				1.E+01	
			Dermal	Tetrachloroethene	172	ug/L	5.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00
				Trichloroethene	81	ug/L	7.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	8.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00
			Exp. Route Total									5.E-06				3.E+00	
			Inhalation	Tetrachloroethene	172	ug/L	2.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	3.4E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-02
				Trichloroethene	81	ug/L	1.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	1.6E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	8.E-01
			Exp. Route Total									6.E-07				9.E-01	
			Exposure Point Total									3.E-05				1.E+01	
Exposure Medium Total									3.E-05				1.E+01				
Groundwater Total MS-15									3.E-05				1.E+01				
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	29	ug/L	1.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01
				Trichloroethene	14	ug/L	6.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00
			Exp. Route Total									3.E-06				2.E+00	
			Dermal	Tetrachloroethene	29	ug/L	9.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01
				Trichloroethene	14	ug/L	1.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01
			Exp. Route Total									8.E-07				5.E-01	
			Inhalation	Tetrachloroethene	29	ug/L	5.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	5.8E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02
				Trichloroethene	14	ug/L	2.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	2.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01
			Exp. Route Total									1.E-07				2.E-01	
			Exposure Point Total									4.E-06				2.E+00	
Exposure Medium Total									4.E-06				2.E+00				
Groundwater Total MS-16									4.E-06				2.E+00				

Table G-105  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	74	ug/L	3.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	4.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01
				Trichloroethene	35	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E+00
			Exp. Route Total									9.E-06				5.E+00	
			Dermal	Tetrachloroethene	74	ug/L	2.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-01
				Trichloroethene	35	ug/L	3.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.7E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	7.E-01
			Exp. Route Total									2.E-06				1.E+00	
			Inhalation	Tetrachloroethene	74	ug/L	1.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	4.E-02
				Trichloroethene	35	ug/L	6.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	7.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	3.E-01
			Exp. Route Total									3.E-07				4.E-01	
			Exposure Point Total									1.E-05				6.E+00	
Exposure Medium Total									1.E-05				6.E+00				
Groundwater Total MS-17																	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	111	ug/L	5.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00
				Trichloroethene	53	ug/L	2.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	3.0E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E+00
			Exp. Route Total									1.E-05				7.E+00	
			Dermal	Tetrachloroethene	111	ug/L	3.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	4.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01
				Trichloroethene	53	ug/L	4.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									3.E-06				2.E+00	
			Inhalation	Tetrachloroethene	111	ug/L	1.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	2.2E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	6.E-02
				Trichloroethene	53	ug/L	9.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	1.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	5.E-01
			Exp. Route Total									4.E-07				6.E-01	
			Exposure Point Total									2.E-05				9.E+00	
Exposure Medium Total									2.E-05				9.E+00				
Groundwater Total MS-18																	
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	399	ug/L	2.0E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-06	2.3E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E+00
				Trichloroethene	188	ug/L	9.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-05	1.1E-02	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+01
			Exp. Route Total									5.E-05				3.E+01	
			Dermal	Tetrachloroethene	399	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.5E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00
				Trichloroethene	188	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E+00
			Exp. Route Total									1.E-05				6.E+00	
			Inhalation	Tetrachloroethene	399	ug/L	6.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	8.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01
				Trichloroethene	188	ug/L	3.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	3.8E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E+00
			Exp. Route Total									2.E-06				2.E+00	
			Exposure Point Total									6.E-05				3.E+01	
Exposure Medium Total									6.E-05				3.E+01				
Groundwater Total MS-19																	

Table G-105  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	267	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.5E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E+00	
				Trichloroethene	126	ug/L	6.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	7.2E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+01	
			Exp. Route Total									3.E-05						2.E+01
			Dermal	Tetrachloroethene	267	ug/L	8.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00	
				Trichloroethene	126	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00	
			Exp. Route Total									7.E-06						4.E+00
			Inhalation	Tetrachloroethene	267	ug/L	4.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	5.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01	
				Trichloroethene	126	ug/L	2.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-07	2.5E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E+00	
			Exp. Route Total									1.E-06						1.E+00
			Exposure Point Total									4.E-05						2.E+01
			Exposure Medium Total									4.E-05						2.E+01
			Groundwater Total MS-20															
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	27	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01	
				Trichloroethene	13	ug/L	6.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.2E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00	
			Exp. Route Total									3.E-06						2.E+00
			Dermal	Tetrachloroethene	27	ug/L	8.4E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	9.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01	
				Trichloroethene	13	ug/L	1.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01	
			Exp. Route Total									7.E-07						4.E-01
			Inhalation	Tetrachloroethene	27	ug/L	4.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	5.3E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02	
				Trichloroethene	13	ug/L	2.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-08	2.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01	
			Exp. Route Total									1.E-07						1.E-01
			Exposure Point Total									4.E-06						2.E+00
			Exposure Medium Total									4.E-06						2.E+00
			Groundwater Total MS-21															
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	6	ug/L	3.0E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	3.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-02	
				Exp. Route Total									6.E-08					
			Dermal	Tetrachloroethene	6	ug/L	1.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-08	2.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-02	
				Exp. Route Total									4.E-08					
			Inhalation	Tetrachloroethene	6	ug/L	1.0E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-09	1.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-03	
				Exp. Route Total									3.E-09					
Exposure Point Total									1.E-07						1.E-01			
Exposure Medium Total									1.E-07						1.E-01			
Groundwater Total MS-22																		

Notes:  
 NA = Not available

Total Ear HI Across All Media = 1.E+02  
 Total Heart HI Across All Media = 1.E+02  
 Total Immune System HI Across All Media = 1.E+02  
 Total Neurological HI Across All Media = 3.E+01

Table G-106  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	259	ug/L	5.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	5.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00			
				Trichloroethene	123	ug/L	2.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	2.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E+00			
			Exp. Route Total								1.E-05								6.E+00	
			Dermal	Tetrachloroethene	259	ug/L	8.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00			
				Trichloroethene	123	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00			
			Exp. Route Total								7.E-06									4.E+00
			Inhalation	Tetrachloroethene	259	ug/L	1.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.7E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-02			
				Trichloroethene	123	ug/L	6.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	8.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-01			
			Exp. Route Total								3.E-07									4.E-01
			Exposure Point Total								2.E-05									1.E+01
Exposure Medium Total								2.E-05									1.E+01			
Groundwater Total DN-13																				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	447	ug/L	8.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	1.0E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00			
				Trichloroethene	210	ug/L	4.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	4.7E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E+00			
			Exp. Route Total								2.E-05									1.E+01
			Dermal	Tetrachloroethene	447	ug/L	8.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00			
				Trichloroethene	210	ug/L	1.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-06	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00			
			Exp. Route Total								1.E-05									4.E+00
			Inhalation	Tetrachloroethene	447	ug/L	2.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	2.9E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-02			
				Trichloroethene	210	ug/L	1.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	1.4E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	7.E-01			
			Exp. Route Total								6.E-07									8.E-01
			Exposure Point Total								3.E-05									2.E+01
Exposure Medium Total								3.E-05									2.E+01			
Groundwater Total MS-14																				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	172	ug/L	3.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	3.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01			
				Trichloroethene	81	ug/L	1.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	1.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E+00			
			Exp. Route Total								8.E-06									4.E+00
			Dermal	Tetrachloroethene	172	ug/L	3.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	3.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01			
				Trichloroethene	81	ug/L	7.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	5.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00			
			Exp. Route Total								4.E-06									2.E+00
			Inhalation	Tetrachloroethene	172	ug/L	9.7E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02			
				Trichloroethene	81	ug/L	4.6E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01			
			Exp. Route Total								2.E-07									3.E-01
			Exposure Point Total								1.E-05									6.E+00
Exposure Medium Total								1.E-05									6.E+00			
Groundwater Total MS-15																				
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	29	ug/L	5.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	6.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01			
				Trichloroethene	14	ug/L	2.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-01			
			Exp. Route Total								1.E-06									7.E-01
			Dermal	Tetrachloroethene	29	ug/L	5.3E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	6.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01			
				Trichloroethene	14	ug/L	1.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-07	8.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01			
			Exp. Route Total								7.E-07									3.E-01
			Inhalation	Tetrachloroethene	29	ug/L	1.6E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.9E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-03			
				Trichloroethene	14	ug/L	7.8E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	9.1E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-02			
			Exp. Route Total								4.E-08									5.E-02
			Exposure Point Total								2.E-06									1.E+00
Exposure Medium Total								2.E-06									1.E+00			
Groundwater Total MS-16																				

Table G-106  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	74	ug/L	1.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01
				Trichloroethene	35	ug/L	6.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00
			Exp. Route Total									3.E-06					2.E+00
			Dermal	Tetrachloroethene	74	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01
				Trichloroethene	35	ug/L	3.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E-01
			Exp. Route Total									2.E-06					7.E-01
			Inhalation	Tetrachloroethene	74	ug/L	4.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	4.9E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	1.E-02
				Trichloroethene	35	ug/L	2.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	2.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E-01
			Exp. Route Total									9.E-08					1.E-01
			Exposure Point Total									5.E-06					3.E+00
Exposure Medium Total									5.E-06					3.E+00			
Groundwater Total MS-17																	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	111	ug/L	2.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01
				Trichloroethene	53	ug/L	1.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.2E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00
			Exp. Route Total									5.E-06					3.E+00
			Dermal	Tetrachloroethene	111	ug/L	2.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01
				Trichloroethene	53	ug/L	2.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.2E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E-01
			Exp. Route Total									2.E-06					1.E+00
			Inhalation	Tetrachloroethene	111	ug/L	6.3E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	7.3E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02
				Trichloroethene	53	ug/L	3.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	3.5E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01
			Exp. Route Total									1.E-07					2.E-01
			Exposure Point Total									7.E-06					4.E+00
Exposure Medium Total									7.E-06					4.E+00			
Groundwater Total MS-18																	
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	399	ug/L	7.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	8.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00
				Trichloroethene	188	ug/L	3.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	4.2E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	8.E+00
			Exp. Route Total									2.E-05					1.E+01
			Dermal	Tetrachloroethene	399	ug/L	7.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	8.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00
				Trichloroethene	188	ug/L	9.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	1.2E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00
			Exp. Route Total									6.E-06					4.E+00
			Inhalation	Tetrachloroethene	399	ug/L	2.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	2.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	7.E-02
				Trichloroethene	188	ug/L	1.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	1.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	6.E-01
			Exp. Route Total									5.E-07					7.E-01
			Exposure Point Total									2.E-05					1.E+01
Exposure Medium Total									2.E-05					1.E+01			
Groundwater Total MS-19																	

**Table G-106**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 3  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	267	ug/L	5.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00	
				Trichloroethene	126	ug/L	2.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	2.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E+00	
			Exp. Route Total									1.E-05						7.E+00
			Dermal	Tetrachloroethene	267	ug/L	4.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	5.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	9.E-01	
				Trichloroethene	126	ug/L	6.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00	
			Exp. Route Total									4.E-06						2.E+00
			Inhalation	Tetrachloroethene	267	ug/L	1.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.8E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-02	
				Trichloroethene	126	ug/L	7.1E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	8.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-01	
			Exp. Route Total									3.E-07						5.E-01
			Exposure Point Total									2.E-05						1.E+01
Exposure Medium Total									2.E-05						1.E+01			
Groundwater Total MS-20																	1.E+01	
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	27	ug/L	5.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	6.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-01	
				Trichloroethene	13	ug/L	2.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.8E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	6.E-01	
			Exp. Route Total									1.E-06						7.E-01
			Dermal	Tetrachloroethene	27	ug/L	4.8E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	5.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	9.E-02	
				Trichloroethene	13	ug/L	6.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	7.7E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01	
			Exp. Route Total									4.E-07						2.E-01
			Inhalation	Tetrachloroethene	27	ug/L	1.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.8E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03	
				Trichloroethene	13	ug/L	7.1E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	8.3E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-02	
			Exp. Route Total									3.E-08						5.E-02
			Exposure Point Total									2.E-06						1.E+00
Exposure Medium Total									2.E-06						1.E+00			
Groundwater Total MS-21																	1.E+00	
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	6	ug/L	1.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	1.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total									2.E-08					
			Dermal	Tetrachloroethene	6	ug/L	1.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	1.3E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02	
				Exp. Route Total									2.E-08					
			Inhalation	Tetrachloroethene	6	ug/L	3.4E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-10	4.0E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03	
				Exp. Route Total									9.E-10					
Exposure Point Total									5.E-08						4.E-02			
Exposure Medium Total									5.E-08						4.E-02			
Groundwater Total MS-22																	4.E-02	

Notes:  
 NA = Not available

Total Ear HI Across All Media = 5.E+01  
 Total Heart HI Across All Media = 5.E+01  
 Total Immune System HI Across All Media = 5.E+01  
 Total Neurological HI Across All Media = 1.E+01

**Table G-107**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk	
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	1.E-05	2.E-06	
				Trichloroethene	1.E-04	2.E-05	
			Exp. Route Total		1.E-04	2.E-05	
			Dermal	Tetrachloroethene	5.E-06	3.E-06	
				Trichloroethene	2.E-05	1.E-05	
			Exp. Route Total		2.E-05	1.E-05	
			Inhalation	Tetrachloroethene	4.E-07	8.E-08	
				Trichloroethene	3.E-06	6.E-07	
			Exp. Route Total		3.E-06	7.E-07	
			Exposure Point Total			1.E-04	4.E-05
			Exposure Medium Total			1.E-04	4.E-05
			Groundwater Total DN-13				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	2.E-05	3.E-06	
				Trichloroethene	2.E-04	4.E-05	
			Exp. Route Total		2.E-04	4.E-05	
			Dermal	Tetrachloroethene	8.E-06	3.E-06	
				Trichloroethene	3.E-05	2.E-05	
			Exp. Route Total		4.E-05	2.E-05	
			Inhalation	Tetrachloroethene	7.E-07	1.E-07	
				Trichloroethene	5.E-06	1.E-06	
			Exp. Route Total		6.E-06	1.E-06	
			Exposure Point Total			2.E-04	6.E-05
			Exposure Medium Total			2.E-04	6.E-05
			Groundwater Total MS-14				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	7.E-06	1.E-06	
				Trichloroethene	7.E-05	1.E-05	
			Exp. Route Total		7.E-05	2.E-05	
			Dermal	Tetrachloroethene	3.E-06	1.E-06	
				Trichloroethene	1.E-05	6.E-06	
			Exp. Route Total		1.E-05	8.E-06	
			Inhalation	Tetrachloroethene	3.E-07	5.E-08	
				Trichloroethene	2.E-06	4.E-07	
			Exp. Route Total		2.E-06	5.E-07	
			Exposure Point Total			9.E-05	2.E-05
			Exposure Medium Total			9.E-05	2.E-05
			Groundwater Total MS-14				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	1.E-06	2.E-07	
				Trichloroethene	1.E-05	2.E-06	
			Exp. Route Total		1.E-05	3.E-06	
			Dermal	Tetrachloroethene	5.E-07	2.E-07	
				Trichloroethene	2.E-06	1.E-06	
			Exp. Route Total		2.E-06	1.E-06	
			Inhalation	Tetrachloroethene	4.E-08	9.E-09	
				Trichloroethene	3.E-07	7.E-08	
			Exp. Route Total		4.E-07	8.E-08	
			Exposure Point Total			2.E-05	4.E-06
			Exposure Medium Total			2.E-05	4.E-06
			Groundwater Total MS-15				
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	3.E-06	6.E-07	
				Trichloroethene	3.E-05	6.E-06	
			Exp. Route Total		3.E-06	6.E-07	
			Dermal	Tetrachloroethene	1.E-06	5.E-07	
				Trichloroethene	5.E-06	3.E-06	
			Exp. Route Total		1.E-06	5.E-07	
			Inhalation	Tetrachloroethene	1.E-07	2.E-08	
				Trichloroethene	8.E-07	2.E-07	
			Exp. Route Total		1.E-07	2.E-08	
			Exposure Point Total			4.E-06	1.E-06
			Exposure Medium Total			4.E-06	1.E-06
			Groundwater Total MS-17				

**Table G-107**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk			
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	4.E-06	9.E-07			
				Trichloroethene	4.E-05	9.E-06			
			Exp. Route Total		5.E-05	1.E-05			
			Dermal	Tetrachloroethene	2.E-06	7.E-07			
				Trichloroethene	6.E-06	2.E-06			
			Exp. Route Total		8.E-06	3.E-06			
			Inhalation	Tetrachloroethene	2.E-07	3.E-08			
				Trichloroethene	1.E-06	3.E-07			
			Exp. Route Total		1.E-06	3.E-07			
			Exposure Point Total					6.E-05	1.E-05
			Exposure Medium Total					6.E-05	1.E-05
			Groundwater Total MS-18					6.E-05	1.E-05
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	2.E-05	3.E-06			
				Trichloroethene	2.E-04	3.E-05			
			Exp. Route Total		2.E-04	3.E-05			
			Dermal	Tetrachloroethene	7.E-06	3.E-06			
				Trichloroethene	2.E-05	8.E-06			
			Exp. Route Total		3.E-05	1.E-05			
			Inhalation	Tetrachloroethene	6.E-07	1.E-07			
				Trichloroethene	4.E-06	9.E-07			
			Exp. Route Total		5.E-06	1.E-06			
			Exposure Point Total					2.E-04	5.E-05
			Exposure Medium Total					2.E-04	5.E-05
			Groundwater Total MS-19					2.E-04	5.E-05
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	1.E-05	2.E-06			
				Trichloroethene	1.E-04	2.E-05			
			Exp. Route Total		1.E-04	2.E-05			
			Dermal	Tetrachloroethene	5.E-06	2.E-06			
				Trichloroethene	1.E-05	5.E-06			
			Exp. Route Total		2.E-05	7.E-06			
			Inhalation	Tetrachloroethene	4.E-07	8.E-08			
				Trichloroethene	3.E-06	6.E-07			
			Exp. Route Total		3.E-06	7.E-07			
			Exposure Point Total					1.E-04	3.E-05
			Exposure Medium Total					1.E-04	3.E-05
			Groundwater Total MS-20					1.E-04	3.E-05
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	1.E-06	2.E-07			
				Trichloroethene	1.E-05	2.E-06			
			Exp. Route Total		1.E-05	2.E-06			
			Dermal	Tetrachloroethene	5.E-07	2.E-07			
				Trichloroethene	1.E-06	5.E-07			
			Exp. Route Total		2.E-06	7.E-07			
			Inhalation	Tetrachloroethene	4.E-08	8.E-09			
				Trichloroethene	3.E-07	6.E-08			
			Exp. Route Total		3.E-07	7.E-08			
			Exposure Point Total					1.E-05	3.E-06
			Exposure Medium Total					1.E-05	3.E-06
			Groundwater Total MS-21					1.E-05	3.E-06
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	2.E-07	5.E-08			
				Trichloroethene	2.E-07	5.E-08			
			Exp. Route Total		2.E-07	5.E-08			
			Dermal	Tetrachloroethene	1.E-07	4.E-08			
				Trichloroethene	1.E-07	4.E-08			
			Exp. Route Total		1.E-07	4.E-08			
			Inhalation	Tetrachloroethene	4.E-07	9.E-08			
				Trichloroethene	4.E-07	9.E-08			
			Exp. Route Total		4.E-07	9.E-08			
			Exposure Point Total					7.E-07	2.E-07
			Exposure Medium Total					7.E-07	2.E-07
			Groundwater Total MS-22					7.E-07	2.E-07

Notes:  
NA = Not available

Table G-108  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	69	ug/L	9.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01			
				Trichloroethene	34	ug/L	4.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E+00			
			Exp. Route Total								2.E-05								3.E+00	
			Dermal	Tetrachloroethene	69	ug/L	3.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01			
				Trichloroethene	34	ug/L	7.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01			
			Exp. Route Total								4.E-06									5.E-01
			Inhalation	Tetrachloroethene	69	ug/L	2.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	8.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02			
				Trichloroethene	34	ug/L	1.4E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-07	4.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01			
			Exp. Route Total								6.E-07									2.E-01
			Exposure Point Total								3.E-05									4.E+00
Exposure Medium Total								3.E-05									4.E+00			
Groundwater Total DN-13								3.E-05									4.E+00			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	407	ug/L	5.4E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-05	1.6E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E+00			
				Trichloroethene	191	ug/L	2.5E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-04	7.3E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+01			
			Exp. Route Total								1.E-04								2.E+01	
			Dermal	Tetrachloroethene	407	ug/L	2.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-06	6.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00			
				Trichloroethene	191	ug/L	4.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	9.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00			
			Exp. Route Total								2.E-05									3.E+00
			Inhalation	Tetrachloroethene	407	ug/L	1.6E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	4.7E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	1.E-01			
				Trichloroethene	191	ug/L	7.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-06	2.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E+00			
			Exp. Route Total								4.E-06									1.E+00
			Exposure Point Total								2.E-04									2.E+01
Exposure Medium Total								2.E-04									2.E+01			
Groundwater Total MS-14								2.E-04									2.E+01			
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	139	ug/L	1.8E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-06	5.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	9.E-01			
				Trichloroethene	65	ug/L	8.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-05	2.5E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	5.E+00			
			Exp. Route Total								4.E-05								6.E+00	
			Dermal	Tetrachloroethene	139	ug/L	7.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01			
				Trichloroethene	65	ug/L	1.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	3.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E-01			
			Exp. Route Total								8.E-06									1.E+00
			Inhalation	Tetrachloroethene	139	ug/L	5.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	1.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	4.E-02			
				Trichloroethene	65	ug/L	2.6E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	7.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	4.E-01			
			Exp. Route Total								1.E-06									4.E-01
			Exposure Point Total								5.E-05									7.E+00
Exposure Medium Total								5.E-05									7.E+00			
Groundwater Total MS-15								5.E-05									7.E+00			
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	8	ug/L	1.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	3.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-02			
				Trichloroethene	4	ug/L	5.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01			
			Exp. Route Total								3.E-06								4.E-01	
			Dermal	Tetrachloroethene	8	ug/L	4.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-07	1.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-02			
				Trichloroethene	4	ug/L	8.4E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-07	1.9E-05	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E-02			
			Exp. Route Total								5.E-07									6.E-02
			Inhalation	Tetrachloroethene	8	ug/L	3.3E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	9.7E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-03			
				Trichloroethene	4	ug/L	1.6E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	4.6E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02			
			Exp. Route Total								7.E-08									3.E-02
			Exposure Point Total								3.E-06									4.E-01
Exposure Medium Total								3.E-06									4.E-01			
Groundwater Total MS-16								3.E-06									4.E-01			

Table G-108  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	55	ug/L	7.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01		
				Trichloroethene	26	ug/L	3.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	9.9E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00		
			Exp. Route Total								2.E-05								2.E+00
			Dermal	Tetrachloroethene	55	ug/L	3.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	9.0E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01		
				Trichloroethene	26	ug/L	5.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E-01		
			Exp. Route Total								3.E-06								4.E-01
			Inhalation	Tetrachloroethene	55	ug/L	2.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	6.4E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02		
				Trichloroethene	26	ug/L	1.0E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	3.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E-01		
			Exp. Route Total								5.E-07								2.E-01
			Exposure Point Total								2.E-05								3.E+00
Exposure Medium Total								2.E-05								3.E+00			
Groundwater Total MS-17																			
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	57	ug/L	7.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	2.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01		
				Trichloroethene	27	ug/L	3.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	1.0E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00		
			Exp. Route Total								2.E-05								2.E+00
			Dermal	Tetrachloroethene	57	ug/L	3.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	9.4E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01		
				Trichloroethene	27	ug/L	4.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01		
			Exp. Route Total								3.E-06								4.E-01
			Inhalation	Tetrachloroethene	57	ug/L	2.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	6.7E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-02		
				Trichloroethene	27	ug/L	1.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	3.1E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01		
			Exp. Route Total								5.E-07								2.E-01
			Exposure Point Total								2.E-05								3.E+00
Exposure Medium Total								2.E-05								3.E+00			
Groundwater Total MS-18																			
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	314	ug/L	4.1E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-06	1.2E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00		
				Trichloroethene	148	ug/L	1.9E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-05	5.7E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+01		
			Exp. Route Total								1.E-04								1.E+01
			Dermal	Tetrachloroethene	314	ug/L	1.8E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-06	5.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	9.E-01		
				Trichloroethene	148	ug/L	2.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	7.0E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00		
			Exp. Route Total								1.E-05								2.E+00
			Inhalation	Tetrachloroethene	314	ug/L	1.2E-03	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	3.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	9.E-02		
				Trichloroethene	148	ug/L	5.9E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	1.7E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	9.E-01		
			Exp. Route Total								3.E-06								9.E-01
			Exposure Point Total								1.E-04								2.E+01
Exposure Medium Total								1.E-04								2.E+01			
Groundwater Total MS-19																			

Table G-108  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	227	ug/L	3.0E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-06	8.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00	
				Trichloroethene	107	ug/L	1.4E-03	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-05	4.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E+00	
			Exp. Route Total									7.E-05						1.E+01
			Dermal	Tetrachloroethene	227	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	3.7E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	6.E-01	
				Trichloroethene	107	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	5.1E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00	
			Exp. Route Total									1.E-05						2.E+00
			Inhalation	Tetrachloroethene	227	ug/L	9.0E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	2.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-02	
				Trichloroethene	107	ug/L	4.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-06	1.2E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	6.E-01	
			Exp. Route Total									2.E-06						7.E-01
			Exposure Point Total									8.E-05						1.E+01
			Exposure Medium Total									8.E-05						1.E+01
			Groundwater Total MS-20															
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	0.005	ug/L	7.2E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-10	2.1E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-05	
				Trichloroethene	0.003	ug/L	3.4E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-09	9.8E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-04	
			Exp. Route Total									2.E-09						2.E-04
			Dermal	Tetrachloroethene	0.005	ug/L	3.0E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-11	8.9E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-05	
				Trichloroethene	0.003	ug/L	4.2E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-10	1.2E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-05	
			Exp. Route Total									3.E-10						4.E-05
			Inhalation	Tetrachloroethene	0.005	ug/L	2.2E-08	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-12	6.3E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-06	
				Trichloroethene	0.003	ug/L	1.0E-08	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-11	3.0E-08	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-05	
			Exp. Route Total									5.E-11						2.E-05
			Exposure Point Total									2.E-09						3.E-04
			Exposure Medium Total									2.E-09						3.E-04
			Groundwater Total MS-21															
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	0.004	ug/L	5.7E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-10	1.6E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-05	
				Exp. Route Total									1.E-10					
			Dermal	Tetrachloroethene	0.004	ug/L	2.4E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-11	7.0E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-05	
				Exp. Route Total									5.E-11					
			Inhalation	Tetrachloroethene	0.004	ug/L	1.7E-08	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-12	5.0E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-06	
				Exp. Route Total									4.E-12					
Exposure Point Total									2.E-10						4.E-05			
Exposure Medium Total									2.E-10						4.E-05			
Groundwater Total MS-22																		

Notes:  
 NA = Not available

Total Ear HI Across All Media = 6.E+01  
 Total Heart HI Across All Media = 6.E+01  
 Total Immune System HI Across All Media = 8.E+01  
 Total Neurological HI Across All Media = 1.E+01

Table G-109  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	69	ug/L	1.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	9.5E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01			
				Trichloroethene	34	ug/L	6.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	4.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E-01			
			Exp. Route Total								3.E-06								1.E+00	
			Dermal	Tetrachloroethene	69	ug/L	1.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01			
				Trichloroethene	34	ug/L	2.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-01			
			Exp. Route Total								2.E-06									5.E-01
			Inhalation	Tetrachloroethene	69	ug/L	4.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	3.5E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-03			
				Trichloroethene	34	ug/L	2.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-08	1.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	9.E-02			
			Exp. Route Total								1.E-07									9.E-02
			Exposure Point Total								5.E-06									2.E+00
Exposure Medium Total								5.E-06									2.E+00			
Groundwater Total DN-13								5.E-06									2.E+00			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	407	ug/L	7.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	5.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	9.E-01			
				Trichloroethene	191	ug/L	3.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	2.6E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E+00			
			Exp. Route Total								2.E-05								6.E+00	
			Dermal	Tetrachloroethene	407	ug/L	5.6E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	4.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01			
				Trichloroethene	191	ug/L	1.5E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-06	6.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00			
			Exp. Route Total								8.E-06									2.E+00
			Inhalation	Tetrachloroethene	407	ug/L	2.6E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	2.0E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-02			
				Trichloroethene	191	ug/L	1.2E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	9.6E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	5.E-01			
			Exp. Route Total								6.E-07									5.E-01
			Exposure Point Total								3.E-05									9.E+00
Exposure Medium Total								3.E-05									9.E+00			
Groundwater Total MS-14								3.E-05									9.E+00			
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	139	ug/L	2.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	1.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01			
				Trichloroethene	65	ug/L	1.1E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-06	8.9E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00			
			Exp. Route Total								6.E-06								2.E+00	
			Dermal	Tetrachloroethene	139	ug/L	1.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-01			
				Trichloroethene	65	ug/L	5.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E-01			
			Exp. Route Total								3.E-06									7.E-01
			Inhalation	Tetrachloroethene	139	ug/L	8.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	7.0E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02			
				Trichloroethene	65	ug/L	4.2E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	3.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-01			
			Exp. Route Total								2.E-07									2.E-01
			Exposure Point Total								9.E-06									3.E+00
Exposure Medium Total								9.E-06									3.E+00			
Groundwater Total MS-15								9.E-06									3.E+00			
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	8	ug/L	1.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02			
				Trichloroethene	4	ug/L	6.9E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	5.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-01			
			Exp. Route Total								3.E-07									1.E-01
			Dermal	Tetrachloroethene	8	ug/L	1.2E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-08	9.0E-05	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-02			
				Trichloroethene	4	ug/L	3.2E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-02			
			Exp. Route Total								2.E-07									4.E-02
			Inhalation	Tetrachloroethene	8	ug/L	5.4E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	4.2E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03			
				Trichloroethene	4	ug/L	2.5E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.0E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-02			
			Exp. Route Total								1.E-08									1.E-02
			Exposure Point Total								5.E-07									2.E-01
Exposure Medium Total								5.E-07									2.E-01			
Groundwater Total MS-16								5.E-07									2.E-01			

**Table G-109**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	55	ug/L	9.7E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	7.6E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01
				Trichloroethene	26	ug/L	4.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.5E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	7.E-01
			<b>Exp. Route Total</b>									2.E-06				8.E-01	
			Dermal	Tetrachloroethene	55	ug/L	7.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	5.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01
				Trichloroethene	26	ug/L	2.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	8.1E-05	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E-01
			<b>Exp. Route Total</b>									1.E-06				3.E-01	
			Inhalation	Tetrachloroethene	55	ug/L	3.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	2.8E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	7.E-03
				Trichloroethene	26	ug/L	1.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	1.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	6.E-02
			<b>Exp. Route Total</b>									8.E-08				7.E-02	
			<b>Exposure Point Total</b>									3.E-06				1.E+00	
			<b>Exposure Medium Total</b>									3.E-06				1.E+00	
			<b>Groundwater Total MS-17</b>														
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	57	ug/L	1.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	7.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01
				Trichloroethene	27	ug/L	4.7E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.7E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	7.E-01
			<b>Exp. Route Total</b>									2.E-06				9.E-01	
			Dermal	Tetrachloroethene	57	ug/L	7.9E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	6.2E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E-01
				Trichloroethene	27	ug/L	1.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-07	8.4E-05	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E-01
			<b>Exp. Route Total</b>									7.E-07				3.E-01	
			Inhalation	Tetrachloroethene	57	ug/L	3.7E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	2.9E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	7.E-03
				Trichloroethene	27	ug/L	1.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-08	1.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	7.E-02
			<b>Exp. Route Total</b>									8.E-08				7.E-02	
			<b>Exposure Point Total</b>									3.E-06				1.E+00	
			<b>Exposure Medium Total</b>									3.E-06				1.E+00	
			<b>Groundwater Total MS-18</b>														
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	314	ug/L	5.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	4.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	7.E-01
				Trichloroethene	148	ug/L	2.6E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	4.E+00
			<b>Exp. Route Total</b>									1.E-05				5.E+00	
			Dermal	Tetrachloroethene	314	ug/L	4.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-07	3.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01
				Trichloroethene	148	ug/L	5.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	4.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	9.E-01
			<b>Exp. Route Total</b>									4.E-06				1.E+00	
			Inhalation	Tetrachloroethene	314	ug/L	2.0E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	1.6E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	4.E-02
				Trichloroethene	148	ug/L	9.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	7.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	4.E-01
			<b>Exp. Route Total</b>									4.E-07				4.E-01	
			<b>Exposure Point Total</b>									2.E-05				7.E+00	
			<b>Exposure Medium Total</b>									2.E-05				7.E+00	
			<b>Groundwater Total MS-19</b>														

Table G-109  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	227	ug/L	4.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	8.E-07	3.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01
				Trichloroethene	107	ug/L	1.9E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-06	1.5E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00
			Exp. Route Total									9.E-06				3.E+00	
			Dermal	Tetrachloroethene	227	ug/L	3.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	2.4E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01
				Trichloroethene	107	ug/L	4.3E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	3.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01
			Exp. Route Total									3.E-06				1.E+00	
			Inhalation	Tetrachloroethene	227	ug/L	1.5E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-08	1.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02
				Trichloroethene	107	ug/L	6.8E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	5.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01
			Exp. Route Total									3.E-07				3.E-01	
			Exposure Point Total									1.E-05				5.E+00	
			Exposure Medium Total									1.E-05				5.E+00	
			Groundwater Total MS-20														
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	0.005	ug/L	9.6E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	7.5E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-05
				Trichloroethene	0.003	ug/L	4.5E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-10	3.5E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-05
			Exp. Route Total									2.E-10				8.E-05	
			Dermal	Tetrachloroethene	0.005	ug/L	7.5E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	5.8E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-05
				Trichloroethene	0.003	ug/L	1.0E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	5.E-11	8.0E-09	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-05
			Exp. Route Total									6.E-11				3.E-05	
			Inhalation	Tetrachloroethene	0.005	ug/L	3.5E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-13	2.7E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-07
				Trichloroethene	0.003	ug/L	1.6E-09	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-12	1.3E-08	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	6.E-06
			Exp. Route Total									8.E-12				7.E-06	
			Exposure Point Total									3.E-10				1.E-04	
			Exposure Medium Total									3.E-10				1.E-04	
			Groundwater Total MS-21														
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	0.004	ug/L	7.6E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	5.9E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E-05
				Exp. Route Total									2.E-11				1.E-05
			Dermal	Tetrachloroethene	0.004	ug/L	5.9E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-11	4.6E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-06
				Exp. Route Total									1.E-11				8.E-06
			Inhalation	Tetrachloroethene	0.004	ug/L	2.8E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-13	2.1E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	5.E-07
				Exp. Route Total									7.E-13				5.E-07
Exposure Point Total									3.E-11				2.E-05				
Exposure Medium Total									3.E-11				2.E-05				
Groundwater Total MS-22																	

Notes:

NA = Not available

Total Ear HI Across All Media = 2.E+01  
 Total Heart HI Across All Media = 2.E+01  
 Total Immune System HI Across All Media = 2.E+01  
 Total Neurological HI Across All Media = 5.E+00

Table G-110  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units	target organ			
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	69	ug/L	3.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	7.E-07	4.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	7.E-01		
				Trichloroethene	34	ug/L	1.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E+00		
			Exp. Route Total								8.E-06								5.E+00
			Dermal	Tetrachloroethene	69	ug/L	2.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01		
				Trichloroethene	34	ug/L	3.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01		
			Exp. Route Total								2.E-06								1.E+00
			Inhalation	Tetrachloroethene	69	ug/L	1.2E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.4E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-02		
				Trichloroethene	34	ug/L	5.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	6.9E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-01		
			Exp. Route Total								3.E-07								4.E-01
			Exposure Point Total								1.E-05								6.E+00
Exposure Medium Total								1.E-05								6.E+00			
Groundwater Total DN-13								1.E-05								6.E+00			
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	407	ug/L	2.0E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-06	2.3E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E+00		
				Trichloroethene	191	ug/L	9.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-05	1.1E-02	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+01		
			Exp. Route Total								5.E-05							3.E+01	
			Dermal	Tetrachloroethene	407	ug/L	1.3E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.5E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00		
				Trichloroethene	191	ug/L	1.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	2.0E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	4.E+00		
			Exp. Route Total								1.E-05							7.E+00	
			Inhalation	Tetrachloroethene	407	ug/L	7.0E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	8.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-01		
				Trichloroethene	191	ug/L	3.3E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	3.8E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E+00		
			Exp. Route Total								2.E-06							2.E+00	
			Exposure Point Total								6.E-05							3.E+01	
Exposure Medium Total								6.E-05							3.E+01				
Groundwater Total MS-14								6.E-05							3.E+01				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	139	ug/L	6.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	8.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00		
				Trichloroethene	65	ug/L	3.2E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	3.8E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E+00		
			Exp. Route Total								2.E-05							9.E+00	
			Dermal	Tetrachloroethene	139	ug/L	4.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-07	5.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	9.E-01		
				Trichloroethene	65	ug/L	6.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00		
			Exp. Route Total								4.E-06							2.E+00	
			Inhalation	Tetrachloroethene	139	ug/L	2.4E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	2.8E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-02		
				Trichloroethene	65	ug/L	1.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-07	1.3E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	7.E-01		
			Exp. Route Total								5.E-07							7.E-01	
			Exposure Point Total								2.E-05							1.E+01	
Exposure Medium Total								2.E-05							1.E+01				
Groundwater Total MS-15								2.E-05							1.E+01				
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	8	ug/L	4.1E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-08	4.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-02		
				Trichloroethene	4	ug/L	1.9E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-07	2.3E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-01		
			Exp. Route Total								1.E-06							5.E-01	
			Dermal	Tetrachloroethene	8	ug/L	2.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-08	3.1E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-02		
				Trichloroethene	4	ug/L	3.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	4.2E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-02		
			Exp. Route Total								2.E-07							1.E-01	
			Inhalation	Tetrachloroethene	8	ug/L	1.4E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-09	1.7E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-03		
				Trichloroethene	4	ug/L	6.7E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	7.9E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-02		
			Exp. Route Total								3.E-08							4.E-02	
			Exposure Point Total								1.E-06							7.E-01	
Exposure Medium Total								1.E-06							7.E-01				
Groundwater Total MS-16								1.E-06							7.E-01				

Table G-110  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	55	ug/L	2.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	3.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	5.E-01
				Trichloroethene	26	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	1.5E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E+00
			Exp. Route Total									6.E-06					4.E+00
			Dermal	Tetrachloroethene	55	ug/L	1.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E-01
				Trichloroethene	26	ug/L	2.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E-01
			Exp. Route Total									1.E-06					9.E-01
			Inhalation	Tetrachloroethene	55	ug/L	9.5E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	1.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02
				Trichloroethene	26	ug/L	4.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.2E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	3.E-01
			Exp. Route Total									2.E-07					3.E-01
			Exposure Point Total									8.E-06					5.E+00
Exposure Medium Total									8.E-06					5.E+00			
Groundwater Total MS-17																	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	57	ug/L	2.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	3.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	6.E-01
				Trichloroethene	27	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	1.5E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E+00
			Exp. Route Total									7.E-06					4.E+00
			Dermal	Tetrachloroethene	57	ug/L	1.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-07	2.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	4.E-01
				Trichloroethene	27	ug/L	2.5E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	2.9E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	6.E-01
			Exp. Route Total									2.E-06					9.E-01
			Inhalation	Tetrachloroethene	57	ug/L	9.8E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	3.E-02
				Trichloroethene	27	ug/L	4.6E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	5.4E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	3.E-01
			Exp. Route Total									2.E-07					3.E-01
			Exposure Point Total									8.E-06					5.E+00
Exposure Medium Total									8.E-06					5.E+00			
Groundwater Total MS-18																	
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	314	ug/L	1.6E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-06	1.8E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	3.E+00
				Trichloroethene	148	ug/L	7.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-05	8.5E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+01
			Exp. Route Total									4.E-05					2.E+01
			Dermal	Tetrachloroethene	314	ug/L	9.9E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	1.2E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E+00
				Trichloroethene	148	ug/L	1.4E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	1.6E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E+00
			Exp. Route Total									8.E-06					5.E+00
			Inhalation	Tetrachloroethene	314	ug/L	5.4E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	6.3E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	2.E-01
				Trichloroethene	148	ug/L	2.5E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-06	3.0E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	1.E+00
			Exp. Route Total									1.E-06					2.E+00
			Exposure Point Total									5.E-05					3.E+01
Exposure Medium Total									5.E-05					3.E+01			
Groundwater Total MS-19																	

Table G-110  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - RME  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units	target organ		
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	227	ug/L	1.1E-03	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	1.3E-02	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00	
				Trichloroethene	107	ug/L	5.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	6.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+01	
			Exp. Route Total									3.E-05						1.E+01
			Dermal	Tetrachloroethene	227	ug/L	7.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	8.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00	
				Trichloroethene	107	ug/L	9.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	1.1E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00	
			Exp. Route Total									6.E-06						4.E+00
			Inhalation	Tetrachloroethene	227	ug/L	3.9E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-07	4.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-01	
				Trichloroethene	107	ug/L	1.8E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	7.E-07	2.1E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E+00	
			Exp. Route Total									8.E-07						1.E+00
			Exposure Point Total									3.E-05						2.E+01
			Exposure Medium Total									3.E-05						2.E+01
			Groundwater Total MS-20															
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	0.005	ug/L	2.7E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-11	3.1E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-05	
				Trichloroethene	0.003	ug/L	1.3E-08	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-10	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-04	
			Exp. Route Total									6.E-10						3.E-04
			Dermal	Tetrachloroethene	0.005	ug/L	1.7E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	2.0E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-05	
				Trichloroethene	0.003	ug/L	2.3E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-10	2.7E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-05	
			Exp. Route Total									1.E-10						9.E-05
			Inhalation	Tetrachloroethene	0.005	ug/L	9.3E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-12	1.1E-07	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	3.E-06	
				Trichloroethene	0.003	ug/L	4.4E-09	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-11	5.1E-08	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	3.E-05	
			Exp. Route Total									2.E-11						3.E-05
			Exposure Point Total									8.E-10						5.E-04
			Exposure Medium Total									8.E-10						5.E-04
			Groundwater Total MS-21															
Groundwater	Groundwater	MS-22	Ingestion	Tetrachloroethene	0.004	ug/L	2.1E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	4.E-11	2.5E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-05	
				Exp. Route Total									4.E-11					
			Dermal	Tetrachloroethene	0.004	ug/L	1.4E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-11	1.6E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-05	
				Exp. Route Total									3.E-11					
			Inhalation	Tetrachloroethene	0.004	ug/L	7.4E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-12	8.6E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-06	
				Exp. Route Total									2.E-12					
Exposure Point Total									7.E-11						7.E-05			
Exposure Medium Total									7.E-11						7.E-05			
Groundwater Total MS-22																		

Notes:  
 NA = Not available

Total Ear HI Across All Media = 9.E+01  
 Total Heart HI Across All Media = 9.E+01  
 Total Immune System HI Across All Media = 9.E+01  
 Total Neurological HI Across All Media = 2.E+01

Table G-111  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	69	ug/L	1.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-07	1.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-01
				Trichloroethene	34	ug/L	6.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	7.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00
			Exp. Route Total									3.E-06				2.E+00	
			Dermal	Tetrachloroethene	69	ug/L	2.2E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.5E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	4.E-01
				Trichloroethene	34	ug/L	3.1E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	3.7E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	7.E-01
			Exp. Route Total									2.E-06				1.E+00	
			Inhalation	Tetrachloroethene	69	ug/L	3.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-08	4.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-02
				Trichloroethene	34	ug/L	1.9E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-08	2.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-01
			Exp. Route Total									9.E-08				1.E-01	
			Exposure Point Total									5.E-06				3.E+00	
Exposure Medium Total									5.E-06				3.E+00				
Groundwater Total DN-13									5.E-06				3.E+00				
Groundwater	Groundwater	MS-14	Ingestion	Tetrachloroethene	407	ug/L	7.8E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	9.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E+00
				Trichloroethene	191	ug/L	3.7E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-05	4.3E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	9.E+00
			Exp. Route Total									2.E-05				1.E+01	
			Dermal	Tetrachloroethene	407	ug/L	7.3E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-06	8.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	1.E+00
				Trichloroethene	191	ug/L	1.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	8.E-06	1.2E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E+00
			Exp. Route Total									1.E-05				4.E+00	
			Inhalation	Tetrachloroethene	407	ug/L	2.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	2.7E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-02
				Trichloroethene	191	ug/L	1.1E-04	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	4.E-07	1.3E-03	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	6.E-01
			Exp. Route Total									5.E-07				7.E-01	
			Exposure Point Total									3.E-05				1.E+01	
Exposure Medium Total									3.E-05				1.E+01				
Groundwater Total MS-14									3.E-05				1.E+01				
Groundwater	Groundwater	MS-15	Ingestion	Tetrachloroethene	139	ug/L	2.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	6.E-07	3.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01
				Trichloroethene	65	ug/L	1.3E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-06	1.5E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E+00
			Exp. Route Total									6.E-06				3.E+00	
			Dermal	Tetrachloroethene	139	ug/L	2.5E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	5.E-07	2.9E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	5.E-01
				Trichloroethene	65	ug/L	6.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	4.0E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	8.E-01
			Exp. Route Total									3.E-06				1.E+00	
			Inhalation	Tetrachloroethene	139	ug/L	7.9E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-08	9.2E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	2.E-02
				Trichloroethene	65	ug/L	3.7E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	4.3E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	2.E-01
			Exp. Route Total									2.E-07				2.E-01	
			Exposure Point Total									1.E-05				5.E+00	
Exposure Medium Total									1.E-05				5.E+00				
Groundwater Total MS-15									1.E-05				5.E+00				
Groundwater	Groundwater	MS-16	Ingestion	Tetrachloroethene	8	ug/L	1.6E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.9E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02
				Trichloroethene	4	ug/L	7.5E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-07	8.8E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	2.E-01
			Exp. Route Total									4.E-07				2.E-01	
			Dermal	Tetrachloroethene	8	ug/L	1.5E-05	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	3.E-08	1.8E-04	mg/kg/day	6.0E-03	mg/kg/day	neurological	3.E-02
				Trichloroethene	4	ug/L	3.6E-06	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-07	2.4E-05	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E-02
			Exp. Route Total									2.E-07				8.E-02	
			Inhalation	Tetrachloroethene	8	ug/L	4.8E-06	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	1.E-09	5.5E-05	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	1.E-03
				Trichloroethene	4	ug/L	2.2E-06	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	9.E-09	2.6E-05	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	1.E-02
			Exp. Route Total									1.E-08				1.E-02	
			Exposure Point Total									6.E-07				3.E-01	
Exposure Medium Total									6.E-07				3.E-01				
Groundwater Total MS-16									6.E-07				3.E-01				

Table G-111  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	target organ	
Groundwater	Groundwater	MS-17	Ingestion	Tetrachloroethene	55	ug/L	1.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	26	ug/L	5.0E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	5.8E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									3.E-06				1.E+00	
			Dermal	Tetrachloroethene	55	ug/L	1.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	26	ug/L	2.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-06	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01
			Exp. Route Total									1.E-06				5.E-01	
			Inhalation	Tetrachloroethene	55	ug/L	3.1E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-09	3.6E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	9.E-03
				Trichloroethene	26	ug/L	1.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.7E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	9.E-02
			Exp. Route Total									7.E-08				9.E-02	
			Exposure Point Total									4.E-06				2.E+00	
Exposure Medium Total									4.E-06				2.E+00				
Groundwater Total MS-17																	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	57	ug/L	1.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.3E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	27	ug/L	5.2E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-06	6.0E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	1.E+00
			Exp. Route Total									3.E-06				1.E+00	
			Dermal	Tetrachloroethene	57	ug/L	1.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-07	1.2E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	2.E-01
				Trichloroethene	27	ug/L	1.4E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	7.E-07	1.6E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	3.E-01
			Exp. Route Total									9.E-07				5.E-01	
			Inhalation	Tetrachloroethene	57	ug/L	3.2E-05	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-09	3.8E-04	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	9.E-03
				Trichloroethene	27	ug/L	1.5E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-08	1.8E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	9.E-02
			Exp. Route Total									7.E-08				1.E-01	
			Exposure Point Total									4.E-06				2.E+00	
Exposure Medium Total									4.E-06				2.E+00				
Groundwater Total MS-18																	
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	314	ug/L	6.0E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	7.0E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00
				Trichloroethene	148	ug/L	2.8E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	1.E-05	3.3E-03	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	7.E+00
			Exp. Route Total									1.E-05				8.E+00	
			Dermal	Tetrachloroethene	314	ug/L	5.7E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	1.E-06	6.6E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological heart, immune system	1.E+00
				Trichloroethene	148	ug/L	7.8E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	4.E-06	9.1E-04	mg/kg/day	5.0E-04	mg/kg/day	neurological heart, immune system	2.E+00
			Exp. Route Total									5.E-06				3.E+00	
			Inhalation	Tetrachloroethene	314	ug/L	1.8E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	5.E-08	2.1E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological heart, immune system	5.E-02
				Trichloroethene	148	ug/L	8.4E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-07	9.8E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	neurological heart, immune system	5.E-01
			Exp. Route Total									4.E-07				5.E-01	
			Exposure Point Total									2.E-05				1.E+01	
Exposure Medium Total									2.E-05				1.E+01				
Groundwater Total MS-19																	

Table G-111  
 Calculation of Chemical Cancer Risks and Non-Cancer Hazards - CTE  
 Human Health Risk Assessment  
 RACER Trust, Moraine, Ohio

Scenario Timeframe: Future  
 Exposure Area: Potable Water, Pumping Scenario 4  
 Receptor: Off-site Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC			Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units	target organ				
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	227	ug/L	4.4E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-07	5.1E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-01			
				Trichloroethene	107	ug/L	2.0E-04	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	9.E-06	2.4E-03	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	5.E+00			
			Exp. Route Total									1.E-05						6.E+00		
			Dermal	Tetrachloroethene	227	ug/L	4.1E-04	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	9.E-07	4.8E-03	mg/kg/day	6.0E-03	mg/kg/day	neurological	8.E-01			
				Trichloroethene	107	ug/L	5.6E-05	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	3.E-06	6.5E-04	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E+00			
			Exp. Route Total									3.E-06						2.E+00		
			Inhalation	Tetrachloroethene	227	ug/L	1.3E-04	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	3.E-08	1.5E-03	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	4.E-02			
				Trichloroethene	107	ug/L	6.0E-05	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	2.E-07	7.0E-04	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	4.E-01			
			Exp. Route Total									3.E-07						4.E-01		
			Exposure Point Total									1.E-05						8.E+00		
			Exposure Medium Total									1.E-05						8.E+00		
			Groundwater Total MS-20																	
			Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	0.005	ug/L	1.0E-08	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-05
							Trichloroethene	0.003	ug/L	4.9E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	2.E-10	5.7E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	1.E-04
Exp. Route Total												2.E-10						1.E-04		
Dermal	Tetrachloroethene	0.005				ug/L	9.8E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	1.1E-07	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-05			
	Trichloroethene	0.003				ug/L	1.3E-09	mg/kg/day	4.6E-02	(mg/kg/day) <sup>-1</sup>	6.E-11	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	heart, immune system	3.E-05			
Exp. Route Total												8.E-11						5.E-05		
Inhalation	Tetrachloroethene	0.005				ug/L	3.1E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	8.E-13	3.6E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	9.E-07			
	Trichloroethene	0.003				ug/L	1.4E-09	mg/m <sup>3</sup>	4.1E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-12	1.7E-08	mg/m <sup>3</sup>	2.0E-03	mg/m <sup>3</sup>	heart, immune system	8.E-06			
Exp. Route Total												7.E-12						9.E-06		
Exposure Point Total												3.E-10						2.E-04		
Exposure Medium Total												3.E-10						2.E-04		
Groundwater Total MS-21																				
Groundwater	Groundwater	MS-22				Ingestion	Tetrachloroethene	0.004	ug/L	8.2E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	9.6E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-05
							Exp. Route Total									2.E-11				
			Dermal	Tetrachloroethene	0.004	ug/L	7.8E-09	mg/kg/day	2.1E-03	(mg/kg/day) <sup>-1</sup>	2.E-11	9.0E-08	mg/kg/day	6.0E-03	mg/kg/day	neurological	2.E-05			
				Exp. Route Total									2.E-11						2.E-05	
			Inhalation	Tetrachloroethene	0.004	ug/L	2.4E-09	mg/m <sup>3</sup>	2.6E-04	(mg/m <sup>3</sup> ) <sup>-1</sup>	6.E-13	2.8E-08	mg/m <sup>3</sup>	4.0E-02	mg/m <sup>3</sup>	neurological	7.E-07			
				Exp. Route Total									6.E-13						7.E-07	
Exposure Point Total									3.E-11						3.E-05					
Exposure Medium Total									3.E-11						3.E-05					
Groundwater Total MS-22																				

Notes:  
 NA = Not available

Total Ear HI Across All Media = 4.E+01  
 Total Heart HI Across All Media = 4.E+01  
 Total Immune System HI Across All Media = 4.E+01  
 Total Neurological HI Across All Media = 1.E+01

**Table G-112**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk
Groundwater	Groundwater	DN-13	Ingestion	Tetrachloroethene	3.E-06	5.E-07
				Trichloroethene	3.E-05	6.E-06
			Exp. Route Total		3.E-05	6.E-06
			Dermal	Tetrachloroethene	1.E-06	8.E-07
				Trichloroethene	5.E-06	3.E-06
			Exp. Route Total		6.E-06	3.E-06
			Inhalation	Tetrachloroethene	1.E-07	2.E-08
				Trichloroethene	8.E-07	2.E-07
			Exp. Route Total		9.E-07	2.E-07
			Exposure Point Total		4.E-05	1.E-05
			Exposure Medium Total		4.E-05	1.E-05
			Groundwater Total DN-13		4.E-05	1.E-05
			Groundwater	Groundwater	MS-14	Ingestion
Trichloroethene	2.E-04	3.E-05				
Exp. Route Total		2.E-04				4.E-05
Dermal	Tetrachloroethene	7.E-06				3.E-06
	Trichloroethene	3.E-05				2.E-05
Exp. Route Total		3.E-05				2.E-05
Inhalation	Tetrachloroethene	6.E-07				1.E-07
	Trichloroethene	4.E-06				9.E-07
Exp. Route Total		5.E-06				1.E-06
Exposure Point Total		2.E-04				5.E-05
Exposure Medium Total		2.E-04				5.E-05
Groundwater Total MS-14		2.E-04				5.E-05
Groundwater	Groundwater	MS-14				Ingestion
			Trichloroethene	5.E-05	1.E-05	
			Exp. Route Total		6.E-05	1.E-05
			Dermal	Tetrachloroethene	3.E-06	9.E-07
				Trichloroethene	9.E-06	5.E-06
			Exp. Route Total		1.E-05	6.E-06
			Inhalation	Tetrachloroethene	2.E-07	4.E-08
				Trichloroethene	2.E-06	3.E-07
			Exp. Route Total		2.E-06	4.E-07
			Exposure Point Total		7.E-05	2.E-05
			Exposure Medium Total		7.E-05	2.E-05
			Groundwater Total MS-14		7.E-05	2.E-05
			Groundwater	Groundwater	MS-15	Ingestion
Trichloroethene	3.E-06	7.E-07				
Exp. Route Total		4.E-06				7.E-07
Dermal	Tetrachloroethene	2.E-07				6.E-08
	Trichloroethene	6.E-07				3.E-07
Exp. Route Total		7.E-07				4.E-07
Inhalation	Tetrachloroethene	1.E-08				3.E-09
	Trichloroethene	9.E-08				2.E-08
Exp. Route Total		1.E-07				2.E-08
Exposure Point Total		4.E-06				1.E-06
Exposure Medium Total		4.E-06				1.E-06
Groundwater Total MS-15		4.E-06				1.E-06
Groundwater	Groundwater	MS-17				Ingestion
			Trichloroethene	2.E-05	4.E-06	
			Exp. Route Total		2.E-05	5.E-06
			Dermal	Tetrachloroethene	1.E-06	4.E-07
				Trichloroethene	4.E-06	2.E-06
			Exp. Route Total		5.E-06	2.E-06
			Inhalation	Tetrachloroethene	8.E-08	2.E-08
				Trichloroethene	6.E-07	1.E-07
			Exp. Route Total		8.E-08	2.E-08
			Exposure Point Total		3.E-05	7.E-06
			Exposure Medium Total		3.E-05	7.E-06
			Groundwater Total MS-17		3.E-05	7.E-06

**Table G-112**  
**Calculation of Chemical Cancer Risks and Non-Cancer Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Scenario Timeframe: Future
Exposure Area: Potable Water, Pumping Scenario 1
Receptor: Off-site Resident
Receptor Age: Adult + Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	RME Cancer Risk	CTE Cancer Risk	
Groundwater	Groundwater	MS-18	Ingestion	Tetrachloroethene	2.E-06	4.E-07	
				Trichloroethene	2.E-05	5.E-06	
			Exp. Route Total		2.E-05	5.E-06	
			Dermal	Tetrachloroethene	1.E-06	4.E-07	
				Trichloroethene	3.E-06	1.E-06	
			Exp. Route Total		4.E-06	2.E-06	
			Inhalation	Tetrachloroethene	8.E-08	2.E-08	
				Trichloroethene	6.E-07	1.E-07	
			Exp. Route Total		7.E-07	2.E-07	
			Exposure Point Total			3.E-05	7.E-06
			Exposure Medium Total			3.E-05	7.E-06
			Groundwater Total MS-18			3.E-05	7.E-06
Groundwater	Groundwater	MS-19	Ingestion	Tetrachloroethene	1.E-05	2.E-06	
				Trichloroethene	1.E-04	3.E-05	
			Exp. Route Total		1.E-04	3.E-05	
			Dermal	Tetrachloroethene	6.E-06	2.E-06	
				Trichloroethene	2.E-05	6.E-06	
			Exp. Route Total		2.E-05	8.E-06	
			Inhalation	Tetrachloroethene	5.E-07	1.E-07	
				Trichloroethene	3.E-06	7.E-07	
			Exp. Route Total		4.E-06	8.E-07	
			Exposure Point Total			2.E-04	4.E-05
			Exposure Medium Total			2.E-04	4.E-05
			Groundwater Total MS-19			2.E-04	4.E-05
Groundwater	Groundwater	MS-20	Ingestion	Tetrachloroethene	9.E-06	2.E-06	
				Trichloroethene	9.E-05	2.E-05	
			Exp. Route Total		1.E-04	2.E-05	
			Dermal	Tetrachloroethene	4.E-06	2.E-06	
				Trichloroethene	1.E-05	5.E-06	
			Exp. Route Total		2.E-05	6.E-06	
			Inhalation	Tetrachloroethene	3.E-07	7.E-08	
				Trichloroethene	2.E-06	5.E-07	
			Exp. Route Total		3.E-06	6.E-07	
			Exposure Point Total			1.E-04	3.E-05
			Exposure Medium Total			1.E-04	3.E-05
			Groundwater Total MS-20			1.E-04	3.E-05
Groundwater	Groundwater	MS-21	Ingestion	Tetrachloroethene	2.E-10	4.E-11	
				Trichloroethene	2.E-09	4.E-10	
			Exp. Route Total		2.E-09	5.E-10	
			Dermal	Tetrachloroethene	1.E-10	4.E-11	
				Trichloroethene	3.E-10	1.E-10	
			Exp. Route Total		4.E-10	1.E-10	
			Inhalation	Tetrachloroethene	8.E-12	2.E-12	
				Trichloroethene	6.E-11	1.E-11	
			Exp. Route Total		7.E-11	1.E-11	
			Exposure Point Total			3.E-09	6.E-10
			Exposure Medium Total			3.E-09	6.E-10
			Groundwater Total MS-21			3.E-09	6.E-10
Groundwater	Groundwater	MS-22	Ingestion	Trichloroethene	2.E-10	3.E-11	
				Exp. Route Total		2.E-10	3.E-11
			Dermal	Trichloroethene	0.E+00	0.E+00	
				Exp. Route Total		0.E+00	0.E+00
			Inhalation	Trichloroethene	2.E-10	6.E-11	
				Exp. Route Total		2.E-10	6.E-11
			Exposure Point Total			4.E-10	1.E-10
			Exposure Medium Total			4.E-10	1.E-10
Groundwater Total MS-22			4.E-10	1.E-10			

Notes:  
NA = Not available

**Table G-113**  
**Summary of On-site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
On-site Routine Worker	Landfill 1	Soil (waste)	Ingestion	3.E-05	2.E+00	5.E-06	8.E-01
			Dermal	3.E-05	8.E-01	1.E-06	8.E-02
			Inhalation	2.E-06	2.E-01	9.E-07	2.E-01
			Total	6.E-05	3.E+00	7.E-06	1.E+00
		Groundwater	Ingestion	7.E-06	1.E-01	2.E-06	1.E-01
			Dermal	1.E-06	2.E-01	2.E-07	9.E-02
			Inhalation	2.E-06	5.E-01	3.E-07	3.E-01
			Total	1.E-05	8.E-01	3.E-06	5.E-01
		All Media	Total	7.E-05	3.E+00	1.E-05	2.E+00
		On-site Maintenance Worker	Landfill 1	Soil (waste)	Ingestion	2.E-06	4.E-02
Dermal	1.E-06				2.E-02	2.E-08	1.E-03
Inhalation	8.E-07				7.E-03	7.E-08	2.E-03
Total	4.E-06				7.E-02	5.E-07	2.E-02
Groundwater	Ingestion			3.E-07	4.E-03	5.E-08	2.E-03
	Dermal			3.E-08	4.E-03	5.E-09	2.E-03
	Inhalation			4.E-08	1.E-04	6.E-09	5.E-05
	Total			3.E-07	8.E-03	6.E-08	4.E-03
All Media	Total			4.E-06	7.E-02	5.E-07	3.E-02
On-site Construction Worker	Landfill 1			Soil (waste)	Ingestion	7.E-06	3.E+00
		Dermal	2.E-06		8.E-01	3.E-07	1.E-01
		Inhalation	8.E-07		2.E-01	2.E-07	4.E-02
		Total	9.E-06		4.E+00	4.E-06	2.E+00
		Groundwater	Ingestion	3.E-07	1.E-01	1.E-07	5.E-02
			Dermal	3.E-08	9.E-02	1.E-08	4.E-02
			Inhalation	4.E-08	3.E-03	2.E-08	1.E-03
			Total	3.E-07	2.E-01	2.E-07	1.E-01
		All Media	Total	1.E-05	4.E+00	4.E-06	2.E+00
		On-site Routine Worker	Landfill 1	Soil (native)	Ingestion	3.E-08	8.E-05
Dermal	0.E+00				0.E+00	0.E+00	0.E+00
Inhalation	7.E-08				7.E-05	2.E-08	7.E-05
Total	1.E-07				2.E-04	3.E-08	1.E-04
Groundwater	Ingestion			7.E-06	1.E-01	2.E-06	1.E-01
	Dermal			1.E-06	2.E-01	2.E-07	9.E-02
	Inhalation			2.E-06	5.E-01	3.E-07	3.E-01
	Total			1.E-05	8.E-01	3.E-06	5.E-01
All Media	Total			1.E-05	8.E-01	3.E-06	5.E-01
On-site Maintenance Worker	Landfill 1			Soil (native)	Ingestion	2.E-09	6.E-06
		Dermal	0.E+00		0.E+00	0.E+00	0.E+00
		Inhalation	2.E-08		3.E-06	2.E-09	7.E-07
		Total	2.E-08		9.E-06	2.E-09	4.E-06
		Groundwater	Ingestion	3.E-07	4.E-03	5.E-08	2.E-03
			Dermal	3.E-08	4.E-03	5.E-09	2.E-03
			Inhalation	4.E-08	1.E-04	6.E-09	5.E-05
			Total	3.E-07	8.E-03	6.E-08	4.E-03
		All Media	Total	4.E-07	8.E-03	6.E-08	4.E-03
		On-site Construction Worker	Landfill 1	Soil (native)	Ingestion	8.E-09	5.E-04
Dermal	0.E+00				0.E+00	0.E+00	0.E+00
Inhalation	2.E-08				7.E-05	5.E-09	2.E-05
Total	3.E-08				6.E-04	9.E-09	3.E-04
Groundwater	Ingestion			3.E-07	1.E-01	1.E-07	5.E-02
	Dermal			3.E-08	9.E-02	1.E-08	4.E-02
	Inhalation			4.E-08	3.E-03	2.E-08	1.E-03
	Total			3.E-07	2.E-01	2.E-07	1.E-01
All Media	Total			4.E-07	2.E-01	2.E-07	1.E-01

**Table G-113**  
**Summary of On-site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
On-site Routine Worker	West Tank Farm	Soil	Ingestion	1.E-06	1.E-02	3.E-07	6.E-03
			Dermal	1.E-07	6.E-04	4.E-09	6.E-05
			Inhalation	6.E-07	7.E-03	2.E-07	7.E-03
			Total	2.E-06	2.E-02	5.E-07	1.E-02
		Groundwater	Ingestion	2.E-06	2.E-01	6.E-07	2.E-01
			Dermal	6.E-06	9.E-01	1.E-06	4.E-01
			Inhalation	9.E-06	3.E+00	2.E-06	2.E+00
			Total	2.E-05	4.E+00	3.E-06	2.E+00
		All Media	Total	2.E-05	4.E+00	4.E-06	2.E+00
		On-site Maintenance Worker	West Tank Farm	Soil	Ingestion	1.E-07	7.E-04
Dermal	4.E-09				3.E-05	7.E-11	1.E-06
Inhalation	2.E-07				9.E-04	2.E-08	2.E-04
Total	3.E-07				2.E-03	4.E-08	6.E-04
Groundwater	Ingestion			7.E-08	8.E-03	1.E-08	4.E-03
	Dermal			1.E-07	1.E-02	2.E-08	7.E-03
	Inhalation			2.E-07	3.E-03	3.E-08	1.E-03
	Total			4.E-07	3.E-02	7.E-08	1.E-02
All Media	Total			7.E-07	3.E-02	1.E-07	1.E-02
On-site Construction Worker	West Tank Farm			Soil	Ingestion	4.E-07	6.E-02
		Dermal	6.E-09		1.E-03	1.E-09	2.E-04
		Inhalation	2.E-07		2.E-02	5.E-08	5.E-03
		Total	6.E-07		8.E-02	2.E-07	4.E-02
		Groundwater	Ingestion	7.E-08	2.E-01	4.E-08	1.E-01
			Dermal	1.E-07	4.E-01	6.E-08	2.E-01
			Inhalation	2.E-07	7.E-02	9.E-08	3.E-02
			Total	4.E-07	6.E-01	2.E-07	3.E-01
		All Media	Total	1.E-06	7.E-01	4.E-07	3.E-01
		On-site Routine Worker	Box Sewer	Groundwater	Ingestion	4.E-06	5.E-01
Dermal	2.E-05				3.E+00	3.E-06	1.E+00
Inhalation	2.E-05				7.E+00	4.E-06	4.E+00
Total	4.E-05				1.E+01	8.E-06	5.E+00
All Media	Total			4.E-05	1.E+01	8.E-06	5.E+00
On-site Maintenance Worker	Box Sewer	Groundwater	Ingestion	2.E-07	2.E-02	3.E-08	9.E-03
			Dermal	3.E-07	3.E-02	6.E-08	1.E-02
			Inhalation	4.E-07	2.E-02	8.E-08	1.E-02
			Total	9.E-07	7.E-02	2.E-07	3.E-02
		All Media	Total	9.E-07	7.E-02	2.E-07	3.E-02
On-site Construction Worker	Box Sewer	Groundwater	Ingestion	2.E-07	4.E-01	8.E-08	2.E-01
			Dermal	3.E-07	7.E-01	2.E-07	4.E-01
			Inhalation	4.E-07	5.E-01	2.E-07	2.E-01
			Total	9.E-07	2.E+00	5.E-07	8.E-01
		All Media	Total	9.E-07	2.E+00	5.E-07	8.E-01

**Table G-113**  
**Summary of On-site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
On-site Routine Worker	Process Sump Area	Soil	Ingestion	8.E-07	1.E-01	1.E-07	6.E-02
			Dermal	0.E+00	0.E+00	0.E+00	0.E+00
			Inhalation	2.E-06	6.E-01	7.E-07	6.E-01
			Total	3.E-06	7.E-01	8.E-07	7.E-01
		Groundwater	Ingestion	8.E-05	1.E+01	3.E-05	1.E+01
			Dermal	3.E-04	5.E+01	6.E-05	2.E+01
			Inhalation	4.E-04	1.E+02	8.E-05	7.E+01
			Total	8.E-04	2.E+02	2.E-04	1.E+02
		All Media	Total	8.E-04	2.E+02	2.E-04	1.E+02
		On-site Maintenance Worker	Process Sump Area	Soil	Ingestion	6.E-08	6.E-03
Dermal	0.E+00				0.E+00	0.E+00	0.E+00
Inhalation	6.E-07				6.E-02	5.E-08	2.E-02
Total	7.E-07				7.E-02	7.E-08	2.E-02
Groundwater	Ingestion			3.E-06	4.E-01	6.E-07	2.E-01
	Dermal			7.E-06	6.E-01	1.E-06	3.E-01
	Inhalation			9.E-06	3.E-01	2.E-06	1.E-01
	Total			2.E-05	1.E+00	3.E-06	6.E-01
All Media	Total			2.E-05	1.E+00	3.E-06	6.E-01
On-site Construction Worker	Process Sump Area			Soil	Ingestion	2.E-07	5.E-01
		Dermal	0.E+00		0.E+00	0.E+00	0.E+00
		Inhalation	6.E-07		2.E+00	2.E-07	4.E-01
		Total	8.E-07		2.E+00	3.E-07	6.E-01
		Groundwater	Ingestion	3.E-06	9.E+00	2.E-06	5.E+00
			Dermal	7.E-06	2.E+01	3.E-06	8.E+00
			Inhalation	9.E-06	7.E+00	4.E-06	3.E+00
			Total	2.E-05	3.E+01	9.E-06	2.E+01
		All Media	Total	2.E-05	3.E+01	9.E-06	2.E+01
		On-site Routine Worker	Historic Fill Area	Groundwater	Ingestion	2.E-06	2.E-01
Dermal	7.E-06				8.E-01	1.E-06	4.E-01
Inhalation	9.E-06				3.E+00	2.E-06	2.E-01
Total	2.E-05				4.E+00	4.E-06	8.E-01
All Media	Total			2.E-05	4.E+00	4.E-06	8.E-01
On-site Maintenance Worker	Historic Fill Area	Groundwater	Ingestion	9.E-08	9.E-03	2.E-08	4.E-03
			Dermal	1.E-07	1.E-02	2.E-08	7.E-03
			Inhalation	2.E-07	2.E-04	3.E-08	4.E-05
			Total	4.E-07	2.E-02	7.E-08	1.E-02
		All Media	Total	4.E-07	2.E-02	7.E-08	1.E-02
On-site Construction Worker	Historic Fill Area	Groundwater	Ingestion	9.E-08	2.E-01	4.E-08	1.E-01
			Dermal	1.E-07	4.E-01	7.E-08	2.E-01
			Inhalation	2.E-07	1.E-02	9.E-08	5.E-03
			Total	4.E-07	6.E-01	2.E-07	3.E-01
		All Media	Total	4.E-07	6.E-01	2.E-07	3.E-01

**Table G-113**  
**Summary of On-site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
On-site Routine Worker	Former Building 21	Groundwater	Ingestion	1.E-06	2.E-01	4.E-07	2.E-01
			Dermal	4.E-06	5.E-01	7.E-07	3.E-01
			Inhalation	6.E-06	2.E+00	1.E-06	1.E-01
			Total	1.E-05	3.E+00	2.E-06	6.E-01
		All Media	Total	1.E-05	3.E+00	2.E-06	6.E-01
On-site Maintenance Worker	Former Building 21	Groundwater	Ingestion	5.E-08	6.E-03	8.E-09	3.E-03
			Dermal	8.E-08	9.E-03	1.E-08	5.E-03
			Inhalation	1.E-07	3.E-04	2.E-08	5.E-05
			Total	3.E-07	2.E-02	5.E-08	8.E-03
		All Media	Total	3.E-07	2.E-02	5.E-08	8.E-03
On-site Construction Worker	Former Building 21	Groundwater	Ingestion	5.E-08	1.E-01	2.E-08	7.E-02
			Dermal	8.E-08	2.E-01	4.E-08	1.E-01
			Inhalation	1.E-07	2.E-02	6.E-08	8.E-03
			Total	3.E-07	4.E-01	1.E-07	2.E-01
		All Media	Total	3.E-07	4.E-01	1.E-07	2.E-01

**Table G-114**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater MW-14 PSA1	Ingestion	3.E-05	4.E+00	4.E-06	2.E+00
			Dermal	6.E-06	7.E-01	2.E-06	5.E-01
			Inhalation	9.E-07	3.E-01	1.E-07	1.E-01
			Total	4.E-05	6.E+00	7.E-06	2.E+00
		All Media	Total	4.E-05	6.E+00	7.E-06	2.E+00
Off-site Resident, Child	Off-site	Groundwater MW-14 PSA1	Ingestion	1.E-05	7.E+00	5.E-06	3.E+00
			Dermal	3.E-06	2.E+00	2.E-06	1.E+00
			Inhalation	4.E-07	5.E-01	1.E-07	2.E-01
			Total	2.E-05	9.E+00	7.E-06	4.E+00
		All Media	Total	2.E-05	9.E+00	7.E-06	4.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-14 PSA1	Ingestion	5.E-05	NA	9.E-06	NA
			Dermal	9.E-06	NA	5.E-06	NA
			Inhalation	1.E-06	NA	3.E-07	NA
			Total	6.E-05		1.E-05	
		All Media	Total	6.E-05		1.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-15 PSA1	Ingestion	4.E-06	6.E-01	6.E-07	2.E-01
			Dermal	7.E-07	1.E-01	2.E-07	6.E-02
			Inhalation	1.E-07	4.E-02	2.E-08	2.E-02
			Total	5.E-06	7.E-01	8.E-07	3.E-01
		All Media	Total	5.E-06	7.E-01	8.E-07	3.E-01
Off-site Resident, Child	Off-site	Groundwater MW-15 PSA1	Ingestion	2.E-06	9.E-01	6.E-07	4.E-01
			Dermal	4.E-07	2.E-01	2.E-07	1.E-01
			Inhalation	5.E-08	7.E-02	2.E-08	2.E-02
			Total	2.E-06	1.E+00	9.E-07	5.E-01
		All Media	Total	2.E-06	1.E+00	9.E-07	5.E-01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-15 PSA1	Ingestion	6.E-06	NA	1.E-06	NA
			Dermal	1.E-06	NA	4.E-07	NA
			Inhalation	2.E-07	NA	4.E-08	NA
			Total	7.E-06		2.E-06	
		All Media	Total	7.E-06		2.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-17 PSA1	Ingestion	2.E-07	5.E-02	3.E-08	2.E-02
			Dermal	9.E-08	2.E-02	2.E-08	1.E-02
			Inhalation	8.E-09	2.E-03	1.E-09	1.E-03
			Total	3.E-07	7.E-02	5.E-08	3.E-02
		All Media	Total	3.E-07	7.E-02	5.E-08	3.E-02

**Table G-114**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-17 PSA1	Ingestion	8.E-08	8.E-02	3.E-08	3.E-02
			Dermal	5.E-08	5.E-02	3.E-08	3.E-02
			Inhalation	4.E-09	4.E-03	1.E-09	1.E-03
			Total	1.E-07	1.E-01	6.E-08	6.E-02
		All Media	Total	1.E-07	1.E-01	6.E-08	6.E-02
Off-site Resident, Adult + Child	Off-site	Groundwater MW-17 PSA1	Ingestion	3.E-07	NA	6.E-08	NA
			Dermal	1.E-07	NA	5.E-08	NA
			Inhalation	1.E-08	NA	2.E-09	NA
			Total	5.E-07		1.E-07	
		All Media	Total	5.E-07		1.E-07	
Off-site Resident, Adult	Off-site	Groundwater MW-18 PSA1	Ingestion	6.E-06	8.E-01	8.E-07	3.E-01
			Dermal	9.E-07	1.E-01	2.E-07	9.E-02
			Inhalation	2.E-07	6.E-02	3.E-08	2.E-02
			Total	7.E-06	1.E+00	1.E-06	4.E-01
		All Media	Total	7.E-06	1.E+00	1.E-06	4.E-01
Off-site Resident, Child	Off-site	Groundwater MW-18 PSA1	Ingestion	2.E-06	1.E+00	8.E-07	5.E-01
			Dermal	5.E-07	3.E-01	3.E-07	2.E-01
			Inhalation	7.E-08	1.E-01	2.E-08	3.E-02
			Total	3.E-06	2.E+00	1.E-06	7.E-01
		All Media	Total	3.E-06	2.E+00	1.E-06	7.E-01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-18 PSA1	Ingestion	8.E-06	NA	2.E-06	NA
			Dermal	1.E-06	NA	5.E-07	NA
			Inhalation	2.E-07	NA	5.E-08	NA
			Total	1.E-05		2.E-06	
		All Media	Total	1.E-05		2.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-19 PSA1	Ingestion	3.E-05	5.E+00	5.E-06	2.E+00
			Dermal	5.E-06	8.E-01	1.E-06	5.E-01
			Inhalation	1.E-06	3.E-01	2.E-07	1.E-01
			Total	4.E-05	6.E+00	6.E-06	2.E+00
		All Media	Total	4.E-05	6.E+00	6.E-06	2.E+00
Off-site Resident, Child	Off-site	Groundwater MW-19 PSA1	Ingestion	1.E-05	7.E+00	5.E-06	3.E+00
			Dermal	3.E-06	2.E+00	2.E-06	1.E+00
			Inhalation	4.E-07	6.E-01	1.E-07	2.E-01
			Total	2.E-05	9.E+00	7.E-06	4.E+00
		All Media	Total	2.E-05	9.E+00	7.E-06	4.E+00

**Table G-114**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult + Child	Off-site	Groundwater MW-19 PSA1	Ingestion	5.E-05	NA	1.E-05	NA
			Dermal	8.E-06	NA	3.E-06	NA
			Inhalation	1.E-06	NA	3.E-07	NA
			Total	6.E-05		1.E-05	
		All Media	Total	6.E-05		1.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-20 PSA1	Ingestion	2.E-05	3.E+00	3.E-06	1.E+00
			Dermal	3.E-06	5.E-01	7.E-07	3.E-01
			Inhalation	6.E-07	2.E-01	9.E-08	8.E-02
			Total	2.E-05	3.E+00	3.E-06	1.E+00
		All Media	Total	2.E-05	3.E+00	3.E-06	1.E+00
Off-site Resident, Child	Off-site	Groundwater MW-20 PSA1	Ingestion	7.E-06	4.E+00	3.E-06	2.E+00
			Dermal	2.E-06	1.E+00	1.E-06	6.E-01
			Inhalation	2.E-07	3.E-01	8.E-08	1.E-01
			Total	9.E-06	5.E+00	4.E-06	2.E+00
		All Media	Total	9.E-06	5.E+00	4.E-06	2.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-20 PSA1	Ingestion	3.E-05	NA	6.E-06	NA
			Dermal	5.E-06	NA	2.E-06	NA
			Inhalation	8.E-07	NA	2.E-07	NA
			Total	3.E-05		7.E-06	
		All Media	Total	3.E-05		7.E-06	

**Table G-115**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater MW-14 PSA2	Ingestion	4.E-05	5.E+00	5.E-06	2.E+00
			Dermal	7.E-06	9.E-01	3.E-06	6.E-01
			Inhalation	1.E-06	4.E-01	2.E-07	2.E-01
			Total	5.E-05	7.E+00	8.E-06	3.E+00
		All Media	Total	5.E-05	7.E+00	8.E-06	3.E+00
Off-site Resident, Child	Off-site	Groundwater MW-14 PSA2	Ingestion	1.E-05	8.E+00	6.E-06	3.E+00
			Dermal	3.E-06	2.E+00	3.E-06	1.E+00
			Inhalation	5.E-07	7.E-01	2.E-07	2.E-01
			Total	2.E-05	1.E+01	9.E-06	4.E+00
		All Media	Total	2.E-05	1.E+01	9.E-06	4.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-14 PSA2	Ingestion	5.E-05	NA	1.E-05	NA
			Dermal	1.E-05	NA	5.E-06	NA
			Inhalation	2.E-06	NA	3.E-07	NA
			Total	7.E-05		2.E-05	
		All Media	Total	7.E-05		2.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-15 PSA2	Ingestion	2.E-07	5.E-02	3.E-08	2.E-02
			Dermal	9.E-08	2.E-02	2.E-08	1.E-02
			Inhalation	8.E-09	2.E-03	1.E-09	9.E-04
			Total	3.E-07	7.E-02	5.E-08	3.E-02
		All Media	Total	3.E-07	7.E-02	5.E-08	3.E-02
Off-site Resident, Child	Off-site	Groundwater MW-15 PSA2	Ingestion	8.E-08	7.E-02	3.E-08	3.E-02
			Dermal	5.E-08	4.E-02	3.E-08	3.E-02
			Inhalation	3.E-09	4.E-03	1.E-09	1.E-03
			Total	1.E-07	1.E-01	6.E-08	5.E-02
		All Media	Total	1.E-07	1.E-01	6.E-08	5.E-02
Off-site Resident, Adult + Child	Off-site	Groundwater MW-15 PSA2	Ingestion	3.E-07	NA	6.E-08	NA
			Dermal	1.E-07	NA	5.E-08	NA
			Inhalation	1.E-08	NA	2.E-09	NA
			Total	4.E-07		1.E-07	
		All Media	Total	4.E-07		1.E-07	
Off-site Resident, Adult	Off-site	Groundwater MW-17 PSA2	Ingestion	2.E-07	5.E-02	3.E-08	2.E-02
			Dermal	8.E-08	2.E-02	2.E-08	1.E-02
			Inhalation	7.E-09	2.E-03	1.E-09	9.E-04
			Total	3.E-07	7.E-02	5.E-08	3.E-02
		All Media	Total	3.E-07	7.E-02	5.E-08	3.E-02

**Table G-115**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-17 PSA2	Ingestion	7.E-08	7.E-02	3.E-08	3.E-02
			Dermal	5.E-08	4.E-02	3.E-08	3.E-02
			Inhalation	3.E-09	4.E-03	1.E-09	1.E-03
			Total	1.E-07	1.E-01	6.E-08	5.E-02
		All Media	Total	1.E-07	1.E-01	6.E-08	5.E-02
Off-site Resident, Adult + Child	Off-site	Groundwater MW-17 PSA2	Ingestion	3.E-07	NA	6.E-08	NA
			Dermal	1.E-07	NA	5.E-08	NA
			Inhalation	1.E-08	NA	2.E-09	NA
			Total	4.E-07		1.E-07	
		All Media	Total	4.E-07		1.E-07	
Off-site Resident, Adult	Off-site	Groundwater MW-18 PSA2	Ingestion	4.E-06	5.E-01	5.E-07	2.E-01
			Dermal	6.E-07	9.E-02	1.E-07	6.E-02
			Inhalation	1.E-07	4.E-02	2.E-08	2.E-02
			Total	5.E-06	7.E-01	7.E-07	3.E-01
		All Media	Total	5.E-06	7.E-01	7.E-07	3.E-01
Off-site Resident, Child	Off-site	Groundwater MW-18 PSA2	Ingestion	2.E-06	8.E-01	6.E-07	3.E-01
			Dermal	3.E-07	2.E-01	2.E-07	1.E-01
			Inhalation	5.E-08	7.E-02	2.E-08	2.E-02
			Total	2.E-06	1.E+00	8.E-07	5.E-01
		All Media	Total	2.E-06	1.E+00	8.E-07	5.E-01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-18 PSA2	Ingestion	6.E-06	NA	1.E-06	NA
			Dermal	9.E-07	NA	3.E-07	NA
			Inhalation	2.E-07	NA	3.E-08	NA
			Total	7.E-06		1.E-06	
		All Media	Total	7.E-06		1.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-19 PSA2	Ingestion	6.E-05	8.E+00	8.E-06	3.E+00
			Dermal	9.E-06	1.E+00	2.E-06	9.E-01
			Inhalation	2.E-06	6.E-01	3.E-07	2.E-01
			Total	7.E-05	1.E+01	1.E-05	4.E+00
		All Media	Total	7.E-05	1.E+01	1.E-05	4.E+00
Off-site Resident, Child	Off-site	Groundwater MW-19 PSA2	Ingestion	2.E-05	1.E+01	8.E-06	5.E+00
			Dermal	5.E-06	3.E+00	3.E-06	2.E+00
			Inhalation	7.E-07	1.E+00	2.E-07	3.E-01
			Total	3.E-05	2.E+01	1.E-05	7.E+00
		All Media	Total	3.E-05	2.E+01	1.E-05	7.E+00

**Table G-115**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult + Child	Off-site	Groundwater MW-19 PSA2	Ingestion	8.E-05	NA	2.E-05	NA
			Dermal	1.E-05	NA	5.E-06	NA
			Inhalation	2.E-06	NA	5.E-07	NA
			Total	1.E-04		2.E-05	
		All Media	Total	1.E-04		2.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-20 PSA2	Ingestion	5.E-05	7.E+00	7.E-06	3.E+00
			Dermal	8.E-06	1.E+00	2.E-06	8.E-01
			Inhalation	1.E-06	5.E-01	2.E-07	2.E-01
			Total	6.E-05	9.E+00	9.E-06	4.E+00
		All Media	Total	6.E-05	9.E+00	9.E-06	4.E+00
Off-site Resident, Child	Off-site	Groundwater MW-20 PSA2	Ingestion	2.E-05	1.E+01	8.E-06	4.E+00
			Dermal	4.E-06	3.E+00	3.E-06	2.E+00
			Inhalation	6.E-07	9.E-01	2.E-07	3.E-01
			Total	2.E-05	1.E+01	1.E-05	6.E+00
		All Media	Total	2.E-05	1.E+01	1.E-05	6.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-20 PSA2	Ingestion	7.E-05	NA	1.E-05	NA
			Dermal	1.E-05	NA	4.E-06	NA
			Inhalation	2.E-06	NA	4.E-07	NA
			Total	9.E-05		2.E-05	
		All Media	Total	9.E-05		2.E-05	

**Table G-116**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater DN-13 PSA3	Ingestion	8.E-05	1.E+01	1.E-05	4.E+00
			Dermal	2.E-05	2.E+00	6.E-06	2.E+00
			Inhalation	2.E-06	8.E-01	4.E-07	3.E-01
			Total	1.E-04	1.E+01	2.E-05	6.E+00
		All Media	Total	1.E-04	1.E+01	2.E-05	6.E+00
Off-site Resident, Child	Off-site	Groundwater DN-13 PSA3	Ingestion	3.E-05	2.E+01	1.E-05	6.E+00
			Dermal	7.E-06	4.E+00	7.E-06	4.E+00
			Inhalation	1.E-06	1.E+00	3.E-07	4.E-01
			Total	4.E-05	2.E+01	2.E-05	1.E+01
		All Media	Total	4.E-05	2.E+01	2.E-05	1.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater DN-13 PSA3	Ingestion	1.E-04	NA	2.E-05	NA
			Dermal	2.E-05	NA	1.E-05	NA
			Inhalation	3.E-06	NA	7.E-07	NA
			Total	1.E-04		4.E-05	
		All Media	Total	1.E-04		4.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-14 PSA3	Ingestion	1.E-04	2.E+01	2.E-05	7.E+00
			Dermal	3.E-05	3.E+00	9.E-06	2.E+00
			Inhalation	4.E-06	1.E+00	6.E-07	6.E-01
			Total	2.E-04	2.E+01	3.E-05	9.E+00
		All Media	Total	2.E-04	2.E+01	3.E-05	9.E+00
Off-site Resident, Child	Off-site	Groundwater MW-14 PSA3	Ingestion	5.E-05	3.E+01	2.E-05	1.E+01
			Dermal	1.E-05	7.E+00	1.E-05	4.E+00
			Inhalation	2.E-06	2.E+00	6.E-07	8.E-01
			Total	7.E-05	4.E+01	3.E-05	2.E+01
		All Media	Total	7.E-05	4.E+01	3.E-05	2.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-14 PSA3	Ingestion	2.E-04	NA	4.E-05	NA
			Dermal	4.E-05	NA	2.E-05	NA
			Inhalation	6.E-06	NA	1.E-06	NA
			Total	2.E-04		6.E-05	
		All Media	Total	2.E-04		6.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-15 PSA3	Ingestion	5.E-05	7.E+00	7.E-06	3.E+00
			Dermal	1.E-05	1.E+00	3.E-06	8.E-01
			Inhalation	1.E-06	5.E-01	2.E-07	2.E-01
			Total	7.E-05	9.E+00	1.E-05	4.E+00
		All Media	Total	7.E-05	9.E+00	1.E-05	4.E+00

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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-15 PSA3	Ingestion	2.E-05	1.E+01	8.E-06	4.E+00
			Dermal	5.E-06	3.E+00	4.E-06	2.E+00
			Inhalation	6.E-07	9.E-01	2.E-07	3.E-01
			Total	3.E-05	1.E+01	1.E-05	6.E+00
		All Media	Total	3.E-05	1.E+01	1.E-05	6.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-15 PSA3	Ingestion	7.E-05	NA	2.E-05	NA
			Dermal	1.E-05	NA	8.E-06	NA
			Inhalation	2.E-06	NA	5.E-07	NA
			Total	9.E-05		2.E-05	
		All Media	Total	9.E-05		2.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-16 PSA3	Ingestion	9.E-06	1.E+00	1.E-06	4.E-01
			Dermal	2.E-06	2.E-01	6.E-07	1.E-01
			Inhalation	3.E-07	9.E-02	4.E-08	4.E-02
			Total	1.E-05	2.E+00	2.E-06	6.E-01
		All Media	Total	1.E-05	2.E+00	2.E-06	6.E-01
Off-site Resident, Child	Off-site	Groundwater MW-16 PSA3	Ingestion	3.E-06	2.E+00	1.E-06	7.E-01
			Dermal	8.E-07	5.E-01	7.E-07	3.E-01
			Inhalation	1.E-07	2.E-01	4.E-08	5.E-02
			Total	4.E-06	2.E+00	2.E-06	1.E+00
		All Media	Total	4.E-06	2.E+00	2.E-06	1.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-16 PSA3	Ingestion	1.E-05	NA	3.E-06	NA
			Dermal	2.E-06	NA	1.E-06	NA
			Inhalation	4.E-07	NA	8.E-08	NA
			Total	2.E-05		4.E-06	
		All Media	Total	2.E-05		4.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-17 PSA3	Ingestion	2.E-05	3.E+00	3.E-06	1.E+00
			Dermal	4.E-06	5.E-01	1.E-06	3.E-01
			Inhalation	6.E-07	2.E-01	1.E-07	1.E-01
			Total	3.E-05	4.E+00	5.E-06	2.E+00
		All Media	Total	3.E-05	4.E+00	5.E-06	2.E+00
Off-site Resident, Child	Off-site	Groundwater MW-17 PSA3	Ingestion	9.E-06	5.E+00	3.E-06	2.E+00
			Dermal	2.E-06	1.E+00	2.E-06	7.E-01
			Inhalation	3.E-07	4.E-01	9.E-08	1.E-01
			Total	1.E-05	6.E+00	5.E-06	3.E+00
		All Media	Total	1.E-05	6.E+00	5.E-06	3.E+00

**Table G-116**  
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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult + Child	Off-site	Groundwater MW-17 PSA3	Ingestion	3.E-06	NA	6.E-07	NA
			Dermal	1.E-06	NA	5.E-07	NA
			Inhalation	1.E-07	NA	2.E-08	NA
			Total	4.E-06		1.E-06	
		All Media	Total	4.E-06		1.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-18 PSA3	Ingestion	3.E-05	5.E+00	5.E-06	2.E+00
			Dermal	5.E-06	8.E-01	1.E-06	5.E-01
			Inhalation	1.E-06	3.E-01	2.E-07	1.E-01
			Total	4.E-05	6.E+00	6.E-06	2.E+00
		All Media	Total	4.E-05	6.E+00	6.E-06	2.E+00
Off-site Resident, Child	Off-site	Groundwater MW-18 PSA3	Ingestion	1.E-05	7.E+00	5.E-06	3.E+00
			Dermal	3.E-06	2.E+00	2.E-06	1.E+00
			Inhalation	4.E-07	6.E-01	1.E-07	2.E-01
			Total	2.E-05	9.E+00	7.E-06	4.E+00
		All Media	Total	2.E-05	9.E+00	7.E-06	4.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-18 PSA3	Ingestion	5.E-05	NA	1.E-05	NA
			Dermal	8.E-06	NA	3.E-06	NA
			Inhalation	1.E-06	NA	3.E-07	NA
			Total	6.E-05		1.E-05	
		All Media	Total	6.E-05		1.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-19 PSA3	Ingestion	1.E-04	2.E+01	2.E-05	6.E+00
			Dermal	2.E-05	3.E+00	5.E-06	2.E+00
			Inhalation	3.E-06	1.E+00	6.E-07	5.E-01
			Total	1.E-04	2.E+01	2.E-05	8.E+00
		All Media	Total	1.E-04	2.E+01	2.E-05	8.E+00
Off-site Resident, Child	Off-site	Groundwater MW-19 PSA3	Ingestion	5.E-05	3.E+01	2.E-05	1.E+01
			Dermal	1.E-05	6.E+00	6.E-06	4.E+00
			Inhalation	2.E-06	2.E+00	5.E-07	7.E-01
			Total	6.E-05	3.E+01	2.E-05	1.E+01
		All Media	Total	6.E-05	3.E+01	2.E-05	1.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-19 PSA3	Ingestion	2.E-04	NA	3.E-05	NA
			Dermal	3.E-05	NA	1.E-05	NA
			Inhalation	5.E-06	NA	1.E-06	NA
			Total	2.E-04		5.E-05	
		All Media	Total	2.E-04		5.E-05	

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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater MW-20 PSA3	Ingestion	8.E-05	1.E+01	1.E-05	4.E+00
			Dermal	1.E-05	2.E+00	3.E-06	1.E+00
			Inhalation	2.E-06	8.E-01	4.E-07	3.E-01
			Total	1.E-04	1.E+01	1.E-05	6.E+00
		All Media	Total	1.E-04	1.E+01	1.E-05	6.E+00
Off-site Resident, Child	Off-site	Groundwater MW-20 PSA3	Ingestion	3.E-05	2.E+01	1.E-05	7.E+00
			Dermal	7.E-06	4.E+00	4.E-06	2.E+00
			Inhalation	1.E-06	1.E+00	3.E-07	5.E-01
			Total	4.E-05	2.E+01	2.E-05	1.E+01
		All Media	Total	4.E-05	2.E+01	2.E-05	1.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-20 PSA3	Ingestion	1.E-04	NA	2.E-05	NA
			Dermal	2.E-05	NA	7.E-06	NA
			Inhalation	3.E-06	NA	7.E-07	NA
			Total	1.E-04		3.E-05	
		All Media	Total	1.E-04		3.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-21 PSA3	Ingestion	8.E-06	1.E+00	1.E-06	4.E-01
			Dermal	1.E-06	2.E-01	3.E-07	1.E-01
			Inhalation	2.E-07	8.E-02	4.E-08	3.E-02
			Total	1.E-05	1.E+00	1.E-06	6.E-01
		All Media	Total	1.E-05	1.E+00	1.E-06	6.E-01
Off-site Resident, Child	Off-site	Groundwater MW-21 PSA3	Ingestion	3.E-06	2.E+00	1.E-06	7.E-01
			Dermal	7.E-07	4.E-01	4.E-07	2.E-01
			Inhalation	1.E-07	1.E-01	3.E-08	5.E-02
			Total	4.E-06	2.E+00	2.E-06	1.E+00
		All Media	Total	4.E-06	2.E+00	2.E-06	1.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-21 PSA3	Ingestion	1.E-05	NA	2.E-06	NA
			Dermal	2.E-06	NA	7.E-07	NA
			Inhalation	3.E-07	NA	7.E-08	NA
			Total	1.E-05		3.E-06	
		All Media	Total	1.E-05		3.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-22 PSA3	Ingestion	2.E-07	4.E-02	2.E-08	1.E-02
			Dermal	7.E-08	2.E-02	2.E-08	1.E-02
			Inhalation	6.E-09	2.E-03	1.E-09	8.E-04
			Total	2.E-07	6.E-02	4.E-08	3.E-02
		All Media	Total	2.E-07	6.E-02	4.E-08	3.E-02

**Table G-116**  
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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-22 PSA3	Ingestion	6.E-08	6.E-02	2.E-08	2.E-02
			Dermal	4.E-08	4.E-02	2.E-08	2.E-02
			Inhalation	3.E-09	3.E-03	9.E-10	1.E-03
			Total	1.E-07	1.E-01	5.E-08	4.E-02
		All Media	Total	1.E-07	1.E-01	5.E-08	4.E-02
Off-site Resident, Adult + Child	Off-site	Groundwater MW-22 PSA3	Ingestion	2.E-07	NA	5.E-08	NA
			Dermal	1.E-07	NA	4.E-08	NA
			Inhalation	4.E-07	NA	9.E-08	NA
			Total	7.E-07		2.E-07	
		All Media	Total	7.E-07		2.E-07	

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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater DN-13 PSA4	Ingestion	2.E-05	3.E+00	3.E-06	1.E+00
			Dermal	4.E-06	5.E-01	2.E-06	5.E-01
			Inhalation	6.E-07	2.E-01	1.E-07	9.E-02
			Total	3.E-05	4.E+00	5.E-06	2.E+00
		All Media	Total	3.E-05	4.E+00	5.E-06	2.E+00
Off-site Resident, Child	Off-site	Groundwater DN-13 PSA4	Ingestion	8.E-06	5.E+00	3.E-06	2.E+00
			Dermal	2.E-06	1.E+00	2.E-06	1.E+00
			Inhalation	3.E-07	4.E-01	9.E-08	1.E-01
			Total	1.E-05	6.E+00	5.E-06	3.E+00
		All Media	Total	1.E-05	6.E+00	5.E-06	3.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater DN-13 PSA4	Ingestion	3.E-05	NA	6.E-06	NA
			Dermal	6.E-06	NA	3.E-06	NA
			Inhalation	9.E-07	NA	2.E-07	NA
			Total	4.E-05		1.E-05	
		All Media	Total	4.E-05		1.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-14 PSA4	Ingestion	1.E-04	2.E+01	2.E-05	6.E+00
			Dermal	2.E-05	3.E+00	8.E-06	2.E+00
			Inhalation	4.E-06	1.E+00	6.E-07	5.E-01
			Total	2.E-04	2.E+01	3.E-05	9.E+00
		All Media	Total	2.E-04	2.E+01	3.E-05	9.E+00
Off-site Resident, Child	Off-site	Groundwater MW-14 PSA4	Ingestion	5.E-05	3.E+01	2.E-05	1.E+01
			Dermal	1.E-05	7.E+00	1.E-05	4.E+00
			Inhalation	2.E-06	2.E+00	5.E-07	7.E-01
			Total	6.E-05	3.E+01	3.E-05	1.E+01
		All Media	Total	6.E-05	3.E+01	3.E-05	1.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-14 PSA4	Ingestion	2.E-04	NA	4.E-05	NA
			Dermal	3.E-05	NA	2.E-05	NA
			Inhalation	5.E-06	NA	1.E-06	NA
			Total	2.E-04		5.E-05	
		All Media	Total	2.E-04		5.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-15 PSA4	Ingestion	4.E-05	6.E+00	6.E-06	2.E+00
			Dermal	8.E-06	1.E+00	3.E-06	7.E-01
			Inhalation	1.E-06	4.E-01	2.E-07	2.E-01
			Total	5.E-05	7.E+00	9.E-06	3.E+00
		All Media	Total	5.E-05	7.E+00	9.E-06	3.E+00

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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-15 PSA4	Ingestion	2.E-05	9.E+00	6.E-06	3.E+00
			Dermal	4.E-06	2.E+00	3.E-06	1.E+00
			Inhalation	5.E-07	7.E-01	2.E-07	2.E-01
			Total	2.E-05	1.E+01	1.E-05	5.E+00
		All Media	Total	2.E-05	1.E+01	1.E-05	5.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-15 PSA4	Ingestion	6.E-05	NA	1.E-05	NA
			Dermal	1.E-05	NA	6.E-06	NA
			Inhalation	2.E-06	NA	4.E-07	NA
			Total	7.E-05		2.E-05	
		All Media	Total	7.E-05		2.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-16 PSA4	Ingestion	3.E-06	4.E-01	3.E-07	1.E-01
			Dermal	5.E-07	6.E-02	2.E-07	4.E-02
			Inhalation	7.E-08	3.E-02	1.E-08	1.E-02
			Total	3.E-06	4.E-01	5.E-07	2.E-01
		All Media	Total	3.E-06	4.E-01	5.E-07	2.E-01
Off-site Resident, Child	Off-site	Groundwater MW-16 PSA4	Ingestion	1.E-06	5.E-01	4.E-07	2.E-01
			Dermal	2.E-07	1.E-01	2.E-07	8.E-02
			Inhalation	3.E-08	4.E-02	1.E-08	1.E-02
			Total	1.E-06	7.E-01	6.E-07	3.E-01
		All Media	Total	1.E-06	7.E-01	6.E-07	3.E-01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-16 PSA4	Ingestion	4.E-06	NA	7.E-07	NA
			Dermal	7.E-07	NA	4.E-07	NA
			Inhalation	1.E-07	NA	2.E-08	NA
			Total	4.E-06		1.E-06	
		All Media	Total	4.E-06		1.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-17 PSA4	Ingestion	2.E-05	2.E+00	2.E-06	8.E-01
			Dermal	3.E-06	4.E-01	1.E-06	3.E-01
			Inhalation	5.E-07	2.E-01	8.E-08	7.E-02
			Total	2.E-05	3.E+00	3.E-06	1.E+00
		All Media	Total	2.E-05	3.E+00	3.E-06	1.E+00
Off-site Resident, Child	Off-site	Groundwater MW-17 PSA4	Ingestion	6.E-06	4.E+00	3.E-06	1.E+00
			Dermal	1.E-06	9.E-01	1.E-06	5.E-01
			Inhalation	2.E-07	3.E-01	7.E-08	9.E-02
			Total	8.E-06	5.E+00	4.E-06	2.E+00
		All Media	Total	8.E-06	5.E+00	4.E-06	2.E+00

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Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult + Child	Off-site	Groundwater MW-17 PSA4	Ingestion	2.E-05	NA	5.E-06	NA
			Dermal	5.E-06	NA	2.E-06	NA
			Inhalation	8.E-08	NA	2.E-08	NA
			Total	3.E-05		7.E-06	
		All Media	Total	3.E-05		7.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-18 PSA4	Ingestion	2.E-05	2.E+00	2.E-06	9.E-01
			Dermal	3.E-06	4.E-01	7.E-07	3.E-01
			Inhalation	5.E-07	2.E-01	8.E-08	7.E-02
			Total	2.E-05	3.E+00	3.E-06	1.E+00
		All Media	Total	2.E-05	3.E+00	3.E-06	1.E+00
Off-site Resident, Child	Off-site	Groundwater MW-18 PSA4	Ingestion	7.E-06	4.E+00	3.E-06	1.E+00
			Dermal	2.E-06	9.E-01	9.E-07	5.E-01
			Inhalation	2.E-07	3.E-01	7.E-08	1.E-01
			Total	8.E-06	5.E+00	4.E-06	2.E+00
		All Media	Total	8.E-06	5.E+00	4.E-06	2.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-18 PSA4	Ingestion	2.E-05	NA	5.E-06	NA
			Dermal	4.E-06	NA	2.E-06	NA
			Inhalation	7.E-07	NA	2.E-07	NA
			Total	3.E-05		7.E-06	
		All Media	Total	3.E-05		7.E-06	
Off-site Resident, Adult	Off-site	Groundwater MW-19 PSA4	Ingestion	1.E-04	1.E+01	1.E-05	5.E+00
			Dermal	1.E-05	2.E+00	4.E-06	1.E+00
			Inhalation	3.E-06	9.E-01	4.E-07	4.E-01
			Total	1.E-04	2.E+01	2.E-05	7.E+00
		All Media	Total	1.E-04	2.E+01	2.E-05	7.E+00
Off-site Resident, Child	Off-site	Groundwater MW-19 PSA4	Ingestion	4.E-05	2.E+01	1.E-05	8.E+00
			Dermal	8.E-06	5.E+00	5.E-06	3.E+00
			Inhalation	1.E-06	2.E+00	4.E-07	5.E-01
			Total	5.E-05	3.E+01	2.E-05	1.E+01
		All Media	Total	5.E-05	3.E+01	2.E-05	1.E+01
Off-site Resident, Adult + Child	Off-site	Groundwater MW-19 PSA4	Ingestion	1.E-04	NA	3.E-05	NA
			Dermal	2.E-05	NA	8.E-06	NA
			Inhalation	4.E-06	NA	8.E-07	NA
			Total	2.E-04		4.E-05	
		All Media	Total	2.E-04		4.E-05	

**Table G-117**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Adult	Off-site	Groundwater MW-20 PSA4	Ingestion	7.E-05	1.E+01	9.E-06	3.E+00
			Dermal	1.E-05	2.E+00	3.E-06	1.E+00
			Inhalation	2.E-06	7.E-01	3.E-07	3.E-01
			Total	8.E-05	1.E+01	1.E-05	5.E+00
		All Media	Total	8.E-05	1.E+01	1.E-05	5.E+00
Off-site Resident, Child	Off-site	Groundwater MW-20 PSA4	Ingestion	3.E-05	1.E+01	1.E-05	6.E+00
			Dermal	6.E-06	4.E+00	3.E-06	2.E+00
			Inhalation	8.E-07	1.E+00	3.E-07	4.E-01
			Total	3.E-05	2.E+01	1.E-05	8.E+00
		All Media	Total	3.E-05	2.E+01	1.E-05	8.E+00
Off-site Resident, Adult + Child	Off-site	Groundwater MW-20 PSA4	Ingestion	1.E-04	NA	2.E-05	NA
			Dermal	2.E-05	NA	6.E-06	NA
			Inhalation	3.E-06	NA	6.E-07	NA
			Total	1.E-04		3.E-05	
		All Media	Total	1.E-04		3.E-05	
Off-site Resident, Adult	Off-site	Groundwater MW-21 PSA4	Ingestion	2.E-09	2.E-04	2.E-10	8.E-05
			Dermal	3.E-10	4.E-05	6.E-11	3.E-05
			Inhalation	5.E-11	2.E-05	8.E-12	7.E-06
			Total	2.E-09	3.E-04	3.E-10	1.E-04
		All Media	Total	2.E-09	3.E-04	3.E-10	1.E-04
Off-site Resident, Child	Off-site	Groundwater MW-21 PSA4	Ingestion	6.E-10	3.E-04	2.E-10	1.E-04
			Dermal	1.E-10	9.E-05	8.E-11	5.E-05
			Inhalation	2.E-11	3.E-05	7.E-12	9.E-06
			Total	8.E-10	5.E-04	3.E-10	2.E-04
		All Media	Total	8.E-10	5.E-04	3.E-10	2.E-04
Off-site Resident, Adult + Child	Off-site	Groundwater MW-21 PSA4	Ingestion	2.E-09	NA	5.E-10	NA
			Dermal	4.E-10	NA	1.E-10	NA
			Inhalation	7.E-11	NA	1.E-11	NA
			Total	3.E-09		6.E-10	
		All Media	Total	3.E-09		6.E-10	
Off-site Resident, Adult	Off-site	Groundwater MW-22 PSA4	Ingestion	1.E-10	3.E-05	2.E-11	1.E-05
			Dermal	5.E-11	1.E-05	1.E-11	8.E-06
			Inhalation	4.E-12	1.E-06	7.E-13	5.E-07
			Total	2.E-10	4.E-05	3.E-11	2.E-05
		All Media	Total	2.E-10	4.E-05	3.E-11	2.E-05

**Table G-117**  
**Summary of Off-Site Receptor-Specific Risks and Hazards**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Receptor	Exposure Area	Exposure Media	Exposure Route	RME Cancer Risks	RME Non-Cancer Hazards	CTE Cancer Risks	CTE Non-Cancer Hazards
Off-site Resident, Child	Off-site	Groundwater MW-22 PSA4	Ingestion	4.E-11	4.E-05	2.E-11	2.E-05
			Dermal	3.E-11	3.E-05	2.E-11	2.E-05
			Inhalation	2.E-12	2.E-06	6.E-13	7.E-07
			Total	7.E-11	7.E-05	3.E-11	3.E-05
		All Media	Total	7.E-11	7.E-05	3.E-11	3.E-05
Off-site Resident, Adult + Child	Off-site	Groundwater MW-22 PSA4	Ingestion	2.E-10	NA	3.E-11	NA
			Dermal	0.E+00	NA	0.E+00	NA
			Inhalation	2.E-10	NA	6.E-11	NA
			Total	4.E-10		1.E-10	
		All Media	Total	4.E-10		1.E-10	

**Table G-118**  
**Summary of Parameter Values Used in the Adult Lead Model (ALM) for Evaluation of Non-Residential Lead Risks Associated with Exposure to Soils**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Exposure Variable	Description	Units	On-Site Routine Worker, Landfill L1 <sup>[1]</sup>	On-Site Maintenance Worker, Landfill L1 <sup>[1]</sup>	On-Site Construction Worker, Landfill L1 <sup>[1]</sup>
PbS	Average lead concentration in soil <sup>[2]</sup>	ppm	498	498	498
R <sub>fetal/maternal</sub>	Fetal/maternal PbB ratio	--	0.9 [a]	0.9 [a]	0.9 [a]
BKSF	Biokinetic slope factor	µg/dL per µg/day	0.4 [a]	0.4 [a]	0.4 [a]
GSD <sub>i</sub>	Geometric standard deviation PbB	--	1.8 [b]	1.8 [b]	1.8 [b]
PbB <sub>0</sub>	Baseline PbB	µg/dL	1.0 [b]	1.0 [b]	1.0 [b]
IR <sub>S,D</sub>	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050 [a]	0.100 [c]	0.100 [c]
AF <sub>S,D</sub>	Absorption fraction, Pb in soil and dust	--	0.12 [a]	0.12 [a]	0.12 [a]
EF <sub>S,D</sub>	Exposure frequency, Pb pathway	days/yr	250 [d]	5 [d]	125 [d]
AT <sub>S,D</sub>	Averaging time, Pb pathway	days/yr	365 [e]	7 [e]	182 [e]

Notes:

[1] Lead was identified as a COPC in Landfill L1 waste based on historic sampling.

[2] Consistent with the ALM guidance (USEPA, 2003a; 2008), the arithmetic mean of lead concentrations was used in the ALM.

[a] Default value (USEPA, 2003a).

[b] Updated default central tendency estimate (CTE) for all U.S. populations (USEPA, 2009).

[c] Default CTE value for soil ingestion for contact-intensive adult scenarios (USEPA, 2011).

[d] Exposure frequency is the same value used to quantify potential exposures for other chemicals in the HHRA.

[e] Averaging time is based on EF to avoid diluting exposures over the entire year (e.g., 7 days per week x 26 weeks/year = 182 days/year) (USEPA, 2003b).

µg/dL = micrograms per deciliter

g/day = grams per day

ppm = parts per million

References:

USEPA. 2003a. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001. January 2003.

USEPA. 2003b. Assessing Intermittent or Variable Exposures at Lead Sites. OSWER Directive #9285.7-76. EPA-540-R-03-008. November.

USEPA. 2009. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. OSWER 9200.2-82. June 26.

**Table G-119**  
**Calculation of Blood Lead Concentrations (PbBs) for Receptors Exposed to Soils**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Exposure Variable	Description of Exposure Variable	Units	On-Site Routine Worker, Landfill L1	On-Site Maintenance Worker, Landfill L1	On-Site Construction Worker, Landfill L1
PbS	Soil lead concentration	µg/g or ppm	498	498	498
R <sub>fetal/maternal</sub>	Fetal/maternal PbB ratio	--	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4
IR <sub>S</sub>	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.100	0.100
IR <sub>S+D</sub>	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--
W <sub>S</sub>	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	--
K <sub>SD</sub>	Mass fraction of soil in dust	--	--	--	--
AF <sub>S,D</sub>	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12
EF <sub>S,D</sub>	Exposure frequency (same for soil and dust)	days/yr	250	5	125
AT <sub>S,D</sub>	Averaging time (same for soil and dust)	days/yr	365	7	182
<b>PbB<sub>adult</sub></b>	<b>PbB of adult/adolescent, geometric mean</b>	<b>µg/dL</b>	<b>0.8</b>	<b>1.7</b>	<b>1.6</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

Notes:

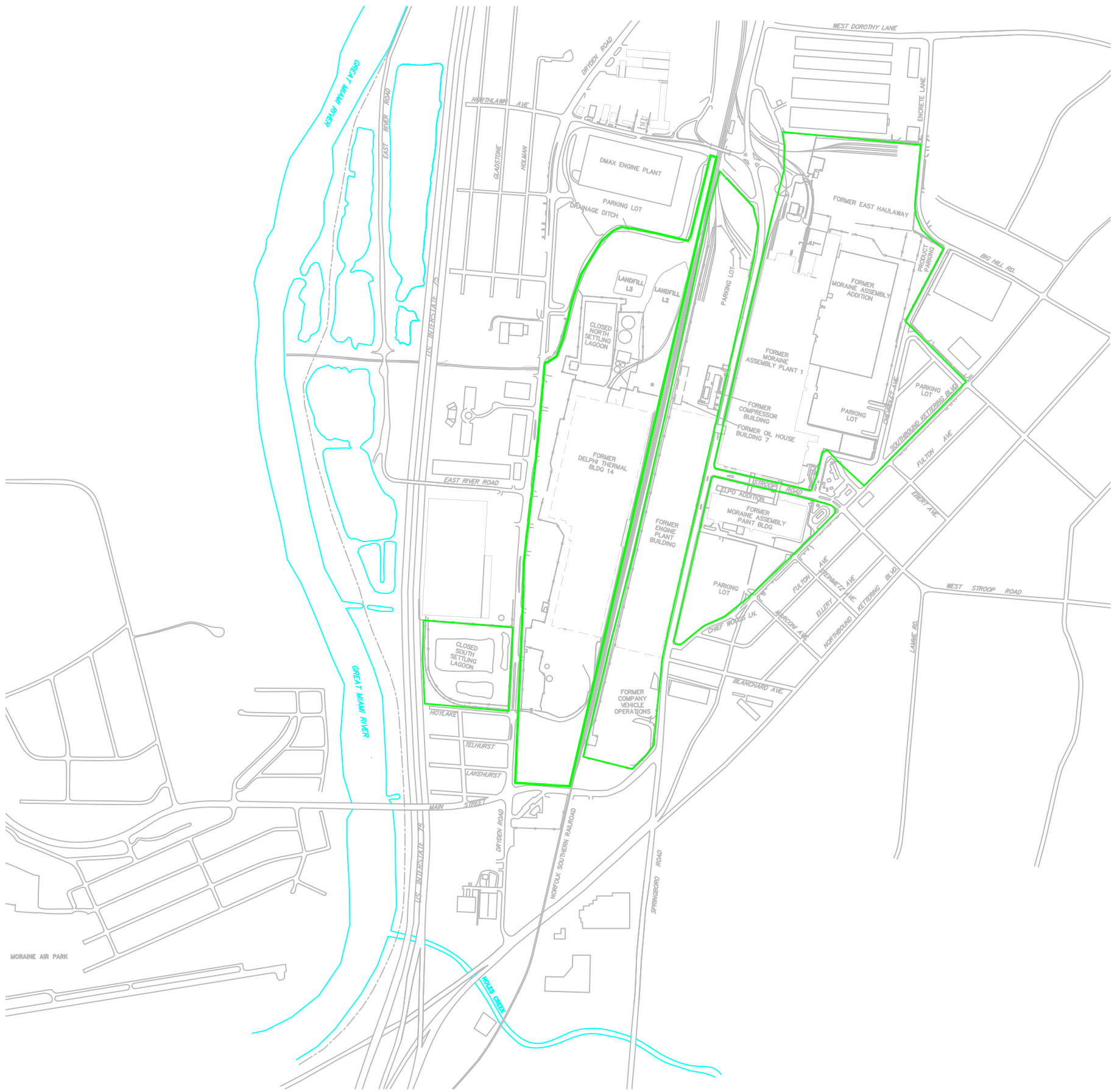
ALM Version date 5/19/05

See Table G-115 for sources of exposure variables.

**Table G-120**  
**Summary of Blood Lead Concentrations (PbBs) for Receptors Exposed to Lead**  
**Human Health Risk Assessment**  
**RACER Trust, Moraine, Ohio**

Exposure Variable	Description of Exposure Variable	Units	On-Site Routine Worker, Landfill L1	On-Site Maintenance Worker, Landfill L1	On-Site Construction Worker, Landfill L1
$R_{\text{fetal/maternal}}$	Fetal/maternal PbB ratio	--	1	1	1
$GSD_I$	Geometric standard deviation PbB	--	1.8	1.8	1.8
$PbB_0$	Baseline PbB	µg/dL	1.0	1.0	1.0
$PbB_{\text{adult, soil}}$	PbB of adult worker, geometric mean, soil	µg/dL	0.819	1.707	1.642
<b><math>PbB_{\text{adult}}</math></b>	<b>PbB of adult worker, geometric mean (all pathways)</b>	<b>µg/dL</b>	<b>1.819</b>	<b>2.707</b>	<b>2.642</b>
$PbB_{\text{fetal, 0.95}}$	95th percentile PbB for adolescent or fetus of adult workers	µg/dL	4.8	7.1	6.9
$PbB_t$	Target PbB level of concern (e.g., 10 µg/dL)	µg/dL	10	10	10
<b><math>P(PbB_{\text{fetal}} &gt; PbB_t)</math></b>	<b>Probability that <math>PbB &gt; PbB_t</math>, assuming lognormal distribution</b>	<b>%</b>	<b>0.2%</b>	<b>1.3%</b>	<b>1.2%</b>

Notes:  
ALM Version date 5/19/05



- LEGEND**
- PROPERTY BOUNDARY
  - RIVER LEVEE
  - FORMER BUILDING FOOTPRINT
  - SURFACE WATER FEATURE

RACER TRUST MORAINE, OHIO OH000294.2012	
<b>SITE LAYOUT</b>	
	FIGURE <b>G-1</b>

