



CHEMICAL UPDATE WORKSHEET

Chemical Name:	Methylene chloride (Dichloromethane)
CAS #:	75-09-2
Revised By:	RRD Toxicology Unit
Revision Date:	August 21, 2015

(A) Chemical-Physical Properties

	Part 201 Value	Updated Value	Reference Source	Comments
Molecular Weight (g/mol)	50.5	84.93	EPI	EXP
Physical State at ambient temp	Liquid	Liquid	MDEQ	
Melting Point (°C)	---	-95.10	EPI	EXP
Boiling Point (°C)	40	40.00	EPI	EXP
Solubility (ug/L)	1.70E+7	13000000	EPI	EXP
Vapor Pressure (mmHg at 25°C)	372.4	4.35E+02	EPI	EXP
HLC (atm-m³/mol at 25°C)	2.40E-3	3.25E-03	EPI	EXP
Log Kow (log P; octanol-water)	1.26	1.25	EPI	EXP
Koc (organic carbon; L/Kg)	11.9	21.73	EPI	EST
Ionizing Koc (L/kg)		NR	NA	NA
Diffusivity in Air (Di; cm²/s)	0.101	9.99E-02	W9	EST
Diffusivity in Water (Dw; cm²/s)	1.17E-5	1.25E-05	W9	EST
Soil Water Partition Coefficient (Kd; inorganics)	NR	NR	NA	NA

	Part 201 Value	Updated Value	Reference Source	Comments
Flash Point (°C)	NA	NA	NA	NA
Lower Explosivity Level (LEL; unitless)	0.13	0.13	CRC	EXP
Critical Temperature (K)		510	EPA2004	EXP
Enthalpy of Vaporization (cal/mol)		6.71E+03	EPA2004	EXP
Density (g/mL, g/cm ³)		1.3266	CRC	EXP
EMSOFT Flux Residential 2 m (mg/day/cm ²)	2.65E-05	2.78E-05	EMSOFT	EST
EMSOFT Flux Residential 5 m (mg/day/cm ²)	6.27E-05	6.73E-05	EMSOFT	EST
EMSOFT Flux Nonresidential 2 m (mg/day/cm ²)	3.76E-05	4.43E-05	EMSOFT	EST
EMSOFT Flux Nonresidential 5 m (mg/day/cm ²)	8.80E-05	1.06E-04	EMSOFT	EST

(B) Toxicity Values/Benchmarks

	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
Reference Dose (RfD) (mg/kg/day)	5.8E-2	6.0E-3	IRIS, 2011	
RfD details	IRIS RfD rounded to 6.0E-2 mg/kg. 2-year rat drinking water study. NOAEL = 5.85 mg/kg. Critical effect = liver toxicity. UF = 100; (National Coffee Assoc., 1982).	<p>Tier 1 Source: IRIS: Basis for selection: IRIS utilizes the most up to date method for deriving a reference dose. Critical Study: Serota, DG; Thakur, AK; Ulland, BM; et al. (1986a) A two-year drinking water study of dichloromethane in rodents. I. Rats. Food Chem Toxicol 24(9):951–958. Methods: Serota et al. (1986a) exposed F344 rats (85/sex/dose, 135 controls) to dichloromethane in drinking water. Mean doses were 0, 6, 52, 125, and 235 mg/kg-day in males and 0, 6, 58, 136, and 263 mg/kg-day in females. A physiologically based pharmacokinetic (PBPK) model for the rat (Andersen et al., 1991, modified by EPA) was used to estimate rat internal doses from the Serota et al. (1986a) study. The dose metric used to conduct the modeling was mg dichloromethane metabolized via the CYP pathway/liter of liver tissue/day. Liver incidence data (foci/areas of cellular alteration) for the male rat (Serota et al., 1986a) were fit to the available dichotomous models in BMDS version 2.0 (using internal dose as the dose measure) to obtain the rat internal BMDL10. Because the dose metric is a rate of metabolism and the clearance of these metabolites may be slower per volume tissue in the human compared with the rat, this rodent internal dose metric was adjusted by dividing by a pharmacokinetic allometric scaling factor of body weight (BW) 0.75 (operationalized as [BW_{human}/BW_{rat}]^{0.25} ≈ 4.09) to obtain a human equivalent internal BMDL10. The human equivalent internal BMDL10 was then converted to the human equivalent dose (HED) using a human PBPK model (adapted from David et al., 2006) that provided a distribution of HEDs. The 1st percentile of the distribution of HEDs, 0.19 mg/kg-day, was used as the point of departure for the RfD. See Section 5.1.4 of the Toxicological Review of Dichloromethane (U.S. EPA, 2011) for further details. Critical effect: Hepatic effects (hepatic vacuolation, liver foci) End Point or Point of Departure (POD): BMDL₁₀(HED) = 0.19 mg/kg/day (1st</p>		Complete



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
		<p>percentile human equivalent dose). For Conversion Factors and Assumptions see IRIS 2011.</p> <p>Uncertainty Factors: UF = 30: UF of 3 for extrapolating from lab animals to humans; UF for database deficiencies = 3; UF of 3 to account for variation within the human population.</p> <p>Source: IRIS, 11/18/2011</p> <p>Tier 2 Sources:</p> <p>PPRTV: No PPRTV record available at this time.</p> <p>MRL: <u>Oral chronic MRL = 0.06 mg/kg/day</u></p> <p>Critical Study: Serota D, Thakur, AK, Ulland BM, et al. 1986a. A two year drinking water study of dichloromethane in rodents. I. Rats. Food Chem Toxicol 24:951-958.</p> <p>Methods: Fischer-344 rats (85/sex/dose) and B6C3F1 mice (50–200/sex/dose) were exposed to methylene chloride in deionized drinking water at target concentrations aimed at exposing rats to 0, 5, 50, 125, or 250 mg/kg/day and mice to 0, 60, 125, 185, and 250 mg/kg/day for 104 weeks. Two untreated control groups were run concurrently. The nominal mean doses were 0, 6, 55, 131, and 249 mg/kg/day. A satellite group was exposed to nominal daily doses of 250 mg/kg/day for 78 weeks followed by a 24-week recovery period.</p> <p>Critical effect: rat liver effects (hepatic foci, areas of cellular alterations)</p> <p>End point or Point of Departure (POD): NOAEL = 6 mg/kg/day</p> <p>Uncertainty factors: UF = 100; (10 each for intra- and intraspecies variability)</p> <p>Source and date: ATSDR 09/2000</p> <p>Per ATSDR (09/2000), <u>oral acute MRL = 0.2 mg/kg/day</u>; UF = 100; neurological effects.</p> <p>Tier 3 Source:</p> <p>MDEQ: Per DEQ-CCD/WRD 9/1/1987: RfD = 5.8E-2 (same as RRD, 1985). See Part 201 Value info.</p>		
Oral Cancer Slope Factor (CSF)	4.2E-3	2.0E-3	IRIS, 2011	



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
(mg/kg-day) ⁻¹)				
CSF details	<p>SF is arithmetic mean of two SF's from inhalation exposure (1.4E-3) (NTP, 1986) and oral drinking water (6.9E-3) (NCA, 1983) in mice. Critical effect hepatocellular adenomas or carcinomas (NTP) and hepatocellular cancer and neoplastic nodules (NCA). SF modified with revised species scaling factor = (BWh/BWa) to the 0.25 power. RD calculation date: 2/16/00.</p>	<p>Tier 1 Source: IRIS: Basis: IRIS is a Tier 1 source. Critical Study: Serota, DG; Thakur, AK; Ulland, BM; et al. (1986b) A two-year drinking water study of dichloromethane in rodents. II. Mice. Food Chem Toxicol 24(9):959–963. Methods: In the only oral exposure cancer bioassay involving lifetime exposure, increases in incidence of liver adenomas and carcinomas were observed in male but not female B6C3F1 mice exposed for 2 years (Serota et al., 1986b; Hazleton Laboratories, 1983). Based on the Hazleton Laboratories (1983) statistical analysis, EPA concluded that dichloromethane induced a carcinogenic response in male B6C3F1 mice as evidenced by a marginally increased trend test (p = 0.058) for combined hepatocellular adenomas and carcinomas, and by small but statistically significant (p < 0.05) increases in hepatocellular adenomas and carcinomas at dose levels of 125 (p = 0.021), 185 (p = 0.019), and 250 mg/kg-day (p = 0.036). Extrapolation Method: Multistage model with linear extrapolation from the point of departure (BMDL10). Carcinogen Weight-of-Evidence (WOE) Class (IRIS 2011): Following U.S. EPA (2005a) Guidelines for Carcinogen Risk Assessment, dichloromethane is "likely to be carcinogenic in humans," based predominantly on evidence of carcinogenicity at two sites in 2-year bioassays in male and female B6C3F1 mice (liver and lung tumors) with inhalation exposure (NTP, 1986) and at one site in male B6C3F1 mice (liver tumors) with drinking water exposure (Serota et al., 1986b; Hazleton Laboratories, 1983). Source: IRIS, 11/18/2011</p> <p>Tier 2 Sources: PPRTV: No PPRTV record available at this time. MRL: NA; MRLs are for non-cancer effects only.</p> <p>Tier 3 Source:</p>		Complete



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
		MDEQ: Per DEQ-CCD/WRD oral CSF = 7.03 (03/01/1995); per DEQ-CCD/RRD (11/6/2000), oral CSF = 4.2E-3.		
Reference Concentration (RfC) or Initial Threshold Screening Level (ITSL) (µg/m³)	NA	6.0E+2	IRIS,2011	
RfC/ITSL details	--	<p>Tier 1 Source:</p> <p>IRIS:</p> <p>Basis: IRIS is a Tier 1 source.</p> <p>Critical Study: Nitschke, KD; Burek, JD; Bell, TJ; et al. (1988a) Methylene chloride: a 2-year inhalation toxicity and oncogenicity study in rats. Fundam Appl Toxicol 11:48–59.</p> <p>Methods: Nitschke et al. (1988a) exposed groups of 90 male and 90 female Sprague-Dawley rats to 0, 50, 200, or 500 ppm dichloromethane (>99.5% pure) for 6 hours/day, 5 days/week for 2 years. Interim sacrifices were conducted at 6, 12, 15, and 18 months (five rats/sex/interval). A PBPK model for the rat (Andersen et al., 1991, modified by EPA) was used to estimate rat internal doses from the Nitschke et al. (1988a) study. The dose metric used to conduct the modeling was mg dichloromethane metabolized via the CYP pathway/liter of liver tissue/day. Incidence data for hepatic effects (hepatic vacuolation) in the rat from Nitschke et al. (1988a) were fit to the available dichotomous models in BMD5 version 2.0 (using internal dose as the dose measure) to obtain the rat internal BMDL10. Because the dose metric is a rate of metabolism and the clearance of these metabolites may be slower per volume tissue in the human compared with the rat, this rodent internal dose metric was adjusted by dividing by a pharmacokinetic allometric scaling factor of body weight (BW)^{0.75} (operationalized as [BW_{human}/BW_{rat}]^{0.25} ≈ 4.09) to obtain a human equivalent internal BMDL10.</p> <p>Critical effect: Hepatic effects (hepatic vacuolation).</p> <p>End point or Point of Departure (POD): BMDL₁₀(HEC) = 17.2 mg/m³. The human equivalent internal BMDL10 was then converted to the human equivalent</p>		Completed



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
		<p>concentration (HEC) using a human PBPK model (adapted from David et al., 2006) that provided a distribution of HECs. The 1st percentile of the distribution of HECs, 17.2 mg/m³, was used as a point of departure for the RfC. See Section 5.2.3 of the Toxicological Review of Dichloromethane (U.S. EPA, 2011) for further details.</p> <p>Uncertainty Factors: UF = 30. UF = 3 for extrapolation from lab animals to humans; UF = 3 for sensitive individuals; UF = 3 for database deficiencies.</p> <p>Source: IRIS, 11/18/2011</p> <p>Tier 2 Sources: PPRTV: No PPRTV record available at this time. MRL: Per ATSDR (09/2000), INH MRL = 0.3 ppm=1.04 mg/m³. Molecular weight = 84.93 g/mol. Critical study: Nitschke KD, Burek JD, Bell TJ, et al. 1988a. Methylene Chloride: A 2-year inhalation toxicity and oncogenicity study in rats. Fundam Appl Toxicol 11:60-67. Methods: Groups of 90 male and 108 female Sprague-Dawley rats were exposed to concentrations of 0, 50, 200, and 500 ppm of methylene chloride for 6 hours/day, 5 days/week for 2 years Critical effect: liver histopathology in female rats (hepatocellular cytoplasmic vacuolization consistent with fatty changes and multinucleated hepatocytes) End point or Point of Departure (POD): NOAEL: 50 ppm (173.68 mg/m³) Uncertainty factors: UF = 30; 10 for human variability and 3 for animal to human extrapolation)</p> <p>Tier 3 Source: MDEQ: Per DEQ-CCD-AQD (03/26/2012): ITSL = 2000 µg/m³ (annual averaging time). ITSL based on RfC Point of Departure determined in IRIS based on Nitschke et al (1988a) study. POD = 17.2 mg/m³/UF (10) = 1.72mg/m³ = 2,000 ug/m³ (1 sig fig) with an annual averaging time due to adoption of an acute ITSL. An acute ITSL of 14,000 was adopted from Cal EPA acute REL of 14,000 ug/m³ based on Putz et al (1976) study with a 1 hour averaging time.</p>		
Inhalation Unit Risk Factor	4.7E-7		IRIS, 2011	



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
(IURF) (($\mu\text{g}/\text{m}^3$) ⁻¹)		1E-8		
IURF details	<p>Per AQD: Potency is based on the 2012 final assessment in IRIS. The IUR was based on Mennear et al (1988) and NTP (1986) study on male mice exposed to 0, 2000 or 4000 ppm methylene chloride for 2 years which developed hepatocellular carcinomas and adenomas and alveolar and bronchiolar carcinomas and adenomas.</p> <p>Calculation date - 3/26/12.</p> <p>No PPRTV (11/21/11; 7/31/13).</p>	<p>Tier 1 Source: IRIS: Basis: IRIS is a Tier 1 source. Critical Studies:</p> <p>1) Mennear, JH; McConnell, EE; Huff, JE; et al. (1988) Inhalation and carcinogenesis studies of methylene chloride (dichloromethane) in F344/n rats and B6C3F1 mice. Ann NY Acad Sci 534:343–351.</p> <p>2) NTP (National Toxicology Program). (1986) Toxicology and carcinogenesis studies of dichloromethane (methylene chloride) (CAS No. 75-09-2) in F344/N rats and B6C3F1 mice (inhalation studies). Public Health Service, U.S. Department of Health and Human Services; NTP TR 306.</p> <p>Methods: A 2-year inhalation exposure study in B6C3F1 mice, similar to that in F344/N rats, was also conducted by NTP. The mice (50/sex/exposure level) were exposed to dichloromethane (>99% pure) by inhalation at concentrations of 0, 2,000, or 4,000 ppm in exposure chambers 6 hours/day, 5 days/week for 2 years. As with the study in rats, mean daily concentrations in the mice never exceeded 110% of target and were <90% of target in only 23 of 1,476 analyses. Endpoints monitored included clinical signs, mortality, and gross and microscopic examinations of 32 tissues at study termination. Clinical examinations were conducted weekly for 3.5 months and biweekly until month 8. After 8 months, the animals were clinically examined and palpated monthly for tumors and masses until the end of the study.</p> <p><i>Extrapolation Method:</i> Multistage model with linear extrapolation from the point of departure (BMDL10).</p> <p><i>Tumor Types</i> — Hepatocellular carcinomas or adenomas, bronchoalveolar carcinomas or adenomas</p> <p>Carcinogen Weight-of-Evidence (WOE) Class: Likely to be carcinogenic in humans.</p> <p>IRIS WOE Basis: Following U.S. EPA (2005a) Guidelines for Carcinogen Risk Assessment, dichloromethane is "likely to be carcinogenic in humans," based predominantly on evidence of carcinogenicity at two sites in 2-year bioassays in</p>		Completed



	Part 201 Value	Updated Value	Source/Reference/Date	Comments/Notes/Issues
		<p>male and female B6C3F1 mice (liver and lung tumors) with inhalation exposure (NTP, 1986) and at one site in male B6C3F1 mice (liver tumors) with drinking water exposure (Serota et al., 1986b; Hazleton Laboratories, 1983). Source and Date: IRIS 11/18/2011</p> <p>Tier 2 Sources: PPRTV: No PPRTV record available at this time. MRL: MRLs are for non-cancer effects only.</p> <p>Tier 3 Source: MDEQ: Per DEQ-CCD-AQD, 03/26/2012, inhalation slope factor = 1E-8 µg/m3 based on IRIS Potency is based on IRIS. The IUR was based on Mennear et al (1988) and NTP (1986) study on male mice exposed to 0, 2000 or 4000 ppm methylene chloride for 2 years which developed hepatocellular carcinomas and adenomas and alveolar and bronchiolar carcinomas and adenomas.</p>		
Mutagenic Mode of Action (MMOA)? (Y/N)	--	YES	USEPA, 2015	
MMOA Details	--	Listed as a carcinogen with mutagenic MOA in the USEPA OSWER List. For MMOA details of this carcinogen, refer to IRIS.		
Developmental or Reproductive Effector? (Y/N)	--	NO	MDEQ, 2015	
Developmental or Reproductive Toxicity Details	--	The RfD or the RfC is not based on a reproductive-developmental effect.		
State Drinking Water Standard (SDWS) (µg/L)	--	5	SDWA, 1976	
SDWS details	--	MI Safe Drinking Water Act (SDWA) 1976 PA 399		



	Part 201 Value	Updated Value	Source/Reference/ Date	Comments/Notes /Issues
Secondary Maximum Contaminant Level (SMCL) (µg/L)	--	NO	SDWA, 1976 and USEPA SMCL List	
SMCL details	--	MI Safe Drinking Water Act (SDWA) 1976 PA 399 and USEPA SMCL List, 2015		
Is there an Aesthetic Value? (Y/N)	NO	Not evaluated.	NA	
Aesthetic value details	NA	NA		
Is there a Phytotoxicity Value? (Y/N)	NO	Not evaluated.	NA	
Phytotoxicity details	NA	NA		
Others:				

(C) Chemical-specific Absorption Factors

	Part 201 Value	Update	Source/Reference/ Dates	Comments/Notes /Issues
Gastrointestinal absorption efficiency value (ABS _{gi})	---	1.0	MDEQ, 2015/USEPA RAGS-E, 2004	
ABS _{gi} details		RAGS E (USEPA, 2004) Default Value		
Skin absorption efficiency value (A _{Ed})	---	0.1	MDEQ, 2015	
A _{Ed} details				
Ingestion Absorption Efficiency (A _{Ei})		1.0	MDEQ, 2015	
A _{Ei} Details				
Relative Source Contribution for Water (RSC _w)		0.2	MDEQ, 2015	
Relative Source Contribution for Soil (RSC _s)		1.0	MDEQ, 2015	
Relative Source Contribution for Air (RSC _A)		1.0	MDEQ, 2015	
Others				



(D) Rule 57 Water Quality Values and GSI Criteria

Current GSI value (µg/L)	1,500 (X)
Updated GSI value (µg/L)	1,500 (X)
Rule 57 Drinking Water Value (µg/L)	47

	Rule 57 Value (µg/L)	Verification Date
Human Non-cancer Values- Drinking water source (HNV-drink)	1,600	7/1997
Human Non-Cancer Values- Non-drinking water sources (HNV-Non-drink)	90,000	7/1997
Wildlife Value (WV)	NA	NA
Human Cancer Values for Drinking Water Source (HCV-drink)	47	7/1997
Human Cancer values for non-drinking water source (HCV-Non-drink)	2,600	7/1997
Final Chronic Value (FCV)	1,500	11/2009
Aquatic maximum value (AMV)	8,500	11/2009
Final Acute Value (FAV)	17,000	11/2009

Sources:

1. MDEQ Surface Water Assessment Section Rule 57 [website](#)
2. MDEQ Rule 57 [table](#)



(E) Target Detection Limits (TDL)

	Value	Source
Target Detection Limit – Soil ($\mu\text{g}/\text{kg}$)	100	MDEQ, 2015
Target Detection Limit – Water ($\mu\text{g}/\text{L}$)	5	MDEQ, 2015
Target Detection Limit – Air (ppbv)	2.70E+01	MDEQ, 2015
Target Detection Limit – Soil Gas (ppbv)	8.80E+02	MDEQ, 2015

CHEMICAL UPDATE WORKSHEET ABBREVIATIONS:

CAS # - Chemical Abstract Service Number.

Section (A) Chemical-Physical Properties**Reference Source(s):**

CRC	Chemical Rubber Company Handbook of Chemistry and Physics, 95th edition, 2014-2015
EMSOFT	USEPA Exposure Model for Soil-Organic Fate and Transport (EMSOFT) (EPA, 2002)
EPA2001	USEPA (2001) Fact Sheet, Correcting the Henry's Law Constant for Soil Temperature. Office of Solid Waste and Emergency Response, Washington, D.C.
EPA4	USEPA (2004) User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. February 22, 2004.
EPI	USEPA's Estimation Programs Interface SUITE 4.1, Copyright 2000-2012
HSDB	Hazardous Substances Data Bank
MDEQ	Michigan Department of Environmental Quality
NPG	National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards
PC	National Center for Biotechnology Information's PubChem database
PP	Syracuse Research Corporation's PhysProp database
SCDM	USEPA's Superfund Chemical Data Matrix
SSG	USEPA's Soil Screening Guidance: Technical Background Document, Second Edition, 1996
USEPA/EPA	United States environmental protection agency's Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). July, 2004.

W9 USEPA's User Guide for Water9 Software, Version 2.0.0, 2001

Basis/Comments:

EST	estimated
EXP	experimental
EXT	extrapolated
NA	not available or not applicable
NR	not relevant

Section (B) Toxicity Values/Benchmarks**Sources/References:**

ATSDR	Agency for Toxic Substances and Disease Registry
CALEPA	California Environmental Protection Agency
CAL DTSC	California Department of Toxic Substances Control
CAL OEHHA	CAEPA Office of Environmental Health Hazard Assessment
CCD	MDEQ Chemical Criteria Database
ECHA	European Chemicals Agency (REACH)
OECD HPV	Organization for Economic Cooperation and Development HPV Database
HEAST	USEPA's Health Effects Assessment Summary Tables
IRIS	USEPA's Integrated Risk Information System
MADEP	Massachusetts Department of Environmental Protection
MDEQ/DEQ	Michigan Department of Environmental Quality
DEQ-CCD/AQD	MDEQ Air Quality Division
DEQ-CCD/RRD	MDEQ Remediation and Redevelopment Division
DEQ-CCD/WRD	MDEQ Water Resources Division
MNDOH	Minnesota Department of Health

NJDEP	New Jersey Department of Environmental Protection
NYDEC	New York State Department of Environmental Conservation
OPP/OPPT	USEPA's Office of Pesticide Programs
PPRTV	USEPA's Provisional Peer Reviewed Toxicity Values
RIVM	The Netherlands National Institute of Public Health and the Environment
TCEQ	Texas Commission on Environmental Quality
USEPA	United States Environmental Protection Agency
USEPA OSWER	USEPA Office of Solid Waste and Emergency Response
USEPA MCL	USEPA Maximum Contaminant Level
WHO	World Health Organization
WHO IPCS	International Programme on Chemical Safety (IPCS/INCHEM)
WHO IARC	International Agency for Research on Cancers
NA	Not Available.
NR	Not Relevant.

Toxicity terms:

BMC	Benchmark concentration
BMCL	Lower bound confidence limit on the BMC
BMD	benchmark dose
BMDL	Lower bound confidence limit on the BMD
CSF	Cancer slope Factor
CNS	Central nervous system
IURF or IUR	Inhalation unit risk factor
LOAEL	Lowest observed adverse effect level
LOEL	Lowest observed effect level
MRL	Minimal risk level (ATSDR)
NOAEL	No observed adverse effect level
NOEL	No observed effect level

RfC	Reference concentration
RfD	Reference dose
p-RfD	Provisional RfD
aRfD	Acute RfD
UF	Uncertainty factor
WOE	Weight of evidence

Section (C) Chemical-specific Absorption Factors

MDEQ	Michigan Department of Environmental Quality
USEPA RAGS-E	United States Environmental Protection Agency's Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). July, 2004.

Section (D) Rule 57 Water Quality Values and GSI Criteria

GSI	Groundwater-surface water interface
NA	A value is not available or not applicable.
ID	Insufficient data to derive value
NLS	No literature search has been conducted