West Virginia Department of Environmental Protection
Documentation of 2021 Proposed Updates to the WV De Minimis Standards

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1.0 Background

The Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22-1, et seq.) established the WV Voluntary Remediation Program (VRP), which applies De Minimis Standards during voluntary remediation activities and brownfield revitalization. De Minimis Standards are contaminant levels that pose no substantial risk to human health based on the current or reasonably anticipated future land and groundwater use for either residential or industrial purposes. The Voluntary Remediation and Redevelopment Rule (60CSR3 §9.2.d) outlines the method for calculating De Minimis Standards, which are to be reviewed annually and updated as necessary to reflect current toxicity information, chemical-specific data, and exposure parameters.

2.0 Overview of 2021 Proposed Updates

The De Minimis Standards are based on the product of *Exposure times Toxicity*. Exposure is calculated based on chemical-specific data and receptor-specific exposure parameters. As outlined in the Voluntary Remediation and Redevelopment Rule (60CSR3), the chemical-specific data for the contaminants in the De Minimis Standards Table were each compared to the current data in the Risk Assessment Information System (RAIS) Chemical Data Profiles (https://rais.ornl.gov/tools/profile.php) and the U.S. EPA Comptox database (https://comptox.epa.gov/dashboard). The exposure parameters used in De Minimis Standard calculations were taken from the most recent U.S. EPA Default Exposure Parameters, and the equations were compared to those defined in the U.S. EPA Regional Screening Level User's Guide (https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide).

Toxicity is based on values from various sources of toxicological research to determine carcinogenic responses to chemical exposures via ingestion (Cancer Slope Factor (CSF)) or inhalation (Inhalation Unit Risk (IUR)), and non-carcinogenic responses via ingestion (Reference Dose (RfD)) and inhalation (Reference Concentration (RfC)). The carcinogenic and non-carcinogenic effects due to dermal exposures have been developed for very few chemicals and are therefore assessed on a chemical-specific basis as a dermal absorption fraction of the ingestion toxic responses, with most chemicals having a dermal fraction value of one (1). The hierarchy of sources of toxicity values are determined in 60CSR3, with Tier 1 values being the Integrated Risk Information System (IRIS), Tier 2 being the Provisional Peer-Reviewed Toxicity Values (PPRTVs), and Tier 3 being all other sources. The toxicity updates were validated against the approved sources (Table 1).

Updates of parameters used to calculate exposure for the De Minimis Standards were cross-checked against the most current U.S. EPA Regional Screening Levels (RSLs) data as a last validation step. The RSLs are updated twice a year by U.S. EPA, and the WV De Minimis Standards updates represented here include all RSL updates through May 2021. The WV chemical-specific toxicity and exposure data were then updated in the De Minimis Standards calculation spreadsheet. Several corrections were simply

changes in nomenclature; "Chlordane (Technical)" was changed to "Chlordane (Technical Mixture)", the spelling of "Metolachlor (Dual)" was corrected, synonyms of NuStar (i.e., Flusilazole) and of Pursuit (i.e., Imazethapyr) were added, and the CAS Number for Polybrominated biphenyls was changed to 36355-01-8.

3.0 Updates of Toxicity Values

Toxicity values are mandated by 60CSR3 to be the most updated values from IRIS as the first preference (Tier 1) and the Provisionally Peer-Reviewed Toxicity Values (PPRTV) as the second preference (Tier 2). Other governmental (e.g., CalEPA and OPP) or relevant scientific sources (ATSDR) may also be used (Tier 3) when there are not values available from IRIS or PPRTV. Since the last update of the De Minimis Standards Table (which became effective April 1, 2018), the toxicity values of numerous chemicals have changed (Table 1), requiring that the De Minimis Standards Table be updated to reflect these new values. Note that some changes to the toxicity data are just to the source, which was documented incorrectly in the previous version of the De Minimis Standards calculation spreadsheet. These edits are denoted with "stat" in Table 1.

Toxicity Value Sources	
Tier 1	IRIS – *Integrated Risk Information System*
Tier 2	PPRTV – *Peer-Reviewed Provisional Toxicity Values*
Tier 3	ATSDR – *Agency for Toxic Substances and Disease Registry, derived from Minimal Risk Levels* CalEPA – *California Environmental Protection Agency* OPP – *U.S. EPA Office of Pesticide Programs* PPRTV APP – *Peer-Reviewed Provisional Toxicity Values published in Appendix* RSL TEF – *U.S. EPA Regional Screening Levels Toxicity Equivalence Factors where the toxicity of several PAHs ae based on their toxicity relative to Benzo(a)pyrene in the absence of values in IRIS* RSL UG – *U.S. EPA Regional Screening Levels User's Guide providing modifications to toxicity values as deemed appropriate*

In addition, the references for several toxicity sources published in previous versions of the De Minimis Standards Table were unclear. The following edits were made to provide clarity to the source of certain screening values. The edits described below did not affect the numeric value of the screening values:

- *Changed sources of toxicity values from "m" to "at" to differentiate between those listed in ATSDR in ppm vs. mg/m3:* Acrylonitrile RfD, Cadmium and compounds RfC, Diazinon RfD, HCH (alpha) RfD, 4-Methylphenol (p-cresol) RfD, Nickel RfC, and 1-Methylnaphthalene RfD.

- *Changed sources of toxicity values from "p" to "pa" to clarify PPRTV Toxicity Values from PPRTV Appendix Toxicity Values:* p-Chlorobenzoic acid RfD, 4-Chloro-2-methylaniline RfD, o-Chloronitrobenzene RfC, DDD RfD, DDE RfD, Dibenzofuran RfD, 1,2-Dichloroethylene (trans) RfC, 2,4-Dimethylaniline RfD, Glycidaldehyde RfC, 2-Methyl-5-nitroaniline RfD, 2-Nitroaniline RfD, N-Nitrosodimethylamine RfC, m-Nitrotoluene RfD, p-Phenylenediamine RfD, p-Phthalic acid RfD, n-Propylbenzene RfD and RfC, Thallium and compounds RfD, Toluene-2,5-diamine CSF and RfD, p-Toluidine RfD, and 1,2,3-Trichloropropene RfD.

- *Changed notation for toxicity source from PPRTV Appendix ("sp" to "pa"):* Toxicity values from the PPRTV Appendix were previously referencing "sp", and the description of "sp" was unclear. Therefore, the "sp" footnote was clarified and updated to "pa" to clearly reference the PPRTV Appendix values. This change affected the following constituents: Dichlorodifluoromethane RfC, 1,2-Dichloroethane RfD, Dicyclopentadiene RfC, Dinitrotoluene

(Technical Grade) CSF and RfD, 2,6-Dinitrotoluene RfD, Formic Acid RfC, Methyl acetate RfD, 2-Nitroaniline RfC, 2,4,6-Trichloroaniline CSF and RfD, and 1,1,2-Trichloroethane RfC.

- *Changed notation of toxicity source from CalEPA ("c" to "cal"):* The source of the selenium RfC was incorrectly referencing "c" for the California EPA; however, "c" refers to the U.S. EPA Region III SSL Background Data. Therefore, the source was revised to "cal" for the selenium RfC.

- *Change of toxicity source from "x" to "pa":* The source of the Methylene bromide (Dibromomethane) RfC was incorrectly referencing "x" for the PPRTV Appendix (note this is the reference utilized in the U.S. EPA RSL Tables). However, the description of "x" did not accurately describe the PPRTV Appendix and was not utilized elsewhere in the spreadsheet, so this source "x" was removed. In addition, the source of the Methylene bromide (Dibromomethane) RfC was revised from "x" to "pa".

Table 1:
Required Changes to Toxicity Data and Sources of Data for Chemicals Based on the Three Tiers of Toxicity Data

CHEMICAL	Oral Cancer Slope Factor (CSFo) $(mg/kd-d)^{-1}$	CSFo source	Oral Reference Dose (RfDo) (mg/kg-d)	RfDo source	Inhalation Unit Risk (IUR) $(ug/m3)^{-1}$	IUR source	Reference Concentration (RfC) (mg/m3)	RfC source
Aniline					Stat	CalEPA		
Antimony and compounds							3.0E-4	ATSDR
Benzaldehyde	4.0E-03	PPRTV						
1,3-Butadiene	6.0E-01	CalEPA						
p-Chloronitrobenzene	6.0E-02	PPRTV	7.0E-04	PPRTV			2.0E-03	PPRTV
Chromium VI	Stat	CalEPA			8.4 E-02	RSL UG		
Cyanide							stat	RSL UG
Cyhalothrin/Karate			1.0E-03	OPP				
Cypermethrin			6.0E-02 [a]	OPP				
DDD			3.0E-05	PPRTV APP				
DDE			3.0E-04	PPRTV APP				
1,4-Dichlorobenzene			stat	ATSDR				
1,2-Dichloroethylene (trans)							4.E-02	PPRTV APP
4-(2,4-Dichlorophenoxy)butyric acid			3.0E-02	OPP				
1,2-Dichloropropane	3.7E-02	PPRTV	4.0E-02	PPRTV	3.7E-06	PPRTV		
Difenzoquat (Avenge)			8.3E-02	OPP				
N-N-Dimethylaniline	2.7E-02	PPRTV						
1,4-Dioxane			3.2E-02	IRIS				
Diphenylamine			1.0E-01	OPP				
Fomesafen	Deleted		2.5E-03	OPP				
Formaldehyde							9.83E-03	ATSDR
Glycidaldehyde							Stat	PPRTV
Lithium			Stat	PPRTV				
Manganese (non-food)			2.4E-02	IRIS				
Mercury (elemental and inorganic)			Stat	CalEPA				
Methidathion			1.5E-03	OPP				
2-Methylaniline	1.6E-02	PPRTV						

CHEMICAL	Oral Cancer Slope Factor (CSFo) $(mg/kd-d)^{-1}$	CSFo source	Oral Reference Dose (RfDo) (mg/kg-d)	RfDo source	Inhalation Unit Risk (IUR) $(ug/m3)^{-1}$	IUR source	Reference Concentration (RfC) (mg/m3)	RfC source
4-(2-Methyl-4-chlorophenoxy) butyric acid			4.4E-03	OPP				
Methylene Bromide (Dibromomethane)							Stat	PPRTV APP
Molybdenum							2.0E-03	ATSDR
NuStar (Flusilazole)			2.0E-03	OPP				
Oryzalin	7.8E-03	OPP	1.4E-01	OPP				
Oxyfluorfen	7.3E-02	OPP	3.0E-02	OPP				
p-Phenylenediamine			1.0E-03	PPRTV APP				
p-Phthalic acid			5.0E-01	PPRTV APP				
Polychlorinated biphenyls					5.7E-04	IRIS		
Benz(a)anthracene	1.0E-01	RSL TEF			6.0E-05	RSL TEF		
Benzo(b)fluoranthene	1.0E-01	RSL TEF			6.0E-05	RSL TEF		
Benzo(k)fluoranthene	1.0E-02	RSL TEF			6.0E-06	RSL TEF		
Benzo(a)pyrene	1.0E+00	IRIS	3.0E-04	IRIS	6.0E-04	IRIS	2.0E-06	IRIS
Chrysene	1.0E-03	RSL TEF			6.0E-07	RSL TEF		
Dibenz(a,h)anthracene	1.0E+00	RSL TEF			6.0E-04	RSL TEF		
Indeno(1,2,3-cd)pyrene	1.0E-01	RSL TEF			6.0E-05	RSL TEF		
Naphthalene	1.2E-01	CalEPA			Stat	CalEPA		
Prometryn			4.0E-02	OPP				
Propargite	1.9E-01	OPP	4.0E-02	OPP				
Pursuit (Imazethapyr)			2.5E+00	OPP				
Toluene-2, 4-diamine	4.0E+00	CalEPA			1.1E-03	CalEPA		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)							5.0E+00	PPRTV
1,2,4-Trimethylbenzene			1.0E-02	IRIS			6.0E-02	IRIS
1,3,5-Trimethylbenzene			Stat	IRIS			6.0E-02	IRIS
2,4,5-Trinitrotoluene					Deleted			
2,4,6-Trinitrotoluene			5.0E-04	IRIS				
Vanadium and compounds[b]			9.0E-03	IRIS	8.3E-03	PPRTV	7.0E-06	PPRTV
Vinclozolin			1.2E-03	OPP				
Vinyl bromide					1.5E-05	PPRTV		

CHEMICAL	Oral Cancer Slope Factor (CSFo) $(mg/kd\text{-}d)^{-1}$	CSFo source	Oral Reference Dose (RfDo) (mg/kg-d)	RfDo source	Inhalation Unit Risk (IUR) $(ug/m3)^{-1}$	IUR source	Reference Concentration (RfC) (mg/m3)	RfC source
[a]The chronic oral reference dose for cypermethrin was updated in accordance with the May 2021 U.S. EPA RSL updates. Although the U.S. EPA Human Health Benchmarks for Pesticides database (https://iaspub.epa.gov/apex/pesticides/f?p=HHBP:home) does not show the chronic RfD of 0.06 mg/kg-day as of the date of this document, this value was utilized due to its recognition by U.S. EPA and its publication in the RAIS database. [b]Vanadium and compounds toxicity is now based on Vanadium Pentoxide. It formerly used the U.S. EPA RSL toxicity for Vanadium in which they adjusted the toxicity of Vanadium Pentoxide by mathematically accounting for the oxygen via atomic weight ratios. However, there is no scientific basis for such an adjustment, and Vanadium Pentoxide is considered to be one of the most toxic forms of Vanadium, if not the most toxic form. Therefore, Vanadium Pentoxide is used as the surrogate for all Vanadium compounds since it is the most scientifically-defensible and conservative estimate. Note that IRIS is currently undergoing a review of Vanadium and Compounds, and these toxic values will likely be adjusted once IRIS has rendered a decision.								

4.0 Updates of Exposure Values

4a. Updates of Chemical-Specific Parameters to Calculate Exposure (sources from RAIS except where noted)

- *B (ratio of permeability coefficient of stratum corneum to permeability coefficient of viable epidermis) (unitless):* Arsenic (3.3E-03), Beryllium and compounds (1.2E-03), Dinitrotoluene (Technical Grade) (3.7E-02), Diquat (2.8E-02), 4,4'-Methylene bis(N,N'-dimethyl)aniline (2.9E-01), Phosphorus (White) (2.1E-03), Polychlorinated biphenyls (3.6E+00), Aroclor 1016 (1.9E+00), and Arochlor 1248 (3.1E+00).

- *Dermal Absorption from Soil (ABS_d):* U.S. EPA corrected the dermal absorption fraction from soils for Dibenzofuran, Furan, and Tetrahydrofuran because they mistakenly applied the ABS_d value for chlorinated dioxins and dioxin like compounds (0.03) to these three volatile chemicals. All volatile chemicals are considered to have negligible dermal absorption because they will volatilize to the air before they have a chance to be absorbed through the skin. Therefore, WVDEP made the same corrections to these compounds.

- *Dermal Permeability Coefficient (Kp) (cm/hr) from EPI:* Diquat (5.4E-03) and 4,4'-Methylene bis(N,N'-dimethyl)aniline (4.7E-02).

- *Diffusivity in Air (Di) (cm2/s):* Dibenzofuran (6.51E-02), Dinitrotoluene (Technical Grade) (2.84E-02), Diquat (5.87E-02), Hexachlorodibenzo-p-dioxin mixture (HxCDD) (4.27E-02), and Indeno[1,2,3]pyrene (2.47E-2). In addition, the source of the diffusivity in air values for several constituents were updated to RAIS. The numerical values did not change.

- *Diffusivity in Water (Dw) (cm2/s):* Dinitrotoluene (Technical Grade) (3.32E-06), Diquat (6.86E-06), and Indeno[1,2,3]pyrene (6.37E-6). In addition, the source of the diffusivity in water values for several constituents were updated to RAIS. The numerical values did not change.

- *H' (dimensionless Henry's Law Constant):* Chlordane (Technical) (1.99E-03), Dinitrotoluene (Technical Grade) (3.79E-06), and Diquat (5.81E-06).

- *Henry's Law Constant (atm-m3/mol):* Chlordane (Technical) (4.86E-05), Dinitrotoluene (Technical Grade) (9.26E-08), Diquat (1.42E-07), tert-butanol (9.05E-06), Toluene-2, 4-diamine (7.92E-10), and Toluene-2, 6-diamine (7.49E-09).

- *Kd (soil-water partition coefficient for inorganic compounds) (cm3/g):* Mercury (methyl) (7.00E+03).

- *Koc (soil-water partition coefficient for organic compounds) (cm3/g):* Benzoic acid (6.00E-01), 2-Chlorophenol (3.88E+02), 2,4-Dichlorophenol (1.47E+02), Diquat (4.04E+03), HMX (3.26E+01) from CompTox, Hydrazine (2.00E+00), Pentachlorophenol (5.92E+02), Propachlor (2.04E+02), Propargite (3.66E+04), RDX (Cyclonite) (4.51E+01) from CompTox, and 2,4,6-Trichlorophenol (3.81E+02). In addition, the source of Koc values were added for several constituents that were missing. The numerical values did not change.

- *Liquid/Solid at Soil Temperature:* Cyanogen bromide change to solid, Dicyclopentadiene changed to liquid, 2.4-Dimethylaniline hydrochloride changed to solid, Phosphorus (White) changed to solid, and tert-butanol changed to solid.

- *Melting Point (°C):* Acetone (-94.8), Acetonitrile (-43.8), Acetophenone (19.6), Aldrin (104.0), Arsenic (270.0), Assure (92.0), Baygon (90.0), Butyl benzyl phthalate (-35.0), Carbon disulfide (-111.5), Carbosulfan (25.0), Cobalt (1495), Cyanogen (-27.9), Cyanogen bromide (52.0), Cypermethrin (80.5), 1,4-Dichloro-2-butene (3.5), 1,2-Dichloroethylene(cis) (-80.0), 1,2-Dichloroethylene(trans) (-49.8), Dicyclopentadiene (-1.0), Dieldrin (175.5), 2,4-Dimethylaniline hydrochloride (157), 2,4-Dinitrophenol (114.8), Diquat (95.3), Epichlorohydrin (-57.2), Ethyl methacrylate (-75.0), HCH(alpha) (159.5), HCH(beta) (314.5), HMX (286), p-Hydroquinone (170), Iron (1538), Lead(tetraethyl) (-134), 2-Methylaniline (-14.4), 2-(2-Methyl-4-chlorophenoxy) propionic acid (94.5), Methyl methacrylate (-47.6), 2-Methyl-5-nitroaniline (105.5), Methyl styrene (-86.3), Metolachlor (-62.1), Mirex (485), Molybdenum (2622), Nickel and compounds (1455), Phosphorus (White) (44.1), p-Phthalic acid (368) note that the experimental average was used instead of the median since CompTox questionably reported the median as the upper end of the range, Phthalic anhydride (130.8), Polychlorinated biphenyls (122.3), Aroclor 1016 (100.9), Aroclor 1242 (122.3), Aroclor 1248 (122.3), Aroclor 1254 (134.6), Aroclor 1260 (163.6), Benzo(a)pyrene (176.5), Dibenz(a,h)anthracene (269.5), Fluoranthene (107.8), Indeno(1,2,3-cd)pyrene (163.6), Prometon (91.0), Propargite (173.2), Resmethrin (56.5), Selenium (221), tert-butanol (25.4), 1,2,4,5-Tetrachlorobenzene (139.5), Thallium and compounds (303.5), p-Toluidine (43.6), Toxaphene (77.0), 1,2,4-Trichlorobenzene (17.0), 2-(2,4,5-Trichlorophenoxy) propionic acid (181.6), 1,3,5-Trinitrobenzene (121.5), Trinitrophenylmethylnitramine (Tetyl) (131.5), Vinyl bromide (-137.8), Vinyl chloride (-153.7), and Zinc and compounds (419.5).

- *Molecular Weight:* Antimony and compounds (121.8), Arsenic (74.9), Barium and compounds (137.3), Beryllium and compounds (9.0), Dinitrotoluene (Technical Grade) (546.41), Phosphorus (White) (31.0), and Thallium and compounds (204.4).

- *Solubility (mg/L-water):* Chlordane (Technical) (5.60E-02), Cyanogen (8.00E+03), Diquat (7.0E+01), and Phosphorus (White) (3.00E+00).

- *t* (time to reach steady-state) (hr):* Antimony and compounds (1.2E+00), Arsenic (6.6E-01), Beryllium and compounds (2.8E-01), 2,4-Dinitrophenol (2.7E+00), Dinitrotoluene (Technical Grade) (2.9E+02), Diquat (2.7), Phosphorus (White) (3.8E-01), Polychlorinated biphenyls (1.9E+01), Aroclor 1016 (1.2E+01), and Aroclor 1248 (1.9E+00). Additionally, two columns were added to include the values of correlation coefficients from RAGS-E Equations A.7 and A.8. The *t** was previously left blank before adding these values. These additions only effected 2-Methylaniline, Acenaphthylene, Benzo(g,h,i)perylene, Phenanthrene, Propylene glycol (monoethyl ether), tert-butanol, Toluene-2, 4-diamine, and Toluene-2,6-diamine.

- *Vapor Pressure (mm Hg):* Diquat (1.0E-08)

- *Water Dermal Fraction Absorbed (FA) (unitless):* The fraction of a compound absorbed through the skin as part of the dermal pathway incorrectly used the Dermal Absorption from Soils (ABS) parameter in the current De Minimis Standards Table. The correct fraction absorbed through water (FA) was calculated using the Water Dermal Fraction Absorbed (FA) from RAGS Part E Exhibit B-3, but this Exhibit does not have all of the FA values and the information is old. The U.S. EPA RSLs give the equations to calculate FA based on regression equations that are available at https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide#chemicalspecific based on the values for B and tau. Thus, a "raw FA" was calculated for each of the chemicals in the De Minimis Standards spreadsheet that have B and tau values using those equations. The

"raw FA" values were then rounded to a single significant figure. The rounded version of FA is the value used to calculate the dermal absorption from water.

- *τ-event (event duration, aka tau) (hr/event):* Antimony and compounds (5.1E-01), Arsenic (2.8E-01), Barium and compounds (6.2E-01), Beryllium and compounds (1.2E-01), Dinitrotoluene (Technical Grade) (1.2E+02), Diquat (1.1), Phosphorus (White) (1.6E-01), Polychlorinated biphenyls (4.5E+00), Aroclor 1016 (2.9E+00), and Aroclor 1248 (4.5E+00).

4b. Updates to Exposure Assumptions

Default exposure assumptions have not changed, with one important exception. The default soil ingestion rate for industrial workers was increased from 50 mg/day to 100 mg/day. This change was made because industrial workers includes both indoor and outdoor workers. The current 50 mg/day value was based on the incidental soil ingestion rate of indoor workers from the U.S. EPA Exposure Factors Handbook in 2011. However, the U.S.EPA default soil ingestion rate for outdoor workers is 100 mg/day. The Industrial De Minimis is intended to be protective of all industrial/commercial workers, and the old values based on the indoor worker exposures was not sufficiently protective of the outdoor workers. For this reason, U.S. EPA uses the 100 mg/day default value to calculate the RSLs for industrial/commercial workers. Thus, this change to the De Minimis Standards Table aligns the WV De Minimis Standards methods with the U.S. EPA RSL methods, but it will only impact the Industrial De Minimis Standards that were based on the ingestion pathway.

In addition, the Industrial De Minimis Standards are typically used to screen the potential risks to construction/utility workers exposed to just soils while excavating trenches (i.e., no groundwater in the trench). While construction/utility workers will not have the same exposure frequency, duration, or time at a location as a typical industrial/commercial worker, they have a much higher default soil ingestion rate of 330 mg/day, as well as higher dermal contact and inhalation rates. Thus, increasing the default soil ingestion rate for the Industrial De Minimis Standards also allows for more protective screening of construction/utility workers exposed to soils during excavation activities.

4c. Vinyl Chloride and Trichlorethylene De Minimis Updates

The current version of the De Minimis Standards has Vinyl Chloride separated into two categories of exposures: Lifetime (Residential De Minimis) and Adult (Industrial De Minimis). However, this is the only chemical which has separate categories of exposures in the De Minimis Standards Table, and the U.S. EPA RSLs do not separate the Vinyl Chloride exposures. Thus, the Vinyl Chloride exposures were combined into one so that this chemical would align with the other chemicals in the De Minimis Standards Table and with the U.S. EPA RSLs. Additionally, the previous Vinyl Chloride and Trichloroethylene De Minimis Standards did not use the chemical-specific equations developed by U.S. EPA for the RSLs for both of these chemicals following the Residential cancer and Groundwater cancer pathways (https://www.epa.gov/risk/regional-screening-levels-rsls-equations). The proposed updates to the De Minimis Standards for Vinyl Chloride and Trichloroethylene utilize these pathway-specific equations.

4d. Correction to Groundwater Standards

The current version of the De Minimis Standards reports the Groundwater De Minimis for Antimony and Compounds as 7.8 µg/L. However, U.S. EPA has developed a Maximum Contaminant Level (MCL) for Antimony as 6 µg/L under the Safe Drinking Water Act (SDWA) requirements, and the WV Requirements Governing Groundwater Standards (47CSR12) uses these U.S. EPA standards. The 7.8 ug/L value for Antimony is incorrect since the Groundwater De Minimis Standards are supposed to follow the U.S. EPA MCLs and/or WV 47CSR12 when they are available. Thus, the Groundwater De Minimis Standard for Antimony was updated to the EPA MCL of 6 µg/L.

In addition, the Groundwater De Minimis Standards were updated with values published in 47CSR12 for the following constituents (µg/L): Bromodichloromethane (8.0E+01), Bromoform (8.0E+01), Copper (1.3E+03), and Dibromochloromethane (8.0E+01). Additionally, the WV Requirements Governing Groundwater Standards has a value of 0.000005 µg/L for 2,3,7,8-TCDD (Dioxin) that is incorrectly reported as 0.00003 µg/L in the current version of the De Minimis Standards.

4e. Lead

There are no toxicity values for Lead because there is no observable threshold of responses due to exposures to Lead. Therefore, De Minimis Standards cannot be calculated for Lead in the same manner as other chemicals. Lead exposure is evaluated using models, such as the Integrate Exposure-Uptake Biokinetic Model (IEUBK) and the Adult Lead Model (ALM).

The U.S. EPA Office of Solid Waste released a detailed directive recommending that soil Lead levels less than 400 mg/kg are generally safe for residential use, and this value is used for the U.S. EPA Regional Screening Level and the WV Residential De Minimis Standard. However, a recent analysis of the *Blood Lead Concentrations of U.S. Adult Females: Summary Statistics from Phases 1 and 2 of the National Health and Nutrition Evaluation Survey (NHANES III)*(U.S. EPA 2002) resulted in an update of the goal for non-residential commercial/industrial uses to 800 mg/kg. U.S. EPA's *Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology* (U.S. EPA 2018) states that the 800 mg/kg clean up goal is protective of all subpopulations. The U.S. EPA RSL was updated to reflect this new Industrial soil screening level, but the WV Industrial De Minimis Standard has remained at 1000 mg/kg. Thus, the Industrial De Minimis Standard for Lead is being updated to 800 mg/kg to reflect the more recent risk-based guidance from U.S. EPA. This lower Industrial De Minimis Standard for Lead also accounts for the increased default soil ingestion rate for Outdoor Workers and the exposures of a fetus through a pregnant worker.

5.0 Proposed Changes to the De Minimis Standards

Once the updated exposure and toxicity values were input into the De Minimis Standards calculation spreadsheet, the final screening values of the De Minimis Standards were updated accordingly. Table 2 shows the current values and the proposed new values together. If no change is being proposed, then only one value is presented as both current and new. However, for those standards which changed, the current standard is ~~struck through~~ and the proposed new standard is in parentheses. Upon completion of the approval process, the final version of the De Minimis Standards Table will be published in the Voluntary Remediation Program Guidance Manual and on the WVDEP Office of Environmental Remediation Technical Guidance and Templates webpage (https://dep.wv.gov/dlr/oer/technicalguidanceandtemplates/Pages/default.aspx).

Table 2:
Proposed Changes to the De Minimis Standards

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Acetaldehyde	75-07-0	1.2E+01	c	3.7E+02	nc	2.6E+00	c
Acetochlor	34256-82-1	1.3E+03	nc	~~2.5E+04~~(1.6E+04)	nc	3.5E+02	nc
Acetone	67-64-1	6.1E+04	nc	1.1E+05	Csat	1.4E+04	nc
Acetonitrile	75-05-8	8.7E+02	nc	3.7E+03	nc	1.3E+02	nc
Acetophenone	98-86-2	2.5E+03	Csat	2.5E+03	Csat	1.9E+03	nc
Acrolein	107-02-8	1.5E-01	nc	6.5E-01	nc	4.2E-02	nc
Acrylamide	79-06-1	2.4E-01	c	~~7.1E+01~~(4.6E+01)	c	5.0E-02	c
Acrylonitrile	107-13-1	2.7E-01	c	~~1.3E+01~~(1.2E+01)	c	5.2E-02	c
Alachlor	15972-60-8	9.7E+00	c	~~6.3E+02~~(4.1E+02)	c	2.0E+00	gws
Alar	1596-84-5	3.0E+01	c	~~2.9E+03~~(1.3E+03)	c	4.3E+00	c
Aldicarb	116-06-3	6.3E+01	nc	~~1.3E+03~~(8.2E+02)	nc	3.0E+00	gws
Aldicarb sulfone	1646-88-4	6.3E+01	nc	~~1.3E+03~~(8.2E+02)	nc	2.0E+00	gws
Aldrin	309-00-2	3.9E-02	c	~~3.6E+00~~(1.8E+00)	c	9.2E-04	c
Aluminum	7429-90-5	7.7E+04	nc	1.0E+06	max	2.0E+04	nc
Aniline	62-53-3	9.5E+01	c	~~6.2E+03~~(4.0E+03)	c	1.3E+01	c
Antimony and compounds	7440-36-0	3.1E+01	nc	~~9.3E+02~~(4.7E+02)	nc	~~7.8E+00~~(6.0E+00)	~~nc~~gws
Arsenic	7440-38-2	~~4.3E-01~~(6.8E-01)	c	~~3.5E+01~~(3.0E+01)	c	1.0E+01	gws
Assure	76578-14-8	5.7E+02	nc	~~1.1E+04~~(7.4E+03)	nc	1.2E+02	nc
Atrazine	1912-24-9	2.4E+00	c	~~1.5E+02~~(1.0E+02)	c	3.0E+00	gws
Azobenzene	103-33-3	5.6E+00	c	~~4.7E+02~~(2.6E+02)	c	1.2E-01	c
Barium and compounds	7440-39-3	1.5E+04	nc	~~4.0E+05~~(2.2E+05)	nc	2.0E+03	gws
Baygon	114-26-1	2.5E+02	nc	~~5.1E+03~~(3.3E+03)	nc	7.8E+01	nc
Baythroid	68359-37-5	1.6E+03	nc	~~3.2E+04~~(2.1E+04)	nc	1.2E+02	nc
Bentazon	25057-89-0	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	5.7E+02	nc
Benzaldehyde	100-52-7	~~1.2E+03~~(1.7E+02)	~~Csat~~c	1.2E+03	Csat	~~1.9E+03~~(1.9E+01)	~~nc~~c
Benzene	71-43-2	1.2E+00	c	~~5.7E+01~~(5.4E+01)	c	5.0E+00	gws
Benzidine	92-87-5	5.3E-04	c	~~1.5E-01~~(1.0E-01)	c	1.1E-04	c
Benzoic acid	65-85-0	2.5E+05	nc	1.0E+06	max	7.5E+04	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Benzyl alcohol	100-51-6	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	2.0E+03	nc
Benzyl chloride	100-44-7	1.1E+00	c	~~5.8E+01~~(5.1E+01)	c	8.9E-02	c
Beryllium and compounds	7440-41-7	1.6E+02	nc	~~4.5E+03~~(2.3E+03)	nc	4.0E+00	gws
1,1'-Biphenyl	92-52-4	5.1E+01	nc	2.1E+02	nc	8.3E-01	nc
Bis(2-chloroethyl)ether	111-44-4	2.4E-01	c	~~1.3E+01~~(1.1E+01)	c	1.4E-02	c
Bis(2-chloroisopropyl)ether	108-60-1	5.1E+00	c	~~3.1E+02~~(2.3E+02)	c	3.6E-01	c
Bis(chloromethyl)ether	542-88-1	8.9E-05	c	3.9E-03	c	7.2E-05	c
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	3.9E+01	c	~~2.5E+03~~(1.6E+03)	c	6.0E+00	gws
Bromodichloromethane	75-27-4	3.1E-01	c	1.4E+01	c	~~1.3E-01~~(8.0E+01)	~~c~~gws
Bromoform (tribromomethane)	75-25-2	2.0E+01	c	9.1E+02	~~C~~satc	~~3.3E+00~~ (8.0E+01)	~~c~~gws
Bromomethane	74-83-9	7.3E+00	nc	~~3.3E+01~~(3.2E+01)	nc	7.5E+00	nc
Bromophos	2104-96-3	3.4E+02	nc	~~6.5E+03~~(3.8E+03)	nc	1.8E+01	nc
1,3-Butadiene	106-99-0	~~6.1E-02~~(8.1E-02)	c	~~3.2E+00~~(3.6E+00)	c	~~1.8E-02~~(7.1E-02)	c
1-Butanol	71-36-3	4.7E+03	nc	7.6E+03	Csat	5.3E+02	nc
Butylate	2008-41-5	3.2E+03	nc	~~4.5E+04~~(3.3E+04)	nc	2.1E+02	nc
n-Butylbenzene	104-51-8	1.1E+02	Csat	1.1E+02	Csat	1.0E+03	nc
Butyl benzyl phthalate	85-68-7	2.9E+02	c	~~1.9E+04~~(1.2E+04)	c	1.6E+01	c
Cadmium and compounds	7440-43-9	3.7E+01	nc	~~9.8E+02~~(5.3E+02)	nc	5.0E+00	gws
Caprolactam	105-60-2	3.1E+04	nc	~~6.0E+05~~(4.0E+05)	nc	9.9E+03	nc
Carbaryl	63-25-2	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	1.8E+03	nc
Carbon disulfide	75-15-0	7.4E+02	Csat	7.4E+02	Csat	8.1E+02	nc
Carbon tetrachloride	56-23-5	7.0E-01	c	~~3.2E+01~~(3.1E+01)	c	5.0E+00	gws
Carbosulfan	55285-14-8	6.3E+02	nc	~~1.3E+04~~(8.2E+03)	nc	5.1E+01	nc
Chloranil	118-75-2	1.4E+00	c	~~8.9E+01~~(5.7E+01)	c	1.8E-01	c
Chlordane (Technical Mixture)	12789-03-6	1.9E+00	c	~~1.6E+02~~(8.9E+01)	c	2.0E+00	gws
Chloroacetic acid	79-11-8	1.3E+02	nc	~~2.5E+03~~(1.6E+03)	nc	~~4.0E+01~~(6.0E+01)	~~nc~~gws
4-Chloroaniline	106-47-8	2.7E+00	c	~~1.8E+02~~(1.1E+02)	c	3.7E-01	c
Chlorobenzene	108-90-7	2.9E+02	nc	7.6E+02	Csat	1.0E+02	gws
Chlorobenzilate	510-15-6	4.9E+00	c	~~3.2E+02~~(2.1E+02)	c	3.1E-01	c
p-Chlorobenzoic acid	74-11-3	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	5.1E+02	nc
2-Chloro-1,3-butadiene	126-99-8	1.1E-02	c	4.7E-01	c	1.9E-02	c

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
1-Chlorobutane	109-69-3	2.5E+02	nc	7.3E+02	Csat	2.0E+02	nc
Chloroethane	75-00-3	2.1E+03	Csat	2.1E+03	Csat	2.1E+04	nc
Chloroform	67-66-3	3.4E-01	c	1.5E+01	c	2.2E-01(8.0E+01)	cgws
Chloromethane	74-87-3	1.2E+02	nc	5.0E+02	nc	1.9E+02	nc
4-Chloro-2-methylaniline	95-69-2	5.4E+00	c	3.5E+02(2.3E+02)	c	7.0E-01	c
beta-Chloronaphthalene	91-58-7	5.0E+03	nc	6.7E+04(5.0E+04)	nc	3.3E+02	nc
o-Chloronitrobenzene	88-73-3	1.8E+00	c	1.2E+02(7.7E+01)	c	2.4E-01	c
p-Chloronitrobenzene	100-00-5	6.3E+01(9.0E+00)	ncc	1.3E+03(3.8E+02)	ncc	1.1E+01(1.2E+00)	c
2-Chlorophenol	95-57-8	3.4E+02	nc	5.5E+03(3.9E+03)	nc	2.7E+01	nc
o-Chlorotoluene	95-49-8	4.5E+02	nc	9.1E+02	Csat	9.0E+01	nc
Chlorpyrifos-methyl	5598-13-0	6.3E+02	nc	1.3E+04(8.2E+03)	nc	1.2E+02	nc
Chromium III	16065-83-1	1.2E+05	nc	1.0E+06	max	2.2E+04	nc
Chromium VI	18540-29-9	3.0E-01	c	1.3E+02(6.3E+01)	c	3.5E-02	c
Cobalt	7440-48-4	2.3E+01	nc	6.9E+02(3.5E+02)	nc	6.0E+00	nc
Copper and compounds	7440-50-8	3.1E+03	nc	9.3E+04(4.7E+04)	nc	8.0E+02(1.3E+03)	ncgws
Crotonaldehyde	123-73-9	8.2E-02	c	4.1E+00(3.6E+00)	c	8.2E-03	c
Cyanazine	21725-46-2	6.5E-01	c	4.2E+01(2.7E+01)	c	8.8E-02	c
Cyanide and compounds	74-90-8	2.3E+01	nc	1.7E+02(1.5E+02)	nc	2.0E+02	gws
Cyanogen	460-19-5	7.8E+01	nc	2.3E+03(1.2E+03)	nc	2.0E+01	nc
Cyanogen bromide	506-68-3	7.0E+03	nc	2.1E+05(1.1E+05)	nc	1.8E+03	nc
Cyclohexane	110-82-7	1.2E+02	Csat	1.2E+02	Csat	1.3E+04	nc
Cyclohexanone	108-94-1	5.1E+03	Csat	5.1E+03	Csat	1.4E+03	nc
Cyhalothrin/Karate	68085-85-8	3.2E+02(6.3E+01)	nc	6.3E+03(8.2E+02)	nc	1.0E+02(2.0E+01)	nc
Cypermethrin	52315-07-8	6.3E+02(3.8E+03)	nc	1.3E+04(4.9E+04)	nc	2.0E+02(1.2E+03)	nc
Dacthal	1861-32-1	6.3E+02	nc	1.3E+04(8.2E+03)	nc	1.2E+02	nc
Dalapon	75-99-0	1.9E+03	nc	3.8E+04(2.5E+04)	nc	2.0E+02	gws
DDD	72-54-8	2.3E+00(1.9E+00)	cnc	1.5E+02(2.5E+01)	cnc	3.2E-02	c
DDE	72-55-9	2.0E+00	c	1.8E+02(9.3E+01)	c	4.6E-02	c
DDT	50-29-3	1.9E+00	c	1.5E+02(8.5E+01)	c	2.3E-01	c
Diazinon	333-41-5	4.4E+01	nc	8.9E+02(5.7E+02)	nc	1.0E+01	nc
Dibenzofuran	132-64-9	7.8E+01	nc	2.3E+03(1.2E+03)	nc	7.9E+00	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
1,4-Dibromobenzene	106-37-6	4.1E+02	nc	~~3.1E+03~~(2.8E+03)	nc	4.7E+01	nc
Dibromochloromethane	124-48-1	8.3E+00	c	~~7.8E+02~~(3.9E+02)	c	~~8.7E-01~~(8.0E+01)	egws
1,2-Dibromo-3-chloropropane	96-12-8	5.7E-03	c	~~7.0E-01~~(6.9E-01)	c	2.0E-01	gws
1,2-Dibromoethane	106-93-4	3.9E-02	c	~~1.8E+00~~(1.7E+00)	c	5.0E-02	gws
Dibutyl phthalate	84-74-2	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	9.0E+02	nc
Dicamba	1918-00-9	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	5.7E+02	nc
1,2-Dichlorobenzene	95-50-1	3.8E+02	Csat	3.8E+02	Csat	6.0E+02	gws
1,4-Dichlorobenzene	106-46-7	2.8E+00	c	1.2E+02	c	7.5E+01	gws
3,3'-Dichlorobenzidine	91-94-1	1.2E+00	c	~~7.9E+01~~(5.1E+01)	c	1.3E-01	c
1,4-Dichloro-2-butene	764-41-0	2.3E-03	c	1.0E-01	c	1.3E-03	c
Dichlorodifluoromethane	75-71-8	9.4E+01	nc	4.0E+02	nc	2.0E+02	nc
1,1-Dichloroethane	75-34-3	3.8E+00	c	1.7E+02	c	2.8E+00	c
1,2-Dichloroethane	107-06-2	5.0E-01	c	~~2.3E+01~~(2.2E+01)	c	5.0E+00	gws
1,1-Dichloroethylene	75-35-4	2.4E+02	nc	1.1E+03	nc	7.0E+00	gws
1,2-Dichloroethylene (cis)	156-59-2	1.7E+01	nc	~~8.1E+01~~(8.0E+01)	nc	7.0E+01	gws
1,2-Dichloroethylene (trans)	156-60-5	~~1.3E+02~~(7.5E+01)	nc	~~5.7E+02~~(3.2E+02)	nc	1.0E+02	gws
2,4-Dichlorophenol	120-83-2	1.9E+02	nc	~~3.8E+03~~(2.5E+03)	nc	4.6E+01	nc
4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	94-82-6	~~5.1E+02~~(1.9E+03)	nc	~~4.0E+04~~(2.5E+04)	nc	~~1.2E+02~~(4.5E+02)	nc
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94-75-7	7.0E+02	nc	~~1.6E+04~~(9.6E+03)	nc	7.0E+01	gws
1,2-Dichloropropane	78-87-5	~~1.1E+00~~(2.7E+00)	c	~~4.9E+01~~(7.1E+01)	enc	5.0E+00	gws
1,3-Dichloropropene	542-75-6	1.9E+00	c	~~9.9E+01~~(8.6E+01)	c	4.7E-01	c
2,3-Dichloropropanol	616-23-9	1.9E+02	nc	~~3.8E+03~~(2.5E+03)	nc	5.9E+01	nc
Dichlorvos	62-73-7	1.9E+00	c	~~1.2E+02~~(7.9E+01)	c	2.6E-01	c
Dicyclopentadiene	77-73-6	1.4E+00	nc	5.8E+00	nc	6.3E-01	nc
Dieldrin	60-57-1	4.2E-02	c	~~3.8E+00~~(2.0E+00)	c	7.2E-04	c
Diethylene glycol, monobutyl ether	112-34-5	1.9E+03	nc	~~3.6E+04~~(2.4E+04)	nc	6.0E+02	nc
Diethylene glycol, monoethyl ether	111-90-0	3.8E+03	nc	~~7.3E+04~~(4.8E+04)	nc	1.2E+03	nc
Di(2-ethylhexyl)adipate	103-23-1	4.5E+02	c	~~3.0E+04~~(1.9E+04)	c	4.0E+02	gws
Diethyl phthalate	84-66-2	5.1E+04	nc	~~1.0E+06~~(6.6E+05)	~~max~~nc	1.5E+04	nc
Diethylstilbestrol	56-53-1	1.6E-03	c	~~1.0E-01~~(6.6E-02)	c	5.1E-05	c
Difenzoquat (Avenge)	43222-48-6	~~5.1E+03~~(5.2E+03)	nc	~~1.0E+05~~(6.8E+04)	nc	~~1.6E+03~~(1.7E+03)	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
1,1-Difluoroethane	75-37-6	1.4E+03	Csat	1.4E+03	Csat	8.3E+04	nc
Diisopropyl methylphosphonate	1445-75-6	5.3E+02	Csat	5.3E+02	Csat	1.6E+03	nc
3,3'-Dimethoxybenzidine	119-90-4	3.4E-01	c	2.2E+01(1.4E+01)	c	4.7E-02	c
N-N-Dimethylaniline	121-69-7	9.6E+01(2.6E+01)	nc	8.3E+02(7.2E+02)	Csatn c	1.0E+01(2.5E+00)	nc
2,4-Dimethylaniline	95-68-1	2.7E+00	c	1.8E+02(1.1E+02)	c	3.7E-01	c
2,4-Dimethylaniline hydrochloride	21436-96-4	9.4E-01	c	6.1E+01(4.0E+01)	c	1.3E-01	c
3,3'-Dimethylbenzidine	119-93-7	4.9E-02	c	3.2E+00(2.1E+00)	c	6.5E-03	c
2,4-Dimethylphenol	105-67-9	1.3E+03	nc	2.5E+04(1.6E+04)	nc	3.6E+02	nc
2,6-Dimethylphenol	576-26-1	3.8E+01	nc	7.6E+02(4.9E+02)	nc	1.1E+01	nc
3,4-Dimethylphenol	95-65-8	6.3E+01	nc	1.3E+03(8.2E+02)	nc	1.8E+01	nc
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	1.3E+02	nc	2.5E+03(1.6E+03)	nc	2.3E+01	nc
1,2-Dinitrobenzene	528-29-0	6.3E+00	nc	1.3E+02(8.2E+01)	nc	1.9E+00	nc
1,3-Dinitrobenzene	99-65-0	6.3E+00	nc	1.3E+02(8.2E+01)	nc	2.0E+00	nc
1,4-Dinitrobenzene	100-25-4	6.3E+00	nc	1.3E+02(8.2E+01)	nc	2.0E+00	nc
2,4-Dinitrophenol	51-28-5	1.3E+02	nc	2.5E+03(1.6E+03)	nc	3.9E+01	nc
Dinitrotoluene (Technical Grade)	25321-14-6	1.2E+00	c	7.9E+01(5.1E+01)	c	1.6E-01(1.0E-01)	c
2,4-Dinitrotoluene	121-14-2	1.7E+00	c	1.1E+02(7.4E+01)	c	2.4E-01	c
2,6-Dinitrotoluene	606-20-2	3.6E-01	c	2.4E+01(1.5E+01)	c	4.9E-02	c
Dinoseb	88-85-7	6.3E+01	nc	1.3E+03(8.2E+02)	nc	7.0E+00	gws
1,4-Dioxane	123-91-1	5.4E+00	c	4.0E+02(2.5E+02)	c	4.6E-01	c
Diphenylamine	122-39-4	1.6E+03(6.3E+03)	nc	3.2E+04(8.2E+04)	nc	3.1E+02(1.3E+03)	nc
1,2-Diphenylhydrazine	122-66-7	6.8E-01	c	4.4E+01(2.9E+01)	c	7.8E-02	c
Diquat	85-00-7 (2764-72-9)	1.4E+02	nc	2.8E+03(1.8E+03)	nc	2.0E+01	gws
Disulfoton	298-04-4	2.5E+00	nc	5.1E+01(3.3E+01)	nc	5.0E-01	nc
1,4-Dithiane	505-29-3	5.4E+02	nc	6.7E+03(4.6E+03)	nc	5.3E+01	nc
Diuron	330-54-1	1.3E+02	nc	2.5E+03(1.6E+03)	nc	3.6E+01	nc
Endosulfan	115-29-7	4.5E+02	nc	1.0E+04(6.0E+03)	nc	3.1E+01	nc
Endothall	145-73-3	1.3E+03	nc	2.5E+04(1.6E+04)	nc	1.0E+02	gws
Endrin	72-20-8	1.9E+01	nc	3.8E+02(2.5E+02)	nc	2.0E+00	gws
Epichlorohydrin	106-89-8	2.0E+01	nc	8.9E+01(8.8E+01)	nc	2.0E+00	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Ethion	563-12-2	3.2E+01	nc	~~6.3E+02~~(4.1E+02)	nc	4.3E+00	nc
2-Ethoxyethanol	110-80-5	5.3E+03	nc	~~6.4E+04~~(4.9E+04)	nc	3.4E+02	nc
Ethyl acetate	141-78-6	6.7E+02	nc	2.8E+03	nc	1.4E+02	nc
Ethylbenzene	100-41-4	6.2E+00	c	~~2.8E+02~~(2.7E+02)	c	7.0E+02	gws
Ethylene diamine	107-15-3	6.3E+03	nc	~~1.2E+05~~(7.6E+04)	nc	4.9E+02	nc
Ethylene glycol	107-21-1	1.3E+05	nc	1.0E+06	max	4.0E+04	nc
Ethylene glycol, monobutyl ether	111-76-2	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	2.0E+03	nc
Ethylene thiourea (ETU)	96-45-7	5.1E+00	nc	~~1.0E+02~~(6.6E+01)	nc	1.6E+00	nc
Ethyl ether	60-29-7	2.1E+03	nc	~~1.0E+04~~(9.9E+03)	nc	1.1E+03	nc
Ethyl methacrylate	97-63-2	1.1E+03	Csat	1.1E+03	Csat	6.3E+02	nc
Fenamiphos	22224-92-6	1.6E+01	nc	~~3.2E+02~~(2.1E+02)	nc	4.4E+00	nc
Fluometuron	2164-17-2	8.2E+02	nc	~~1.6E+04~~(1.1E+04)	nc	2.4E+02	nc
Fluorine (Soluble Fluoride)	7782-41-4	4.7E+03	nc	~~1.4E+05~~(7.0E+04)	nc	4.0E+03	gws
Fomesafen	72178-02-0	~~2.9E+00~~(1.6E+02)	~~c~~nc	~~1.9E+02~~(2.1E+03)	~~c~~nc	~~3.9E-01~~(4.8E+01)	~~c~~nc
Fonofos	944-22-9	1.3E+02	nc	~~2.5E+03~~(1.6E+03)	nc	2.4E+01	nc
Formaldehyde	50-00-0	1.8E+01	c	7.9E+02	c	4.3E-01	c
Formic Acid	64-18-6	3.1E+01	nc	1.3E+02	nc	6.3E-01	nc
Furan	110-00-9	9.1E+00	nc	4.2E+01	nc	5.3E+00	nc
Furazolidone	67-45-8	1.4E-01	c	~~9.3E+00~~(6.0E+00)	c	2.0E-02	c
Furfural	98-01-1	2.2E+02	nc	~~4.3E+03~~(2.7E+03)	nc	3.8E+01	nc
Glycidaldehyde	765-34-4	2.4E+01	nc	~~2.8E+02~~(2.1E+02)	nc	1.7E+00	nc
Glyphosate	1071-83-6	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	7.0E+02	gws
Heptachlor	76-44-8	1.4E-01	c	~~1.1E+01~~(6.3+00)	c	4.0E-01	gws
Heptachlor epoxide	1024-57-3	7.1E-02	c	~~6.2E+00~~(3.3E+00)	c	2.0E-01	gws
Hexabromobenzene	87-82-1	1.5E+02	nc	~~3.4E+03~~(2.0E+03)	nc	1.1E+01	nc
Hexachlorobenzene	118-74-1	2.2E-01	c	~~1.3E+01~~(1.0E+01)	c	1.0E+00	gws
Hexachlorobutadiene	87-68-3	1.3E+00	c	1.7E+01	Csat	1.4E-01	c
HCH (alpha)	319-84-6	8.6E-02	c	~~5.6E+00~~(3.6E+00)	c	7.2E-03	c
HCH (beta)	319-85-7	3.0E-01	c	~~2.0E+01~~(1.3E+01)	c	2.5E-02	c
HCH (gamma) Lindane	58-89-9	5.7E-01	c	~~4.4E+01~~(2.5E+01)	c	2.0E-01	gws
HCH-technical	608-73-1	3.0E-01	c	~~2.0E+01~~(1.3E+01)	c	2.5E-02	c

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Hexachlorocyclopentadiene	77-47-4	1.9E+00	nc	8.0E+00	nc	5.0E+01	gws
Hexachlorodibenzo-p-dioxin mixture (HxCDD)	Various	1.0E-04	c	~~8.4E-03~~(4.7E-03)	c	1.3E-05	c
Hexachloroethane	67-72-1	2.0E+00	c	~~9.1E+01~~(8.6E+01)	c	3.3E-01	c
Hexachlorophene	70-30-4	1.9E+01	nc	~~3.8E+02~~(2.5E+02)	nc	6.0E+00	nc
1,6-Hexamethylene diisocyanate	822-06-0	3.4E+00	nc	1.4E+01	nc	2.1E-02	nc
n-Hexane	110-54-3	1.4E+02	Csat	1.4E+02	Csat	1.5E+03	nc
Hexazinone	51235-04-2	2.1E+03	nc	~~4.2E+04~~(2.7E+04)	nc	6.4E+02	nc
HMX	2691-41-0	3.9E+03	nc	~~1.1E+05~~(5.7E+04)	nc	1.0E+03	nc
Hydrazine	302-01-2	~~2.3E-01~~(3.4E-02)	c	~~2.2E+01~~(1.5E+00)	c	1.1E-03	c
Hydrogen sulfide	7783-06-4	1.0E+06	max	1.0E+06	max	4.2E+00	nc
p-Hydroquinone	123-31-9	9.0E+00	c	~~5.9E+02~~(3.8E+02)	c	1.3E+00	c
Iron	7439-89-6	5.5E+04	nc	~~1.0E+06~~(8.2E+05)	~~max~~nc	1.4E+04	nc
Isobutanol	78-83-1	1.0E+04	Csat	1.0E+04	Csat	1.7E+03	nc
Isophorone	78-59-1	5.7E+02	c	~~3.7E+04~~(2.4E+04)	c	7.8E+01	c
Isopropalin	33820-53-0	1.1E+03	nc	~~2.6E+04~~(1.5E+04)	nc	2.9E+01	nc
Isopropylbenzene (Cumene)	98-82-8	2.7E+02	Csat	2.7E+02	Csat	4.5E+02	nc
Isopropyl methyl phosphonic acid	1832-54-8	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	2.0E+03	nc
Lead*	7439-92-1	4.0E+02	nc	~~4.0E+03~~(8.0E+02)	nc	1.5E+01	gws
Lead (tetraethyl)	78-00-2	7.8E-03	nc	~~2.3E-01~~(1.2E-01)	nc	1.3E-03	nc
Lithium	7439-93-2	1.6E+02	nc	~~4.7E+03~~(2.3E+03)	nc	4.0E+01	nc
Malathion	121-75-5	1.3E+03	nc	~~2.5E+04~~(1.6E+04)	nc	3.9E+02	nc
Maleic anhydride	108-31-6	6.3E+03	nc	~~1.2E+05~~(8.0E+04)	nc	1.9E+03	nc
Manganese (non-food)	7439-96-5	~~3.5E+03~~(1.8E+03)	nc	~~8.0E+04~~(2.6E+04)	nc	~~8.5E+02~~(4.3E+02)	nc
Mephosfolan	950-10-7	5.7E+00	nc	~~1.1E+02~~(7.4E+01)	nc	1.8E+00	nc
Mepiquat	24307-26-4	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	6.0E+02	nc
Mercury (elemental and inorganic)	7439-97-6	3.1E+00	Csat	3.1E+00	Csat	2.0E+00	gws
Mercury (methyl)	22967-92-6	7.8E+00	nc	~~2.3E+02~~(1.2E+02)	nc	2.0E+00	nc
Methacrylonitrile	126-98-7	7.6E+00	nc	~~1.9E+02~~(1.0E+02)	nc	1.9E+00	nc
Methanol	67-56-1	1.1E+05	Csat	1.1E+05	Csat	2.0E+04	nc
Methidathion	950-37-8	~~6.3E+01~~(9.5E+01)	nc	~~1.3E+03~~(1.2E+03)	nc	~~1.9E+01~~(2.9E+01)	nc
Methoxychlor	72-43-5	3.2E+02	nc	~~6.3E+03~~(4.1E+03)	nc	4.0E+01	gws

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Methyl acetate	79-20-9	2.3E+04	nc	2.9E+04	Csat	5.3E+03	nc
Methyl acrylate	96-33-3	1.6E+02	nc	6.6E+02	nc	4.2E+01	nc
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	5.0E+01	c	~~2.3E+03~~(2.2E+03)	c	1.4E+01	c
2-Methylaniline (o-toluidine)	95-53-4	~~3.0E+00~~(3.4E+01)	c	~~2.0E+02~~(1.4E+03)	c	~~4.3E-01~~(4.7E+00)	c
2-Methyl-4-chlorophenoxyacetic acid	94-74-6	3.2E+01	nc	~~6.3E+02~~(4.1E+02)	nc	7.5E+00	nc
4-(2-Methyl-4-chlorophenoxy) butyric acid	94-81-5	~~6.3E+02~~(2.8E+02)	nc	~~1.3E+04~~(3.6E+03)	nc	~~1.5E+02~~(6.5E+01)	nc
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	6.3E+01	nc	~~1.3E+03~~(8.2E+02)	nc	1.6E+01	nc
4,4'-Methylenebisbenzeneamine	101-77-9	3.4E-01	c	~~2.2E+01~~(1.4E+01)	c	4.7E-02	c
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1.2E+00	c	~~3.5E+02~~(2.3E+02)	c	1.6E-01	c
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	1.2E+01	c	~~7.7E+02~~(5.0E+02)	c	~~4.8E-01~~(7.4E-01)	c
Methylene bromide	74-95-3	2.5E+01	nc	1.1E+02	nc	8.0E+00	nc
Methylene chloride	75-09-2	5.8E+01	c	3.3E+03	~~Csat~~nc	5.0E+00	gws
Methylenediphenyl diisocyanate	101-68-8	6.5E+05	nc	1.0E+06	max		
Methyl ethyl ketone	78-93-3	2.8E+04	nc	2.8E+04	Csat	5.6E+03	nc
Methyl isobutyl ketone	108-10-1	3.4E+03	Csat	3.4E+03	Csat	1.2E+03	nc
Methyl methacrylate	80-62-6	2.4E+03	Csat	2.4E+03	Csat	1.4E+03	nc
2-Methyl-5-nitroaniline	99-55-8	6.0E+01	c	~~3.9E+03~~(2.6E+03)	c	8.2E+00	c
Methyl parathion	298-00-0	1.6E+01	nc	~~3.2E+02~~(2.1E+02)	nc	4.5E+00	nc
2-Methylphenol	95-48-7	3.2E+03	nc	~~6.3E+04~~(4.1E+04)	nc	9.3E+02	nc
3-Methylphenol (Cresol)	108-39-4	3.2E+03	nc	~~6.3E+04~~(4.1E+04)	nc	9.3E+02	nc
4-Methylphenol	106-44-5	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	1.9E+03	nc
Methyl styrene (mixture)	25013-15-4	3.3E+02	nc	3.9E+02	Csat	2.3E+01	nc
Methyl styrene (alpha)	98-83-9	5.0E+02	Csat	5.0E+02	Csat	7.8E+02	nc
Metolachlor (Dual)	51218-45-2	9.5E+03	nc	~~1.9E+05~~(1.2E+05)	nc	2.7E+03	nc
Metribuzin	21087-64-9	1.6E+03	nc	~~3.2E+04~~(2.1E+04)	nc	4.9E+02	nc
Mirex	2385-85-5	3.6E-02	c	~~3.1E+00~~(1.7E+00)	c	8.8E-04	c
Molybdenum	7439-98-7	3.9E+02	nc	~~1.2E+04~~(5.8E+03)	nc	1.0E+02	nc
Monochloramine	10599-90-3	7.8E+03	nc	~~2.3E+05~~(1.2E+05)	nc	~~2.0E+03~~(4.0E+03)	~~nc~~gws
Naled	300-76-5	1.2E+02	nc	~~1.3E+03~~(1.0E+03)	nc	1.1E+01	nc
Nickel and compounds	7440-02-0	1.5E+03	nc	~~4.3E+04~~(2.2E+04)	nc	3.9E+02	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Nitrate	14797-55-8	1.3E+05	nc	1.0E+06	max	1.0E+04	gws
Nitrite	14797-65-0	7.8E+03	nc	~~2.3E+05~~(1.2E+05)	nc	1.0E+03	gws
2-Nitroaniline	88-74-4	6.3E+02	nc	~~1.2E+04~~(8.0E+03)	nc	1.9E+02	nc
Nitrobenzene	98-95-3	5.5E+00	c	2.4E+02	c	1.4E-01	c
Nitrofurantoin	67-20-9	4.4E+03	nc	~~8.9E+04~~(5.7E+04)	nc	1.4E+03	nc
Nitrofurazone	59-87-0	4.2E-01	c	~~2.7E+01~~(1.8E+01)	c	6.0E-02	c
Nitroglycerin	55-63-0	6.3E+00	nc	~~1.3E+02~~(8.2E+01)	nc	2.0E+00	nc
2-Nitropropane	79-46-9	1.5E-02	c	6.4E-01	c	2.1E-03	c
N-Nitrosodi-n-butylamine	924-16-3	1.0E-01	c	~~7.6E+00~~(4.7E+00)	c	2.7E-03	c
N-Nitrosodiethanolamine	1116-54-7	1.9E-01	c	~~1.3E+01~~(8.2E+00)	c	2.8E-02	c
N-Nitrosodiethylamine	55-18-5	8.1E-04	c	~~2.4E-01~~(1.5E-01)	c	1.7E-04	c
N-Nitrosodimethylamine	62-75-9	2.0E-03	c	~~4.8E-01~~(3.5E-01)	c	1.1E-04	c
N-Nitrosodiphenylamine	86-30-6	1.1E+02	c	~~7.2E+03~~(4.7E+03)	c	1.2E+01	c
N-Nitroso di-n-propylamine	621-64-7	7.8E-02	c	~~5.1E+00~~(3.3E+00)	c	1.1E-02	c
N-Nitroso-N-methylethylamine	10595-95-6	2.0E-02	c	~~1.4E+00~~(9.4E-01)	c	7.1E-04	c
N-Nitrosopyrrolidine	930-55-2	2.6E-01	c	~~1.7E+01~~(1.1E+01)	c	3.7E-02	c
m-Nitrotoluene	99-08-1	6.3E+00	nc	~~1.3E+02~~(8.2E+01)	nc	1.7E+00	nc
o-Nitrotoluene	88-72-2	3.2E+00	c	~~3.0E+02~~(1.5E+02)	c	3.1E-01	c
p-Nitrotoluene	99-99-0	3.4E+01	c	~~2.2E+03~~(1.4E+03)	c	4.3E+00	c
NuStar (Flusilazole)	85509-19-9	~~4.4E+01~~(1.3E+02)	nc	~~8.9E+02~~(1.6E+03)	nc	~~1.1E+01~~(3.1E+01)	nc
Oryzalin	19044-88-3	~~3.2E+03~~(7.0E+01)	ncc	~~6.3E+04~~(2.9E+03)	ncc	~~8.1E+02~~(7.9E+00)	ncc
Oxadiazon	19666-30-9	3.2E+02	nc	~~6.3E+03~~(4.1E+03)	nc	4.7E+01	nc
Oxamyl	23135-22-0	1.6E+03	nc	~~3.2E+04~~(2.1E+04)	nc	2.0E+02	gws
Oxyfluorfen	42874-03-3	~~1.9E+02~~(7.4E+00)	ncc	~~3.8E+03~~(3.1E+02)	ncc	~~3.2E+01~~(5.4E-01)	ncc
Paraquat dichloride	1910-42-5	2.8E+02	nc	~~5.7E+03~~(3.7E+03)	nc	9.0E+01	nc
Parathion	56-38-2	3.8E+02	nc	~~7.6E+03~~(4.9E+03)	nc	8.6E+01	nc
Pentachlorobenzene	608-93-5	5.0E+01	nc	~~6.8E+02~~(5.0E+02)	nc	2.0E+00	nc
Pentachloronitrobenzene	82-68-8	2.7E+00	c	~~2.5E+02~~(1.3E+02)	c	1.2E-01	c
Pentachlorophenol	87-86-5	1.0E+00	c	~~5.2E+01~~(4.0E+01)	c	1.0E+00	gws
Perchlorate and perchlorate salts	Various	5.5E+01	nc	~~1.6E+03~~(8.2E+02)	nc	1.4E+01	nc
Permethrin	52645-53-1	3.2E+03	nc	~~6.3E+04~~(4.1E+04)	nc	1.0E+03	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Phenol	108-95-2	1.9E+04	nc	~~3.8E+05~~(2.5E+05)	nc	5.8E+03	nc
m-Phenylenediamine	108-45-2	3.8E+02	nc	~~7.6E+03~~(4.9E+03)	nc	1.2E+02	nc
p-Phenylenediamine	106-50-3	~~1.2E+04~~(6.3E+01)	nc	~~2.4E+05~~(8.2E+02)	nc	~~3.8E+03~~(2.0E+01)	nc
2-Phenylphenol	90-43-7	2.9E+02	c	~~1.9E+04~~(1.2E+04)	c	3.1E+01	c
Phosphine	7803-51-2	2.3E+01	nc	~~7.0E+02~~(3.5E+02)	nc	5.7E-01	nc
Phosphorus (white)	7723-14-0	1.6E+00	nc	~~1.2E+01~~(2.3E+01)	~~Csatn~~ c	4.0E-01	nc
p-Phthalic acid	100-21-0	~~6.3E+04~~(3.2E+04)	nc	~~1.0E+06~~(4.1E+05)	~~max~~nc	~~1.9E+04~~(9.4E+03)	nc
Phthalic anhydride	85-44-9	1.3E+05	nc	1.0E+06	max	3.9E+04	nc
Polybrominated biphenyls	~~59536-65-1~~(36355-01-8)	1.8E-02	c	~~1.2E+00~~(7.7E-01)	c	2.6E-03	c
Polychlorinated biphenyls (PCBs)	1336-36-3	~~3.4E-01~~(3.1E-01)	c	~~3.1E+01~~(1.4E+01)	c	5.0E-01	gws
Aroclor 1016	12674-11-2	5.5E+00	nc	~~1.6E+02~~(8.2E+01)	nc	2.2E-01	c
Aroclor 1221	11104-28-2	2.6E-01	c	~~1.9E+01~~(1.2E+01)	c	7.9E-03	c
Aroclor 1232	11141-16-5	2.2E-01	c	~~1.4E+01~~(1.0E+01)	c	7.9E-03	c
Aroclor 1242	53469-21-9	3.1E-01	c	~~2.6E+01~~(1.5E+01)	c	7.9E-03	c
Aroclor 1248	12672-29-6	3.1E-01	c	~~2.7E+01~~(1.5E+01)	c	7.9E-03	c
Aroclor 1254	11097-69-1	3.2E-01	c	~~2.8E+01~~(1.5E+01)	c	7.9E-03	c
Aroclor 1260	11096-82-5	3.3E-01	c	~~3.0E+01~~(1.6E+01)	c	7.9E-03	c
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	83-32-9	4.1E+03	nc	~~7.0E+04~~(4.7E+04)	nc	2.4E+02	nc
Acenaphthylene	208-96-8	4.2E+03	nc	~~8.0E+04~~(5.1E+04)	nc	~~3.2E+02~~(2.4E+02)	nc
Anthracene	120-12-7	2.3E+04	nc	~~7.0E+05~~(3.5E+05)	nc	1.8E+03	nc
Benz[a]anthracene	56-55-3	~~2.1E-01~~(1.5E+00)	c	~~8.3E+01~~(3.2E+02)	c	~~1.2E-02~~(3.0E-02)	c
Benzo[b]fluoranthene	205-99-2	~~1.6E-01~~(1.1E+00)	c	~~4.3E+01~~(2.1E+02)	c	~~3.4E-02~~(2.5E-01)	c
Benzo[k]fluoranthene	207-08-9	~~1.6E+00~~(1.1E+01)	c	~~4.3E+02~~(2.1E+03)	c	~~3.4E-01~~(2.5E+00)	c
Benzo[g,h,i]perylene	191-24-2	1.8E+03	nc	~~3.3E+04~~(2.3E+04)	nc	6.0E+02	nc
Benzo[a]pyrene	50-32-8	~~1.6E-02~~(1.1E-01)	c	~~4.3E+00~~(2.1E+01)	c	2.0E-01	gws
Chrysene	218-01-9	~~1.6E+01~~(1.1E+02)	c	~~4.3E+03~~(2.1E+04)	c	~~3.4E+00~~(2.5E+01)	c
Dibenz[a,h]anthracene	53-70-3	~~1.6E-02~~(1.1E-01)	c	~~4.3E+00~~(2.1E+01)	c	~~3.4E-03~~(2.5E-02)	c
Fluoranthene	206-44-0	2.4E+03	nc	~~4.4E+04~~(3.0E+04)	nc	8.0E+02	nc
Fluorene	86-73-7	2.9E+03	nc	~~5.2E+04~~(3.7E+04)	nc	1.5E+02	nc

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
Indeno[1,2,3-cd]pyrene	193-39-5	~~1.6E-01~~(1.1E+00)	c	~~4.3E+01~~(2.1E+02)	c	~~3.4E-02~~(2.5E-01)	c
1-Methylnaphthalene	90-12-0	2.4E+01	c	3.9E+02	Csat	1.1E+00	c
2-Methylnaphthalene	91-57-6	3.1E+02	nc	~~9.3E+03~~(4.7E+03)	nc	3.6E+01	nc
Naphthalene	91-20-3	~~4.1E+00~~(2.4E+00)	c	~~1.8E+02~~(1.1E+02)	c	~~1.7E-01~~(1.2E-01)	c
Phenanthrene	85-01-8	2.3E+04	nc	~~7.0E+05~~(3.5E+05)	nc	~~6.0E+03~~(1.7E+03)	nc
Pyrene	129-00-0	2.3E+03	nc	~~6.6E+04~~(3.4E+04)	nc	7.9E+01	nc
Prometon	1610-18-0	9.5E+02	nc	~~1.9E+04~~(1.2E+04)	nc	2.5E+02	nc
Prometryn	7287-19-6	~~2.5E+02~~(2.5E+03)	nc	~~5.1E+03~~(3.3E+04)	nc	~~6.0E+01~~(6.0E+02)	nc
Propachlor	1918-16-7	8.2E+02	nc	~~1.6E+04~~(1.1E+04)	nc	2.5E+02	nc
Propanil	709-98-8	3.2E+02	nc	~~6.3E+03~~(4.1E+03)	nc	8.2E+01	nc
Propargite	2312-35-8	~~1.3E+03~~(2.9E+00)	~~nc~~c	~~2.5E+04~~(1.2E+02)	~~nc~~c	~~1.6E+02~~(1.6E-01)	~~nc~~c
n-Propylbenzene	103-65-1	2.6E+02	Csat	2.6E+02	Csat	6.6E+02	nc
Propylene glycol	57-55-6	1.0E+06	max	1.0E+06	max	4.0E+05	nc
Propylene glycol, monoethyl ether	1569-02-4	3.9E+04	Csat	3.9E+04	Csat	1.4E+04	nc
Propylene glycol, monomethyl ether	107-98-2	4.2E+04	nc	1.1E+05	Csat	3.2E+03	nc
Pursuit (Imazethapyr)	81335-77-5	~~1.6E+04~~(1.6E+05)	nc	~~3.2E+05~~(1.0E+06)	~~nc~~max	~~4.7E+03~~(4.7E+04)	nc
Pyridine	110-86-1	5.8E+01	nc	~~6.6E+02~~(5.1E+02)	nc	5.3E+00	nc
Quinoline	91-22-5	1.8E-01	c	~~4.2E+01~~(7.7E+00)	c	2.4E-02	c
RDX (Cyclonite)	121-82-4	6.1E+00	c	~~5.3E+02~~(2.8E+02)	c	7.0E-01	c
Resmethrin	10453-86-8	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	6.7E+01	nc
Ronnel	299-84-3	3.8E+03	nc	~~9.0E+04~~(5.1E+04)	nc	2.0E+02	nc
Rotenone	83-79-4	2.5E+02	nc	~~5.1E+03~~(3.3E+03)	nc	6.1E+01	nc
Selenious Acid	7783-00-8	3.9E+02	nc	~~1.2E+04~~(5.8E+03)	nc	~~9.9E+01~~(1.0E+02)	nc
Selenium	7782-49-2	3.9E+02	nc	~~1.2E+04~~(5.8E+03)	nc	5.0E+01	gws
Silver and compounds	7440-22-4	3.9E+02	nc	~~1.2E+04~~(5.8E+03)	nc	9.4E+01	nc
Simazine	122-34-9	4.5E+00	c	~~3.9E+02~~(1.9E+02)	c	4.0E+00	gws
Sodium azide	26628-22-8	3.1E+02	nc	~~9.3E+03~~(4.7E+03)	nc	8.0E+01	nc
Sodium diethyldithiocarbamate	148-18-5	2.0E+00	c	~~1.3E+02~~(8.5E+01)	c	2.9E-01	c
Strontium, stable	7440-24-6	4.7E+04	nc	~~1.0E+06~~(7.0E+05)	~~max~~nc	1.2E+04	nc
Strychnine	57-24-9	1.9E+01	nc	~~3.8E+02~~(2.5E+02)	nc	5.9E+00	nc
Styrene	100-42-5	8.7E+02	Csat	8.7E+02	Csat	1.0E+02	gws

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
tert-butanol	75-65-0	1.4E+03	nc	~~4.2E+04~~(2.1E+04)	nc	3.6E+02	nc
2,3,7,8-Tetrachlorodibenzodioxin (TCDD/dioxin)	1746-01-6	5.2E-06	c	~~4.7E-04~~(2.4E-04)	c	3.0E-05	gws
1,2,4,5-Tetrachlorobenzene	95-94-3	1.7E+01	nc	~~1.9E+02~~(1.5E+02)	nc	9.8E-01	nc
1,1,1,2-Tetrachloroethane	630-20-6	2.1E+00	c	~~9.7E+01~~(9.4E+01)	c	5.7E-01	c
1,1,2,2-Tetrachloroethane	79-34-5	6.4E-01	c	~~3.1E+01~~(2.8E+01)	c	7.6E-02	c
Tetrachloroethylene (PCE)	127-18-4	2.5E+01	c	1.7E+02	Csat	5.0E+00	gws
2,3,4,6-Tetrachlorophenol	58-90-2	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	2.4E+02	nc
p,a,a,a-Tetrachlorotoluene	5216-25-1	2.1E-02	c	~~1.4E+00~~(9.8E-01)	c	~~5.7E-04~~(5.5E-04)	c
Tetrahydrofuran	109-99-9	2.0E+04	nc	~~1.1E+05~~(1.0E+05)	nc	3.4E+03	nc
Thallium and compounds	7440-28-0	7.8E-01	nc	~~2.3E+01~~(1.2E+01)	nc	2.0E+00	gws
Thiobencarb	28249-77-6	6.3E+02	nc	~~1.3E+04~~(8.2E+03)	nc	1.6E+02	nc
Thiocyanates	Various	1.6E+01	nc	~~4.7E+02~~(2.3E+02)	nc	4.0E+00	nc
Tin and compounds	7440-31-5	4.7E+04	nc	~~1.0E+06~~(7.0E+05)	~~max~~nc	1.2E+04	nc
Toluene	108-88-3	8.2E+02	Csat	8.2E+02	Csat	1.0E+03	gws
Toluene-2,4-diamine	95-80-7	~~1.7E-01~~(1.4E-01)	c	~~1.1E+01~~(5.7E+00)	c	~~2.4E-02~~(1.9E-02)	c
Toluene-2,5-diamine	95-70-5	3.0E+00	c	~~2.0E+02~~(1.3E+02)	c	4.3E-01	c
Toluene-2,6-diamine	823-40-5	1.9E+03	nc	~~3.8E+04~~(2.5E+04)	nc	6.0E+02	nc
p-Toluidine	106-49-0	1.8E+01	c	~~1.2E+03~~(7.7E+02)	c	2.5E+00	c
Toxaphene	8001-35-2	4.9E-01	c	~~3.2E+01~~(2.1E+01)	c	3.0E+00	gws
1,2,4-Tribromobenzene	615-54-3	2.8E+02	nc	~~3.0E+03~~(2.4E+03)	nc	2.0E+01	nc
Tributyltin oxide (TBTO)	56-35-9	1.9E+01	nc	~~3.8E+02~~(2.5E+02)	nc	5.7E+00	nc
2,4,6-Trichloroaniline	634-93-5	1.9E+00	nc	~~3.8E+01~~(2.5E+01)	nc	4.0E-01	nc
1,2,4-Trichlorobenzene	120-82-1	2.4E+01	c	2.8E+02	nc	7.0E+01	gws
1,1,1-Trichloroethane	71-55-6	6.4E+02	Csat	6.4E+02	Csat	2.0E+02	gws
1,1,2-Trichloroethane	79-00-5	1.2E+00	c	6.8E+00	nc	5.0E+00	gws
Trichloroethylene (TCE)	79-01-6	~~5.0E-01~~(1.0E+00)	c	2.0E+01	nc	5.0E+00	gws
Trichlorofluoromethane	75-69-4	7.9E+02	nc	1.2E+03	Csat	1.1E+03	nc
2,4,5-Trichlorophenol	95-95-4	6.3E+03	nc	~~1.3E+05~~(8.2E+04)	nc	1.2E+03	nc
2,4,6-Trichlorophenol	88-06-2	4.9E+01	c	~~1.3E+03~~(8.2E+02)	nc	4.1E+00	c
2,4,5-Trichlorophenoxyacetic Acid	93-76-5	6.3E+02	nc	~~1.3E+04~~(8.2E+03)	nc	1.6E+02	nc
2-(2,4,5-Trichlorophenoxy) propionic acid	93-72-1	5.1E+02	nc	~~1.0E+04~~(6.6E+03)	nc	5.0E+01	gws

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
1,1,2-Trichloropropane	598-77-6	1.7E+02	nc	~~1.1E+03~~(1.0E+03)	nc	2.6E+01	nc
1,2,3-Trichloropropane	96-18-4	5.1E-03	c	~~2.2E+00~~(1.1E+00)	c	7.5E-04	c
1,2,3-Trichloropropene	96-19-5	7.8E-01	nc	3.3E+00	nc	6.2E-01	nc
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	9.1E+02	Csat	9.1E+02	Csat	~~5.7E+04~~(1.0E+04)	nc
1,2,4-Trimethylbenzene	95-63-6	~~6.2E+01~~(2.2E+02)	~~nc~~Csat	2.2E+02	Csat	~~1.5E+01~~(5.6E+01)	nc
1,3,5-Trimethylbenzene	108-67-8	1.8E+02	Csat	1.8E+02	Csat	~~1.2E+02~~(6.0E+01)	nc
Trimethyl phosphate	512-56-1	2.7E+01	c	~~1.8E+03~~(1.1E+03)	c	3.9E+00	c
1,3,5-Trinitrobenzene	99-35-4	2.2E+03	nc	~~6.0E+04~~(3.2E+04)	nc	5.9E+02	nc
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	1.6E+02	nc	~~4.6E+03~~(2.3E+03)	nc	3.9E+01	nc
2,4,6-Trinitrotoluene	118-96-7	2.1E+01	c	~~9.2E+02~~(5.1E+02)	nc	2.5E+00	c
Vanadium and compounds	7440-62-2	~~5.5E+00~~(4.6E+02)	~~nc~~c	~~1.6E+02~~(8.4E+03)	nc	~~1.2E+00~~(1.5E+02)	nc
Vinclozolin	50471-44-8	~~1.6E+03~~(7.6E+01)	nc	~~3.2E+04~~(9.8E+02)	nc	~~4.4E+02~~(2.1E+01)	nc
Vinyl acetate	108-05-4	9.7E+02	nc	2.7E+03	Csat	4.1E+02	nc
Vinyl bromide	593-60-2	~~1.3E-01~~(2.8E-01)	c	~~6.6E+00~~(1.2E+01)	c	~~1.8E-01~~(3.7E-01)	c
Vinyl chloride ~~(lifetime)~~	75-01-4	~~5.7E-02~~(6.1E-02)	c	(1.8E+01)	c	2.0E+00	gws
~~Vinyl chloride (adult)~~	~~75-01-4~~	-	-	~~2.2E+01~~	~~c~~	~~2.0E+00~~	~~gws~~
Warfarin	81-81-2	1.9E+01	nc	~~3.8E+02~~(2.5E+02)	nc	5.6E+00	nc
Xylenes	1330-20-7	2.6E+02	Csat	2.6E+02	Csat	1.0E+04	gws
Zinc and Compounds	7440-66-6	2.3E+04	nc	~~7.0E+05~~(3.5E+05)	nc	6.0E+03	nc
Zinc phosphide	1314-84-7	2.3E+01	nc	~~7.0E+02~~(3.5E+02)	nc	~~5.9E+00~~(6.0E+00)	nc
Zineb	12122-67-7	3.2E+03	nc	~~6.3E+04~~(4.1E+04)	nc	9.9E+02	nc

Notes

[1]Where appropriate, the residential and industrial soil values consider ingestion and dermal exposure to soil and inhalation exposure to contaminants moving from soil to ambient air from volatilization or particulate emission.

[2]Groundwater standards promulgated under 47CSR12 are provided, where available. Standards that are unavailable under 47CSR12 are based on a risk-based methodology that considers ingestion, dermal, and inhalation exposure arising from the domestic use of groundwater.

[3]The concentrations in this table shall be applied where the exposure pathways described in footnotes 1 and 2 are the major contributors to risks identified in the site assessment. If other exposure pathways are identified, the acceptable contractions shall be determined only in consultation with the Secretary, considering all exposure pathways, and all other requirements of the regulations.

[4]Basis of standard: c – cancer effect; nc – noncancer effect; max – calculated risk-based concentration exceeds maximum possible contaminant level of $1x10^6$ mg/kg; Csat – calculated risk-based concentration exceeds residual saturation level; gws – West Virginia Groundwater Quality Standards from 47CSR12.

CONTAMINANT	CAS No.	Residential Soil[1,3] (mg/kg)	Value Basis[4]	Industrial Soil[1,3] (mg/kg)	Value Basis[4]	Groundwater[2,3] (ug/L)	Value Basis[4]
*Lead – Residential soil based on Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (July 1994), U.S. EPA OSWER Directive 9355.4-12. Industrial soil based on the U.S. EPA's *Blood Lead Concentrations of U.S. Adult Females: Summary Statistics from Phases 1 and 2 of the National Health and Nutrition Evaluation Survey (NHANES III)* (2002) and *Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology* (2018).							