Tier 1 Environmental Action Levels Surfer

Hawai'i Department of Health
(Summer 2016, rev Jan 2017)

Key updates to 2011-2012 EALs
(Last major updates Summer 2016, refer to Appendix 9 for details)

1. Physiochemical parameter values and toxicity factors updated to reflect values used in May 2016 USEPA Regional Screening Levels guidance (USEPA 2016). No significant change to action levels for common contaminants. Refer to Volume 2, Appendix 8, update memo for details.

2. Added option for selection of chemicals by CAS number.

3. Vapor intrusion action level models revised to reflect tropical climate conditions, including a higher indoor air exchange rate and lower vapor entry rate that expected for colder climates.

4. Action levels for carcinogenic PAHs revised upwards to reflect a target cancer risk of 10-4 and take into account urban area background from auto exhaust and other anthropogenic sources.

5. Clarifications to various issues added to text (e.g., background of lead action levels, "TPH" includes petroleum hydrocarbons and related metabolites/degradants, soil EALs not applicable to bedrock, vapor intrusion action levels not applicable outside of tropical climate regions, etc.).

6. November 2016: Edits made to Summer 2016 updates to correct errors in default foc used for Csat, cadmium direct exposure action levles, phenol taste and odor threshold, links to mercury aquatic toxicity action levels, and links to Chemical Summary worksheet in the EAL Surfer. Aquatic toxicity screening levels revised to reflect 2012 HAR §11-54-1 Water Quality Standards (affected dinitrotoluenes, antimony, ethylbenzene, phenol and toluene).

7. December 2016: Soil screening levels for 3-Dibromo 1,2 chloropropane and Dibromochloromethane revised to correct error in vapor intrusion model. This only affected the commercial/industrial soil action levels for these chemicals in Appendix 1, Table C-1b. This did not affect the Tier 1 EALs or the EAL Surfer.

8. Revised January 2017 allow selection of chemical by CAS#.

References:

HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

USEPA, 2016, Screening Levels for Chemical Contaminants: U.S. Environmental Protection Agency, May 2016, prepared by Oak Ridge National Laboratories, http://www.epa.gov/region09/waste/sfund/prg/

Tier 1 Environmental Action Levels Surfer

Hawai'i Department of Health
(updated Summer 2016, rev Nov 2016)

Instructions For Use of EALs and EAL Surfer
(Refer also to Volume 1, Section 2 of EHE document)

Check with overseeing agency to ensure that you have the most up-to-date version of the EAL Surfer available and that the screening levels can be applied to your site (see Volume 1, Section 1.5).
Individual Surfer worksheets write-protected (password "EAL").

Steps 1 through 3 refer to the EAL - Site Input Worksheet ("EAL Surfer - Tier 1 EALs")

agency to ensure that proper categories are selected. "Unrestricted Land Use" category recommended for initial use at all sites to determine if future land use restrictions are needed. (Refer to Volume 1, Section 2.)

STEP 2. Select chemical of potential concern.

Surfer generates summary and detailed EALs for selected site scenario and chemical of concern.

STEP 3 (optional): Input representative site chemical concentration in soil, groundwater and/or soil gas. Surfer identifies if EALs exceeded. Refer to Detailed EAL worksheet tab to tentatively identified environmental hazards.

STEP 4: Laboratory method reporting limit takes precedence if greater than the EAL (assuming standard MRL for a commercial laboratory). Natural background concentration of metals takes precedence if greater than the EAL. (Refer to Volume 1, Section 2.9).

STEP 5: Determine vertical and lateral extent of soil and/or groundwater impacted above action levels to extent feasible. EALs may also be used as a guide for re-use of excavated soil.

STEP 6: Prepare *Environmental Hazard Evaluation* (EHE) with recommendations for additional actions (see Chapter 3). Identify potential environmental hazards. Evaluate need for corrective actions (e.g., cleanup to Tier 1 EALs, advanced evaluation of tentatively identified hazards, development of alternative cleanup levels, long-term management of contamination, need for land use restrictions and other institutional and engineering controls, closure with no further action, etc.). Refer to Chapters 4 and 5 in Volume 1of EHE guidance document and teh HEER office Technical Guidance Manual (HDOH 2009).

References:

HDOH, 2009, Technical Guidance Manual (2009 and updates): Hawai‘i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Environmental Action Levels Surfer
Hawai'i DOH (Summer 2016, rev Jan 2017)

Worksheet is write protected. Disable protection under "Tools" if you have have trouble selecting options (password = EAL).

Steps 1 and 2:
Click in cell and use pull-down boxes to make selection.

STEP 1: Select [1]Site Scenario:

[2]Land Use:	Unrestricted
[3]Groundwater Utility:	Drinking Water Resource
[4]Distance To Nearest Surface Water Body:	< 150m

STEP 2: [5]Select Contaminant

Chemical Name or CAS #?	Chemical Name
	BENZENE

STEP 3 (optional): Enter site data.
(Potential environmental hazards highlighted in Red on Detailed EAL worksheet.)

Soil (mg/kg):	
Groundwater (ug/L):	
Soil Vapor (ug/m³):	

BENZENE

Final EALs

Soil (mg/kg):	3.0E-01
Groundwater (ug/L):	5.0E+00
Soil Vapor (ug/m³):	7.2E+02

Notes

Volatile chemical. Collect soil gas data for site-specific evaluation of vapor intrusion hazards if Tier 1 action levels for this hazard exceeded (see Advanced EHE Options tab of Surfer).

Reference:

HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Notes:

1. Site scenario options based on scenarios used to develop EAL lookup tables (HDOH 2016). "Tier 1" EALs presented in summary lookup tables based on unrestricted land use scenario within 150m of a surface water body and over groundwater that is a use of drinking water.

2. "Unrestricted" land use category suitable for residential housing, schools, day care, medical facilities, parks and similar sensitive uses. Use to evaluate the need for future land use restrictions. Screen using a commercial/industrial land use scenario if site is to be used only for these purposes and contamination will not be cleaned up to meet action levels (or acceptable alternatives) for unrestricted land use. Future land-use restrictions may apply (refer to Chapter 5 of Volume 1).

3. See Section 2.4 of Volume 1 for determination of groundwater utility.

chronic goals to migrate into the 150m buffer zone must also be evaluated.

5. Cyanide EALs based on CN- (57-12-5); mercury EALs based on mercuric salts (7487-94-7), PCB EALs based on Arochlor 1254 (11097-69-1).

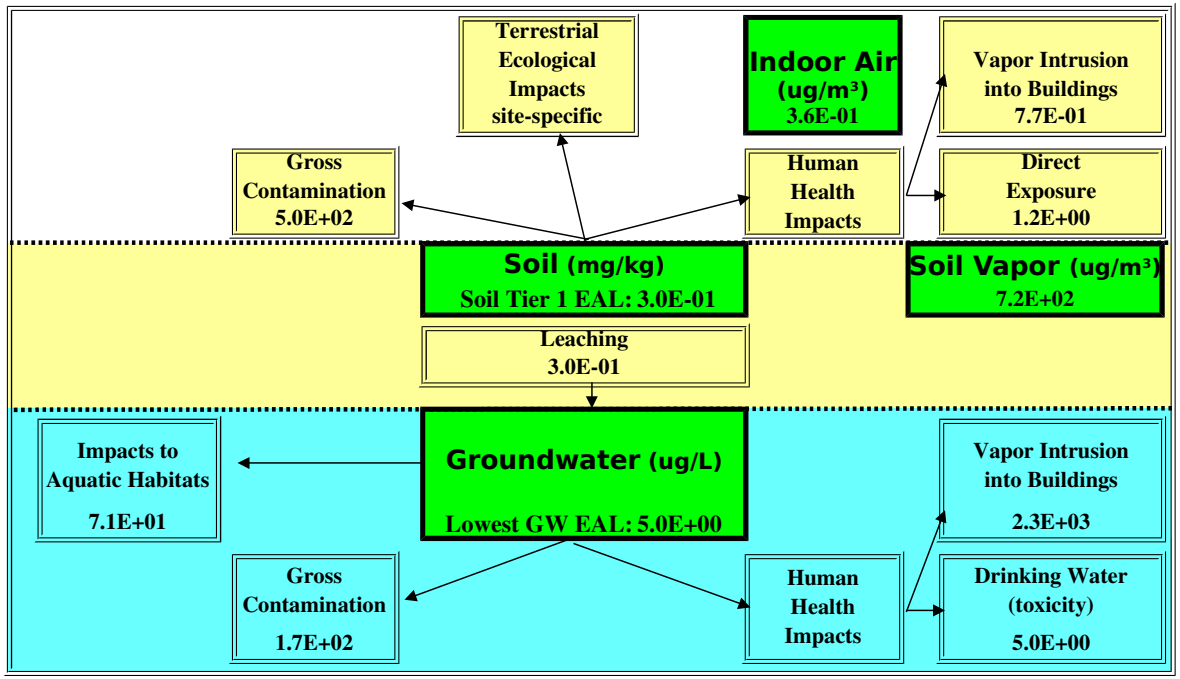
Surfer.

See also attached Detailed EALs, Surfer Report, Chemical Summary worksheet, Advanced EHE Options and Glossary.

Tier 1 Environmental Action Levels Surfer
(Screening Levels For Specific Environmental Hazards)

Hawai'i DOH (Summer 2016, rev Nov 2016)

BENZENE



Selected Site Scenario	
Land Use:	Unrestricted
Groundwater Utility:	Drinking Water Resource
Distance to Surface Water:	< 150m

Reference: HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Site Scenarios: Site scenario options based on scenarios used to develop EAL lookup tables.

Soil Eco-Risk: Site specific, ecological risk assessment recommended at sites where anthropogenic contamination identified and sensitive, terrestrial ecological habitats could be threatened (see Volume 1 Section 4.2).

See also attached Tier 1 EAL Summary Report, Chemical Summary, Glossary and Advanced EHE Overview.

[1]Tier 1 EAL SURFER SUMMARY REPORT

Hawai'i DOH (Summer 2016, rev Nov 2016)

Site Name:	
Site Address:	
Site ID Number:	
Date of EAL Search:	

Selected Site Scenario	
Land Use:	Unrestricted
Groundwater Utility:	Drinking Water Resource
Distance To Nearest Surface Water Body:	< 150m

Selected Chemical of Concern:	**BENZENE**

Input Site Concentrations	
Soil (mg/kg):	-
Groundwater (ug/L):	-
Soil Vapor (ug/m^3):	-

Soil Environmental Hazards	Units	Tier 1 Action Level	[2]Potential Hazard?	[3]Referenced Table
Direct Exposure:	mg/kg	1.2E+00	-	Table I-1
Vapor Emissions To Indoor Air:	mg/kg	7.7E-01	-	Table C-1b
Terrestrial Ecotoxicity:	mg/kg	site-specific	-	Table L
Gross Contamination:	mg/kg	5.0E+02	-	Table F-2
Leaching (threat to groundwater):	mg/kg	3.0E-01	-	Table E-1
Background:	mg/kg	-		
Final Soil Tier 1 EAL:	**mg/kg**	**3.0E-01**		
Basis:	**Leaching**			

Groundwater Environmental Hazards	Units	Tier 1 Action Level	[2]Potential Hazard?	[3]Referenced Table
Drinking Water (Toxicity):	ug/L	5.0E+00	-	Table D-1a
Vapor Emissions To Indoor Air:	ug/L	2.3E+03	-	Table C-1a
Aquatic Ecotoxicity:	ug/L	7.1E+01	-	Table D-4a
Gross Contamination:	ug/L	1.7E+02	-	Table G-1
Final Groundwater Tier 1 EAL:	**ug/L**	**5.0E+00**		
Basis:	**Drinking Water Toxicity**			

Other Tier 1 EALs:	Units	EAL	[2]Potential Hazard?	[3]Referenced Table
Shallow Soil Vapor:	ug/m^3	7.2E+02	-	Table C-2
Indoor Air:	ug/m^3	3.6E-01	-	Table C-3

Notes:

1. Include Surfer Summary Report in appendices of *Environmental Hazard Evaluation* (EHE) for contaminants that exceed Tier 1 EALs (refer to Chapter 3 of main text).
2. Environmental hazard could exist of concentration of contaminant exceeds action level.
3. Referenced tables presented in Appendix 1 of EHE guidance document.

Reference: HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Tier 1 Environmental Action Levels Surfer
Hawai'i DOH (Summer 2016, rev Nov 2016)

Summary of Toxicity and Fate & Transport Information

BENZENE

Human Toxicity Factors	Value	Units	Appendix 1 Reference Table
Cancer Slope Factor - oral	5.5E-02	$(mg/kg\text{-}day)^{-1}$	Table H
Cancer Inhalation Unit Risk Factor	7.8E-06	$(ug/m^3)^{-1}$	Table H
Reference Dose - oral	4.0E-03	mg/kg-day	Table H
Reference Dose - inhalation	3.0E-02	(mg/m^3)	Table H
Gastro-Intestinal Absorption Factor	1	unitless	Table H
Skin Absorption Factor		unitless	Table H
Target Excess Cancer Risk Used:	1.E-06	unitless	Table I-1
Target Hazard Quotient Used:	0.2	unitless	Table I-1

Aquatic Habitat Protection Goals	Value	Units	Appendix 1 Reference Table
Freshwater Chronic Goal	160	ug/L	Table D-4a
Marine Chronic Goal	71.3	ug/L	Table D-4a
Estuary Chronic Goal	71.3	ug/L	Table D-4a
Freshwater Acute Goal	1800	ug/L	Table D-4a
Marine Acute Goal	1700	ug/L	Table D-4a
Estuary Acute Goal	1700	ug/L	Table D-4a
*Bioaccumulation Goal	13	ug/L	Table D-4f

*Bioaccumulation goals used to screen surface water only (refer to Volume 1, Chapter 2 of EAL text).

Fate & Transport Information	Value	Units	Appendix 1 Reference Table
Molecular Weight	78		Table H
Physical State	volatile liquid		Table H
Organic Carbon Partition Coeff. (koc)	1.5E+02	cm^3/g	Table H
Diffusivity in air	9.0E-02	cm^2/s	Table H
Diffusivity in water	1.0E-05	cm^2/s	Table H
Solubility (water)	1.8E+03	mg/L	Table H
Henry's Law Constant	5.6E-03	$atm\text{-}m^3/mol$	Table H
Henry's Law Constant	2.3E-01	unitless	Table H

*Potential Health Effects	Target Organs & Health Effect
Carcinogen	X
Mutagen	
Alimentary Tract	X
Cardiovascular	
Developmental	X
Endocrine	
Eye	
Hematologic	X
Immune	X
Kidney	
Nervous	X
Reproductive	
Respiratory	
Skin	
Other	

*Not intended to serve as a comprehensive source of toxicological information. Ultimate potential health effects dependent on exposure dose, duration of exposure and numerous other factors. Refer to Appendix 1, Table J for specific references.

Reference: HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Example advanced Environmental Hazard Evaluation options when Tier 1 EALs exceeded and cleanup to EALs is not feasible (see also Chapter 4 of EHE Guidance)

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SOIL

Direct Exposure:	Use Tier 2, Direct Exposure Spreadsheet to calculate more site-specific action levels. Refer to Tier 2 action levels for arsenic, dioxin and technical chlordane (see Chapter 4 of EHE guidance)
Vapor Emissions To Indoor Air:	Proceed directly to site-specific vapor intrusion evaluation (e.g., collection of soil vapor data an comparison to screening levels). Input site-specific data into Tier 1 soil vapor intrusion models (not generally recommended).
Terrestrial Ecotoxicity:	No further action required if site lacks sigificant terrestrial eco habitats or threatened/endangered species. Proceed to site-specific assessment if significant habitats or threatened/endangered species are present.
Gross Contamination:	Inspect site (or boring cuttings) for potential gross contamination concerns. Include future management of grossly contaminated soil in an Environmental Hazard Management Plan if identified and left in place at the site.
Leaching:	Use laboratory batch test to evaluate contaminant mobility and potential groundwater impacts (see Chapter 4 of EHE guidance).

GROUNDWATER

Drinking Water (Toxicity):	No Tier 2 option for adustment of promulgated Maximum Contaminant Levels (MCLs). Refer to USEPA Tapwater Screening Levels. Review updated toxicity data used in model to develop risk-based action level for drinking water concerns in cases where a promulgated MCL was not available.
Vapor Emissions To Indoor Air:	Proceed directly to site-specific vapor intrusion evaluation (e.g., collection of soil vapor data an comparison to screening levels). Input site-specific data into Tier 1 soil vapor intrusion models (not generally recommended).
Aquatic Ecotoxicity:	No Tier 2 option for adustment of promulgated Surface Water Standards (refer to Table F-4d). Review aquatic ecotoxicity data used to develop chronic or acute action levels in cases where a promulgated standard is not available.
Gross Contamination:	Inspect site (or boring cuttings) for potential gross contamination concerns. Include future management of grossly contaminated soil in an Environmental Hazard Management Plan if identified and left in place at the site.

SOIL GAS (Vapor Intrusion)	Input site-specific building design and ventilation data into Tier 1 soil gas vapor intrusion models. Evalaute need to proceed to indoor air study.

Soil and Groundwater Background	Review published or site-specific data to evaluate natural background concentrations of metals in soil or groundwater if Tier 1 EAL exceeded and no known potential source of a release.

Reference: HDOH 2016, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Summer 2016): Hawai'i Department of Health, Hazard Evaluation and Emergency Response, http://hawaii.gov/health/environmental/hazard/index.html

Tier 1 Environmental Action Levels Surfer
Hawai'i DOH (Summer 2016)

GLOSSARY

Site Scenarios

Land Use: Unrestricted land use includes single-family homes and high-density housing areas. Also appropriate for other sensitive property uses, including schools, day care centers, medical facilities, etc.

Groundwater Utility: Groundwater categorized as drinking water or nondrinking water resource. See Section 2.4 of Volume 1 for determination of groundwater utility at a specific site.

Distance to Surface Water Body: Used to evaluate potential impacts to aquatic habitats. Chronic aquatic toxicity goals used to screen groundwater situated ≤150m from an aquatic habitat. Acute aquatic toxicity goals used to screen groundwater situated >150m from an aquatic habitat. Potential for groundwater contaminated above chronic goals to migrate into the 150m buffer zone must also be evaluated.

Soil EALS:

Direct Exposure: Address direct exposure and toxicity to humans. Includes incidental ingestion, dermal contact and inhalation of vapors or dust particles in outdoor air.

Vapor Emissions To Indoor Air: Address potential impacts to indoor air due to the intrusion of vapors from underlying, contaminated soil.

Terrestrial Ecological Impacts: Address potential toxicity to terrestrial flora and fauna. Site specific, ecological risk assessment recommended at sites where anthropogenic contamination identified and sensitive, terrestrial ecological habitats could be threatened.

Gross Contamination: Address odor, nuisance, generation of explosive vapors and other, non-risk related hazards posed by heavily contaminated soil.

Leaching: Address potential leaching of chemicals from soil and subsequent impact on first-encountered groundwater. Action levels for metals not included (must be evaluated on a site-by-site basis).

Groundwater EALs:

Drinking Water (Toxicity): Address potential toxicity to humans using the water as a drinking water resource. Based on promulgated Primary Maximum Contaminant Levels (Primary MCLs) or equivalent.

Vapor Emissions To Indoor Air: Address potential impacts to indoor air due to the intrusion of vapors from underlying, contaminated groundwater.

Discharges to Surface Water: Address potential chronic impacts to aquatic organisms. Promulgated chronic surface water standard or equivalent.

vapors and other, non-risk related hazards posed by heavily contamniated groundwater. For drinking water resources, Secondary Maximum Contaminant Level (Secondary MCL) or equivalent for taste and odor concerns also considered.

Indoor Air and Soil Gas EALs:

Indoor Air: Address direct exposure to volatile chemicals via inhalation.

Soil Gas: Address intrusion of subsurface vapors into a building and subsequent impacts to indoor air.

Tier 1 EALs Compiler (Hide in public version)

Site Scenario Selected:	
Chemical Selected:	BENZENE
Land Use:	Unrestricted
Groundwater Utility:	Drinking Water Resource
Distance To Nearest Surface Water Body:	< 150m
Input Soil Concentration (mg/kg):	-
Input Groundwater Concentration (ug/L):	-
Input Soil Gas Concentration (ug/m³)	-

Soil Tier 1 EAL Tables	Groundwater Utility:	Distance To Nearest Surface Water Body:	Selected?
Table A-1:	Drinking Water Resource	>150m	NO
Table A-2:	Drinking Water Resource	< 150m	YES
Table B-1:	Nondrinking Water Resource	>150m	NO
Table B-2:	Nondrinking Water Resource	< 150m	NO
Final Soil Tier 1 EALs (mg/kg)	Table A-2		
Direct Exposure:	1.2E+00		
Vapor Intrusion:	7.7E-01		
Leaching:	3.0E-01		
Terrestrial Ecotoxicity:	site-specific		
Gross Contamination:	5.0E+02		
Background:	-	**Basis**	
Lowest Soil EAL:	**3.0E-01**	**Leaching**	

Final Groundwater Action Levels (ug/L)	Groundwater Utility:	Distance To Nearest Surface Water Body:	Selected?
Table D-1a:	Drinking Water Resource	< 150m	YES
Table D-1b:	Drinking Water Resource	>150m	NO
Table D-1c:	Nondrinking Water Resource	< 150m	NO
Table D-1d:	Nondrinking Water Resource	>150m	NO
Groundwater (ug/L)	Table D-1a		
Drinking Water:	5.0E+00		
Vapor Intrusion:	2.3E+03		
Aquatic Ecotoxicity:	7.1E+01		
Gross Contamination:	1.7E+02	**Basis**	
Lowest GW EAL:	**5.0E+00**	**Drinking Water Toxicity**	

Soil Action Levels (mg/kg)		Referenced Table
Direct Exposure		
Residential:	1.2E+00	Table I-1
Commercial or Industrial:	5.5E+00	Table I-2
Construction/Trench Worker	3.0E+01	Table I-3
Final Direct Exposure:	**1.2E+00**	**Table I-1**
Vapor Intrusion		
Residential:	7.7E-01	Table C-1b
Commercial or Industrial:	5.6E+00	Table C-1b
Final Vapor Intrusion:	**7.7E-01**	Table C-1b
Leaching		
DW, <150m	3.0E-01	Table E-1
DW, >150m	3.0E-01	Table E-1
NDW, <150m	4.3E+00	Table E-1
NDW, >150m	1.0E+02	Table E-1
Final Leaching:	**3.0E-01**	**Table E-1**
Terrestrial Ecotoxicity		
Residential:	site-specific	Table L
Commercial or Industrial:	site-specific	Table L
Final Terrestrial Ecotoxicity:	**site-specific**	Table L
Gross Contamination		
Residential Exposed Soil:	5.0E+02	Table F-2
Residential Isolated Soil:	1.0E+03	Table F-3
Final Residential Action Level:	**5.0E+02**	
Commercial/Industrial Exposed Soil:	1.0E+03	Table F-2
Commercial/Industrial Isolated Soil:	1.9E+03	Table F-3
Final Commercial/Industrial Action Level:	**1.0E+03**	
Final Tier 1 Gross Contamination:	**5.0E+02**	**Table F-2**
Lowest Soil EAL:	**3.0E-01**	
Background:	**-**	
Final Tier 1 Soil EAL:	**3.0E-01**	
Basis:	**Leaching**	

Groundwater Action Levels (ug/L)		Referenced Table
Drinking Water Toxicity	**5.0E+00**	**Table D-3a**
Vapor Intrusion		
Residential:	2.3E+03	Table C-1a
Commercial or Industrial:	2.0E+04	Table C-1a
Final Vapor Intrusion:	**2.3E+03**	**Table C-1a**
Aquatic Ecotoxicity		
Chronic:	7.1E+01	Table D-4a
Acute:	1.7E+03	Table D-4a
Final Aquatic Ecotoxicity:	**7.1E+01**	Table D-4a
Gross Contamination		
Drinking Water:	1.7E+02	Table G-1
Nondrinking Water:	2.0E+04	Table G-2
Final Gross Contamination:	**1.7E+02**	**Table G-1**
Final Tier 1 GW EAL:	**5.0E+00**	
Basis:	**Drinking Water Toxicity**	

Indoor Air and Soil Gas Action Levels (ug/m³)		Referenced Table
Indoor Air		
Residential:	3.6E-01	Table C-3
Commercial or Industrial:	1.6E+00	Table C-3
Final Indoor Air:	**3.6E-01**	**Table C-3**
Soil Gas		
Residential:	7.2E+02	Table C-2
Commercial or Industrial:	6.3E+03	Table C-2
Final Soil Gas:	**7.2E+02**	**Table C-2**

TABLE A. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
ACENAPHTHENE	1.2E+02	2.0E+01	1.2E+02
ACENAPHTHYLENE	1.0E+02	2.4E+02	5.5E+00
ACETONE	8.7E+00	1.4E+04	9.2E-01
ALDRIN	3.9E+00	5.1E-03	3.9E+00
AMETRYN	1.3E+01	1.8E+02	1.3E+01
AMINO,2- DINITROTOLUENE,4,6-	1.9E+00	4.0E+01	8.5E-01
AMINO,4- DINITROTOLUENE,2,6-	1.9E+00	4.0E+01	5.2E-01
ANTHRACENE	4.2E+00	1.8E-01	4.2E+00
ANTIMONY	6.3E+00	6.0E+00	6.3E+00
ARSENIC	2.4E+01	1.0E+01	2.4E+01
ATRAZINE	1.1E-01	3.0E+00	1.1E-01
BARIUM	1.0E+03	2.0E+03	1.0E+03
BENOMYL	1.6E-01	2.8E+00	7.8E-03
BENZENE	3.0E-01	5.0E+00	3.0E-01
BENZO(a)ANTHRACENE	1.0E+01	1.1E-02	1.0E+01
BENZO(a)PYRENE	1.6E+00	2.0E-01	1.6E+00
BENZO(b)FLUORANTHENE	5.4E+00	2.9E-02	5.4E+00
BENZO(g,h,i)PERYLENE	3.5E+01	1.3E-01	3.5E+01
BENZO(k)FLUORANTHENE	2.9E+01	2.9E-01	2.9E+01
BERYLLIUM	3.1E+01	4.0E+00	3.1E+01
BIPHENYL, 1,1-	1.0E+01	5.0E-01	1.0E+01
BIS(2-CHLOROETHYL)ETHER	7.5E-05	1.4E-02	7.5E-05
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	3.7E-01	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	6.0E+00	3.9E+01
BORON	1.0E+03	4.0E+03	1.0E+03
BROMODICHLOROMETHANE	2.5E-03	1.4E-01	2.5E-03
BROMOFORM	6.9E-01	8.0E+01	6.9E-01
BROMOMETHANE	2.2E-01	7.6E+00	2.2E-01
CADMIUM	1.4E+01	3.0E+00	1.4E+01
CARBON TETRACHLORIDE	1.0E-01	5.0E+00	1.0E-01
CHLORDANE (TECHNICAL)	1.7E+01	9.0E-02	1.7E+01
CHLOROANILINE, p-	7.3E-03	3.9E-01	7.3E-03
CHLOROBENZENE	2.2E+00	5.0E+01	1.5E+00
CHLOROETHANE	1.2E+00	1.6E+01	1.2E+00
CHLOROFORM	2.6E-02	7.0E+01	2.6E-02
CHLOROMETHANE	4.0E+00	1.9E+02	4.0E+00
CHLOROPHENOL, 2-	1.2E-02	1.8E-01	1.2E-02
CHROMIUM (Total)	1.1E+03	1.6E+01	1.1E+03
CHROMIUM III	1.0E+03	5.7E+02	1.0E+03
CHROMIUM VI	3.0E+01	4.3E+00	3.0E+01
CHRYSENE	3.0E+01	1.0E+00	3.0E+01
COBALT	8.0E+01	6.0E+00	8.0E+01
COPPER	6.3E+02	2.9E+00	6.3E+02
CYANIDE (Free)	4.8E+00	1.0E+00	4.8E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.0E-02	7.1E-01	1.0E-02
DALAPON	1.1E-01	2.0E+02	1.1E-01
DIBENZO(a,h)ANTHTRACENE	1.6E+00	2.9E-03	1.6E+00
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	4.0E-02	8.1E-04
DIBROMOCHLOROMETHANE	2.1E-03	2.1E-01	2.1E-03
DIBROMOETHANE, 1,2-	4.2E-04	4.0E-02	4.2E-04

TABLE A. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
DICHLOROBENZENE, 1,2-	7.5E-01	1.0E+01	7.5E-01
DICHLOROBENZENE, 1,3-	5.7E-01	5.0E+00	5.7E-01
DICHLOROBENZENE, 1,4-	5.5E-02	5.0E+00	5.5E-02
DICHLOROBENZIDINE, 3,3-	9.2E-02	1.7E-01	9.2E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	1.9E-01	2.3E+00
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	4.6E-02	2.0E+00
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	1.3E-02	1.9E+00
DICHLOROETHANE, 1,1-	1.1E-01	2.8E+00	1.1E-01
DICHLOROETHANE, 1,2-	2.3E-02	5.0E+00	2.3E-02
DICHLOROETHYLENE, 1,1-	1.2E+00	7.0E+00	1.2E+00
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	7.0E+01	3.6E-01
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	1.0E+02	3.6E+00
DICHLOROPHENOL, 2,4-	7.3E-03	3.0E-01	7.3E-03
DICHLOROPHENOXYACETIC ACID (2,4-D)	3.4E-01	7.0E+01	3.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	5.0E+00	6.0E-02
DICHLOROPROPENE, 1,3-	1.7E-02	5.0E-01	2.1E-03
DIELDRIN	2.5E+00	1.1E-02	2.5E+00
DIETHYLPHTHALATE	1.7E+01	9.8E+02	3.7E+00
DIMETHYLPHENOL, 2,4-	3.3E+01	4.0E+02	9.8E+00
DIMETHYLPHTHALATE	7.4E+01	3.2E+03	2.6E+01
DINITROBENZENE, 1,3-	1.2E-01	2.0E+00	1.2E-01
DINITROPHENOL, 2,4-	3.1E+00	4.0E+01	1.1E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	2.4E-02	2.5E-01	2.4E-02
DINITROTOLUENE, 2,6- (2,6-DNT)	5.1E-03	5.2E-02	5.1E-03
DIOXANE, 1,4-	2.1E-04	4.6E-01	2.1E-04
DIOXINS (TEQ)	2.4E-04	3.0E-05	2.4E-04
DIURON	7.3E-01	4.0E+01	7.3E-01
ENDOSULFAN	1.3E+01	3.4E-02	1.3E+01
ENDRIN	3.8E+00	3.7E-02	3.8E+00
ETHANOL	4.5E+00	5.0E+04	4.5E+00
ETHYLBENZENE	3.7E+00	3.0E+01	9.0E-01
FLUORANTHENE	1.2E+02	1.3E+01	8.7E+01
FLUORENE	9.3E+01	2.4E+02	9.3E+01
GLYPHOSATE	2.4E+02	7.0E+02	2.4E+02
HEPTACHLOR	1.4E-01	5.3E-02	1.4E-01
HEPTACHLOR EPOXIDE	7.1E-02	5.3E-02	7.1E-02
HEXACHLOROBENZENE	2.2E-01	3.0E-04	2.2E-01
HEXACHLOROBUTADIENE	4.1E-02	2.0E-01	4.1E-02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	7.5E-02	1.6E-01	2.9E-02
HEXACHLOROETHANE	2.3E-02	4.0E-01	2.3E-02
HEXAZINONE	1.4E+01	6.6E+02	1.4E+01
INDENO(1,2,3-cd)PYRENE	9.6E+00	2.9E-02	9.6E+00
ISOPHORONE	8.9E-01	8.2E+01	8.9E-01
LEAD	2.0E+02	1.5E+01	2.0E+02
MERCURY	4.7E+00	2.0E+00	4.7E+00
METHOXYCHLOR	1.6E+01	7.0E-01	1.6E+01

TABLE A. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
METHYL ETHYL KETONE	6.2E+00	5.6E+03	6.2E+00
METHYL ISOBUTYL KETONE	3.8E+00	1.3E+03	5.0E-01
METHYL MERCURY	1.6E+00	9.9E-02	1.6E+00
METHYL TERT BUTYL ETHER	2.8E-02	5.0E+00	2.8E-02
METHYLENE CHLORIDE	1.2E-01	5.0E+00	1.2E-01
METHYLNAPHTHALENE, 1-	2.5E+00	6.0E+00	8.9E-01
METHYLNAPHTHALENE, 2-	4.1E+00	1.0E+01	1.9E+00
MOLYBDENUM	7.8E+01	1.0E+02	7.8E+01
NAPHTHALENE	4.4E+00	1.7E+01	3.1E+00
NICKEL	4.1E+02	5.0E+00	4.1E+02
NITROBENZENE	5.3E-03	1.4E-01	5.3E-03
NITROGLYCERIN	3.9E-02	2.0E+00	3.9E-02
NITROTOLUENE, 2-	4.9E-03	7.9E-02	4.9E-03
NITROTOLUENE, 3-	1.2E-01	2.0E+00	1.2E-01
NITROTOLUENE, 4-	2.9E-01	4.9E+00	2.9E-01
PENTACHLOROPHENOL	9.8E-02	1.0E+00	9.8E-02
PENTAERYTHRITOLTETRANITRATE (PETN)	2.1E+00	1.9E+01	2.1E+00
PERCHLORATE	7.0E-03	1.5E+01	7.0E-03
PHENANTHRENE	4.6E+02	2.4E+02	6.9E+01
PHENOL	9.3E+00	3.0E+02	1.8E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	5.0E-01	1.2E+00
PROPICONAZOLE	6.7E+01	2.6E+02	2.5E+01
PYRENE	4.4E+01	6.8E+01	4.4E+01
SELENIUM	7.8E+01	2.0E+01	7.8E+01
SILVER	7.8E+01	1.0E+00	7.8E+01
SIMAZINE	9.7E-02	4.0E+00	9.7E-02
STYRENE	9.1E-01	1.0E+01	9.1E-01
TERBACIL	2.2E+00	2.6E+02	2.2E+00
tert-BUTYL ALCOHOL	3.6E-02	5.8E+00	3.6E-02
TETRACHLOROETHANE, 1,1,1,2-	1.8E-02	6.1E-01	1.8E-02
TETRACHLOROETHANE, 1,1,2,2-	1.4E-03	7.8E-02	1.4E-03
TETRACHLOROETHYLENE	9.8E-02	5.0E+00	9.8E-02
TETRACHLOROPHENOL, 2,3,4,6-	5.1E-01	1.1E+01	5.6E-02
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	8.8E+01	1.0E+03	1.9E+01
THALLIUM	7.8E-01	2.0E+00	7.8E-01
TOLUENE	3.2E+00	4.0E+01	7.8E-01
TOXAPHENE	4.9E-01	2.1E-01	4.9E-01
TPH (gasolines)	1.0E+02	1.0E+02	1.0E+02
TPH (middle distillates)	1.0E+02	1.0E+02	1.0E+02
TPH (residual fuels)	5.0E+02	1.0E+02	5.0E+02
TRICHLOROBENZENE, 1,2,4-	1.6E-01	7.0E+01	1.6E-01
TRICHLOROETHANE, 1,1,1-	2.3E+01	2.0E+02	1.2E+00
TRICHLOROETHANE, 1,1,2-	8.9E-03	5.0E+00	8.9E-03
TRICHLOROETHYLENE	8.9E-02	5.0E+00	8.9E-02
TRICHLOROPHENOL, 2,4,5-	4.5E+00	1.7E+01	5.0E-01
TRICHLOROPHENOL, 2,4,6-	4.5E-01	7.1E+00	3.1E-01

TABLE A. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	**[1]Soil (mg/kg)**	**[2]Groundwater (ug/L)**	**[1]Soil (mg/kg)**
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	3.6E+00	2.0E+02	3.6E+00
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.5E+00	5.0E+01	8.7E-01
TRICHLOROPROPANE, 1,2,3-	1.6E-03	6.0E-01	1.6E-03
TRICHLOROPROPENE, 1,2,3-	8.1E-02	6.2E-01	8.1E-02
TRIFLURALIN	2.8E+01	1.0E+01	1.8E+01
TRINITROBENZENE, 1,3,5-	7.5E+00	2.7E+01	2.8E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	4.0E+01	3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.2E+00	2.6E+00	1.2E+00
VANADIUM	7.7E+02	9.0E+01	7.7E+02

TABLE A. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	**[1]Soil (mg/kg)**	**[2]Groundwater (ug/L)**	**[1]Soil (mg/kg)**
VINYL CHLORIDE	3.6E-02	2.0E+00	3.6E-02
XYLENES	2.1E+00	2.0E+01	1.4E+00
ZINC	1.0E+03	2.2E+01	1.0E+03
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	-	2.0
Sodium Adsorption Ratio	5.0	-	5.0

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care cente sensitive uses.
2. Assumes potential impacts to drinking water source and discharge of groundwater into a freshwater, marine or estuary surface water sys *dissolved-phase* concentration.

Source of Soil Action Levels: Refer to Appendix 1, Tables A-1 and A-2.

Source of Groundwater Action Levels: Appendix 1, Table D-1a (≤150m to Surface Water Body) and Table D-1b (>150m to Surface Water B

Soil data should be reported on dry-weight basis (see Appendix 1, Section 6.2).

Soil Action Levels intended to address direct-exposure, vapor intrusion, groundwater protection (leaching) and gross contamination hazards be collected for additional evaluation of potential vapor intrusion hazards at sites with significant areas of VOC-impacted soil. See also Sec The need for a site-specific, ecological risk assessment should be evaluated if sensitive, terrestrial or aquatic habitats are within or nearby soil.

Groundwater Action Levels intended to address surface water impacts, vapor intrusion and nuisance hazards Use in conjunction with soil g evaluate potential impacts to vapor intrusion hazards if groundwater action levels for this concern approached or exceeded (refer to Table C See also Section 4.4 and Table C.

Groundwater action levels should be compared to dissolved-phase chemical concentrations unless otherwise instructed by HDOH.

Groundwater ALs >150m to Surface Water Body: Groundwater screened with respect to acute surface water goals (See Table D-1b).

Groundwater ALs ≤150m to Surface Water Body: Groundwater screened with respect to chronic surface water goals (see Table D-1a).

TPH -Total Petroleum Hydrocarbons: TPH Action Levels must be used in conjunction with Action Levels for related chemicals (e.g., BTEX, See Section 2.6 in text.

TPH soil action levels for gross contamination hazards in isolated soils may be used as final cleanup levels if soil situated >3m deep at resi otherwise capped) at commercial sites AND site data indicate that remaining contamination will not pose leaching or vapor intrusion hazard Appendix 1; TPHg = 4,500 mg/kg, TPHmd & TPHrf = 5,000 mg/kg). TPH soil action levels noted in above table should be applied at sites w drinking water resources or aquatic habitats. Refer to Section 2.6 in text.

ıce Water Body
[2]Groundwater (ug/L)
1.5E+01
1.3E+01
1.5E+03
1.4E-04
1.8E+02
1.8E+01
1.1E+01
2.0E-02
6.0E+00
1.0E+01
3.0E+00
2.2E+02
1.4E-01
5.0E+00
1.1E-02
6.0E-02
2.9E-02
1.3E-01
2.9E-01
6.6E-01
5.0E-01
1.4E-02
3.7E-01
3.0E+00
1.0E+03
1.4E-01
8.0E+01
7.6E+00
3.0E+00
5.0E+00
4.0E-03
3.9E-01
2.5E+01
1.6E+01
2.8E+01
1.9E+02
1.8E-01
1.1E+01
2.0E+01
4.3E+00
1.0E+00
6.0E+00
2.9E+00
1.0E+00
7.1E-01
2.0E+02
2.9E-03
4.0E-02
2.1E-01
4.0E-02

ıce Water Body
[2]Groundwater (ug/L)
1.0E+01
5.0E+00
5.0E+00
1.7E-01
1.1E-02
4.6E-02
1.0E-03
2.8E+00
5.0E+00
7.0E+00
7.0E+01
1.0E+02
3.0E-01
7.0E+01
5.0E+00
6.0E-02
1.9E-03
2.1E+02
1.2E+02
1.1E+03
2.0E+00
1.4E+01
2.5E-01
5.2E-02
4.6E-01
3.1E-09
4.0E+01
8.7E-03
2.3E-03
5.0E+04
7.3E+00
8.0E-01
3.9E+00
7.0E+02
3.6E-03
3.6E-03
3.0E-04
2.0E-01
6.3E-02
4.0E-01
6.6E+02
2.9E-02
8.2E+01
5.6E+00
2.5E-02
3.0E-02

ıce Water Body
[2]Groundwater (ug/L)
5.6E+03
1.7E+02
2.8E-03
5.0E+00
5.0E+00
2.1E+00
4.7E+00
1.0E+02
1.2E+01
5.0E+00
1.4E-01
2.0E+00
7.9E-02
2.0E+00
4.9E+00
1.0E+00
1.9E+01
1.5E+01
2.3E+00
5.8E+01
1.4E-02
9.5E+01
4.6E+00
5.0E+00
1.0E-01
4.0E+00
1.0E+01
2.6E+02
5.8E+00
6.1E-01
7.8E-02
5.0E+00
1.2E+00
2.2E+02
2.0E+00
9.8E+00
2.0E-04
1.0E+02
1.0E+02
1.0E+02
7.0E+01
1.1E+01
5.0E+00
5.0E+00
1.9E+00
4.9E+00

ıce Water Body
[2]Groundwater (ug/L)
2.0E+02
3.0E+01
6.0E-01
6.2E-01
1.1E+00
1.0E+01
4.0E+01
2.6E+00
2.7E+01

ıce Water Body	
	[2]Groundwater (ug/L)
	2.0E+00
	1.3E+01
	2.2E+01
	-
	-

ers, parks and other

stem. Compare to

Body).

s. Soil gas data should
ction 4.4 and Table C.
areas of contaminated

las action levels to
C-1a in Appendix 1).

PAHs, oxidizers, etc.).

dential site and >1m (or
ds (refer to Table F-3 in
with elevated threats to

TABLE B. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS NOT Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
ACENAPHTHENE	1.2E+02	2.0E+02	1.2E+02
ACENAPHTHYLENE	1.3E+02	3.0E+02	5.5E+00
ACETONE	9.2E+00	1.5E+04	9.2E-01
ALDRIN	3.9E+00	1.3E+00	3.9E+00
AMETRYN	1.1E+02	1.8E+03	5.0E+01
AMINO,2- DINITROTOLUENE,4,6-	7.5E+00	1.6E+02	8.5E-01
AMINO,4- DINITROTOLUENE,2,6-	4.6E+00	9.8E+01	5.2E-01
ANTHRACENE	4.2E+00	1.8E-01	4.2E+00
ANTIMONY	6.3E+00	1.8E+02	6.3E+00
ARSENIC	2.4E+01	6.9E+01	2.4E+01
ATRAZINE	2.4E+00	3.3E+02	4.5E-01
BARIUM	1.0E+03	2.0E+03	1.0E+03
BENOMYL	1.6E-01	2.8E+00	7.8E-03
BENZENE	7.7E-01	1.7E+03	7.7E-01
BENZO(a)ANTHRACENE	1.6E+01	4.7E+00	1.0E+01
BENZO(a)PYRENE	1.6E+00	8.0E-01	1.6E+00
BENZO(b)FLUORANTHENE	1.6E+01	7.5E-01	1.6E+01
BENZO(g,h,i)PERYLENE	3.5E+01	1.3E-01	3.5E+01
BENZO(k)FLUORANTHENE	3.9E+01	4.0E-01	3.9E+01
BERYLLIUM	3.1E+01	3.5E+01	3.1E+01
BIPHENYL, 1,1-	1.0E+01	5.0E+00	1.0E+01
BIS(2-CHLOROETHYL)ETHER	7.9E-03	1.8E+02	7.9E-03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	3.7E-01	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	2.7E+01	3.9E+01
BORON	1.0E+03	3.4E+04	1.0E+03
BROMODICHLOROMETHANE	1.6E-02	1.1E+02	1.6E-02
BROMOFORM	9.5E+00	1.1E+03	2.0E+00
BROMOMETHANE	2.2E-01	3.8E+01	2.2E-01
CADMIUM	1.4E+01	3.0E+00	1.4E+01
CARBON TETRACHLORIDE	1.0E-01	1.1E+02	1.0E-01
CHLORDANE (TECHNICAL)	1.7E+01	9.0E-02	1.7E+01
CHLOROANILINE, p-	2.7E+00	4.6E+02	3.6E-01
CHLOROBENZENE	2.2E+00	2.2E+02	1.5E+00
CHLOROETHANE	1.2E+01	1.6E+02	1.2E+01
CHLOROFORM	2.6E-02	1.1E+02	2.6E-02
CHLOROMETHANE	4.0E+00	1.9E+02	4.0E+00
CHLOROPHENOL, 2-	1.2E-01	1.8E+00	1.2E-01
CHROMIUM (Total)	1.1E+03	1.6E+01	1.1E+03
CHROMIUM III	1.0E+03	5.7E+02	1.0E+03
CHROMIUM VI	3.0E+01	1.6E+01	3.0E+01
CHRYSENE	3.0E+01	1.0E+00	3.0E+01
COBALT	8.0E+01	1.2E+02	8.0E+01
COPPER	6.3E+02	2.9E+00	6.3E+02
CYANIDE (Free)	4.8E+00	1.0E+00	4.8E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	6.1E+00	5.2E+02	1.2E+00
DALAPON	1.6E+00	3.0E+03	1.6E-01
DIBENZO(a,h)ANTHTRACENE	1.6E+00	1.3E+00	1.6E+00
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	4.0E-02	8.1E-04
DIBROMOCHLOROMETHANE	2.9E-02	4.5E+02	2.9E-02
DIBROMOETHANE, 1,2-	1.0E-03	1.9E+01	1.0E-03

TABLE B. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS NOT Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
DICHLOROBENZENE, 1,2-	7.5E+00	1.0E+02	1.1E+00
DICHLOROBENZENE, 1,3-	4.2E+01	3.7E+02	2.5E+00
DICHLOROBENZENE, 1,4-	5.5E-02	1.1E+02	5.5E-02
DICHLOROBENZIDINE, 3,3-	1.2E+00	4.1E+01	1.2E+00
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	1.9E-01	2.3E+00
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	7.0E+00	2.0E+00
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	1.3E-02	1.9E+00
DICHLOROETHANE, 1,1-	3.8E-01	8.3E+02	3.8E-01
DICHLOROETHANE, 1,2-	2.3E-02	1.8E+02	2.3E-02
DICHLOROETHYLENE, 1,1-	8.9E+00	3.9E+03	4.2E+00
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	1.3E+03	3.6E-01
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	2.6E+03	3.6E+00
DICHLOROPHENOL, 2,4-	7.3E-02	3.0E+00	7.3E-02
DICHLOROPHENOXYACETIC ACID (2,4-D)	6.4E-01	1.3E+02	3.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	1.0E+02	6.0E-02
DICHLOROPROPENE, 1,3-	1.5E-01	2.6E+02	2.1E-03
DIELDRIN	2.5E+00	7.1E-01	2.5E+00
DIETHYLPHTHALATE	1.7E+01	9.8E+02	3.7E+00
DIMETHYLPHENOL, 2,4-	5.7E+01	7.0E+02	9.8E+00
DIMETHYLPHTHALATE	7.4E+01	3.2E+03	2.6E+01
DINITROBENZENE, 1,3-	1.3E+00	1.0E+02	5.8E-01
DINITROPHENOL, 2,4-	2.5E+01	3.8E+02	1.1E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	1.7E+00	1.1E+02	8.7E-01
DINITROTOLUENE, 2,6- (2,6-DNT)	3.6E-01	1.1E+02	3.6E-01
DIOXANE, 1,4-	5.4E+00	5.0E+04	5.4E+00
DIOXINS (TEQ)	2.4E-04	3.0E-03	2.4E-04
DIURON	3.6E+00	2.0E+02	1.1E+00
ENDOSULFAN	1.3E+01	3.4E-02	1.3E+01
ENDRIN	3.8E+00	3.7E-02	3.8E+00
ETHANOL	4.5E+00	5.0E+04	4.5E+00
ETHYLBENZENE	1.7E+01	1.4E+02	9.0E-01
FLUORANTHENE	1.2E+02	1.3E+01	8.7E+01
FLUORENE	9.3E+01	3.0E+02	9.3E+01
GLYPHOSATE	5.0E+02	2.2E+04	5.0E+02
HEPTACHLOR	1.4E-01	5.3E-02	1.4E-01
HEPTACHLOR EPOXIDE	7.1E-02	5.3E-02	7.1E-02
HEXACHLOROBENZENE	2.2E-01	3.0E-04	2.2E-01
HEXACHLOROBUTADIENE	1.3E+00	1.1E+01	6.1E-02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	7.5E-02	1.6E-01	2.9E-02
HEXACHLOROETHANE	2.0E+00	1.0E+02	6.8E-01
HEXAZINONE	4.2E+02	5.0E+04	3.7E+02
INDENO(1,2,3-cd)PYRENE	1.6E+01	9.5E-02	1.6E+01
ISOPHORONE	4.7E+01	4.3E+03	1.0E+01
LEAD	2.0E+02	2.9E+01	2.0E+02
MERCURY	4.7E+00	2.1E+00	4.7E+00
METHOXYCHLOR	1.6E+01	7.0E-01	1.6E+01

TABLE B. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS NOT Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	[1]Soil (mg/kg)	[2]Groundwater (ug/L)	[1]Soil (mg/kg)
METHYL ETHYL KETONE	5.5E+01	5.0E+04	1.5E+01
METHYL ISOBUTYL KETONE	6.5E+00	2.2E+03	5.0E-01
METHYL MERCURY	1.6E+00	9.9E-02	1.6E+00
METHYL TERT BUTYL ETHER	2.3E+00	1.8E+03	2.3E+00
METHYLENE CHLORIDE	2.2E+01	8.5E+03	2.2E+01
METHYLNAPHTHALENE, 1-	1.6E+01	3.7E+01	8.9E-01
METHYLNAPHTHALENE, 2-	1.7E+01	4.2E+01	1.9E+00
MOLYBDENUM	7.8E+01	7.2E+03	7.8E+01
NAPHTHALENE	7.0E+00	2.1E+02	3.1E+00
NICKEL	4.1E+02	5.0E+00	4.1E+02
NITROBENZENE	5.6E+00	2.0E+03	5.6E+00
NITROGLYCERIN	1.3E+00	1.6E+02	3.5E-01
NITROTOLUENE, 2-	2.2E+00	6.4E+02	2.2E+00
NITROTOLUENE, 3-	1.3E+00	3.8E+02	1.3E+00
NITROTOLUENE, 4-	2.5E+01	4.1E+02	2.8E+00
PENTACHLOROPHENOL	1.0E+00	1.3E+01	7.8E-01
PENTAERYTHRITOLTETRANITRATE (PETN)	2.5E+01	2.2E+04	2.5E+01
PERCHLORATE	1.2E+00	5.0E+03	1.2E+00
PHENANTHRENE	4.6E+02	3.0E+02	6.9E+01
PHENOL	9.3E+00	3.0E+02	1.8E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	2.0E+00	1.2E+00
PROPICONAZOLE	1.1E+02	4.3E+02	2.5E+01
PYRENE	4.4E+01	6.8E+01	4.4E+01
SELENIUM	7.8E+01	2.0E+01	7.8E+01
SILVER	7.8E+01	1.0E+00	7.8E+01
SIMAZINE	1.9E+00	8.0E+01	2.2E-01
STYRENE	1.0E+01	1.1E+02	2.9E+00
TERBACIL	2.2E+00	2.6E+02	2.2E+00
tert-BUTYL ALCOHOL	9.9E+01	5.0E+04	9.9E+01
TETRACHLOROETHANE, 1,1,1,2-	2.2E+00	7.7E+02	3.2E-01
TETRACHLOROETHANE, 1,1,2,2-	1.0E-02	2.4E+02	1.0E-02
TETRACHLOROETHYLENE	9.8E-02	1.9E+02	9.8E-02
TETRACHLOROPHENOL, 2,3,4,6-	5.1E-01	1.1E+01	5.6E-02
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.1E+02	1.2E+03	1.9E+01
THALLIUM	7.8E-01	4.7E+02	7.8E-01
TOLUENE	3.2E+01	4.0E+02	7.8E-01
TOXAPHENE	4.9E-01	2.1E-01	4.9E-01
TPH (gasolines)	1.0E+02	5.0E+03	1.0E+02
TPH (middle distillates)	2.6E+02	2.5E+03	2.6E+02
TPH (residual fuels)	5.0E+02	2.5E+03	5.0E+02
TRICHLOROBENZENE, 1,2,4-	1.6E-01	4.2E+02	1.6E-01
TRICHLOROETHANE, 1,1,1-	2.2E+02	6.0E+03	1.2E+00
TRICHLOROETHANE, 1,1,2-	8.9E-03	1.1E+02	8.9E-03
TRICHLOROETHYLENE	8.9E-02	2.1E+02	8.9E-02
TRICHLOROPHENOL, 2,4,5-	4.5E+00	1.7E+01	5.0E-01
TRICHLOROPHENOL, 2,4,6-	2.5E+00	3.9E+01	3.1E-01

TABLE B. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS NOT Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	**[1]Soil (mg/kg)**	**[2]Groundwater (ug/L)**	**[1]Soil (mg/kg)**
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.2E+01	6.9E+02	1.2E+01
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	7.9E+00	2.7E+02	8.7E-01
TRICHLOROPROPANE, 1,2,3-	1.6E-03	1.4E+02	1.6E-03
TRICHLOROPROPENE, 1,2,3-	8.1E-02	6.2E-01	8.1E-02
TRIFLURALIN	5.6E+01	2.1E+01	1.8E+01
TRINITROBENZENE, 1,3,5-	7.5E+00	2.7E+01	2.8E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	4.0E+01	3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	7.3E+00	2.1E+02	6.1E+00
VANADIUM	7.7E+02	9.0E+01	7.7E+02

TABLE B. ENVIRONMENTAL ACTION LEVELS (EALs)
Groundwater IS NOT Current or Potential Source of Drinking Water

	>150m to Surface Water Body		≤150m to Surfa
CONTAMINANT	**[1]Soil (mg/kg)**	**[2]Groundwater (ug/L)**	**[1]Soil (mg/kg)**
VINYL CHLORIDE	3.6E-02	1.8E+01	3.6E-02
XYLENES	2.4E+01	2.3E+02	1.4E+00
ZINC	1.0E+03	2.2E+01	1.0E+03
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	not applicable	2.0
Sodium Adsorption Ratio	5.0	not applicable	5.0

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care cente sensitive uses.

2. Assumes potential discharge of groundwater into a freshwater, marine or estuary surface water system. Compare to *dissolved-phase* co

Source of Soil Action Levels: Refer to Appendix 1, Tables B-1 and B-2.

Source of Groundwater Action Levels: Appendix 1, Table D-1c (≤150m to Surface Water Body) and Table D-1d (>150m to Surface Water E

Soil data should be reported on dry-weight basis (see Appendix 1, Section 6.2).

Soil Action Levels intended to address direct-exposure, vapor intrusion, groundwater protection (leaching) and gross contamination hazards be collected for additional evaluation of potential vapor intrusion hazards at sites with significant areas of VOC-impacted soil. See also Sec The need for a site-specific, ecological risk assessment should be evaluated if sensitive, terrestrial or aquatic habitats are within or nearby soil.

Groundwater Action Levels intended to address surface water impacts, vapor intrusion and nuisance hazards Use in conjunction with soil g evaluate potential impacts to vapor intrusion hazards if groundwater action levels for this concern approached or exceeded (refer to Table C See also Section 4.4 and Table C.

Groundwater action levels should be compared to dissolved-phase chemical concentrations unless otherwise instructed by HDOH.

Groundwater ALs >150m to Surface Water Body: Groundwater screened with respect to acute surface water goals (See Table D-1d).

Groundwater ALs ≤150m to Surface Water Body: Groundwater screened with respect to chronic surface water goals (see Table D-1c).

TPH -Total Petroleum Hydrocarbons: TPH Action Levels must be used in conjunction with Action Levels for related chemicals (e.g., BTEX, oxidizers, etc.). See Section 2.6 in text.

TPH soil action levels for gross contamination hazards in isolated soils may be used as final cleanup levels if soil situated >3m deep at resi otherwise capped) at commercial sites AND site data indicate that remaining contamination will not pose leaching or vapor intrusion hazard Appendix 1; TPHg = 4,500 mg/kg, TPHmd & TPHrf = 5,000 mg/kg). TPH soil action levels noted in above table should be applied at sites w drinking water resources or aquatic habitats. Refer to Section 2.6 in text.

ıce Water Body
[2]Groundwater (ug/L)
1.5E+01
1.3E+01
1.5E+03
1.4E-04
7.0E+02
1.8E+01
1.1E+01
2.0E-02
3.0E+01
3.6E+01
1.2E+01
2.2E+02
1.4E-01
7.1E+01
2.7E-02
6.0E-02
6.8E-01
1.3E-01
4.0E-01
6.6E-01
5.0E+00
1.8E+02
3.7E-01
3.0E+00
1.0E+03
1.1E+02
2.3E+02
1.6E+01
3.0E+00
9.8E+00
4.0E-03
1.9E+01
2.5E+01
1.6E+02
2.8E+01
1.9E+02
1.8E+00
1.1E+01
2.0E+01
1.1E+01
1.0E+00
1.9E+01
2.9E+00
1.0E+00
7.9E+01
3.0E+02
8.0E-01
4.0E-02
3.4E+01
1.9E+01

ıce Water Body
[2]Groundwater (ug/L)
1.4E+01
2.2E+01
9.4E+00
4.5E+00
1.1E-02
4.1E-01
1.0E-03
4.7E+01
1.8E+02
2.5E+01
6.2E+02
5.6E+02
3.0E+00
7.0E+01
1.0E+02
6.0E-02
1.9E-03
2.1E+02
1.2E+02
1.1E+03
1.0E+01
1.4E+01
9.1E+00
8.1E+01
5.0E+04
3.1E-09
6.0E+01
8.7E-03
2.3E-03
5.0E+04
7.3E+00
8.0E-01
3.9E+00
1.8E+03
3.6E-03
3.6E-03
3.0E-04
3.0E-01
6.3E-02
1.2E+01
1.7E+04
9.5E-02
9.2E+02
5.6E+00
2.5E-02
3.0E-02

ıce Water Body
[2]Groundwater (ug/L)
1.4E+04
1.7E+02
2.8E-03
7.3E+02
1.5E+03
2.1E+00
4.7E+00
3.7E+02
1.2E+01
5.0E+00
3.8E+02
1.8E+01
7.1E+01
4.2E+01
4.6E+01
7.9E+00
2.2E+04
6.0E+02
2.3E+00
5.8E+01
1.4E-02
9.5E+01
4.6E+00
5.0E+00
1.0E-01
9.0E+00
3.2E+01
2.6E+02
1.8E+04
1.1E+01
2.0E+02
5.3E+01
1.2E+00
2.2E+02
6.0E+00
9.8E+00
2.0E-04
5.0E+02
6.4E+02
6.4E+02
1.1E+02
1.1E+01
1.1E+02
4.7E+01
1.9E+00
4.9E+00

ıce Water Body
[2]Groundwater (ug/L)
6.9E+02
3.0E+01
1.4E+01
6.2E-01
1.1E+00
1.0E+01
4.0E+01
1.3E+01
2.7E+01

ıce Water Body
[2]Groundwater (ug/L)
1.8E+01
1.3E+01
2.2E+01
not applicable
not applicable

ers, parks and other

ncentration.

Body).

s. Soil gas data should
ction 4.4 and Table C.
areas of contaminated

las action levels to
C-1a in Appendix 1).

PAHs,

dential site and >1m (or
ds (refer to Table F-3 in
with elevated threats to

TABLE C. ENVIRONMENTAL ACTION LEVELS (EALs)
Indoor Air and Soil Vapor
(Vapor Intrusion Hazards)

			INDOOR AIR ACTION LEVELS		[2]SHALLOW S ACTION
CHEMICAL PARAMETER	Physical State		[1]Residential (ug/m3)	Commercial/ Industrial (ug/m^3)	[1]Residential (ug/m3)
ACENAPHTHENE	V	S	5.0E+01	2.1E+02	1.0E+05
ACENAPHTHYLENE	V	S	3.3E+01	1.4E+02	6.7E+04
ACETONE	V	L	6.5E+03	2.7E+04	1.3E+07
ALDRIN	SV	S	2.1E-01	8.8E-01	4.2E+02
AMETRYN	NV	S			
AMINO,2- DINITROTOLUENE,4,6-	NV	S			
AMINO,4- DINITROTOLUENE,2,6-	NV	S			
ANTHRACENE	V	S	2.5E+02	1.1E+03	5.0E+05
ANTIMONY	NV	S			
ARSENIC	NV	S			
ATRAZINE	NV	S			
BARIUM	NV	S			
BENOMYL	NV	S			
BENZENE	V	L	3.6E-01	1.6E+00	7.2E+02
BENZO(a)ANTHRACENE	SV	S	9.2E-01	1.1E+00	1.8E+03
BENZO(a)PYRENE	NV	S			
BENZO(b)FLUORANTHENE	NV	S			
BENZO(g,h,i)PERYLENE	NV	S			
BENZO(k)FLUORANTHENE	NV	S			
BERYLLIUM	NV	S			
BIPHENYL, 1,1-	V	S	8.3E-02	3.5E-01	1.7E+02
BIS(2-CHLOROETHYL)ETHER	V	L	8.5E-03	3.7E-02	1.7E+01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	2.8E-01	1.2E+00	5.6E+02
BIS(2-ETHYLHEXYL)PHTHALATE	NV	S			
BORON	NV	S			
BROMODICHLOROMETHANE	V	L	7.6E-02	3.3E-01	1.5E+02
BROMOFORM	SV	S	2.6E+00	1.1E+01	5.1E+03
BROMOMETHANE	V	G	1.0E+00	4.4E+00	2.1E+03
CADMIUM	NV	S			
CARBON TETRACHLORIDE	V	L	4.7E-01	2.0E+00	9.4E+02
CHLORDANE (TECHNICAL)	SV	S	2.8E-01	1.2E+00	5.6E+02
CHLOROANILINE, p-	NV	S			
CHLOROBENZENE	V	L	1.0E+01	4.4E+01	2.1E+04
CHLOROETHANE	V	G	2.1E+03	8.8E+03	4.2E+06
CHLOROFORM	V	L	1.2E-01	5.3E-01	2.4E+02
CHLOROMETHANE	V	G	1.9E+01	7.9E+01	3.8E+04
CHLOROPHENOL, 2-	V	L	4.2E+00	1.8E+01	8.3E+03
CHROMIUM (Total)	NV	S			
CHROMIUM III	NV	S			
CHROMIUM VI	NV	S			
CHRYSENE	NV	S			
COBALT	NV	S			
COPPER	NV	S			
CYANIDE (Free)	V	S	1.7E-01	7.0E-01	3.3E+02
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S			
DALAPON	NV	L			
DIBENZO(a,h)ANTHTRACENE	NV	S			

TABLE C. ENVIRONMENTAL ACTION LEVELS (EALs)
Indoor Air and Soil Vapor
(Vapor Intrusion Hazards)

			INDOOR AIR ACTION LEVELS		[2]SHALLOW S ACTION
CHEMICAL PARAMETER	Physical State		[1]Residential (ug/m3)	Commercial/ Industrial (ug/m^3)	[1]Residential (ug/m3)
DIBROMO,1,2- CHLOROPROPANE,3-	V	L	1.7E-04	2.0E-03	3.4E-01
DIBROMOCHLOROMETHANE	V	S	1.3E-01	5.8E-01	2.7E+02
DIBROMOETHANE, 1,2-	V	S	4.7E-03	2.0E-02	9.4E+00
DICHLOROBENZENE, 1,2-	V	L	4.2E+01	1.8E+02	8.3E+04
DICHLOROBENZENE, 1,3-	V	L	2.5E+01	1.1E+02	5.0E+04
DICHLOROBENZENE, 1,4-	V	S	2.6E-01	1.1E+00	5.1E+02
DICHLOROBENZIDINE, 3,3-	NV	S			
DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S			
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S	2.9E-02	1.3E-01	5.8E+01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S			
DICHLOROETHANE, 1,1-	V	L	1.8E+00	7.7E+00	3.5E+03
DICHLOROETHANE, 1,2-	V	L	1.1E-01	4.7E-01	2.2E+02
DICHLOROETHYLENE, 1,1-	V	L	4.2E+01	1.8E+02	8.3E+04
DICHLOROETHYLENE, Cis 1,2-	V	L	1.7E+00	7.0E+00	3.3E+03
DICHLOROETHYLENE, Trans 1,2-	V	L	1.7E+01	7.0E+01	3.3E+04
DICHLOROPHENOL, 2,4-	NV	S			
DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S			
DICHLOROPROPANE, 1,2-	V	L	2.8E-01	1.2E+00	5.6E+02
DICHLOROPROPENE, 1,3-	V	L	7.0E-01	3.1E+00	1.4E+03
DIELDRIN	NV	S			
DIETHYLPHTHALATE	NV	S			
DIMETHYLPHENOL, 2,4-	NV	S			
DIMETHYLPHTHALATE	NV	S			
DINITROBENZENE, 1,3-	NV	S			
DINITROPHENOL, 2,4-	NV	S			
DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S			
DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S			
DIOXANE, 1,4-	V	L	5.6E-01	2.5E+00	1.1E+03
DIOXINS (TEQ)	SV	S	7.4E-06	3.2E-05	1.5E-02
DIURON	NV	S			
ENDOSULFAN	SV	S			
ENDRIN	NV	S			
ETHANOL	V	L			
ETHYLBENZENE	V	L	1.1E+01	4.9E+01	2.2E+04
FLUORANTHENE	NV	S			
FLUORENE	V	S	3.3E+01	1.4E+02	6.7E+04
GLYPHOSATE	NV	S			
HEPTACHLOR	SV	S	2.2E-03	9.4E-03	4.3E+00
HEPTACHLOR EPOXIDE	SV	S	1.1E-03	4.7E-03	2.2E+00
HEXACHLOROBENZENE	SV	S	6.1E-03	2.7E-02	1.2E+01
HEXACHLOROBUTADIENE	SV	S	1.3E-01	5.6E-01	2.6E+02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S			
HEXACHLOROETHANE	SV	S	2.6E-01	1.1E+00	5.1E+02

TABLE C. ENVIRONMENTAL ACTION LEVELS (EALs)
Indoor Air and Soil Vapor
(Vapor Intrusion Hazards)

			INDOOR AIR ACTION LEVELS		[2]SHALLOW S ACTION
CHEMICAL PARAMETER	Physical State		[1]Residential (ug/m3)	Commercial/ Industrial (ug/m^3)	[1]Residential (ug/m3)
HEXAZINONE	NV	S			
INDENO(1,2,3-cd)PYRENE	NV	S			
ISOPHORONE	NV	L			
LEAD	NV	S			
MERCURY	NV	S			
METHOXYCHLOR	NV	S			
METHYL ETHYL KETONE	V	L	1.0E+03	4.4E+03	2.1E+06
METHYL ISOBUTYL KETONE	V	L	6.3E+02	2.6E+03	1.3E+06
METHYL MERCURY	NV	S			
METHYL TERT BUTYL ETHER	V	L	1.1E+01	4.7E+01	2.2E+04
METHYLENE CHLORIDE	V	L	1.0E+02	5.3E+02	2.0E+05
METHYLNAPHTHALENE, 1-	V	S	3.9E+00	1.7E+01	7.7E+03
METHYLNAPHTHALENE, 2-	V	S	3.3E+00	1.4E+01	6.7E+03
MOLYBDENUM	NV	S			
NAPHTHALENE	V	S	6.3E-01	2.6E+00	1.3E+03
NICKEL	NV	S			
NITROBENZENE	V	L	7.0E-02	3.1E-01	1.4E+02
NITROGLYCERIN	NV	L			
NITROTOLUENE, 2-	V	S	5.1E-02	2.2E-01	1.0E+02
NITROTOLUENE, 3-	NV	S			
NITROTOLUENE, 4-	NV	S			
PENTACHLOROPHENOL	NV	S			
PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S			
PERCHLORATE	NV	S			
PHENANTHRENE	V	S	3.3E+01	1.4E+02	6.7E+04
PHENOL	NV	S			
POLYCHLORINATED BIPHENYLS (PCBs)	SV	S	4.9E-02	2.2E-01	9.9E+01
PROPICONAZOLE	NV	L			
PYRENE	V	S	2.5E+01	1.1E+02	5.0E+04
SELENIUM	NV	S			
SILVER	NV	S			
SIMAZINE	NV	S			
STYRENE	V	L	2.1E+02	8.8E+02	4.2E+05
TERBACIL	NV	S			
tert-BUTYL ALCOHOL	V	L	3.7E+00	1.6E+01	7.5E+03
TETRACHLOROETHANE, 1,1,1,2-	V	L	3.8E-01	1.7E+00	7.6E+02
TETRACHLOROETHANE, 1,1,2,2-	V	L	4.8E-02	2.1E-01	9.7E+01
TETRACHLOROETHYLENE	V	L	4.6E-01	2.0E+00	9.2E+02
TETRACHLOROPHENOL, 2,3,4,6-	NV	S			
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S			
THALLIUM	NV	S			
TOLUENE	V	L	1.0E+03	4.4E+03	2.1E+06
TOXAPHENE	NV	S			

TABLE C. ENVIRONMENTAL ACTION LEVELS (EALs)
Indoor Air and Soil Vapor
(Vapor Intrusion Hazards)

			INDOOR AIR ACTION LEVELS		[2]SHALLOW S ACTION
CHEMICAL PARAMETER	**Physical State**		**[1]Residential (ug/m3)**	**Commercial/ Industrial (ug/m³)**	**[1]Residential (ug/m3)**
TPH (gasolines)	V	L	2.9E+02	1.2E+03	5.9E+05
TPH (middle distillates)	V	L	1.3E+02	5.5E+02	2.6E+05
TPH (residual fuels)	NV	L			
TRICHLOROBENZENE, 1,2,4-	V	S	3.9E-01	1.7E+00	7.7E+02
TRICHLOROETHANE, 1,1,1-	V	L	1.0E+03	4.4E+03	2.1E+06
TRICHLOROETHANE, 1,1,2-	V	L	4.2E-02	1.8E-01	8.3E+01
TRICHLOROETHYLENE	V	L	4.2E-01	1.8E+00	8.3E+02
TRICHLOROPHENOL, 2,4,5-	NV	S			
TRICHLOROPHENOL, 2,4,6-	NV	S			
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S			
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S			
TRICHLOROPROPANE, 1,2,3-	V	L	1.4E-04	1.6E-03	2.7E-01
TRICHLOROPROPENE, 1,2,3-	V	L	6.3E-02	2.6E-01	1.3E+02
TRIFLURALIN	SV	S			
TRINITROBENZENE, 1,3,5-	NV	S			
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S			
TRINITROTOLUENE, 2,4,6- (TNT)	NV	S			
VANADIUM	NV	S			

TABLE C. ENVIRONMENTAL ACTION LEVELS (EALs)
Indoor Air and Soil Vapor
(Vapor Intrusion Hazards)

			INDOOR AIR ACTION LEVELS		[2]SHALLOW S ACTION
CHEMICAL PARAMETER	**Physical State**		**[1]Residential (ug/m3)**	**Commercial/ Industrial (ug/m³)**	**[1]Residential (ug/m3)**
VINYL CHLORIDE	V	G	1.7E-01	2.8E+00	3.4E+02
XYLENES	V	L	2.1E+01	8.8E+01	4.2E+04
ZINC	NV	S			
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)			not applicable	not applicable	not apploicable
Sodium Adsorption Ratio			not applicable	not applicable	not applicable

Notes:

1. Category "Residential" considered adequate for other sensitive uses (e.g., day-care centers, hospitals, etc.)

2. Soil Vapor: Screening levels based on soil vapor data collected immediately beneath a building slab or within 1.5 meters (five feet) ground su Intended for evaluation of potential vapor intrusion hazards.

Soil vapor action levels apply to areas that overlie contaminated soil and/or contaminated groundwater.

TPH -Total Petroleum Hydrocarbons. TPH (or equivalent) must be included in analyses for soil vapor collected at petroleum release sites, in ad targeted VOCs (e.g., BTEX, etc.). See Volume 1, Section 2.6 and Appendix 1, Chapter 5.

SOIL VAPOR LEVELS
Commercial/ Industrial (ug/m^3)
8.4E+05
5.6E+05
1.1E+08
3.5E+03
4.2E+06
6.3E+03
4.5E+03
1.4E+03
1.5E+02
4.9E+03
1.3E+03
4.5E+04
1.8E+04
8.2E+03
4.9E+03
1.8E+05
3.5E+07
2.1E+03
3.2E+05
7.0E+04
2.8E+03

SOIL VAPOR LEVELS
Commercial/ Industrial (ug/m^3)
8.2E+00
2.3E+03
8.2E+01
7.0E+05
4.2E+05
4.5E+03
5.1E+02
3.1E+04
1.9E+03
7.0E+05
2.8E+04
2.8E+05
4.9E+03
1.2E+04
9.8E+03
1.3E-01
2.0E+05
5.6E+05
3.8E+01
1.9E+01
1.1E+02
2.2E+03
4.5E+03

SOIL VAPOR LEVELS
Commercial/ Industrial (ug/m^3)
1.8E+07
1.1E+07
1.9E+05
2.1E+06
6.8E+04
5.6E+04
1.1E+04
1.2E+03
8.9E+02
5.6E+05
8.6E+02
4.2E+05
3.5E+06
6.5E+04
6.6E+03
8.5E+02
8.0E+03
1.8E+07

SOIL VAPOR LEVELS
Commercial/ Industrial (ug/m^3)
4.9E+06
2.2E+06
6.8E+03
1.8E+07
7.0E+02
7.0E+03
6.5E+00
1.1E+03

SOIL VAPOR LEVELS
Commercial/ Industrial (ug/m^3)
1.1E+04
3.5E+05
not applicable
not applicable

rface in open areas.

dition to individual,

TABLE D. ENVIRONMENTAL ACTION LEVELS (EALs)
[1]Surface Water Bodies

CHEMICAL PARAMETER	SURFACE WATER ACTION LEVELS		
	[2]Freshwater (ug/L)	[3]Marine (ug/L)	[4]Estuarine (ug/L)
ACENAPHTHENE	1.5E+01	2.0E+01	1.5E+01
ACENAPHTHYLENE	1.3E+01	3.1E+02	1.3E+01
ACETONE	1.7E+03	1.5E+03	1.5E+03
ALDRIN	2.6E-05	2.6E-05	2.6E-05
AMETRYN	1.8E+02	7.0E+02	7.0E+02
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	2.0E+01	1.8E+01
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	1.1E+01	1.1E+01
ANTHRACENE	2.0E-02	7.3E-01	2.0E-02
ANTIMONY	6.0E+00	3.0E+01	3.0E+01
ARSENIC	1.4E-01	1.4E-01	1.4E-01
ATRAZINE	3.0E+00	1.2E+01	1.2E+01
BARIUM	2.2E+02	2.2E+02	2.2E+02
BENOMYL	1.4E-01	1.4E-01	1.4E-01
BENZENE	5.0E+00	1.3E+01	1.3E+01
BENZO(a)ANTHRACENE	1.1E-02	1.8E-02	1.8E-02
BENZO(a)PYRENE	1.8E-02	1.8E-02	1.8E-02
BENZO(b)FLUORANTHENE	1.8E-02	1.8E-02	1.8E-02
BENZO(g,h,i)PERYLENE	1.3E-01	1.3E-01	1.3E-01
BENZO(k)FLUORANTHENE	1.8E-02	1.8E-02	1.8E-02
BERYLLIUM	3.8E-02	3.8E-02	3.8E-02
BIPHENYL, 1,1-	5.0E-01	5.0E-01	5.0E-01
BIS(2-CHLOROETHYL)ETHER	1.4E-02	4.4E-01	4.4E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	3.7E-01	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	2.2E+00	2.2E+00	2.2E+00
BORON	4.0E+03	1.0E+03	1.0E+03
BROMODICHLOROMETHANE	1.4E-01	3.4E+02	3.4E+02
BROMOFORM	8.0E+01	1.4E+02	1.4E+02
BROMOMETHANE	7.6E+00	1.6E+01	1.6E+01
CADMIUM	3.0E+00	9.3E+00	3.0E+00
CARBON TETRACHLORIDE	2.3E+00	2.3E+00	2.D1013
CHLORDANE (TECHNICAL)	1.6E-05	1.6E-05	1.6E-05
CHLOROANILINE, p-	3.9E-01	1.9E+01	1.9E+01
CHLOROBENZENE	2.5E+01	5.0E+01	2.5E+01
CHLOROETHANE	1.6E+01	1.6E+01	1.6E+01
CHLOROFORM	5.1E+00	5.1E+00	5.1E+00
CHLOROMETHANE	1.9E+02	1.9E+02	1.9E+02
CHLOROPHENOL, 2-	1.8E-01	1.8E-01	1.8E-01
CHROMIUM (Total)	1.1E+01	5.0E+01	1.1E+01
CHROMIUM III	7.4E+01	2.0E+01	2.0E+01
CHROMIUM VI	4.3E+00	5.0E+01	1.1E+01
CHRYSENE	1.8E-02	1.8E-02	1.8E-02
COBALT	6.0E+00	2.3E+01	1.9E+01
COPPER	6.0E+00	2.9E+00	2.9E+00
CYANIDE (Free)	5.2E+00	1.0E+00	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	1.9E+02	7.9E+01

TABLE D. ENVIRONMENTAL ACTION LEVELS (EALs)
[1]Surface Water Bodies

CHEMICAL PARAMETER	SURFACE WATER ACTION LEVELS		
	[2]Freshwater (ug/L)	[3]Marine (ug/L)	[4]Estuarine (ug/L)
DALAPON	2.0E+02	3.0E+02	3.0E+02
DIBENZO(a,h)ANTHTRACENE	2.9E-03	1.8E-02	1.8E-02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	4.0E-02	4.0E-02
DIBROMOCHLOROMETHANE	2.1E-01	1.3E+01	1.3E+01
DIBROMOETHANE, 1,2-	4.0E-02	1.4E+03	1.4E+03
DICHLOROBENZENE, 1,2-	1.0E+01	1.0E+01	1.0E+01
DICHLOROBENZENE, 1,3-	2.2E+01	7.1E+01	2.2E+01
DICHLOROBENZENE, 1,4-	5.0E+00	1.1E+01	9.4E+00
DICHLOROBENZIDINE, 3,3-	7.0E-03	7.0E-03	7.0E-03
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.1E-04	3.1E-04	3.1E-04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.2E-04	2.2E-04	2.2E-04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.0E-06	8.0E-06	8.0E-06
DICHLOROETHANE, 1,1-	2.8E+00	4.7E+01	4.7E+01
DICHLOROETHANE, 1,2-	5.0E+00	7.9E+01	7.9E+01
DICHLOROETHYLENE, 1,1-	6.0E-01	6.0E-01	6.0E-01
DICHLOROETHYLENE, Cis 1,2-	7.0E+01	6.2E+02	6.2E+02
DICHLOROETHYLENE, Trans 1,2-	1.0E+02	2.6E+02	2.6E+02
DICHLOROPHENOL, 2,4-	3.0E-01	3.0E-01	3.0E-01
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	7.0E+01	7.0E+01
DICHLOROPROPANE, 1,2-	5.0E+00	1.0E+01	1.0E+01
DICHLOROPROPENE, 1,3-	5.0E-01	6.0E-02	6.0E-02
DIELDRIN	2.5E-05	2.5E-05	2.5E-05
DIETHYLPHTHALATE	2.2E+02	2.1E+02	2.1E+02
DIMETHYLPHENOL, 2,4-	1.2E+02	1.2E+02	1.2E+02
DIMETHYLPHTHALATE	1.1E+03	2.9E+03	1.1E+03
DINITROBENZENE, 1,3-	2.0E+00	1.0E+01	1.0E+01
DINITROPHENOL, 2,4-	4.0E+01	1.4E+01	1.4E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	3.0E+00	3.0E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	8.1E+01	8.1E+01
DIOXANE, 1,4-	4.6E-01	5.0E+04	5.0E+04
DIOXINS (TEQ)	3.1E-09	3.1E-09	3.1E-09
DIURON	4.0E+01	6.0E+01	6.0E+01
ENDOSULFAN	5.6E-02	8.7E-03	8.7E-03
ENDRIN	2.3E-03	2.3E-03	2.3E-03
ETHANOL	5.0E+04	5.0E+04	5.0E+04
ETHYLBENZENE	3.0E+01	7.3E+00	7.3E+00
FLUORANTHENE	8.0E-01	7.1E+00	8.0E-01
FLUORENE	1.9E+01	3.9E+00	3.9E+00
GLYPHOSATE	7.0E+02	1.8E+03	1.8E+03
HEPTACHLOR	9.0E-05	9.0E-05	9.0E-05
HEPTACHLOR EPOXIDE	3.9E-05	3.9E-05	3.9E-05
HEXACHLOROBENZENE	2.4E-04	2.4E-04	2.4E-04
HEXACHLOROBUTADIENE	2.0E-01	3.0E-01	3.0E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-02	2.0E-02	2.0E-02
HEXACHLOROETHANE	4.0E-01	2.9E+00	2.9E+00

TABLE D. ENVIRONMENTAL ACTION LEVELS (EALs)
[1]Surface Water Bodies

CHEMICAL PARAMETER	SURFACE WATER ACTION LEVELS		
	[2]Freshwater (ug/L)	[3]Marine (ug/L)	[4]Estuarine (ug/L)
HEXAZINONE	6.6E+02	1.7E+04	1.7E+04
INDENO(1,2,3-cd)PYRENE	1.8E-02	1.8E-02	1.8E-02
ISOPHORONE	8.2E+01	9.2E+02	9.2E+02
LEAD	1.5E+01	5.6E+00	5.6E+00
MERCURY	4.7E-02	2.5E-02	2.5E-02
METHOXYCHLOR	3.0E-02	3.0E-02	3.0E-02
METHYL ETHYL KETONE	5.6E+03	8.4E+03	8.4E+03
METHYL ISOBUTYL KETONE	1.7E+02	1.7E+02	1.7E+02
METHYL MERCURY	2.8E-03	2.8E-03	2.8E-03
METHYL TERT BUTYL ETHER	5.0E+00	1.8E+02	1.8E+02
METHYLENE CHLORIDE	5.0E+00	5.9E+02	5.9E+02
METHYLNAPHTHALENE, 1-	2.1E+00	2.1E+00	2.1E+00
METHYLNAPHTHALENE, 2-	4.7E+00	1.0E+01	4.7E+00
MOLYBDENUM	1.0E+02	3.7E+02	3.7E+02
NAPHTHALENE	1.7E+01	1.2E+01	1.2E+01
NICKEL	5.0E+00	8.3E+00	5.0E+00
NITROBENZENE	1.4E-01	3.8E+02	3.8E+02
NITROGLYCERIN	2.0E+00	1.8E+01	1.8E+01
NITROTOLUENE, 2-	7.9E-02	7.1E+01	7.1E+01
NITROTOLUENE, 3-	2.0E+00	4.2E+01	4.2E+01
NITROTOLUENE, 4-	4.9E+00	4.6E+01	4.6E+01
PENTACHLOROPHENOL	1.0E+00	3.0E+00	3.0E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	2.2E+04	2.2E+04
PERCHLORATE	1.5E+01	6.0E+02	6.0E+02
PHENANTHRENE	2.3E+00	4.6E+00	2.3E+00
PHENOL	1.6E+02	5.8E+01	5.8E+01
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-05	7.9E-05	7.9E-05
PROPICONAZOLE	9.5E+01	9.5E+01	9.5E+01
PYRENE	4.6E+00	1.0E+01	4.6E+00
SELENIUM	5.0E+00	7.1E+01	5.0E+00
SILVER	1.0E+00	1.0E-01	1.0E-01
SIMAZINE	4.0E+00	9.0E+00	9.0E+00
STYRENE	1.0E+01	1.1E+01	1.1E+01
TERBACIL	2.6E+02	2.6E+02	2.6E+02
tert-BUTYL ALCOHOL	5.8E+00	1.8E+04	1.8E+04
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	1.1E+01	1.1E+01
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	3.5E+00	3.5E+00
TETRACHLOROETHYLENE	2.9E+00	2.9E+00	2.9E+00
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	1.2E+00	1.2E+00
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	3.3E+02	2.2E+02
THALLIUM	2.0E+00	1.2E+01	6.0E+00
TOLUENE	4.0E+01	9.8E+00	9.8E+00
TOXAPHENE	2.0E-04	2.0E-04	2.0E-04
TPH (gasolines)	1.0E+02	3.7E+03	5.0E+02
TPH (middle distillates)	1.0E+02	6.4E+02	6.4E+02

TABLE D. ENVIRONMENTAL ACTION LEVELS (EALs)
[1]Surface Water Bodies

CHEMICAL PARAMETER	SURFACE WATER ACTION LEVELS [2]Freshwater (ug/L)	[3]Marine (ug/L)	[4]Estuarine (ug/L)
TPH (residual fuels)	1.0E+02	6.4E+02	6.4E+02
TRICHLOROBENZENE, 1,2,4-	7.0E+01	1.1E+02	1.1E+02
TRICHLOROETHANE, 1,1,1-	7.6E+01	1.1E+01	1.1E+01
TRICHLOROETHANE, 1,1,2-	5.0E+00	1.4E+01	1.4E+01
TRICHLOROETHYLENE	5.0E+00	2.6E+01	2.6E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	1.2E+01	1.9E+00
TRICHLOROPHENOL, 2,4,6-	1.2E+00	1.2E+00	1.2E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	6.9E+02	6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	5.0E+01	3.0E+01
TRICHLOROPROPANE, 1,2,3-	6.0E-01	1.4E+01	1.4E+01
TRICHLOROPROPENE, 1,2,3-	6.2E-01	6.2E-01	6.2E-01
TRIFLURALIN	1.1E+00	1.1E+00	1.1E+00
TRINITROBENZENE, 1,3,5-	1.1E+01	1.0E+01	1.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	4.0E+01	4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	2.0E+01	1.3E+01
VANADIUM	2.7E+01	8.1E+01	2.7E+01
VINYL CHLORIDE	2.0E+00	1.7E+02	1.7E+02
XYLENES	2.0E+01	1.3E+01	1.3E+01
ZINC	2.2E+01	8.6E+01	2.2E+01
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	not applicable	not applicable	not applicable
Sodium Adsorption Ratio	not applicable	not applicable	not applicable

Notes:

1. Compiled for screening of contaminated groundwater that could discharge to surface water. Check with agency overseeing surface water quality for application to aquatic habitats.

2. Source of Freshwater EALs: Refer to Appendix 1, Table D-2a for basis. Includes consideration of drinking water action levels.

3. Source of Marine EALs: Refer to Appendix 1, Table D-2b for basis.

4. Source of Estuarine EALs: Refer to Appendix 1, Table D-2c for basis.

Surface water action levels lowest of drinking water goal (freshwater only), chronic aquatic habitat goal, goal to address bioaccumulation in aquatic organisms and subsequent consumption by humans, and general nuisance goal (odors, etc.). Refer to Chapter 2 of text and Appendix 1 for details.

Estuarine action levels lowest of freshwater and marine action levels.

Water EALs for ethanol based on gross contamination concerns (see Appendix 1, Chapter 5 and related tables).

TPH -Total Petroleum Hydrocarbons. TPH EALs must be used in conjunction with EALs for related chemicals (e.g., BTEX, PAHs, oxidizers, etc.). See Section 2.6 and Appendix 1, Chapter 5, and HEER office Technical Guidance Manual.

TABLE A-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
ACENAPHTHENE	1.2E+02	Vapor Intrusion	1.0E+03	site-specific		6.6E+02	1.2E+02	1.2E+02
ACENAPHTHYLENE	1.0E+02	Groundwater Protection	5.0E+02	site-specific		3.4E+02	(Use soil gas)	1.0E+02
ACETONE	8.7E+00	Groundwater Protection	5.0E+02	site-specific		1.2E+04	1.4E+04	8.7E+00
ALDRIN	3.9E+00	Direct Exposure	1.0E+03	site-specific		3.9E+00		8.4E+00
AMETRYN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		1.1E+02		1.3E+01
AMINO,2- DINITROTOLUENE,4,6-	1.9E+00	Groundwater Protection	5.0E+02	site-specific		3.1E+01		1.9E+00
AMINO,4- DINITROTOLUENE,2,6-	1.9E+00	Groundwater Protection	5.0E+02	site-specific		3.1E+01		1.9E+00
ANTHRACENE	4.2E+00	Vapor Intrusion	5.0E+02	site-specific		3.5E+03	4.2E+00	4.2E+00
ANTIMONY	6.3E+00	Direct Exposure	1.0E+03	site-specific	2.4E+00	6.3E+00		(Use batch test)
ARSENIC	2.4E+01	Background	1.0E+03	site-specific	2.4E+01	2.3E+01		(Use batch test)
ATRAZINE	1.1E-01	Groundwater Protection	5.0E+02	site-specific		2.4E+00		1.1E-01
BARIUM	1.0E+03	Ceiling Value	1.0E+03	site-specific	6.9E+02	3.1E+03		(Use batch test)
BENOMYL	1.6E-01	Groundwater Protection	1.0E+03	site-specific		6.3E+02		1.6E-01
BENZENE	3.0E-01	Groundwater Protection	5.0E+02	site-specific		1.2E+00	7.7E-01	3.0E-01
BENZO(a)ANTHRACENE	1.0E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+01		1.0E+01
BENZO(a)PYRENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		2.0E+01
BENZO(b)FLUORANTHENE	5.4E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+01		5.4E+00
BENZO(g,h,i)PERYLENE	3.5E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		3.5E+01
BENZO(k)FLUORANTHENE	2.9E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.9E+01
BERYLLIUM	3.1E+01	Direct Exposure	1.0E+03	site-specific	3.0E+00	3.1E+01		(Use batch test)
BIPHENYL, 1,1-	1.0E+01	Direct Exposure	5.0E+02	site-specific		1.0E+01	(Use soil gas)	2.3E+02
BIS(2-CHLOROETHYL)ETHER	7.5E-05	Groundwater Protection	5.0E+02	site-specific		2.4E-01	7.9E-03	7.5E-05
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+00	(Use soil gas)	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	Direct Exposure	5.0E+02	site-specific		3.9E+01		1.9E+02
BORON	1.0E+03	Ceiling Value	1.0E+03	site-specific		3.1E+03		(Use batch test)
BROMODICHLOROMETHANE	2.5E-03	Groundwater Protection	9.3E+02	site-specific		3.2E-01	1.6E-02	2.5E-03
BROMOFORM	6.9E-01	Groundwater Protection	5.0E+02	site-specific		2.0E+01		6.9E-01
BROMOMETHANE	2.2E-01	Vapor Intrusion	5.0E+02	site-specific		1.5E+00	2.2E-01	3.6E-01
CADMIUM	1.4E+01	Direct Exposure	1.0E+03	site-specific	2.3E+00	1.4E+01		(Use batch test)
CARBON TETRACHLORIDE	1.0E-01	Vapor Intrusion	4.5E+02	site-specific		7.1E-01	1.0E-01	9.1E-01
CHLORDANE (TECHNICAL)	1.7E+01	Direct Exposure	1.0E+03	site-specific		1.7E+01		2.3E+01
CHLOROANILINE, p-	7.3E-03	Groundwater Protection	1.0E+03	site-specific		2.7E+00		7.3E-03
CHLOROBENZENE	2.2E+00	Vapor Intrusion	5.0E+02	site-specific		5.9E+01	2.2E+00	2.9E+00
CHLOROETHANE	1.2E+00	Groundwater Protection	5.0E+02	site-specific		2.1E+03	4.5E+02	1.2E+00
CHLOROFORM	2.6E-02	Vapor Intrusion	5.0E+02	site-specific		3.4E-01	2.6E-02	2.0E+00
CHLOROMETHANE	4.0E+00	Vapor Intrusion	1.0E+02	site-specific		2.4E+01	4.0E+00	1.1E+01
CHLOROPHENOL, 2-	1.2E-02	Groundwater Protection	1.0E+02	site-specific		7.0E+01	4.2E+01	1.2E-02
CHROMIUM (Total)	1.1E+03	Background	-	site-specific	1.1E+03			(Use batch test)
CHROMIUM III	1.0E+03	Ceiling Value	1.0E+03	site-specific		2.3E+04		(Use batch test)
CHROMIUM VI	3.0E+01	Direct Exposure	1.0E+03	site-specific		3.0E+01		(Use batch test)
CHRYSENE	3.0E+01	Groundwater Protection	1.0E+03	site-specific		1.6E+03		3.0E+01

TABLE A-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
COBALT	8.0E+01	Background	1.0E+03	site-specific	8.0E+01	4.7E+00		(Use batch test)
COPPER	6.3E+02	Direct Exposure	1.0E+03	site-specific	2.5E+02	6.3E+02		(Use batch test)
CYANIDE (Free)	4.8E+00	Direct Exposure	1.0E+02	site-specific		4.8E+00	(Use soil gas)	(Use batch test)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.0E-02	Groundwater Protection	5.0E+02	site-specific		6.1E+00		1.0E-02
DALAPON	1.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+02		1.1E-01
DIBENZO(a,h)ANTHTRACENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		2.9E+01
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	Groundwater Protection	5.0E+02	site-specific		5.7E-03	(Use soil gas)	8.1E-04
DIBROMOCHLOROMETHANE	2.1E-03	Groundwater Protection	1.0E+02	site-specific		1.0E+00	2.9E-02	2.1E-03
DIBROMOETHANE, 1,2-	4.2E-04	Groundwater Protection	5.0E+02	site-specific		3.9E-02	1.0E-03	4.2E-04
DICHLOROBENZENE, 1,2-	7.5E-01	Groundwater Protection	3.8E+02	site-specific		3.8E+02	8.9E+00	7.5E-01
DICHLOROBENZENE, 1,3-	5.7E-01	Groundwater Protection	1.0E+02	site-specific		2.0E+02	(Use soil gas)	5.7E-01
DICHLOROBENZENE, 1,4-	5.5E-02	Vapor Intrusion	5.0E+02	site-specific		2.8E+00	5.5E-02	3.9E-01
DICHLOROBENZIDINE, 3,3-	9.2E-02	Groundwater Protection	5.0E+02	site-specific		1.2E+00		9.2E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	Direct Exposure	5.0E+02	site-specific		2.3E+00		6.3E+01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	Direct Exposure	5.0E+02	site-specific		2.0E+00		2.8E+01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	Direct Exposure	1.0E+03	site-specific		1.9E+00		5.6E+00
DICHLOROETHANE, 1,1-	1.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+00	3.8E-01	1.1E-01
DICHLOROETHANE, 1,2-	2.3E-02	Vapor Intrusion	5.0E+02	site-specific		5.0E-01	2.3E-02	7.0E-02
DICHLOROETHYLENE, 1,1-	1.2E+00	Groundwater Protection	5.0E+02	site-specific		4.9E+01	8.9E+00	1.2E+00
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	Vapor Intrusion	1.0E+02	site-specific		3.9E+00	3.6E-01	2.2E+00
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	Vapor Intrusion	5.0E+02	site-specific		2.9E+01	3.6E+00	6.5E+00
DICHLOROPHENOL, 2,4-	7.3E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+01		7.3E-03
DICHLOROPHENOXYACETIC ACID (2,4-D)	3.4E-01	Groundwater Protection	5.0E+02	site-specific		1.4E+02		3.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	Vapor Intrusion	1.0E+02	site-specific		1.1E+00	6.0E-02	1.4E-01
DICHLOROPROPENE, 1,3-	1.7E-02	Groundwater Protection	5.0E+02	site-specific		1.9E+00	1.5E-01	1.7E-02
DIELDRIN	2.5E+00	Direct Exposure	1.0E+03	site-specific		2.5E+00		2.4E+01
DIETHYLPHTHALATE	1.7E+01	Groundwater Protection	5.0E+02	site-specific		1.0E+04		1.7E+01
DIMETHYLPHENOL, 2,4-	3.3E+01	Groundwater Protection	1.0E+02	site-specific		2.5E+02		3.3E+01
DIMETHYLPHTHALATE	7.4E+01	Groundwater Protection	5.0E+02	site-specific		1.3E+05		7.4E+01
DINITROBENZENE, 1,3-	1.2E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		1.2E-01
DINITROPHENOL, 2,4-	3.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		3.1E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	2.4E-02	Groundwater Protection	5.0E+02	site-specific		1.7E+00		2.4E-02
DINITROTOLUENE, 2,6- (2,6-DNT)	5.1E-03	Groundwater Protection	5.0E+02	site-specific		3.6E-01		5.1E-03
DIOXANE, 1,4-	2.1E-04	Groundwater Protection	5.0E+02	site-specific		5.4E+00	(Use soil gas)	2.1E-04
DIOXINS (TEQ)	2.4E-04	Direct Exposure	1.0E+03	site-specific	2.0E-05	2.4E-04		3.0E-01
DIURON	7.3E-01	Groundwater Protection	5.0E+02	site-specific		2.5E+01		7.3E-01
ENDOSULFAN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		9.4E+01		1.3E+01
ENDRIN	3.8E+00	Direct Exposure	5.0E+02	site-specific		3.8E+00		3.0E+01
ETHANOL	4.5E+00	Groundwater Protection	5.0E+02	site-specific			(Use soil gas)	4.5E+00
ETHYLBENZENE	3.7E+00	Groundwater Protection	4.8E+02	site-specific		6.3E+01	2.4E+01	3.7E+00
FLUORANTHENE	1.2E+02	Groundwater Protection	5.0E+02	site-specific		4.8E+02		1.2E+02
FLUORENE	9.3E+01	Vapor Intrusion	5.0E+02	site-specific		4.6E+02	9.3E+01	3.6E+02

TABLE A-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
GLYPHOSATE	2.4E+02	Groundwater Protection	5.0E+02	site-specific		1.3E+03		2.4E+02
HEPTACHLOR	1.4E-01	Direct Exposure	1.0E+03	site-specific		1.4E-01		4.5E+01
HEPTACHLOR EPOXIDE	7.1E-02	Direct Exposure	1.0E+03	site-specific		7.1E-02		1.2E+01
HEXACHLOROBENZENE	2.2E-01	Direct Exposure	5.0E+02	site-specific		2.2E-01		2.3E-01
HEXACHLOROBUTADIENE	4.1E-02	Groundwater Protection	5.0E+02	site-specific		1.3E+00		4.1E-02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	7.5E-02	Groundwater Protection	5.0E+02	site-specific		5.7E-01		7.5E-02
HEXACHLOROETHANE	2.3E-02	Groundwater Protection	5.0E+02	site-specific		2.0E+00		2.3E-02
HEXAZINONE	1.4E+01	Groundwater Protection	5.0E+02	site-specific		4.2E+02		1.4E+01
INDENO(1,2,3-cd)PYRENE	9.6E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+01		9.6E+00
ISOPHORONE	8.9E-01	Groundwater Protection	5.0E+02	site-specific		5.7E+02		8.9E-01
LEAD	2.0E+02	Direct Exposure	1.0E+03	site-specific	7.3E+01	2.0E+02		(Use batch test)
MERCURY	4.7E+00	Direct Exposure	5.0E+02	site-specific	7.2E-01	4.7E+00		(Use batch test)
METHOXYCHLOR	1.6E+01	Groundwater Protection	5.0E+02	site-specific		6.3E+01		1.6E+01
METHYL ETHYL KETONE	6.2E+00	Groundwater Protection	5.0E+02	site-specific		5.6E+03	2.2E+03	6.2E+00
METHYL ISOBUTYL KETONE	3.8E+00	Groundwater Protection	1.0E+02	site-specific		3.4E+03	1.3E+03	3.8E+00
METHYL MERCURY	1.6E+00	Direct Exposure	1.0E+02	site-specific		1.6E+00		(Use batch test)
METHYL TERT BUTYL ETHER	2.8E-02	Groundwater Protection	1.0E+02	site-specific		5.0E+01	2.3E+00	2.8E-02
METHYLENE CHLORIDE	1.2E-01	Groundwater Protection	5.0E+02	site-specific		5.8E+01	2.2E+01	1.2E-01
METHYLNAPHTHALENE, 1-	2.5E+00	Groundwater Protection	5.0E+02	site-specific		1.0E+02	5.9E+01	2.5E+00
METHYLNAPHTHALENE, 2-	4.1E+00	Groundwater Protection	5.0E+02	site-specific		3.9E+01	5.0E+01	4.1E+00
MOLYBDENUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	4.0E+00	7.8E+01		(Use batch test)
NAPHTHALENE	4.4E+00	Groundwater Protection	5.0E+02	site-specific		2.8E+01	7.0E+00	4.4E+00
NICKEL	4.1E+02	Background	1.0E+03	site-specific	4.1E+02	3.1E+02		(Use batch test)
NITROBENZENE	5.3E-03	Groundwater Protection	5.0E+02	site-specific		5.6E+00	(Use soil gas)	5.3E-03
NITROGLYCERIN	3.9E-02	Groundwater Protection	5.0E+02	site-specific		1.3E+00		3.9E-02
NITROTOLUENE, 2-	4.9E-03	Groundwater Protection	5.0E+02	site-specific		2.2E+00	(Use soil gas)	4.9E-03
NITROTOLUENE, 3-	1.2E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		1.2E-01
NITROTOLUENE, 4-	2.9E-01	Groundwater Protection	5.0E+02	site-specific		3.4E+01		2.9E-01
PENTACHLOROPHENOL	9.8E-02	Groundwater Protection	5.0E+02	site-specific		1.0E+00		9.8E-02
PENTAERYTHRITOLTETRANITRATE (PETN)	2.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		2.1E+00
PERCHLORATE	7.0E-03	Groundwater Protection	1.0E+03	site-specific		1.1E+01		7.0E-03
PHENANTHRENE	4.6E+02	Direct Exposure	5.0E+02	site-specific		4.6E+02	(Use soil gas)	5.5E+02
PHENOL	9.3E+00	Groundwater Protection	5.0E+02	site-specific		3.8E+03		9.3E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		3.4E+01
PROPICONAZOLE	6.7E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		6.7E+01
PYRENE	4.4E+01	Vapor Intrusion	5.0E+02	site-specific		3.6E+02	4.4E+01	6.1E+02
SELENIUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	7.1E+00	7.8E+01		(Use batch test)
SILVER	7.8E+01	Direct Exposure	1.0E+03	site-specific	1.5E+00	7.8E+01		(Use batch test)
SIMAZINE	9.7E-02	Groundwater Protection	5.0E+02	site-specific		4.5E+00		9.7E-02
STYRENE	9.1E-01	Groundwater Protection	5.0E+02	site-specific		8.7E+02	4.5E+02	9.1E-01
TERBACIL	2.2E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.2E+00
tert-BUTYL ALCOHOL	3.6E-02	Groundwater Protection	1.0E+02	site-specific		9.9E+01	(Use soil gas)	3.6E-02

TABLE A-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
TETRACHLOROETHANE, 1,1,1,2-	1.8E-02	Groundwater Protection	1.0E+02	site-specific		2.2E+00	(Use soil gas)	1.8E-02
TETRACHLOROETHANE, 1,1,2,2-	1.4E-03	Groundwater Protection	5.0E+02	site-specific		6.5E-01	1.0E-02	1.4E-03
TETRACHLOROETHYLENE	9.8E-02	Vapor Intrusion	1.7E+02	site-specific		1.1E+00	9.8E-02	6.4E-01
TETRACHLOROPHENOL, 2,3,4,6-	5.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+02		5.1E-01
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	8.8E+01	Groundwater Protection	5.0E+02	site-specific		7.7E+02		8.8E+01
THALLIUM	7.8E-01	Direct Exposure	1.0E+03	site-specific	2.5E-01	7.8E-01		(Use batch test)
TOLUENE	3.2E+00	Groundwater Protection	5.0E+02	site-specific		8.2E+02	8.2E+02	3.2E+00
TOXAPHENE	4.9E-01	Direct Exposure	5.0E+02	site-specific		4.9E-01		2.5E+02
TPH (gasolines)	1.0E+02	Ceiling Value	1.0E+02	site-specific		4.8E+02	(Use soil gas)	1.0E+02
TPH (middle distillates)	1.0E+02	Groundwater Protection	5.0E+02	site-specific		2.6E+02	(Use soil gas)	1.0E+02
TPH (residual fuels)	5.0E+02	Ceiling Value	5.0E+02	site-specific		9.4E+03		1.0E+03
TRICHLOROBENZENE, 1,2,4-	1.6E-01	Vapor Intrusion	5.0E+02	site-specific		8.2E+00	1.6E-01	1.6E+01
TRICHLOROETHANE, 1,1,1-	2.3E+01	Groundwater Protection	5.0E+02	site-specific		6.4E+02	2.2E+02	2.3E+01
TRICHLOROETHANE, 1,1,2-	8.9E-03	Vapor Intrusion	1.0E+02	site-specific		3.2E-01	8.9E-03	7.6E-02
TRICHLOROETHYLENE	8.9E-02	Vapor Intrusion	5.0E+02	site-specific		8.9E-01	8.9E-02	3.6E-01
TRICHLOROPHENOL, 2,4,5-	4.5E+00	Groundwater Protection	1.0E+02	site-specific		1.3E+03		4.5E+00
TRICHLOROPHENOL, 2,4,6-	4.5E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+01		4.5E-01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	3.6E+00	Groundwater Protection	1.0E+03	site-specific		1.3E+02		3.6E+00
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.5E+00	Groundwater Protection	5.0E+02	site-specific		1.0E+02		1.5E+00
TRICHLOROPROPANE, 1,2,3-	1.6E-03	Direct Exposure	1.0E+02	site-specific		1.6E-03	(Use soil gas)	1.3E-02
TRICHLOROPROPENE, 1,2,3-	8.1E-02	Groundwater Protection	1.0E+02	site-specific		1.6E-01	(Use soil gas)	8.1E-02
TRIFLURALIN	2.8E+01	Groundwater Protection	1.0E+02	site-specific		9.0E+01		2.8E+01
TRINITROBENZENE, 1,3,5-	7.5E+00	Groundwater Protection	5.0E+02	site-specific		4.5E+02		7.5E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.2E+00	Groundwater Protection	5.0E+02	site-specific		7.3E+00		1.2E+00
VANADIUM	7.7E+02	Background	1.0E+03	site-specific	7.7E+02	7.8E+01		(Use batch test)
VINYL CHLORIDE	3.6E-02	Vapor Intrusion	5.0E+02	site-specific		5.9E-02	3.6E-02	3.5E-01
XYLENES	2.1E+00	Groundwater Protection	2.6E+02	site-specific		1.2E+02	4.5E+01	2.1E+00
ZINC	1.0E+03	Ceiling Value	1.0E+03	site-specific	3.5E+02	4.7E+03		(Use batch test)
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	-	-	-		-	-	-
Sodium Adsorption Ratio	5.0	-	-	-		-	-	-

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers, parks and other sensitive uses.

Final Environmental Action Level is lowest of gross contamination, ecotoxicity, direct-exposure, vapor intrusion and leaching action levels.

Assumes soil pH 5.0 to 9.0.

Soil data should be reported on dry-weight basis (see Chapter 7).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TABLE A-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
ACENAPHTHENE	1.2E+02	Vapor Intrusion	1.0E+03	site-specific		6.6E+02	1.2E+02	1.2E+02
ACENAPHTHYLENE	5.5E+00	Groundwater Protection	5.0E+02	site-specific		3.4E+02	(Use soil gas)	5.5E+00
ACETONE	9.2E-01	Groundwater Protection	5.0E+02	site-specific		1.2E+04	1.4E+04	9.2E-01
ALDRIN	3.9E+00	Direct Exposure	1.0E+03	site-specific		3.9E+00		8.4E+00
AMETRYN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		1.1E+02		1.3E+01
AMINO,2- DINITROTOLUENE,4,6-	8.5E-01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		8.5E-01
AMINO,4- DINITROTOLUENE,2,6-	5.2E-01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		5.2E-01
ANTHRACENE	4.2E+00	Vapor Intrusion	5.0E+02	site-specific		3.5E+03	4.2E+00	4.2E+00
ANTIMONY	6.3E+00	Direct Exposure	1.0E+03	site-specific	2.4E+00	6.3E+00		(Use batch test)
ARSENIC	2.4E+01	Background	1.0E+03	site-specific	2.4E+01	2.3E+01		(Use batch test)
ATRAZINE	1.1E-01	Groundwater Protection	5.0E+02	site-specific		2.4E+00		1.1E-01
BARIUM	1.0E+03	Ceiling Value	1.0E+03	site-specific	6.9E+02	3.1E+03		(Use batch test)
BENOMYL	7.8E-03	Groundwater Protection	1.0E+03	site-specific		6.3E+02		7.8E-03
BENZENE	3.0E-01	Groundwater Protection	5.0E+02	site-specific		1.2E+00	7.7E-01	3.0E-01
BENZO(a)ANTHRACENE	1.0E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+01		1.0E+01
BENZO(a)PYRENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		5.9E+00
BENZO(b)FLUORANTHENE	5.4E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+01		5.4E+00
BENZO(g,h,i)PERYLENE	3.5E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		3.5E+01
BENZO(k)FLUORANTHENE	2.9E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.9E+01
BERYLLIUM	3.1E+01	Direct Exposure	1.0E+03	site-specific	3.0E+00	3.1E+01		(Use batch test)
BIPHENYL, 1,1-	1.0E+01	Direct Exposure	5.0E+02	site-specific		1.0E+01	(Use soil gas)	2.3E+02
BIS(2-CHLOROETHYL)ETHER	7.5E-05	Groundwater Protection	5.0E+02	site-specific		2.4E-01	7.9E-03	7.5E-05
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+00	(Use soil gas)	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	Direct Exposure	5.0E+02	site-specific		3.9E+01		1.9E+02
BORON	1.0E+03	Ceiling Value	1.0E+03	site-specific		3.1E+03		(Use batch test)
BROMODICHLOROMETHANE	2.5E-03	Groundwater Protection	9.3E+02	site-specific		3.2E-01	1.6E-02	2.5E-03
BROMOFORM	6.9E-01	Groundwater Protection	5.0E+02	site-specific		2.0E+01		6.9E-01
BROMOMETHANE	2.2E-01	Vapor Intrusion	5.0E+02	site-specific		1.5E+00	2.2E-01	3.6E-01
CADMIUM	1.4E+01	Direct Exposure	1.0E+03	site-specific	2.3E+00	1.4E+01		(Use batch test)
CARBON TETRACHLORIDE	1.0E-01	Vapor Intrusion	4.5E+02	site-specific		7.1E-01	1.0E-01	9.1E-01
CHLORDANE (TECHNICAL)	1.7E+01	Direct Exposure	1.0E+03	site-specific		1.7E+01		2.3E+01
CHLOROANILINE, p-	7.3E-03	Groundwater Protection	1.0E+03	site-specific		2.7E+00		7.3E-03
CHLOROBENZENE	1.5E+00	Groundwater Protection	5.0E+02	site-specific		5.9E+01	2.2E+00	1.5E+00
CHLOROETHANE	1.2E+00	Groundwater Protection	5.0E+02	site-specific		2.1E+03	4.5E+02	1.2E+00
CHLOROFORM	2.6E-02	Vapor Intrusion	5.0E+02	site-specific		3.4E-01	2.6E-02	7.9E-01
CHLOROMETHANE	4.0E+00	Vapor Intrusion	1.0E+02	site-specific		2.4E+01	4.0E+00	1.1E+01
CHLOROPHENOL, 2-	1.2E-02	Groundwater Protection	1.0E+02	site-specific		7.0E+01	4.2E+01	1.2E-02
CHROMIUM (Total)	1.1E+03	Background	-	site-specific	1.1E+03			(Use batch test)
CHROMIUM III	1.0E+03	Ceiling Value	1.0E+03	site-specific		2.3E+04		(Use batch test)
CHROMIUM VI	3.0E+01	Direct Exposure	1.0E+03	site-specific		3.0E+01		(Use batch test)
CHRYSENE	3.0E+01	Groundwater Protection	1.0E+03	site-specific		1.6E+03		3.0E+01
COBALT	8.0E+01	Background	1.0E+03	site-specific	8.0E+01	4.7E+00		(Use batch test)

TABLE A-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
COPPER	6.3E+02	Direct Exposure	1.0E+03	site-specific	2.5E+02	6.3E+02		(Use batch test)
CYANIDE (Free)	4.8E+00	Direct Exposure	1.0E+02	site-specific		4.8E+00	(Use soil gas)	(Use batch test)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.0E-02	Groundwater Protection	5.0E+02	site-specific		6.1E+00		1.0E-02
DALAPON	1.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+02		1.1E-01
DIBENZO(a,h)ANTHTRACENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		2.9E+01
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	Groundwater Protection	5.0E+02	site-specific		5.7E-03	(Use soil gas)	8.1E-04
DIBROMOCHLOROMETHANE	2.1E-03	Groundwater Protection	1.0E+02	site-specific		1.0E+00	2.9E-02	2.1E-03
DIBROMOETHANE, 1,2-	4.2E-04	Groundwater Protection	5.0E+02	site-specific		3.9E-02	1.0E-03	4.2E-04
DICHLOROBENZENE, 1,2-	7.5E-01	Groundwater Protection	3.8E+02	site-specific		3.8E+02	8.9E+00	7.5E-01
DICHLOROBENZENE, 1,3-	5.7E-01	Groundwater Protection	1.0E+02	site-specific		2.0E+02	(Use soil gas)	5.7E-01
DICHLOROBENZENE, 1,4-	5.5E-02	Vapor Intrusion	5.0E+02	site-specific		2.8E+00	5.5E-02	3.9E-01
DICHLOROBENZIDINE, 3,3-	9.2E-02	Groundwater Protection	5.0E+02	site-specific		1.2E+00		9.2E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	Direct Exposure	5.0E+02	site-specific		2.3E+00		6.3E+01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	Direct Exposure	5.0E+02	site-specific		2.0E+00		2.8E+01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	Direct Exposure	1.0E+03	site-specific		1.9E+00		5.6E+00
DICHLOROETHANE, 1,1-	1.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+00	3.8E-01	1.1E-01
DICHLOROETHANE, 1,2-	2.3E-02	Vapor Intrusion	5.0E+02	site-specific		5.0E-01	2.3E-02	7.0E-02
DICHLOROETHYLENE, 1,1-	1.2E+00	Groundwater Protection	5.0E+02	site-specific		4.9E+01	8.9E+00	1.2E+00
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	Vapor Intrusion	1.0E+02	site-specific		3.9E+00	3.6E-01	2.2E+00
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	Vapor Intrusion	5.0E+02	site-specific		2.9E+01	3.6E+00	6.5E+00
DICHLOROPHENOL, 2,4-	7.3E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+01		7.3E-03
DICHLOROPHENOXYACETIC ACID (2,4-D)	3.4E-01	Groundwater Protection	5.0E+02	site-specific		1.4E+02		3.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	Vapor Intrusion	1.0E+02	site-specific		1.1E+00	6.0E-02	1.4E-01
DICHLOROPROPENE, 1,3-	2.1E-03	Groundwater Protection	5.0E+02	site-specific		1.9E+00	1.5E-01	2.1E-03
DIELDRIN	2.5E+00	Direct Exposure	1.0E+03	site-specific		2.5E+00		2.4E+01
DIETHYLPHTHALATE	3.7E+00	Groundwater Protection	5.0E+02	site-specific		1.0E+04		3.7E+00
DIMETHYLPHENOL, 2,4-	9.8E+00	Groundwater Protection	1.0E+02	site-specific		2.5E+02		9.8E+00
DIMETHYLPHTHALATE	2.6E+01	Groundwater Protection	5.0E+02	site-specific		1.3E+05		2.6E+01
DINITROBENZENE, 1,3-	1.2E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		1.2E-01
DINITROPHENOL, 2,4-	1.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		1.1E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	2.4E-02	Groundwater Protection	5.0E+02	site-specific		1.7E+00		2.4E-02
DINITROTOLUENE, 2,6- (2,6-DNT)	5.1E-03	Groundwater Protection	5.0E+02	site-specific		3.6E-01		5.1E-03
DIOXANE, 1,4-	2.1E-04	Groundwater Protection	5.0E+02	site-specific		5.4E+00	(Use soil gas)	2.1E-04
DIOXINS (TEQ)	2.4E-04	Direct Exposure	1.0E+03	site-specific	2.0E-05	2.4E-04		3.0E-01
DIURON	7.3E-01	Groundwater Protection	5.0E+02	site-specific		2.5E+01		7.3E-01
ENDOSULFAN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		9.4E+01		1.3E+01
ENDRIN	3.8E+00	Direct Exposure	5.0E+02	site-specific		3.8E+00		3.0E+01
ETHANOL	4.5E+00	Groundwater Protection	5.0E+02	site-specific			(Use soil gas)	4.5E+00
ETHYLBENZENE	9.0E-01	Groundwater Protection	4.8E+02	site-specific		6.3E+01	2.4E+01	9.0E-01
FLUORANTHENE	8.7E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		8.7E+01
FLUORENE	9.3E+01	Vapor Intrusion	5.0E+02	site-specific		4.6E+02	9.3E+01	9.3E+01
GLYPHOSATE	2.4E+02	Groundwater Protection	5.0E+02	site-specific		1.3E+03		2.4E+02

TABLE A-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
HEPTACHLOR	1.4E-01	Direct Exposure	1.0E+03	site-specific		1.4E-01		4.5E+01
HEPTACHLOR EPOXIDE	7.1E-02	Direct Exposure	1.0E+03	site-specific		7.1E-02		1.2E+01
HEXACHLOROBENZENE	2.2E-01	Direct Exposure	5.0E+02	site-specific		2.2E-01		2.3E-01
HEXACHLOROBUTADIENE	4.1E-02	Groundwater Protection	5.0E+02	site-specific		1.3E+00		4.1E-02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.9E-02	Groundwater Protection	5.0E+02	site-specific		5.7E-01		2.9E-02
HEXACHLOROETHANE	2.3E-02	Groundwater Protection	5.0E+02	site-specific		2.0E+00		2.3E-02
HEXAZINONE	1.4E+01	Groundwater Protection	5.0E+02	site-specific		4.2E+02		1.4E+01
INDENO(1,2,3-cd)PYRENE	9.6E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+01		9.6E+00
ISOPHORONE	8.9E-01	Groundwater Protection	5.0E+02	site-specific		5.7E+02		8.9E-01
LEAD	2.0E+02	Direct Exposure	1.0E+03	site-specific	7.3E+01	2.0E+02		(Use batch test)
MERCURY	4.7E+00	Direct Exposure	5.0E+02	site-specific	7.2E-01	4.7E+00		(Use batch test)
METHOXYCHLOR	1.6E+01	Groundwater Protection	5.0E+02	site-specific		6.3E+01		1.6E+01
METHYL ETHYL KETONE	6.2E+00	Groundwater Protection	5.0E+02	site-specific		5.6E+03	2.2E+03	6.2E+00
METHYL ISOBUTYL KETONE	5.0E-01	Groundwater Protection	1.0E+02	site-specific		3.4E+03	1.3E+03	5.0E-01
METHYL MERCURY	1.6E+00	Direct Exposure	1.0E+02	site-specific		1.6E+00		(Use batch test)
METHYL TERT BUTYL ETHER	2.8E-02	Groundwater Protection	1.0E+02	site-specific		5.0E+01	2.3E+00	2.8E-02
METHYLENE CHLORIDE	1.2E-01	Groundwater Protection	5.0E+02	site-specific		5.8E+01	2.2E+01	1.2E-01
METHYLNAPHTHALENE, 1-	8.9E-01	Groundwater Protection	5.0E+02	site-specific		1.0E+02	5.9E+01	8.9E-01
METHYLNAPHTHALENE, 2-	1.9E+00	Groundwater Protection	5.0E+02	site-specific		3.9E+01	5.0E+01	1.9E+00
MOLYBDENUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	4.0E+00	7.8E+01		(Use batch test)
NAPHTHALENE	3.1E+00	Groundwater Protection	5.0E+02	site-specific		2.8E+01	7.0E+00	3.1E+00
NICKEL	4.1E+02	Background	1.0E+03	site-specific	4.1E+02	3.1E+02		(Use batch test)
NITROBENZENE	5.3E-03	Groundwater Protection	5.0E+02	site-specific		5.6E+00	(Use soil gas)	5.3E-03
NITROGLYCERIN	3.9E-02	Groundwater Protection	5.0E+02	site-specific		1.3E+00		3.9E-02
NITROTOLUENE, 2-	4.9E-03	Groundwater Protection	5.0E+02	site-specific		2.2E+00	(Use soil gas)	4.9E-03
NITROTOLUENE, 3-	1.2E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		1.2E-01
NITROTOLUENE, 4-	2.9E-01	Groundwater Protection	5.0E+02	site-specific		3.4E+01		2.9E-01
PENTACHLOROPHENOL	9.8E-02	Groundwater Protection	5.0E+02	site-specific		1.0E+00		9.8E-02
PENTAERYTHRITOLTETRANITRATE (PETN)	2.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		2.1E+00
PERCHLORATE	7.0E-03	Groundwater Protection	1.0E+03	site-specific		1.1E+01		7.0E-03
PHENANTHRENE	6.9E+01	Groundwater Protection	5.0E+02	site-specific		4.6E+02	(Use soil gas)	6.9E+01
PHENOL	1.8E+00	Groundwater Protection	5.0E+02	site-specific		3.8E+03		1.8E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		3.4E+01
PROPICONAZOLE	2.5E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.5E+01
PYRENE	4.4E+01	Vapor Intrusion	5.0E+02	site-specific		3.6E+02	4.4E+01	4.4E+01
SELENIUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	7.1E+00	7.8E+01		(Use batch test)
SILVER	7.8E+01	Direct Exposure	1.0E+03	site-specific	1.5E+00	7.8E+01		(Use batch test)
SIMAZINE	9.7E-02	Groundwater Protection	5.0E+02	site-specific		4.5E+00		9.7E-02
STYRENE	9.1E-01	Groundwater Protection	5.0E+02	site-specific		8.7E+02	4.5E+02	9.1E-01
TERBACIL	2.2E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.2E+00
tert-BUTYL ALCOHOL	3.6E-02	Groundwater Protection	1.0E+02	site-specific		9.9E+01	(Use soil gas)	3.6E-02
TETRACHLOROETHANE, 1,1,1,2-	1.8E-02	Groundwater Protection	1.0E+02	site-specific		2.2E+00	(Use soil gas)	1.8E-02

TABLE A-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	Drinking Water Resource Table E
TETRACHLOROETHANE, 1,1,2,2-	1.4E-03	Groundwater Protection	5.0E+02	site-specific		6.5E-01	1.0E-02	1.4E-03
TETRACHLOROETHYLENE	9.8E-02	Vapor Intrusion	1.7E+02	site-specific		1.1E+00	9.8E-02	6.4E-01
TETRACHLOROPHENOL, 2,3,4,6-	5.6E-02	Groundwater Protection	5.0E+02	site-specific		3.8E+02		5.6E-02
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.9E+01	Groundwater Protection	5.0E+02	site-specific		7.7E+02		1.9E+01
THALLIUM	7.8E-01	Direct Exposure	1.0E+03	site-specific	2.5E-01	7.8E-01		(Use batch test)
TOLUENE	7.8E-01	Groundwater Protection	5.0E+02	site-specific		8.2E+02	8.2E+02	7.8E-01
TOXAPHENE	4.9E-01	Direct Exposure	5.0E+02	site-specific		4.9E-01		2.5E+02
TPH (gasolines)	1.0E+02	Ceiling Value	1.0E+02	site-specific		4.8E+02	(Use soil gas)	1.0E+02
TPH (middle distillates)	1.0E+02	Groundwater Protection	5.0E+02	site-specific		2.6E+02	(Use soil gas)	1.0E+02
TPH (residual fuels)	5.0E+02	Ceiling Value	5.0E+02	site-specific		9.4E+03		1.0E+03
TRICHLOROBENZENE, 1,2,4-	1.6E-01	Vapor Intrusion	5.0E+02	site-specific		8.2E+00	1.6E-01	1.6E+01
TRICHLOROETHANE, 1,1,1-	1.2E+00	Groundwater Protection	5.0E+02	site-specific		6.4E+02	2.2E+02	1.2E+00
TRICHLOROETHANE, 1,1,2-	8.9E-03	Vapor Intrusion	1.0E+02	site-specific		3.2E-01	8.9E-03	7.6E-02
TRICHLOROETHYLENE	8.9E-02	Vapor Intrusion	5.0E+02	site-specific		8.9E-01	8.9E-02	3.6E-01
TRICHLOROPHENOL, 2,4,5-	5.0E-01	Groundwater Protection	1.0E+02	site-specific		1.3E+03		5.0E-01
TRICHLOROPHENOL, 2,4,6-	3.1E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+01		3.1E-01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	3.6E+00	Groundwater Protection	1.0E+03	site-specific		1.3E+02		3.6E+00
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	8.7E-01	Groundwater Protection	5.0E+02	site-specific		1.0E+02		8.7E-01
TRICHLOROPROPANE, 1,2,3-	1.6E-03	Direct Exposure	1.0E+02	site-specific		1.6E-03	(Use soil gas)	1.3E-02
TRICHLOROPROPENE, 1,2,3-	8.1E-02	Groundwater Protection	1.0E+02	site-specific		1.6E-01	(Use soil gas)	8.1E-02
TRIFLURALIN	1.8E+01	Groundwater Protection	1.0E+02	site-specific		9.0E+01		1.8E+01
TRINITROBENZENE, 1,3,5-	2.8E+00	Groundwater Protection	5.0E+02	site-specific		4.5E+02		2.8E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.2E+00	Groundwater Protection	5.0E+02	site-specific		7.3E+00		1.2E+00
VANADIUM	7.7E+02	Background	1.0E+03	site-specific	7.7E+02	7.8E+01		(Use batch test)
VINYL CHLORIDE	3.6E-02	Vapor Intrusion	5.0E+02	site-specific		5.9E-02	3.6E-02	3.5E-01
XYLENES	1.4E+00	Groundwater Protection	2.6E+02	site-specific		1.2E+02	4.5E+01	1.4E+00
ZINC	1.0E+03	Ceiling Value	1.0E+03	site-specific	3.5E+02	4.7E+03		(Use batch test)
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	-	-	-	-	-	-	-
Sodium Adsorption Ratio	5.0	-	-	-	-	-	-	-

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers, parks and other sensitive uses.

Final Environmental Action Level is lowest of gross contamination, ecotoxicity, direct-exposure, vapor intrusion and leaching action levels.

Assumes soil pH 5.0 to 9.0.

Soil data should be reported on dry-weight basis (see Chapter 7).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TABLE B-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
ACENAPHTHENE	1.2E+02	Vapor Intrusion	1.0E+03	site-specific		6.6E+02	1.2E+02	1.7E+02
ACENAPHTHYLENE	1.3E+02	Groundwater Protection	5.0E+02	site-specific		3.4E+02	(Use soil gas)	1.3E+02
ACETONE	9.2E+00	Groundwater Protection	5.0E+02	site-specific		1.2E+04	1.4E+04	9.2E+00
ALDRIN	3.9E+00	Direct Exposure	1.0E+03	site-specific		3.9E+00		1.8E+01
AMETRYN	1.1E+02	Direct Exposure	5.0E+02	site-specific		1.1E+02		1.3E+02
AMINO,2- DINITROTOLUENE,4,6-	7.5E+00	Groundwater Protection	5.0E+02	site-specific		3.1E+01		7.5E+00
AMINO,4- DINITROTOLUENE,2,6-	4.6E+00	Groundwater Protection	5.0E+02	site-specific		3.1E+01		4.6E+00
ANTHRACENE	4.2E+00	Vapor Intrusion	5.0E+02	site-specific		3.5E+03	4.2E+00	4.2E+00
ANTIMONY	6.3E+00	Direct Exposure	1.0E+03	site-specific	2.4E+00	6.3E+00		(Use batch test)
ARSENIC	2.4E+01	Background	1.0E+03	site-specific	2.4E+01	2.3E+01		(Use batch test)
ATRAZINE	2.4E+00	Direct Exposure	5.0E+02	site-specific		2.4E+00		1.2E+01
BARIUM	1.0E+03	Ceiling Value	1.0E+03	site-specific	6.9E+02	3.1E+03		(Use batch test)
BENOMYL	1.6E-01	Groundwater Protection	1.0E+03	site-specific		6.3E+02		1.6E-01
BENZENE	7.7E-01	Vapor Intrusion	5.0E+02	site-specific		1.2E+00	7.7E-01	1.0E+02
BENZO(a)ANTHRACENE	1.6E+01	Direct Exposure	5.0E+02	site-specific		1.6E+01		1.4E+02
BENZO(a)PYRENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		7.8E+01
BENZO(b)FLUORANTHENE	1.6E+01	Direct Exposure	5.0E+02	site-specific		1.6E+01		7.5E+01
BENZO(g,h,i)PERYLENE	3.5E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		3.5E+01
BENZO(k)FLUORANTHENE	3.9E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		3.9E+01
BERYLLIUM	3.1E+01	Direct Exposure	1.0E+03	site-specific	3.0E+00	3.1E+01		(Use batch test)
BIPHENYL, 1,1-	1.0E+01	Direct Exposure	5.0E+02	site-specific		1.0E+01	(Use soil gas)	2.3E+02
BIS(2-CHLOROETHYL)ETHER	7.9E-03	Vapor Intrusion	5.0E+02	site-specific		2.4E-01	7.9E-03	9.6E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+00	(Use soil gas)	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	Direct Exposure	5.0E+02	site-specific		3.9E+01		5.4E+02
BORON	1.0E+03	Ceiling Value	1.0E+03	site-specific		3.1E+03		(Use batch test)
BROMODICHLOROMETHANE	1.6E-02	Vapor Intrusion	9.3E+02	site-specific		3.2E-01	1.6E-02	2.1E+00
BROMOFORM	9.5E+00	Groundwater Protection	5.0E+02	site-specific		2.0E+01		9.5E+00
BROMOMETHANE	2.2E-01	Vapor Intrusion	5.0E+02	site-specific		1.5E+00	2.2E-01	1.8E+00
CADMIUM	1.4E+01	Direct Exposure	1.0E+03	site-specific	2.3E+00	1.4E+01		(Use batch test)
CARBON TETRACHLORIDE	1.0E-01	Vapor Intrusion	4.5E+02	site-specific		7.1E-01	1.0E-01	2.0E+01
CHLORDANE (TECHNICAL)	1.7E+01	Direct Exposure	1.0E+03	site-specific		1.7E+01		2.3E+01
CHLOROANILINE, p-	2.7E+00	Direct Exposure	1.0E+03	site-specific		2.7E+00		8.6E+00
CHLOROBENZENE	2.2E+00	Vapor Intrusion	5.0E+02	site-specific		5.9E+01	2.2E+00	1.3E+01
CHLOROETHANE	1.2E+01	Groundwater Protection	5.0E+02	site-specific		2.1E+03	4.5E+02	1.2E+01
CHLOROFORM	2.6E-02	Vapor Intrusion	5.0E+02	site-specific		3.4E-01	2.6E-02	3.1E+00
CHLOROMETHANE	4.0E+00	Vapor Intrusion	1.0E+02	site-specific		2.4E+01	4.0E+00	1.1E+01
CHLOROPHENOL, 2-	1.2E-01	Groundwater Protection	1.0E+02	site-specific		7.0E+01	4.2E+01	1.2E-01
CHROMIUM (Total)	1.1E+03	Background	-	site-specific	1.1E+03			(Use batch test)
CHROMIUM III	1.0E+03	Ceiling Value	1.0E+03	site-specific		2.3E+04		(Use batch test)
CHROMIUM VI	3.0E+01	Direct Exposure	1.0E+03	site-specific		3.0E+01		(Use batch test)
CHRYSENE	3.0E+01	Groundwater Protection	1.0E+03	site-specific		1.6E+03		3.0E+01
COBALT	8.0E+01	Background	1.0E+03	site-specific	8.0E+01	4.7E+00		(Use batch test)

TABLE B-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
COPPER	6.3E+02	Direct Exposure	1.0E+03	site-specific	2.5E+02	6.3E+02		(Use batch test)
CYANIDE (Free)	4.8E+00	Direct Exposure	1.0E+02	site-specific		4.8E+00	(Use soil gas)	(Use batch test)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	6.1E+00	Direct Exposure	5.0E+02	site-specific		6.1E+00		7.7E+00
DALAPON	1.6E+00	Groundwater Protection	5.0E+02	site-specific		3.8E+02		1.6E+00
DIBENZO(a,h)ANTHTRACENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		4.0E+02
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	Groundwater Protection	5.0E+02	site-specific		5.7E-03	(Use soil gas)	8.1E-04
DIBROMOCHLOROMETHANE	2.9E-02	Vapor Intrusion	1.0E+02	site-specific		1.0E+00	2.9E-02	4.6E+00
DIBROMOETHANE, 1,2-	1.0E-03	Vapor Intrusion	5.0E+02	site-specific		3.9E-02	1.0E-03	2.0E-01
DICHLOROBENZENE, 1,2-	7.5E+00	Groundwater Protection	3.8E+02	site-specific		3.8E+02	8.9E+00	7.5E+00
DICHLOROBENZENE, 1,3-	4.2E+01	Groundwater Protection	1.0E+02	site-specific		2.0E+02	(Use soil gas)	4.2E+01
DICHLOROBENZENE, 1,4-	5.5E-02	Vapor Intrusion	5.0E+02	site-specific		2.8E+00	5.5E-02	8.5E+00
DICHLOROBENZIDINE, 3,3-	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		2.2E+01
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	Direct Exposure	5.0E+02	site-specific		2.3E+00		6.3E+01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	Direct Exposure	5.0E+02	site-specific		2.0E+00		1.4E+02
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	Direct Exposure	1.0E+03	site-specific		1.9E+00		5.6E+00
DICHLOROETHANE, 1,1-	3.8E-01	Vapor Intrusion	5.0E+02	site-specific		3.8E+00	3.8E-01	3.3E+01
DICHLOROETHANE, 1,2-	2.3E-02	Vapor Intrusion	5.0E+02	site-specific		5.0E-01	2.3E-02	2.6E+00
DICHLOROETHYLENE, 1,1-	8.9E+00	Vapor Intrusion	5.0E+02	site-specific		4.9E+01	8.9E+00	6.5E+02
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	Vapor Intrusion	1.0E+02	site-specific		3.9E+00	3.6E-01	4.1E+01
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	Vapor Intrusion	5.0E+02	site-specific		2.9E+01	3.6E+00	1.7E+02
DICHLOROPHENOL, 2,4-	7.3E-02	Groundwater Protection	5.0E+02	site-specific		3.8E+01		7.3E-02
DICHLOROPHENOXYACETIC ACID (2,4-D)	6.4E-01	Groundwater Protection	5.0E+02	site-specific		1.4E+02		6.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	Vapor Intrusion	1.0E+02	site-specific		1.1E+00	6.0E-02	2.7E+00
DICHLOROPROPENE, 1,3-	1.5E-01	Vapor Intrusion	5.0E+02	site-specific		1.9E+00	1.5E-01	8.9E+00
DIELDRIN	2.5E+00	Direct Exposure	1.0E+03	site-specific		2.5E+00		2.4E+01
DIETHYLPHTHALATE	1.7E+01	Groundwater Protection	5.0E+02	site-specific		1.0E+04		1.7E+01
DIMETHYLPHENOL, 2,4-	5.7E+01	Groundwater Protection	1.0E+02	site-specific		2.5E+02		5.7E+01
DIMETHYLPHTHALATE	7.4E+01	Groundwater Protection	5.0E+02	site-specific		1.3E+05		7.4E+01
DINITROBENZENE, 1,3-	1.3E+00	Direct Exposure	5.0E+02	site-specific		1.3E+00		5.8E+00
DINITROPHENOL, 2,4-	2.5E+01	Direct Exposure	5.0E+02	site-specific		2.5E+01		2.9E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	1.7E+00	Direct Exposure	5.0E+02	site-specific		1.7E+00		1.1E+01
DINITROTOLUENE, 2,6- (2,6-DNT)	3.6E-01	Direct Exposure	5.0E+02	site-specific		3.6E-01		1.1E+01
DIOXANE, 1,4-	5.4E+00	Direct Exposure	5.0E+02	site-specific		5.4E+00	(Use soil gas)	2.3E+01
DIOXINS (TEQ)	2.4E-04	Direct Exposure	1.0E+03	site-specific	2.0E-05	2.4E-04		3.0E-01
DIURON	3.6E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		3.6E+00
ENDOSULFAN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		9.4E+01		1.3E+01
ENDRIN	3.8E+00	Direct Exposure	5.0E+02	site-specific		3.8E+00		3.0E+01
ETHANOL	4.5E+00	Groundwater Protection	5.0E+02	site-specific			(Use soil gas)	4.5E+00
ETHYLBENZENE	1.7E+01	Groundwater Protection	4.8E+02	site-specific		6.3E+01	2.4E+01	1.7E+01
FLUORANTHENE	1.2E+02	Groundwater Protection	5.0E+02	site-specific		4.8E+02		1.2E+02
FLUORENE	9.3E+01	Vapor Intrusion	5.0E+02	site-specific		4.6E+02	9.3E+01	4.6E+02
GLYPHOSATE	5.0E+02	Ceiling Value	5.0E+02	site-specific		1.3E+03		7.5E+03

TABLE B-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
HEPTACHLOR	1.4E-01	Direct Exposure	1.0E+03	site-specific		1.4E-01		4.5E+01
HEPTACHLOR EPOXIDE	7.1E-02	Direct Exposure	1.0E+03	site-specific		7.1E-02		1.2E+01
HEXACHLOROBENZENE	2.2E-01	Direct Exposure	5.0E+02	site-specific		2.2E-01		2.3E-01
HEXACHLOROBUTADIENE	1.3E+00	Direct Exposure	5.0E+02	site-specific		1.3E+00		2.2E+00
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	7.5E-02	Groundwater Protection	5.0E+02	site-specific		5.7E-01		7.5E-02
HEXACHLOROETHANE	2.0E+00	Direct Exposure	5.0E+02	site-specific		2.0E+00		5.7E+00
HEXAZINONE	4.2E+02	Direct Exposure	5.0E+02	site-specific		4.2E+02		1.1E+03
INDENO(1,2,3-cd)PYRENE	1.6E+01	Direct Exposure	5.0E+02	site-specific		1.6E+01		3.1E+01
ISOPHORONE	4.7E+01	Groundwater Protection	5.0E+02	site-specific		5.7E+02		4.7E+01
LEAD	2.0E+02	Direct Exposure	1.0E+03	site-specific	7.3E+01	2.0E+02		(Use batch test)
MERCURY	4.7E+00	Direct Exposure	5.0E+02	site-specific	7.2E-01	4.7E+00		(Use batch test)
METHOXYCHLOR	1.6E+01	Groundwater Protection	5.0E+02	site-specific		6.3E+01		1.6E+01
METHYL ETHYL KETONE	5.5E+01	Groundwater Protection	5.0E+02	site-specific		5.6E+03	2.2E+03	5.5E+01
METHYL ISOBUTYL KETONE	6.5E+00	Groundwater Protection	1.0E+02	site-specific		3.4E+03	1.3E+03	6.5E+00
METHYL MERCURY	1.6E+00	Direct Exposure	1.0E+02	site-specific		1.6E+00		(Use batch test)
METHYL TERT BUTYL ETHER	2.3E+00	Vapor Intrusion	1.0E+02	site-specific		5.0E+01	2.3E+00	1.0E+01
METHYLENE CHLORIDE	2.2E+01	Vapor Intrusion	5.0E+02	site-specific		5.8E+01	2.2E+01	2.0E+02
METHYLNAPHTHALENE, 1-	1.6E+01	Groundwater Protection	5.0E+02	site-specific		1.0E+02	5.9E+01	1.6E+01
METHYLNAPHTHALENE, 2-	1.7E+01	Groundwater Protection	5.0E+02	site-specific		3.9E+01	5.0E+01	1.7E+01
MOLYBDENUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	4.0E+00	7.8E+01		(Use batch test)
NAPHTHALENE	7.0E+00	Vapor Intrusion	5.0E+02	site-specific		2.8E+01	7.0E+00	5.4E+01
NICKEL	4.1E+02	Background	1.0E+03	site-specific	4.1E+02	3.1E+02		(Use batch test)
NITROBENZENE	5.6E+00	Direct Exposure	5.0E+02	site-specific		5.6E+00	(Use soil gas)	7.5E+01
NITROGLYCERIN	1.3E+00	Direct Exposure	5.0E+02	site-specific		1.3E+00		3.1E+00
NITROTOLUENE, 2-	2.2E+00	Direct Exposure	5.0E+02	site-specific		2.2E+00	(Use soil gas)	3.9E+01
NITROTOLUENE, 3-	1.3E+00	Direct Exposure	5.0E+02	site-specific		1.3E+00		2.3E+01
NITROTOLUENE, 4-	2.5E+01	Groundwater Protection	5.0E+02	site-specific		3.4E+01		2.5E+01
PENTACHLOROPHENOL	1.0E+00	Direct Exposure	5.0E+02	site-specific		1.0E+00		1.3E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	2.5E+01	Direct Exposure	5.0E+02	site-specific		2.5E+01		2.3E+03
PERCHLORATE	1.2E+00	Groundwater Protection	1.0E+03	site-specific		1.1E+01		1.2E+00
PHENANTHRENE	4.6E+02	Direct Exposure	5.0E+02	site-specific		4.6E+02	(Use soil gas)	7.0E+02
PHENOL	9.3E+00	Groundwater Protection	5.0E+02	site-specific		3.8E+03		9.3E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		4.3E+01
PROPICONAZOLE	1.1E+02	Groundwater Protection	5.0E+02	site-specific		1.6E+02		1.1E+02
PYRENE	4.4E+01	Vapor Intrusion	5.0E+02	site-specific		3.6E+02	4.4E+01	6.1E+02
SELENIUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	7.1E+00	7.8E+01		(Use batch test)
SILVER	7.8E+01	Direct Exposure	1.0E+03	site-specific	1.5E+00	7.8E+01		(Use batch test)
SIMAZINE	1.9E+00	Groundwater Protection	5.0E+02	site-specific		4.5E+00		1.9E+00
STYRENE	1.0E+01	Groundwater Protection	5.0E+02	site-specific		8.7E+02	4.5E+02	1.0E+01
TERBACIL	2.2E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.2E+00
tert-BUTYL ALCOHOL	9.9E+01	Direct Exposure	1.0E+02	site-specific		9.9E+01	(Use soil gas)	3.1E+02
TETRACHLOROETHANE, 1,1,1,2-	2.2E+00	Direct Exposure	1.0E+02	site-specific		2.2E+00	(Use soil gas)	2.3E+01

TABLE B-1. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS NOT located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
TETRACHLOROETHANE, 1,1,2,2-	1.0E-02	Vapor Intrusion	5.0E+02	site-specific		6.5E-01	1.0E-02	4.3E+00
TETRACHLOROETHYLENE	9.8E-02	Vapor Intrusion	1.7E+02	site-specific		1.1E+00	9.8E-02	2.5E+01
TETRACHLOROPHENOL, 2,3,4,6-	5.1E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+02		5.1E-01
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.1E+02	Groundwater Protection	5.0E+02	site-specific		7.7E+02		1.1E+02
THALLIUM	7.8E-01	Direct Exposure	1.0E+03	site-specific	2.5E-01	7.8E-01		(Use batch test)
TOLUENE	3.2E+01	Groundwater Protection	5.0E+02	site-specific		8.2E+02	8.2E+02	3.2E+01
TOXAPHENE	4.9E-01	Direct Exposure	5.0E+02	site-specific		4.9E-01		2.5E+02
TPH (gasolines)	1.0E+02	Ceiling Value	1.0E+02	site-specific		4.8E+02	(Use soil gas)	2.0E+03
TPH (middle distillates)	2.6E+02	Direct Exposure	5.0E+02	site-specific		2.6E+02	(Use soil gas)	5.0E+03
TPH (residual fuels)	5.0E+02	Ceiling Value	5.0E+02	site-specific		9.4E+03		5.0E+03
TRICHLOROBENZENE, 1,2,4-	1.6E-01	Vapor Intrusion	5.0E+02	site-specific		8.2E+00	1.6E-01	9.8E+01
TRICHLOROETHANE, 1,1,1-	2.2E+02	Vapor Intrusion	5.0E+02	site-specific		6.4E+02	2.2E+02	6.8E+02
TRICHLOROETHANE, 1,1,2-	8.9E-03	Vapor Intrusion	1.0E+02	site-specific		3.2E-01	8.9E-03	1.6E+00
TRICHLOROETHYLENE	8.9E-02	Vapor Intrusion	5.0E+02	site-specific		8.9E-01	8.9E-02	1.5E+01
TRICHLOROPHENOL, 2,4,5-	4.5E+00	Groundwater Protection	1.0E+02	site-specific		1.3E+03		4.5E+00
TRICHLOROPHENOL, 2,4,6-	2.5E+00	Groundwater Protection	5.0E+02	site-specific		1.3E+01		2.5E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.2E+01	Groundwater Protection	1.0E+03	site-specific		1.3E+02		1.2E+01
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	7.9E+00	Groundwater Protection	5.0E+02	site-specific		1.0E+02		7.9E+00
TRICHLOROPROPANE, 1,2,3-	1.6E-03	Direct Exposure	1.0E+02	site-specific		1.6E-03	(Use soil gas)	3.0E+00
TRICHLOROPROPENE, 1,2,3-	8.1E-02	Groundwater Protection	1.0E+02	site-specific		1.6E-01	(Use soil gas)	8.1E-02
TRIFLURALIN	5.6E+01	Groundwater Protection	1.0E+02	site-specific		9.0E+01		5.6E+01
TRINITROBENZENE, 1,3,5-	7.5E+00	Groundwater Protection	5.0E+02	site-specific		4.5E+02		7.5E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	7.3E+00	Direct Exposure	5.0E+02	site-specific		7.3E+00		9.8E+01
VANADIUM	7.7E+02	Background	1.0E+03	site-specific	7.7E+02	7.8E+01		(Use batch test)
VINYL CHLORIDE	3.6E-02	Vapor Intrusion	5.0E+02	site-specific		5.9E-02	3.6E-02	3.3E+00
XYLENES	2.4E+01	Groundwater Protection	2.6E+02	site-specific		1.2E+02	4.5E+01	2.4E+01
ZINC	1.0E+03	Ceiling Value	1.0E+03	site-specific	3.5E+02	4.7E+03		(Use batch test)
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	-	-	-	-	-	-	-
Sodium Adsorption Ratio	5.0	-	-	-	-	-	-	-

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers, parks and other sensitive uses.

Final Environmental Action Level is lowest of gross contamination, ecotoxicity, direct-exposure, vapor intrusion and leaching action levels.

Assumes soil pH 5.0 to 9.0.

Soil data should be reported on dry-weight basis (see Chapter 7).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TABLE B-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
ACENAPHTHENE	1.2E+02	Vapor Intrusion	1.0E+03	site-specific		6.6E+02	1.2E+02	1.2E+02
ACENAPHTHYLENE	5.5E+00	Groundwater Protection	5.0E+02	site-specific		3.4E+02	(Use soil gas)	5.5E+00
ACETONE	9.2E-01	Groundwater Protection	5.0E+02	site-specific		1.2E+04	1.4E+04	9.2E-01
ALDRIN	3.9E+00	Direct Exposure	1.0E+03	site-specific		3.9E+00		8.4E+00
AMETRYN	5.0E+01	Groundwater Protection	5.0E+02	site-specific		1.1E+02		5.0E+01
AMINO,2- DINITROTOLUENE,4,6-	8.5E-01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		8.5E-01
AMINO,4- DINITROTOLUENE,2,6-	5.2E-01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		5.2E-01
ANTHRACENE	4.2E+00	Vapor Intrusion	5.0E+02	site-specific		3.5E+03	4.2E+00	4.2E+00
ANTIMONY	6.3E+00	Direct Exposure	1.0E+03	site-specific	2.4E+00	6.3E+00		(Use batch test)
ARSENIC	2.4E+01	Background	1.0E+03	site-specific	2.4E+01	2.3E+01		(Use batch test)
ATRAZINE	4.5E-01	Groundwater Protection	5.0E+02	site-specific		2.4E+00		4.5E-01
BARIUM	1.0E+03	Ceiling Value	1.0E+03	site-specific	6.9E+02	3.1E+03		(Use batch test)
BENOMYL	7.8E-03	Groundwater Protection	1.0E+03	site-specific		6.3E+02		7.8E-03
BENZENE	7.7E-01	Vapor Intrusion	5.0E+02	site-specific		1.2E+00	7.7E-01	4.3E+00
BENZO(a)ANTHRACENE	1.0E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+01		1.0E+01
BENZO(a)PYRENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		5.9E+00
BENZO(b)FLUORANTHENE	1.6E+01	Direct Exposure	5.0E+02	site-specific		1.6E+01		6.8E+01
BENZO(g,h,i)PERYLENE	3.5E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		3.5E+01
BENZO(k)FLUORANTHENE	3.9E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		3.9E+01
BERYLLIUM	3.1E+01	Direct Exposure	1.0E+03	site-specific	3.0E+00	3.1E+01		(Use batch test)
BIPHENYL, 1,1-	1.0E+01	Direct Exposure	5.0E+02	site-specific		1.0E+01	(Use soil gas)	2.3E+02
BIS(2-CHLOROETHYL)ETHER	7.9E-03	Vapor Intrusion	5.0E+02	site-specific		2.4E-01	7.9E-03	9.6E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	4.0E-03	Groundwater Protection	5.0E+02	site-specific		3.8E+00	(Use soil gas)	4.0E-03
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	Direct Exposure	5.0E+02	site-specific		3.9E+01		1.9E+02
BORON	1.0E+03	Ceiling Value	1.0E+03	site-specific		3.1E+03		(Use batch test)
BROMODICHLOROMETHANE	1.6E-02	Vapor Intrusion	9.3E+02	site-specific		3.2E-01	1.6E-02	2.1E+00
BROMOFORM	2.0E+00	Groundwater Protection	5.0E+02	site-specific		2.0E+01		2.0E+00
BROMOMETHANE	2.2E-01	Vapor Intrusion	5.0E+02	site-specific		1.5E+00	2.2E-01	7.6E-01
CADMIUM	1.4E+01	Direct Exposure	1.0E+03	site-specific	2.3E+00	1.4E+01		(Use batch test)
CARBON TETRACHLORIDE	1.0E-01	Vapor Intrusion	4.5E+02	site-specific		7.1E-01	1.0E-01	1.8E+00
CHLORDANE (TECHNICAL)	1.7E+01	Direct Exposure	1.0E+03	site-specific		1.7E+01		2.3E+01
CHLOROANILINE, p-	3.6E-01	Groundwater Protection	1.0E+03	site-specific		2.7E+00		3.6E-01
CHLOROBENZENE	1.5E+00	Groundwater Protection	5.0E+02	site-specific		5.9E+01	2.2E+00	1.5E+00
CHLOROETHANE	1.2E+01	Groundwater Protection	5.0E+02	site-specific		2.1E+03	4.5E+02	1.2E+01
CHLOROFORM	2.6E-02	Vapor Intrusion	5.0E+02	site-specific		3.4E-01	2.6E-02	7.9E-01
CHLOROMETHANE	4.0E+00	Vapor Intrusion	1.0E+02	site-specific		2.4E+01	4.0E+00	1.1E+01
CHLOROPHENOL, 2-	1.2E-01	Groundwater Protection	1.0E+02	site-specific		7.0E+01	4.2E+01	1.2E-01
CHROMIUM (Total)	1.1E+03	Background	-	site-specific	1.1E+03			(Use batch test)
CHROMIUM III	1.0E+03	Ceiling Value	1.0E+03	site-specific		2.3E+04		(Use batch test)
CHROMIUM VI	3.0E+01	Direct Exposure	1.0E+03	site-specific		3.0E+01		(Use batch test)
CHRYSENE	3.0E+01	Groundwater Protection	1.0E+03	site-specific		1.6E+03		3.0E+01
COBALT	8.0E+01	Background	1.0E+03	site-specific	8.0E+01	4.7E+00		(Use batch test)

TABLE B-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
COPPER	6.3E+02	Direct Exposure	1.0E+03	site-specific	2.5E+02	6.3E+02		(Use batch test)
CYANIDE (Free)	4.8E+00	Direct Exposure	1.0E+02	site-specific		4.8E+00	(Use soil gas)	(Use batch test)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.2E+00	Groundwater Protection	5.0E+02	site-specific		6.1E+00		1.2E+00
DALAPON	1.6E-01	Groundwater Protection	5.0E+02	site-specific		3.8E+02		1.6E-01
DIBENZO(a,h)ANTHTRACENE	1.6E+00	Direct Exposure	5.0E+02	site-specific		1.6E+00		2.5E+02
DIBROMO,1,2- CHLOROPROPANE,3-	8.1E-04	Groundwater Protection	5.0E+02	site-specific		5.7E-03	(Use soil gas)	8.1E-04
DIBROMOCHLOROMETHANE	2.9E-02	Vapor Intrusion	1.0E+02	site-specific		1.0E+00	2.9E-02	3.4E-01
DIBROMOETHANE, 1,2-	1.0E-03	Vapor Intrusion	5.0E+02	site-specific		3.9E-02	1.0E-03	2.0E-01
DICHLOROBENZENE, 1,2-	1.1E+00	Groundwater Protection	3.8E+02	site-specific		3.8E+02	8.9E+00	1.1E+00
DICHLOROBENZENE, 1,3-	2.5E+00	Groundwater Protection	1.0E+02	site-specific		2.0E+02	(Use soil gas)	2.5E+00
DICHLOROBENZENE, 1,4-	5.5E-02	Vapor Intrusion	5.0E+02	site-specific		2.8E+00	5.5E-02	7.3E-01
DICHLOROBENZIDINE, 3,3-	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		2.4E+00
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	Direct Exposure	5.0E+02	site-specific		2.3E+00		6.3E+01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	Direct Exposure	5.0E+02	site-specific		2.0E+00		2.8E+01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	Direct Exposure	1.0E+03	site-specific		1.9E+00		5.6E+00
DICHLOROETHANE, 1,1-	3.8E-01	Vapor Intrusion	5.0E+02	site-specific		3.8E+00	3.8E-01	1.9E+00
DICHLOROETHANE, 1,2-	2.3E-02	Vapor Intrusion	5.0E+02	site-specific		5.0E-01	2.3E-02	2.6E+00
DICHLOROETHYLENE, 1,1-	4.2E+00	Groundwater Protection	5.0E+02	site-specific		4.9E+01	8.9E+00	4.2E+00
DICHLOROETHYLENE, Cis 1,2-	3.6E-01	Vapor Intrusion	1.0E+02	site-specific		3.9E+00	3.6E-01	2.0E+01
DICHLOROETHYLENE, Trans 1,2-	3.6E+00	Vapor Intrusion	5.0E+02	site-specific		2.9E+01	3.6E+00	3.6E+01
DICHLOROPHENOL, 2,4-	7.3E-02	Groundwater Protection	5.0E+02	site-specific		3.8E+01		7.3E-02
DICHLOROPHENOXYACETIC ACID (2,4-D)	3.4E-01	Groundwater Protection	5.0E+02	site-specific		1.4E+02		3.4E-01
DICHLOROPROPANE, 1,2-	6.0E-02	Vapor Intrusion	1.0E+02	site-specific		1.1E+00	6.0E-02	2.7E+00
DICHLOROPROPENE, 1,3-	2.1E-03	Groundwater Protection	5.0E+02	site-specific		1.9E+00	1.5E-01	2.1E-03
DIELDRIN	2.5E+00	Direct Exposure	1.0E+03	site-specific		2.5E+00		2.4E+01
DIETHYLPHTHALATE	3.7E+00	Groundwater Protection	5.0E+02	site-specific		1.0E+04		3.7E+00
DIMETHYLPHENOL, 2,4-	9.8E+00	Groundwater Protection	1.0E+02	site-specific		2.5E+02		9.8E+00
DIMETHYLPHTHALATE	2.6E+01	Groundwater Protection	5.0E+02	site-specific		1.3E+05		2.6E+01
DINITROBENZENE, 1,3-	5.8E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		5.8E-01
DINITROPHENOL, 2,4-	1.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		1.1E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	8.7E-01	Groundwater Protection	5.0E+02	site-specific		1.7E+00		8.7E-01
DINITROTOLUENE, 2,6- (2,6-DNT)	3.6E-01	Direct Exposure	5.0E+02	site-specific		3.6E-01		7.9E+00
DIOXANE, 1,4-	5.4E+00	Direct Exposure	5.0E+02	site-specific		5.4E+00	(Use soil gas)	2.3E+01
DIOXINS (TEQ)	2.4E-04	Direct Exposure	1.0E+03	site-specific	2.0E-05	2.4E-04		3.0E-01
DIURON	1.1E+00	Groundwater Protection	5.0E+02	site-specific		2.5E+01		1.1E+00
ENDOSULFAN	1.3E+01	Groundwater Protection	5.0E+02	site-specific		9.4E+01		1.3E+01
ENDRIN	3.8E+00	Direct Exposure	5.0E+02	site-specific		3.8E+00		3.0E+01
ETHANOL	4.5E+00	Groundwater Protection	5.0E+02	site-specific			(Use soil gas)	4.5E+00
ETHYLBENZENE	9.0E-01	Groundwater Protection	4.8E+02	site-specific		6.3E+01	2.4E+01	9.0E-01
FLUORANTHENE	8.7E+01	Groundwater Protection	5.0E+02	site-specific		4.8E+02		8.7E+01
FLUORENE	9.3E+01	Vapor Intrusion	5.0E+02	site-specific		4.6E+02	9.3E+01	9.3E+01
GLYPHOSATE	5.0E+02	Ceiling Value	5.0E+02	site-specific		1.3E+03		6.3E+02

TABLE B-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
HEPTACHLOR	1.4E-01	Direct Exposure	1.0E+03	site-specific		1.4E-01		4.5E+01
HEPTACHLOR EPOXIDE	7.1E-02	Direct Exposure	1.0E+03	site-specific		7.1E-02		1.2E+01
HEXACHLOROBENZENE	2.2E-01	Direct Exposure	5.0E+02	site-specific		2.2E-01		2.3E-01
HEXACHLOROBUTADIENE	6.1E-02	Groundwater Protection	5.0E+02	site-specific		1.3E+00		6.1E-02
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.9E-02	Groundwater Protection	5.0E+02	site-specific		5.7E-01		2.9E-02
HEXACHLOROETHANE	6.8E-01	Groundwater Protection	5.0E+02	site-specific		2.0E+00		6.8E-01
HEXAZINONE	3.7E+02	Groundwater Protection	5.0E+02	site-specific		4.2E+02		3.7E+02
INDENO(1,2,3-cd)PYRENE	1.6E+01	Direct Exposure	5.0E+02	site-specific		1.6E+01		3.1E+01
ISOPHORONE	1.0E+01	Groundwater Protection	5.0E+02	site-specific		5.7E+02		1.0E+01
LEAD	2.0E+02	Direct Exposure	1.0E+03	site-specific	7.3E+01	2.0E+02		(Use batch test)
MERCURY	4.7E+00	Direct Exposure	5.0E+02	site-specific	7.2E-01	4.7E+00		(Use batch test)
METHOXYCHLOR	1.6E+01	Groundwater Protection	5.0E+02	site-specific		6.3E+01		1.6E+01
METHYL ETHYL KETONE	1.5E+01	Groundwater Protection	5.0E+02	site-specific		5.6E+03	2.2E+03	1.5E+01
METHYL ISOBUTYL KETONE	5.0E-01	Groundwater Protection	1.0E+02	site-specific		3.4E+03	1.3E+03	5.0E-01
METHYL MERCURY	1.6E+00	Direct Exposure	1.0E+02	site-specific		1.6E+00		(Use batch test)
METHYL TERT BUTYL ETHER	2.3E+00	Vapor Intrusion	1.0E+02	site-specific		5.0E+01	2.3E+00	4.1E+00
METHYLENE CHLORIDE	2.2E+01	Vapor Intrusion	5.0E+02	site-specific		5.8E+01	2.2E+01	3.6E+01
METHYLNAPHTHALENE, 1-	8.9E-01	Groundwater Protection	5.0E+02	site-specific		1.0E+02	5.9E+01	8.9E-01
METHYLNAPHTHALENE, 2-	1.9E+00	Groundwater Protection	5.0E+02	site-specific		3.9E+01	5.0E+01	1.9E+00
MOLYBDENUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	4.0E+00	7.8E+01		(Use batch test)
NAPHTHALENE	3.1E+00	Groundwater Protection	5.0E+02	site-specific		2.8E+01	7.0E+00	3.1E+00
NICKEL	4.1E+02	Background	1.0E+03	site-specific	4.1E+02	3.1E+02		(Use batch test)
NITROBENZENE	5.6E+00	Direct Exposure	5.0E+02	site-specific		5.6E+00	(Use soil gas)	1.4E+01
NITROGLYCERIN	3.5E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+00		3.5E-01
NITROTOLUENE, 2-	2.2E+00	Direct Exposure	5.0E+02	site-specific		2.2E+00	(Use soil gas)	4.4E+00
NITROTOLUENE, 3-	1.3E+00	Direct Exposure	5.0E+02	site-specific		1.3E+00		2.5E+00
NITROTOLUENE, 4-	2.8E+00	Groundwater Protection	5.0E+02	site-specific		3.4E+01		2.8E+00
PENTACHLOROPHENOL	7.8E-01	Groundwater Protection	5.0E+02	site-specific		1.0E+00		7.8E-01
PENTAERYTHRITOLTETRANITRATE (PETN)	2.5E+01	Direct Exposure	5.0E+02	site-specific		2.5E+01		2.3E+03
PERCHLORATE	1.2E+00	Groundwater Protection	1.0E+03	site-specific		1.1E+01		1.2E+00
PHENANTHRENE	6.9E+01	Groundwater Protection	5.0E+02	site-specific		4.6E+02	(Use soil gas)	6.9E+01
PHENOL	1.8E+00	Groundwater Protection	5.0E+02	site-specific		3.8E+03		1.8E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	Direct Exposure	5.0E+02	site-specific		1.2E+00		3.4E+01
PROPICONAZOLE	2.5E+01	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.5E+01
PYRENE	4.4E+01	Vapor Intrusion	5.0E+02	site-specific		3.6E+02	4.4E+01	4.4E+01
SELENIUM	7.8E+01	Direct Exposure	1.0E+03	site-specific	7.1E+00	7.8E+01		(Use batch test)
SILVER	7.8E+01	Direct Exposure	1.0E+03	site-specific	1.5E+00	7.8E+01		(Use batch test)
SIMAZINE	2.2E-01	Groundwater Protection	5.0E+02	site-specific		4.5E+00		2.2E-01
STYRENE	2.9E+00	Groundwater Protection	5.0E+02	site-specific		8.7E+02	4.5E+02	2.9E+00
TERBACIL	2.2E+00	Groundwater Protection	5.0E+02	site-specific		1.6E+02		2.2E+00
tert-BUTYL ALCOHOL	9.9E+01	Direct Exposure	1.0E+02	site-specific		9.9E+01	(Use soil gas)	1.1E+02
TETRACHLOROETHANE, 1,1,1,2-	3.2E-01	Groundwater Protection	1.0E+02	site-specific		2.2E+00	(Use soil gas)	3.2E-01

TABLE B-2. SOIL ACTION LEVELS
(Potentially impacted groundwater IS NOT a current or potential drinking water resource; Surface water body IS located within 150m of release site)

	(mg/kg)							
						[1]Human Health		Leaching & Groundwater Protection
CHEMICAL PARAMETER	Final EAL	Basis	[1]Gross Contamination (Odors, etc.) Table F-2	Terrestrial Ecotoxicity Table L	Background Table K	Direct Exposure Table I-1	Vapor Intrusion Into Buildings Table C-1b	NON-Drinking Water Resource Table E
TETRACHLOROETHANE, 1,1,2,2-	1.0E-02	Vapor Intrusion	5.0E+02	site-specific		6.5E-01	1.0E-02	3.6E+00
TETRACHLOROETHYLENE	9.8E-02	Vapor Intrusion	1.7E+02	site-specific		1.1E+00	9.8E-02	6.8E+00
TETRACHLOROPHENOL, 2,3,4,6-	5.6E-02	Groundwater Protection	5.0E+02	site-specific		3.8E+02		5.6E-02
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.9E+01	Groundwater Protection	5.0E+02	site-specific		7.7E+02		1.9E+01
THALLIUM	7.8E-01	Direct Exposure	1.0E+03	site-specific	2.5E-01	7.8E-01		(Use batch test)
TOLUENE	7.8E-01	Groundwater Protection	5.0E+02	site-specific		8.2E+02	8.2E+02	7.8E-01
TOXAPHENE	4.9E-01	Direct Exposure	5.0E+02	site-specific		4.9E-01		2.5E+02
TPH (gasolines)	1.0E+02	Ceiling Value	1.0E+02	site-specific		4.8E+02	(Use soil gas)	4.0E+02
TPH (middle distillates)	2.6E+02	Direct Exposure	5.0E+02	site-specific		2.6E+02	(Use soil gas)	5.0E+02
TPH (residual fuels)	5.0E+02	Ceiling Value	5.0E+02	site-specific		9.4E+03		1.0E+03
TRICHLOROBENZENE, 1,2,4-	1.6E-01	Vapor Intrusion	5.0E+02	site-specific		8.2E+00	1.6E-01	2.6E+01
TRICHLOROETHANE, 1,1,1-	1.2E+00	Groundwater Protection	5.0E+02	site-specific		6.4E+02	2.2E+02	1.2E+00
TRICHLOROETHANE, 1,1,2-	8.9E-03	Vapor Intrusion	1.0E+02	site-specific		3.2E-01	8.9E-03	1.6E+00
TRICHLOROETHYLENE	8.9E-02	Vapor Intrusion	5.0E+02	site-specific		8.9E-01	8.9E-02	3.4E+00
TRICHLOROPHENOL, 2,4,5-	5.0E-01	Groundwater Protection	1.0E+02	site-specific		1.3E+03		5.0E-01
TRICHLOROPHENOL, 2,4,6-	3.1E-01	Groundwater Protection	5.0E+02	site-specific		1.3E+01		3.1E-01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.2E+01	Groundwater Protection	1.0E+03	site-specific		1.3E+02		1.2E+01
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	8.7E-01	Groundwater Protection	5.0E+02	site-specific		1.0E+02		8.7E-01
TRICHLOROPROPANE, 1,2,3-	1.6E-03	Direct Exposure	1.0E+02	site-specific		1.6E-03	(Use soil gas)	3.0E-01
TRICHLOROPROPENE, 1,2,3-	8.1E-02	Groundwater Protection	1.0E+02	site-specific		1.6E-01	(Use soil gas)	8.1E-02
TRIFLURALIN	1.8E+01	Groundwater Protection	1.0E+02	site-specific		9.0E+01		1.8E+01
TRINITROBENZENE, 1,3,5-	2.8E+00	Groundwater Protection	5.0E+02	site-specific		4.5E+02		2.8E+00
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	Groundwater Protection	5.0E+02	site-specific		3.1E+01		3.1E+01
TRINITROTOLUENE, 2,4,6- (TNT)	6.1E+00	Groundwater Protection	5.0E+02	site-specific		7.3E+00		6.1E+00
VANADIUM	7.7E+02	Background	1.0E+03	site-specific	7.7E+02	7.8E+01		(Use batch test)
VINYL CHLORIDE	3.6E-02	Vapor Intrusion	5.0E+02	site-specific		5.9E-02	3.6E-02	3.3E+00
XYLENES	1.4E+00	Groundwater Protection	2.6E+02	site-specific		1.2E+02	4.5E+01	1.4E+00
ZINC	1.0E+03	Ceiling Value	1.0E+03	site-specific	3.5E+02	4.7E+03		(Use batch test)
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	-	-	-	-	-	-	-
Sodium Adsorption Ratio	5.0	-	-	-	-	-	-	-

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers, parks and other sensitive uses.

Final Environmental Action Level is lowest of gross contamination, ecotoxicity, direct-exposure, vapor intrusion and leaching action levels.

Assumes soil pH 5.0 to 9.0.

Soil data should be reported on dry-weight basis (see Chapter 7).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TABLE C-1a. GROUNDWATER ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[1,3]Unrestricted Land Use (ug/L)	Commercial/ Industrial Land Use Only (ug/L)
#ACENAPHTHENE	V	S	3.9E+03	3.9E+03
ACENAPHTHYLENE	V	S	(Use soil gas)	(Use soil gas)
#ACETONE	V	L	6.2E+08	1.0E+09
ALDRIN	SV	S		
AMETRYN	NV	S		
AMINO,2- DINITROTOLUENE,4,6-	NV	S		
AMINO,4- DINITROTOLUENE,2,6-	NV	S		
#ANTHRACENE	V	S	4.3E+01	4.3E+01
ANTIMONY	NV	S		
ARSENIC	NV	S		
ATRAZINE	NV	S		
BARIUM	NV	S		
BENOMYL	NV	S		
#BENZENE	V	L	2.3E+03	2.0E+04
BENZO(a)ANTHRACENE	SV	S		
BENZO(a)PYRENE	NV	S		
BENZO(b)FLUORANTHENE	NV	S		
BENZO(g,h,i)PERYLENE	NV	S		
BENZO(k)FLUORANTHENE	NV	S		
BERYLLIUM	NV	S		
BIPHENYL, 1,1-	V	S	(Use soil gas)	(Use soil gas)
BIS(2-CHLOROETHYL)ETHER	V	L	1.8E+02	1.5E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	(Use soil gas)	(Use soil gas)
BIS(2-ETHYLHEXYL)PHTHALATE	NV	S		
BORON	NV	S		
BROMODICHLOROMETHANE	V	L	1.1E+02	1.0E+03
BROMOFORM	SV	S		
BROMOMETHANE	V	G	4.1E+02	3.4E+03
CADMIUM	NV	S		
CARBON TETRACHLORIDE	V	L	1.1E+02	9.6E+02
CHLORDANE (TECHNICAL)	SV	S		
CHLOROANILINE, p-	NV	S		
CHLOROBENZENE	V	L	1.2E+04	1.0E+05
CHLOROETHANE	V	G	6.0E+05	5.1E+06
CHLOROFORM	V	L	1.1E+02	9.5E+02
CHLOROMETHANE	V	G	5.2E+03	4.4E+04
CHLOROPHENOL, 2-	V	L	1.0E+05	8.4E+05
CHROMIUM (Total)	NV	S		
CHROMIUM III	NV	S		
CHROMIUM VI	NV	S		
CHRYSENE	NV	S		
COBALT	NV	S		
COPPER	NV	S		
CYANIDE (Free)	V	S	(Use soil gas)	(Use soil gas)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S		
DALAPON	NV	L		
DIBENZO(a,h)ANTHTRACENE	NV	S		
DIBROMO,1,2- CHLOROPROPANE,3-	V	L	(Use soil gas)	(Use soil gas)
DIBROMOCHLOROMETHANE	V	S	4.5E+02	3.9E+03

TABLE C-1a. GROUNDWATER ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[1,3]Unrestricted Land Use (ug/L)	Commercial/ Industrial Land Use Only (ug/L)
DIBROMOETHANE, 1,2-	V	S	1.9E+01	1.6E+02
DICHLOROBENZENE, 1,2-	V	L	8.3E+04	1.6E+05
DICHLOROBENZENE, 1,3-	V	L	(Use soil gas)	(Use soil gas)
DICHLOROBENZENE, 1,4-	V	S	4.5E+02	3.9E+03
DICHLOROBENZIDINE, 3,3-	NV	S		
DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S		
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S		
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S		
DICHLOROETHANE, 1,1-	V	L	1.1E+03	9.6E+03
DICHLOROETHANE, 1,2-	V	L	1.8E+02	1.6E+03
DICHLOROETHYLENE, 1,1-	V	L	6.6E+03	5.6E+04
DICHLOROETHYLENE, Cis 1,2-	V	L	1.3E+03	1.1E+04
DICHLOROETHYLENE, Trans 1,2-	V	L	6.6E+03	5.5E+04
DICHLOROPHENOL, 2,4-	NV	S		
DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S		
DICHLOROPROPANE, 1,2-	V	L	3.4E+02	2.9E+03
DICHLOROPROPENE, 1,3-	V	L	6.7E+02	5.9E+03
DIELDRIN	NV	S		
DIETHYLPHTHALATE	NV	S		
#DIMETHYLPHENOL, 2,4-	NV	S		
DIMETHYLPHTHALATE	NV	S		
DINITROBENZENE, 1,3-	NV	S		
DINITROPHENOL, 2,4-	NV	S		
DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S		
DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S		
DIOXANE, 1,4-	V	L	(Use soil gas)	(Use soil gas)
DIOXINS (TEQ)	SV	S		
DIURON	NV	S		
ENDOSULFAN	SV	S		
ENDRIN	NV	S		
ETHANOL	V	L	(Use soil gas)	(Use soil gas)
#ETHYLBENZENE	V	L	7.6E+04	1.7E+05
FLUORANTHENE	NV	S		
#FLUORENE	V	S	1.7E+03	1.7E+03
GLYPHOSATE	NV	S		
HEPTACHLOR	SV	S		
HEPTACHLOR EPOXIDE	SV	S		
HEXACHLOROBENZENE	SV	S		
HEXACHLOROBUTADIENE	SV	S		
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S		
HEXACHLOROETHANE	SV	S		
HEXAZINONE	NV	S		
INDENO(1,2,3-cd)PYRENE	NV	S		
ISOPHORONE	NV	L		
LEAD	NV	S		
MERCURY	NV	S		
METHOXYCHLOR	NV	S		
#METHYL ETHYL KETONE	V	L	2.2E+08	2.2E+08
#METHYL ISOBUTYL KETONE	V	L	1.9E+07	1.9E+07

TABLE C-1a. GROUNDWATER ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[1,3]Unrestricted Land Use (ug/L)	Commercial/ Industrial Land Use Only (ug/L)
METHYL MERCURY	NV	S		
METHYL TERT BUTYL ETHER	V	L	3.1E+04	2.7E+05
METHYLENE CHLORIDE	V	L	7.6E+04	7.9E+05
#METHYLNAPHTHALENE, 1-	V	S	2.6E+04	2.6E+04
#METHYLNAPHTHALENE, 2-	V	S	2.5E+04	2.5E+04
MOLYBDENUM	NV	S		
#NAPHTHALENE	V	S	2.9E+04	3.1E+04
NICKEL	NV	S		
NITROBENZENE	V	L	(Use soil gas)	(Use soil gas)
NITROGLYCERIN	NV	L		
NITROTOLUENE, 2-	V	S	(Use soil gas)	(Use soil gas)
NITROTOLUENE, 3-	NV	S		
NITROTOLUENE, 4-	NV	S		
PENTACHLOROPHENOL	NV	S		
PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S		
PERCHLORATE	NV	S		
PHENANTHRENE	V	S	(Use soil gas)	(Use soil gas)
PHENOL	NV	S		
POLYCHLORINATED BIPHENYLS (PCBs)	SV	S		
PROPICONAZOLE	NV	L		
#PYRENE	V	S	1.4E+02	1.4E+02
SELENIUM	NV	S		
SILVER	NV	S		
SIMAZINE	NV	S		
#STYRENE	V	L	3.1E+05	3.1E+05
TERBACIL	NV	S		
tert-BUTYL ALCOHOL	V	L	(Use soil gas)	(Use soil gas)
TETRACHLOROETHANE, 1,1,1,2-	V	L	(Use soil gas)	(Use soil gas)
TETRACHLOROETHANE, 1,1,2,2-	V	L	2.4E+02	2.1E+03
TETRACHLOROETHYLENE	V	L	1.9E+02	1.7E+03
TETRACHLOROPHENOL, 2,3,4,6-	NV	S		
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S		
THALLIUM	NV	S		
#TOLUENE	V	L	5.3E+05	5.3E+05
TOXAPHENE	NV	S		
TPH (gasolines)	V	L	(Use soil gas)	(Use soil gas)
TPH (middle distillates)	V	L	(Use soil gas)	(Use soil gas)
TPH (residual fuels)	NV	L		
TRICHLOROBENZENE, 1,2,4-	V	S	1.2E+03	1.0E+04
TRICHLOROETHANE, 1,1,1-	V	L	3.4E+05	1.3E+06
TRICHLOROETHANE, 1,1,2-	V	L	1.1E+02	9.0E+02
TRICHLOROETHYLENE	V	L	2.1E+02	1.8E+03
TRICHLOROPHENOL, 2,4,5-	NV	S		
TRICHLOROPHENOL, 2,4,6-	NV	S		
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S		
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S		
TRICHLOROPROPANE, 1,2,3-	V	L	(Use soil gas)	(Use soil gas)
TRICHLOROPROPENE, 1,2,3-	V	L	(Use soil gas)	(Use soil gas)
TRIFLURALIN	SV	S		

TABLE C-1a. GROUNDWATER ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[1,3]Unrestricted Land Use (ug/L)	Commercial/ Industrial Land Use Only (ug/L)
TRINITROBENZENE, 1,3,5-	NV	S		
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S		
TRINITROTOLUENE, 2,4,6- (TNT)	NV	S		
VANADIUM	NV	S		

TABLE C-1a. GROUNDWATER ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[1,3]Unrestricted Land Use (ug/L)	Commercial/ Industrial Land Use Only (ug/L)
VINYL CHLORIDE	V	G	1.8E+01	6.1E+02
#XYLENES	V	L	1.1E+05	1.1E+05
ZINC	NV	S		

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers and other sensitive uses.
2. Soil model: One meter dry sandy soil (92% sand, 5% silt, 3% clay) over one meter moist clayey loam (33% sand, 34% silt, 33% clay). Used to reflect general field calibration of groundwater data to soil gas data.
3. For inclusion in Tier 1 action levels, all groundwater assumed to potentially migrate under a residential area. Action levels for protection of indoor air under a residential exposure scenario carried forward for use at both residential and commercial/industrial sites (see Table D series).

Action levels calculated using spreadsheet provided with User's Guide for the USEPA vapor intrusion guidance (USEPA 2004)
Assumed vadose-zone thickness/depth to groundwater three meters. See Appendix 1 text for model details.
Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S -solid, L - liquid, G - gas).
Chemical considered to be "volatile" if Henry's number (atm m3/mole) >0.00001 and molecular weight <200.
Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004, 2008).
Target cancer risk = 1E-06, Target Hazard Quotient = 0.2 except as noted.
"#": Nonchlorinated VOCs (except MTBE) adjusted upwards by factor of ten to account for assumed biodegradation in vadose-zone prior to emission at surface.

TABLE C-1b. SOIL ACTION LEVELS
FOR EVALUATION OF POTENTIAL VAPOR INTRUSION H
(volatile chemicals only)
(Use with Soil Gas Action Levels for sites with significant V(

For VLOOKUP	CHEMICAL PARAMETER	Physical State		[1]Unrestricted Land Use (mg/kg)
ACENAPHTH	#ACENAPHTHENE	V	S	1.2E+02
ACENAPHTH	ACENAPHTHYLENE	V	S	(Use soil gas)
ACETONE	#ACETONE	V	L	1.4E+04
ALDRIN	ALDRIN	SV	S	
AMETRYN	AMETRYN	NV	S	
AMINO,2- DI	AMINO,2- DINITROTOLUENE,4,6-	NV	S	
AMINO,4- DI	AMINO,4- DINITROTOLUENE,2,6-	NV	S	
ANTHRACEN	#ANTHRACENE	V	S	4.2E+00
ANTIMONY	ANTIMONY	NV	S	
ARSENIC	ARSENIC	NV	S	
ATRAZINE	ATRAZINE	NV	S	
BARIUM	BARIUM	NV	S	
BENOMYL	BENOMYL	NV	S	
BENZENE	#BENZENE	V	L	7.7E-01
BENZO(a)AN	BENZO(a)ANTHRACENE	SV	S	
BENZO(a)PY	BENZO(a)PYRENE	NV	S	
BENZO(b)FL	BENZO(b)FLUORANTHENE	NV	S	
BENZO(g,h,i	BENZO(g,h,i)PERYLENE	NV	S	
BENZO(k)FL	BENZO(k)FLUORANTHENE	NV	S	
BERYLLIUM	BERYLLIUM	NV	S	
BIPHENYL, 1	BIPHENYL, 1,1-	V	S	(Use soil gas)
BIS(2-CHLO	BIS(2-CHLOROETHYL)ETHER	V	L	7.9E-03
BIS(2-CHLOR	BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	(Use soil gas)
BIS(2-ETHYL	BIS(2-ETHYLHEXYL)PHTHALATE	NV	S	
BORON	BORON	NV	S	
BROMODICH	BROMODICHLOROMETHANE	V	L	1.6E-02
BROMOFORI	BROMOFORM	SV	S	
BROMOMETH	BROMOMETHANE	V	G	2.2E-01
CADMIUM	CADMIUM	NV	S	
CARBON TET	CARBON TETRACHLORIDE	V	L	1.0E-01
CHLORDANE	CHLORDANE (TECHNICAL)	SV	S	
CHLOROANIL	CHLOROANILINE, p-	NV	S	
CHLOROBEN	CHLOROBENZENE	V	L	2.2E+00
CHLOROETH	CHLOROETHANE	V	G	4.5E+02
CHLOROFOR	CHLOROFORM	V	L	2.6E-02
CHLOROMET	CHLOROMETHANE	V	G	4.0E+00
CHLOROPHE	CHLOROPHENOL, 2-	V	L	4.2E+01
CHROMIUM (	CHROMIUM (Total)	NV	S	
CHROMIUM I	CHROMIUM III	NV	S	
CHROMIUM \	CHROMIUM VI	NV	S	
CHRYSENE	CHRYSENE	NV	S	
COBALT	COBALT	NV	S	
COPPER	COPPER	NV	S	
CYANIDE (Fr	CYANIDE (Free)	V	S	(Use soil gas)
CYCLO-1,3,5-	CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S	
DALAPON	DALAPON	NV	L	
DIBENZO(a,h	DIBENZO(a,h)ANTHTRACENE	NV	S	
DIBROMO,1,2	DIBROMO,1,2- CHLOROPROPANE,3-	V	L	(Use soil gas)
DIBROMOCH	DIBROMOCHLOROMETHANE	V	S	2.9E-02

TABLE C-1b. SOIL ACTION LEVELS
FOR EVALUATION OF POTENTIAL VAPOR INTRUSION H
(volatile chemicals only)
(Use with Soil Gas Action Levels for sites with significant V(

For VLOOKUP	CHEMICAL PARAMETER	Physical State		[1]Unrestricted Land Use (mg/kg)
DIBROMOET	DIBROMOETHANE, 1,2-	V	S	1.0E-03
DICHLOROBE	DICHLOROBENZENE, 1,2-	V	L	8.9E+00
DICHLOROBE	DICHLOROBENZENE, 1,3-	V	L	(Use soil gas)
DICHLOROBE	DICHLOROBENZENE, 1,4-	V	S	5.5E-02
DICHLOROBE	DICHLOROBENZIDINE, 3,3-	NV	S	
DICHLORODI	DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S	
DICHLORODI	DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S	
DICHLORODI	DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S	
DICHLOROET	DICHLOROETHANE, 1,1-	V	L	3.8E-01
DICHLOROET	DICHLOROETHANE, 1,2-	V	L	2.3E-02
DICHLOROET	DICHLOROETHYLENE, 1,1-	V	L	8.9E+00
DICHLOROET	DICHLOROETHYLENE, Cis 1,2-	V	L	3.6E-01
DICHLOROET	DICHLOROETHYLENE, Trans 1,2-	V	L	3.6E+00
DICHLOROPH	DICHLOROPHENOL, 2,4-	NV	S	
DICHLOROPH	DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S	
DICHLOROPR	DICHLOROPROPANE, 1,2-	V	L	6.0E-02
DICHLOROPR	DICHLOROPROPENE, 1,3-	V	L	1.5E-01
DIELDRIN	DIELDRIN	NV	S	
DIETHYLPHT	DIETHYLPHTHALATE	NV	S	
DIMETHYLPH	#DIMETHYLPHENOL, 2,4-	NV	S	
DIMETHYLPH	DIMETHYLPHTHALATE	NV	S	
DINITROBEN	DINITROBENZENE, 1,3-	NV	S	
DINITROPHE	DINITROPHENOL, 2,4-	NV	S	
DINITROTOL	DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S	
DINITROTOL	DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S	
DIOXANE, 1,4	DIOXANE, 1,4-	V	L	(Use soil gas)
DIOXINS (TE(	DIOXINS (TEQ)	SV	S	
DIURON	DIURON	NV	S	
ENDOSULFA	ENDOSULFAN	SV	S	
ENDRIN	ENDRIN	NV	S	
ETHANOL	ETHANOL	V	L	(Use soil gas)
ETHYLBENZE	#ETHYLBENZENE	V	L	2.4E+01
FLUORANTH	FLUORANTHENE	NV	S	
FLUORENE	#FLUORENE	V	S	9.3E+01
GLYPHOSAT	GLYPHOSATE	NV	S	
HEPTACHLO	HEPTACHLOR	SV	S	
HEPTACHLO	HEPTACHLOR EPOXIDE	SV	S	
HEXACHLOR	HEXACHLOROBENZENE	SV	S	
HEXACHLOR	HEXACHLOROBUTADIENE	SV	S	
HEXACHLOR	HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S	
HEXACHLOR	HEXACHLOROETHANE	SV	S	
HEXAZINONE	HEXAZINONE	NV	S	
INDENO(1,2,	INDENO(1,2,3-cd)PYRENE	NV	S	
ISOPHORON	ISOPHORONE	NV	L	
LEAD	LEAD	NV	S	
MERCURY	MERCURY	NV	S	
METHOXYCH	METHOXYCHLOR	NV	S	
METHYL ETH	#METHYL ETHYL KETONE	V	L	2.2E+03
METHYL ISO	#METHYL ISOBUTYL KETONE	V	L	1.3E+03

TABLE C-1b. SOIL ACTION LEVELS
FOR EVALUATION OF POTENTIAL VAPOR INTRUSION H
(volatile chemicals only)
(Use with Soil Gas Action Levels for sites with significant V(

For VLOOKUP	CHEMICAL PARAMETER	Physical State		[1]Unrestricted Land Use (mg/kg)
METHYL MEF	METHYL MERCURY	NV	S	
METHYL TER	METHYL TERT BUTYL ETHER	V	L	2.3E+00
METHYLENE	METHYLENE CHLORIDE	V	L	2.2E+01
METHYLNAP	#METHYLNAPHTHALENE, 1-	V	S	5.9E+01
METHYLNAP	#METHYLNAPHTHALENE, 2-	V	S	5.0E+01
MOLYBDENU	MOLYBDENUM	NV	S	
NAPHTHALEI	#NAPHTHALENE	V	S	7.0E+00
NICKEL	NICKEL	NV	S	
NITROBENZE	NITROBENZENE	V	L	(Use soil gas)
NITROGLYCE	NITROGLYCERIN	NV	L	
NITROTOLUE	NITROTOLUENE, 2-	V	S	(Use soil gas)
NITROTOLUE	NITROTOLUENE, 3-	NV	S	
NITROTOLUE	NITROTOLUENE, 4-	NV	S	
PENTACHLO	PENTACHLOROPHENOL	NV	S	
PENTAERYTI	PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S	
PERCHLORA	PERCHLORATE	NV	S	
PHENANTHR	PHENANTHRENE	V	S	(Use soil gas)
PHENOL	PHENOL	NV	S	
POLYCHLOR	POLYCHLORINATED BIPHENYLS (PCBs)	SV	S	
PROPICONAZ	PROPICONAZOLE	NV	L	
PYRENE	#PYRENE	V	S	4.4E+01
SELENIUM	SELENIUM	NV	S	
SILVER	SILVER	NV	S	
SIMAZINE	SIMAZINE	NV	S	
STYRENE	#STYRENE	V	L	4.5E+02
TERBACIL	TERBACIL	NV	S	
tert-BUTYL	tert-BUTYL ALCOHOL	V	L	(Use soil gas)
TETRACHLO	TETRACHLOROETHANE, 1,1,1,2-	V	L	(Use soil gas)
TETRACHLO	TETRACHLOROETHANE, 1,1,2,2-	V	L	1.0E-02
TETRACHLO	TETRACHLOROETHYLENE	V	L	9.8E-02
TETRACHLO	TETRACHLOROPHENOL, 2,3,4,6-	NV	S	
TETRANITRO	TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S	
THALLIUM	THALLIUM	NV	S	
TOLUENE	#TOLUENE	V	L	8.2E+02
TOXAPHENE	TOXAPHENE	NV	S	
TPH (gasoline	TPH (gasolines)	V	L	(Use soil gas)
TPH (middle d	TPH (middle distillates)	V	L	(Use soil gas)
TPH (residual	TPH (residual fuels)	NV	L	
TRICHLOROE	TRICHLOROBENZENE, 1,2,4-	V	S	1.6E-01
TRICHLOROE	TRICHLOROETHANE, 1,1,1-	V	L	2.2E+02
TRICHLOROE	TRICHLOROETHANE, 1,1,2-	V	L	8.9E-03
TRICHLOROE	TRICHLOROETHYLENE	V	L	8.9E-02
TRICHLOROF	TRICHLOROPHENOL, 2,4,5-	NV	S	
TRICHLOROF	TRICHLOROPHENOL, 2,4,6-	NV	S	
TRICHLOROF	TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S	
TRICHLOROF	TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S	
TRICHLOROF	TRICHLOROPROPANE, 1,2,3-	V	L	(Use soil gas)
TRICHLOROF	TRICHLOROPROPENE, 1,2,3-	V	L	(Use soil gas)
TRIFLURALIN	TRIFLURALIN	SV	S	

TABLE C-1b. SOIL ACTION LEVELS
FOR EVALUATION OF POTENTIAL VAPOR INTRUSION H
(volatile chemicals only)
(Use with Soil Gas Action Levels for sites with significant V(

For VLOOKUP	CHEMICAL PARAMETER	Physical State		[1]Unrestricted Land Use (mg/kg)
TRINITROBE	TRINITROBENZENE, 1,3,5-	NV	S	
TRINITROPH	TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S	
TRINITROTO	TRINITROTOLUENE, 2,4,6- (TNT)	NV	S	
VANADIUM	VANADIUM	NV	S	

TABLE C-1b. SOIL ACTION LEVELS
FOR EVALUATION OF POTENTIAL VAPOR INTRUSION H
(volatile chemicals only)
(Use with Soil Gas Action Levels for sites with significant V(

For VLOOKUP	CHEMICAL PARAMETER	Physical State		[1]Unrestricted Land Use (mg/kg)
VINYL CHLOI	VINYL CHLORIDE	V	G	3.6E-02
XYLENES	#XYLENES	V	L	4.5E+01
ZINC	ZINC	NV	S	

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, m centers and other sensitive uses.

Action levels calculated using spreadsheet provided with User's Guide for the USEPA vapor intrusion guidan
Soil model: Two meters dry sandy soil (92% sand, 5% silt, 3% clay) directly underlying building foundation.
Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S -solid, L - liquid, G - gas).
Chemical considered to be "volatile" if Henry's number (atm m3/mole) >0.00001 and molecular weight <200.
Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (US
Target cancer risk = 1E-06, Target Hazard Quotient = 0.2 except as noted.
"#": Nonchlorinated VOCs (except MTBE) adjusted upwards by factor of ten to account for assumed biodegra vadose-zone prior to emission at surface.

HAZARDS

OC releases)

Commercial/ Industrial Land Use Only
(mg/kg)
1.2E+02
(Use soil gas)
1.1E+05
4.2E+00
5.6E+00
(Use soil gas)
6.7E-02
(Use soil gas)
1.2E-01
1.6E+00
7.3E-01
1.6E+01
2.1E+03
1.9E-01
2.8E+01
3.5E+02
(Use soil gas)
(Use soil gas)
2.1E-01

HAZARDS

OC releases)

Commercial/ Industrial Land Use Only
(mg/kg)
7.3E-03
6.2E+01
(Use soil gas)
4.0E-01
2.7E+00
1.7E-01
6.2E+01
2.5E+00
2.5E+01
4.4E-01
1.1E+00
(Use soil gas)
(Use soil gas)
1.7E+02
9.3E+01
1.6E+04
3.4E+03

HAZARDS

OC releases)

Commercial/ Industrial Land Use Only
(mg/kg)
1.7E+01
1.9E+02
3.9E+02
3.7E+02
5.8E+01
(Use soil gas)
(Use soil gas)
(Use soil gas)
4.4E+01
8.7E+02
(Use soil gas)
(Use soil gas)
7.5E-02
7.2E-01
8.2E+02
(Use soil gas)
(Use soil gas)
1.4E+00
6.4E+02
6.2E-02
6.2E-01
(Use soil gas)
(Use soil gas)

HAZARDS

OC releases)

Commercial/ Industrial Land Use Only
(mg/kg)

HAZARDS

OC releases)

Commercial/ Industrial Land Use Only
(mg/kg)
9.9E-01
2.6E+02

edical facilities, day-care

ce (USEPA 2004)

EPA 2004, 2008).

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TABLE C-2. [1]SHALLOW SOIL VAPOR ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

			[2]Unrestricted Land Use			Commercial/Industrial Land Use Only		
	Physical State		Lowest Residential	Carcinogenic Effects	Noncarcinogenic Effects	Lowest C/I	Carcinogenic Effects	Noncarcinogenic Effects
CHEMICAL PARAMETER			(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)
ACENAPHTHENE	V	S	1.0E+05		1.0E+05	8.4E+05		8.4E+05
ACENAPHTHYLENE	V	S	6.7E+04		6.7E+04	5.6E+05		5.6E+05
ACETONE	V	L	1.3E+07		1.3E+07	1.1E+08		1.1E+08
ALDRIN	SV	S	4.2E+02	6.6E+02	4.2E+02	3.5E+03	5.8E+03	3.5E+03
AMETRYN	NV	S						
AMINO,2- DINITROTOLUENE,4,6-	NV	S						
AMINO,4- DINITROTOLUENE,2,6-	NV	S						
ANTHRACENE	V	S	5.0E+05		5.0E+05	4.2E+06		4.2E+06
ANTIMONY	NV	S						
ARSENIC	NV	S						
ATRAZINE	NV	S						
BARIUM	NV	S						
BENOMYL	NV	S						
BENZENE	V	L	7.2E+02	7.2E+02	1.3E+04	6.3E+03	6.3E+03	1.1E+05
BENZO(a)ANTHRACENE	SV	S	1.8E+03	1.8E+03		4.5E+03	4.5E+03	
BENZO(a)PYRENE	NV	S						
BENZO(b)FLUORANTHENE	NV	S						
BENZO(g,h,i)PERYLENE	NV	S						
BENZO(k)FLUORANTHENE	NV	S						
BERYLLIUM	NV	S						
BIPHENYL, 1,1-	V	S	1.7E+02	2.8E+03	1.7E+02	1.4E+03	2.5E+04	1.4E+03
BIS(2-CHLOROETHYL)ETHER	V	L	1.7E+01	1.7E+01		1.5E+02	1.5E+02	
BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	5.6E+02	5.6E+02	5.8E+04	4.9E+03	4.9E+03	4.9E+05
BIS(2-ETHYLHEXYL)PHTHALATE	NV	S						
BORON	NV	S						
BROMODICHLOROMETHANE	V	L	1.5E+02	1.5E+02	3.3E+04	1.3E+03	1.3E+03	2.8E+05
BROMOFORM	SV	S	5.1E+03	5.1E+03		4.5E+04	4.5E+04	
BROMOMETHANE	V	G	2.1E+03		2.1E+03	1.8E+04		1.8E+04
CADMIUM	NV	S						
CARBON TETRACHLORIDE	V	L	9.4E+02	9.4E+02	4.2E+04	8.2E+03	8.2E+03	3.5E+05
CHLORDANE (TECHNICAL)	SV	S	5.6E+02	5.6E+02	1.5E+03	4.9E+03	4.9E+03	1.2E+04
CHLOROANILINE, p-	NV	S						
CHLOROBENZENE	V	L	2.1E+04		2.1E+04	1.8E+05		1.8E+05
CHLOROETHANE	V	G	4.2E+06		4.2E+06	3.5E+07		3.5E+07
CHLOROFORM	V	L	2.4E+02	2.4E+02	4.1E+04	2.1E+03	2.1E+03	3.4E+05
CHLOROMETHANE	V	G	3.8E+04		3.8E+04	3.2E+05		3.2E+05
CHLOROPHENOL, 2-	V	L	8.3E+03		8.3E+03	7.0E+04		7.0E+04
CHROMIUM (Total)	NV	S						
CHROMIUM III	NV	S						
CHROMIUM VI	NV	S						
CHRYSENE	NV	S						
COBALT	NV	S						
COPPER	NV	S						
CYANIDE (Free)	V	S	3.3E+02		3.3E+02	2.8E+03		2.8E+03

TABLE C-2. [1]SHALLOW SOIL VAPOR ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

			[2]Unrestricted Land Use			Commercial/Industrial Land Use Only		
	Physical		Lowest	Carcinogenic	Noncarcinogenic	Lowest	Carcinogenic	Noncarcinogenic
			Residential	Effects	Effects	C/I	Effects	Effects
CHEMICAL PARAMETER	State		(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S						
DALAPON	NV	L						
DIBENZO(a,h)ANTHTRACENE	NV	S						
DIBROMO,1,2- CHLOROPROPANE,3-	V	L	3.4E-01	3.4E-01	8.3E+01	8.2E+00	8.2E+00	7.0E+02
DIBROMOCHLOROMETHANE	V	S	2.7E+02	2.7E+02	3.3E+04	2.3E+03	2.3E+03	2.8E+05
DIBROMOETHANE, 1,2-	V	S	9.4E+00	9.4E+00	3.8E+03	8.2E+01	8.2E+01	3.2E+04
DICHLOROBENZENE, 1,2-	V	L	8.3E+04		8.3E+04	7.0E+05		7.0E+05
DICHLOROBENZENE, 1,3-	V	L	5.0E+04		5.0E+04	4.2E+05		4.2E+05
DICHLOROBENZENE, 1,4-	V	S	5.1E+02	5.1E+02	3.3E+05	4.5E+03	4.5E+03	2.8E+06
DICHLOROBENZIDINE, 3,3-	NV	S						
DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S						
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S	5.8E+01	5.8E+01		5.1E+02	5.1E+02	
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S						
DICHLOROETHANE, 1,1-	V	L	3.5E+03	3.5E+03	3.3E+05	3.1E+04	3.1E+04	2.8E+06
DICHLOROETHANE, 1,2-	V	L	2.2E+02	2.2E+02	2.9E+03	1.9E+03	1.9E+03	2.5E+04
DICHLOROETHYLENE, 1,1-	V	L	8.3E+04		8.3E+04	7.0E+05		7.0E+05
DICHLOROETHYLENE, Cis 1,2-	V	L	3.3E+03		3.3E+03	2.8E+04		2.8E+04
DICHLOROETHYLENE, Trans 1,2-	V	L	3.3E+04		3.3E+04	2.8E+05		2.8E+05
DICHLOROPHENOL, 2,4-	NV	S						
DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S						
DICHLOROPROPANE, 1,2-	V	L	5.6E+02	5.6E+02	1.7E+03	4.9E+03	4.9E+03	1.4E+04
DICHLOROPROPENE, 1,3-	V	L	1.4E+03	1.4E+03	8.3E+03	1.2E+04	1.2E+04	7.0E+04
DIELDRIN	NV	S						
DIETHYLPHTHALATE	NV	S						
DIMETHYLPHENOL, 2,4-	NV	S						
DIMETHYLPHTHALATE	NV	S						
DINITROBENZENE, 1,3-	NV	S						
DINITROPHENOL, 2,4-	NV	S						
DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S						
DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S						
DIOXANE, 1,4-	V	L	1.1E+03	1.1E+03	1.3E+04	9.8E+03	9.8E+03	1.1E+05
DIOXINS (TEQ)	SV	S	1.5E-02	1.5E-02	2.8E-02	1.3E-01	1.3E-01	2.3E-01
DIURON	NV	S						
ENDOSULFAN	SV	S						
ENDRIN	NV	S						
ETHANOL	V	L						
ETHYLBENZENE	V	L	2.2E+04	2.2E+04	4.2E+05	2.0E+05	2.0E+05	3.5E+06
FLUORANTHENE	NV	S						
FLUORENE	V	S	6.7E+04		6.7E+04	5.6E+05		5.6E+05
GLYPHOSATE	NV	S						
HEPTACHLOR	SV	S	4.3E+00	4.3E+00		3.8E+01	3.8E+01	
HEPTACHLOR EPOXIDE	SV	S	2.2E+00	2.2E+00		1.9E+01	1.9E+01	
HEXACHLOROBENZENE	SV	S	1.2E+01	1.2E+01		1.1E+02	1.1E+02	
HEXACHLOROBUTADIENE	SV	S	2.6E+02	2.6E+02		2.2E+03	2.2E+03	

TABLE C-2. [1]SHALLOW SOIL VAPOR ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[2]Unrestricted Land Use			Commercial/Industrial Land Use Only		
			Lowest Residential (ug/m^3)	Carcinogenic Effects (ug/m^3)	Noncarcinogenic Effects (ug/m^3)	Lowest C/I (ug/m^3)	Carcinogenic Effects (ug/m^3)	Noncarcinogenic Effects (ug/m^3)
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S						
HEXACHLOROETHANE	SV	S	5.1E+02	5.1E+02	1.3E+04	4.5E+03	4.5E+03	1.1E+05
HEXAZINONE	NV	S						
INDENO(1,2,3-cd)PYRENE	NV	S						
ISOPHORONE	NV	L						
LEAD	NV	S						
MERCURY	NV	S						
METHOXYCHLOR	NV	S						
METHYL ETHYL KETONE	V	L	2.1E+06		2.1E+06	1.8E+07		1.8E+07
METHYL ISOBUTYL KETONE	V	L	1.3E+06		1.3E+06	1.1E+07		1.1E+07
METHYL MERCURY	NV	S						
METHYL TERT BUTYL ETHER	V	L	2.2E+04	2.2E+04	1.3E+06	1.9E+05	1.9E+05	1.1E+07
METHYLENE CHLORIDE	V	L	2.0E+05	2.0E+05	2.5E+05	2.1E+06	4.9E+06	2.1E+06
METHYLNAPHTHALENE, 1-	V	S	7.7E+03	7.7E+03	1.2E+05	6.8E+04	6.8E+04	9.8E+05
METHYLNAPHTHALENE, 2-	V	S	6.7E+03		6.7E+03	5.6E+04		5.6E+04
MOLYBDENUM	NV	S						
NAPHTHALENE	V	S	1.3E+03	1.7E+03	1.3E+03	1.1E+04	1.4E+04	1.1E+04
NICKEL	NV	S						
NITROBENZENE	V	L	1.4E+02	1.4E+02	3.8E+03	1.2E+03	1.2E+03	3.2E+04
NITROGLYCERIN	NV	L						
NITROTOLUENE, 2-	V	S	1.0E+02	1.0E+02	1.5E+03	8.9E+02	8.9E+02	1.3E+04
NITROTOLUENE, 3-	NV	S						
NITROTOLUENE, 4-	NV	S						
PENTACHLOROPHENOL	NV	S						
PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S						
PERCHLORATE	NV	S						
PHENANTHRENE	V	S	6.7E+04		6.7E+04	5.6E+05		5.6E+05
PHENOL	NV	S						
POLYCHLORINATED BIPHENYLS (PCBs)	SV	S	9.9E+01	9.9E+01		8.6E+02	8.6E+02	
PROPICONAZOLE	NV	L						
PYRENE	V	S	5.0E+04		5.0E+04	4.2E+05		4.2E+05
SELENIUM	NV	S						
SILVER	NV	S						
SIMAZINE	NV	S						
STYRENE	V	L	4.2E+05		4.2E+05	3.5E+06		3.5E+06
TERBACIL	NV	S						
tert-BUTYL ALCOHOL	V	L	7.5E+03	7.5E+03		6.5E+04	6.5E+04	
TETRACHLOROETHANE, 1,1,1,2-	V	L	7.6E+02	7.6E+02	5.0E+04	6.6E+03	6.6E+03	4.2E+05
TETRACHLOROETHANE, 1,1,2,2-	V	L	9.7E+01	9.7E+01		8.5E+02	8.5E+02	
TETRACHLOROETHYLENE	V	L	9.2E+02	9.2E+02	1.7E+04	8.0E+03	8.0E+03	1.4E+05
TETRACHLOROPHENOL, 2,3,4,6-	NV	S						
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S						
THALLIUM	NV	S						
TOLUENE	V	L	2.1E+06		2.1E+06	1.8E+07		1.8E+07

TABLE C-2. [1]SHALLOW SOIL VAPOR ACTION LEVELS FOR EVALUATION OF POTENTIAL VAPOR INTRUSION HAZARDS (volatile chemicals only)

CHEMICAL PARAMETER	Physical State		[2]Unrestricted Land Use			Commercial/Industrial Land Use Only		
			Lowest Residential (ug/m^3)	Carcinogenic Effects (ug/m^3)	Noncarcinogenic Effects (ug/m^3)	Lowest C/I (ug/m^3)	Carcinogenic Effects (ug/m^3)	Noncarcinogenic Effects (ug/m^3)
TOXAPHENE	NV	S						
TPH (gasolines)	V	L	5.9E+05		5.9E+05	4.9E+06		4.9E+06
TPH (middle distillates)	V	L	2.6E+05		2.6E+05	2.2E+06		2.2E+06
TPH (residual fuels)	NV	L						
TRICHLOROBENZENE, 1,2,4-	V	S	7.7E+02	7.7E+02	8.3E+02	6.8E+03	6.8E+03	7.0E+03
TRICHLOROETHANE, 1,1,1-	V	L	2.1E+06		2.1E+06	1.8E+07		1.8E+07
TRICHLOROETHANE, 1,1,2-	V	L	8.3E+01	3.5E+02	8.3E+01	7.0E+02	3.1E+03	7.0E+02
TRICHLOROETHYLENE	V	L	8.3E+02	9.6E+02	8.3E+02	7.0E+03	1.2E+04	7.0E+03
TRICHLOROPHENOL, 2,4,5-	NV	S						
TRICHLOROPHENOL, 2,4,6-	NV	S						
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S						
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S						
TRICHLOROPROPANE, 1,2,3-	V	L	2.7E-01	2.7E-01	1.3E+02	6.5E+00	6.5E+00	1.1E+03
TRICHLOROPROPENE, 1,2,3-	V	L	1.3E+02		1.3E+02	1.1E+03		1.1E+03
TRIFLURALIN	SV	S						
TRINITROBENZENE, 1,3,5-	NV	S						
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S						
TRINITROTOLUENE, 2,4,6- (TNT)	NV	S						
VANADIUM	NV	S						
VINYL CHLORIDE	V	G	3.4E+02	3.4E+02	4.2E+04	1.1E+04	1.1E+04	3.5E+05
XYLENES	V	L	4.2E+04		4.2E+04	3.5E+05		3.5E+05
ZINC	NV	S						

Notes:

1. Shallow soil gas defined as soil gas sample data collected within 1.5 meters (five feet) from a building foundation or the ground surface. Assumes very permeable (e.g., sandy) fill material immediately beneath building slab or could be present below future buildings following redevelopment. Evaluation of deeper soil gas data (e.g., >1.5m bgs) should be carried out on a site-specific basis.
2. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers and other sensitive uses.

Soil gas action levels intended to be protective of indoor air quality, calculated for volatile chemicals only.
Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S - solid, L - liquid, G - gas).
Chemical considered to be "volatile" if Henry's number (atm m3/mole) >0.00001 and molecular weight <200.
Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004, 2008).
Target cancer risk = 1E-06, Target Hazard Quotient = 0.2 for all chemicals except as noted.
Target Hazard Quotient = 1.0 for TPH.
Residential soil gas:indoor air attenuation factor = 0.001 (1/1000). Commercial/industrial soil gas:indoor air attenuation factor = 0.0005 (1/2000). Refer to Section 3.3.
Soil gas action levels for TPHgasolines based on action levels for TPHmiddle distillates due to potential for mixture of fuel types at release sites.
Soil gas action levels do not address mass-balance issues. May be overly conservative for sites with low permeability soils immediately beneath a building slab or limited soil impacts and no source of VOCs in groundwater.
Indoor-air sampling and/or passive vapor mitigation measures may be prudent for sites where concentrations of chemicals in soil gas approach but do not exceed action levels. Consider other sources of VOCs in all indoor air studies.

TABLE C-3. INDOOR AIR ACTION LEVELS
(volatile chemicals only)

CHEMICAL PARAMETER	Physical State		Health-Based Action Levels									50% Odor Recognition Threshold (Table F-2)
			Unit Risk Factor URF	Reference Concentration RfC	[1]Unrestricted Land Use			Commercial/Industrial Use Only				
					Lowest Residential	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	Lowest C/I	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)		
			$(ug/m^3)^{-1}$	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)		(ug/m^3)
ACENAPHTHENE	V	S		2.4E+02	5.0E+01		5.0E+01	2.1E+02		2.1E+02		5.13E+02
ACENAPHTHYLENE	V	S		1.6E+02	3.3E+01		3.3E+01	1.4E+02		1.4E+02		-
ACETONE	V	L		3.1E+04	6.5E+03		6.5E+03	2.7E+04		2.7E+04		3.09E+04
ALDRIN	SV	S	8.5E-04	4.0E-01	2.1E-01	3.3E-01	2.1E-01	8.8E-01	1.4E+00	8.8E-01		2.63E+02
AMETRYN	NV	S										-
AMINO,2- DINITROTOLUENE,4,6-	NV	S										-
AMINO,4- DINITROTOLUENE,2,6-	NV	S										-
ANTHRACENE	V	S		1.2E+03	2.5E+02		2.5E+02	1.1E+03		1.1E+03		-
ANTIMONY	NV	S										-
ARSENIC	NV	S										-
ATRAZINE	NV	S										-
BARIUM	NV	S										-
BENOMYL	NV	S										-
BENZENE	V	L	7.8E-06	3.0E+01	3.6E-01	3.6E-01	6.3E+00	1.6E+00	1.6E+00	2.6E+01		4.89E+03
BENZO(a)ANTHRACENE	SV	S	1.1E-04		9.2E-01	9.2E-01		1.1E+00	1.1E+00			-
BENZO(a)PYRENE	NV	S										-
BENZO(b)FLUORANTHENE	NV	S										-
BENZO(g,h,i)PERYLENE	NV	S										-
BENZO(k)FLUORANTHENE	NV	S										-
BERYLLIUM	NV	S										-
BIPHENYL, 1,1-	V	S	2.0E-06	4.0E-01	8.3E-02	1.4E+00	8.3E-02	3.5E-01	6.1E+00	3.5E-01		6.00E+01
BIS(2-CHLOROETHYL)ETHER	V	L	3.3E-04		8.5E-03	8.5E-03		3.7E-02	3.7E-02			2.87E+02
BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	1.0E-05	1.4E+02	2.8E-01	2.8E-01	2.9E+01	1.2E+00	1.2E+00	1.2E+02		2.24E+03
BIS(2-ETHYLHEXYL)PHTHALATE	NV	S										-
BORON	NV	S										-
BROMODICHLOROMETHANE	V	L	3.7E-05	8.0E+01	7.6E-02	7.6E-02	1.7E+01	3.3E-01	3.3E-01	7.0E+01		1.10E+07
BROMOFORM	SV	S	1.1E-06		2.6E+00	2.6E+00		1.1E+01	1.1E+01			1.35E+04
BROMOMETHANE	V	G		5.0E+00	1.0E+00		1.0E+00	4.4E+00		4.4E+00		8.00E+04
CADMIUM	NV	S										-
CARBON TETRACHLORIDE	V	L	6.0E-06	1.0E+02	4.7E-01	4.7E-01	2.1E+01	2.0E+00	2.0E+00	8.8E+01		6.30E+04
CHLORDANE (TECHNICAL)	SV	S	1.0E-04	7.0E-01	2.8E-01	2.8E-01	7.3E-01	1.2E+00	1.2E+00	3.1E+00		8.40E+00
CHLOROANILINE, p-	NV	S										-
CHLOROBENZENE	V	L		5.0E+01	1.0E+01		1.0E+01	4.4E+01		4.4E+01		1.00E+03
CHLOROETHANE	V	G		1.0E+04	2.1E+03		2.1E+03	8.8E+03		8.8E+03		3.80E+05
CHLOROFORM	V	L	2.3E-05	9.8E+01	1.2E-01	1.2E-01	2.0E+01	5.3E-01	5.3E-01	8.6E+01		4.22E+05
CHLOROMETHANE	V	G		9.0E+01	1.9E+01		1.9E+01	7.9E+01		7.9E+01		-
CHLOROPHENOL, 2-	V	L		2.0E+01	4.2E+00		4.2E+00	1.8E+01		1.8E+01		1.90E+01
CHROMIUM (Total)	NV	S										-
CHROMIUM III	NV	S										-
CHROMIUM VI	NV	S										-
CHRYSENE	NV	S										-
COBALT	NV	S										-

TABLE C-3. INDOOR AIR ACTION LEVELS
(volatile chemicals only)

CHEMICAL PARAMETER	Physical State		Health-Based Action Levels								50% Odor Recognition Threshold (Table F-2)
			Unit Risk Factor URF	Reference Concentration RfC	[1]Unrestricted Land Use			Commercial/Industrial Use Only			
					Lowest Residential	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	Lowest C/I	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	
			(ug/m^3)$^{-1}$	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
COPPER	NV	S									-
CYANIDE (Free)	V	S		8.0E-01	1.7E-01		1.7E-01	7.0E-01		7.0E-01	6.52E+02
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S									-
DALAPON	NV	L									-
DIBENZO(a,h)ANTHTRACENE	NV	S									-
DIBROMO,1,2- CHLOROPROPANE,3-	V	L	6.0E-03	2.0E-01	1.7E-04	1.7E-04	4.2E-02	2.0E-03	2.0E-03	1.8E-01	-
DIBROMOCHLOROMETHANE	V	S	2.1E-05	8.0E+01	1.3E-01	1.3E-01	1.7E+01	5.8E-01	5.8E-01	7.0E+01	-
DIBROMOETHANE, 1,2-	V	S	6.0E-04	9.0E+00	4.7E-03	4.7E-03	1.9E+00	2.0E-02	2.0E-02	7.9E+00	2.00E+05
DICHLOROBENZENE, 1,2-	V	L		2.0E+02	4.2E+01		4.2E+01	1.8E+02		1.8E+02	3.05E+05
DICHLOROBENZENE, 1,3-	V	L		1.2E+02	2.5E+01		2.5E+01	1.1E+02		1.1E+02	-
DICHLOROBENZENE, 1,4-	V	S	1.1E-05	8.0E+02	2.6E-01	2.6E-01	1.7E+02	1.1E+00	1.1E+00	7.0E+02	1.10E+03
DICHLOROBENZIDINE, 3,3-	NV	S									-
DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S									-
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S	9.7E-05		2.9E-02	2.9E-02		1.3E-01	1.3E-01		-
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S									-
DICHLOROETHANE, 1,1-	V	L	1.6E-06	8.0E+02	1.8E+00	1.8E+00	1.7E+02	7.7E+00	7.7E+00	7.0E+02	1.25E+05
DICHLOROETHANE, 1,2-	V	L	2.6E-05	7.0E+00	1.1E-01	1.1E-01	1.5E+00	4.7E-01	4.7E-01	6.1E+00	2.42E+03
DICHLOROETHYLENE, 1,1-	V	L		2.0E+02	4.2E+01		4.2E+01	1.8E+02		1.8E+02	2.00E+06
DICHLOROETHYLENE, Cis 1,2-	V	L		8.0E+00	1.7E+00		1.7E+00	7.0E+00		7.0E+00	-
DICHLOROETHYLENE, Trans 1,2-	V	L		8.0E+01	1.7E+01		1.7E+01	7.0E+01		7.0E+01	6.73E+04
DICHLOROPHENOL, 2,4-	NV	S									1.40E+03
DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S									-
DICHLOROPROPANE, 1,2-	V	L	1.0E-05	4.0E+00	2.8E-01	2.8E-01	8.3E-01	1.2E+00	1.2E+00	3.5E+00	1.19E+03
DICHLOROPROPENE, 1,3-	V	L	4.0E-06	2.0E+01	7.0E-01	7.0E-01	4.2E+00	3.1E+00	3.1E+00	1.8E+01	4.16E+03
DIELDRIN	NV	S									-
DIETHYLPHTHALATE	NV	S									-
DIMETHYLPHENOL, 2,4-	NV	S									1.00E+00
DIMETHYLPHTHALATE	NV	S									-
DINITROBENZENE, 1,3-	NV	S									-
DINITROPHENOL, 2,4-	NV	S									-
DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S									-
DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S									-
DIOXANE, 1,4-	V	L	5.0E-06	3.0E+01	5.6E-01	5.6E-01	6.3E+00	2.5E+00	2.5E+00	2.6E+01	6.12E+05
DIOXINS (TEQ)	SV	S	3.8E+01	1.3E-05	7.4E-06	7.4E-06	1.4E-05	3.2E-05	3.2E-05	5.8E-05	-
DIURON	NV	S									-
ENDOSULFAN	SV	S									-
ENDRIN	NV	S									-
ETHANOL	V	L									1.92E+04
ETHYLBENZENE	V	L	2.5E-06	1.0E+03	1.1E+01	1.1E+01	2.1E+02	4.9E+01	4.9E+01	8.8E+02	2.00E+03
FLUORANTHENE	NV	S									-
FLUORENE	V	S		1.6E+02	3.3E+01		3.3E+01	1.4E+02		1.4E+02	-
GLYPHOSATE	NV	S									-

TABLE C-3. INDOOR AIR ACTION LEVELS
(volatile chemicals only)

CHEMICAL PARAMETER	Physical State		Health-Based Action Levels								50% Odor Recognition Threshold (Table F-2)
			Unit Risk Factor URF	Reference Concentration RfC	[1]Unrestricted Land Use			Commercial/Industrial Use Only			
					Lowest Residential	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	Lowest C/I	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	
			$(ug/m^3)^{-1}$	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
HEPTACHLOR	SV	S	1.3E-03		2.2E-03	2.2E-03		9.4E-03	9.4E-03		3.00E+02
HEPTACHLOR EPOXIDE	SV	S	2.6E-03		1.1E-03	1.1E-03		4.7E-03	4.7E-03		3.00E+02
HEXACHLOROBENZENE	SV	S	4.6E-04		6.1E-03	6.1E-03		2.7E-02	2.7E-02		-
HEXACHLOROBUTADIENE	SV	S	2.2E-05		1.3E-01	1.3E-01		5.6E-01	5.6E-01		1.20E+04
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S									-
HEXACHLOROETHANE	SV	S	1.1E-05	3.0E+01	2.6E-01	2.6E-01	6.3E+00	1.1E+00	1.1E+00	2.6E+01	-
HEXAZINONE	NV	S									-
INDENO(1,2,3-cd)PYRENE	NV	S									-
ISOPHORONE	NV	L									-
LEAD	NV	S									-
MERCURY	NV	S									-
METHOXYCHLOR	NV	S									-
METHYL ETHYL KETONE	V	L		5.0E+03	1.0E+03		1.0E+03	4.4E+03		4.4E+03	3.20E+04
METHYL ISOBUTYL KETONE	V	L		3.0E+03	6.3E+02		6.3E+02	2.6E+03		2.6E+03	4.20E+02
METHYL MERCURY	NV	S									-
METHYL TERT BUTYL ETHER	V	L	2.6E-07	3.0E+03	1.1E+01	1.1E+01	6.3E+02	4.7E+01	4.7E+01	2.6E+03	5.30E+02
METHYLENE CHLORIDE	V	L	1.0E-08	6.0E+02	1.0E+02	1.0E+02	1.3E+02	5.3E+02	1.2E+03	5.3E+02	5.60E+05
METHYLNAPHTHALENE, 1-	V	S	7.3E-06	2.8E+02	3.9E+00	3.9E+00	5.8E+01	1.7E+01	1.7E+01	2.5E+02	6.80E+01
METHYLNAPHTHALENE, 2-	V	S		1.6E+01	3.3E+00		3.3E+00	1.4E+01		1.4E+01	6.80E+01
MOLYBDENUM	NV	S									-
NAPHTHALENE	V	S	3.4E-05	3.0E+00	6.3E-01	8.3E-01	6.3E-01	2.6E+00	3.6E+00	2.6E+00	4.40E+02
NICKEL	NV	S									-
NITROBENZENE	V	L	4.0E-05	9.0E+00	7.0E-02	7.0E-02	1.9E+00	3.1E-01	3.1E-01	7.9E+00	-
NITROGLYCERIN	NV	L									-
NITROTOLUENE, 2-	V	S	5.5E-05	3.6E+00	5.1E-02	5.1E-02	7.5E-01	2.2E-01	2.2E-01	3.2E+00	-
NITROTOLUENE, 3-	NV	S									-
NITROTOLUENE, 4-	NV	S									-
PENTACHLOROPHENOL	NV	S									-
PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S									-
PERCHLORATE	NV	S									-
PHENANTHRENE	V	S		1.6E+02	3.3E+01		3.3E+01	1.4E+02		1.4E+02	5.50E+01
PHENOL	NV	S									1.56E+02
POLYCHLORINATED BIPHENYLS (PCBs)	SV	S	5.7E-04		4.9E-02	4.9E-02		2.2E-01	2.2E-01		-
PROPICONAZOLE	NV	L									-
PYRENE	V	S		1.2E+02	2.5E+01		2.5E+01	1.1E+02		1.1E+02	-
SELENIUM	NV	S									-
SILVER	NV	S									-
SIMAZINE	NV	S									-
STYRENE	V	L		1.0E+03	2.1E+02		2.1E+02	8.8E+02		8.8E+02	1.36E+03
TERBACIL	NV	S									-
tert-BUTYL ALCOHOL	V	L	7.5E-07		3.7E+00	3.7E+00		1.6E+01	1.6E+01		-
TETRACHLOROETHANE, 1,1,1,2-	V	L	7.4E-06	1.2E+02	3.8E-01	3.8E-01	2.5E+01	1.7E+00	1.7E+00	1.1E+02	-

TABLE C-3. INDOOR AIR ACTION LEVELS
(volatile chemicals only)

CHEMICAL PARAMETER	Physical State		Health-Based Action Levels								50% Odor Recognition Threshold (Table F-2)
			Unit Risk Factor URF	Reference Concentration RfC	[1]Unrestricted Land Use			Commercial/Industrial Use Only			
					Lowest Residential	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	Lowest C/I	Indoor Air (carcinogens)	Indoor Air (noncarcinogens)	
			$(ug/m^3)^{-1}$	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)
TETRACHLOROETHANE, 1,1,2,2-	V	L	5.8E-05		4.8E-02	4.8E-02		2.1E-01	2.1E-01		1.05E+04
TETRACHLOROETHYLENE	V	L	6.1E-06	4.0E+01	4.6E-01	4.6E-01	8.3E+00	2.0E+00	2.0E+00	3.5E+01	3.17E+04
TETRACHLOROPHENOL, 2,3,4,6-	NV	S									-
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S									-
THALLIUM	NV	S									-
TOLUENE	V	L		5.0E+03	1.0E+03		1.0E+03	4.4E+03		4.4E+03	3.00E+04
TOXAPHENE	NV	S									-
TPH (gasolines)	V	L		2.8E+02	2.9E+02		2.9E+02	1.2E+03		1.2E+03	1.10E+03
TPH (middle distillates)	V	L		1.3E+02	1.3E+02		1.3E+02	5.5E+02		5.5E+02	5.00E+03
TPH (residual fuels)	NV	L									-
TRICHLOROBENZENE, 1,2,4-	V	S	7.3E-06	2.0E+00	3.9E-01	3.9E-01	4.2E-01	1.7E+00	1.7E+00	1.8E+00	2.20E+04
TRICHLOROETHANE, 1,1,1-	V	L		5.0E+03	1.0E+03		1.0E+03	4.4E+03		4.4E+03	6.51E+04
TRICHLOROETHANE, 1,1,2-	V	L	1.6E-05	2.0E-01	4.2E-02	1.8E-01	4.2E-02	1.8E-01	7.7E-01	1.8E-01	-
TRICHLOROETHYLENE	V	L	4.1E-06	2.0E+00	4.2E-01	4.8E-01	4.2E-01	1.8E+00	3.0E+00	1.8E+00	1.36E+06
TRICHLOROPHENOL, 2,4,5-	NV	S									-
TRICHLOROPHENOL, 2,4,6-	NV	S									3.00E-01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S									-
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S									-
TRICHLOROPROPANE, 1,2,3-	V	L	7.5E-03	3.0E-01	1.4E-04	1.4E-04	6.3E-02	1.6E-03	1.6E-03	2.6E-01	-
TRICHLOROPROPENE, 1,2,3-	V	L		3.0E-01	6.3E-02		6.3E-02	2.6E-01		2.6E-01	-
TRIFLURALIN	SV	S									-
TRINITROBENZENE, 1,3,5-	NV	S									-
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S									-
TRINITROTOLUENE, 2,4,6- (TNT)	NV	S									-
VANADIUM	NV	S									-
VINYL CHLORIDE	V	G	4.4E-06	1.0E+02	1.7E-01	1.7E-01	2.1E+01	2.8E+00	2.8E+00	8.8E+01	7.71E+05
XYLENES	V	L		1.0E+02	2.1E+01		2.1E+01	8.8E+01		8.8E+01	4.41E+02
ZINC	NV	S									-

Notes:

1. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers and other sensitive uses.

Target cancer risk = 1E-06, Target Hazard Quotient = 0.2 for all chemicals except as noted.
Target Hazard Quotient = 1.0 for TPH (see Appendix 1 and Appendix 9 Fall 2011 EAL update memo).
Physical state of chemical at ambient conditions (V - volatile, NV - nonvolatile, S - solid, L - liquid, G - gas).
Chemical considered to be "volatile" if Henry's number (atm m3/mole) >0.00001 and molecular weight <200.
Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004, 2011).
Action levels calculated using spreadhseet provided with User's Guide for the USEPA vapor intrusion guidance (USEPA 2004, refer to Appendix 2 for equations and default input parameter values).
Indoor air action levels listed only for volatile chemicals included in database of referenced model spreadsheet (plus MTBE).
outdoor air from petroleum-based cleaners, auto exhaust, etc.
Indoor air action level for ethanol based on potential odor concerns (refer to Chapter 4 and Table F series). Human health risk toxicity data not available but likely to exceed odor thresholds.
50% Odor Recognition Thresholds from Massachusetts Department of Environmental Protection (MADEP, 1994) and ATSDR; included for reference (potential nuisance concerns, see Table F series).

TABLE D-1a. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS located within 150 meters of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
ACENAPHTHENE	1.5E+01	Aquatic Habitat Goal	2.0E+01	3.5E+02	3.9E+03	1.5E+01
ACENAPHTHYLENE	1.3E+01	Aquatic Habitat Goal	2.0E+03	2.4E+02	(Use soil gas)	1.3E+01
ACETONE	1.5E+03	Aquatic Habitat Goal	2.0E+04	1.4E+04	6.2E+08	1.5E+03
ALDRIN	1.4E-04	Aquatic Habitat Goal	8.5E+00	5.1E-03		1.4E-04
AMETRYN	1.8E+02	Drinking Water Toxicity	5.0E+04	1.8E+02		7.0E+02
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	Aquatic Habitat Goal	5.0E+04	4.0E+01		1.8E+01
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	Aquatic Habitat Goal	5.0E+04	4.0E+01		1.1E+01
ANTHRACENE	2.0E-02	Aquatic Habitat Goal	2.2E+01	1.8E+03	4.3E+01	2.0E-02
ANTIMONY	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00		3.0E+01
ARSENIC	1.0E+01	Drinking Water Toxicity	5.0E+04	1.0E+01		3.6E+01
ATRAZINE	3.0E+00	Drinking Water Toxicity	2.0E+01	3.0E+00		1.2E+01
BARIUM	2.2E+02	Aquatic Habitat Goal	5.0E+04	2.0E+03		2.2E+02
BENOMYL	1.4E-01	Aquatic Habitat Goal	1.9E+03	1.0E+03		1.4E-01
BENZENE	5.0E+00	Drinking Water Toxicity	1.7E+02	5.0E+00	2.3E+03	7.1E+01
BENZO(a)ANTHRACENE	1.1E-02	Drinking Water Toxicity	4.7E+00	1.1E-02		2.7E-02
BENZO(a)PYRENE	6.0E-02	Aquatic Habitat Goal	8.0E-01	2.0E-01		6.0E-02
BENZO(b)FLUORANTHENE	2.9E-02	Drinking Water Toxicity	7.5E-01	2.9E-02		6.8E-01
BENZO(g,h,i)PERYLENE	1.3E-01	Gross Contamination	1.3E-01	8.0E+02		4.4E-01
BENZO(k)FLUORANTHENE	2.9E-01	Drinking Water Toxicity	4.0E-01	2.9E-01		6.4E-01
BERYLLIUM	6.6E-01	Aquatic Habitat Goal	5.0E+04	4.0E+00		6.6E-01
BIPHENYL, 1,1-	5.0E-01	Gross Contamination	5.0E-01	8.3E-01	(Use soil gas)	6.5E+00
BIS(2-CHLOROETHYL)ETHER	1.4E-02	Drinking Water Toxicity	3.6E+02	1.4E-02	1.8E+02	2.4E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Goal	3.2E+02	3.7E-01	(Use soil gas)	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	3.0E+00	Aquatic Habitat Goal	1.4E+02	6.0E+00		3.0E+00
BORON	1.0E+03	Aquatic Habitat Goal	5.0E+04	4.0E+03		1.0E+03
BROMODICHLOROMETHANE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	1.1E+02	3.4E+02
BROMOFORM	8.0E+01	Drinking Water Toxicity	5.1E+02	8.0E+01		2.3E+02
BROMOMETHANE	7.6E+00	Drinking Water Toxicity	5.0E+04	7.6E+00	4.1E+02	1.6E+01
CADMIUM	3.0E+00	Aquatic Habitat Goal	5.0E+04	5.0E+00		3.0E+00
CARBON TETRACHLORIDE	5.0E+00	Drinking Water Toxicity	5.2E+02	5.0E+00	1.1E+02	9.8E+00
CHLORDANE (TECHNICAL)	4.0E-03	Aquatic Habitat Goal	2.5E+00	2.0E+00		4.0E-03
CHLOROANILINE, p-	3.9E-01	Drinking Water Toxicity	5.0E+04	3.9E-01		1.9E+01
CHLOROBENZENE	2.5E+01	Aquatic Habitat Goal	5.0E+01	1.0E+02	1.2E+04	2.5E+01
CHLOROETHANE	1.6E+01	Gross Contamination	1.6E+01	2.1E+04	6.0E+05	2.1E+04
CHLOROFORM	2.8E+01	Aquatic Habitat Goal	2.4E+03	7.0E+01	1.1E+02	2.8E+01
CHLOROMETHANE	1.9E+02	Aquatic Habitat Goal	5.0E+04	1.9E+02	5.2E+03	1.9E+02
CHLOROPHENOL, 2-	1.8E-01	Gross Contamination	1.8E-01	2.9E+01	1.0E+05	3.2E+01
CHROMIUM (Total)	1.1E+01	Aquatic Habitat Goal	5.0E+04	1.0E+02		1.1E+01
CHROMIUM III	2.0E+01	Aquatic Habitat Goal	5.0E+04	3.0E+04		2.0E+01
CHROMIUM VI	4.3E+00	Drinking Water Toxicity	5.0E+04	4.3E+00		1.1E+01
CHRYSENE	1.0E+00	Gross Contamination	1.0E+00	2.9E+00		2.0E+00
COBALT	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00		1.9E+01
COPPER	2.9E+00	Aquatic Habitat Goal	1.0E+03	1.3E+03		2.9E+00

TABLE D-1a. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS located within 150 meters of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
CYANIDE (Free)	1.0E+00	Aquatic Habitat Goal	1.7E+02	2.0E+02	(Use soil gas)	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	Drinking Water Toxicity	3.0E+04	7.1E-01		7.9E+01
DALAPON	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02		3.0E+02
DIBENZO(a,h)ANTHTRACENE	2.9E-03	Drinking Water Toxicity	1.3E+00	2.9E-03		8.0E-01
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Goal	1.0E+01	4.0E-02	(Use soil gas)	4.0E-02
DIBROMOCHLOROMETHANE	2.1E-01	Drinking Water Toxicity	5.0E+04	2.1E-01	4.5E+02	3.4E+01
DIBROMOETHANE, 1,2-	4.0E-02	Drinking Water Toxicity	5.0E+04	4.0E-02	1.9E+01	1.4E+03
DICHLOROBENZENE, 1,2-	1.0E+01	Gross Contamination	1.0E+01	6.0E+02	8.3E+04	1.4E+01
DICHLOROBENZENE, 1,3-	5.0E+00	Gross Contamination	5.0E+00	1.8E+02	(Use soil gas)	2.2E+01
DICHLOROBENZENE, 1,4-	5.0E+00	Gross Contamination	5.0E+00	7.5E+01	4.5E+02	9.4E+00
DICHLOROBENZIDINE, 3,3-	1.7E-01	Drinking Water Toxicity	1.6E+03	1.7E-01		4.5E+00
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E-02	Aquatic Habitat Goal	4.5E+01	3.2E-01		1.1E-02
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.6E-02	Drinking Water Toxicity	2.0E+01	4.6E-02		4.1E-01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E-03	Aquatic Habitat Goal	2.8E+00	2.3E-01		1.0E-03
DICHLOROETHANE, 1,1-	2.8E+00	Drinking Water Toxicity	5.0E+04	2.8E+00	1.1E+03	4.7E+01
DICHLOROETHANE, 1,2-	5.0E+00	Drinking Water Toxicity	7.0E+03	5.0E+00	1.8E+02	9.1E+02
DICHLOROETHYLENE, 1,1-	7.0E+00	Drinking Water Toxicity	1.5E+03	7.0E+00	6.6E+03	2.5E+01
DICHLOROETHYLENE, Cis 1,2-	7.0E+01	Drinking Water Toxicity	5.0E+04	7.0E+01	1.3E+03	6.2E+02
DICHLOROETHYLENE, Trans 1,2-	1.0E+02	Drinking Water Toxicity	2.6E+02	1.0E+02	6.6E+03	5.6E+02
DICHLOROPHENOL, 2,4-	3.0E-01	Gross Contamination	3.0E-01	6.0E+01		1.1E+01
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Aquatic Habitat Goal	5.0E+04	7.0E+01		7.0E+01
DICHLOROPROPANE, 1,2-	5.0E+00	Drinking Water Toxicity	1.0E+01	5.0E+00	3.4E+02	5.2E+02
DICHLOROPROPENE, 1,3-	6.0E-02	Aquatic Habitat Goal	5.0E+04	5.0E-01	6.7E+02	6.0E-02
DIELDRIN	1.9E-03	Aquatic Habitat Goal	4.1E+01	1.1E-02		1.9E-03
DIETHYLPHTHALATE	2.1E+02	Aquatic Habitat Goal	5.0E+04	1.6E+04		2.1E+02
DIMETHYLPHENOL, 2,4-	1.2E+02	Aquatic Habitat Goal	4.0E+02	4.0E+02		1.2E+02
DIMETHYLPHTHALATE	1.1E+03	Aquatic Habitat Goal	5.0E+04	2.0E+05		1.1E+03
DINITROBENZENE, 1,3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		1.0E+01
DINITROPHENOL, 2,4-	1.4E+01	Aquatic Habitat Goal	5.0E+04	4.0E+01		1.4E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	Drinking Water Toxicity	5.0E+04	2.5E-01		9.1E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	Drinking Water Toxicity	5.0E+04	5.2E-02		8.1E+01
DIOXANE, 1,4-	4.6E-01	Drinking Water Toxicity	5.0E+04	4.6E-01	(Use soil gas)	3.4E+05
DIOXINS (TEQ)	3.1E-09	Aquatic Habitat Goal	1.0E-01	3.0E-05		3.1E-09
DIURON	4.0E+01	Drinking Water Toxicity	2.1E+04	4.0E+01		6.0E+01
ENDOSULFAN	8.7E-03	Aquatic Habitat Goal	1.6E+02	1.2E+02		8.7E-03
ENDRIN	2.3E-03	Aquatic Habitat Goal	4.1E+01	2.0E+00		2.3E-03
ETHANOL	5.0E+04	Gross Contamination	5.0E+04		(Use soil gas)	
ETHYLBENZENE	7.3E+00	Aquatic Habitat Goal	3.0E+01	7.0E+02	7.6E+04	7.3E+00
FLUORANTHENE	8.0E-01	Aquatic Habitat Goal	1.3E+02	8.0E+02		8.0E-01
FLUORENE	3.9E+00	Aquatic Habitat Goal	8.5E+02	2.4E+02	1.7E+03	3.9E+00
GLYPHOSATE	7.0E+02	Drinking Water Toxicity	5.0E+04	7.0E+02		1.8E+03
HEPTACHLOR	3.6E-03	Aquatic Habitat Goal	2.0E+01	4.0E-01		3.6E-03
HEPTACHLOR EPOXIDE	3.6E-03	Aquatic Habitat Goal	1.0E+02	2.0E-01		3.6E-03

TABLE D-1a. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS located within 150 meters of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
HEXACHLOROBENZENE	3.0E-04	Aquatic Habitat Goal	3.1E+00	1.0E+00		3.0E-04
HEXACHLOROBUTADIENE	2.0E-01	Drinking Water Toxicity	6.0E+00	2.0E-01		3.0E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	6.3E-02	Aquatic Habitat Goal	3.7E+03	2.0E-01		6.3E-02
HEXACHLOROETHANE	4.0E-01	Drinking Water Toxicity	1.0E+01	4.0E-01		1.2E+01
HEXAZINONE	6.6E+02	Drinking Water Toxicity	5.0E+04	6.6E+02		1.7E+04
INDENO(1,2,3-cd)PYRENE	2.9E-02	Drinking Water Toxicity	9.5E-02	2.9E-02		2.8E-01
ISOPHORONE	8.2E+01	Drinking Water Toxicity	5.0E+04	8.2E+01		9.2E+02
LEAD	5.6E+00	Aquatic Habitat Goal	5.0E+04	1.5E+01		5.6E+00
MERCURY	2.5E-02	Aquatic Habitat Goal	5.0E+04	2.0E+00		2.5E-02
METHOXYCHLOR	3.0E-02	Aquatic Habitat Goal	5.0E+01	4.0E+01		3.0E-02
METHYL ETHYL KETONE	5.6E+03	Drinking Water Toxicity	8.4E+03	5.6E+03	2.2E+08	1.4E+04
METHYL ISOBUTYL KETONE	1.7E+02	Aquatic Habitat Goal	1.3E+03	6.3E+03	1.9E+07	1.7E+02
METHYL MERCURY	2.8E-03	Aquatic Habitat Goal	5.0E+04	2.0E+00		2.8E-03
METHYL TERT BUTYL ETHER	5.0E+00	Gross Contamination	5.0E+00	1.4E+01	3.1E+04	7.3E+02
METHYLENE CHLORIDE	5.0E+00	Drinking Water Toxicity	9.1E+03	5.0E+00	7.6E+04	1.5E+03
METHYLNAPHTHALENE, 1-	2.1E+00	Aquatic Habitat Goal	1.0E+01	6.0E+00	2.6E+04	2.1E+00
METHYLNAPHTHALENE, 2-	4.7E+00	Aquatic Habitat Goal	1.0E+01	2.4E+01	2.5E+04	4.7E+00
MOLYBDENUM	1.0E+02	Drinking Water Toxicity	5.0E+04	1.0E+02		3.7E+02
NAPHTHALENE	1.2E+01	Aquatic Habitat Goal	2.1E+01	1.7E+01	2.9E+04	1.2E+01
NICKEL	5.0E+00	Aquatic Habitat Goal	5.0E+04	4.0E+02		5.0E+00
NITROBENZENE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	(Use soil gas)	3.8E+02
NITROGLYCERIN	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		1.8E+01
NITROTOLUENE, 2-	7.9E-02	Drinking Water Toxicity	5.0E+04	7.9E-02	(Use soil gas)	7.1E+01
NITROTOLUENE, 3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		4.2E+01
NITROTOLUENE, 4-	4.9E+00	Drinking Water Toxicity	5.0E+04	4.9E+00		4.6E+01
PENTACHLOROPHENOL	1.0E+00	Drinking Water Toxicity	3.0E+01	1.0E+00		7.9E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	Drinking Water Toxicity	2.2E+04	1.9E+01		8.5E+05
PERCHLORATE	1.5E+01	Drinking Water Toxicity	5.0E+04	1.5E+01		6.0E+02
PHENANTHRENE	2.3E+00	Aquatic Habitat Goal	4.1E+02	2.4E+02	(Use soil gas)	2.3E+00
PHENOL	5.8E+01	Aquatic Habitat Goal	7.9E+03	6.0E+03		5.8E+01
POLYCHLORINATED BIPHENYLS (PCBs)	1.4E-02	Aquatic Habitat Goal	2.2E+01	5.0E-01		1.4E-02
PROPICONAZOLE	9.5E+01	Aquatic Habitat Goal	5.0E+04	2.6E+02		9.5E+01
PYRENE	4.6E+00	Aquatic Habitat Goal	6.8E+01	1.8E+02	1.4E+02	4.6E+00
SELENIUM	5.0E+00	Aquatic Habitat Goal	5.0E+04	5.0E+01		5.0E+00
SILVER	1.0E-01	Aquatic Habitat Goal	1.0E+02	1.0E+02		1.0E-01
SIMAZINE	4.0E+00	Drinking Water Toxicity	3.1E+03	4.0E+00		9.0E+00
STYRENE	1.0E+01	Gross Contamination	1.0E+01	1.0E+02	3.1E+05	3.2E+01
TERBACIL	2.6E+02	Aquatic Habitat Goal	5.0E+04	2.6E+02		2.6E+02
tert-BUTYL ALCOHOL	5.8E+00	Drinking Water Toxicity	5.0E+04	5.8E+00	(Use soil gas)	1.8E+04
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	Drinking Water Toxicity	5.0E+04	6.1E-01	(Use soil gas)	1.1E+01
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	Drinking Water Toxicity	5.0E+02	7.8E-02	2.4E+02	2.0E+02
TETRACHLOROETHYLENE	5.0E+00	Drinking Water Toxicity	1.7E+02	5.0E+00	1.9E+02	5.3E+01
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	Aquatic Habitat Goal	1.2E+04	6.0E+02		1.2E+00

TABLE D-1a. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS located within 150 meters of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	Aquatic Habitat Goal	2.5E+03	1.0E+03		2.2E+02
THALLIUM	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		6.0E+00
TOLUENE	9.8E+00	Aquatic Habitat Goal	4.0E+01	1.0E+03	5.3E+05	9.8E+00
TOXAPHENE	2.0E-04	Aquatic Habitat Goal	1.4E+02	3.0E+00		2.0E-04
TPH (gasolines)	1.0E+02	Gross Contamination	1.0E+02	3.0E+02	(Use soil gas)	5.0E+02
TPH (middle distillates)	1.0E+02	Gross Contamination	1.0E+02	1.6E+02	(Use soil gas)	6.4E+02
TPH (residual fuels)	1.0E+02	Gross Contamination	1.0E+02	2.4E+03		6.4E+02
TRICHLOROBENZENE, 1,2,4-	7.0E+01	Drinking Water Toxicity	3.0E+03	7.0E+01	1.2E+03	1.1E+02
TRICHLOROETHANE, 1,1,1-	1.1E+01	Aquatic Habitat Goal	9.7E+02	2.0E+02	3.4E+05	1.1E+01
TRICHLOROETHANE, 1,1,2-	5.0E+00	Drinking Water Toxicity	5.0E+04	5.0E+00	1.1E+02	7.3E+02
TRICHLOROETHYLENE	5.0E+00	Drinking Water Toxicity	3.1E+02	5.0E+00	2.1E+02	4.7E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	Aquatic Habitat Goal	2.0E+02	2.0E+03		1.9E+00
TRICHLOROPHENOL, 2,4,6-	4.9E+00	Aquatic Habitat Goal	1.0E+02	7.1E+00		4.9E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02		6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	Aquatic Habitat Goal	3.6E+04	5.0E+01		3.0E+01
TRICHLOROPROPANE, 1,2,3-	6.0E-01	Drinking Water Toxicity	5.0E+04	6.0E-01	(Use soil gas)	1.4E+01
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Goal	5.0E+04	6.2E-01	(Use soil gas)	6.2E-01
TRIFLURALIN	1.1E+00	Aquatic Habitat Goal	9.0E+01	1.0E+01		1.1E+00
TRINITROBENZENE, 1,3,5-	1.0E+01	Aquatic Habitat Goal	5.0E+04	6.0E+02		1.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Goal	3.7E+04	4.0E+01		4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	Drinking Water Toxicity	5.0E+04	2.6E+00		1.3E+01
VANADIUM	2.7E+01	Aquatic Habitat Goal	5.0E+04	1.0E+02		2.7E+01
VINYL CHLORIDE	2.0E+00	Drinking Water Toxicity	3.4E+03	2.0E+00	1.8E+01	9.3E+02
XYLENES	1.3E+01	Aquatic Habitat Goal	2.0E+01	1.0E+04	1.1E+05	1.3E+01
ZINC	2.2E+01	Aquatic Habitat Goal	5.0E+03	6.0E+03		2.2E+01

Notes:

1. Lowest of action levels for gross contamination, drinking water toxicity, vapor intrusion and aquatic habitat impacts. Used to develop soil leaching action levels for protection of groundwater quality.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.
Gross Contamination: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit general groundwater resource degradation.
Drinking Water Toxicity: Based on primary maximum concentration levels (MCLs), or equivalent. Considered protective of human health.
Vapor Intrusion: Addresses potential emission of volatile chemicals from groundwater into buildings and subsequent impact on indoor air. Assumes moderately permeable, sandy soil or fill material immediately beneath building slab and unrestricted ("residential") land use (refer to Chapter 5).
Aquatic Habitat Impacts: Addresses potential discharge of groundwater to estuarine aquatic habitat and subsequent impact on aquatic life; dilution of groundwater upon discharge to surface water not considered, in order to take into account potential impacts to benthic organisms (see Chapter 5).
Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).
Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-1b. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
ACENAPHTHENE	2.0E+01	Gross Contamination	2.0E+01	3.5E+02	3.9E+03	3.2E+02
ACENAPHTHYLENE	2.4E+02	Drinking Water Toxicity	2.0E+03	2.4E+02	(Use soil gas)	3.0E+02
ACETONE	1.4E+04	Drinking Water Toxicity	2.0E+04	1.4E+04	6.2E+08	1.5E+04
ALDRIN	5.1E-03	Drinking Water Toxicity	8.5E+00	5.1E-03		1.3E+00
AMETRYN	1.8E+02	Drinking Water Toxicity	5.0E+04	1.8E+02		1.8E+03
AMINO,2- DINITROTOLUENE,4,6-	4.0E+01	Drinking Water Toxicity	5.0E+04	4.0E+01		1.6E+02
AMINO,4- DINITROTOLUENE,2,6-	4.0E+01	Drinking Water Toxicity	5.0E+04	4.0E+01		9.8E+01
ANTHRACENE	1.8E-01	Aquatic Habitat Goal	2.2E+01	1.8E+03	4.3E+01	1.8E-01
ANTIMONY	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00		1.8E+02
ARSENIC	1.0E+01	Drinking Water Toxicity	5.0E+04	1.0E+01		6.9E+01
ATRAZINE	3.0E+00	Drinking Water Toxicity	2.0E+01	3.0E+00		3.3E+02
BARIUM	2.0E+03	Aquatic Habitat Goal	5.0E+04	2.0E+03		2.0E+03
BENOMYL	2.8E+00	Aquatic Habitat Goal	1.9E+03	1.0E+03		2.8E+00
BENZENE	5.0E+00	Drinking Water Toxicity	1.7E+02	5.0E+00	2.3E+03	1.7E+03
BENZO(a)ANTHRACENE	1.1E-02	Drinking Water Toxicity	4.7E+00	1.1E-02		3.0E+02
BENZO(a)PYRENE	2.0E-01	Drinking Water Toxicity	8.0E-01	2.0E-01		3.0E+02
BENZO(b)FLUORANTHENE	2.9E-02	Drinking Water Toxicity	7.5E-01	2.9E-02		3.0E+02
BENZO(g,h,i)PERYLENE	1.3E-01	Gross Contamination	1.3E-01	8.0E+02		3.0E+02
BENZO(k)FLUORANTHENE	2.9E-01	Drinking Water Toxicity	4.0E-01	2.9E-01		3.0E+02
BERYLLIUM	4.0E+00	Drinking Water Toxicity	5.0E+04	4.0E+00		3.5E+01
BIPHENYL, 1,1-	5.0E-01	Gross Contamination	5.0E-01	8.3E-01	(Use soil gas)	2.6E+01
BIS(2-CHLOROETHYL)ETHER	1.4E-02	Drinking Water Toxicity	3.6E+02	1.4E-02	1.8E+02	2.4E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Goal	3.2E+02	3.7E-01	(Use soil gas)	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	6.0E+00	Drinking Water Toxicity	1.4E+02	6.0E+00		2.7E+01
BORON	4.0E+03	Drinking Water Toxicity	5.0E+04	4.0E+03		3.4E+04
BROMODICHLOROMETHANE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	1.1E+02	3.1E+03
BROMOFORM	8.0E+01	Drinking Water Toxicity	5.1E+02	8.0E+01		1.1E+03
BROMOMETHANE	7.6E+00	Drinking Water Toxicity	5.0E+04	7.6E+00	4.1E+02	3.8E+01
CADMIUM	3.0E+00	Aquatic Habitat Goal	5.0E+04	5.0E+00		3.0E+00
CARBON TETRACHLORIDE	5.0E+00	Drinking Water Toxicity	5.2E+02	5.0E+00	1.1E+02	1.2E+04
CHLORDANE (TECHNICAL)	9.0E-02	Aquatic Habitat Goal	2.5E+00	2.0E+00		9.0E-02
CHLOROANILINE, p-	3.9E-01	Drinking Water Toxicity	5.0E+04	3.9E-01		4.6E+02
CHLOROBENZENE	5.0E+01	Gross Contamination	5.0E+01	1.0E+02	1.2E+04	2.2E+02
CHLOROETHANE	1.6E+01	Gross Contamination	1.6E+01	2.1E+04	6.0E+05	2.1E+04
CHLOROFORM	7.0E+01	Drinking Water Toxicity	2.4E+03	7.0E+01	1.1E+02	4.9E+02
CHLOROMETHANE	1.9E+02	Aquatic Habitat Goal	5.0E+04	1.9E+02	5.2E+03	1.9E+02
CHLOROPHENOL, 2-	1.8E-01	Gross Contamination	1.8E-01	2.9E+01	1.0E+05	4.0E+02
CHROMIUM (Total)	1.6E+01	Aquatic Habitat Goal	5.0E+04	1.0E+02		1.6E+01
CHROMIUM III	5.7E+02	Aquatic Habitat Goal	5.0E+04	3.0E+04		5.7E+02
CHROMIUM VI	4.3E+00	Drinking Water Toxicity	5.0E+04	4.3E+00		1.6E+01
CHRYSENE	1.0E+00	Gross Contamination	1.0E+00	2.9E+00		3.0E+02
COBALT	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00		1.2E+02
COPPER	2.9E+00	Aquatic Habitat Goal	1.0E+03	1.3E+03		2.9E+00

TABLE D-1b. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
CYANIDE (Free)	1.0E+00	Aquatic Habitat Goal	1.7E+02	2.0E+02	(Use soil gas)	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	Drinking Water Toxicity	3.0E+04	7.1E-01		5.2E+02
DALAPON	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02		3.0E+03
DIBENZO(a,h)ANTHTRACENE	2.9E-03	Drinking Water Toxicity	1.3E+00	2.9E-03		3.0E+02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Goal	1.0E+01	4.0E-02	(Use soil gas)	4.0E-02
DIBROMOCHLOROMETHANE	2.1E-01	Drinking Water Toxicity	5.0E+04	2.1E-01	4.5E+02	2.9E+03
DIBROMOETHANE, 1,2-	4.0E-02	Drinking Water Toxicity	5.0E+04	4.0E-02	1.9E+01	1.4E+03
DICHLOROBENZENE, 1,2-	1.0E+01	Gross Contamination	1.0E+01	6.0E+02	8.3E+04	3.7E+02
DICHLOROBENZENE, 1,3-	5.0E+00	Gross Contamination	5.0E+00	1.8E+02	(Use soil gas)	3.7E+02
DICHLOROBENZENE, 1,4-	5.0E+00	Gross Contamination	5.0E+00	7.5E+01	4.5E+02	3.7E+02
DICHLOROBENZIDINE, 3,3-	1.7E-01	Drinking Water Toxicity	1.6E+03	1.7E-01		4.1E+01
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.9E-01	Aquatic Habitat Goal	4.5E+01	3.2E-01		1.9E-01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.6E-02	Drinking Water Toxicity	2.0E+01	4.6E-02		7.0E+00
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.3E-02	Aquatic Habitat Goal	2.8E+00	2.3E-01		1.3E-02
DICHLOROETHANE, 1,1-	2.8E+00	Drinking Water Toxicity	5.0E+04	2.8E+00	1.1E+03	8.3E+02
DICHLOROETHANE, 1,2-	5.0E+00	Drinking Water Toxicity	7.0E+03	5.0E+00	1.8E+02	3.8E+04
DICHLOROETHYLENE, 1,1-	7.0E+00	Drinking Water Toxicity	1.5E+03	7.0E+00	6.6E+03	3.9E+03
DICHLOROETHYLENE, Cis 1,2-	7.0E+01	Drinking Water Toxicity	5.0E+04	7.0E+01	1.3E+03	5.5E+03
DICHLOROETHYLENE, Trans 1,2-	1.0E+02	Drinking Water Toxicity	2.6E+02	1.0E+02	6.6E+03	1.0E+04
DICHLOROPHENOL, 2,4-	3.0E-01	Gross Contamination	3.0E-01	6.0E+01		6.7E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Drinking Water Toxicity	5.0E+04	7.0E+01		1.3E+02
DICHLOROPROPANE, 1,2-	5.0E+00	Drinking Water Toxicity	1.0E+01	5.0E+00	3.4E+02	3.4E+03
DICHLOROPROPENE, 1,3-	5.0E-01	Drinking Water Toxicity	5.0E+04	5.0E-01	6.7E+02	2.6E+02
DIELDRIN	1.1E-02	Drinking Water Toxicity	4.1E+01	1.1E-02		7.1E-01
DIETHYLPHTHALATE	9.8E+02	Aquatic Habitat Goal	5.0E+04	1.6E+04		9.8E+02
DIMETHYLPHENOL, 2,4-	4.0E+02	Gross Contamination	4.0E+02	4.0E+02		7.0E+02
DIMETHYLPHTHALATE	3.2E+03	Aquatic Habitat Goal	5.0E+04	2.0E+05		3.2E+03
DINITROBENZENE, 1,3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		1.0E+02
DINITROPHENOL, 2,4-	4.0E+01	Drinking Water Toxicity	5.0E+04	4.0E+01		3.8E+02
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	Drinking Water Toxicity	5.0E+04	2.5E-01		1.1E+02
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	Drinking Water Toxicity	5.0E+04	5.2E-02		1.1E+02
DIOXANE, 1,4-	4.6E-01	Drinking Water Toxicity	5.0E+04	4.6E-01	(Use soil gas)	3.4E+06
DIOXINS (TEQ)	3.0E-05	Drinking Water Toxicity	1.0E-01	3.0E-05		3.0E-03
DIURON	4.0E+01	Drinking Water Toxicity	2.1E+04	4.0E+01		2.0E+02
ENDOSULFAN	3.4E-02	Aquatic Habitat Goal	1.6E+02	1.2E+02		3.4E-02
ENDRIN	3.7E-02	Aquatic Habitat Goal	4.1E+01	2.0E+00		3.7E-02
ETHANOL	5.0E+04	Gross Contamination	5.0E+04		(Use soil gas)	
ETHYLBENZENE	3.0E+01	Gross Contamination	3.0E+01	7.0E+02	7.6E+04	1.4E+02
FLUORANTHENE	1.3E+01	Aquatic Habitat Goal	1.3E+02	8.0E+02		1.3E+01
FLUORENE	2.4E+02	Drinking Water Toxicity	8.5E+02	2.4E+02	1.7E+03	3.0E+02
GLYPHOSATE	7.0E+02	Drinking Water Toxicity	5.0E+04	7.0E+02		2.2E+04
HEPTACHLOR	5.3E-02	Aquatic Habitat Goal	2.0E+01	4.0E-01		5.3E-02
HEPTACHLOR EPOXIDE	5.3E-02	Aquatic Habitat Goal	1.0E+02	2.0E-01		5.3E-02

TABLE D-1b. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
HEXACHLOROBENZENE	3.0E-04	Aquatic Habitat Goal	3.1E+00	1.0E+00		3.0E-04
HEXACHLOROBUTADIENE	2.0E-01	Drinking Water Toxicity	6.0E+00	2.0E-01		1.1E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.6E-01	Aquatic Habitat Goal	3.7E+03	2.0E-01		1.6E-01
HEXACHLOROETHANE	4.0E-01	Drinking Water Toxicity	1.0E+01	4.0E-01		3.1E+02
HEXAZINONE	6.6E+02	Drinking Water Toxicity	5.0E+04	6.6E+02		1.4E+05
INDENO(1,2,3-cd)PYRENE	2.9E-02	Drinking Water Toxicity	9.5E-02	2.9E-02		3.0E+02
ISOPHORONE	8.2E+01	Drinking Water Toxicity	5.0E+04	8.2E+01		4.3E+03
LEAD	1.5E+01	Drinking Water Toxicity	5.0E+04	1.5E+01		2.9E+01
MERCURY	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		2.1E+00
METHOXYCHLOR	7.0E-01	Aquatic Habitat Goal	5.0E+01	4.0E+01		7.0E-01
METHYL ETHYL KETONE	5.6E+03	Drinking Water Toxicity	8.4E+03	5.6E+03	2.2E+08	2.0E+05
METHYL ISOBUTYL KETONE	1.3E+03	Gross Contamination	1.3E+03	6.3E+03	1.9E+07	2.2E+03
METHYL MERCURY	9.9E-02	Aquatic Habitat Goal	5.0E+04	2.0E+00		9.9E-02
METHYL TERT BUTYL ETHER	5.0E+00	Gross Contamination	5.0E+00	1.4E+01	3.1E+04	6.5E+03
METHYLENE CHLORIDE	5.0E+00	Drinking Water Toxicity	9.1E+03	5.0E+00	7.6E+04	8.5E+03
METHYLNAPHTHALENE, 1-	6.0E+00	Drinking Water Toxicity	1.0E+01	6.0E+00	2.6E+04	3.7E+01
METHYLNAPHTHALENE, 2-	1.0E+01	Gross Contamination	1.0E+01	2.4E+01	2.5E+04	4.2E+01
MOLYBDENUM	1.0E+02	Drinking Water Toxicity	5.0E+04	1.0E+02		7.2E+03
NAPHTHALENE	1.7E+01	Drinking Water Toxicity	2.1E+01	1.7E+01	2.9E+04	7.7E+02
NICKEL	5.0E+00	Aquatic Habitat Goal	5.0E+04	4.0E+02		5.0E+00
NITROBENZENE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	(Use soil gas)	2.0E+03
NITROGLYCERIN	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		1.6E+02
NITROTOLUENE, 2-	7.9E-02	Drinking Water Toxicity	5.0E+04	7.9E-02	(Use soil gas)	6.4E+02
NITROTOLUENE, 3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		3.8E+02
NITROTOLUENE, 4-	4.9E+00	Drinking Water Toxicity	5.0E+04	4.9E+00		4.1E+02
PENTACHLOROPHENOL	1.0E+00	Drinking Water Toxicity	3.0E+01	1.0E+00		1.3E+01
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	Drinking Water Toxicity	2.2E+04	1.9E+01		8.5E+05
PERCHLORATE	1.5E+01	Drinking Water Toxicity	5.0E+04	1.5E+01		5.0E+03
PHENANTHRENE	2.4E+02	Drinking Water Toxicity	4.1E+02	2.4E+02	(Use soil gas)	3.0E+02
PHENOL	3.0E+02	Aquatic Habitat Goal	7.9E+03	6.0E+03		3.0E+02
POLYCHLORINATED BIPHENYLS (PCBs)	5.0E-01	Drinking Water Toxicity	2.2E+01	5.0E-01		2.0E+00
PROPICONAZOLE	2.6E+02	Drinking Water Toxicity	5.0E+04	2.6E+02		4.3E+02
PYRENE	6.8E+01	Gross Contamination	6.8E+01	1.8E+02	1.4E+02	3.0E+02
SELENIUM	2.0E+01	Aquatic Habitat Goal	5.0E+04	5.0E+01		2.0E+01
SILVER	1.0E+00	Aquatic Habitat Goal	1.0E+02	1.0E+02		1.0E+00
SIMAZINE	4.0E+00	Drinking Water Toxicity	3.1E+03	4.0E+00		8.0E+01
STYRENE	1.0E+01	Gross Contamination	1.0E+01	1.0E+02	3.1E+05	2.9E+02
TERBACIL	2.6E+02	Aquatic Habitat Goal	5.0E+04	2.6E+02		2.6E+02
tert-BUTYL ALCOHOL	5.8E+00	Drinking Water Toxicity	5.0E+04	5.8E+00	(Use soil gas)	1.8E+05
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	Drinking Water Toxicity	5.0E+04	6.1E-01	(Use soil gas)	7.7E+02
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	Drinking Water Toxicity	5.0E+02	7.8E-02	2.4E+02	9.1E+02
TETRACHLOROETHYLENE	5.0E+00	Drinking Water Toxicity	1.7E+02	5.0E+00	1.9E+02	1.8E+03
TETRACHLOROPHENOL, 2,3,4,6-	1.1E+01	Aquatic Habitat Goal	1.2E+04	6.0E+02		1.1E+01

TABLE D-1b. GROUNDWATER ACTION LEVELS
(Groundwater IS a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-1	Drinking Water Toxicity Table D-3a	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.0E+03	Drinking Water Toxicity	2.5E+03	1.0E+03		1.2E+03
THALLIUM	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00		4.7E+02
TOLUENE	4.0E+01	Gross Contamination	4.0E+01	1.0E+03	5.3E+05	2.1E+03
TOXAPHENE	2.1E-01	Aquatic Habitat Goal	1.4E+02	3.0E+00		2.1E-01
TPH (gasolines)	1.0E+02	Gross Contamination	1.0E+02	3.0E+02	(Use soil gas)	5.0E+03
TPH (middle distillates)	1.0E+02	Gross Contamination	1.0E+02	1.6E+02	(Use soil gas)	2.5E+03
TPH (residual fuels)	1.0E+02	Gross Contamination	1.0E+02	2.4E+03		2.5E+03
TRICHLOROBENZENE, 1,2,4-	7.0E+01	Drinking Water Toxicity	3.0E+03	7.0E+01	1.2E+03	4.2E+02
TRICHLOROETHANE, 1,1,1-	2.0E+02	Drinking Water Toxicity	9.7E+02	2.0E+02	3.4E+05	6.0E+03
TRICHLOROETHANE, 1,1,2-	5.0E+00	Drinking Water Toxicity	5.0E+04	5.0E+00	1.1E+02	5.2E+03
TRICHLOROETHYLENE	5.0E+00	Drinking Water Toxicity	3.1E+02	5.0E+00	2.1E+02	7.0E+02
TRICHLOROPHENOL, 2,4,5-	1.7E+01	Aquatic Habitat Goal	2.0E+02	2.0E+03		1.7E+01
TRICHLOROPHENOL, 2,4,6-	7.1E+00	Drinking Water Toxicity	1.0E+02	7.1E+00		3.9E+01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02		6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	5.0E+01	Drinking Water Toxicity	3.6E+04	5.0E+01		2.7E+02
TRICHLOROPROPANE, 1,2,3-	6.0E-01	Drinking Water Toxicity	5.0E+04	6.0E-01	(Use soil gas)	1.4E+02
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Goal	5.0E+04	6.2E-01	(Use soil gas)	6.2E-01
TRIFLURALIN	1.0E+01	Drinking Water Toxicity	9.0E+01	1.0E+01		2.1E+01
TRINITROBENZENE, 1,3,5-	2.7E+01	Aquatic Habitat Goal	5.0E+04	6.0E+02		2.7E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Goal	3.7E+04	4.0E+01		4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	Drinking Water Toxicity	5.0E+04	2.6E+00		2.1E+02
VANADIUM	9.0E+01	Aquatic Habitat Goal	5.0E+04	1.0E+02		9.0E+01
VINYL CHLORIDE	2.0E+00	Drinking Water Toxicity	3.4E+03	2.0E+00	1.8E+01	8.4E+03
XYLENES	2.0E+01	Gross Contamination	2.0E+01	1.0E+04	1.1E+05	2.3E+02
ZINC	2.2E+01	Aquatic Habitat Goal	5.0E+03	6.0E+03		2.2E+01

Notes:

1. Lowest of action levels for gross contamination, drinking water toxicity, vapor intrusion and aquatic habitat impacts. Used to develop soil leaching action levels for protection of groundwater quality.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.
Gross Contamination: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit general groundwater resource degradation.
Drinking Water Toxicity: Based on primary maximum concentration levels (MCLs), or equivalent. Considered protective of human health.
Vapor Intrusion: Addresses potential emission of volatile chemicals from groundwater into buildings and subsequent impact on indoor air. Assumes moderately permeable, sandy soil or fill material immediately beneath building slab and unrestricted ("residential") land use (refer to Chapter 5).
Aquatic Habitat Impacts: Addresses potential discharge of groundwater to estuarine aquatic habitat and subsequent impact on aquatic life; dilution of groundwater upon discharge to surface water not considered, in order to take into account potential impacts to benthic organisms (see Chapter 5).
Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).
Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-1c. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
ACENAPHTHENE	1.5E+01	Aquatic Habitat Goal	2.0E+02	3.9E+03	1.5E+01
ACENAPHTHYLENE	1.3E+01	Aquatic Habitat Goal	2.0E+03	(Use soil gas)	1.3E+01
ACETONE	1.5E+03	Aquatic Habitat Goal	5.0E+04	6.2E+08	1.5E+03
ALDRIN	1.4E-04	Aquatic Habitat Goal	8.5E+00		1.4E-04
AMETRYN	7.0E+02	Aquatic Habitat Goal	5.0E+04		7.0E+02
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	Aquatic Habitat Goal	5.0E+04		1.8E+01
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	Aquatic Habitat Goal	5.0E+04		1.1E+01
ANTHRACENE	2.0E-02	Aquatic Habitat Goal	2.2E+01	4.3E+01	2.0E-02
ANTIMONY	3.0E+01	Aquatic Habitat Goal	5.0E+04		3.0E+01
ARSENIC	3.6E+01	Aquatic Habitat Goal	5.0E+04		3.6E+01
ATRAZINE	1.2E+01	Aquatic Habitat Goal	1.8E+04		1.2E+01
BARIUM	2.2E+02	Aquatic Habitat Goal	5.0E+04		2.2E+02
BENOMYL	1.4E-01	Aquatic Habitat Goal	1.9E+03		1.4E-01
BENZENE	7.1E+01	Aquatic Habitat Goal	2.0E+04	2.3E+03	7.1E+01
BENZO(a)ANTHRACENE	2.7E-02	Aquatic Habitat Goal	4.7E+00		2.7E-02
BENZO(a)PYRENE	6.0E-02	Aquatic Habitat Goal	8.0E-01		6.0E-02
BENZO(b)FLUORANTHENE	6.8E-01	Aquatic Habitat Goal	7.5E-01		6.8E-01
BENZO(g,h,i)PERYLENE	1.3E-01	Gross Contamination	1.3E-01		4.4E-01
BENZO(k)FLUORANTHENE	4.0E-01	Gross Contamination	4.0E-01		6.4E-01
BERYLLIUM	6.6E-01	Aquatic Habitat Goal	5.0E+04		6.6E-01
BIPHENYL, 1,1-	5.0E+00	Gross Contamination	5.0E+00	(Use soil gas)	6.5E+00
BIS(2-CHLOROETHYL)ETHER	1.8E+02	Vapor Intrusion	3.6E+03	1.8E+02	2.4E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Goal	3.2E+03	(Use soil gas)	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	3.0E+00	Aquatic Habitat Goal	1.4E+02		3.0E+00
BORON	1.0E+03	Aquatic Habitat Goal	5.0E+04		1.0E+03
BROMODICHLOROMETHANE	1.1E+02	Vapor Intrusion	5.0E+04	1.1E+02	3.4E+02
BROMOFORM	2.3E+02	Aquatic Habitat Goal	5.1E+03		2.3E+02
BROMOMETHANE	1.6E+01	Aquatic Habitat Goal	5.0E+04	4.1E+02	1.6E+01
CADMIUM	3.0E+00	Aquatic Habitat Goal	5.0E+04		3.0E+00
CARBON TETRACHLORIDE	9.8E+00	Aquatic Habitat Goal	5.2E+03	1.1E+02	9.8E+00
CHLORDANE (TECHNICAL)	4.0E-03	Aquatic Habitat Goal	2.5E+01		4.0E-03
CHLOROANILINE, p-	1.9E+01	Aquatic Habitat Goal	5.0E+04		1.9E+01
CHLOROBENZENE	2.5E+01	Aquatic Habitat Goal	5.0E+02	1.2E+04	2.5E+01
CHLOROETHANE	1.6E+02	Gross Contamination	1.6E+02	6.0E+05	2.1E+04
CHLOROFORM	2.8E+01	Aquatic Habitat Goal	2.4E+04	1.1E+02	2.8E+01
CHLOROMETHANE	1.9E+02	Aquatic Habitat Goal	5.0E+04	5.2E+03	1.9E+02
CHLOROPHENOL, 2-	1.8E+00	Gross Contamination	1.8E+00	1.0E+05	3.2E+01
CHROMIUM (Total)	1.1E+01	Aquatic Habitat Goal	5.0E+04		1.1E+01
CHROMIUM III	2.0E+01	Aquatic Habitat Goal	5.0E+04		2.0E+01
CHROMIUM VI	1.1E+01	Aquatic Habitat Goal	5.0E+04		1.1E+01
CHRYSENE	1.0E+00	Gross Contamination	1.0E+00		2.0E+00
COBALT	1.9E+01	Aquatic Habitat Goal	5.0E+04		1.9E+01
COPPER	2.9E+00	Aquatic Habitat Goal	5.0E+04		2.9E+00

TABLE D-1c. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
CYANIDE (Free)	1.0E+00	Aquatic Habitat Goal	1.7E+03	(Use soil gas)	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.9E+01	Aquatic Habitat Goal	3.0E+04		7.9E+01
DALAPON	3.0E+02	Aquatic Habitat Goal	5.0E+04		3.0E+02
DIBENZO(a,h)ANTHTRACENE	8.0E-01	Aquatic Habitat Goal	1.3E+00		8.0E-01
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Goal	1.0E+02	(Use soil gas)	4.0E-02
DIBROMOCHLOROMETHANE	3.4E+01	Aquatic Habitat Goal	5.0E+04	4.5E+02	3.4E+01
DIBROMOETHANE, 1,2-	1.9E+01	Vapor Intrusion	5.0E+04	1.9E+01	1.4E+03
DICHLOROBENZENE, 1,2-	1.4E+01	Aquatic Habitat Goal	1.0E+02	8.3E+04	1.4E+01
DICHLOROBENZENE, 1,3-	2.2E+01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	2.2E+01
DICHLOROBENZENE, 1,4-	9.4E+00	Aquatic Habitat Goal	1.1E+02	4.5E+02	9.4E+00
DICHLOROBENZIDINE, 3,3-	4.5E+00	Aquatic Habitat Goal	1.6E+03		4.5E+00
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E-02	Aquatic Habitat Goal	4.5E+01		1.1E-02
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.1E-01	Aquatic Habitat Goal	2.0E+01		4.1E-01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E-03	Aquatic Habitat Goal	2.8E+00		1.0E-03
DICHLOROETHANE, 1,1-	4.7E+01	Aquatic Habitat Goal	5.0E+04	1.1E+03	4.7E+01
DICHLOROETHANE, 1,2-	1.8E+02	Vapor Intrusion	5.0E+04	1.8E+02	9.1E+02
DICHLOROETHYLENE, 1,1-	2.5E+01	Aquatic Habitat Goal	1.5E+04	6.6E+03	2.5E+01
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	Aquatic Habitat Goal	5.0E+04	1.3E+03	6.2E+02
DICHLOROETHYLENE, Trans 1,2-	5.6E+02	Aquatic Habitat Goal	2.6E+03	6.6E+03	5.6E+02
DICHLOROPHENOL, 2,4-	3.0E+00	Gross Contamination	3.0E+00		1.1E+01
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Aquatic Habitat Goal	5.0E+04		7.0E+01
DICHLOROPROPANE, 1,2-	1.0E+02	Gross Contamination	1.0E+02	3.4E+02	5.2E+02
DICHLOROPROPENE, 1,3-	6.0E-02	Aquatic Habitat Goal	5.0E+04	6.7E+02	6.0E-02
DIELDRIN	1.9E-03	Aquatic Habitat Goal	9.8E+01		1.9E-03
DIETHYLPHTHALATE	2.1E+02	Aquatic Habitat Goal	5.0E+04		2.1E+02
DIMETHYLPHENOL, 2,4-	1.2E+02	Aquatic Habitat Goal	4.0E+03		1.2E+02
DIMETHYLPHTHALATE	1.1E+03	Aquatic Habitat Goal	5.0E+04		1.1E+03
DINITROBENZENE, 1,3-	1.0E+01	Aquatic Habitat Goal	5.0E+04		1.0E+01
DINITROPHENOL, 2,4-	1.4E+01	Aquatic Habitat Goal	5.0E+04		1.4E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	9.1E+00	Aquatic Habitat Goal	5.0E+04		9.1E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	Aquatic Habitat Goal	5.0E+04		8.1E+01
DIOXANE, 1,4-	5.0E+04	Gross Contamination	5.0E+04	(Use soil gas)	3.4E+05
DIOXINS (TEQ)	3.1E-09	Aquatic Habitat Goal	1.0E-01		3.1E-09
DIURON	6.0E+01	Aquatic Habitat Goal	2.1E+04		6.0E+01
ENDOSULFAN	8.7E-03	Aquatic Habitat Goal	1.6E+02		8.7E-03
ENDRIN	2.3E-03	Aquatic Habitat Goal	1.3E+02		2.3E-03
ETHANOL	5.0E+04	Gross Contamination	5.0E+04	(Use soil gas)	
ETHYLBENZENE	7.3E+00	Aquatic Habitat Goal	3.0E+02	7.6E+04	7.3E+00
FLUORANTHENE	8.0E-01	Aquatic Habitat Goal	1.3E+02		8.0E-01
FLUORENE	3.9E+00	Aquatic Habitat Goal	8.5E+02	1.7E+03	3.9E+00
GLYPHOSATE	1.8E+03	Aquatic Habitat Goal	5.0E+04		1.8E+03
HEPTACHLOR	3.6E-03	Aquatic Habitat Goal	9.0E+01		3.6E-03
HEPTACHLOR EPOXIDE	3.6E-03	Aquatic Habitat Goal	1.0E+02		3.6E-03

TABLE D-1c. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
HEXACHLOROBENZENE	3.0E-04	Aquatic Habitat Goal	3.1E+00		3.0E-04
HEXACHLOROBUTADIENE	3.0E-01	Aquatic Habitat Goal	6.0E+01		3.0E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	6.3E-02	Aquatic Habitat Goal	3.7E+03		6.3E-02
HEXACHLOROETHANE	1.2E+01	Aquatic Habitat Goal	1.0E+02		1.2E+01
HEXAZINONE	1.7E+04	Aquatic Habitat Goal	5.0E+04		1.7E+04
INDENO(1,2,3-cd)PYRENE	9.5E-02	Gross Contamination	9.5E-02		2.8E-01
ISOPHORONE	9.2E+02	Aquatic Habitat Goal	5.0E+04		9.2E+02
LEAD	5.6E+00	Aquatic Habitat Goal	5.0E+04		5.6E+00
MERCURY	2.5E-02	Aquatic Habitat Goal	5.0E+04		2.5E-02
METHOXYCHLOR	3.0E-02	Aquatic Habitat Goal	5.0E+01		3.0E-02
METHYL ETHYL KETONE	1.4E+04	Aquatic Habitat Goal	5.0E+04	2.2E+08	1.4E+04
METHYL ISOBUTYL KETONE	1.7E+02	Aquatic Habitat Goal	1.3E+04	1.9E+07	1.7E+02
METHYL MERCURY	2.8E-03	Aquatic Habitat Goal	5.0E+04		2.8E-03
METHYL TERT BUTYL ETHER	7.3E+02	Aquatic Habitat Goal	1.8E+03	3.1E+04	7.3E+02
METHYLENE CHLORIDE	1.5E+03	Aquatic Habitat Goal	5.0E+04	7.6E+04	1.5E+03
METHYLNAPHTHALENE, 1-	2.1E+00	Aquatic Habitat Goal	1.0E+02	2.6E+04	2.1E+00
METHYLNAPHTHALENE, 2-	4.7E+00	Aquatic Habitat Goal	1.0E+02	2.5E+04	4.7E+00
MOLYBDENUM	3.7E+02	Aquatic Habitat Goal	5.0E+04		3.7E+02
NAPHTHALENE	1.2E+01	Aquatic Habitat Goal	2.1E+02	2.9E+04	1.2E+01
NICKEL	5.0E+00	Aquatic Habitat Goal	5.0E+04		5.0E+00
NITROBENZENE	3.8E+02	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	3.8E+02
NITROGLYCERIN	1.8E+01	Aquatic Habitat Goal	5.0E+04		1.8E+01
NITROTOLUENE, 2-	7.1E+01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	7.1E+01
NITROTOLUENE, 3-	4.2E+01	Aquatic Habitat Goal	5.0E+04		4.2E+01
NITROTOLUENE, 4-	4.6E+01	Aquatic Habitat Goal	5.0E+04		4.6E+01
PENTACHLOROPHENOL	7.9E+00	Aquatic Habitat Goal	5.9E+03		7.9E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Gross Contamination	2.2E+04		8.5E+05
PERCHLORATE	6.0E+02	Aquatic Habitat Goal	5.0E+04		6.0E+02
PHENANTHRENE	2.3E+00	Aquatic Habitat Goal	4.1E+02	(Use soil gas)	2.3E+00
PHENOL	5.8E+01	Aquatic Habitat Goal	5.0E+04		5.8E+01
POLYCHLORINATED BIPHENYLS (PCBs)	1.4E-02	Aquatic Habitat Goal	2.2E+01		1.4E-02
PROPICONAZOLE	9.5E+01	Aquatic Habitat Goal	5.0E+04		9.5E+01
PYRENE	4.6E+00	Aquatic Habitat Goal	6.8E+01	1.4E+02	4.6E+00
SELENIUM	5.0E+00	Aquatic Habitat Goal	5.0E+04		5.0E+00
SILVER	1.0E-01	Aquatic Habitat Goal	5.0E+04		1.0E-01
SIMAZINE	9.0E+00	Aquatic Habitat Goal	3.1E+03		9.0E+00
STYRENE	3.2E+01	Aquatic Habitat Goal	1.1E+02	3.1E+05	3.2E+01
TERBACIL	2.6E+02	Aquatic Habitat Goal	5.0E+04		2.6E+02
tert-BUTYL ALCOHOL	1.8E+04	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	1.8E+04
TETRACHLOROETHANE, 1,1,1,2-	1.1E+01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	1.1E+01
TETRACHLOROETHANE, 1,1,2,2-	2.0E+02	Aquatic Habitat Goal	5.0E+03	2.4E+02	2.0E+02
TETRACHLOROETHYLENE	5.3E+01	Aquatic Habitat Goal	3.0E+03	1.9E+02	5.3E+01
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	Aquatic Habitat Goal	1.2E+04		1.2E+00

TABLE D-1c. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (chronic) Table D-4a
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	Aquatic Habitat Goal	2.5E+03		2.2E+02
THALLIUM	6.0E+00	Aquatic Habitat Goal	5.0E+04		6.0E+00
TOLUENE	9.8E+00	Aquatic Habitat Goal	4.0E+02	5.3E+05	9.8E+00
TOXAPHENE	2.0E-04	Aquatic Habitat Goal	1.4E+02		2.0E-04
TPH (gasolines)	5.0E+02	Aquatic Habitat Goal	5.0E+03	(Use soil gas)	5.0E+02
TPH (middle distillates)	6.4E+02	Aquatic Habitat Goal	2.5E+03	(Use soil gas)	6.4E+02
TPH (residual fuels)	6.4E+02	Aquatic Habitat Goal	2.5E+03		6.4E+02
TRICHLOROBENZENE, 1,2,4-	1.1E+02	Aquatic Habitat Goal	2.5E+04	1.2E+03	1.1E+02
TRICHLOROETHANE, 1,1,1-	1.1E+01	Aquatic Habitat Goal	5.0E+04	3.4E+05	1.1E+01
TRICHLOROETHANE, 1,1,2-	1.1E+02	Vapor Intrusion	5.0E+04	1.1E+02	7.3E+02
TRICHLOROETHYLENE	4.7E+01	Aquatic Habitat Goal	5.0E+04	2.1E+02	4.7E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	Aquatic Habitat Goal	2.0E+03		1.9E+00
TRICHLOROPHENOL, 2,4,6-	4.9E+00	Aquatic Habitat Goal	1.0E+03		4.9E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	Aquatic Habitat Goal	5.0E+04		6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	Aquatic Habitat Goal	3.6E+04		3.0E+01
TRICHLOROPROPANE, 1,2,3-	1.4E+01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	1.4E+01
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	6.2E-01
TRIFLURALIN	1.1E+00	Aquatic Habitat Goal	9.0E+01		1.1E+00
TRINITROBENZENE, 1,3,5-	1.0E+01	Aquatic Habitat Goal	5.0E+04		1.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Goal	3.7E+04		4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.3E+01	Aquatic Habitat Goal	5.0E+04		1.3E+01
VANADIUM	2.7E+01	Aquatic Habitat Goal	5.0E+04		2.7E+01
VINYL CHLORIDE	1.8E+01	Vapor Intrusion	3.4E+04	1.8E+01	9.3E+02
XYLENES	1.3E+01	Aquatic Habitat Goal	5.3E+03	1.1E+05	1.3E+01
ZINC	2.2E+01	Aquatic Habitat Goal	5.0E+04		2.2E+01

Notes:

1. Lowest of action levels for gross contamination, vapor intrusion and aquatic habitat impacts. Used to develop soil leaching action levels for protection of groundwater quality.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Gross Contamination: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit general groundwater resource degradation.

Vapor Intrusion: Addresses potential emission of volatile chemicals from groundwater into buildings and subsequent impact on indoor air. Assumes moderately permeable, sandy soil or fill material immediately beneath building slab and unrestricted ("residential") land use (refer to Chapter 5).

Aquatic Habitat Impacts: Addresses potential discharge of groundwater to estuarine aquatic habitat and subsequent impact on aquatic life; dilution of groundwater upon discharge to surface water not considered, in order to take into account potential impacts to benthic organisms (see Chapter 5).

Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).

Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-1d. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
ACENAPHTHENE	2.0E+02	Gross Contamination	2.0E+02	3.9E+03	3.2E+02
ACENAPHTHYLENE	3.0E+02	Aquatic Habitat Goal	2.0E+03	(Use soil gas)	3.0E+02
ACETONE	1.5E+04	Aquatic Habitat Goal	5.0E+04	6.2E+08	1.5E+04
ALDRIN	1.3E+00	Aquatic Habitat Goal	8.5E+00		1.3E+00
AMETRYN	1.8E+03	Aquatic Habitat Goal	5.0E+04		1.8E+03
AMINO,2- DINITROTOLUENE,4,6-	1.6E+02	Aquatic Habitat Goal	5.0E+04		1.6E+02
AMINO,4- DINITROTOLUENE,2,6-	9.8E+01	Aquatic Habitat Goal	5.0E+04		9.8E+01
ANTHRACENE	1.8E-01	Aquatic Habitat Goal	2.2E+01	4.3E+01	1.8E-01
ANTIMONY	1.8E+02	Aquatic Habitat Goal	5.0E+04		1.8E+02
ARSENIC	6.9E+01	Aquatic Habitat Goal	5.0E+04		6.9E+01
ATRAZINE	3.3E+02	Aquatic Habitat Goal	1.8E+04		3.3E+02
BARIUM	2.0E+03	Aquatic Habitat Goal	5.0E+04		2.0E+03
BENOMYL	2.8E+00	Aquatic Habitat Goal	1.9E+03		2.8E+00
BENZENE	1.7E+03	Aquatic Habitat Goal	2.0E+04	2.3E+03	1.7E+03
BENZO(a)ANTHRACENE	4.7E+00	Gross Contamination	4.7E+00		3.0E+02
BENZO(a)PYRENE	8.0E-01	Gross Contamination	8.0E-01		3.0E+02
BENZO(b)FLUORANTHENE	7.5E-01	Gross Contamination	7.5E-01		3.0E+02
BENZO(g,h,i)PERYLENE	1.3E-01	Gross Contamination	1.3E-01		3.0E+02
BENZO(k)FLUORANTHENE	4.0E-01	Gross Contamination	4.0E-01		3.0E+02
BERYLLIUM	3.5E+01	Aquatic Habitat Goal	5.0E+04		3.5E+01
BIPHENYL, 1,1-	5.0E+00	Gross Contamination	5.0E+00	(Use soil gas)	2.6E+01
BIS(2-CHLOROETHYL)ETHER	1.8E+02	Vapor Intrusion	3.6E+03	1.8E+02	2.4E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Goal	3.2E+03	(Use soil gas)	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	2.7E+01	Aquatic Habitat Goal	1.4E+02		2.7E+01
BORON	3.4E+04	Aquatic Habitat Goal	5.0E+04		3.4E+04
BROMODICHLOROMETHANE	1.1E+02	Vapor Intrusion	5.0E+04	1.1E+02	3.1E+03
BROMOFORM	1.1E+03	Aquatic Habitat Goal	5.1E+03		1.1E+03
BROMOMETHANE	3.8E+01	Aquatic Habitat Goal	5.0E+04	4.1E+02	3.8E+01
CADMIUM	3.0E+00	Aquatic Habitat Goal	5.0E+04		3.0E+00
CARBON TETRACHLORIDE	1.1E+02	Vapor Intrusion	5.2E+03	1.1E+02	1.2E+04
CHLORDANE (TECHNICAL)	9.0E-02	Aquatic Habitat Goal	2.5E+01		9.0E-02
CHLOROANILINE, p-	4.6E+02	Aquatic Habitat Goal	5.0E+04		4.6E+02
CHLOROBENZENE	2.2E+02	Aquatic Habitat Goal	5.0E+02	1.2E+04	2.2E+02
CHLOROETHANE	1.6E+02	Gross Contamination	1.6E+02	6.0E+05	2.1E+04
CHLOROFORM	1.1E+02	Vapor Intrusion	2.4E+04	1.1E+02	4.9E+02
CHLOROMETHANE	1.9E+02	Aquatic Habitat Goal	5.0E+04	5.2E+03	1.9E+02
CHLOROPHENOL, 2-	1.8E+00	Gross Contamination	1.8E+00	1.0E+05	4.0E+02
CHROMIUM (Total)	1.6E+01	Aquatic Habitat Goal	5.0E+04		1.6E+01
CHROMIUM III	5.7E+02	Aquatic Habitat Goal	5.0E+04		5.7E+02
CHROMIUM VI	1.6E+01	Aquatic Habitat Goal	5.0E+04		1.6E+01
CHRYSENE	1.0E+00	Gross Contamination	1.0E+00		3.0E+02
COBALT	1.2E+02	Aquatic Habitat Goal	5.0E+04		1.2E+02

TABLE D-1d. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
COPPER	2.9E+00	Aquatic Habitat Goal	5.0E+04		2.9E+00
CYANIDE (Free)	1.0E+00	Aquatic Habitat Goal	1.7E+03	(Use soil gas)	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	5.2E+02	Aquatic Habitat Goal	3.0E+04		5.2E+02
DALAPON	3.0E+03	Aquatic Habitat Goal	5.0E+04		3.0E+03
DIBENZO(a,h)ANTHTRACENE	1.3E+00	Gross Contamination	1.3E+00		3.0E+02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Goal	1.0E+02	(Use soil gas)	4.0E-02
DIBROMOCHLOROMETHANE	4.5E+02	Vapor Intrusion	5.0E+04	4.5E+02	2.9E+03
DIBROMOETHANE, 1,2-	1.9E+01	Vapor Intrusion	5.0E+04	1.9E+01	1.4E+03
DICHLOROBENZENE, 1,2-	1.0E+02	Gross Contamination	1.0E+02	8.3E+04	3.7E+02
DICHLOROBENZENE, 1,3-	3.7E+02	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	3.7E+02
DICHLOROBENZENE, 1,4-	1.1E+02	Gross Contamination	1.1E+02	4.5E+02	3.7E+02
DICHLOROBENZIDINE, 3,3-	4.1E+01	Aquatic Habitat Goal	1.6E+03		4.1E+01
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.9E-01	Aquatic Habitat Goal	4.5E+01		1.9E-01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	7.0E+00	Aquatic Habitat Goal	2.0E+01		7.0E+00
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.3E-02	Aquatic Habitat Goal	2.8E+00		1.3E-02
DICHLOROETHANE, 1,1-	8.3E+02	Aquatic Habitat Goal	5.0E+04	1.1E+03	8.3E+02
DICHLOROETHANE, 1,2-	1.8E+02	Vapor Intrusion	5.0E+04	1.8E+02	3.8E+04
DICHLOROETHYLENE, 1,1-	3.9E+03	Aquatic Habitat Goal	1.5E+04	6.6E+03	3.9E+03
DICHLOROETHYLENE, Cis 1,2-	1.3E+03	Vapor Intrusion	5.0E+04	1.3E+03	5.5E+03
DICHLOROETHYLENE, Trans 1,2-	2.6E+03	Gross Contamination	2.6E+03	6.6E+03	1.0E+04
DICHLOROPHENOL, 2,4-	3.0E+00	Gross Contamination	3.0E+00		6.7E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	1.3E+02	Aquatic Habitat Goal	5.0E+04		1.3E+02
DICHLOROPROPANE, 1,2-	1.0E+02	Gross Contamination	1.0E+02	3.4E+02	3.4E+03
DICHLOROPROPENE, 1,3-	2.6E+02	Aquatic Habitat Goal	5.0E+04	6.7E+02	2.6E+02
DIELDRIN	7.1E-01	Aquatic Habitat Goal	9.8E+01		7.1E-01
DIETHYLPHTHALATE	9.8E+02	Aquatic Habitat Goal	5.0E+04		9.8E+02
DIMETHYLPHENOL, 2,4-	7.0E+02	Aquatic Habitat Goal	4.0E+03		7.0E+02
DIMETHYLPHTHALATE	3.2E+03	Aquatic Habitat Goal	5.0E+04		3.2E+03
DINITROBENZENE, 1,3-	1.0E+02	Aquatic Habitat Goal	5.0E+04		1.0E+02
DINITROPHENOL, 2,4-	3.8E+02	Aquatic Habitat Goal	5.0E+04		3.8E+02
DINITROTOLUENE, 2,4- (2,4-DNT)	1.1E+02	Aquatic Habitat Goal	5.0E+04		1.1E+02
DINITROTOLUENE, 2,6- (2,6-DNT)	1.1E+02	Aquatic Habitat Goal	5.0E+04		1.1E+02
DIOXANE, 1,4-	5.0E+04	Gross Contamination	5.0E+04	(Use soil gas)	3.4E+06
DIOXINS (TEQ)	3.0E-03	Aquatic Habitat Goal	1.0E-01		3.0E-03
DIURON	2.0E+02	Aquatic Habitat Goal	2.1E+04		2.0E+02
ENDOSULFAN	3.4E-02	Aquatic Habitat Goal	1.6E+02		3.4E-02
ENDRIN	3.7E-02	Aquatic Habitat Goal	1.3E+02		3.7E-02
ETHANOL	5.0E+04	Gross Contamination	5.0E+04	(Use soil gas)	
ETHYLBENZENE	1.4E+02	Aquatic Habitat Goal	3.0E+02	7.6E+04	1.4E+02
FLUORANTHENE	1.3E+01	Aquatic Habitat Goal	1.3E+02		1.3E+01
FLUORENE	3.0E+02	Aquatic Habitat Goal	8.5E+02	1.7E+03	3.0E+02
GLYPHOSATE	2.2E+04	Aquatic Habitat Goal	5.0E+04		2.2E+04

TABLE D-1d. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
HEPTACHLOR	5.3E-02	Aquatic Habitat Goal	9.0E+01		5.3E-02
HEPTACHLOR EPOXIDE	5.3E-02	Aquatic Habitat Goal	1.0E+02		5.3E-02
HEXACHLOROBENZENE	3.0E-04	Aquatic Habitat Goal	3.1E+00		3.0E-04
HEXACHLOROBUTADIENE	1.1E+01	Aquatic Habitat Goal	6.0E+01		1.1E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.6E-01	Aquatic Habitat Goal	3.7E+03		1.6E-01
HEXACHLOROETHANE	1.0E+02	Gross Contamination	1.0E+02		3.1E+02
HEXAZINONE	5.0E+04	Gross Contamination	5.0E+04		1.4E+05
INDENO(1,2,3-cd)PYRENE	9.5E-02	Gross Contamination	9.5E-02		3.0E+02
ISOPHORONE	4.3E+03	Aquatic Habitat Goal	5.0E+04		4.3E+03
LEAD	2.9E+01	Aquatic Habitat Goal	5.0E+04		2.9E+01
MERCURY	2.1E+00	Aquatic Habitat Goal	5.0E+04		2.1E+00
METHOXYCHLOR	7.0E-01	Aquatic Habitat Goal	5.0E+01		7.0E-01
METHYL ETHYL KETONE	5.0E+04	Gross Contamination	5.0E+04	2.2E+08	2.0E+05
METHYL ISOBUTYL KETONE	2.2E+03	Aquatic Habitat Goal	1.3E+04	1.9E+07	2.2E+03
METHYL MERCURY	9.9E-02	Aquatic Habitat Goal	5.0E+04		9.9E-02
METHYL TERT BUTYL ETHER	1.8E+03	Gross Contamination	1.8E+03	3.1E+04	6.5E+03
METHYLENE CHLORIDE	8.5E+03	Aquatic Habitat Goal	5.0E+04	7.6E+04	8.5E+03
METHYLNAPHTHALENE, 1-	3.7E+01	Aquatic Habitat Goal	1.0E+02	2.6E+04	3.7E+01
METHYLNAPHTHALENE, 2-	4.2E+01	Aquatic Habitat Goal	1.0E+02	2.5E+04	4.2E+01
MOLYBDENUM	7.2E+03	Aquatic Habitat Goal	5.0E+04		7.2E+03
NAPHTHALENE	2.1E+02	Gross Contamination	2.1E+02	2.9E+04	7.7E+02
NICKEL	5.0E+00	Aquatic Habitat Goal	5.0E+04		5.0E+00
NITROBENZENE	2.0E+03	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	2.0E+03
NITROGLYCERIN	1.6E+02	Aquatic Habitat Goal	5.0E+04		1.6E+02
NITROTOLUENE, 2-	6.4E+02	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	6.4E+02
NITROTOLUENE, 3-	3.8E+02	Aquatic Habitat Goal	5.0E+04		3.8E+02
NITROTOLUENE, 4-	4.1E+02	Aquatic Habitat Goal	5.0E+04		4.1E+02
PENTACHLOROPHENOL	1.3E+01	Aquatic Habitat Goal	5.9E+03		1.3E+01
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Gross Contamination	2.2E+04		8.5E+05
PERCHLORATE	5.0E+03	Aquatic Habitat Goal	5.0E+04		5.0E+03
PHENANTHRENE	3.0E+02	Aquatic Habitat Goal	4.1E+02	(Use soil gas)	3.0E+02
PHENOL	3.0E+02	Aquatic Habitat Goal	5.0E+04		3.0E+02
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	Aquatic Habitat Goal	2.2E+01		2.0E+00
PROPICONAZOLE	4.3E+02	Aquatic Habitat Goal	5.0E+04		4.3E+02
PYRENE	6.8E+01	Gross Contamination	6.8E+01	1.4E+02	3.0E+02
SELENIUM	2.0E+01	Aquatic Habitat Goal	5.0E+04		2.0E+01
SILVER	1.0E+00	Aquatic Habitat Goal	5.0E+04		1.0E+00
SIMAZINE	8.0E+01	Aquatic Habitat Goal	3.1E+03		8.0E+01
STYRENE	1.1E+02	Gross Contamination	1.1E+02	3.1E+05	2.9E+02
TERBACIL	2.6E+02	Aquatic Habitat Goal	5.0E+04		2.6E+02
tert-BUTYL ALCOHOL	5.0E+04	Gross Contamination	5.0E+04	(Use soil gas)	1.8E+05
TETRACHLOROETHANE, 1,1,1,2-	7.7E+02	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	7.7E+02

TABLE D-1d. GROUNDWATER ACTION LEVELS
(Groundwater IS NOT a current or potential drinking water resource)
(Surface water body IS NOT located within 150m of release site)
(ug/l)

CONTAMINANT	[1]Final Groundwater Action Level	Basis	Gross Contamination (Odors, etc.) Table G-2	Vapor Intrusion Into Buildings Table C-1a	Aquatic Habitat Impacts (acute) Table D-4a
TETRACHLOROETHANE, 1,1,2,2-	2.4E+02	Vapor Intrusion	5.0E+03	2.4E+02	9.1E+02
TETRACHLOROETHYLENE	1.9E+02	Vapor Intrusion	3.0E+03	1.9E+02	1.8E+03
TETRACHLOROPHENOL, 2,3,4,6-	1.1E+01	Aquatic Habitat Goal	1.2E+04		1.1E+01
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.2E+03	Aquatic Habitat Goal	2.5E+03		1.2E+03
THALLIUM	4.7E+02	Aquatic Habitat Goal	5.0E+04		4.7E+02
TOLUENE	4.0E+02	Gross Contamination	4.0E+02	5.3E+05	2.1E+03
TOXAPHENE	2.1E-01	Aquatic Habitat Goal	1.4E+02		2.1E-01
TPH (gasolines)	5.0E+03	Aquatic Habitat Goal	5.0E+03	(Use soil gas)	5.0E+03
TPH (middle distillates)	2.5E+03	Aquatic Habitat Goal	2.5E+03	(Use soil gas)	2.5E+03
TPH (residual fuels)	2.5E+03	Aquatic Habitat Goal	2.5E+03		2.5E+03
TRICHLOROBENZENE, 1,2,4-	4.2E+02	Aquatic Habitat Goal	2.5E+04	1.2E+03	4.2E+02
TRICHLOROETHANE, 1,1,1-	6.0E+03	Aquatic Habitat Goal	5.0E+04	3.4E+05	6.0E+03
TRICHLOROETHANE, 1,1,2-	1.1E+02	Vapor Intrusion	5.0E+04	1.1E+02	5.2E+03
TRICHLOROETHYLENE	2.1E+02	Vapor Intrusion	5.0E+04	2.1E+02	7.0E+02
TRICHLOROPHENOL, 2,4,5-	1.7E+01	Aquatic Habitat Goal	2.0E+03		1.7E+01
TRICHLOROPHENOL, 2,4,6-	3.9E+01	Aquatic Habitat Goal	1.0E+03		3.9E+01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	Aquatic Habitat Goal	5.0E+04		6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	2.7E+02	Aquatic Habitat Goal	3.6E+04		2.7E+02
TRICHLOROPROPANE, 1,2,3-	1.4E+02	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	1.4E+02
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Goal	5.0E+04	(Use soil gas)	6.2E-01
TRIFLURALIN	2.1E+01	Aquatic Habitat Goal	9.0E+01		2.1E+01
TRINITROBENZENE, 1,3,5-	2.7E+01	Aquatic Habitat Goal	5.0E+04		2.7E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Goal	3.7E+04		4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.1E+02	Aquatic Habitat Goal	5.0E+04		2.1E+02
VANADIUM	9.0E+01	Aquatic Habitat Goal	5.0E+04		9.0E+01
VINYL CHLORIDE	1.8E+01	Vapor Intrusion	3.4E+04	1.8E+01	8.4E+03
XYLENES	2.3E+02	Aquatic Habitat Goal	5.3E+03	1.1E+05	2.3E+02
ZINC	2.2E+01	Aquatic Habitat Goal	5.0E+04		2.2E+01

Notes:

1. Lowest of action levels for gross contamination, vapor intrusion and aquatic habitat impacts. Used to develop soil leaching action levels for protection of groundwater quality.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Gross Contamination: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit general groundwater resource degradation.

Vapor Intrusion: Addresses potential emission of volatile chemicals from groundwater into buildings and subsequent impact on indoor air. Assumes moderately permeable, sandy soil or fill material immediately beneath building slab and unrestricted ("residential") land use (refer to Chapter 5).

Aquatic Habitat Impacts: Addresses potential discharge of groundwater to estuarine aquatic habitat and subsequent impact on aquatic life; dilution of groundwater upon discharge to surface water not considered, in order to take into account potential impacts to benthic organisms (see Chapter 5).

Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).

Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-2a. SURFACE WATER ACTION LEVELS
Fresh Water Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-3	Drinking Water (Toxicity) Table D-3a	Fresh Water Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
ACENAPHTHENE	1.5E+01	Aquatic Habitat Chronic Toxicity	2.0E+01	3.5E+02	1.5E+01	9.9E+02
ACENAPHTHYLENE	1.3E+01	Aquatic Habitat Chronic Toxicity	2.0E+03	2.4E+02	1.3E+01	
ACETONE	1.7E+03	Aquatic Habitat Chronic Toxicity	2.0E+04	1.4E+04	1.7E+03	
ALDRIN	2.6E-05	Bioaccumulation/Human Consumption	8.5E+00	5.1E-03	3.5E-02	2.6E-05
AMETRYN	1.8E+02	Drinking Water Toxicity	5.0E+04	1.8E+02	7.0E+02	
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.0E+01	1.8E+01	
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.0E+01	1.1E+01	
ANTHRACENE	2.0E-02	Aquatic Habitat Chronic Toxicity	2.2E+01	1.8E+03	2.0E-02	4.0E+04
ANTIMONY	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00	1.3E+02	1.5E+04
ARSENIC	1.4E-01	Bioaccumulation/Human Consumption	5.0E+04	1.0E+01	1.9E+02	1.4E-01
ATRAZINE	3.0E+00	Drinking Water Toxicity	2.0E+01	3.0E+00	1.2E+01	
BARIUM	2.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+03	2.2E+02	
BENOMYL	1.4E-01	Aquatic Habitat Chronic Toxicity	1.9E+03	1.0E+03	1.4E-01	
BENZENE	5.0E+00	Drinking Water Toxicity	1.7E+02	5.0E+00	1.6E+02	1.3E+01
BENZO(a)ANTHRACENE	1.1E-02	Drinking Water Toxicity	4.7E+00	1.1E-02	4.7E+00	1.8E-02
BENZO(a)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	8.0E-01	2.0E-01	6.0E-02	1.8E-02
BENZO(b)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	7.5E-01	2.9E-02	2.6E+00	1.8E-02
BENZO(g,h,i)PERYLENE	1.3E-01	Ceiling Value	1.3E-01	8.0E+02	4.4E-01	
BENZO(k)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	4.0E-01	2.9E-01	6.4E-01	1.8E-02
BERYLLIUM	3.8E-02	Bioaccumulation/Human Consumption	5.0E+04	4.0E+00	1.1E+01	3.8E-02
BIPHENYL, 1,1-	5.0E-01	Ceiling Value	5.0E-01	8.3E-01	6.5E+00	
BIS(2-CHLOROETHYL)ETHER	1.4E-02	Drinking Water Toxicity	3.6E+02	1.4E-02	2.4E+03	4.4E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Drinking Water Toxicity	3.2E+02	3.7E-01	3.7E-01	1.4E+03
BIS(2-ETHYLHEXYL)PHTHALATE	2.2E+00	Bioaccumulation/Human Consumption	1.4E+02	6.0E+00	3.0E+00	2.2E+00
BORON	4.0E+03	Drinking Water Toxicity	5.0E+04	4.0E+03	7.2E+03	
BROMODICHLOROMETHANE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	3.4E+02	
BROMOFORM	8.0E+01	Drinking Water Toxicity	5.1E+02	8.0E+01	2.3E+02	1.4E+02
BROMOMETHANE	7.6E+00	Drinking Water Toxicity	5.0E+04	7.6E+00	1.6E+01	1.5E+03
CADMIUM	3.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+00	3.0E+00	
CARBON TETRACHLORIDE	2.3E+00	Bioaccumulation/Human Consumption	5.2E+02	5.0E+00	7.7E+01	2.3E+00
CHLORDANE (TECHNICAL)	1.6E-05	Bioaccumulation/Human Consumption	2.5E+00	2.0E+00	4.3E-03	1.6E-05
CHLOROANILINE, p-	3.9E-01	Drinking Water Toxicity	5.0E+04	3.9E-01	1.9E+01	
CHLOROBENZENE	2.5E+01	Aquatic Habitat Chronic Toxicity	5.0E+01	1.0E+02	2.5E+01	2.1E+04
CHLOROETHANE	1.6E+01	Ceiling Value	1.6E+01	2.1E+04	2.1E+04	
CHLOROFORM	5.1E+00	Bioaccumulation/Human Consumption	2.4E+03	7.0E+01	1.4E+02	5.1E+00
CHLOROMETHANE	1.9E+02	Drinking Water Toxicity	5.0E+04	1.9E+02	1.9E+02	
CHLOROPHENOL, 2-	1.8E-01	Ceiling Value	1.8E-01	2.9E+01	3.2E+01	1.5E+02
CHROMIUM (Total)	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+02	1.1E+01	
CHROMIUM III	7.4E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+04	7.4E+01	
CHROMIUM VI	4.3E+00	Drinking Water Toxicity	5.0E+04	4.3E+00	1.1E+01	
CHRYSENE	1.8E-02	Bioaccumulation/Human Consumption	1.0E+00	2.9E+00	4.7E+00	1.8E-02

TABLE D-2a. SURFACE WATER ACTION LEVELS
Fresh Water Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-3	Drinking Water (Toxicity) Table D-3a	Fresh Water Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
COBALT	6.0E+00	Drinking Water Toxicity	5.0E+04	6.0E+00	1.9E+01	
COPPER	6.0E+00	Aquatic Habitat Chronic Toxicity	1.0E+03	1.3E+03	6.0E+00	
CYANIDE (Free)	5.2E+00	Aquatic Habitat Chronic Toxicity	1.7E+02	2.0E+02	5.2E+00	2.2E+05
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	Drinking Water Toxicity	3.0E+04	7.1E-01	7.9E+01	
DALAPON	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02	3.0E+02	
DIBENZO(a,h)ANTHTRACENE	2.9E-03	Drinking Water Toxicity	1.3E+00	2.9E-03	8.0E-01	1.8E-02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Drinking Water Toxicity	1.0E+01	4.0E-02	4.0E-02	
DIBROMOCHLOROMETHANE	2.1E-01	Drinking Water Toxicity	5.0E+04	2.1E-01	3.2E+02	1.3E+01
DIBROMOETHANE, 1,2-	4.0E-02	Drinking Water Toxicity	5.0E+04	4.0E-02	1.4E+03	
DICHLOROBENZENE, 1,2-	1.0E+01	Ceiling Value	1.0E+01	6.0E+02	2.3E+01	8.5E+02
DICHLOROBENZENE, 1,3-	2.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+02	2.2E+01	8.5E+02
DICHLOROBENZENE, 1,4-	5.0E+00	Ceiling Value	5.0E+00	7.5E+01	9.4E+00	8.5E+02
DICHLOROBENZIDINE, 3,3-	7.0E-03	Bioaccumulation/Human Consumption	1.6E+03	1.7E-01	4.5E+00	7.0E-03
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.1E-04	Bioaccumulation/Human Consumption	4.5E+01	3.2E-01	1.1E-02	3.1E-04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.2E-04	Bioaccumulation/Human Consumption	2.0E+01	4.6E-02	4.1E-01	2.2E-04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.0E-06	Bioaccumulation/Human Consumption	2.8E+00	2.3E-01	1.0E-03	8.0E-06
DICHLOROETHANE, 1,1-	2.8E+00	Drinking Water Toxicity	5.0E+04	2.8E+00	4.1E+02	
DICHLOROETHANE, 1,2-	5.0E+00	Drinking Water Toxicity	7.0E+03	5.0E+00	2.0E+03	7.9E+01
DICHLOROETHYLENE, 1,1-	6.0E-01	Bioaccumulation/Human Consumption	1.5E+03	7.0E+00	1.3E+02	6.0E-01
DICHLOROETHYLENE, Cis 1,2-	7.0E+01	Drinking Water Toxicity	5.0E+04	7.0E+01	6.2E+02	
DICHLOROETHYLENE, Trans 1,2-	1.0E+02	Drinking Water Toxicity	2.6E+02	1.0E+02	5.6E+02	140000
DICHLOROPHENOL, 2,4-	3.0E-01	Ceiling Value	3.0E-01	6.0E+01	1.1E+01	2.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Drinking Water Toxicity	5.0E+04	7.0E+01	7.9E+01	
DICHLOROPROPANE, 1,2-	5.0E+00	Drinking Water Toxicity	1.0E+01	5.0E+00	5.2E+02	1.5E+01
DICHLOROPROPENE, 1,3-	5.0E-01	Drinking Water Toxicity	5.0E+04	5.0E-01	1.7E+00	4.6E+00
DIELDRIN	2.5E-05	Bioaccumulation/Human Consumption	4.1E+01	1.1E-02	1.9E-03	2.5E-05
DIETHYLPHTHALATE	2.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	1.6E+04	2.2E+02	4.4E+04
DIMETHYLPHENOL, 2,4-	1.2E+02	Aquatic Habitat Chronic Toxicity	4.0E+02	4.0E+02	1.2E+02	8.5E+02
DIMETHYLPHTHALATE	1.1E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+05	1.1E+03	1.1E+06
DINITROBENZENE, 1,3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00	2.2E+01	
DINITROPHENOL, 2,4-	4.0E+01	Drinking Water Toxicity	5.0E+04	4.0E+01	7.1E+01	5.3E+03
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	Drinking Water Toxicity	5.0E+04	2.5E-01	4.4E+01	3.0E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	Drinking Water Toxicity	5.0E+04	5.2E-02	8.1E+01	
DIOXANE, 1,4-	4.6E-01	Drinking Water Toxicity	5.0E+04	4.6E-01	3.4E+05	
DIOXINS (TEQ)	3.1E-09	Aquatic Habitat Chronic Toxicity	1.0E-01	3.0E-05	3.1E-09	5.0E-09
DIURON	4.0E+01	Drinking Water Toxicity	2.1E+04	4.0E+01	6.0E+01	
ENDOSULFAN	5.6E-02	Aquatic Habitat Chronic Toxicity	1.6E+02	1.2E+02	5.6E-02	5.2E+01
ENDRIN	2.3E-03	Aquatic Habitat Chronic Toxicity	4.1E+01	2.0E+00	2.3E-03	8.1E-01
ETHANOL	5.0E+04	Ceiling Value	5.0E+04			
ETHYLBENZENE	3.0E+01	Ceiling Value	3.0E+01	7.0E+02	6.1E+01	1.1E+03
FLUORANTHENE	8.0E-01	Aquatic Habitat Chronic Toxicity	1.3E+02	8.0E+02	8.0E-01	1.8E+01

TABLE D-2a. SURFACE WATER ACTION LEVELS
Fresh Water Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-3	Drinking Water (Toxicity) Table D-3a	Fresh Water Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
FLUORENE	1.9E+01	Aquatic Habitat Chronic Toxicity	8.5E+02	2.4E+02	1.9E+01	5.3E+03
GLYPHOSATE	7.0E+02	Drinking Water Toxicity	5.0E+04	7.0E+02	1.8E+03	
HEPTACHLOR	9.0E-05	Bioaccumulation/Human Consumption	2.0E+01	4.0E-01	3.8E-03	9.0E-05
HEPTACHLOR EPOXIDE	3.9E-05	Bioaccumulation/Human Consumption	1.0E+02	2.0E-01	3.8E-03	3.9E-05
HEXACHLOROBENZENE	2.4E-04	Bioaccumulation/Human Consumption	3.1E+00	1.0E+00	3.0E-04	2.4E-04
HEXACHLOROBUTADIENE	2.0E-01	Drinking Water Toxicity	6.0E+00	2.0E-01	1.0E+00	1.6E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-02	Bioaccumulation/Human Consumption	3.7E+03	2.0E-01	8.0E-02	2.0E-02
HEXACHLOROETHANE	4.0E-01	Drinking Water Toxicity	1.0E+01	4.0E-01	1.2E+01	2.9E+00
HEXAZINONE	6.6E+02	Drinking Water Toxicity	5.0E+04	6.6E+02	1.7E+04	
INDENO(1,2,3-cd)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	9.5E-02	2.9E-02	2.8E-01	1.8E-02
ISOPHORONE	8.2E+01	Drinking Water Toxicity	5.0E+04	8.2E+01	9.2E+02	1.7E+05
LEAD	1.5E+01	Drinking Water Toxicity	5.0E+04	1.5E+01	2.9E+01	
MERCURY	4.7E-02	Bioaccumulation/Human Consumption	5.0E+04	2.0E+00	5.5E-01	4.7E-02
METHOXYCHLOR	3.0E-02	Aquatic Habitat Chronic Toxicity	5.0E+01	4.0E+01	3.0E-02	
METHYL ETHYL KETONE	5.6E+03	Drinking Water Toxicity	8.4E+03	5.6E+03	2.2E+04	
METHYL ISOBUTYL KETONE	1.7E+02	Aquatic Habitat Chronic Toxicity	1.3E+03	6.3E+03	1.7E+02	
METHYL MERCURY	2.8E-03	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+00	2.8E-03	
METHYL TERT BUTYL ETHER	5.0E+00	Ceiling Value	5.0E+00	1.4E+01	7.3E+02	
METHYLENE CHLORIDE	5.0E+00	Drinking Water Toxicity	9.1E+03	5.0E+00	1.5E+03	5.9E+02
METHYLNAPHTHALENE, 1-	2.1E+00	Aquatic Habitat Chronic Toxicity	1.0E+01	6.0E+00	2.1E+00	
METHYLNAPHTHALENE, 2-	4.7E+00	Aquatic Habitat Chronic Toxicity	1.0E+01	2.4E+01	4.7E+00	
MOLYBDENUM	1.0E+02	Drinking Water Toxicity	5.0E+04	1.0E+02	8.0E+02	
NAPHTHALENE	1.7E+01	Drinking Water Toxicity	2.1E+01	1.7E+01	2.1E+01	
NICKEL	5.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	4.0E+02	5.0E+00	3.3E+01
NITROBENZENE	1.4E-01	Drinking Water Toxicity	5.0E+04	1.4E-01	3.8E+02	
NITROGLYCERIN	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00	1.8E+01	
NITROTOLUENE, 2-	7.9E-02	Drinking Water Toxicity	5.0E+04	7.9E-02	7.1E+01	
NITROTOLUENE, 3-	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00	4.2E+01	
NITROTOLUENE, 4-	4.9E+00	Drinking Water Toxicity	5.0E+04	4.9E+00	4.6E+01	
PENTACHLOROPHENOL	1.0E+00	Drinking Water Toxicity	3.0E+01	1.0E+00	1.3E+01	3.0E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	Drinking Water Toxicity	2.2E+04	1.9E+01	8.5E+05	
PERCHLORATE	1.5E+01	Drinking Water Toxicity	5.0E+04	1.5E+01	6.0E+02	
PHENANTHRENE	2.3E+00	Aquatic Habitat Chronic Toxicity	4.1E+02	2.4E+02	2.3E+00	
PHENOL	1.6E+02	Aquatic Habitat Chronic Toxicity	7.9E+03	6.0E+03	1.6E+02	1.7E+06
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-05	Bioaccumulation/Human Consumption	2.2E+01	5.0E-01	1.4E-02	7.9E-05
PROPICONAZOLE	9.5E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.6E+02	9.5E+01	
PYRENE	4.6E+00	Aquatic Habitat Chronic Toxicity	6.8E+01	1.8E+02	4.6E+00	4.0E+03
SELENIUM	5.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+01	5.0E+00	
SILVER	1.0E+00	Aquatic Habitat Chronic Toxicity	1.0E+02	1.0E+02	1.0E+00	
SIMAZINE	4.0E+00	Drinking Water Toxicity	3.1E+03	4.0E+00	9.0E+00	
STYRENE	1.0E+01	Ceiling Value	1.0E+01	1.0E+02	3.2E+01	

TABLE D-2a. SURFACE WATER ACTION LEVELS
Fresh Water Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Taste & Odors, etc.) Table G-3	Drinking Water (Toxicity) Table D-3a	Fresh Water Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
TERBACIL	2.6E+02	Drinking Water Toxicity	5.0E+04	2.6E+02	1.2E+03	
tert-BUTYL ALCOHOL	5.8E+00	Drinking Water Toxicity	5.0E+04	5.8E+00	1.8E+04	
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	Drinking Water Toxicity	5.0E+04	6.1E-01	8.5E+01	
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	Drinking Water Toxicity	5.0E+02	7.8E-02	2.0E+02	3.5E+00
TETRACHLOROETHYLENE	2.9E+00	Bioaccumulation/Human Consumption	1.7E+02	5.0E+00	5.3E+01	2.9E+00
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	Aquatic Habitat Chronic Toxicity	1.2E+04	6.0E+02	1.2E+00	
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	1.0E+03	2.2E+02	
THALLIUM	2.0E+00	Drinking Water Toxicity	5.0E+04	2.0E+00	6.0E+00	1.6E+01
TOLUENE	4.0E+01	Ceiling Value	4.0E+01	1.0E+03	6.2E+01	1.4E+05
TOXAPHENE	2.0E-04	Aquatic Habitat Chronic Toxicity	1.4E+02	3.0E+00	2.0E-04	2.4E-04
TPH (gasolines)	1.0E+02	Ceiling Value	1.0E+02	3.0E+02	5.0E+02	
TPH (middle distillates)	1.0E+02	Ceiling Value	1.0E+02	1.6E+02	6.4E+02	
TPH (residual fuels)	1.0E+02	Ceiling Value	1.0E+02	2.4E+03	6.4E+02	
TRICHLOROBENZENE, 1,2,4-	7.0E+01	Drinking Water Toxicity	3.0E+03	7.0E+01	1.3E+02	
TRICHLOROETHANE, 1,1,1-	7.6E+01	Aquatic Habitat Chronic Toxicity	9.7E+02	2.0E+02	7.6E+01	3.4E+05
TRICHLOROETHANE, 1,1,2-	5.0E+00	Drinking Water Toxicity	5.0E+04	5.0E+00	7.3E+02	1.4E+01
TRICHLOROETHYLENE	5.0E+00	Drinking Water Toxicity	3.1E+02	5.0E+00	2.0E+02	2.6E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	Aquatic Habitat Chronic Toxicity	2.0E+02	2.0E+03	1.9E+00	3.6E+03
TRICHLOROPHENOL, 2,4,6-	1.2E+00	Bioaccumulation/Human Consumption	1.0E+02	7.1E+00	4.9E+00	1.2E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	Drinking Water Toxicity	5.0E+04	2.0E+02	6.9E+02	-
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	Aquatic Habitat Chronic Toxicity	3.6E+04	5.0E+01	3.0E+01	
TRICHLOROPROPANE, 1,2,3-	6.0E-01	Drinking Water Toxicity	5.0E+04	6.0E-01	1.4E+01	
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Drinking Water Toxicity	5.0E+04	6.2E-01	6.2E-01	
TRIFLURALIN	1.1E+00	Aquatic Habitat Chronic Toxicity	9.0E+01	1.0E+01	1.1E+00	
TRINITROBENZENE, 1,3,5-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E+02	1.1E+01	
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Drinking Water Toxicity	3.7E+04	4.0E+01	4.0E+01	
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	Drinking Water Toxicity	5.0E+04	2.6E+00	1.3E+01	
VANADIUM	2.7E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+02	2.7E+01	
VINYL CHLORIDE	2.0E+00	Drinking Water Toxicity	3.4E+03	2.0E+00	9.3E+02	1.7E+02
XYLENES	2.0E+01	Ceiling Value	2.0E+01	1.0E+04	2.7E+01	
ZINC	2.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+03	6.0E+03	2.2E+01	

Notes:

1. Lowest of gross contamination, drinking water toxicity, aquatic habitat and bioaccumulation action levels.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Gross Contamination: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit nuisances and general resource degradation.

Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).

Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-2b. SURFACE WATER ACTION LEVELS
Marine Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Marine Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4F
ACENAPHTHENE	2.0E+01	Ceiling Level	2.0E+01	2.0E+01	9.9E+02
ACENAPHTHYLENE	3.1E+02	Aquatic Habitat Chronic Toxicity	2.0E+03	3.1E+02	
ACETONE	1.5E+03	Aquatic Habitat Chronic Toxicity	2.0E+04	1.5E+03	
ALDRIN	2.6E-05	Bioaccumulation/Human Consumption	8.5E+00	1.4E-04	2.6E-05
AMETRYN	7.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	7.0E+02	
AMINO,2- DINITROTOLUENE,4,6-	2.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+01	
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
ANTHRACENE	7.3E-01	Aquatic Habitat Chronic Toxicity	2.2E+01	7.3E-01	4.0E+04
ANTIMONY	3.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+01	1.5E+04
ARSENIC	1.4E-01	Bioaccumulation/Human Consumption	5.0E+04	3.6E+01	1.4E-01
ATRAZINE	1.2E+01	Aquatic Habitat Chronic Toxicity	1.8E+04	1.2E+01	
BARIUM	2.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.2E+02	
BENOMYL	1.4E-01	Aquatic Habitat Chronic Toxicity	1.9E+03	1.4E-01	
BENZENE	1.3E+01	Bioaccumulation/Human Consumption	2.0E+03	7.1E+01	1.3E+01
BENZO(a)ANTHRACENE	1.8E-02	Bioaccumulation/Human Consumption	4.7E+00	2.7E-02	1.8E-02
BENZO(a)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	8.0E-01	3.0E-01	1.8E-02
BENZO(b)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	7.5E-01	6.8E-01	1.8E-02
BENZO(g,h,i)PERYLENE	1.3E-01	Ceiling Level	1.3E-01	4.4E-01	
BENZO(k)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	4.0E-01	6.4E-01	1.8E-02
BERYLLIUM	3.8E-02	Bioaccumulation/Human Consumption	5.0E+04	6.6E-01	3.8E-02
BIPHENYL, 1,1-	5.0E-01	Ceiling Level	5.0E-01	1.4E+01	
BIS(2-CHLOROETHYL)ETHER	4.4E-01	Bioaccumulation/Human Consumption	3.6E+02	2.4E+03	4.4E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Chronic Toxicity	3.2E+02	3.7E-01	1.4E+03
BIS(2-ETHYLHEXYL)PHTHALATE	2.2E+00	Bioaccumulation/Human Consumption	1.4E+02	3.0E+00	2.2E+00
BORON	1.0E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+03	
BROMODICHLOROMETHANE	3.4E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.4E+02	
BROMOFORM	1.4E+02	Bioaccumulation/Human Consumption	5.1E+02	3.2E+02	1.4E+02
BROMOMETHANE	1.6E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.6E+01	1.5E+03
CADMIUM	9.3E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	9.3E+00	
CARBON TETRACHLORIDE	2.3E+00	Bioaccumulation/Human Consumption	5.2E+02	9.8E+00	2.3E+00
CHLORDANE (TECHNICAL)	1.6E-05	Bioaccumulation/Human Consumption	2.5E+00	4.0E-03	1.6E-05
CHLOROANILINE, p-	1.9E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.9E+01	
CHLOROBENZENE	5.0E+01	Ceiling Level	5.0E+01	6.4E+01	2.1E+04
CHLOROETHANE	1.6E+01	Ceiling Level	1.6E+01	2.1E+04	
CHLOROFORM	5.1E+00	Bioaccumulation/Human Consumption	2.4E+03	2.8E+01	5.1E+00
CHLOROMETHANE	1.9E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	1.9E+02	
CHLOROPHENOL, 2-	1.8E-01	Ceiling Level	1.8E-01	4.0E+02	1.5E+02
CHROMIUM (Total)	5.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+01	
CHROMIUM III	2.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+01	
CHROMIUM VI	5.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+01	
CHRYSENE	1.8E-02	Bioaccumulation/Human Consumption	1.0E+00	2.0E+00	1.8E-02

TABLE D-2b. SURFACE WATER ACTION LEVELS
Marine Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Marine Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4F
COBALT	2.3E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.3E+01	
COPPER	2.9E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	2.9E+00	
CYANIDE (Free)	1.0E+00	Aquatic Habitat Chronic Toxicity	1.7E+02	1.0E+00	2.2E+05
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.9E+02	Aquatic Habitat Chronic Toxicity	3.0E+04	1.9E+02	
DALAPON	3.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+02	
DIBENZO(a,h)ANTHTRACENE	1.8E-02	Bioaccumulation/Human Consumption	1.3E+00	7.1E+00	1.8E-02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Chronic Toxicity	1.0E+01	4.0E-02	
DIBROMOCHLOROMETHANE	1.3E+01	Bioaccumulation/Human Consumption	5.0E+04	3.4E+01	1.3E+01
DIBROMOETHANE, 1,2-	1.4E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+03	
DICHLOROBENZENE, 1,2-	1.0E+01	Ceiling Level	1.0E+01	1.4E+01	8.5E+02
DICHLOROBENZENE, 1,3-	7.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.1E+01	8.5E+02
DICHLOROBENZENE, 1,4-	1.1E+01	Ceiling Level	1.1E+01	1.5E+01	8.5E+02
DICHLOROBENZIDINE, 3,3-	7.0E-03	Bioaccumulation/Human Consumption	1.6E+03	4.5E+00	7.0E-03
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.1E-04	Bioaccumulation/Human Consumption	4.5E+01	1.1E-02	3.1E-04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.2E-04	Bioaccumulation/Human Consumption	2.0E+01	4.1E-01	2.2E-04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.0E-06	Bioaccumulation/Human Consumption	2.8E+00	1.0E-03	8.0E-06
DICHLOROETHANE, 1,1-	4.7E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.7E+01	
DICHLOROETHANE, 1,2-	7.9E+01	Bioaccumulation/Human Consumption	2.0E+04	9.1E+02	7.9E+01
DICHLOROETHYLENE, 1,1-	6.0E-01	Bioaccumulation/Human Consumption	1.5E+03	2.5E+01	6.0E-01
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.2E+02	
DICHLOROETHYLENE, Trans 1,2-	2.6E+02	Ceiling Level	2.6E+02	5.6E+02	140000
DICHLOROPHENOL, 2,4-	3.0E-01	Ceiling Level	3.0E-01	7.9E+02	2.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.0E+01	
DICHLOROPROPANE, 1,2-	1.0E+01	Ceiling Level	1.0E+01	5.2E+02	1.5E+01
DICHLOROPROPENE, 1,3-	6.0E-02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E-02	4.6E+00
DIELDRIN	2.5E-05	Bioaccumulation/Human Consumption	4.1E+01	1.9E-03	2.5E-05
DIETHYLPHTHALATE	2.1E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.1E+02	4.4E+04
DIMETHYLPHENOL, 2,4-	1.2E+02	Aquatic Habitat Chronic Toxicity	4.0E+02	1.2E+02	8.5E+02
DIMETHYLPHTHALATE	2.9E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	2.9E+03	1.1E+06
DINITROBENZENE, 1,3-	1.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+01	
DINITROPHENOL, 2,4-	1.4E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+01	5.3E+03
DINITROTOLUENE, 2,4- (2,4-DNT)	3.0E+00	Bioaccumulation/Human Consumption	5.0E+04	9.1E+00	3.0E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	8.1E+01	
DIOXANE, 1,4-	5.0E+04	Ceiling Level	5.0E+04	5.0E+05	
DIOXINS (TEQ)	3.1E-09	Aquatic Habitat Chronic Toxicity	1.0E-01	3.1E-09	5.0E-09
DIURON	6.0E+01	Aquatic Habitat Chronic Toxicity	2.1E+04	6.0E+01	
ENDOSULFAN	8.7E-03	Aquatic Habitat Chronic Toxicity	1.6E+02	8.7E-03	5.2E+01
ENDRIN	2.3E-03	Aquatic Habitat Chronic Toxicity	4.1E+01	2.3E-03	8.1E-01
ETHANOL	5.0E+04	Ceiling Level	5.0E+04		
ETHYLBENZENE	7.3E+00	Aquatic Habitat Chronic Toxicity	3.0E+01	7.3E+00	1.1E+03
FLUORANTHENE	7.1E+00	Aquatic Habitat Chronic Toxicity	1.3E+02	7.1E+00	1.8E+01

TABLE D-2b. SURFACE WATER ACTION LEVELS
Marine Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Marine Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4F
FLUORENE	3.9E+00	Aquatic Habitat Chronic Toxicity	8.5E+02	3.9E+00	5.3E+03
GLYPHOSATE	1.8E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+03	
HEPTACHLOR	9.0E-05	Bioaccumulation/Human Consumption	2.0E+01	3.6E-03	9.0E-05
HEPTACHLOR EPOXIDE	3.9E-05	Bioaccumulation/Human Consumption	1.0E+02	3.6E-03	3.9E-05
HEXACHLOROBENZENE	2.4E-04	Bioaccumulation/Human Consumption	3.1E+00	3.0E-04	2.4E-04
HEXACHLOROBUTADIENE	3.0E-01	Aquatic Habitat Chronic Toxicity	6.0E+00	3.0E-01	1.6E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-02	Bioaccumulation/Human Consumption	3.7E+03	6.3E-02	2.0E-02
HEXACHLOROETHANE	2.9E+00	Bioaccumulation/Human Consumption	1.0E+01	1.2E+01	2.9E+00
HEXAZINONE	1.7E+04	Aquatic Habitat Chronic Toxicity	5.0E+04	1.7E+04	
INDENO(1,2,3-cd)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	9.5E-02	2.8E-01	1.8E-02
ISOPHORONE	9.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	9.2E+02	1.7E+05
LEAD	5.6E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.6E+00	
MERCURY	2.5E-02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.5E-02	4.7E-02
METHOXYCHLOR	3.0E-02	Aquatic Habitat Chronic Toxicity	5.0E+01	3.0E-02	
METHYL ETHYL KETONE	8.4E+03	Ceiling Level	8.4E+03	1.4E+04	
METHYL ISOBUTYL KETONE	1.7E+02	Aquatic Habitat Chronic Toxicity	1.3E+03	1.7E+02	
METHYL MERCURY	2.8E-03	Aquatic Habitat Chronic Toxicity	5.0E+04	2.8E-03	
METHYL TERT BUTYL ETHER	1.8E+02	Ceiling Level	1.8E+02	1.8E+04	
METHYLENE CHLORIDE	5.9E+02	Bioaccumulation/Human Consumption	9.1E+03	2.2E+03	5.9E+02
METHYLNAPHTHALENE, 1-	2.1E+00	Aquatic Habitat Chronic Toxicity	1.0E+01	2.1E+00	
METHYLNAPHTHALENE, 2-	1.0E+01	Ceiling Level	1.0E+01	7.2E+01	
MOLYBDENUM	3.7E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.7E+02	
NAPHTHALENE	1.2E+01	Aquatic Habitat Chronic Toxicity	2.1E+01	1.2E+01	
NICKEL	8.3E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	8.3E+00	3.3E+01
NITROBENZENE	3.8E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.8E+02	
NITROGLYCERIN	1.8E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+01	
NITROTOLUENE, 2-	7.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.1E+01	
NITROTOLUENE, 3-	4.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.2E+01	
NITROTOLUENE, 4-	4.6E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.6E+01	
PENTACHLOROPHENOL	3.0E+00	Bioaccumulation/Human Consumption	5.9E+02	7.9E+00	3.0E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Ceiling Level	2.2E+04	8.5E+05	
PERCHLORATE	6.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E+02	
PHENANTHRENE	4.6E+00	Aquatic Habitat Chronic Toxicity	4.1E+02	4.6E+00	
PHENOL	5.8E+01	Aquatic Habitat Chronic Toxicity	7.9E+03	5.8E+01	1.7E+06
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-05	Bioaccumulation/Human Consumption	2.2E+01	3.0E-02	7.9E-05
PROPICONAZOLE	9.5E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	9.5E+01	
PYRENE	1.0E+01	Aquatic Habitat Chronic Toxicity	6.8E+01	1.0E+01	4.0E+03
SELENIUM	7.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.1E+01	
SILVER	1.0E-01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E-01	
SIMAZINE	9.0E+00	Aquatic Habitat Chronic Toxicity	3.1E+03	9.0E+00	
STYRENE	1.1E+01	Ceiling Level	1.1E+01	3.2E+01	

TABLE D-2b. SURFACE WATER ACTION LEVELS
Marine Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Marine Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4F
TERBACIL	2.6E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.6E+02	
tert-BUTYL ALCOHOL	1.8E+04	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+04	
TETRACHLOROETHANE, 1,1,1,2-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
TETRACHLOROETHANE, 1,1,2,2-	3.5E+00	Bioaccumulation/Human Consumption	5.0E+02	6.1E+02	3.5E+00
TETRACHLOROETHYLENE	2.9E+00	Bioaccumulation/Human Consumption	3.0E+02	1.5E+02	2.9E+00
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	Aquatic Habitat Chronic Toxicity	1.2E+04	1.2E+00	
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	3.3E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	3.3E+02	
THALLIUM	1.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.2E+01	1.6E+01
TOLUENE	9.8E+00	Aquatic Habitat Chronic Toxicity	4.0E+01	9.8E+00	1.4E+05
TOXAPHENE	2.0E-04	Aquatic Habitat Chronic Toxicity	1.4E+02	2.0E-04	2.4E-04
TPH (gasolines)	3.7E+03	Aquatic Habitat Chronic Toxicity	5.0E+03	3.7E+03	
TPH (middle distillates)	6.4E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	6.4E+02	
TPH (residual fuels)	6.4E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	6.4E+02	
TRICHLOROBENZENE, 1,2,4-	1.1E+02	Aquatic Habitat Chronic Toxicity	3.0E+03	1.1E+02	
TRICHLOROETHANE, 1,1,1-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	3.4E+05
TRICHLOROETHANE, 1,1,2-	1.4E+01	Bioaccumulation/Human Consumption	5.0E+04	1.2E+03	1.4E+01
TRICHLOROETHYLENE	2.6E+01	Bioaccumulation/Human Consumption	1.0E+04	4.7E+01	2.6E+01
TRICHLOROPHENOL, 2,4,5-	1.2E+01	Aquatic Habitat Chronic Toxicity	2.0E+02	1.2E+01	3.6E+03
TRICHLOROPHENOL, 2,4,6-	1.2E+00	Bioaccumulation/Human Consumption	1.0E+02	6.5E+00	1.2E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.9E+02	
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	5.0E+01	Aquatic Habitat Chronic Toxicity	3.6E+04	5.0E+01	
TRICHLOROPROPANE, 1,2,3-	1.4E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+01	
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Chronic Toxicity	5.0E+04	6.2E-01	
TRIFLURALIN	1.1E+00	Aquatic Habitat Chronic Toxicity	9.0E+01	1.1E+00	
TRINITROBENZENE, 1,3,5-	1.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+01	
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Chronic Toxicity	3.7E+04	4.0E+01	
TRINITROTOLUENE, 2,4,6- (TNT)	2.0E+01	Ceiling Level	2.0E+01	9.0E+01	
VANADIUM	8.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	8.1E+01	
VINYL CHLORIDE	1.7E+02	Bioaccumulation/Human Consumption	3.4E+03	9.3E+02	1.7E+02
XYLENES	1.3E+01	Aquatic Habitat Chronic Toxicity	5.3E+02	1.3E+01	
ZINC	8.6E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	8.6E+01	

Notes:

1. Lowest of gross contamination, aquatic habitat and bioaccumulation action levels.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.
Ceiling Level: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit nuisances and general resource degradation.
Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).
Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-2c. SURFACE WATER ACTION LEVELS
*Estuary Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Estuary Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
ACENAPHTHENE	1.5E+01	Aquatic Habitat Chronic Toxicity	2.0E+01	1.5E+01	9.9E+02
ACENAPHTHYLENE	1.3E+01	Aquatic Habitat Chronic Toxicity	2.0E+03	1.3E+01	
ACETONE	1.5E+03	Aquatic Habitat Chronic Toxicity	2.0E+04	1.5E+03	
ALDRIN	2.6E-05	Bioaccumulation/Human Consumption	8.5E+00	1.4E-04	2.6E-05
AMETRYN	7.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	7.0E+02	
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+01	
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
ANTHRACENE	2.0E-02	Aquatic Habitat Chronic Toxicity	2.2E+01	2.0E-02	4.0E+04
ANTIMONY	3.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+01	1.5E+04
ARSENIC	1.4E-01	Bioaccumulation/Human Consumption	5.0E+04	3.6E+01	1.4E-01
ATRAZINE	1.2E+01	Aquatic Habitat Chronic Toxicity	1.8E+04	1.2E+01	
BARIUM	2.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.2E+02	
BENOMYL	1.4E-01	Aquatic Habitat Chronic Toxicity	1.9E+03	1.4E-01	
BENZENE	1.3E+01	Bioaccumulation/Human Consumption	2.0E+03	7.1E+01	1.3E+01
BENZO(a)ANTHRACENE	1.8E-02	Bioaccumulation/Human Consumption	4.7E+00	2.7E-02	1.8E-02
BENZO(a)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	8.0E-01	6.0E-02	1.8E-02
BENZO(b)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	7.5E-01	6.8E-01	1.8E-02
BENZO(g,h,i)PERYLENE	1.3E-01	Ceiling Level	1.3E-01	4.4E-01	
BENZO(k)FLUORANTHENE	1.8E-02	Bioaccumulation/Human Consumption	4.0E-01	6.4E-01	1.8E-02
BERYLLIUM	3.8E-02	Bioaccumulation/Human Consumption	5.0E+04	6.6E-01	3.8E-02
BIPHENYL, 1,1-	5.0E-01	Ceiling Level	5.0E-01	6.5E+00	
BIS(2-CHLOROETHYL)ETHER	4.4E-01	Bioaccumulation/Human Consumption	3.6E+02	2.4E+03	4.4E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	Aquatic Habitat Chronic Toxicity	3.2E+02	3.7E-01	1.4E+03
BIS(2-ETHYLHEXYL)PHTHALATE	2.2E+00	Bioaccumulation/Human Consumption	1.4E+02	3.0E+00	2.2E+00
BORON	1.0E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+03	
BROMODICHLOROMETHANE	3.4E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.4E+02	
BROMOFORM	1.4E+02	Bioaccumulation/Human Consumption	5.1E+02	2.3E+02	1.4E+02
BROMOMETHANE	1.6E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.6E+01	1.5E+03
CADMIUM	3.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+00	
CARBON TETRACHLORIDE	2.3E+00	Bioaccumulation/Human Consumption	5.2E+02	9.8E+00	2.3E+00
CHLORDANE (TECHNICAL)	1.6E-05	Bioaccumulation/Human Consumption	2.5E+00	4.0E-03	1.6E-05
CHLOROANILINE, p-	1.9E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.9E+01	
CHLOROBENZENE	2.5E+01	Aquatic Habitat Chronic Toxicity	5.0E+01	2.5E+01	2.1E+04
CHLOROETHANE	1.6E+01	Ceiling Level	1.6E+01	2.1E+04	
CHLOROFORM	5.1E+00	Bioaccumulation/Human Consumption	2.4E+03	2.8E+01	5.1E+00
CHLOROMETHANE	1.9E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	1.9E+02	
CHLOROPHENOL, 2-	1.8E-01	Ceiling Level	1.8E-01	3.2E+01	1.5E+02
CHROMIUM (Total)	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
CHROMIUM III	2.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.0E+01	
CHROMIUM VI	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
CHRYSENE	1.8E-02	Bioaccumulation/Human Consumption	1.0E+00	2.0E+00	1.8E-02

TABLE D-2c. SURFACE WATER ACTION LEVELS
*Estuary Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Estuary Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
COBALT	1.9E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.9E+01	
COPPER	2.9E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	2.9E+00	
CYANIDE (Free)	1.0E+00	Aquatic Habitat Chronic Toxicity	1.7E+02	1.0E+00	2.2E+05
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.9E+01	Aquatic Habitat Chronic Toxicity	3.0E+04	7.9E+01	
DALAPON	3.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.0E+02	
DIBENZO(a,h)ANTHTRACENE	1.8E-02	Bioaccumulation/Human Consumption	1.3E+00	8.0E-01	1.8E-02
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	Aquatic Habitat Chronic Toxicity	1.0E+01	4.0E-02	
DIBROMOCHLOROMETHANE	1.3E+01	Bioaccumulation/Human Consumption	5.0E+04	3.4E+01	1.3E+01
DIBROMOETHANE, 1,2-	1.4E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+03	
DICHLOROBENZENE, 1,2-	1.0E+01	Ceiling Level	1.0E+01	1.4E+01	8.5E+02
DICHLOROBENZENE, 1,3-	2.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.2E+01	8.5E+02
DICHLOROBENZENE, 1,4-	9.4E+00	Aquatic Habitat Chronic Toxicity	1.1E+01	9.4E+00	8.5E+02
DICHLOROBENZIDINE, 3,3-	7.0E-03	Bioaccumulation/Human Consumption	1.6E+03	4.5E+00	7.0E-03
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.1E-04	Bioaccumulation/Human Consumption	4.5E+01	1.1E-02	3.1E-04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.2E-04	Bioaccumulation/Human Consumption	2.0E+01	4.1E-01	2.2E-04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.0E-06	Bioaccumulation/Human Consumption	2.8E+00	1.0E-03	8.0E-06
DICHLOROETHANE, 1,1-	4.7E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.7E+01	
DICHLOROETHANE, 1,2-	7.9E+01	Bioaccumulation/Human Consumption	2.0E+04	9.1E+02	7.9E+01
DICHLOROETHYLENE, 1,1-	6.0E-01	Bioaccumulation/Human Consumption	1.5E+03	2.5E+01	6.0E-01
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.2E+02	
DICHLOROETHYLENE, Trans 1,2-	2.6E+02	Ceiling Level	2.6E+02	5.6E+02	140000
DICHLOROPHENOL, 2,4-	3.0E-01	Ceiling Level	3.0E-01	1.1E+01	2.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.0E+01	
DICHLOROPROPANE, 1,2-	1.0E+01	Ceiling Level	1.0E+01	5.2E+02	1.5E+01
DICHLOROPROPENE, 1,3-	6.0E-02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E-02	4.6E+00
DIELDRIN	2.5E-05	Bioaccumulation/Human Consumption	4.1E+01	1.9E-03	2.5E-05
DIETHYLPHTHALATE	2.1E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.1E+02	4.4E+04
DIMETHYLPHENOL, 2,4-	1.2E+02	Aquatic Habitat Chronic Toxicity	4.0E+02	1.2E+02	8.5E+02
DIMETHYLPHTHALATE	1.1E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+03	1.1E+06
DINITROBENZENE, 1,3-	1.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+01	
DINITROPHENOL, 2,4-	1.4E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+01	5.3E+03
DINITROTOLUENE, 2,4- (2,4-DNT)	3.0E+00	Bioaccumulation/Human Consumption	5.0E+04	9.1E+00	3.0E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	8.1E+01	
DIOXANE, 1,4-	5.0E+04	Ceiling Level	5.0E+04	3.4E+05	
DIOXINS (TEQ)	3.1E-09	Aquatic Habitat Chronic Toxicity	1.0E-01	3.1E-09	5.0E-09
DIURON	6.0E+01	Aquatic Habitat Chronic Toxicity	2.1E+04	6.0E+01	
ENDOSULFAN	8.7E-03	Aquatic Habitat Chronic Toxicity	1.6E+02	8.7E-03	5.2E+01
ENDRIN	2.3E-03	Aquatic Habitat Chronic Toxicity	4.1E+01	2.3E-03	8.1E-01
ETHANOL	5.0E+04	Ceiling Level	5.0E+04		
ETHYLBENZENE	7.3E+00	Aquatic Habitat Chronic Toxicity	3.0E+01	7.3E+00	1.1E+03
FLUORANTHENE	8.0E-01	Aquatic Habitat Chronic Toxicity	1.3E+02	8.0E-01	1.8E+01

TABLE D-2c. SURFACE WATER ACTION LEVELS
*Estuary Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Estuary Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
FLUORENE	3.9E+00	Aquatic Habitat Chronic Toxicity	8.5E+02	3.9E+00	5.3E+03
GLYPHOSATE	1.8E+03	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+03	
HEPTACHLOR	9.0E-05	Bioaccumulation/Human Consumption	2.0E+01	3.6E-03	9.0E-05
HEPTACHLOR EPOXIDE	3.9E-05	Bioaccumulation/Human Consumption	1.0E+02	3.6E-03	3.9E-05
HEXACHLOROBENZENE	2.4E-04	Bioaccumulation/Human Consumption	3.1E+00	3.0E-04	2.4E-04
HEXACHLOROBUTADIENE	3.0E-01	Aquatic Habitat Chronic Toxicity	6.0E+00	3.0E-01	1.6E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-02	Bioaccumulation/Human Consumption	3.7E+03	6.3E-02	2.0E-02
HEXACHLOROETHANE	2.9E+00	Bioaccumulation/Human Consumption	1.0E+01	1.2E+01	2.9E+00
HEXAZINONE	1.7E+04	Aquatic Habitat Chronic Toxicity	5.0E+04	1.7E+04	
INDENO(1,2,3-cd)PYRENE	1.8E-02	Bioaccumulation/Human Consumption	9.5E-02	2.8E-01	1.8E-02
ISOPHORONE	9.2E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	9.2E+02	1.7E+05
LEAD	5.6E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.6E+00	
MERCURY	2.5E-02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.5E-02	4.7E-02
METHOXYCHLOR	3.0E-02	Aquatic Habitat Chronic Toxicity	5.0E+01	3.0E-02	
METHYL ETHYL KETONE	8.4E+03	Ceiling Level	8.4E+03	1.4E+04	
METHYL ISOBUTYL KETONE	1.7E+02	Aquatic Habitat Chronic Toxicity	1.3E+03	1.7E+02	
METHYL MERCURY	2.8E-03	Aquatic Habitat Chronic Toxicity	5.0E+04	2.8E-03	
METHYL TERT BUTYL ETHER	1.8E+02	Ceiling Level	1.8E+02	7.3E+02	
METHYLENE CHLORIDE	5.9E+02	Bioaccumulation/Human Consumption	9.1E+03	1.5E+03	5.9E+02
METHYLNAPHTHALENE, 1-	2.1E+00	Aquatic Habitat Chronic Toxicity	1.0E+01	2.1E+00	
METHYLNAPHTHALENE, 2-	4.7E+00	Aquatic Habitat Chronic Toxicity	1.0E+01	4.7E+00	
MOLYBDENUM	3.7E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.7E+02	
NAPHTHALENE	1.2E+01	Aquatic Habitat Chronic Toxicity	2.1E+01	1.2E+01	
NICKEL	5.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+00	3.3E+01
NITROBENZENE	3.8E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	3.8E+02	
NITROGLYCERIN	1.8E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+01	
NITROTOLUENE, 2-	7.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	7.1E+01	
NITROTOLUENE, 3-	4.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.2E+01	
NITROTOLUENE, 4-	4.6E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	4.6E+01	
PENTACHLOROPHENOL	3.0E+00	Bioaccumulation/Human Consumption	5.9E+02	7.9E+00	3.0E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Ceiling Level	2.2E+04	8.5E+05	
PERCHLORATE	6.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E+02	
PHENANTHRENE	2.3E+00	Aquatic Habitat Chronic Toxicity	4.1E+02	2.3E+00	
PHENOL	5.8E+01	Aquatic Habitat Chronic Toxicity	7.9E+03	5.8E+01	1.7E+06
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-05	Bioaccumulation/Human Consumption	2.2E+01	1.4E-02	7.9E-05
PROPICONAZOLE	9.5E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	9.5E+01	
PYRENE	4.6E+00	Aquatic Habitat Chronic Toxicity	6.8E+01	4.6E+00	4.0E+03
SELENIUM	5.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	5.0E+00	
SILVER	1.0E-01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E-01	
SIMAZINE	9.0E+00	Aquatic Habitat Chronic Toxicity	3.1E+03	9.0E+00	
STYRENE	1.1E+01	Ceiling Level	1.1E+01	3.2E+01	

TABLE D-2c. SURFACE WATER ACTION LEVELS
*Estuary Habitats
(ug/l)

CHEMICAL PARAMETER	[1]Final Surface Water Action Level	Basis	Gross Contamination (Odors, etc.) Table G-4	Estuary Aquatic Habitat Goal (Chronic Toxicity) Table D-4a	Bioaccumulation and Human Consumption Table D-4f
TERBACIL	2.6E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	2.6E+02	
tert-BUTYL ALCOHOL	1.8E+04	Aquatic Habitat Chronic Toxicity	5.0E+04	1.8E+04	
TETRACHLOROETHANE, 1,1,1,2-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	
TETRACHLOROETHANE, 1,1,2,2-	3.5E+00	Bioaccumulation/Human Consumption	5.0E+02	2.0E+02	3.5E+00
TETRACHLOROETHYLENE	2.9E+00	Bioaccumulation/Human Consumption	3.0E+02	5.3E+01	2.9E+00
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	Aquatic Habitat Chronic Toxicity	1.2E+04	1.2E+00	
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	2.2E+02	
THALLIUM	6.0E+00	Aquatic Habitat Chronic Toxicity	5.0E+04	6.0E+00	1.6E+01
TOLUENE	9.8E+00	Aquatic Habitat Chronic Toxicity	4.0E+01	9.8E+00	1.4E+05
TOXAPHENE	2.0E-04	Aquatic Habitat Chronic Toxicity	1.4E+02	2.0E-04	2.4E-04
TPH (gasolines)	5.0E+02	Aquatic Habitat Chronic Toxicity	5.0E+03	5.0E+02	
TPH (middle distillates)	6.4E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	6.4E+02	
TPH (residual fuels)	6.4E+02	Aquatic Habitat Chronic Toxicity	2.5E+03	6.4E+02	
TRICHLOROBENZENE, 1,2,4-	1.1E+02	Aquatic Habitat Chronic Toxicity	3.0E+03	1.1E+02	
TRICHLOROETHANE, 1,1,1-	1.1E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.1E+01	3.4E+05
TRICHLOROETHANE, 1,1,2-	1.4E+01	Bioaccumulation/Human Consumption	5.0E+04	7.3E+02	1.4E+01
TRICHLOROETHYLENE	2.6E+01	Bioaccumulation/Human Consumption	1.0E+04	4.7E+01	2.6E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	Aquatic Habitat Chronic Toxicity	2.0E+02	1.9E+00	3.6E+03
TRICHLOROPHENOL, 2,4,6-	1.2E+00	Bioaccumulation/Human Consumption	1.0E+02	4.9E+00	1.2E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	Aquatic Habitat Chronic Toxicity	5.0E+04	6.9E+02	
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	Aquatic Habitat Chronic Toxicity	3.6E+04	3.0E+01	
TRICHLOROPROPANE, 1,2,3-	1.4E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.4E+01	
TRICHLOROPROPENE, 1,2,3-	6.2E-01	Aquatic Habitat Chronic Toxicity	5.0E+04	6.2E-01	
TRIFLURALIN	1.1E+00	Aquatic Habitat Chronic Toxicity	9.0E+01	1.1E+00	
TRINITROBENZENE, 1,3,5-	1.0E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	1.0E+01	
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	Aquatic Habitat Chronic Toxicity	3.7E+04	4.0E+01	
TRINITROTOLUENE, 2,4,6- (TNT)	1.3E+01	Aquatic Habitat Chronic Toxicity	2.0E+01	1.3E+01	
VANADIUM	2.7E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.7E+01	
VINYL CHLORIDE	1.7E+02	Bioaccumulation/Human Consumption	3.4E+03	9.3E+02	1.7E+02
XYLENES	1.3E+01	Aquatic Habitat Chronic Toxicity	5.3E+02	1.3E+01	
ZINC	2.2E+01	Aquatic Habitat Chronic Toxicity	5.0E+04	2.2E+01	

Notes:

***Estuary Habitats: Mixed freshwater/marine water habitats.**

1. Lowest of gross contamination, aquatic habitat and bioaccumulation action levels.

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Ceiling Level: Odor threshold, 1/2 solubility or 50000 ug/L maximum, whichever is lower. Intended to limit nuisances and general resource degradation.

Review of aquatic ecotoxicity data for ethanol underway. Based on preliminary review of available data, chronic toxicity screening levels likely to be significantly greater than ceiling level of 50,000 ug/L (refer to USEPA 2003b, ECOTOX database).

Method reporting limits and background concentrations replace final screening level as appropriate.

TABLE D-3a. FINAL DRINKING WATER ACTION LEVELS FOR HUMAN TOXICITY.

(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	HDOH Primary MCL	Other Criteria	Reference	Risk-Based Action Level (Table D-3b)	Basis
ACENAPHTHENE	3.5E+02	noncarcinogenic effects				3.5E+02	noncarcinogenic effects
ACENAPHTHYLENE	2.4E+02	noncarcinogenic effects				2.4E+02	noncarcinogenic effects
ACETONE	1.4E+04	noncarcinogenic effects				1.4E+04	noncarcinogenic effects
ALDRIN	5.1E-03	carcinogenic effects				5.1E-03	carcinogenic effects
AMETRYN	1.8E+02	noncarcinogenic effects				1.8E+02	noncarcinogenic effects
AMINO,2- DINITROTOLUENE,4,6-	4.0E+01	noncarcinogenic effects				4.0E+01	noncarcinogenic effects
AMINO,4- DINITROTOLUENE,2,6-	4.0E+01	noncarcinogenic effects				4.0E+01	noncarcinogenic effects
ANTHRACENE	1.8E+03	noncarcinogenic effects				1.8E+03	noncarcinogenic effects
ANTIMONY	6.0E+00	HDOH Primary MCL	6.0E+00			8.0E+00	noncarcinogenic effects
ARSENIC	1.0E+01	HDOH Primary MCL	1.0E+01			5.2E-02	carcinogenic effects
ATRAZINE	3.0E+00	HDOH Primary MCL	3.0E+00			3.4E-01	carcinogenic effects
BARIUM	2.0E+03	HDOH Primary MCL	2.0E+03			4.0E+03	noncarcinogenic effects
BENOMYL	1.0E+03	noncarcinogenic effects				1.0E+03	noncarcinogenic effects
BENZENE	5.0E+00	HDOH Primary MCL	5.0E+00			4.8E-01	carcinogenic effects
BENZO(a)ANTHRACENE	1.1E-02	mutagenic effects				1.1E-02	mutagenic effects
BENZO(a)PYRENE	2.0E-01	HDOH Primary MCL	2.0E-01			2.9E-03	mutagenic effects
BENZO(b)FLUORANTHENE	2.9E-02	mutagenic effects				2.9E-02	mutagenic effects
BENZO(g,h,i)PERYLENE	8.0E+02	noncarcinogenic effects				8.0E+02	noncarcinogenic effects
BENZO(k)FLUORANTHENE	2.9E-01	mutagenic effects				2.9E-01	mutagenic effects
BERYLLIUM	4.0E+00	HDOH Primary MCL	4.0E+00			4.0E+01	noncarcinogenic effects
BIPHENYL, 1,1-	8.3E-01	noncarcinogenic effects				8.3E-01	noncarcinogenic effects
BIS(2-CHLOROETHYL)ETHER	1.4E-02	carcinogenic effects				1.4E-02	carcinogenic effects
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	carcinogenic effects				3.7E-01	carcinogenic effects
BIS(2-ETHYLHEXYL)PHTHALATE	6.0E+00	HDOH Primary MCL	6.0E+00			5.6E+00	carcinogenic effects
BORON	4.0E+03	noncarcinogenic effects				4.0E+03	noncarcinogenic effects
BROMODICHLOROMETHANE	1.4E-01	carcinogenic effects				1.4E-01	carcinogenic effects
BROMOFORM	8.0E+01	HDOH Primary MCL	8.0E+01		Total Trihalomethanes	3.4E+00	carcinogenic effects
BROMOMETHANE	7.6E+00	noncarcinogenic effects				7.6E+00	noncarcinogenic effects
CADMIUM	5.0E+00	HDOH Primary MCL	5.0E+00			2.0E+01	noncarcinogenic effects
CARBON TETRACHLORIDE	5.0E+00	HDOH Primary MCL	5.0E+00			5.1E-01	carcinogenic effects
CHLORDANE (TECHNICAL)	2.0E+00	HDOH Primary MCL	2.0E+00			4.5E-02	carcinogenic effects
CHLOROANILINE, p-	3.9E-01	carcinogenic effects				3.9E-01	carcinogenic effects
CHLOROBENZENE	1.0E+02	HDOH Primary MCL	1.0E+02			8.3E+01	noncarcinogenic effects
CHLOROETHANE	2.1E+04	noncarcinogenic effects				2.1E+04	noncarcinogenic effects
CHLOROFORM	7.0E+01	HDOH public health goal		7.0E+01	HDOH public health goal	2.2E-01	carcinogenic effects
CHLOROMETHANE	1.9E+02	noncarcinogenic effects				1.9E+02	noncarcinogenic effects
CHLOROPHENOL, 2-	2.9E+01	noncarcinogenic effects				2.9E+01	noncarcinogenic effects
CHROMIUM (Total)	1.0E+02	HDOH Primary MCL	1.0E+02				not applicable
CHROMIUM III	3.0E+04	noncarcinogenic effects				3.0E+04	noncarcinogenic effects
CHROMIUM VI	4.3E+00	mutagenic effects				4.3E+00	mutagenic effects
CHRYSENE	2.9E+00	mutagenic effects				2.9E+00	mutagenic effects

TABLE D-3a. FINAL DRINKING WATER ACTION LEVELS FOR HUMAN TOXICITY.

(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	HDOH Primary MCL	Other Criteria	Reference	Risk-Based Action Level (Table D-3b)	Basis
COBALT	6.0E+00	noncarcinogenic effects				6.0E+00	noncarcinogenic effects
COPPER	1.3E+03	HDOH Primary MCL	1.3E+03			8.0E+02	noncarcinogenic effects
CYANIDE (Free)	2.0E+02	HDOH Primary MCL	2.0E+02			1.5E+00	noncarcinogenic effects
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	carcinogenic effects				7.1E-01	carcinogenic effects
DALAPON	2.0E+02	HDOH Primary MCL	2.0E+02			6.0E+02	noncarcinogenic effects
DIBENZO(a,h)ANTHTRACENE	2.9E-03	mutagenic effects				2.9E-03	mutagenic effects
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	HDOH Primary MCL	4.0E-02			3.3E-04	mutagenic effects
DIBROMOCHLOROMETHANE	2.1E-01	carcinogenic effects				2.1E-01	carcinogenic effects
DIBROMOETHANE, 1,2-	4.0E-02	HDOH Primary MCL	4.0E-02			7.5E-03	carcinogenic effects
DICHLOROBENZENE, 1,2-	6.0E+02	HDOH Primary MCL	6.0E+02			3.4E+02	noncarcinogenic effects
DICHLOROBENZENE, 1,3-	1.8E+02	noncarcinogenic effects				1.8E+02	noncarcinogenic effects
DICHLOROBENZENE, 1,4-	7.5E+01	HDOH Primary MCL	7.5E+01			4.9E-01	carcinogenic effects
DICHLOROBENZIDINE, 3,3-	1.7E-01	carcinogenic effects				1.7E-01	carcinogenic effects
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.2E-01	carcinogenic effects				3.2E-01	carcinogenic effects
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.6E-02	carcinogenic effects				4.6E-02	carcinogenic effects
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.3E-01	carcinogenic effects				2.3E-01	carcinogenic effects
DICHLOROETHANE, 1,1-	2.8E+00	carcinogenic effects				2.8E+00	carcinogenic effects
DICHLOROETHANE, 1,2-	5.0E+00	USEPA MCL		5.0E+00	USEPA MCL	1.7E-01	carcinogenic effects
DICHLOROETHYLENE, 1,1-	7.0E+00	HDOH Primary MCL	7.0E+00			2.9E+02	noncarcinogenic effects
DICHLOROETHYLENE, Cis 1,2-	7.0E+01	HDOH Primary MCL	7.0E+01			1.2E+01	noncarcinogenic effects
DICHLOROETHYLENE, Trans 1,2-	1.0E+02	HDOH Primary MCL	1.0E+02			1.2E+02	noncarcinogenic effects
DICHLOROPHENOL, 2,4-	6.0E+01	noncarcinogenic effects				6.0E+01	noncarcinogenic effects
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	HDOH Primary MCL	7.0E+01			2.0E+02	noncarcinogenic effects
DICHLOROPROPANE, 1,2-	5.0E+00	HDOH Primary MCL	5.0E+00			4.5E-01	carcinogenic effects
DICHLOROPROPENE, 1,3-	5.0E-01	carcinogenic effects				5.0E-01	carcinogenic effects
DIELDRIN	1.1E-02	carcinogenic effects				1.1E-02	carcinogenic effects
DIETHYLPHTHALATE	1.6E+04	noncarcinogenic effects				1.6E+04	noncarcinogenic effects
DIMETHYLPHENOL, 2,4-	4.0E+02	noncarcinogenic effects				4.0E+02	noncarcinogenic effects
DIMETHYLPHTHALATE	2.0E+05	noncarcinogenic effects				2.0E+05	noncarcinogenic effects
DINITROBENZENE, 1,3-	2.0E+00	noncarcinogenic effects				2.0E+00	noncarcinogenic effects
DINITROPHENOL, 2,4-	4.0E+01	noncarcinogenic effects				4.0E+01	noncarcinogenic effects
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	carcinogenic effects				2.5E-01	carcinogenic effects
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	carcinogenic effects				5.2E-02	carcinogenic effects
DIOXANE, 1,4-	4.6E-01	carcinogenic effects				4.6E-01	carcinogenic effects
DIOXINS (TEQ)	3.0E-05	HDOH Primary MCL	3.0E-05			1.2E-07	carcinogenic effects
DIURON	4.0E+01	noncarcinogenic effects				4.0E+01	noncarcinogenic effects
ENDOSULFAN	1.2E+02	noncarcinogenic effects				1.2E+02	noncarcinogenic effects
ENDRIN	2.0E+00	HDOH Primary MCL	2.0E+00			6.0E+00	noncarcinogenic effects
ETHANOL		not available					
ETHYLBENZENE	7.0E+02	HDOH Primary MCL	7.0E+02			1.7E+00	carcinogenic effects
FLUORANTHENE	8.0E+02	noncarcinogenic effects				8.0E+02	noncarcinogenic effects

TABLE D-3a. FINAL DRINKING WATER ACTION LEVELS FOR HUMAN TOXICITY.

(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	HDOH Primary MCL	Other Criteria	Reference	Risk-Based Action Level (Table D-3b)	Basis
FLUORENE	2.4E+02	noncarcinogenic effects				2.4E+02	noncarcinogenic effects
GLYPHOSATE	7.0E+02	HDOH Primary MCL	7.0E+02			2.0E+03	noncarcinogenic effects
HEPTACHLOR	4.0E-01	HDOH Primary MCL	4.0E-01			3.5E-03	carcinogenic effects
HEPTACHLOR EPOXIDE	2.0E-01	HDOH Primary MCL	2.0E-01			1.7E-03	carcinogenic effects
HEXACHLOROBENZENE	1.0E+00	HDOH Primary MCL	1.0E+00			9.8E-03	carcinogenic effects
HEXACHLOROBUTADIENE	2.0E-01	carcinogenic effects				2.0E-01	carcinogenic effects
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-01	HDOH Primary MCL	2.0E-01			7.1E-02	carcinogenic effects
HEXACHLOROETHANE	4.0E-01	carcinogenic effects				4.0E-01	carcinogenic effects
HEXAZINONE	6.6E+02	noncarcinogenic effects				6.6E+02	noncarcinogenic effects
INDENO(1,2,3-cd)PYRENE	2.9E-02	mutagenic effects				2.9E-02	mutagenic effects
ISOPHORONE	8.2E+01	carcinogenic effects				8.2E+01	carcinogenic effects
LEAD	1.5E+01	HDOH Primary MCL	1.5E+01				
MERCURY	2.0E+00	HDOH Primary MCL	2.0E+00			6.0E+00	noncarcinogenic effects
METHOXYCHLOR	4.0E+01	HDOH Primary MCL	4.0E+01			1.0E+02	noncarcinogenic effects
METHYL ETHYL KETONE	5.6E+03	noncarcinogenic effects				5.6E+03	noncarcinogenic effects
METHYL ISOBUTYL KETONE	6.3E+03	noncarcinogenic effects				6.3E+03	noncarcinogenic effects
METHYL MERCURY	2.0E+00	noncarcinogenic effects				2.0E+00	noncarcinogenic effects
METHYL TERT BUTYL ETHER	1.4E+01	carcinogenic effects				1.4E+01	carcinogenic effects
METHYLENE CHLORIDE	5.0E+00	USEPA MCL		5.0E+00	USEPA MCL	1.0E+01	mutagenic effects
METHYLNAPHTHALENE, 1-	6.0E+00	carcinogenic effects				6.0E+00	carcinogenic effects
METHYLNAPHTHALENE, 2-	2.4E+01	noncarcinogenic effects				2.4E+01	noncarcinogenic effects
MOLYBDENUM	1.0E+02	noncarcinogenic effects				1.0E+02	noncarcinogenic effects
NAPHTHALENE	1.7E+01	CDPH notification level		1.7E+01	CDPH notification level	1.7E-01	carcinogenic effects
NICKEL	4.0E+02	noncarcinogenic effects				4.0E+02	noncarcinogenic effects
NITROBENZENE	1.4E-01	carcinogenic effects				1.4E-01	carcinogenic effects
NITROGLYCERIN	2.0E+00	noncarcinogenic effects				2.0E+00	noncarcinogenic effects
NITROTOLUENE, 2-	7.9E-02	carcinogenic effects				7.9E-02	carcinogenic effects
NITROTOLUENE, 3-	2.0E+00	noncarcinogenic effects				2.0E+00	noncarcinogenic effects
NITROTOLUENE, 4-	4.9E+00	carcinogenic effects				4.9E+00	carcinogenic effects
PENTACHLOROPHENOL	1.0E+00	HDOH Primary MCL	1.0E+00			1.9E-01	carcinogenic effects
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	carcinogenic effects				1.9E+01	carcinogenic effects
PERCHLORATE	1.5E+01	USEPA MCL		1.5E+01	USEPA MCL	1.4E+01	noncarcinogenic effects
PHENANTHRENE	2.4E+02	noncarcinogenic effects				2.4E+02	noncarcinogenic effects
PHENOL	6.0E+03	noncarcinogenic effects				6.0E+03	noncarcinogenic effects
POLYCHLORINATED BIPHENYLS (PCBs)	5.0E-01	HDOH Primary MCL	5.0E-01			7.9E-03	carcinogenic effects
PROPICONAZOLE	2.6E+02	noncarcinogenic effects				2.6E+02	noncarcinogenic effects
PYRENE	1.8E+02	noncarcinogenic effects				1.8E+02	noncarcinogenic effects
SELENIUM	5.0E+01	HDOH Primary MCL	5.0E+01			1.0E+02	noncarcinogenic effects
SILVER	1.0E+02	noncarcinogenic effects				1.0E+02	noncarcinogenic effects
SIMAZINE	4.0E+00	HDOH Primary MCL	4.0E+00			6.5E-01	carcinogenic effects
STYRENE	1.0E+02	HDOH Primary MCL	1.0E+02			1.4E+03	noncarcinogenic effects

TABLE D-3a. FINAL DRINKING WATER ACTION LEVELS FOR HUMAN TOXICITY.

(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	HDOH Primary MCL	Other Criteria	Reference	Risk-Based Action Level (Table D-3b)	Basis
TERBACIL	2.6E+02	noncarcinogenic effects				2.6E+02	noncarcinogenic effects
tert-BUTYL ALCOHOL	5.8E+00	carcinogenic effects				5.8E+00	carcinogenic effects
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	carcinogenic effects				6.1E-01	carcinogenic effects
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	carcinogenic effects				7.8E-02	carcinogenic effects
TETRACHLOROETHYLENE	5.0E+00	HDOH Primary MCL	5.0E+00			7.4E-01	carcinogenic effects
TETRACHLOROPHENOL, 2,3,4,6-	6.0E+02	noncarcinogenic effects				6.0E+02	noncarcinogenic effects
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.0E+03	noncarcinogenic effects				1.0E+03	noncarcinogenic effects
THALLIUM	2.0E+00	HDOH Primary MCL	2.0E+00			2.0E-01	noncarcinogenic effects
TOLUENE	1.0E+03	HDOH Primary MCL	1.0E+03			1.4E+03	noncarcinogenic effects
TOXAPHENE	3.0E+00	HDOH Primary MCL	3.0E+00			7.1E-02	carcinogenic effects
TPH (gasolines)	3.0E+02	noncarcinogenic effects				3.0E+02	noncarcinogenic effects
TPH (middle distillates)	1.6E+02	noncarcinogenic effects				1.6E+02	noncarcinogenic effects
TPH (residual fuels)	2.4E+03	noncarcinogenic effects				2.4E+03	noncarcinogenic effects
TRICHLOROBENZENE, 1,2,4-	7.0E+01	HDOH Primary MCL	7.0E+01			6.0E-01	carcinogenic effects
TRICHLOROETHANE, 1,1,1-	2.0E+02	HDOH Primary MCL	2.0E+02			8.3E+03	noncarcinogenic effects
TRICHLOROETHANE, 1,1,2-	5.0E+00	HDOH Primary MCL	5.0E+00			2.8E-01	carcinogenic effects
TRICHLOROETHYLENE	5.0E+00	HDOH Primary MCL	5.0E+00			2.4E-01	mutagenic effects
TRICHLOROPHENOL, 2,4,5-	2.0E+03	noncarcinogenic effects				2.0E+03	noncarcinogenic effects
TRICHLOROPHENOL, 2,4,6-	7.1E+00	carcinogenic effects				7.1E+00	carcinogenic effects
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	noncarcinogenic effects				2.0E+02	noncarcinogenic effects
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	5.0E+01	HDOH Primary MCL	5.0E+01			1.6E+02	noncarcinogenic effects
TRICHLOROPROPANE, 1,2,3-	6.0E-01	HDOH Primary MCL	6.0E-01			2.0E-04	mutagenic effects
TRICHLOROPROPENE, 1,2,3-	6.2E-01	noncarcinogenic effects				6.2E-01	noncarcinogenic effects
TRIFLURALIN	1.0E+01	carcinogenic effects				1.0E+01	carcinogenic effects
TRINITROBENZENE, 1,3,5-	6.0E+02	noncarcinogenic effects				6.0E+02	noncarcinogenic effects
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	noncarcinogenic effects				4.0E+01	noncarcinogenic effects
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	carcinogenic effects				2.6E+00	carcinogenic effects
VANADIUM	1.0E+02	noncarcinogenic effects				1.0E+02	noncarcinogenic effects
VINYL CHLORIDE	2.0E+00	HDOH Primary MCL	2.0E+00			2.0E-02	carcinogenic effects
XYLENES	1.0E+04	HDOH Primary MCL	1.0E+04			2.0E+02	noncarcinogenic effects
ZINC	6.0E+03	noncarcinogenic effects				6.0E+03	noncarcinogenic effects

Source (unless otherwise noted):

Hawai'I Department of Health Primary Maximum Concentration Level. (HDOH 2009).

CDPH: California Department of Public Health, Drinking Water Notification Level (December 2007), http://ww2.cdph.ca.gov/certlic/drinkingwater/Pages/NotificationLevels.aspx

Notes:

Used for development of groundwater and soil screening levels.

Final health-based screening level for drinking water: HDOH Primary MCLs or, in order of preference and availability, USEPA Primary MCL and risk-based Tapwater Goal (Table D-3b)

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TABLE D-3b. RISK-BASED ACTION LEVELS FOR TAPWATER
(ug/l)

CHEMICAL PARAMETER	Lowest Tapwater Goal (ug/L	Basis	Carcinogenic Effects	Mutagenic Effects	Noncancer Effects
ACENAPHTHENE	3.5E+02	noncarcinogenic effects			3.5E+02
ACENAPHTHYLENE	2.4E+02	noncarcinogenic effects			2.4E+02
ACETONE	1.4E+04	noncarcinogenic effects			1.4E+04
ALDRIN	5.1E-03	carcinogenic effects	5.1E-03		5.9E-01
AMETRYN	1.8E+02	noncarcinogenic effects			1.8E+02
AMINO,2- DINITROTOLUENE,4,6-	4.0E+01	noncarcinogenic effects			4.0E+01
AMINO,4- DINITROTOLUENE,2,6-	4.0E+01	noncarcinogenic effects			4.0E+01
ANTHRACENE	1.8E+03	noncarcinogenic effects			1.8E+03
ANTIMONY	8.0E+00	noncarcinogenic effects			8.0E+00
ARSENIC	5.2E-02	carcinogenic effects	5.2E-02		6.0E+00
ATRAZINE	3.4E-01	carcinogenic effects	3.4E-01		7.0E+02
BARIUM	4.0E+03	noncarcinogenic effects			4.0E+03
BENOMYL	1.0E+03	noncarcinogenic effects			1.0E+03
BENZENE	4.8E-01	carcinogenic effects	4.8E-01		3.5E+01
BENZO(a)ANTHRACENE	1.1E-02	mutagenic effects	3.5E-02	1.1E-02	
BENZO(a)PYRENE	2.9E-03	mutagenic effects	1.1E-02	2.9E-03	
BENZO(b)FLUORANTHENE	2.9E-02	mutagenic effects	1.1E-01	2.9E-02	
BENZO(g,h,i)PERYLENE	8.0E+02	noncarcinogenic effects			8.0E+02
BENZO(k)FLUORANTHENE	2.9E-01	mutagenic effects	1.1E+00	2.9E-01	
BERYLLIUM	4.0E+01	noncarcinogenic effects			4.0E+01
BIPHENYL, 1,1-	8.3E-01	noncarcinogenic effects	2.2E+00		8.3E-01
BIS(2-CHLOROETHYL)ETHER	1.4E-02	carcinogenic effects	1.4E-02		
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	carcinogenic effects	3.7E-01		2.1E+02
BIS(2-ETHYLHEXYL)PHTHALATE	5.6E+00	carcinogenic effects	5.6E+00		4.0E+02
BORON	4.0E+03	noncarcinogenic effects			4.0E+03
BROMODICHLOROMETHANE	1.4E-01	carcinogenic effects	1.4E-01		1.2E+02
BROMOFORM	3.4E+00	carcinogenic effects	3.4E+00		4.0E+02
BROMOMETHANE	7.6E+00	noncarcinogenic effects			7.6E+00
CADMIUM	2.0E+01	noncarcinogenic effects			2.0E+01
CARBON TETRACHLORIDE	5.1E-01	carcinogenic effects	5.1E-01		5.8E+01
CHLORDANE (TECHNICAL)	4.5E-02	carcinogenic effects	4.5E-02		1.3E+00
CHLOROANILINE, p-	3.9E-01	carcinogenic effects	3.9E-01		8.0E+01
CHLOROBENZENE	8.3E+01	noncarcinogenic effects			8.3E+01
CHLOROETHANE	2.1E+04	noncarcinogenic effects			2.1E+04
CHLOROFORM	2.2E-01	carcinogenic effects	2.2E-01		1.0E+02
CHLOROMETHANE	1.9E+02	noncarcinogenic effects			1.9E+02
CHLOROPHENOL, 2-	2.9E+01	noncarcinogenic effects			2.9E+01
CHROMIUM (Total)		not applicable			
CHROMIUM III	3.0E+04	noncarcinogenic effects			3.0E+04
CHROMIUM VI	4.3E+00	mutagenic effects	1.6E+01	4.3E+00	6.0E+01
CHRYSENE	2.9E+00	mutagenic effects	1.1E+01	2.9E+00	
COBALT	6.0E+00	noncarcinogenic effects			6.0E+00
COPPER	8.0E+02	noncarcinogenic effects			8.0E+02
CYANIDE (Free)	1.5E+00	noncarcinogenic effects			1.5E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.1E-01	carcinogenic effects	7.1E-01		6.0E+01
DALAPON	6.0E+02	noncarcinogenic effects			6.0E+02
DIBENZO(a,h)ANTHTRACENE	2.9E-03	mutagenic effects	1.1E-02	2.9E-03	
DIBROMO,1,2- CHLOROPROPANE,3-	3.3E-04	mutagenic effects	9.3E-04	3.3E-04	3.8E-01
DIBROMOCHLOROMETHANE	2.1E-01	carcinogenic effects	2.1E-01		1.2E+02
DIBROMOETHANE, 1,2-	7.5E-03	carcinogenic effects	7.5E-03		1.7E+01
DICHLOROBENZENE, 1,2-	3.4E+02	noncarcinogenic effects			3.4E+02
DICHLOROBENZENE, 1,3-	1.8E+02	noncarcinogenic effects			1.8E+02
DICHLOROBENZENE, 1,4-	4.9E-01	carcinogenic effects	4.9E-01		7.6E+02
DICHLOROBENZIDINE, 3,3-	1.7E-01	carcinogenic effects	1.7E-01		
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.2E-01	carcinogenic effects	3.2E-01		
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.6E-02	carcinogenic effects	4.6E-02		
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.3E-01	carcinogenic effects	2.3E-01		1.0E+01
DICHLOROETHANE, 1,1-	2.8E+00	carcinogenic effects	2.8E+00		1.2E+03
DICHLOROETHANE, 1,2-	1.7E-01	carcinogenic effects	1.7E-01		1.3E+01
DICHLOROETHYLENE, 1,1-	2.9E+02	noncarcinogenic effects			2.9E+02
DICHLOROETHYLENE, Cis 1,2-	1.2E+01	noncarcinogenic effects			1.2E+01
DICHLOROETHYLENE, Trans 1,2-	1.2E+02	noncarcinogenic effects			1.2E+02
DICHLOROPHENOL, 2,4-	6.0E+01	noncarcinogenic effects			6.0E+01
DICHLOROPHENOXYACETIC ACID (2,4-D)	2.0E+02	noncarcinogenic effects			2.0E+02
DICHLOROPROPANE, 1,2-	4.5E-01	carcinogenic effects	4.5E-01		8.3E+00
DICHLOROPROPENE, 1,3-	5.0E-01	carcinogenic effects	5.0E-01		3.9E+01
DIELDRIN	1.1E-02	carcinogenic effects	1.1E-02		1.6E+00
DIETHYLPHTHALATE	1.6E+04	noncarcinogenic effects			1.6E+04
DIMETHYLPHENOL, 2,4-	4.0E+02	noncarcinogenic effects			4.0E+02
DIMETHYLPHTHALATE	2.0E+05	noncarcinogenic effects			2.0E+05
DINITROBENZENE, 1,3-	2.0E+00	noncarcinogenic effects			2.0E+00

TABLE D-3b. RISK-BASED ACTION LEVELS FOR TAPWATER
(ug/l)

CHEMICAL PARAMETER	Lowest Tapwater Goal (ug/L	Basis	Carcinogenic Effects	Mutagenic Effects	Noncancer Effects
DINITROPHENOL, 2,4-	4.0E+01	noncarcinogenic effects			4.0E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	2.5E-01	carcinogenic effects	2.5E-01		4.0E+01
DINITROTOLUENE, 2,6- (2,6-DNT)	5.2E-02	carcinogenic effects	5.2E-02		6.0E+00
DIOXANE, 1,4-	4.6E-01	carcinogenic effects	4.6E-01		5.7E+01
DIOXINS (TEQ)	1.2E-07	carcinogenic effects	1.2E-07		1.9E-05
DIURON	4.0E+01	noncarcinogenic effects			4.0E+01
ENDOSULFAN	1.2E+02	noncarcinogenic effects			1.2E+02
ENDRIN	6.0E+00	noncarcinogenic effects			6.0E+00
ETHANOL					
ETHYLBENZENE	1.7E+00	carcinogenic effects	1.7E+00		1.0E+03
FLUORANTHENE	8.0E+02	noncarcinogenic effects			8.0E+02
FLUORENE	2.4E+02	noncarcinogenic effects			2.4E+02
GLYPHOSATE	2.0E+03	noncarcinogenic effects			2.0E+03
HEPTACHLOR	3.5E-03	carcinogenic effects	3.5E-03		1.0E+01
HEPTACHLOR EPOXIDE	1.7E-03	carcinogenic effects	1.7E-03		2.6E-01
HEXACHLOROBENZENE	9.8E-03	carcinogenic effects	9.8E-03		1.6E+01
HEXACHLOROBUTADIENE	2.0E-01	carcinogenic effects	2.0E-01		2.0E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	7.1E-02	carcinogenic effects	7.1E-02		6.0E+00
HEXACHLOROETHANE	4.0E-01	carcinogenic effects	4.0E-01		1.1E+01
HEXAZINONE	6.6E+02	noncarcinogenic effects			6.6E+02
INDENO(1,2,3-cd)PYRENE	2.9E-02	mutagenic effects	1.1E-01	2.9E-02	
ISOPHORONE	8.2E+01	carcinogenic effects	8.2E+01		4.0E+03
LEAD					
MERCURY	6.0E+00	noncarcinogenic effects			6.0E+00
METHOXYCHLOR	1.0E+02	noncarcinogenic effects			1.0E+02
METHYL ETHYL KETONE	5.6E+03	noncarcinogenic effects			5.6E+03
METHYL ISOBUTYL KETONE	6.3E+03	noncarcinogenic effects			6.3E+03
METHYL MERCURY	2.0E+00	noncarcinogenic effects			2.0E+00
METHYL TERT BUTYL ETHER	1.4E+01	carcinogenic effects	1.4E+01		6.3E+03
METHYLENE CHLORIDE	1.0E+01	mutagenic effects	3.6E+01	1.0E+01	1.1E+02
METHYLNAPHTHALENE, 1-	6.0E+00	carcinogenic effects	6.0E+00		4.1E+02
METHYLNAPHTHALENE, 2-	2.4E+01	noncarcinogenic effects			2.4E+01
MOLYBDENUM	1.0E+02	noncarcinogenic effects			1.0E+02
NAPHTHALENE	1.7E-01	carcinogenic effects	1.7E-01		6.2E+00
NICKEL	4.0E+02	noncarcinogenic effects			4.0E+02
NITROBENZENE	1.4E-01	carcinogenic effects	1.4E-01		1.3E+01
NITROGLYCERIN	2.0E+00	noncarcinogenic effects	4.6E+00		2.0E+00
NITROTOLUENE, 2-	7.9E-02	carcinogenic effects	7.9E-02		5.3E+00
NITROTOLUENE, 3-	2.0E+00	noncarcinogenic effects			2.0E+00
NITROTOLUENE, 4-	4.9E+00	carcinogenic effects	4.9E+00		8.0E+01
PENTACHLOROPHENOL	1.9E-01	carcinogenic effects	1.9E-01		1.0E+02
PENTAERYTHRITOLTETRANITRATE (PETN)	1.9E+01	carcinogenic effects	1.9E+01		4.0E+01
PERCHLORATE	1.4E+01	noncarcinogenic effects			1.4E+01
PHENANTHRENE	2.4E+02	noncarcinogenic effects			2.4E+02
PHENOL	6.0E+03	noncarcinogenic effects			6.0E+03
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-03	carcinogenic effects	7.9E-03		4.0E-01
PROPICONAZOLE	2.6E+02	noncarcinogenic effects			2.6E+02
PYRENE	1.8E+02	noncarcinogenic effects			1.8E+02
SELENIUM	1.0E+02	noncarcinogenic effects			1.0E+02
SILVER	1.0E+02	noncarcinogenic effects			1.0E+02
SIMAZINE	6.5E-01	carcinogenic effects	6.5E-01		1.0E+02
STYRENE	1.4E+03	noncarcinogenic effects			1.4E+03
TERBACIL	2.6E+02	noncarcinogenic effects			2.6E+02
tert-BUTYL ALCOHOL	5.8E+00	carcinogenic effects	5.8E+00		
TETRACHLOROETHANE, 1,1,1,2-	6.1E-01	carcinogenic effects	6.1E-01		1.8E+02
TETRACHLOROETHANE, 1,1,2,2-	7.8E-02	carcinogenic effects	7.8E-02		4.0E+02
TETRACHLOROETHYLENE	7.4E-01	carcinogenic effects	7.4E-01		4.9E+01
TETRACHLOROPHENOL, 2,3,4,6-	6.0E+02	noncarcinogenic effects			6.0E+02
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.0E+03	noncarcinogenic effects			1.0E+03
THALLIUM	2.0E-01	noncarcinogenic effects			2.0E-01
TOLUENE	1.4E+03	noncarcinogenic effects			1.4E+03
TOXAPHENE	7.1E-02	carcinogenic effects	7.1E-02		
TPH (gasolines)	3.0E+02	noncarcinogenic effects			3.0E+02
TPH (middle distillates)	1.6E+02	noncarcinogenic effects			1.6E+02
TPH (residual fuels)	2.4E+03	noncarcinogenic effects			2.4E+03
TRICHLOROBENZENE, 1,2,4-	6.0E-01	carcinogenic effects	6.0E-01		4.1E+00
TRICHLOROETHANE, 1,1,1-	8.3E+03	noncarcinogenic effects			8.3E+03
TRICHLOROETHANE, 1,1,2-	2.8E-01	carcinogenic effects	2.8E-01		4.1E-01
TRICHLOROETHYLENE	2.4E-01	mutagenic effects	7.6E-01	2.4E-01	2.9E+00
TRICHLOROPHENOL, 2,4,5-	2.0E+03	noncarcinogenic effects			2.0E+03
TRICHLOROPHENOL, 2,4,6-	7.1E+00	carcinogenic effects	7.1E+00		2.0E+01

TABLE D-3b. RISK-BASED ACTION LEVELS FOR TAPWATER
(ug/l)

CHEMICAL PARAMETER	Lowest Tapwater Goal (ug/L	Basis	Carcinogenic Effects	Mutagenic Effects	Noncancer Effects
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.0E+02	noncarcinogenic effects			2.0E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.6E+02	noncarcinogenic effects			1.6E+02
TRICHLOR+A38OPROPANE, 1,2,3-	2.0E-04	mutagenic effects	5.8E-04	2.0E-04	6.2E-01
TRICHLOROPROPENE, 1,2,3-	6.2E-01	noncarcinogenic effects			6.2E-01
TRIFLURALIN	1.0E+01	carcinogenic effects	1.0E+01		1.5E+02
TRINITROBENZENE, 1,3,5-	6.0E+02	noncarcinogenic effects			6.0E+02
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	noncarcinogenic effects			4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.6E+00	carcinogenic effects	2.6E+00		1.0E+01
VANADIUM	1.0E+02	noncarcinogenic effects			1.0E+02
VINYL CHLORIDE	2.0E-02	carcinogenic effects	2.0E-02	2.8E-02	4.7E+01
XYLENES	2.0E+02	noncarcinogenic effects			2.0E+02
ZINC	6.0E+03	noncarcinogenic effects			6.0E+03

References:

Calculated using Tap Water equations in USEPA Regional Screening Levels guidance (USEPA 2011a).

Notes:

Addresses use of water for drinking water and inhalation of volatile chemicals during showering.

Target risk = 10^{-6}. Target HQ = 1.0. See Appendix 2 for equations.

TPH (gasolines) action level rounded from 95 ug/L to 100 ug/L.

TABLE D-4a. SUMMARY OF AQUATIC HABITAT GOALS

	Estuarine		Freshwater		Marine	
CONTAMINANT	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**
ACENAPHTHENE	1.5E+01	3.2E+02	1.5E+01	5.7E+02	2.0E+01	3.2E+02
ACENAPHTHYLENE	1.3E+01	3.0E+02	1.3E+01	3.0E+02	3.1E+02	3.0E+02
ACETONE	1.5E+03	1.5E+04	1.7E+03	1.5E+04	1.5E+03	2.8E+04
ALDRIN	1.4E-04	1.3E+00	3.5E-02	3.0E+00	1.4E-04	1.3E+00
AMETRYN	7.0E+02	1.8E+03	7.0E+02	1.8E+03	7.0E+02	1.8E+03
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	1.6E+02	1.8E+01	1.6E+02	2.0E+01	1.8E+02
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	9.8E+01	1.1E+01	9.8E+01	1.1E+01	9.8E+01
ANTHRACENE	2.0E-02	1.8E-01	2.0E-02	1.8E-01	7.3E-01	1.3E+01
ANTIMONY	3.0E+01	1.8E+02	1.3E+02	3.0E+03	3.0E+01	1.8E+02
ARSENIC	3.6E+01	6.9E+01	1.9E+02	3.6E+02	3.6E+01	6.9E+01
ATRAZINE	1.2E+01	3.3E+02	1.2E+01	3.3E+02	1.2E+01	3.3E+02
BARIUM	2.2E+02	2.0E+03	2.2E+02	2.0E+03	2.2E+02	2.0E+03
BENOMYL	1.4E-01	2.8E+00	1.4E-01	2.8E+00	1.4E-01	2.8E+00
BENZENE	7.1E+01	1.7E+03	1.6E+02	1.8E+03	7.1E+01	1.7E+03
BENZO(a)ANTHRACENE	2.7E-02	3.0E+02	4.7E+00	3.0E+02	2.7E-02	3.0E+02
BENZO(a)PYRENE	6.0E-02	3.0E+02	6.0E-02	3.0E+02	3.0E-01	3.0E+02
BENZO(b)FLUORANTHENE	6.8E-01	3.0E+02	2.6E+00	3.0E+02	6.8E-01	3.0E+02
BENZO(g,h,i)PERYLENE	4.4E-01	3.0E+02	4.4E-01	3.0E+02	4.4E-01	3.0E+02
BENZO(k)FLUORANTHENE	6.4E-01	3.0E+02	6.4E-01	3.0E+02	6.4E-01	3.0E+02
BERYLLIUM	6.6E-01	3.5E+01	1.1E+01	4.3E+01	6.6E-01	3.5E+01
BIPHENYL, 1,1-	6.5E+00	2.6E+01	6.5E+00	2.6E+01	1.4E+01	2.6E+01
BIS(2-CHLOROETHYL)ETHER	2.4E+03	2.4E+04	2.4E+03	2.4E+04	2.4E+03	2.4E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	3.7E-01	3.7E-01	3.7E-01	3.7E-01	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	3.0E+00	2.7E+01	3.0E+00	2.7E+01	3.0E+00	2.7E+01
BORON	1.0E+03	3.4E+04	7.2E+03	3.4E+04	1.0E+03	3.4E+04
BROMODICHLOROMETHANE	3.4E+02	3.1E+03	3.4E+02	3.1E+03	3.4E+02	3.1E+03
BROMOFORM	2.3E+02	1.1E+03	2.3E+02	1.1E+03	3.2E+02	2.3E+03
BROMOMETHANE	1.6E+01	3.8E+01	1.6E+01	3.8E+01	1.6E+01	3.8E+01
CADMIUM	3.0E+00	3.0E+00	3.0E+00	3.0E+00	9.3E+00	4.3E+01
CARBON TETRACHLORIDE	9.8E+00	1.2E+04	7.7E+01	1.2E+04	9.8E+00	1.6E+04
CHLORDANE (TECHNICAL)	4.0E-03	9.0E-02	4.3E-03	2.4E+00	4.0E-03	9.0E-02
CHLOROANILINE, p-	1.9E+01	4.6E+02	1.9E+01	4.6E+02	1.9E+01	4.6E+02
CHLOROBENZENE	2.5E+01	2.2E+02	2.5E+01	2.2E+02	6.4E+01	1.1E+03
CHLOROETHANE	2.1E+04	2.1E+04	2.1E+04	2.1E+04	2.1E+04	2.1E+04
CHLOROFORM	2.8E+01	4.9E+02	1.4E+02	9.6E+03	2.8E+01	4.9E+02
CHLOROMETHANE	1.9E+02	1.9E+02	1.9E+02	1.9E+02	1.9E+02	1.9E+02
CHLOROPHENOL, 2-	3.2E+01	4.0E+02	3.2E+01	1.4E+03	4.0E+02	4.0E+02
CHROMIUM (Total)	1.1E+01	1.6E+01	1.1E+01	1.6E+01	5.0E+01	1.0E+03
CHROMIUM III	2.0E+01	5.7E+02	7.4E+01	5.7E+02	2.0E+01	5.7E+02
CHROMIUM VI	1.1E+01	1.6E+01	1.1E+01	1.6E+01	5.0E+01	1.1E+03

TABLE D-4a. SUMMARY OF AQUATIC HABITAT GOALS

	Estuarine		Freshwater		Marine	
CONTAMINANT	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**
CHRYSENE	2.0E+00	3.0E+02	4.7E+00	3.0E+02	2.0E+00	3.0E+02
COBALT	1.9E+01	1.2E+02	1.9E+01	1.2E+02	2.3E+01	1.5E+03
COPPER	2.9E+00	2.9E+00	6.0E+00	6.0E+00	2.9E+00	2.9E+00
CYANIDE (Free)	1.0E+00	1.0E+00	5.2E+00	2.2E+01	1.0E+00	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.9E+01	5.2E+02	7.9E+01	5.2E+02	1.9E+02	7.0E+02
DALAPON	3.0E+02	3.0E+03	3.0E+02	3.0E+03	3.0E+02	3.0E+03
DIBENZO(a,h)ANTHTRACENE	8.0E-01	3.0E+02	8.0E-01	3.0E+02	7.1E+00	3.0E+02
DIBROMO-3-CHLOROPROPANE, 1,2-	4.0E-02	4.0E-02	4.0E-02	4.0E-02	4.0E-02	4.0E-02
DIBROMOCHLOROMETHANE	3.4E+01	2.9E+03	3.2E+02	2.9E+03	3.4E+01	2.9E+03
DIBROMOETHANE, 1,2-	1.4E+03	1.4E+03	1.4E+03	1.4E+03	1.4E+03	1.4E+03
DICHLOROBENZENE, 1,2-	1.4E+01	3.7E+02	2.3E+01	3.7E+02	1.4E+01	6.6E+02
DICHLOROBENZENE, 1,3-	2.2E+01	3.7E+02	2.2E+01	3.7E+02	7.1E+01	6.6E+02
DICHLOROBENZENE, 1,4-	9.4E+00	3.7E+02	9.4E+00	3.7E+02	1.5E+01	6.6E+02
DICHLOROBENZIDINE, 3,3-	4.5E+00	4.1E+01	4.5E+00	4.1E+01	4.5E+00	4.1E+01
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E-02	1.9E-01	1.1E-02	1.9E-01	1.1E-02	1.9E-01
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.1E-01	7.0E+00	4.1E-01	7.0E+00	4.1E-01	7.0E+00
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E-03	1.3E-02	1.0E-03	1.1E+00	1.0E-03	1.3E-02
DICHLOROETHANE, 1,1-	4.7E+01	8.3E+02	4.1E+02	3.7E+03	4.7E+01	8.3E+02
DICHLOROETHANE, 1,2-	9.1E+02	3.8E+04	2.0E+03	3.9E+04	9.1E+02	3.8E+04
DICHLOROETHYLENE, 1,1-	2.5E+01	3.9E+03	1.3E+02	3.9E+03	2.5E+01	7.5E+04
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	5.5E+03	6.2E+02	5.5E+03	6.2E+02	5.5E+03
DICHLOROETHYLENE, Trans 1,2-	5.6E+02	1.0E+04	5.6E+02	1.0E+04	5.6E+02	1.0E+04
DICHLOROPHENOL, 2,4-	1.1E+01	6.7E+02	1.1E+01	6.7E+02	7.9E+02	7.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	1.3E+02	7.9E+01	1.3E+02	7.0E+01	1.3E+02
DICHLOROPROPANE, 1,2-	5.2E+02	3.4E+03	5.2E+02	7.7E+03	5.2E+02	3.4E+03
DICHLOROPROPENE, 1,3-	6.0E-02	2.6E+02	1.7E+00	2.0E+03	6.0E-02	2.6E+02
DIELDRIN	1.9E-03	7.1E-01	1.9E-03	2.5E+00	1.9E-03	7.1E-01
DIETHYLPHTHALATE	2.1E+02	9.8E+02	2.2E+02	9.8E+02	2.1E+02	1.8E+03
DIMETHYLPHENOL, 2,4-	1.2E+02	7.0E+02	1.2E+02	7.0E+02	1.2E+02	1.1E+03
DIMETHYLPHTHALATE	1.1E+03	3.2E+03	1.1E+03	3.2E+03	2.9E+03	3.2E+03
DINITROBENZENE, 1,3-	1.0E+01	1.0E+02	2.2E+01	1.0E+02	1.0E+01	1.1E+02
DINITROPHENOL, 2,4-	1.4E+01	3.8E+02	7.1E+01	3.8E+02	1.4E+01	3.8E+02
DINITROTOLUENE, 2,4- (2,4-DNT)	9.1E+00	1.1E+02	4.4E+01	1.1E+02	9.1E+00	2.0E+02
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	1.1E+02	8.1E+01	1.1E+02	8.1E+01	2.0E+02
DIOXANE, 1,4-	3.4E+05	3.4E+06	3.4E+05	3.4E+06	5.0E+05	5.0E+06
DIOXINS (TEQ)	3.1E-09	3.0E-03	3.1E-09	3.0E-03	3.1E-09	3.0E-03
DIURON	6.0E+01	2.0E+02	6.0E+01	2.0E+02	6.0E+01	5.5E+02
ENDOSULFAN	8.7E-03	3.4E-02	5.6E-02	2.2E-01	8.7E-03	3.4E-02
ENDRIN	2.3E-03	3.7E-02	2.3E-03	1.8E-01	2.3E-03	3.7E-02
ETHANOL						

TABLE D-4a. SUMMARY OF AQUATIC HABITAT GOALS

	Estuarine		Freshwater		Marine	
CONTAMINANT	Chronic Aquatic Toxicity (ug/L)	Acute Aquatic Toxicity (ug/L)	Chronic Aquatic Toxicity (ug/L)	Acute Aquatic Toxicity (ug/L)	Chronic Aquatic Toxicity (ug/L)	Acute Aquatic Toxicity (ug/L)
ETHYLBENZENE	7.3E+00	1.4E+02	6.1E+01	1.1E+04	7.3E+00	1.4E+02
FLUORANTHENE	8.0E-01	1.3E+01	8.0E-01	1.3E+03	7.1E+00	1.3E+01
FLUORENE	3.9E+00	3.0E+02	1.9E+01	3.0E+02	3.9E+00	3.0E+02
GLYPHOSATE	1.8E+03	2.2E+04	1.8E+03	2.2E+04	1.8E+03	2.2E+04
HEPTACHLOR	3.6E-03	5.3E-02	3.8E-03	5.2E-01	3.6E-03	5.3E-02
HEPTACHLOR EPOXIDE	3.6E-03	5.3E-02	3.8E-03	5.2E-01	3.6E-03	5.3E-02
HEXACHLOROBENZENE	3.0E-04	3.0E-04	3.0E-04	3.0E-04	3.0E-04	3.0E-04
HEXACHLOROBUTADIENE	3.0E-01	1.1E+01	1.0E+00	3.0E+01	3.0E-01	1.1E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	6.3E-02	1.6E-01	8.0E-02	2.0E+00	6.3E-02	1.6E-01
HEXACHLOROETHANE	1.2E+01	3.1E+02	1.2E+01	3.3E+02	1.2E+01	3.1E+02
HEXAZINONE	1.7E+04	1.4E+05	1.7E+04	1.4E+05	1.7E+04	1.4E+05
INDENO(1,2,3-cd)PYRENE	2.8E-01	3.0E+02	2.8E-01	3.0E+02	2.8E-01	3.0E+02
ISOPHORONE	9.2E+02	4.3E+03	9.2E+02	3.9E+04	9.2E+02	4.3E+03
LEAD	5.6E+00	2.9E+01	2.9E+01	2.9E+01	5.6E+00	1.4E+02
MERCURY	2.5E-02	2.1E+00	5.5E-01	2.4E+00	2.5E-02	2.1E+00
METHOXYCHLOR	3.0E-02	7.0E-01	3.0E-02	7.0E-01	3.0E-02	7.0E-01
METHYL ETHYL KETONE	1.4E+04	2.0E+05	2.2E+04	2.0E+05	1.4E+04	2.4E+05
METHYL ISOBUTYL KETONE	1.7E+02	2.2E+03	1.7E+02	2.2E+03	1.7E+02	2.2E+03
METHYL MERCURY	2.8E-03	9.9E-02	2.8E-03	9.9E-02	2.8E-03	9.9E-02
METHYL TERT BUTYL ETHER	7.3E+02	6.5E+03	7.3E+02	6.5E+03	1.8E+04	5.3E+04
METHYLENE CHLORIDE	1.5E+03	8.5E+03	1.5E+03	8.5E+03	2.2E+03	2.6E+04
METHYLNAPHTHALENE, 1-	2.1E+00	3.7E+01	2.1E+00	3.7E+01	2.1E+00	3.7E+01
METHYLNAPHTHALENE, 2-	4.7E+00	4.2E+01	4.7E+00	4.2E+01	7.2E+01	8.6E+01
MOLYBDENUM	3.7E+02	7.2E+03	8.0E+02	7.2E+03	3.7E+02	1.6E+04
NAPHTHALENE	1.2E+01	7.7E+02	2.1E+01	7.7E+02	1.2E+01	7.8E+02
NICKEL	5.0E+00	5.0E+00	5.0E+00	5.0E+00	8.3E+00	7.5E+01
NITROBENZENE	3.8E+02	2.0E+03	3.8E+02	9.0E+03	3.8E+02	2.0E+03
NITROGLYCERIN	1.8E+01	1.6E+02	1.8E+01	1.6E+02	1.8E+01	1.6E+02
NITROTOLUENE, 2-	7.1E+01	6.4E+02	7.1E+01	6.4E+02	7.1E+01	6.4E+02
NITROTOLUENE, 3-	4.2E+01	3.8E+02	4.2E+01	3.8E+02	4.2E+01	3.8E+02
NITROTOLUENE, 4-	4.6E+01	4.1E+02	4.6E+01	4.1E+02	4.6E+01	4.1E+02
PENTACHLOROPHENOL	7.9E+00	1.3E+01	1.3E+01	2.0E+01	7.9E+00	1.3E+01
PENTAERYTHRITOLTETRANITRATE (PETN)	8.5E+05	8.5E+05	8.5E+05	8.5E+05	8.5E+05	8.5E+05
PERCHLORATE	6.0E+02	5.0E+03	6.0E+02	5.0E+03	6.0E+02	5.0E+03
PHENANTHRENE	2.3E+00	3.0E+02	2.3E+00	3.0E+02	4.6E+00	3.0E+02
PHENOL	5.8E+01	3.0E+02	1.6E+02	4.7E+03	5.8E+01	3.0E+02
POLYCHLORINATED BIPHENYLS (PCBs)	1.4E-02	2.0E+00	1.4E-02	2.0E+00	3.0E-02	1.0E+01
PROPICONAZOLE	9.5E+01	4.3E+02	9.5E+01	4.3E+02	9.5E+01	4.3E+02
PYRENE	4.6E+00	3.0E+02	4.6E+00	3.0E+02	1.0E+01	3.0E+02
SELENIUM	5.0E+00	2.0E+01	5.0E+00	2.0E+01	7.1E+01	3.0E+02

TABLE D-4a. SUMMARY OF AQUATIC HABITAT GOALS

	Estuarine		Freshwater		Marine	
CONTAMINANT	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**	**Chronic Aquatic Toxicity (ug/L)**	**Acute Aquatic Toxicity (ug/L)**
SILVER	1.0E-01	1.0E+00	1.0E+00	1.0E+00	1.0E-01	2.3E+00
SIMAZINE	9.0E+00	8.0E+01	9.0E+00	8.0E+01	9.0E+00	8.0E+01
STYRENE	3.2E+01	2.9E+02	3.2E+01	2.9E+02	3.2E+01	2.9E+02
TERBACIL	2.6E+02	2.6E+02	1.2E+03	2.3E+04	2.6E+02	2.6E+02
tert-BUTYL ALCOHOL	1.8E+04	1.8E+05	1.8E+04	1.8E+05	1.8E+04	1.8E+05
TETRACHLOROETHANE, 1,1,1,2-	1.1E+01	7.7E+02	8.5E+01	3.1E+03	1.1E+01	7.7E+02
TETRACHLOROETHANE, 1,1,2,2-	2.0E+02	9.1E+02	2.0E+02	9.1E+02	6.1E+02	3.0E+03
TETRACHLOROETHYLENE	5.3E+01	1.8E+03	5.3E+01	1.8E+03	1.5E+02	3.4E+03
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	1.1E+01	1.2E+00	1.1E+01	1.2E+00	1.1E+01
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	1.2E+03	2.2E+02	1.2E+03	3.3E+02	1.9E+03
THALLIUM	6.0E+00	4.7E+02	6.0E+00	4.7E+02	1.2E+01	7.1E+02
TOLUENE	9.8E+00	2.1E+03	6.2E+01	5.8E+03	9.8E+00	2.1E+03
TOXAPHENE	2.0E-04	2.1E-01	2.0E-04	7.3E-01	2.0E-04	2.1E-01
TPH (gasolines)	5.0E+02	5.0E+03	5.0E+02	5.0E+03	3.7E+03	5.0E+03
TPH (middle distillates)	6.4E+02	2.5E+03	6.4E+02	2.5E+03	6.4E+02	2.5E+03
TPH (residual fuels)	6.4E+02	2.5E+03	6.4E+02	2.5E+03	6.4E+02	2.5E+03
TRICHLOROBENZENE, 1,2,4-	1.1E+02	4.2E+02	1.3E+02	4.2E+02	1.1E+02	7.0E+02
TRICHLOROETHANE, 1,1,1-	1.1E+01	6.0E+03	7.6E+01	6.0E+03	1.1E+01	1.0E+04
TRICHLOROETHANE, 1,1,2-	7.3E+02	5.2E+03	7.3E+02	6.0E+03	1.2E+03	5.2E+03
TRICHLOROETHYLENE	4.7E+01	7.0E+02	2.0E+02	1.5E+04	4.7E+01	7.0E+02
TRICHLOROPHENOL, 2,4,5-	1.9E+00	1.7E+01	1.9E+00	1.7E+01	1.2E+01	2.6E+02
TRICHLOROPHENOL, 2,4,6-	4.9E+00	3.9E+01	4.9E+00	3.9E+01	6.5E+00	3.9E+01
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	6.9E+02	6.9E+02	6.9E+02	6.9E+02	6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	2.7E+02	3.0E+01	2.7E+02	5.0E+01	2.7E+02
TRICHLOROPROPANE, 1,2,3-	1.4E+01	1.4E+02	1.4E+01	1.4E+02	1.4E+01	1.4E+02
TRICHLOROPROPENE, 1,2,3-	6.2E-01	6.2E-01	6.2E-01	6.2E-01	6.2E-01	6.2E-01
TRIFLURALIN	1.1E+00	2.1E+01	1.1E+00	2.1E+01	1.1E+00	2.1E+01
TRINITROBENZENE, 1,3,5-	1.0E+01	2.7E+01	1.1E+01	2.7E+01	1.0E+01	3.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	4.0E+01	4.0E+01	4.0E+01	4.0E+01	4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.3E+01	2.1E+02	1.3E+01	2.1E+02	9.0E+01	5.7E+02
VANADIUM	2.7E+01	9.0E+01	2.7E+01	1.2E+02	8.1E+01	9.0E+01
VINYL CHLORIDE	9.3E+02	8.4E+03	9.3E+02	8.4E+03	9.3E+02	8.4E+03
XYLENES	1.3E+01	2.3E+02	2.7E+01	2.4E+02	1.3E+01	2.3E+02
ZINC	2.2E+01	2.2E+01	2.2E+01	2.2E+01	8.6E+01	9.5E+01

Notes:

Reference: Appendix 1, Table D-4b (chronic) and D-4c (acute).

Aquatic goals for estuarine environments based on lowest of lowest of freshwater and marine goals.

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	[1]Estuarine Aquatic Habitat Goal (ug/L)	Basis	Lowest Freshwater Aquatic Habitat Goal (ug/L)	Basis	Lowest Marine Aquatic Habitat Goal (ug/L)
ACENAPHTHENE	1.5E+01	USEPA Chronic FW	1.5E+01	USEPA Chronic FW	2.0E+01
ACENAPHTHYLENE	1.3E+01	USEPA Chronic FW	1.3E+01	USEPA Chronic FW	3.1E+02
ACETONE	1.5E+03	USEPA Chronic SW	1.7E+03	USEPA Chronic FW	1.5E+03
ALDRIN	1.4E-04	USEPA Chronic SW	3.5E-02	USEPA Chronic FW	1.4E-04
AMETRYN	7.0E+02	USEPA Off Pesticides (FW)	7.0E+02	USEPA Off Pesticides	7.0E+02
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	USEPA Chronic FW	1.8E+01	USEPA Chronic FW	2.0E+01
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	USEPA Reg IV (FW)	1.1E+01	USEPA Chronic FW	1.1E+01
ANTHRACENE	2.0E-02	USEPA Chronic FW	2.0E-02	USEPA Chronic FW	7.3E-01
ANTIMONY	3.0E+01	USEPA Chronic SW	1.3E+02	USEPA Chronic FW	3.0E+01
ARSENIC	3.6E+01	Hawaii Chronic SW WQS	1.9E+02	Hawaii Chronic FW WQS	3.6E+01
ATRAZINE	1.2E+01	USEPA Reg IV (FW)	1.2E+01	USEPA Chronic FW	1.2E+01
BARIUM	2.2E+02	USEPA Chronic SW	2.2E+02	USEPA Chronic FW	2.2E+02
BENOMYL	1.4E-01	5% USGS 2012 FW acute	1.4E-01	5% USGS 2012 acute	1.4E-01
BENZENE	7.1E+01	USEPA Chronic SW	1.6E+02	USEPA Chronic FW	7.1E+01
BENZO(a)ANTHRACENE	2.7E-02	USEPA Chronic SW	4.7E+00	USEPA Chronic FW	2.7E-02
BENZO(a)PYRENE	6.0E-02	USEPA Chronic FW	6.0E-02	USEPA Chronic FW	3.0E-01
BENZO(b)FLUORANTHENE	6.8E-01	USEPA Chronic SW	2.6E+00	USEPA Chronic FW	6.8E-01
BENZO(g,h,i)PERYLENE	4.4E-01	USEPA Chronic SW	4.4E-01	USEPA Chronic FW	4.4E-01
BENZO(k)FLUORANTHENE	6.4E-01	USEPA Chronic SW	6.4E-01	USEPA Chronic FW	6.4E-01
BERYLLIUM	6.6E-01	USEPA Chronic SW	1.1E+01	USEPA Chronic FW	6.6E-01
BIPHENYL, 1,1-	6.5E+00	USEPA Chronic FW	6.5E+00	USEPA Chronic FW	1.4E+01
BIS(2-CHLOROETHYL)ETHER	2.4E+03	USDOE Chronic (FW)	2.4E+03	USDOE Chronic	2.4E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	=Drinking Water Toxicity	3.7E-01	=Drinking Water Toxicity)	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	3.0E+00	USEPA Chronic SW	3.0E+00	USEPA Chronic FW	3.0E+00
BORON	1.0E+03	USEPA Chronic SW	7.2E+03	USEPA Chronic FW	1.0E+03
BROMODICHLOROMETHANE	3.4E+02	USEPA Reg IV (FW)	3.4E+02	USEPA Chronic FW	3.4E+02
BROMOFORM	2.3E+02	USEPA Chronic FW	2.3E+02	USEPA Chronic FW	3.2E+02
BROMOMETHANE	1.6E+01	USEPA Reg IV (FW)	1.6E+01	USEPA Chronic FW	1.6E+01
CADMIUM	3.0E+00	Hawaii Chronic FW WQS	3.0E+00	Hawaii Chronic FW WQS	9.3E+00
CARBON TETRACHLORIDE	9.8E+00	USEPA Chronic SW	7.7E+01	USEPA Chronic FW	9.8E+00
CHLORDANE (TECHNICAL)	4.0E-03	Hawaii Chronic SW WQS	4.3E-03	Hawaii Chronic FW WQS	4.0E-03
CHLOROANILINE, p-	1.9E+01	USEPA Reg IV (FW)	1.9E+01	USEPA Chronic FW	1.9E+01
CHLOROBENZENE	2.5E+01	USEPA Chronic FW	2.5E+01	USEPA Chronic FW	6.4E+01

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	[1]Estuarine Aquatic Habitat Goal (ug/L)	Basis	Lowest Freshwater Aquatic Habitat Goal (ug/L)	Basis	Lowest Marine Aquatic Habitat Goal (ug/L)
CHLOROETHANE	2.1E+04	=Drinking Water Toxicity	2.1E+04	=Drinking Water Toxicity)	2.1E+04
CHLOROFORM	2.8E+01	USEPA Chronic SW	1.4E+02	USEPA Chronic FW	2.8E+01
CHLOROMETHANE	1.9E+02	=Drinking Water Toxicity	1.9E+02	=Drinking Water Toxicity)	1.9E+02
CHLOROPHENOL, 2-	3.2E+01	USEPA Chronic FW	3.2E+01	USEPA Chronic FW	4.0E+02
CHROMIUM (Total)	1.1E+01	Reg IV Cr VI	1.1E+01	Reg IV Cr VI	5.0E+01
CHROMIUM III	2.0E+01	USEPA Chronic SW	7.4E+01	USEPA Chronic FW	2.0E+01
CHROMIUM VI	1.1E+01	Hawaii Chronic FW WQS	1.1E+01	Hawaii Chronic FW WQS	5.0E+01
CHRYSENE	2.0E+00	USEPA Chronic SW	4.7E+00	USEPA Chronic FW	2.0E+00
COBALT	1.9E+01	USEPA Chronic FW	1.9E+01	USEPA Chronic FW	2.3E+01
COPPER	2.9E+00	Hawaii Chronic SW WQS	6.0E+00	Hawaii Chronic FW WQS	2.9E+00
CYANIDE (Free)	1.0E+00	Hawaii Chronic SW WQS	5.2E+00	Hawaii Chronic FW WQS	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.9E+01	USEPA Chronic FW	7.9E+01	USEPA Chronic FW	1.9E+02
DALAPON	3.0E+02	USEPA AQUIRE (5% FW LC50)	3.0E+02	USEPA AQUIRE (5% FW LC50)	3.0E+02
DIBENZO(a,h)ANTHTRACENE	8.0E-01	USEPA Chronic FW	8.0E-01	USEPA Chronic FW	7.1E+00
DIBROMO,1,2- CHLOROPROPANE,3-	4.0E-02	=Drinking Water Toxicity	4.0E-02	=Drinking Water Toxicity)	4.0E-02
DIBROMOCHLOROMETHANE	3.4E+01	USEPA Chronic SW	3.2E+02	USEPA Chronic FW	3.4E+01
DIBROMOETHANE, 1,2-	1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03
DICHLOROBENZENE, 1,2-	1.4E+01	USEPA Chronic SW	2.3E+01	USEPA Chronic FW	1.4E+01
DICHLOROBENZENE, 1,3-	2.2E+01	USEPA Chronic FW	2.2E+01	USEPA Chronic FW	7.1E+01
DICHLOROBENZENE, 1,4-	9.4E+00	USEPA Chronic FW	9.4E+00	USEPA Chronic FW	1.5E+01
DICHLOROBENZIDINE, 3,3-	4.5E+00	USEPA Reg IV (FW)	4.5E+00	USEPA Chronic FW	4.5E+00
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E-02	USEPA Chronic SW	1.1E-02	USEPA Chronic FW	1.1E-02
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.1E-01	USEPA Reg IV (FW)	4.1E-01	USEPA Chronic FW	4.1E-01
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E-03	Hawaii Chronic SW WQS	1.0E-03	Hawaii Chronic FW WQS	1.0E-03
DICHLOROETHANE, 1,1-	4.7E+01	USEPA Chronic SW	4.1E+02	USEPA Chronic FW	4.7E+01
DICHLOROETHANE, 1,2-	9.1E+02	USEPA Chronic SW	2.0E+03	USEPA Chronic FW	9.1E+02
DICHLOROETHYLENE, 1,1-	2.5E+01	USEPA Chronic SW	1.3E+02	USEPA Chronic FW	2.5E+01
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	USEPA Reg IV (FW)	6.2E+02	USEPA Chronic FW	6.2E+02
DICHLOROETHYLENE, Trans 1,2-	5.6E+02	USEPA Reg IV (FW)	5.6E+02	USEPA Chronic FW	5.6E+02
DICHLOROPHENOL, 2,4-	1.1E+01	USEPA Chronic FW	1.1E+01	USEPA Chronic FW	7.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.0E+01	USEPA Chronic SW	7.9E+01	USEPA Chronic FW	7.0E+01
DICHLOROPROPANE, 1,2-	5.2E+02	USEPA Reg IV (FW)	5.2E+02	USEPA Chronic FW	5.2E+02
DICHLOROPROPENE, 1,3-	6.0E-02	USEPA Chronic SW	1.7E+00	USEPA Chronic FW	6.0E-02

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	[1]Estuarine Aquatic Habitat Goal (ug/L)	Basis	Lowest Freshwater Aquatic Habitat Goal (ug/L)	Basis	Lowest Marine Aquatic Habitat Goal (ug/L)
DIELDRIN	1.9E-03	Hawaii Chronic SW WQS	1.9E-03	Hawaii Chronic FW WQS	1.9E-03
DIETHYLPHTHALATE	2.1E+02	USEPA Chronic SW	2.2E+02	USEPA Chronic FW	2.1E+02
DIMETHYLPHENOL, 2,4-	1.2E+02	USEPA Reg IV (FW)	1.2E+02	USEPA Chronic FW	1.2E+02
DIMETHYLPHTHALATE	1.1E+03	USEPA Chronic FW	1.1E+03	USEPA Chronic FW	2.9E+03
DINITROBENZENE, 1,3-	1.0E+01	USEPA Chronic SW	2.2E+01	USEPA Chronic FW	1.0E+01
DINITROPHENOL, 2,4-	1.4E+01	USEPA Chronic SW	7.1E+01	USEPA Chronic FW	1.4E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	9.1E+00	USEPA Chronic SW	4.4E+01	USEPA Chronic FW	9.1E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	USEPA Reg IV (FW)	8.1E+01	USEPA Chronic FW	8.1E+01
DIOXANE, 1,4-	3.4E+05	Mohr (5% Acute FW LC 50)	3.4E+05	Mohr (5% Acute FW LC 50)	5.0E+05
DIOXINS (TEQ)	3.1E-09	USEPA Reg IV (FW)	3.1E-09	USEPA Chronic FW	3.1E-09
DIURON	6.0E+01	USEPA AQUIRE (50% FW EC50)	6.0E+01	USEPA AQUIRE (50% FW EC50)	6.0E+01
ENDOSULFAN	8.7E-03	Hawaii Chronic SW WQS	5.6E-02	Hawaii Chronic FW WQS	8.7E-03
ENDRIN	2.3E-03	Hawaii Chronic SW WQS	2.3E-03	Hawaii Chronic FW WQS	2.3E-03
ETHANOL		not available		not available	
ETHYLBENZENE	7.3E+00	USEPA Chronic SW	6.1E+01	USEPA Chronic FW	7.3E+00
FLUORANTHENE	8.0E-01	USEPA Chronic FW	8.0E-01	USEPA Chronic FW	7.1E+00
FLUORENE	3.9E+00	USEPA Chronic SW	1.9E+01	USEPA Chronic FW	3.9E+00
GLYPHOSATE	1.8E+03	USEPA Off Pesticides (FW)	1.8E+03	USEPA Off Pesticides	1.8E+03
HEPTACHLOR	3.6E-03	Hawaii Chronic SW WQS	3.8E-03	Hawaii Chronic FW WQS	3.6E-03
HEPTACHLOR EPOXIDE	3.6E-03	USEPA Chronic SW	3.8E-03	USEPA Chronic FW	3.6E-03
HEXACHLOROBENZENE	3.0E-04	USEPA Reg IV (FW)	3.0E-04	USEPA Chronic FW	3.0E-04
HEXACHLOROBUTADIENE	3.0E-01	USEPA Chronic SW	1.0E+00	USEPA Chronic FW	3.0E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	6.3E-02	USEPA Chronic SW	8.0E-02	Hawaii Chronic FW WQS	6.3E-02
HEXACHLOROETHANE	1.2E+01	USEPA Chronic SW	1.2E+01	USEPA Chronic FW	1.2E+01
HEXAZINONE	1.7E+04	USEPA Off Pesticides (FW)	1.7E+04	USEPA Off Pesticides	1.7E+04
INDENO(1,2,3-cd)PYRENE	2.8E-01	USEPA Chronic SW	2.8E-01	USEPA Chronic FW	2.8E-01
ISOPHORONE	9.2E+02	USEPA Reg IV (FW)	9.2E+02	USEPA Chronic FW	9.2E+02
LEAD	5.6E+00	Hawaii Chronic SW WQS	2.9E+01	Hawaii Chronic FW WQS	5.6E+00
MERCURY	2.5E-02	Hawaii Chronic SW WQS	5.5E-01	Hawaii Chronic FW WQS	2.5E-02
METHOXYCHLOR	3.0E-02	Hawaii Chronic SW WQS	3.0E-02	Hawaii Chronic FW WQS	3.0E-02
METHYL ETHYL KETONE	1.4E+04	USEPA Chronic SW	2.2E+04	USEPA Chronic FW	1.4E+04
METHYL ISOBUTYL KETONE	1.7E+02	USEPA Chronic SW	1.7E+02	USEPA Chronic FW	1.7E+02
METHYL MERCURY	2.8E-03	USEPA Chronic SW	2.8E-03	USEPA Chronic FW	2.8E-03

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	[1]Estuarine Aquatic Habitat Goal (ug/L)	Basis	Lowest Freshwater Aquatic Habitat Goal (ug/L)	Basis	Lowest Marine Aquatic Habitat Goal (ug/L)
METHYL TERT BUTYL ETHER	7.3E+02	USEPA Chronic FW	7.3E+02	USEPA Chronic FW	1.8E+04
METHYLENE CHLORIDE	1.5E+03	USEPA Chronic FW	1.5E+03	USEPA Chronic FW	2.2E+03
METHYLNAPHTHALENE, 1-	2.1E+00	USEPA Chronic SW	2.1E+00	USEPA Chronic FW	2.1E+00
METHYLNAPHTHALENE, 2-	4.7E+00	USEPA Chronic FW	4.7E+00	USEPA Chronic FW	7.2E+01
MOLYBDENUM	3.7E+02	USEPA Chronic SW	8.0E+02	USEPA Chronic FW	3.7E+02
NAPHTHALENE	1.2E+01	USEPA Chronic SW	2.1E+01	USEPA Chronic FW	1.2E+01
NICKEL	5.0E+00	Hawaii Chronic FW WQS	5.0E+00	Hawaii Chronic FW WQS	8.3E+00
NITROBENZENE	3.8E+02	USEPA Reg IV (FW)	3.8E+02	USEPA Chronic FW	3.8E+02
NITROGLYCERIN	1.8E+01	USEPA Reg IV (FW)	1.8E+01	USEPA Chronic FW	1.8E+01
NITROTOLUENE, 2-	7.1E+01	USEPA Reg IV (FW)	7.1E+01	USEPA Chronic FW	7.1E+01
NITROTOLUENE, 3-	4.2E+01	USEPA Reg IV (FW)	4.2E+01	USEPA Chronic FW	4.2E+01
NITROTOLUENE, 4-	4.6E+01	USEPA Reg IV (FW)	4.6E+01	USEPA Chronic FW	4.6E+01
PENTACHLOROPHENOL	7.9E+00	USEPA Chronic SW	1.3E+01	Hawaii Chronic FW WQS	7.9E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	8.5E+05	Pascoe et al. (chronic FW)	8.5E+05	Pascoe et al. (chronic FW)	8.5E+05
PERCHLORATE	6.0E+02	USEPA 2002	6.0E+02	USEPA 2002	6.0E+02
PHENANTHRENE	2.3E+00	USEPA Chronic FW	2.3E+00	USEPA Chronic FW	4.6E+00
PHENOL	5.8E+01	USEPA Chronic SW	1.6E+02	USEPA Chronic FW	5.8E+01
POLYCHLORINATED BIPHENYLS (PCBs)	1.4E-02	Hawaii Chronic FW WQS	1.4E-02	Hawaii Chronic FW WQS	3.0E-02
PROPICONAZOLE	9.5E+01	USEPA Off Pesticides (FW)	9.5E+01	USEPA Off Pesticides	9.5E+01
PYRENE	4.6E+00	USEPA Chronic FW	4.6E+00	USEPA Chronic FW	1.0E+01
SELENIUM	5.0E+00	Hawaii Chronic FW WQS	5.0E+00	Hawaii Chronic FW WQS	7.1E+01
SILVER	1.0E-01	USEPA Chronic SW	1.0E+00	Hawaii Chronic FW WQS	1.0E-01
SIMAZINE	9.0E+00	USEPA Reg IV (FW)	9.0E+00	USEPA Chronic FW	9.0E+00
STYRENE	3.2E+01	USEPA Reg IV (FW)	3.2E+01	USEPA Chronic FW	3.2E+01
TERBACIL	2.6E+02	=Drinking Water Toxicity	1.2E+03	USEPA Off Pesticides	2.6E+02
tert-BUTYL ALCOHOL	1.8E+04	USEPA AQUIRE (10% FW LC0)	1.8E+04	USEPA AQUIRE (10% FW LC0)	1.8E+04
TETRACHLOROETHANE, 1,1,1,2-	1.1E+01	USEPA Chronic SW	8.5E+01	USEPA Chronic FW	1.1E+01
TETRACHLOROETHANE, 1,1,2,2-	2.0E+02	USEPA Chronic FW	2.0E+02	USEPA Chronic FW	6.1E+02
TETRACHLOROETHYLENE	5.3E+01	USEPA Chronic FW	5.3E+01	USEPA Chronic FW	1.5E+02
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	USEPA Reg IV (FW)	1.2E+00	USEPA Chronic FW	1.2E+00
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	USEPA Chronic FW	2.2E+02	USEPA Chronic FW	3.3E+02
THALLIUM	6.0E+00	USEPA Chronic FW	6.0E+00	USEPA Chronic FW	1.2E+01
TOLUENE	9.8E+00	USEPA Chronic SW	6.2E+01	USEPA Chronic FW	9.8E+00

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	[1]Estuarine Aquatic Habitat Goal (ug/L)	Basis	Lowest Freshwater Aquatic Habitat Goal (ug/L)	Basis	Lowest Marine Aquatic Habitat Goal (ug/L)
TOXAPHENE	2.0E-04	Hawaii Chronic SW WQS	2.0E-04	Hawaii Chronic FW WQS	2.0E-04
TPH (gasolines)	5.0E+02	CalEPA FW Chronic	5.0E+02	CalEPA FW Chronic	3.7E+03
TPH (middle distillates)	6.4E+02	CalEPA Chronic (FW)	6.4E+02	CalEPA FW Chronic	6.4E+02
TPH (residual fuels)	6.4E+02	CalEPA Chronic (FW)	6.4E+02	CaEPA FW Chronic	6.4E+02
TRICHLOROBENZENE, 1,2,4-	1.1E+02	USEPA Chronic SW	1.3E+02	USEPA Chronic FW	1.1E+02
TRICHLOROETHANE, 1,1,1-	1.1E+01	USEPA Chronic SW	7.6E+01	USEPA Chronic FW	1.1E+01
TRICHLOROETHANE, 1,1,2-	7.3E+02	USEPA Chronic FW	7.3E+02	USEPA Chronic FW	1.2E+03
TRICHLOROETHYLENE	4.7E+01	USEPA Chronic SW	2.0E+02	USEPA Chronic FW	4.7E+01
TRICHLOROPHENOL, 2,4,5-	1.9E+00	USEPA Chronic FW	1.9E+00	USEPA Chronic FW	1.2E+01
TRICHLOROPHENOL, 2,4,6-	4.9E+00	USEPA Chronic FW	4.9E+00	USEPA Chronic FW	6.5E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	USEPA Reg. V FW Chronic	6.9E+02	USEPA Reg. V FW Chronic	6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	USEPA Chronic FW	3.0E+01	USEPA Chronic FW	5.0E+01
TRICHLOROPROPANE, 1,2,3-	1.4E+01	USEPA AQUIRE (50% FW EC50)	1.4E+01	USEPA AQUIRE (50% FW EC50)	1.4E+01
TRICHLOROPROPENE, 1,2,3-	6.2E-01	=Drinking Water Toxicity	6.2E-01	=Drinking Water Toxicity)	6.2E-01
TRIFLURALIN	1.1E+00	USEPA Reg IV (FW)	1.1E+00	USEPA Chronic FW	1.1E+00
TRINITROBENZENE, 1,3,5-	1.0E+01	USEPA Chronic SW	1.1E+01	USEPA Chronic FW	1.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	=Drinking Water Toxicity	4.0E+01	=Drinking Water Toxicity)	4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	1.3E+01	USEPA Chronic FW	1.3E+01	USEPA Chronic FW	9.0E+01
VANADIUM	2.7E+01	USEPA Chronic FW	2.7E+01	USEPA Chronic FW	8.1E+01

TABLE D-4b. SUMMARY OF SELECTED CHRONIC AQUATIC HABITAT GOALS

	[1]Aquatic Habitat Goals				
CHEMICAL PARAMETER	**[1]Estuarine Aquatic Habitat Goal (ug/L)**	**Basis**	**Lowest Freshwater Aquatic Habitat Goal (ug/L)**	**Basis**	**Lowest Marine Aquatic Habitat Goal (ug/L)**
VINYL CHLORIDE	9.3E+02	USEPA Reg. IV SW Chronic	9.3E+02	USEPA Chronic FW	9.3E+02
XYLENES	1.3E+01	USEPA Chronic SW	2.7E+01	USEPA Chronic FW	1.3E+01
ZINC	2.2E+01	Hawaii Chronic FW WQS	2.2E+01	Hawaii Chronic FW WQS	8.6E+01

Notes:

1. Refer to Table D-4d and D-4e for summary of aquatic habitat goal sources. Used for selection of groundwater action levels.
2. Estuarine Goal = Lowest of Freshwater vs Saltwater chronic goals.
3. Drinking water goal substituted as aquatic habitat goal if latter was not available (see text).

Basis
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Off Pesticides (FW)
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Reg IV (FW)
USEPA Chronic SW
5% USGS 2012 FW acute
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USDOE Chronic (FW)
=Drinking Water Toxicity
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Reg IV (FW)
Hawaii Chronic SW WQS
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Reg IV (FW)
USEPA Chronic SW

Basis
=Drinking Water Toxicity
USEPA Chronic SW
=Drinking Water Toxicity
USEPA Chronic SW
Reg IV Cr VI
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Chronic SW
Hawaii Chronic SW WQS
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA AQUIRE (5% FW LC50)
USEPA Chronic SW
=Drinking Water Toxicity
USEPA Chronic SW
50% MOEE FW Chronic AWQC
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Reg IV (FW)
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW

Basis
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg IV (FW)
Mohr (5% Acute SW LC 50)
USEPA Reg IV (FW)
USEPA AQUIRE (50% FW EC50)
Hawaii Chronic SW WQS
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Off Pesticides (FW)
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Off Pesticides (FW)
USEPA Chronic SW
USEPA Reg IV (FW)
Hawaii Chronic SW WQS
Hawaii Chronic SW WQS
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW

Basis
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Reg IV (FW)
USEPA Reg IV (FW)
USEPA Reg IV (FW)
USEPA Reg IV (FW)
USEPA Reg IV (FW)
USEPA Chronic SW
Pascoe et al. (chronic FW)
USEPA 2002
USEPA Chronic SW
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Off Pesticides (FW)
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Chronic SW
USEPA Reg IV (FW)
USEPA Reg IV (FW)
=Drinking Water Toxicity
USEPA AQUIRE (10% FW LC0)
USEPA Chronic SW
USEPA Chronic SW
Hawaii Chronic SW WQS
USEPA Reg IV (FW)
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW

Basis
Hawaii Chronic SW WQS
CalEPA Chronic (SW)
CalEPA Chronic (FW)
CalEPA Chronic (FW)
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Chronic SW
USEPA Reg. V FW Chronic
USEPA Chronic SW
USEPA AQUIRE (50% FW EC50)
=Drinking Water Toxicity
USEPA Reg IV (FW)
USEPA Chronic SW
=Drinking Water Toxicity
USEPA Chronic SW
USEPA Chronic SW

Basis
USEPA Reg. IV SW Chronic
USEPA Chronic SW
Hawaii Chronic SW WQS

TABLE D-4c. SUMMARY OF SELECTED ACUTE AQUATIC HABITAT GOALS

CONTAMINANT	[1]Aquatic Habitat Goals					
	[1]Estuarine Acute Aquatic Habitat Goal (ug/L)	Basis	Freshwater Acute Aquatic Habitat Goal (ug/L)	Basis	Saltwater Acute Aquatic Habitat Goal (ug/L)	Basis
ACENAPHTHENE	3.2E+02	Hawaii Acute SW WQS	5.7E+02	Hawaii Acute FW WQS	3.2E+02	Hawaii Acute SW WQS
ACENAPHTHYLENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
ACETONE	1.5E+04	USEPA Acute FW	1.5E+04	USEPA Acute FW	2.8E+04	USEPA Acute SW
ALDRIN	1.3E+00	Hawaii Acute SW WQS	3.0E+00	Hawaii Acute FW WQS	1.3E+00	Hawaii Acute SW WQS
AMETRYN	1.8E+03	USEPA Off Pesticides (FW)	1.8E+03	USEPA Off Pesticides	1.8E+03	USEPA Off Pesticides (FW)
AMINO,2- DINITROTOLUENE,4,6-	1.6E+02	USEPA Acute FW	1.6E+02	USEPA Acute FW	1.8E+02	USEPA Acute SW
AMINO,4- DINITROTOLUENE,2,6-	9.8E+01	USEPA Reg IV (FW)	9.8E+01	USEPA Acute FW	9.8E+01	USEPA Reg IV (FW)
ANTHRACENE	1.8E-01	USEPA Acute FW	1.8E-01	USEPA Acute FW	1.3E+01	USEPA Acute SW
ANTIMONY	1.8E+02	USEPA Acute SW	3.0E+03	Hawaii Acute FW WQS	1.8E+02	USEPA Acute SW
ARSENIC	6.9E+01	Hawaii Acute SW WQS	3.6E+02	Hawaii Acute FW WQS	6.9E+01	Hawaii Acute SW WQS
ATRAZINE	3.3E+02	USEPA Reg IV (FW)	3.3E+02	USEPA Acute FW	3.3E+02	USEPA Reg IV (FW)
BARIUM	2.0E+03	USEPA Acute SW	2.0E+03	USEPA Acute FW	2.0E+03	USEPA Acute SW
BENOMYL	2.8E+00	USGS Acute (FW)	2.8E+00	USGS 2012	2.8E+00	USGS Acute (FW)
BENZENE	1.7E+03	Hawaii Acute SW WQS	1.8E+03	Hawaii Acute FW WQS	1.7E+03	Hawaii Acute SW WQS
BENZO(a)ANTHRACENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
BENZO(a)PYRENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
BENZO(b)FLUORANTHENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
BENZO(g,h,i)PERYLENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
BENZO(k)FLUORANTHENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
BERYLLIUM	3.5E+01	USEPA Acute SW	4.3E+01	Hawaii Acute FW WQS	3.5E+01	USEPA Acute SW
BIPHENYL, 1,1-	2.6E+01	USEPA Reg IV (FW)	2.6E+01	USEPA Acute FW	2.6E+01	USEPA Reg IV (FW)
BIS(2-CHLOROETHYL)ETHER	2.4E+04	USDOE Acute (FW)	2.4E+04	USDOE Acute	2.4E+04	USDOE Acute (FW)
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.7E-01	=Drinking Water Toxicity	3.7E-01	=Drinking Water Toxicity	3.7E-01	=Drinking Water Toxicity
BIS(2-ETHYLHEXYL)PHTHALATE	2.7E+01	USEPA Acute SW	2.7E+01	USEPA Acute FW	2.7E+01	USEPA Acute SW
BORON	3.4E+04	USEPA Reg IV (FW)	3.4E+04	USEPA Acute FW	3.4E+04	USEPA Reg IV (FW)
BROMODICHLOROMETHANE	3.1E+03	USEPA Reg IV (FW)	3.1E+03	USEPA Acute FW	3.1E+03	USEPA Reg IV (FW)
BROMOFORM	1.1E+03	USEPA Acute FW	1.1E+03	USEPA Acute FW	2.3E+03	USEPA Acute SW
BROMOMETHANE	3.8E+01	USEPA Reg IV (FW)	3.8E+01	USEPA Acute FW	3.8E+01	USEPA Reg IV (FW)
CADMIUM	3.0E+00	Hawaii Acute FW WQS	3.0E+00	Hawaii Acute FW WQS	4.3E+01	Hawaii Acute SW WQS
CARBON TETRACHLORIDE	1.2E+04	Hawaii Acute FW WQS	1.2E+04	Hawaii Acute FW WQS	1.6E+04	Hawaii Acute SW WQS
CHLORDANE (TECHNICAL)	9.0E-02	Hawaii Acute SW WQS	2.4E+00	Hawaii Acute FW WQS	9.0E-02	Hawaii Acute SW WQS
CHLOROANILINE, p-	4.6E+02	USEPA Reg IV (FW)	4.6E+02	USEPA Acute FW	4.6E+02	USEPA Reg IV (FW)
CHLOROBENZENE	2.2E+02	USEPA Acute FW	2.2E+02	USEPA Acute FW	1.1E+03	USEPA Acute SW
CHLOROETHANE	2.1E+04	=Drinking Water Toxicity	2.1E+04	=Drinking Water Toxicity	2.1E+04	=Drinking Water Toxicity
CHLOROFORM	4.9E+02	USEPA Acute SW	9.6E+03	Hawaii Acute FW WQS	4.9E+02	USEPA Acute SW
CHLOROMETHANE	1.9E+02	=Drinking Water Toxicity	1.9E+02	=Drinking Water Toxicity	1.9E+02	=Drinking Water Toxicity
CHLOROPHENOL, 2-	4.0E+02	USEPA Reg IV (SW chronic)	1.4E+03	Hawaii Acute FW WQS	4.0E+02	USEPA Reg IV (SW chronic)
CHROMIUM (Total)	1.6E+01	Reg IV Cr VI	1.6E+01	Reg IV Cr VI	1.0E+03	Reg IV Cr VI
CHROMIUM III	5.7E+02	USEPA Reg IV (FW)	5.7E+02	USEPA Acute FW	5.7E+02	USEPA Reg IV (FW)
CHROMIUM VI	1.6E+01	Hawaii Acute FW WQS	1.6E+01	Hawaii Acute FW WQS	1.1E+03	Hawaii Acute SW WQS
CHRYSENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
COBALT	1.2E+02	USEPA Acute FW	1.2E+02	USEPA Acute FW	1.5E+03	USEPA Acute SW

TABLE D-4c. SUMMARY OF SELECTED ACUTE AQUATIC HABITAT GOALS

CONTAMINANT	[1]Aquatic Habitat Goals					
	[1]Estuarine Acute Aquatic Habitat Goal (ug/L)	Basis	Freshwater Acute Aquatic Habitat Goal (ug/L)	Basis	Saltwater Acute Aquatic Habitat Goal (ug/L)	Basis
COPPER	2.9E+00	Hawaii Acute SW WQS	6.0E+00	Hawaii Acute FW WQS	2.9E+00	Hawaii Acute SW WQS
CYANIDE (Free)	1.0E+00	Hawaii Acute SW WQS	2.2E+01	Hawaii Acute FW WQS	1.0E+00	Hawaii Acute SW WQS
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	5.2E+02	USEPA Acute FW	5.2E+02	USEPA Acute FW	7.0E+02	USEPA Acute SW
DALAPON	3.0E+03	USEPA AQUIRE (50% FW LC50)	3.0E+03	USEPA AQUIRE (50% FW LC50)	3.0E+03	USEPA AQUIRE (50% FW LC50)
DIBENZO(a,h)ANTHTRACENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
DIBROMO-3-CHLOROPROPANE, 1,2-	4.0E-02	=Drinking Water Toxicity	4.0E-02	=Drinking Water Toxicity	4.0E-02	=Drinking Water Toxicity
DIBROMOCHLOROMETHANE	2.9E+03	USEPA Reg IV (FW)	2.9E+03	USEPA Acute FW	2.9E+03	USEPA Reg IV (FW)
DIBROMOETHANE, 1,2-	1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03	50% MOEE FW Chronic AWQC
DICHLOROBENZENE, 1,2-	3.7E+02	Hawaii Acute FW WQS	3.7E+02	Hawaii Acute FW WQS	6.6E+02	Hawaii Acute SW WQS
DICHLOROBENZENE, 1,3-	3.7E+02	Hawaii Acute FW WQS	3.7E+02	Hawaii Acute FW WQS	6.6E+02	Hawaii Acute SW WQS
DICHLOROBENZENE, 1,4-	3.7E+02	Hawaii Acute FW WQS	3.7E+02	Hawaii Acute FW WQS	6.6E+02	Hawaii Acute SW WQS
DICHLOROBENZIDINE, 3,3-	4.1E+01	USEPA Reg IV (FW)	4.1E+01	USEPA Acute FW	4.1E+01	USEPA Reg IV (FW)
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.9E-01	USEPA Acute SW	1.9E-01	USEPA Acute FW	1.9E-01	USEPA Acute SW
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	7.0E+00	USEPA Reg IV (FW)	7.0E+00	USEPA Acute FW	7.0E+00	USEPA Reg IV (FW)
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.3E-02	Hawaii Acute SW WQS	1.1E+00	Hawaii Acute FW WQS	1.3E-02	Hawaii Acute SW WQS
DICHLOROETHANE, 1,1-	8.3E+02	USEPA Acute SW	3.7E+03	USEPA Acute FW	8.3E+02	USEPA Acute SW
DICHLOROETHANE, 1,2-	3.8E+04	Hawaii Acute SW WQS	3.9E+04	Hawaii Acute FW WQS	3.8E+04	Hawaii Acute SW WQS
DICHLOROETHYLENE, 1,1-	3.9E+03	Hawaii Acute FW WQS	3.9E+03	Hawaii Acute FW WQS	7.5E+04	Hawaii Acute SW WQS
DICHLOROETHYLENE, Cis 1,2-	5.5E+03	USEPA Reg IV (FW)	5.5E+03	USEPA Acute FW	5.5E+03	USEPA Reg IV (FW)
DICHLOROETHYLENE, Trans 1,2-	1.0E+04	USEPA Reg IV (FW)	1.0E+04	USEPA Acute FW	1.0E+04	USEPA Reg IV (FW)
DICHLOROPHENOL, 2,4-	6.7E+02	Hawaii Acute FW WQS	6.7E+02	Hawaii Acute FW WQS	7.9E+02	USEPA Reg IV (SW chronic)
DICHLOROPHENOXYACETIC ACID (2,4-D)	1.3E+02	USEPA Reg IV (FW)	1.3E+02	USEPA Acute FW	1.3E+02	USEPA Reg IV (FW)
DICHLOROPROPANE, 1,2-	3.4E+03	Hawaii Acute SW WQS	7.7E+03	Hawaii Acute FW WQS	3.4E+03	Hawaii Acute SW WQS
DICHLOROPROPENE, 1,3-	2.6E+02	Hawaii Acute SW WQS	2.0E+03	Hawaii Acute FW WQS	2.6E+02	Hawaii Acute SW WQS
DIELDRIN	7.1E-01	Hawaii Acute SW WQS	2.5E+00	Hawaii Acute FW WQS	7.1E-01	Hawaii Acute SW WQS
DIETHYLPHTHALATE	9.8E+02	USEPA Acute FW	9.8E+02	USEPA Acute FW	1.8E+03	USEPA Acute SW
DIMETHYLPHENOL, 2,4-	7.0E+02	Hawaii Acute FW WQS	7.0E+02	Hawaii Acute FW WQS	1.1E+03	USEPA Reg IV (FW)
DIMETHYLPHTHALATE	3.2E+03	USEPA Reg IV (FW)	3.2E+03	USEPA Acute FW	3.2E+03	USEPA Reg IV (FW)
DINITROBENZENE, 1,3-	1.0E+02	USEPA Acute FW	1.0E+02	USEPA Acute FW	1.1E+02	USEPA Acute SW
DINITROPHENOL, 2,4-	3.8E+02	0.0E+00	3.8E+02	USEPA Acute FW	3.8E+02	0.0E+00
DINITROTOLUENE, 2,4- (2,4-DNT)	1.1E+02	Hawaii Acute FW WQS	1.1E+02	Hawaii Acute FW WQS	2.0E+02	Hawaii Acute SW WQS
DINITROTOLUENE, 2,6- (2,6-DNT)	1.1E+02	Hawaii Acute FW WQS	1.1E+02	Hawaii Acute FW WQS	2.0E+02	Hawaii Acute SW WQS
DIOXANE, 1,4-	3.4E+06	Mohr (50% FW LC50)	3.4E+06	Mohr (50% FW LC50)	5.0E+06	Mohr (50% SW LC50)
DIOXINS (TEQ)	3.0E-03	USEPA Reg IV (FW)	3.0E-03	Hawaii Acute FW WQS	3.0E-03	USEPA Reg IV (FW)
DIURON	2.0E+02	USEPA AQUIRE (50% FW LC50)	2.0E+02	USEPA AQUIRE (50% FW LC50)	5.5E+02	USEPA AQUIRE (50% SW LC50)
ENDOSULFAN	3.4E-02	Hawaii Acute SW WQS	2.2E-01	Hawaii Acute FW WQS	3.4E-02	Hawaii Acute SW WQS
ENDRIN	3.7E-02	Hawaii Acute SW WQS	1.8E-01	Hawaii Acute FW WQS	3.7E-02	Hawaii Acute SW WQS
ETHANOL		not available		not available		
ETHYLBENZENE	1.4E+02	Hawaii Acute SW WQS	1.1E+04	Hawaii Acute FW WQS	1.4E+02	Hawaii Acute SW WQS
FLUORANTHENE	1.3E+01	Hawaii Acute SW WQS	1.3E+03	Hawaii Acute FW WQS	1.3E+01	Hawaii Acute SW WQS
FLUORENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
GLYPHOSATE	2.2E+04	USEPA Off Pesticides (FW)	2.2E+04	USEPA Off Pesticides	2.2E+04	USEPA Off Pesticides (FW)

TABLE D-4c. SUMMARY OF SELECTED ACUTE AQUATIC HABITAT GOALS

CONTAMINANT	[1]Aquatic Habitat Goals					
	[1]Estuarine Acute Aquatic Habitat Goal (ug/L)	Basis	Freshwater Acute Aquatic Habitat Goal (ug/L)	Basis	Saltwater Acute Aquatic Habitat Goal (ug/L)	Basis
HEPTACHLOR	5.3E-02	Hawaii Acute SW WQS	5.2E-01	Hawaii Acute FW WQS	5.3E-02	Hawaii Acute SW WQS
HEPTACHLOR EPOXIDE	5.3E-02	USEPA Acute SW	5.2E-01	USEPA Acute FW	5.3E-02	USEPA Acute SW
HEXACHLOROBENZENE	3.0E-04	USEPA Reg IV (FW chronic)	3.0E-04	USEPA Reg IV (FW chronic)	3.0E-04	USEPA Reg IV (FW chronic)
HEXACHLOROBUTADIENE	1.1E+01	Hawaii Acute SW WQS	3.0E+01	Hawaii Acute FW WQS	1.1E+01	Hawaii Acute SW WQS
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.6E-01	Hawaii Acute SW WQS	2.0E+00	Hawaii Acute FW WQS	1.6E-01	Hawaii Acute SW WQS
HEXACHLOROETHANE	3.1E+02	Hawaii Acute SW WQS	3.3E+02	Hawaii Acute FW WQS	3.1E+02	Hawaii Acute SW WQS
HEXAZINONE	1.4E+05	USEPA Off Pesticides (FW)	1.4E+05	USEPA Off Pesticides	1.4E+05	USEPA Off Pesticides (FW)
INDENO(1,2,3-cd)PYRENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
ISOPHORONE	4.3E+03	Hawaii Acute SW WQS	3.9E+04	Hawaii Acute FW WQS	4.3E+03	Hawaii Acute SW WQS
LEAD	2.9E+01	Hawaii Acute FW WQS	2.9E+01	Hawaii Acute FW WQS	1.4E+02	Hawaii Acute SW WQS
MERCURY	2.1E+00	Hawaii Acute SW WQS	2.4E+00	Hawaii Acute FW WQS	2.1E+00	Hawaii Acute SW WQS
METHOXYCHLOR	7.0E-01	USEPA Reg IV (FW)	7.0E-01	USEPA Acute FW	7.0E-01	USEPA Reg IV (FW)
METHYL ETHYL KETONE	2.0E+05	USEPA Acute FW	2.0E+05	USEPA Acute FW	2.4E+05	USEPA Acute SW
METHYL ISOBUTYL KETONE	2.2E+03	USEPA Acute SW	2.2E+03	USEPA Acute FW	2.2E+03	USEPA Acute SW
METHYL MERCURY	9.9E-02	USEPA Acute SW	9.9E-02	USEPA Acute FW	9.9E-02	USEPA Acute SW
METHYL TERT BUTYL ETHER	6.5E+03	USEPA Acute FW	6.5E+03	USEPA Acute FW	5.3E+04	USEPA Acute SW
METHYLENE CHLORIDE	8.5E+03	USEPA Acute FW	8.5E+03	USEPA Acute FW	2.6E+04	USEPA Acute SW
METHYLNAPHTHALENE, 1-	3.7E+01	USEPA Acute SW	3.7E+01	USEPA Acute FW	3.7E+01	USEPA Acute SW
METHYLNAPHTHALENE, 2-	4.2E+01	USEPA Acute FW	4.2E+01	USEPA Acute FW	8.6E+01	USEPA Acute SW
MOLYBDENUM	7.2E+03	USEPA Acute FW	7.2E+03	USEPA Acute FW	1.6E+04	USEPA Acute SW
NAPHTHALENE	7.7E+02	Hawaii Acute FW WQS	7.7E+02	Hawaii Acute FW WQS	7.8E+02	Hawaii Acute SW WQS
NICKEL	5.0E+00	Hawaii Acute FW WQS	5.0E+00	Hawaii Acute FW WQS	7.5E+01	Hawaii Acute SW WQS
NITROBENZENE	2.0E+03	Hawaii Acute SW WQS	9.0E+03	Hawaii Acute FW WQS	2.0E+03	Hawaii Acute SW WQS
NITROGLYCERIN	1.6E+02	USEPA Reg IV (FW)	1.6E+02	USEPA Acute FW	1.6E+02	USEPA Reg IV (FW)
NITROTOLUENE, 2-	6.4E+02	USEPA Reg IV (FW)	6.4E+02	USEPA Acute FW	6.4E+02	USEPA Reg IV (FW)
NITROTOLUENE, 3-	3.8E+02	USEPA Reg IV (FW)	3.8E+02	USEPA Acute FW	3.8E+02	USEPA Reg IV (FW)
NITROTOLUENE, 4-	4.1E+02	USEPA Reg IV (FW)	4.1E+02	USEPA Acute FW	4.1E+02	USEPA Reg IV (FW)
PENTACHLOROPHENOL	1.3E+01	Hawaii Acute SW WQS	2.0E+01	Hawaii Acute FW WQS	1.3E+01	Hawaii Acute SW WQS
PENTAERYTHRITOLTETRANITRATE (PETN)	8.5E+05	Pascoe et al. (chronic FW)	8.5E+05	Pascoe et al. (chronic FW)	8.5E+05	Pascoe et al. (chronic FW)
PERCHLORATE	5.0E+03	USEPA 2002	5.0E+03	USEPA 2002	5.0E+03	USEPA 2002
PHENANTHRENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
PHENOL	3.0E+02	USEPA Acute SW	4.7E+03	Hawaii Acute FW WQS	3.0E+02	USEPA Acute SW
POLYCHLORINATED BIPHENYLS (PCBs)	2.0E+00	Hawaii Acute FW WQS	2.0E+00	Hawaii Acute FW WQS	1.0E+01	Hawaii Acute SW WQS
PROPICONAZOLE	4.3E+02	USEPA Off Pesticides (FW)	4.3E+02	USEPA Off Pesticides	4.3E+02	USEPA Off Pesticides (FW)
PYRENE	3.0E+02	CCME 2002	3.0E+02	CCME 2002	3.0E+02	CCME 2002
SELENIUM	2.0E+01	Hawaii Acute FW WQS	2.0E+01	Hawaii Acute FW WQS	3.0E+02	Hawaii Acute SW WQS
SILVER	1.0E+00	Hawaii Acute FW WQS	1.0E+00	Hawaii Acute FW WQS	2.3E+00	Hawaii Acute SW WQS
SIMAZINE	8.0E+01	USEPA Reg IV (FW)	8.0E+01	USEPA Acute FW	8.0E+01	USEPA Reg IV (FW)
STYRENE	2.9E+02	USEPA Reg IV (FW)	2.9E+02	USEPA Acute FW	2.9E+02	USEPA Reg IV (FW)
TERBACIL	2.6E+02	=Drinking Water Toxicity	2.3E+04	USEPA Off Pesticides	2.6E+02	=Drinking Water Toxicity
tert-BUTYL ALCOHOL	1.8E+05	USEPA AQUIRE (FW LC0)	1.8E+05	USEPA AQUIRE (FW LC0)	1.8E+05	USEPA AQUIRE (FW LC0)
TETRACHLOROETHANE, 1,1,1,2-	7.7E+02	USEPA Reg IV (FW)	3.1E+03	Hawaii Acute FW WQS	7.7E+02	USEPA Reg IV (FW)

TABLE D-4c. SUMMARY OF SELECTED ACUTE AQUATIC HABITAT GOALS

CONTAMINANT	[1]Aquatic Habitat Goals					
	[1]Estuarine Acute Aquatic Habitat Goal (ug/L)	Basis	Freshwater Acute Aquatic Habitat Goal (ug/L)	Basis	Saltwater Acute Aquatic Habitat Goal (ug/L)	Basis
TETRACHLOROETHANE, 1,1,2,2-	9.1E+02	USEPA Acute FW	9.1E+02	USEPA Acute FW	3.0E+03	Hawaii Acute SW WQS
TETRACHLOROETHYLENE	1.8E+03	Hawaii Acute FW WQS	1.8E+03	Hawaii Acute FW WQS	3.4E+03	Hawaii Acute SW WQS
TETRACHLOROPHENOL, 2,3,4,6-	1.1E+01	USEPA Reg IV (FW)	1.1E+01	USEPA Acute FW	1.1E+01	USEPA Reg IV (FW)
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.2E+03	USEPA Acute FW	1.2E+03	USEPA Acute FW	1.9E+03	USEPA Acute SW
THALLIUM	4.7E+02	Hawaii Acute FW WQS	4.7E+02	Hawaii Acute FW WQS	7.1E+02	Hawaii Acute SW WQS
TOLUENE	2.1E+03	Hawaii Acute SW WQS	5.8E+03	Hawaii Acute FW WQS	2.1E+03	Hawaii Acute SW WQS
TOXAPHENE	2.1E-01	Hawaii Acute SW WQS	7.3E-01	Hawaii Acute FW WQS	2.1E-01	Hawaii Acute SW WQS
TPH (gasolines)	5.0E+03	Ceiling Level	5.0E+03	Ceiling Level	5.0E+03	Ceiling Level
TPH (middle distillates)	2.5E+03	Ceiling Level	2.5E+03	Ceiling Level	2.5E+03	Ceiling Level
TPH (residual fuels)	2.5E+03	Ceiling Level	2.5E+03	Ceiling Level	2.5E+03	Ceiling Level
TRICHLOROBENZENE, 1,2,4-	4.2E+02	USEPA Acute FW	4.2E+02	USEPA Acute FW	7.0E+02	USEPA Acute SW
TRICHLOROETHANE, 1,1,1-	6.0E+03	Hawaii Acute FW WQS	6.0E+03	Hawaii Acute FW WQS	1.0E+04	Hawaii Acute SW WQS
TRICHLOROETHANE, 1,1,2-	5.2E+03	USEPA Acute SW	6.0E+03	Hawaii Acute FW WQS	5.2E+03	USEPA Acute SW
TRICHLOROETHYLENE	7.0E+02	Hawaii Acute SW WQS	1.5E+04	Hawaii Acute FW WQS	7.0E+02	Hawaii Acute SW WQS
TRICHLOROPHENOL, 2,4,5-	1.7E+01	USEPA Acute FW	1.7E+01	USEPA Acute FW	2.6E+02	USEPA Acute SW
TRICHLOROPHENOL, 2,4,6-	3.9E+01	USEPA Reg IV (FW)	3.9E+01	USEPA Acute FW	3.9E+01	USEPA Reg IV (FW)
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	6.9E+02	USEPA Reg. V FW Chronic	6.9E+02	USEPA Reg. V FW Chronic	6.9E+02	USEPA Reg. V FW Chronic
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	2.7E+02	USEPA Reg IV (FW)	2.7E+02	USEPA Acute FW	2.7E+02	USEPA Reg IV (FW)
TRICHLOROPROPANE, 1,2,3-	1.4E+02	USEPA AQUIRE (5xFW EC50)	1.4E+02	USEPA AQUIRE (5xFW EC50)	1.4E+02	USEPA AQUIRE (5xFW EC50)
TRICHLOROPROPENE, 1,2,3-	6.2E-01	=Drinking Water Toxicity	6.2E-01	=Drinking Water Toxicity	6.2E-01	=Drinking Water Toxicity
TRIFLURALIN	2.1E+01	USEPA Reg IV (FW)	2.1E+01	USEPA Acute FW	2.1E+01	USEPA Reg IV (FW)
TRINITROBENZENE, 1,3,5-	2.7E+01	USEPA Acute FW	2.7E+01	USEPA Acute FW	3.0E+01	USEPA Acute SW
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.0E+01	=Drinking Water Toxicity	4.0E+01	=Drinking Water Toxicity	4.0E+01	=Drinking Water Toxicity
TRINITROTOLUENE, 2,4,6- (TNT)	2.1E+02	USEPA Acute FW	2.1E+02	USEPA Acute FW	5.7E+02	USEPA Acute SW
VANADIUM	9.0E+01	USEPA Acute SW	1.2E+02	USEPA Acute FW	9.0E+01	USEPA Acute SW
VINYL CHLORIDE	8.4E+03	USEPA Reg IV SW Acute	8.4E+03	USEPA Acute FW	8.4E+03	USEPA Reg IV SW Acute
XYLENES	2.3E+02	USEPA Acute SW	2.4E+02	USEPA Acute FW	2.3E+02	USEPA Acute SW
ZINC	2.2E+01	Hawaii Acute FW WQS	2.2E+01	Hawaii Acute FW WQS	9.5E+01	Hawaii Acute SW WQS

Notes:

1. Refer to Table D-4d and D-4e for summary of aquatic habitat goal sources. Used for selection of groundwater action levels.
2. Estuarine Goal = Lowest of Freshwater vs Saltwater chronic goals.
3. Drinking water goal substituted as aquatic habitat goal if latter was not available (see text).

TABLE D-4d. SUMMARY OF HAWAI'I CHRONIC AND ACUTE SURFACE WATER (AQUATIC HABITAT) STANDARDS

	Freshwater (ug/L)		Saltwater (ug/L)	
CONTAMINANT	**Chronic**	**Acute**	**Chronic**	**Acute**
ACENAPHTHENE		5.7E+02		3.2E+02
ACENAPHTHYLENE				
ACETONE				
ALDRIN		3.0E+00		1.3E+00
AMETRYN				
AMINO,2- DINITROTOLUENE,4,6-				
AMINO,4- DINITROTOLUENE,2,6-				
ANTHRACENE				
ANTIMONY		3.0E+03		
ARSENIC	1.9E+02	3.6E+02	3.6E+01	6.9E+01
ATRAZINE				
BARIUM				
BENOMYL				
BENZENE		1.8E+03		1.7E+03
BENZO(a)ANTHRACENE				
BENZO(a)PYRENE				
BENZO(b)FLUORANTHENE				
BENZO(g,h,i)PERYLENE				
BENZO(k)FLUORANTHENE				
BERYLLIUM		4.3E+01		
BIPHENYL, 1,1-				
BIS(2-CHLOROETHYL)ETHER				
BIS(2-CHLORO-1-METHYLETHYL)ETHER				
BIS(2-ETHYLHEXYL)PHTHALATE				
BORON				
BROMODICHLOROMETHANE				
BROMOFORM				
BROMOMETHANE				
CADMIUM	3.0E+00	3.0E+00	9.3E+00	4.3E+01
CARBON TETRACHLORIDE		1.2E+04		1.6E+04
CHLORDANE (TECHNICAL)	4.3E-03	2.4E+00	4.0E-03	9.0E-02
CHLOROANILINE, p-				
CHLOROBENZENE				
CHLOROETHANE				
CHLOROFORM		9.6E+03		
CHLOROMETHANE				
CHLOROPHENOL, 2-		1.4E+03		
CHROMIUM (Total)				
CHROMIUM III				
CHROMIUM VI	1.1E+01	1.6E+01	5.0E+01	1.1E+03
CHRYSENE				
COBALT				
COPPER	6.0E+00	6.0E+00	2.9E+00	2.9E+00
CYANIDE (Free)	5.2E+00	2.2E+01	1.0E+00	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)				
DALAPON				
DIBENZO(a,h)ANTHTRACENE				
DIBROMO-3-CHLOROPROPANE, 1,2-				
DIBROMOCHLOROMETHANE				
DIBROMOETHANE, 1,2-				

TABLE D-4d. SUMMARY OF HAWAI'I CHRONIC AND ACUTE SURFACE WATER (AQUATIC HABITAT) STANDARDS

	Freshwater (ug/L)		Saltwater (ug/L)	
CONTAMINANT	**Chronic**	**Acute**	**Chronic**	**Acute**
DICHLOROBENZENE, 1,2-		3.7E+02		6.6E+02
DICHLOROBENZENE, 1,3-		3.7E+02		6.6E+02
DICHLOROBENZENE, 1,4-		3.7E+02		6.6E+02
DICHLOROBENZIDINE, 3,3-				
DICHLORODIPHENYLDICHLOROETHANE (DDD)				
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)				
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E-03	1.1E+00	1.0E-03	1.3E-02
DICHLOROETHANE, 1,1-				
DICHLOROETHANE, 1,2-		3.9E+04		3.8E+04
DICHLOROETHYLENE, 1,1-		3.9E+03		7.5E+04
DICHLOROETHYLENE, Cis 1,2-				
DICHLOROETHYLENE, Trans 1,2-				
DICHLOROPHENOL, 2,4-		6.7E+02		
DICHLOROPHENOXYACETIC ACID (2,4-D)				
DICHLOROPROPANE, 1,2-		7.7E+03		3.4E+03
DICHLOROPROPENE, 1,3-		2.0E+03		2.6E+02
DIELDRIN	1.9E-03	2.5E+00	1.9E-03	7.1E-01
DIETHYLPHTHALATE				
DIMETHYLPHENOL, 2,4-		7.0E+02		
DIMETHYLPHTHALATE				
DINITROBENZENE, 1,3-				
DINITROPHENOL, 2,4-				
DINITROTOLUENE, 2,4- (2,4-DNT)		1.1E+02		2.0E+02
DINITROTOLUENE, 2,6- (2,6-DNT)		1.1E+02		2.0E+02
DIOXANE, 1,4-				
DIOXINS (TEQ)		3.0E-03		
DIURON				
ENDOSULFAN	5.6E-02	2.2E-01	8.7E-03	3.4E-02
ENDRIN	2.3E-03	1.8E-01	2.3E-03	3.7E-02
ETHANOL				
ETHYLBENZENE		1.1E+04		1.4E+02
FLUORANTHENE		1.3E+03		1.3E+01
FLUORENE				
GLYPHOSATE				
HEPTACHLOR	3.8E-03	5.2E-01	3.6E-03	5.3E-02
HEPTACHLOR EPOXIDE				
HEXACHLOROBENZENE				
HEXACHLOROBUTADIENE		3.0E+01		1.1E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	8.0E-02	2.0E+00		1.6E-01
HEXACHLOROETHANE		3.3E+02		3.1E+02
HEXAZINONE				
INDENO(1,2,3-cd)PYRENE				
ISOPHORONE		3.9E+04		4.3E+03
LEAD	2.9E+01	2.9E+01	5.6E+00	1.4E+02
MERCURY	5.5E-01	2.4E+00	2.5E-02	2.1E+00
METHOXYCHLOR	3.0E-02		3.0E-02	
METHYL ETHYL KETONE				
METHYL ISOBUTYL KETONE				
METHYL MERCURY				
METHYL TERT BUTYL ETHER				
METHYLENE CHLORIDE				
METHYLNAPHTHALENE, 1-				
METHYLNAPHTHALENE, 2-				
MOLYBDENUM				

TABLE D-4d. SUMMARY OF HAWAI'I CHRONIC AND ACUTE SURFACE WATER (AQUATIC HABITAT) STANDARDS

	Freshwater (ug/L)		Saltwater (ug/L)	
CONTAMINANT	**Chronic**	**Acute**	**Chronic**	**Acute**
NAPHTHALENE		7.7E+02		7.8E+02
NICKEL	5.0E+00	5.0E+00	8.3E+00	7.5E+01
NITROBENZENE		9.0E+03		2.0E+03
NITROGLYCERIN				
NITROTOLUENE, 2-				
NITROTOLUENE, 3-				
NITROTOLUENE, 4-				
PENTACHLOROPHENOL	1.3E+01	2.0E+01		1.3E+01
PENTAERYTHRITOLTETRANITRATE (PETN)				
PERCHLORATE				
PHENANTHRENE				
PHENOL		4.7E+03		
POLYCHLORINATED BIPHENYLS (PCBs)	1.4E-02	2.0E+00	3.0E-02	1.0E+01
PROPICONAZOLE				
PYRENE				
SELENIUM	5.0E+00	2.0E+01	7.1E+01	3.0E+02
SILVER	1.0E+00	1.0E+00		2.3E+00
SIMAZINE				
STYRENE				
TERBACIL				
tert-BUTYL ALCOHOL				
TETRACHLOROETHANE, 1,1,1,2-		3.1E+03		
TETRACHLOROETHANE, 1,1,2,2-				3.0E+03
TETRACHLOROETHYLENE		1.8E+03	1.45E+02	3.4E+03
TETRACHLOROPHENOL, 2,3,4,6-				
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)				
THALLIUM		4.7E+02		7.1E+02
TOLUENE		5.8E+03		2.1E+03
TOXAPHENE	2.0E-04	7.3E-01	2.0E-04	2.1E-01
TPH (gasolines)				
TPH (middle distillates)				
TPH (residual fuels)				
TRICHLOROBENZENE, 1,2,4-				
TRICHLOROETHANE, 1,1,1-		6.0E+03		1.0E+04
TRICHLOROETHANE, 1,1,2-		6.0E+03		
TRICHLOROETHYLENE		1.5E+04		7.0E+02
TRICHLOROPHENOL, 2,4,5-				
TRICHLOROPHENOL, 2,4,6-				
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)				
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)				
TRICHLOROPROPANE, 1,2,3-				
TRICHLOROPROPENE, 1,2,3-				
TRIFLURALIN				
TRINITROBENZENE, 1,3,5-				
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)				
TRINITROTOLUENE, 2,4,6- (TNT)				
VANADIUM				
VINYL CHLORIDE				
XYLENES				
ZINC	2.2E+01	2.2E+01	8.6E+01	9.5E+01

Primary Reference:

1. Hawai'I Administrative Rules, Title 11, Chapter 54, Section 11-54-04: Basic Water Quality Criteria, October 2012.

TABLE D-4e. SUMMARY OF USEPA AND OTHER PUBLISHED AQUATIC HABITAT GOALS
(ug/l)

	Freshwater						Marine					
CONTAMINANT	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**
ACENAPHTHENE	1.5E+01				3.0E+02	CCME 2002	2.0E+01				3.0E+02	CCME 2002
ACENAPHTHYLENE	1.3E+01				3.0E+02	CCME 2002	3.1E+02				3.0E+02	CCME 2002
ACETONE	1.7E+03	1.5E+04					1.5E+03	2.8E+04				
ALDRIN	3.5E-02	3.0E+00					1.4E-04	1.3E+00				
AMETRYN			7.0E+02	USEPA Off Pesticides	1.8E+03	USEPA Off Pesticides			7.0E+02	USEPA Off Pesticides (FW)	1.8E+03	USEPA Off Pesticides (FW)
AMINO,2- DINITROTOLUENE,4,6-	1.8E+01	1.6E+02					2.0E+01	1.8E+02				
AMINO,4- DINITROTOLUENE,2,6-	1.1E+01	9.8E+01							1.1E+01	USEPA Reg IV (FW)	9.8E+01	USEPA Reg IV (FW)
ANTHRACENE	2.0E-02	1.8E-01					7.3E-01	1.3E+01			3.0E+02	CCME 2002
ANTIMONY	1.3E+02	3.0E+02					3.0E+01	1.8E+02				
ARSENIC	1.5E+02	3.4E+02					3.6E+01	6.9E+01				
ATRAZINE	1.2E+01	3.3E+02							1.2E+01	USEPA Reg IV (FW)	3.3E+02	USEPA Reg IV (FW)
BARIUM	2.2E+02	2.0E+03					2.2E+02	2.0E+03				
BENOMYL			1.4E-01	5% USGS 2012 acute	2.8E+00	USGS 2012			1.4E-01	5% USGS 2012 FW acute	2.8E+00	USGS Acute (FW)
BENZENE	1.6E+02	7.0E+02					7.1E+01				7.0E+02	USEPA Reg IV (FW)
BENZO(a)ANTHRACENE	4.7E+00				3.0E+02	CCME 2002	2.7E-02				3.0E+02	CCME 2002
BENZO(a)PYRENE	6.0E-02				3.0E+02	CCME 2002	3.0E-01				3.0E+02	CCME 2002
BENZO(b)FLUORANTHENE	2.6E+00				3.0E+02	CCME 2002	6.8E-01				3.0E+02	CCME 2002
BENZO(g,h,i)PERYLENE	4.4E-01				3.0E+02	CCME 2002	4.4E-01				3.0E+02	CCME 2002
BENZO(k)FLUORANTHENE	6.4E-01				3.0E+02	CCME 2002	6.4E-01				3.0E+02	CCME 2002
BERYLLIUM	1.1E+01	9.3E+01					6.6E-01	3.5E+01				
BIPHENYL, 1,1-	6.5E+00	2.6E+01					1.4E+01				2.6E+01	USEPA Reg IV (FW)
BIS(2-CHLOROETHYL)ETHER			2.4E+03	USDOE Chronic	2.4E+04	USDOE Acute			2.4E+03	USDOE Chronic (FW)	2.4E+04	USDOE Acute (FW)
BIS(2-CHLORO-1-METHYLETHYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE	3.0E+00	2.7E+01					3.0E+00	2.7E+01				
BORON	7.2E+03	3.4E+04					1.0E+03				3.4E+04	USEPA Reg IV (FW)
BROMODICHLOROMETHANE	3.4E+02	3.1E+03							3.4E+02	USEPA Reg IV (FW)	3.1E+03	USEPA Reg IV (FW)
BROMOFORM	2.3E+02	1.1E+03					3.2E+02	2.3E+03				
BROMOMETHANE	1.6E+01	3.8E+01							1.6E+01	USEPA Reg IV (FW)	3.8E+01	USEPA Reg IV (FW)
CADMIUM	2.5E-01	2.0E+00					8.8E+00	4.0E+01				
CARBON TETRACHLORIDE	7.7E+01	6.9E+02					9.8E+00	1.8E+02				
CHLORDANE (TECHNICAL)	4.3E-03	2.4E+00					5.9E-04	4.0E-03				
CHLOROANILINE, p-	1.9E+01	4.6E+02							1.9E+01	USEPA Reg IV (FW)	4.6E+02	USEPA Reg IV (FW)
CHLOROBENZENE	2.5E+01	2.2E+02					6.4E+01	1.1E+03				
CHLOROETHANE												
CHLOROFORM	1.4E+02	1.3E+03					2.8E+01	4.9E+02				
CHLOROMETHANE												
CHLOROPHENOL, 2-	3.2E+01	2.9E+02					4.0E+02				4.0E+02	USEPA Reg IV (SW chronic)
CHROMIUM (Total)			1.1E+01	Reg IV Cr VI	1.6E+01	Reg IV Cr VI			5.0E+01	Reg IV Cr VI	1.0E+03	Reg IV Cr VI
CHROMIUM III	7.4E+01	5.7E+02					2.0E+01				5.7E+02	USEPA Reg IV (FW)
CHROMIUM VI	1.1E+01	1.6E+01					5.0E+01	1.1E+03				
CHRYSENE	4.7E+00				3.0E+02	CCME 2002	2.0E+00				3.0E+02	CCME 2002
COBALT	1.9E+01	1.2E+02					2.3E+01	1.5E+03				
COPPER	9.0E+00	1.3E+01					3.1E+00	4.8E+00				
CYANIDE (Free)	5.2E+00	2.2E+01					1.0E+00	1.0E+00				
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	7.9E+01	5.2E+02					1.9E+02	7.0E+02				
DALAPON			3.0E+02	USEPA AQUIRE (5% FW LC50)	3.0E+03	USEPA AQUIRE (50% FW LC50)			3.0E+02	USEPA AQUIRE (5% FW LC50)	3.0E+03	USEPA AQUIRE (50% FW LC50)
DIBENZO(a,h)ANTHTRACENE	8.0E-01			\	3.0E+02	CCME 2002	7.1E+00				3.0E+02	CCME 2002
DIBROMO-3-CHLOROPROPANE, 1,2-												
DIBROMOCHLOROMETHANE	3.2E+02	2.9E+03					3.4E+01				2.9E+03	USEPA Reg IV (FW)
DIBROMOETHANE, 1,2-			1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03	50% MOEE FW Chronic AWQC			1.4E+03	50% MOEE FW Chronic AWQC	1.4E+03	50% MOEE FW Chronic AWQC
DICHLOROBENZENE, 1,2-	2.3E+01	1.3E+02					1.4E+01	2.6E+02				
DICHLOROBENZENE, 1,3-	2.2E+01	7.9E+01					7.1E+01	6.3E+02				
DICHLOROBENZENE, 1,4-	9.4E+00	5.7E+01					1.5E+01	1.8E+02				
DICHLOROBENZIDINE, 3,3-	4.5E+00	4.1E+01							4.5E+00	USEPA Reg IV (FW)	4.1E+01	USEPA Reg IV (FW)
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E-02	1.9E-01					1.1E-02	1.9E-01				
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	4.1E-01	7.0E+00							4.1E-01	USEPA Reg IV (FW)	7.0E+00	USEPA Reg IV (FW)
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	3.2E-03	1.1E+00					1.0E-03	1.3E-01				

TABLE D-4e. SUMMARY OF USEPA AND OTHER PUBLISHED AQUATIC HABITAT GOALS
(ug/l)

	Freshwater						Marine					
CONTAMINANT	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**
DICHLOROETHANE, 1,1-	4.1E+02	3.7E+03					4.7E+01	8.3E+02				
DICHLOROETHANE, 1,2-	2.0E+03	8.2E+03					9.1E+02	8.8E+03				
DICHLOROETHYLENE, 1,1-	1.3E+02	1.2E+03					2.5E+01	4.5E+02				
DICHLOROETHYLENE, Cis 1,2-	6.2E+02	5.5E+03							6.2E+02	USEPA Reg IV (FW)	5.5E+03	USEPA Reg IV (FW)
DICHLOROETHYLENE, Trans 1,2-	5.6E+02	1.0E+04							5.6E+02	USEPA Reg IV (FW)	1.0E+04	USEPA Reg IV (FW)
DICHLOROPHENOL, 2,4-	1.1E+01	1.1E+02					7.9E+02				7.9E+02	USEPA Reg IV (SW chronic)
DICHLOROPHENOXYACETIC ACID (2,4-D)	7.9E+01	1.3E+02					7.0E+01				1.3E+02	USEPA Reg IV (FW)
DICHLOROPROPANE, 1,2-	5.2E+02	3.3E+03						3.4E+03	5.2E+02	USEPA Reg IV (FW)		
DICHLOROPROPENE, 1,3-	1.7E+00	1.5E+01					6.0E-02	9.9E-01				
DIELDRIN	5.6E-02	2.4E-01					1.9E-03	7.1E-01				
DIETHYLPHTHALATE	2.2E+02	9.8E+02					2.1E+02	1.8E+03				
DIMETHYLPHENOL, 2,4-	1.2E+02	1.1E+03							1.2E+02	USEPA Reg IV (FW)	1.1E+03	USEPA Reg IV (FW)
DIMETHYLPHTHALATE	1.1E+03	3.2E+03					2.9E+03				3.2E+03	USEPA Reg IV (FW)
DINITROBENZENE, 1,3-	2.2E+01	1.0E+02					1.0E+01	1.1E+02				USEPA Reg IV (FW)
DINITROPHENOL, 2,4-	7.1E+01	3.8E+02					1.4E+01				3.8E+02	
DINITROTOLUENE, 2,4- (2,4-DNT)	4.4E+01	3.9E+02					9.1E+00	2.0E+02				
DINITROTOLUENE, 2,6- (2,6-DNT)	8.1E+01	7.3E+02						2.0E+02	8.1E+01	USEPA Reg IV (FW)		
DIOXANE, 1,4-			3.4E+05	Mohr (5% Acute FW LC 50)	3.4E+06	Mohr (50% FW LC50)			5.0E+05	Mohr (5% Acute SW LC 50)	5.0E+06	Mohr (50% SW LC50)
DIOXINS (TEQ)	3.1E-09	3.0E-03							3.1E-09	USEPA Reg IV (FW)	3.0E-03	USEPA Reg IV (FW)
DIURON			6.0E+01	USEPA AQUIRE (50% FW EC50)	2.0E+02	USEPA AQUIRE (50% FW LC50)			6.0E+01	USEPA AQUIRE (50% FW EC50)	5.5E+02	USEPA AQUIRE (50% SW LC50)
ENDOSULFAN	1.0E-02	1.1E-01					8.7E-03	3.4E-02				
ENDRIN	3.6E-02	8.6E-02					2.3E-03	3.7E-02				
ETHANOL												
ETHYLBENZENE	6.1E+01	5.5E+02					7.3E+00	1.3E+02				
FLUORANTHENE	8.0E-01				3.0E+02	CCME 2002	7.1E+00				3.0E+02	CCME 2002
FLUORENE	1.9E+01				3.0E+02	CCME 2002	3.9E+00				3.0E+02	CCME 2002
GLYPHOSATE			1.8E+03	USEPA Off Pesticides	2.2E+04	USEPA Off Pesticides			1.8E+03	USEPA Off Pesticides (FW)	2.2E+04	USEPA Off Pesticides (FW)
HEPTACHLOR	3.8E-03	5.2E-01					3.6E-03	5.3E-02				
HEPTACHLOR EPOXIDE	3.8E-03	5.2E-01					3.6E-03	5.3E-02				
HEXACHLOROBENZENE	3.0E-04				3.0E-04	USEPA Reg IV (FW chronic)			3.0E-04	USEPA Reg IV (FW)	3.0E-04	USEPA Reg IV (FW chronic)
HEXACHLOROBUTADIENE	1.0E+00	1.0E+01					3.0E-01	3.0E+00				
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.1E-01	9.5E-01					6.3E-02	1.6E-01				
HEXACHLOROETHANE	1.2E+01	2.1E+02					1.2E+01	2.1E+02				
HEXAZINONE			1.7E+04	USEPA Off Pesticides	1.4E+05	USEPA Off Pesticides			1.7E+04	USEPA Off Pesticides (FW)	1.4E+05	USEPA Off Pesticides (FW)
INDENO(1,2,3-cd)PYRENE	2.8E-01				3.0E+02	CCME 2002	2.8E-01				3.0E+02	CCME 2002
ISOPHORONE	9.2E+02	7.5E+03							9.2E+02	USEPA Reg IV (FW)	7.5E+03	USEPA Reg IV (FW)
LEAD	2.5E+00	6.5E+01					8.1E+00	2.1E+02				
MERCURY	7.7E-01	1.4E+00					9.4E-01	1.8E+00				
METHOXYCHLOR	3.0E-02	7.0E-01					1.9E-02				7.0E-01	USEPA Reg IV (FW)
METHYL ETHYL KETONE	2.2E+04	2.0E+05					1.4E+04	2.4E+05				
METHYL ISOBUTYL KETONE	1.7E+02	2.2E+03					1.7E+02	2.2E+03				
METHYL MERCURY	2.8E-03	9.9E-02					2.8E-03	9.9E-02				
METHYL TERT BUTYL ETHER	7.3E+02	6.5E+03					1.8E+04	5.3E+04				
METHYLENE CHLORIDE	1.5E+03	8.5E+03					2.2E+03	2.6E+04				
METHYLNAPHTHALENE, 1-	2.1E+00	3.7E+01					2.1E+00	3.7E+01				
METHYLNAPHTHALENE, 2-	4.7E+00	4.2E+01					7.2E+01	8.6E+01				
MOLYBDENUM	8.0E+02	7.2E+03					3.7E+02	1.6E+04				
NAPHTHALENE	2.1E+01	1.7E+02					1.2E+01	1.9E+02				
NICKEL	5.2E+01	4.7E+02					8.2E+00	7.4E+01				
NITROBENZENE	3.8E+02	2.0E+03						2.0E+03	3.8E+02	USEPA Reg IV (FW)		
NITROGLYCERIN	1.8E+01	1.6E+02							1.8E+01	USEPA Reg IV (FW)	1.6E+02	USEPA Reg IV (FW)
NITROTOLUENE, 2-	7.1E+01	6.4E+02							7.1E+01	USEPA Reg IV (FW)	6.4E+02	USEPA Reg IV (FW)
NITROTOLUENE, 3-	4.2E+01	3.8E+02							4.2E+01	USEPA Reg IV (FW)	3.8E+02	USEPA Reg IV (FW)
NITROTOLUENE, 4-	4.6E+01	4.1E+02							4.6E+01	USEPA Reg IV (FW)	4.1E+02	USEPA Reg IV (FW)
PENTACHLOROPHENOL	1.5E+01	1.9E+01					7.9E+00	1.3E+01				
PENTAERYTHRITOLTETRANITRATE (PETN)			8.5E+05	Pascoe et al. (chronic FW)	8.5E+05	Pascoe et al. (chronic FW)			8.5E+05	Pascoe et al. (chronic FW)	8.5E+05	Pascoe et al. (chronic FW)
PERCHLORATE			6.0E+02	USEPA 2002	5.0E+03	USEPA 2002			6.0E+02	USEPA 2002	5.0E+03	USEPA 2002
PHENANTHRENE	2.3E+00				3.0E+02	CCME 2002	4.6E+00				3.0E+02	CCME 2002
PHENOL	1.6E+02	4.7E+03					5.8E+01	3.0E+02				
POLYCHLORINATED BIPHENYLS (PCBs)	7.4E-05	1.4E-02							7.4E-05	USEPA Reg IV (FW)	1.4E-02	USEPA Reg IV (FW)
PROPICONAZOLE			9.5E+01	USEPA Off Pesticides	4.3E+02	USEPA Off Pesticides			9.5E+01	USEPA Off Pesticides (FW)	4.3E+02	USEPA Off Pesticides (FW)
PYRENE	4.6E+00				3.0E+02	CCME 2002	1.0E+01				3.0E+02	CCME 2002
SELENIUM	5.0E+00	2.0E+01					7.1E+01	2.9E+02				
SILVER	6.0E-02	3.2E+00					1.0E-01	1.9E+00				

TABLE D-4e. SUMMARY OF USEPA AND OTHER PUBLISHED AQUATIC HABITAT GOALS
(ug/l)

	Freshwater						Marine					
CONTAMINANT	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**	**USEPA Reg IV Chronic**	**USEPA Reg IV Acute**	**Other Chronic**	**Basis**	**Other Acute**	**Basis**
SIMAZINE	9.0E+00	8.0E+01							9.0E+00	USEPA Reg IV (FW)	8.0E+01	USEPA Reg IV (FW)
STYRENE	3.2E+01	2.9E+02							3.2E+01	USEPA Reg IV (FW)	2.9E+02	USEPA Reg IV (FW)
TERBACIL			1.2E+03	USEPA Off Pesticides	2.3E+04	USEPA Off Pesticides						
tert-BUTYL ALCOHOL			1.8E+04	USEPA AQUIRE (10% FW LC0)	1.8E+05	USEPA AQUIRE (FW LC0)			1.8E+04	USEPA AQUIRE (10% FW LC0)	1.8E+05	USEPA AQUIRE (FW LC0)
TETRACHLOROETHANE, 1,1,1,2-	8.5E+01	7.7E+02					1.1E+01				7.7E+02	USEPA Reg IV (FW)
TETRACHLOROETHANE, 1,1,2,2-	2.0E+02	9.1E+02					6.1E+02	2.1E+03				
TETRACHLOROETHYLENE	5.3E+01	4.3E+02					9.8E+01	8.3E+02				
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+00	1.1E+01							1.2E+00	USEPA Reg IV (FW)	1.1E+01	USEPA Reg IV (FW)
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.2E+02	1.2E+03					3.3E+02	1.9E+03				
THALLIUM	6.0E+00	5.4E+01					1.2E+01	1.1E+02				
TOLUENE	6.2E+01	5.6E+02					9.8E+00	1.2E+02				
TOXAPHENE	2.0E-04	7.3E-01					2.0E-04	2.1E-01				
TPH (gasolines)			5.0E+02	CalEPA FW Chronic	5.0E+03	Ceiling Level			3.7E+03	CalEPA Chronic (SW)	5.0E+03	Ceiling Level
TPH (middle distillates)			6.4E+02	CalEPA FW Chronic	2.5E+03	Ceiling Level			6.4E+02	CalEPA Chronic (FW)	2.5E+03	Ceiling Level
TPH (residual fuels)			6.4E+02	CaEPA FW Chronic	2.5E+03	Ceiling Level			6.4E+02	CalEPA Chronic (FW)	2.5E+03	Ceiling Level
TRICHLOROBENZENE, 1,2,4-	1.3E+02	4.2E+02					1.1E+02	7.0E+02				
TRICHLOROETHANE, 1,1,1-	7.6E+01	6.9E+02					1.1E+01	2.0E+02				
TRICHLOROETHANE, 1,1,2-	7.3E+02	3.2E+03					1.2E+03	5.2E+03				
TRICHLOROETHYLENE	2.0E+02	2.0E+03					4.7E+01	4.4E+02				
TRICHLOROPHENOL, 2,4,5-	1.9E+00	1.7E+01					1.2E+01	2.6E+02				
TRICHLOROPHENOL, 2,4,6-	4.9E+00	3.9E+01					6.5E+00				3.9E+01	USEPA Reg IV (FW)
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)			6.9E+02	USEPA Reg. V FW Chronic	6.9E+02	USEPA Reg. V FW Chronic			6.9E+02	USEPA Reg. V FW Chronic	6.9E+02	USEPA Reg. V FW Chronic
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.0E+01	2.7E+02					5.0E+01				2.7E+02	USEPA Reg IV (FW)
TRICHLOROPROPANE, 1,2,3-			1.4E+01	USEPA AQUIRE (50% FW EC50)	1.4E+02	USEPA AQUIRE (5xFW EC50)			1.4E+01	USEPA AQUIRE (50% FW EC50)	1.4E+02	USEPA AQUIRE (5xFW EC50)
TRICHLOROPROPENE, 1,2,3-												
TRIFLURALIN	1.1E+00	2.1E+01							1.1E+00	USEPA Reg IV (FW)	2.1E+01	USEPA Reg IV (FW)
TRINITROBENZENE, 1,3,5-	1.1E+01	2.7E+01					1.0E+01	3.0E+01				
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)												
TRINITROTOLUENE, 2,4,6- (TNT)	1.3E+01	2.1E+02					9.0E+01	5.7E+02				
VANADIUM	2.7E+01	1.2E+02					8.1E+01	9.0E+01				
VINYL CHLORIDE	9.3E+02	8.4E+03							9.3E+02	USEPA Reg. IV SW Chronic	8.4E+03	USEPA Reg IV SW Acute
XYLENES	2.7E+01	2.4E+02					1.3E+01	2.3E+02	1.0E+02	5% Acute SW LC 50	1.0E+03	50% SW LC50
ZINC	1.2E+02	1.2E+02					8.1E+01	9.0E+01				

References:

Primary sources USEPA Region IV (2015) and USEPA Office of Pesticides Aquatic Life Benchmarks database (USEPA 2016b; accessed July 2016). See also USDOE (1997), MOEE (1996), USEPA (2002), USEPA Reg 5 (2003), Pascoe et al. (2010). USEPA AQUIRE ecotox database refered to for pesticides that lacked published, aquatic toxicity screening levels (USEPA 2008b).

Notes:

Used for development of groundwater and soil action levels.
See text for prioritization and selection of surface water quality action levels.
Red: Screening level based on bioaccumulation.
1,4 Dioxane: LC 50 values for presented in "Solvent Stabilizers White Paper" (Mohr 2001).
Perchlorate: Chronic and acute goals from "Perchlorate Environmental Contamination" (USEPA 2002).
tert Buytl Alcohol (TBA): Chronic aquatic goal based on in-house review of USEPA ECOTOX database for TBA (USEPA 2008b). Ten percent of LC0 concentration for Lepomis macrochirus (Bluegill) selected as most conservative goal of data presented.
AWQC: Aquatic Water Quality Criteria
EC50: 50% Effects Concentration
LC0: 0% Lethal Concentration
LC50: 50% Lethal Concentration
FW: Freshwater
SW: Saltwater
TPH Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.
USDOE: US Dept of Energy (Oak Ridge National Laboratories)
USDOE: US Dept of Energy (Oak Ridge National Laboratories)
USEPA: U.S. Environmental Protection Agency

TABLE D-4f. SURFACE WATER QUALITY STANDARDS FOR BIOACCUMULATION AND HUMAN CONSUMPTION OF AQUATIC ORGANISMS

(ug/l)

CONTAMINANT	Selected Criteria	Basis	[1]HI DOH WQS	[2]USEPA NWQC
ACENAPHTHENE	9.9E+02	USEPA Aquatic Organism Consumption		9.9E+02
ACENAPHTHYLENE				
ACETONE				
ALDRIN	2.6E-05	HI DOH Fish Consumption	2.6E-05	5.0E-05
AMETRYN				
AMINO,2- DINITROTOLUENE,4,6-				
AMINO,4- DINITROTOLUENE,2,6-				
ANTHRACENE	4.0E+04	USEPA Aquatic Organism Consumption		4.0E+04
ANTIMONY	1.5E+04	HI DOH Fish Consumption	1.5E+04	6.4E+02
ARSENIC	1.4E-01	USEPA Aquatic Organism Consumption		1.4E-01
ATRAZINE				
BARIUM				
BENOMYL				
BENZENE	1.3E+01	HI DOH Fish Consumption	1.3E+01	5.1E+01
BENZO(a)ANTHRACENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
BENZO(a)PYRENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
BENZO(b)FLUORANTHENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
BENZO(g,h,i)PERYLENE				
BENZO(k)FLUORANTHENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
BERYLLIUM	3.8E-02	HI DOH Fish Consumption	3.8E-02	
BIPHENYL, 1,1-				
BIS(2-CHLOROETHYL)ETHER	4.4E-01	HI DOH Fish Consumption	4.4E-01	5.3E-01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	1.4E+03	HI DOH Fish Consumption	1.4E+03	6.5E+04
BIS(2-ETHYLHEXYL)PHTHALATE	2.2E+00	USEPA Aquatic Organism Consumption		2.2E+00
BORON				
BROMODICHLOROMETHANE				
BROMOFORM	1.4E+02	USEPA Aquatic Organism Consumption		1.4E+02
BROMOMETHANE	1.5E+03	USEPA Aquatic Organism Consumption		1.5E+03
CADMIUM				
CARBON TETRACHLORIDE	2.3E+00	HI DOH Fish Consumption	2.3E+00	1.6E+00
CHLORDANE (TECHNICAL)	1.6E-05	HI DOH Fish Consumption	1.6E-05	8.1E-04
CHLOROANILINE, p-				
CHLOROBENZENE	2.1E+04	USEPA Aquatic Organism Consumption		2.1E+04
CHLOROETHANE				
CHLOROFORM	5.1E+00	HI DOH Fish Consumption	5.1E+00	4.7E+02
CHLOROMETHANE				
CHLOROPHENOL, 2-	1.5E+02	USEPA Aquatic Organism Consumption		1.5E+02
CHROMIUM (Total)				
CHROMIUM III				
CHROMIUM VI				
CHRYSENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02

TABLE D-4f. SURFACE WATER QUALITY STANDARDS FOR BIOACCUMULATION AND HUMAN CONSUMPTION OF AQUATIC ORGANISMS

(ug/l)

CONTAMINANT	Selected Criteria	Basis	[1]HI DOH WQS	[2]USEPA NWQC
COBALT				
COPPER				
CYANIDE (Free)	2.2E+05	USEPA Aquatic Organism Consumption		2.2E+05
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)				
DALAPON				
DIBENZO(a,h)ANTHTRACENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
DIBROMO-3-CHLOROPROPANE, 1,2-				
DIBROMOCHLOROMETHANE	1.3E+01	USEPA Aquatic Organism Consumption		1.3E+01
DIBROMOETHANE, 1,2-				
DICHLOROBENZENE, 1,2-	8.5E+02	HI DOH Fish Consumption	8.5E+02	1.7E+04
DICHLOROBENZENE, 1,3-	8.5E+02	HI DOH Fish Consumption	8.5E+02	9.6E+02
DICHLOROBENZENE, 1,4-	8.5E+02	HI DOH Fish Consumption	8.5E+02	2.6E+03
DICHLOROBENZIDINE, 3,3-	7.0E-03	HI DOH Fish Consumption	7.0E-03	2.8E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	3.1E-04	USEPA Aquatic Organism Consumption		3.1E-04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.2E-04	USEPA Aquatic Organism Consumption		2.2E-04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.0E-06	HI DOH Fish Consumption	8.0E-06	2.2E-04
DICHLOROETHANE, 1,1-				
DICHLOROETHANE, 1,2-	7.9E+01	HI DOH Fish Consumption	7.9E+01	3.7E+01
DICHLOROETHYLENE, 1,1-	6.0E-01	HI DOH Fish Consumption	6.0E-01	3.2E+00
DICHLOROETHYLENE, Cis 1,2-				
DICHLOROETHYLENE, Trans 1,2-	140000	USEPA Aquatic Organism Consumption		140000
DICHLOROPHENOL, 2,4-	2.9E+02	USEPA Aquatic Organism Consumption		2.9E+02
DICHLOROPHENOXYACETIC ACID (2,4-D)				
DICHLOROPROPANE, 1,2-	1.5E+01	USEPA Aquatic Organism Consumption		1.5E+01
DICHLOROPROPENE, 1,3-	4.6E+00	HI DOH Fish Consumption	4.6E+00	1.7E+03
DIELDRIN	2.5E-05	HI DOH Fish Consumption	2.5E-05	5.4E-05
DIETHYLPHTHALATE	4.4E+04	USEPA Aquatic Organism Consumption		4.4E+04
DIMETHYLPHENOL, 2,4-	8.5E+02	USEPA Aquatic Organism Consumption		8.5E+02
DIMETHYLPHTHALATE	1.1E+06	USEPA Aquatic Organism Consumption		1.1E+06
DINITROBENZENE, 1,3-				
DINITROPHENOL, 2,4-	5.3E+03	USEPA Aquatic Organism Consumption		5.3E+03
DINITROTOLUENE, 2,4- (2,4-DNT)	3.0E+00	HI DOH Fish Consumption	3.0E+00	3.4E+00
DINITROTOLUENE, 2,6- (2,6-DNT)				
DIOXANE, 1,4-				
DIOXINS (TEQ)	5.0E-09	HI DOH Fish Consumption	5.0E-09	5.1E-09
DIURON				
ENDOSULFAN	5.2E+01	HI DOH Fish Consumption	5.2E+01	8.9E+01
ENDRIN	8.1E-01	USEPA Aquatic Organism Consumption		8.1E-01
ETHANOL				
ETHYLBENZENE	1.1E+03	HI DOH Fish Consumption	1.1E+03	2.9E+04
FLUORANTHENE	1.8E+01	HI DOH Fish Consumption	1.8E+01	1.4E+02

TABLE D-4f. SURFACE WATER QUALITY STANDARDS FOR BIOACCUMULATION AND HUMAN CONSUMPTION OF AQUATIC ORGANISMS

(ug/l)

CONTAMINANT	Selected Criteria	Basis	[1]HI DOH WQS	[2]USEPA NWQC
FLUORENE	5.3E+03	USEPA Aquatic Organism Consumption		5.3E+03
GLYPHOSATE				
HEPTACHLOR	9.0E-05	HI DOH Fish Consumption	9.0E-05	7.9E-05
HEPTACHLOR EPOXIDE	3.9E-05	USEPA Aquatic Organism Consumption		3.9E-05
HEXACHLOROBENZENE	2.4E-04	HI DOH Fish Consumption	2.4E-04	2.9E-04
HEXACHLOROBUTADIENE	1.6E+01	HI DOH Fish Consumption	1.6E+01	1.8E+01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.0E-02	HI DOH Fish Consumption	2.0E-02	6.3E-02
HEXACHLOROETHANE	2.9E+00	HI DOH Fish Consumption	2.9E+00	3.3E+00
HEXAZINONE				
INDENO(1,2,3-cd)PYRENE	1.8E-02	USEPA Aquatic Organism Consumption		1.8E-02
ISOPHORONE	1.7E+05	HI DOH Fish Consumption	1.70E+05	
LEAD				
MERCURY	4.7E-02	HI DOH Fish Consumption	4.7E-02	3.0E-01
METHOXYCHLOR				
METHYL ETHYL KETONE				
METHYL ISOBUTYL KETONE				
METHYL MERCURY				
METHYL TERT BUTYL ETHER				
METHYLENE CHLORIDE	5.9E+02	USEPA Aquatic Organism Consumption		5.9E+02
METHYLNAPHTHALENE, 1-				
METHYLNAPHTHALENE, 2-				
MOLYBDENUM				
NAPHTHALENE				
NICKEL	3.3E+01	HI DOH Fish Consumption	3.3E+01	4.6E+03
NITROBENZENE				
NITROGLYCERIN				
NITROTOLUENE, 2-				
NITROTOLUENE, 3-				
NITROTOLUENE, 4-				
PENTACHLOROPHENOL	3.0E+00	USEPA Aquatic Organism Consumption		3.0E+00
PENTAERYTHRITOLTETRANITRATE (PETN)				
PERCHLORATE				
PHENANTHRENE				
PHENOL	1.7E+06	USEPA Aquatic Organism Consumption		1.7E+06
POLYCHLORINATED BIPHENYLS (PCBs)	7.9E-05	HI DOH Fish Consumption	7.9E-05	6.4E-05
PROPICONAZOLE				
PYRENE	4.0E+03	USEPA Aquatic Organism Consumption		4.0E+03
SELENIUM				
SILVER				
SIMAZINE				
STYRENE				

TABLE D-4f. SURFACE WATER QUALITY STANDARDS FOR BIOACCUMULATION AND HUMAN CONSUMPTION OF AQUATIC ORGANISMS

(ug/l)

CONTAMINANT	Selected Criteria	Basis	[1]HI DOH WQS	[2]USEPA NWQC
TERBACIL				
tert-BUTYL ALCOHOL				
TETRACHLOROETHANE, 1,1,1,2-				
TETRACHLOROETHANE, 1,1,2,2-	3.5E+00	HI DOH Fish Consumption	3.5E+00	4.0E+00
TETRACHLOROETHYLENE	2.9E+00	HI DOH Fish Consumption	2.90E+00	3.3E+00
TETRACHLOROPHENOL, 2,3,4,6-				
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)				
THALLIUM	1.6E+01	HI DOH Fish Consumption	1.6E+01	6.3E+00
TOLUENE	1.4E+05	HI DOH Fish Consumption	1.4E+05	2.0E+05
TOXAPHENE	2.4E-04	HI DOH Fish Consumption	2.4E-04	2.8E-04
TPH (gasolines)				
TPH (middle distillates)				
TPH (residual fuels)				
TRICHLOROBENZENE, 1,2,4-				
TRICHLOROETHANE, 1,1,1-	3.4E+05	HI DOH Fish Consumption	3.4E+05	
TRICHLOROETHANE, 1,1,2-	1.4E+01	HI DOH Fish Consumption	1.4E+01	1.6E+01
TRICHLOROETHYLENE	2.6E+01	HI DOH Fish Consumption	2.6E+01	3.0E+01
TRICHLOROPHENOL, 2,4,5-	3.6E+03	USEPA Aquatic Organism Consumption		3.6E+03
TRICHLOROPHENOL, 2,4,6-	1.2E+00	HI DOH Fish Consumption	1.2E+00	
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)				
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)				
TRICHLOROPROPANE, 1,2,3-				
TRICHLOROPROPENE, 1,2,3-				
TRIFLURALIN				
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)				
TRINITROTOLUENE, 1,3,5-				
TRINITROTOLUENE, 2,4,6- (TNT)				
VANADIUM				
VINYL CHLORIDE	1.7E+02	HI DOH Fish Consumption	1.70E+02	5.30E+02
XYLENES				
ZINC				

References:

1. Hawai'I Administrative Rules, Title 11, Chapter 54, Section 11-54-04: Basic Water Quality Criteria, August 2009.
2. USEPA National Recommended Water Quality Criteria (USEPA 2006).

Notes:

Hawai'I Surface Water Quality Standards for fish consumption considered if available.
Addresses potential accumulation of chemical in aquatic organisms and subsequent consumption by humans.

TABLE D-5. CALIFORNIA AGRICULTURAL WATER QUALITY GOALS

(ug/l)

CHEMICAL PARAMETER	Agricultural Water Quality Goals
ACENAPHTHENE	-
ACENAPHTHYLENE	-
ACETONE	-
ALDRIN	-
AMETRYN	-
AMINO,2- DINITROTOLUENE,4,6-	-
AMINO,4- DINITROTOLUENE,2,6-	-
ANTHRACENE	-
ANTIMONY	-
ARSENIC	1.0E+02
ATRAZINE	-
BARIUM	-
BENOMYL	
BENZENE	-
BENZO(a)ANTHRACENE	-
BENZO(a)PYRENE	-
BENZO(b)FLUORANTHENE	-
BENZO(g,h,i)PERYLENE	-
BENZO(k)FLUORANTHENE	-
BERYLLIUM	1.0E+02
BIPHENYL, 1,1-	-
BIS(2-CHLOROETHYL)ETHER	-
BIS(2-CHLORO-1-METHYLETHYL)ETHER	-
BIS(2-ETHYLHEXYL)PHTHALATE	-
BORON	7.0E+02
BROMODICHLOROMETHANE	-
BROMOFORM	-
BROMOMETHANE	-
CADMIUM	1.0E+01
CARBON TETRACHLORIDE	-
CHLORDANE (TECHNICAL)	-
CHLOROANILINE, p-	-
CHLOROBENZENE	-
CHLOROETHANE	-
CHLOROFORM	-
CHLOROMETHANE	-
CHLOROPHENOL, 2-	-
CHROMIUM (Total)	-
CHROMIUM III	-
CHROMIUM VI	1.0E+02
CHRYSENE	-
COBALT	5.0E+01
COPPER	2.0E+02
CYANIDE (Free)	-
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	-
DALAPON	-
DIBENZO(a,h)ANTHTRACENE	-
DIBROMO,1,2- CHLOROPROPANE,3-	-
DIBROMOCHLOROMETHANE	-
DIBROMOETHANE, 1,2-	-
DICHLOROBENZENE, 1,2-	-

TABLE D-5. CALIFORNIA AGRICULTURAL WATER QUALITY GOALS

(ug/l)

CHEMICAL PARAMETER	Agricultural Water Quality Goals
DICHLOROBENZENE, 1,3-	-
DICHLOROBENZENE, 1,4-	-
DICHLOROBENZIDINE, 3,3-	-
DICHLORODIPHENYLDICHLOROETHANE (DDD)	-
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	-
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	-
DICHLOROETHANE, 1,1-	-
DICHLOROETHANE, 1,2-	-
DICHLOROETHYLENE, 1,1-	-
DICHLOROETHYLENE, Cis 1,2-	-
DICHLOROETHYLENE, Trans 1,2-	-
DICHLOROPHENOL, 2,4-	-
DICHLOROPHENOXYACETIC ACID (2,4-D)	-
DICHLOROPROPANE, 1,2-	-
DICHLOROPROPENE, 1,3-	-
DIELDRIN	-
DIETHYLPHTHALATE	-
DIMETHYLPHENOL, 2,4-	-
DIMETHYLPHTHALATE	-
DINITROBENZENE, 1,3-	-
DINITROPHENOL, 2,4-	-
DINITROTOLUENE, 2,4- (2,4-DNT)	-
DINITROTOLUENE, 2,6- (2,6-DNT)	-
DIOXANE, 1,4-	-
DIOXINS (TEQ)	-
DIURON	-
ENDOSULFAN	-
ENDRIN	-
ETHANOL	-
ETHYLBENZENE	-
FLUORANTHENE	-
FLUORENE	-
GLYPHOSATE	-
HEPTACHLOR	-
HEPTACHLOR EPOXIDE	-
HEXACHLOROBENZENE	-
HEXACHLOROBUTADIENE	-
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	-
HEXACHLOROETHANE	-
HEXAZINONE	-
INDENO(1,2,3-cd)PYRENE	-
ISOPHORONE	-
LEAD	-
MERCURY	-
METHOXYCHLOR	-
METHYL ETHYL KETONE	-
METHYL ISOBUTYL KETONE	-
METHYL MERCURY	-
METHYL TERT BUTYL ETHER	-
METHYLENE CHLORIDE	-
METHYLNAPHTHALENE, 1-	-

TABLE D-5. CALIFORNIA AGRICULTURAL WATER QUALITY GOALS

(ug/l)

CHEMICAL PARAMETER	Agricultural Water Quality Goals
METHYLNAPHTHALENE, 2-	-
MOLYBDENUM	1.0E+01
NAPHTHALENE	-
NICKEL	2.0E+02
NITROBENZENE	-
NITROGLYCERIN	-
NITROTOLUENE, 2-	-
NITROTOLUENE, 3-	-
NITROTOLUENE, 4-	-
PENTACHLOROPHENOL	-
PENTAERYTHRITOLTETRANITRATE (PETN)	-
PERCHLORATE	-
PHENANTHRENE	-
PHENOL	-
POLYCHLORINATED BIPHENYLS (PCBs)	-
PROPICONAZOLE	-
PYRENE	-
SELENIUM	2.0E+01
SILVER	-
SIMAZINE	-
STYRENE	-
TERBACIL	-
tert-BUTYL ALCOHOL	-
TETRACHLOROETHANE, 1,1,1,2-	-
TETRACHLOROETHANE, 1,1,2,2-	-
TETRACHLOROETHYLENE	-
TETRACHLOROPHENOL, 2,3,4,6-	-
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	-
THALLIUM	-
TOLUENE	-
TOXAPHENE	-
TPH (gasolines)	-
TPH (middle distillates)	-
TPH (residual fuels)	-
TRICHLOROBENZENE, 1,2,4-	-
TRICHLOROETHANE, 1,1,1-	-
TRICHLOROETHANE, 1,1,2-	-
TRICHLOROETHYLENE	-
TRICHLOROPHENOL, 2,4,5-	-
TRICHLOROPHENOL, 2,4,6-	-
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	-
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	-
TRICHLOROPROPANE, 1,2,3-	-
TRICHLOROPROPENE, 1,2,3-	-
TRIFLURALIN	-
TRINITROBENZENE, 1,3,5-	-
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	-
TRINITROTOLUENE, 2,4,6- (TNT)	-
VANADIUM	1.0E+02
VINYL CHLORIDE	-
XYLENES	-

TABLE D-5. CALIFORNIA AGRICULTURAL WATER QUALITY GOALS

(ug/l)

CHEMICAL PARAMETER	Agricultural Water Quality Goals
ZINC	2.0E+03

References:

A Compiliation of Water Quality Goals (RWQCBCV 2007).

Notes:

Addresses use of water (including groundwater) for agricultural/irrigation purposes.

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

					Target Groundwater Concentrations		
					Drinking Water IS Threatened		Drinking Water N
CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
#ACENAPHTHENE	5.03E+03	1.80E-04	8.36E+02	1.2E+02	1.5E+01	2.0E+01	1.5E+01
ACENAPHTHYLENE	2.50E+03	1.45E-03	4.24E+02	5.9E+01	1.3E+01	2.4E+02	1.3E+01
ACETONE	2.40E+00	3.50E-05	6.16E-01	1.1E+05	1.5E+03	1.4E+04	1.5E+03
#ALDRIN	8.20E+04	4.40E-05	1.36E+04	8.4E+00	1.4E-04	5.1E-03	1.4E-04
AMETRYN	4.28E+02	2.40E-09	7.11E+01	5.6E+02	1.8E+02	1.8E+02	7.0E+02
AMINO,2- DINITROTOLUENE,4,6-	2.83E+02	3.30E-11	4.70E+01	2.2E+03	1.8E+01	4.0E+01	1.8E+01
AMINO,4- DINITROTOLUENE,2,6-	2.83E+02	3.30E-11	4.70E+01	2.2E+03	1.1E+01	4.0E+01	1.1E+01
#ANTHRACENE	1.64E+04	5.60E-05	2.72E+03	4.2E+00	2.0E-02	1.8E-01	2.0E-02
ANTIMONY					6.0E+00	6.0E+00	3.0E+01
ARSENIC					1.0E+01	1.0E+01	3.6E+01
ATRAZINE	2.25E+02	2.40E-09	3.73E+01	5.1E+01	3.0E+00	3.0E+00	1.2E+01
BARIUM					2.2E+02	2.0E+03	2.2E+02
BENOMYL	3.36E+02	4.93E-12	5.58E+01	8.0E+00	1.4E-01	2.8E+00	1.4E-01
BENZENE	1.50E+02	5.60E-03	5.97E+01	1.9E+03	5.0E+00	5.0E+00	7.1E+01
#BENZO(a)ANTHRACENE	1.77E+05	1.20E-05	2.94E+04	1.0E+01	1.1E-02	1.1E-02	2.7E-02
#BENZO(a)PYRENE	5.87E+05	4.60E-07	9.75E+04	5.6E+00	6.0E-02	2.0E-01	6.0E-02
#BENZO(b)FLUORANTHENE	5.99E+05	6.60E-07	9.95E+04	5.4E+00	2.9E-02	2.9E-02	6.8E-01
#BENZO(g,h,i)PERYLENE	1.60E+06	1.44E-07	2.66E+05	2.5E+00	1.3E-01	1.3E-01	1.3E-01
#BENZO(k)FLUORANTHENE	5.87E+05	5.80E-07	9.75E+04	2.8E+00	2.9E-01	2.9E-01	4.0E-01
BERYLLIUM					6.6E-01	4.0E+00	6.6E-01
#BIPHENYL, 1,1-	5.13E+03	3.10E-04	8.53E+02	2.3E+02	5.0E-01	5.0E-01	5.0E+00
BIS(2-CHLOROETHYL)ETHER	3.22E+01	1.70E-05	5.45E+00	5.0E+03	1.4E-02	1.4E-02	1.8E+02
BIS(2-CHLORO-1-METHYLETHYL)ETHER	6.10E+01	1.13E-04	1.08E+01	7.9E+02	3.7E-01	3.7E-01	3.7E-01
BIS(2-ETHYLHEXYL)PHTHALATE	1.20E+05	2.70E-07	1.99E+04	1.9E+02	3.0E+00	6.0E+00	3.0E+00
BORON					1.0E+03	4.0E+03	1.0E+03
BROMODICHLOROMETHANE	3.18E+01	2.10E-03	1.83E+01	9.3E+02	1.4E-01	1.4E-01	1.1E+02
BROMOFORM	3.18E+01	5.40E-04	8.63E+00	9.1E+02	8.0E+01	8.0E+01	2.3E+02
BROMOMETHANE	1.32E+01	7.30E-03	4.75E+01	3.6E+03	7.6E+00	7.6E+00	1.6E+01
CADMIUM					3.0E+00	3.0E+00	3.0E+00
CARBON TETRACHLORIDE	4.39E+01	2.80E-02	1.81E+02	4.5E+02	5.0E+00	5.0E+00	9.8E+00

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentrations — Drinking Water N: Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
#CHLORDANE (TECHNICAL)	6.75E+04	4.90E-05	1.12E+04	2.3E+01	4.0E-03	9.0E-02	4.0E-03
CHLOROANILINE, p-	1.13E+02	1.20E-06	1.87E+01	3.0E+03	3.9E-01	3.9E-01	1.9E+01
CHLOROBENZENE	2.34E+02	3.10E-03	5.81E+01	7.6E+02	2.5E+01	5.0E+01	2.5E+01
CHLOROETHANE	2.17E+01	1.10E-02	7.19E+01	2.1E+03	1.6E+01	1.6E+01	1.6E+02
CHLOROFORM	3.18E+01	3.70E-03	2.82E+01	2.5E+03	2.8E+01	7.0E+01	2.8E+01
CHLOROMETHANE	1.32E+01	8.80E-03	5.68E+01	1.3E+03	1.9E+02	1.9E+02	1.9E+02
CHLOROPHENOL, 2-	3.88E+02	1.10E-05	6.45E+01	2.7E+04	1.8E-01	1.8E-01	1.8E+00
CHROMIUM (Total)					1.1E+01	1.6E+01	1.1E+01
CHROMIUM III					2.0E+01	5.7E+02	2.0E+01
CHROMIUM VI					4.3E+00	4.3E+00	1.1E+01
#CHRYSENE	1.81E+05	5.20E-06	3.00E+04	2.2E+00	1.0E+00	1.0E+00	1.0E+00
COBALT					6.0E+00	6.0E+00	1.9E+01
COPPER					2.9E+00	2.9E+00	2.9E+00
CYANIDE (Free)		1.01E-04			1.0E+00	1.0E+00	1.0E+00
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	8.91E+01	2.00E-11	1.48E+01	3.8E+01	7.1E-01	7.1E-01	7.9E+01
DALAPON	3.20E+00	5.70E-08	5.32E-01	6.0E+04	2.0E+02	2.0E+02	3.0E+02
#DIBENZO(a,h)ANTHTRACENE	1.91E+06	1.40E-07	3.17E+05	2.9E+01	2.9E-03	2.9E-03	8.0E-01
DIBROMO,1,2- CHLOROPROPANE,3-	1.16E+02	1.50E-04	2.02E+01	9.8E+02	4.0E-02	4.0E-02	4.0E-02
DIBROMOCHLOROMETHANE	3.18E+01	7.80E-04	1.01E+01	8.0E+02	2.1E-01	2.1E-01	3.4E+01
DIBROMOETHANE, 1,2-	3.96E+01	6.50E-04	1.06E+01	1.3E+03	4.0E-02	4.0E-02	1.9E+01
DICHLOROBENZENE, 1,2-	3.83E+02	1.90E-03	7.54E+01	3.8E+02	1.0E+01	1.0E+01	1.4E+01
DICHLOROBENZENE, 1,3-	6.17E+02	1.90E-03	1.14E+02	6.0E+02	5.0E+00	5.0E+00	2.2E+01
DICHLOROBENZENE, 1,4-	3.75E+02	2.40E-03	7.72E+01	1.9E+02	5.0E+00	5.0E+00	9.4E+00
DICHLOROBENZIDINE, 3,3-	3.19E+03	2.80E-11	5.30E+02	6.0E+01	1.7E-01	1.7E-01	4.5E+00
#DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.18E+05	6.60E-06	1.95E+04	6.3E+01	1.1E-02	1.9E-01	1.1E-02
#DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	1.18E+05	4.20E-05	1.95E+04	2.8E+01	4.6E-02	4.6E-02	4.1E-01
#DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.69E+05	8.30E-06	2.80E+04	5.6E+00	1.0E-03	1.3E-02	1.0E-03
DICHLOROETHANE, 1,1-	3.18E+01	5.60E-03	4.00E+01	1.7E+03	2.8E+00	2.8E+00	4.7E+01
DICHLOROETHANE, 1,2-	3.96E+01	1.20E-03	1.40E+01	3.0E+03	5.0E+00	5.0E+00	1.8E+02
DICHLOROETHYLENE, 1,1-	3.18E+01	2.60E-02	1.67E+02	1.2E+03	7.0E+00	7.0E+00	2.5E+01

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentrations: Drinking Water IS Threatened — Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentrations: Drinking Water IS Threatened — Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentrations: Drinking Water N — Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
DICHLOROETHYLENE, Cis 1,2-	3.96E+01	4.10E-03	3.20E+01	2.4E+03	7.0E+01	7.0E+01	6.2E+02
DICHLOROETHYLENE, Trans 1,2-	3.96E+01	9.40E-03	6.49E+01	1.9E+03	1.0E+02	1.0E+02	5.6E+02
DICHLOROPHENOL, 2,4-	1.47E+02	4.30E-06	2.44E+01	5.5E+03	3.0E-01	3.0E-01	3.0E+00
DICHLOROPHENOXYACETIC ACID (2,4-D)	2.96E+01	3.50E-08	4.92E+00	1.9E+02	7.0E+01	7.0E+01	7.0E+01
DICHLOROPROPANE, 1,2-	6.07E+01	2.80E-03	2.75E+01	1.4E+03	5.0E+00	5.0E+00	1.0E+02
DICHLOROPROPENE, 1,3-	7.22E+01	3.60E-03	3.43E+01	1.6E+03	6.0E-02	5.0E-01	6.0E-02
#DIELDRIN	2.01E+04	1.00E-05	3.34E+03	2.4E+01	1.9E-03	1.1E-02	1.9E-03
DIETHYLPHTHALATE	1.05E+02	6.10E-07	1.74E+01	7.9E+02	2.1E+02	9.8E+02	2.1E+02
DIMETHYLPHENOL, 2,4-	4.92E+02	9.50E-07	8.16E+01	2.4E+04	1.2E+02	4.0E+02	1.2E+02
DIMETHYLPHTHALATE	1.40E+02	1.05E-07	2.32E+01	4.7E+03	1.1E+03	3.2E+03	1.1E+03
DINITROBENZENE, 1,3-	3.52E+02	4.90E-08	5.84E+01	1.2E+03	2.0E+00	2.0E+00	1.0E+01
DINITROPHENOL, 2,4-	4.61E+02	8.60E-08	7.65E+01	8.0E+03	1.4E+01	4.0E+01	1.4E+01
DINITROTOLUENE, 2,4- (2,4-DNT)	5.76E+02	5.40E-08	9.55E+01	7.1E+02	2.5E-01	2.5E-01	9.1E+00
DINITROTOLUENE, 2,6- (2,6-DNT)	5.87E+02	7.50E-07	9.75E+01	6.6E+02	5.2E-02	5.2E-02	8.1E+01
DIOXANE, 1,4-	2.60E+00	4.80E-06	4.61E-01	1.2E+05	4.6E-01	4.6E-01	5.0E+04
#DIOXINS (TEQ)	2.49E+05	5.00E-05	4.14E+04	3.0E-01	3.1E-09	3.0E-05	3.1E-09
DIURON	1.09E+02	5.00E-10	1.81E+01	3.2E+01	4.0E+01	4.0E+01	6.0E+01
#ENDOSULFAN	6.76E+03	6.50E-05	1.12E+03	1.3E+01	8.7E-03	3.4E-02	8.7E-03
#ENDRIN	2.01E+04	6.40E-06	3.33E+03	3.0E+01	2.3E-03	3.7E-02	2.3E-03
ETHANOL	3.09E-01	6.29E-06	9.03E-02	1.0E+05	5.0E+04	5.0E+04	5.0E+04
ETHYLBENZENE	4.46E+02	7.90E-03	1.23E+02	4.8E+02	7.3E+00	3.0E+01	7.3E+00
#FLUORANTHENE	5.55E+04	8.90E-06	9.20E+03	8.7E+01	8.0E-01	1.3E+01	8.0E-01
#FLUORENE	9.16E+03	9.60E-05	1.52E+03	9.3E+01	3.9E+00	2.4E+02	3.9E+00
GLYPHOSATE	2.10E+03	2.10E-12	3.49E+02	1.3E+05	7.0E+02	7.0E+02	1.8E+03
#HEPTACHLOR	4.13E+04	2.90E-04	6.85E+03	4.5E+01	3.6E-03	5.3E-02	3.6E-03
#HEPTACHLOR EPOXIDE	1.01E+04	2.10E-05	1.68E+03	1.2E+01	3.6E-03	5.3E-02	3.6E-03
#HEXACHLOROBENZENE	6.20E+03	1.70E-03	1.04E+03	2.3E-01	3.0E-04	3.0E-04	3.0E-04
HEXACHLOROBUTADIENE	8.45E+02	1.00E-02	2.02E+02	1.7E+01	2.0E-01	2.0E-01	3.0E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.81E+03	5.10E-06	4.66E+02	1.2E+02	6.3E-02	1.6E-01	6.3E-02
HEXACHLOROETHANE	1.97E+02	3.90E-03	5.69E+01	6.6E+01	4.0E-01	4.0E-01	1.2E+01

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentrations — Drinking Water N: Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
HEXAZINONE	1.29E+02	2.30E-12	2.15E+01	2.9E+04	6.6E+02	6.6E+02	1.7E+04
#INDENO(1,2,3-cd)PYRENE	1.95E+06	3.50E-07	3.24E+05	2.2E+00	2.9E-02	2.9E-02	9.5E-02
ISOPHORONE	6.50E+01	6.60E-06	1.08E+01	5.9E+03	8.2E+01	8.2E+01	9.2E+02
LEAD					5.6E+00	1.5E+01	5.6E+00
MERCURY					2.5E-02	2.0E+00	2.5E-02
#METHOXYCHLOR	2.69E+04	2.00E-07	4.46E+03	1.6E+01	3.0E-02	7.0E-01	3.0E-02
METHYL ETHYL KETONE	4.51E+00	5.70E-05	1.10E+00	2.8E+04	5.6E+03	5.6E+03	1.4E+04
METHYL ISOBUTYL KETONE	1.26E+01	1.40E-04	2.96E+00	3.4E+03	1.7E+02	1.3E+03	1.7E+02
METHYL MERCURY					2.8E-03	9.9E-02	2.8E-03
METHYL TERT BUTYL ETHER	1.16E+01	5.90E-04	5.58E+00	8.9E+03	5.0E+00	5.0E+00	7.3E+02
METHYLENE CHLORIDE	2.17E+01	3.30E-03	2.41E+01	3.3E+03	5.0E+00	5.0E+00	1.5E+03
METHYLNAPHTHALENE, 1-	2.53E+03	5.10E-04	4.23E+02	3.9E+02	2.1E+00	6.0E+00	2.1E+00
METHYLNAPHTHALENE, 2-	2.48E+03	5.20E-04	4.15E+02	3.7E+02	4.7E+00	1.0E+01	4.7E+00
MOLYBDENUM					1.0E+02	1.0E+02	3.7E+02
NAPHTHALENE	1.54E+03	4.40E-04	2.59E+02	2.9E+02	1.2E+01	1.7E+01	1.2E+01
NICKEL					5.0E+00	5.0E+00	5.0E+00
NITROBENZENE	2.26E+02	2.40E-05	3.77E+01	3.0E+03	1.4E-01	1.4E-01	3.8E+02
NITROGLYCERIN	1.16E+02	8.70E-08	1.92E+01	1.1E+03	2.0E+00	2.0E+00	1.8E+01
NITROTOLUENE, 2-	3.71E+02	1.30E-05	6.16E+01	1.5E+03	7.9E-02	7.9E-02	7.1E+01
NITROTOLUENE, 3-	3.63E+02	9.30E-06	6.03E+01	1.1E+03	2.0E+00	2.0E+00	4.2E+01
NITROTOLUENE, 4-	3.63E+02	5.60E-06	6.03E+01	1.0E+03	4.9E+00	4.9E+00	4.6E+01
PENTACHLOROPHENOL	5.92E+02	2.50E-08	9.83E+01	5.1E+01	1.0E+00	1.0E+00	7.9E+00
PENTAERYTHRITOLTETRANITRATE (PETN)	6.48E+02	1.30E-09	1.08E+02	1.7E+02	1.9E+01	1.9E+01	2.2E+04
PERCHLORATE					1.5E+01	1.5E+01	6.0E+02
#PHENANTHRENE	1.40E+04	3.93E-05	2.32E+03	6.9E+01	2.3E+00	2.4E+02	2.3E+00
PHENOL	1.87E+02	3.30E-07	3.11E+01	1.0E+05	5.8E+01	3.0E+02	5.8E+01
#POLYCHLORINATED BIPHENYLS (PCBs)	1.31E+05	2.83E-04	2.17E+04	3.4E+01	1.4E-02	5.0E-01	1.4E-02
PROPICONAZOLE	1.56E+03	1.70E-09	2.58E+02	1.0E+03	9.5E+01	2.6E+02	9.5E+01
#PYRENE	5.43E+04	1.20E-05	9.02E+03	4.4E+01	4.6E+00	6.8E+01	4.6E+00
SELENIUM					5.0E+00	2.0E+01	5.0E+00

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentrations — Drinking Water IS Threatened: Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentrations — Drinking Water N: Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
SILVER					1.0E-01	1.0E+00	1.0E-01
SIMAZINE	1.47E+02	9.40E-10	2.43E+01	6.1E+00	4.0E+00	4.0E+00	9.0E+00
STYRENE	4.46E+02	2.80E-03	9.14E+01	8.7E+02	1.0E+01	1.0E+01	3.2E+01
TERBACIL	5.01E+01	1.20E-10	8.32E+00	2.8E+02	2.6E+02	2.6E+02	2.6E+02
tert-BUTYL ALCOHOL	3.70E+01	1.17E-05	6.21E+00	3.2E+05	5.8E+00	5.8E+00	1.8E+04
TETRACHLOROETHANE, 1,1,1,2-	8.60E+01	2.50E-03	2.98E+01	6.8E+02	6.1E-01	6.1E-01	1.1E+01
TETRACHLOROETHANE, 1,1,2,2-	9.49E+01	3.70E-04	1.81E+01	1.9E+03	7.8E-02	7.8E-02	2.0E+02
TETRACHLOROETHYLENE	9.49E+01	1.80E-02	1.27E+02	1.7E+02	5.0E+00	5.0E+00	5.3E+01
TETRACHLOROPHENOL, 2,3,4,6-	2.80E+02	8.80E-06	4.65E+01	4.1E+01	1.2E+00	1.1E+01	1.2E+00
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	5.32E+02	8.70E-10	8.82E+01	1.6E+01	2.2E+02	1.0E+03	2.2E+02
THALLIUM					2.0E+00	2.0E+00	6.0E+00
TOLUENE	2.34E+02	6.60E-03	7.98E+01	8.2E+02	9.8E+00	4.0E+01	9.8E+00
#TOXAPHENE	7.72E+04	6.00E-06	1.28E+04	2.5E+02	2.0E-04	2.1E-01	2.0E-04
TPH (gasolines)	5.00E+03	7.86E-01	5.71E+03	5.4E+03	1.0E+02	1.0E+02	5.0E+02
TPH (middle distillates)	5.00E+03	5.65E-01	4.34E+03	5.0E+02	1.0E+02	1.0E+02	6.4E+02
TPH (residual fuels)					1.0E+02	1.0E+02	6.4E+02
TRICHLOROBENZENE, 1,2,4-	1.36E+03	1.40E-03	2.34E+02	4.0E+02	7.0E+01	7.0E+01	1.1E+02
TRICHLOROETHANE, 1,1,1-	4.39E+01	1.70E-02	1.13E+02	6.4E+02	1.1E+01	2.0E+02	1.1E+01
TRICHLOROETHANE, 1,1,2-	6.07E+01	8.20E-04	1.52E+01	2.2E+03	5.0E+00	5.0E+00	1.1E+02
TRICHLOROETHYLENE	6.07E+01	9.90E-03	7.15E+01	6.9E+02	5.0E+00	5.0E+00	4.7E+01
TRICHLOROPHENOL, 2,4,5-	1.60E+03	1.60E-06	2.65E+02	1.2E+04	1.9E+00	1.7E+01	1.9E+00
TRICHLOROPHENOL, 2,4,6-	3.81E+02	2.60E-06	6.33E+01	1.9E+03	4.9E+00	7.1E+00	4.9E+00
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.07E+02	8.70E-09	1.78E+01	2.1E+02	2.0E+02	2.0E+02	6.9E+02
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.75E+02	9.10E-09	2.91E+01	8.2E+01	3.0E+01	5.0E+01	3.0E+01
TRICHLOROPROPANE, 1,2,3-	1.16E+02	3.40E-04	2.13E+01	1.4E+03	6.0E-01	6.0E-01	1.4E+01
TRICHLOROPROPENE, 1,2,3-	1.16E+02	1.80E-02	1.31E+02	3.1E+02	6.2E-01	6.2E-01	6.2E-01
#TRIFLURALIN	1.64E+04	1.00E-04	2.72E+03	1.8E+01	1.1E+00	1.0E+01	1.1E+00
TRINITROBENZENE, 1,3,5-	1.68E+03	6.50E-09	2.79E+02	2.8E+03	1.0E+01	2.7E+01	1.0E+01
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.61E+03	2.70E-09	7.64E+02	2.1E+03	4.0E+01	4.0E+01	4.0E+01
TRINITROTOLUENE, 2,4,6- (TNT)	2.81E+03	2.10E-08	4.67E+02	2.0E+03	2.6E+00	2.6E+00	1.3E+01

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

					Target Groundwater Concentrations		
					Drinking Water IS Threatened		Drinking Water N
CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
VANADIUM					2.7E+01	9.0E+01	2.7E+01

TABLE E. SOIL ACTION LEVELS FOR LEACHING CONCERNS

					Target Groundwater Concentrations		
					Drinking Water IS Threatened		Drinking Water N
CONTAMINANT	Organic Carbon Coefficient (Koc) (cm^3/g)	Henry's Law Constant (H) ($atm\text{-}m^3/mol$)	Dilution/ Atenuation Factor (DAF)	Saturation Limit (mg/kg)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1a) (ug/L)	Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1b) (ug/L)	Target Groundwater Concentration (Surface Water Within 150m; Table D-1c) (ug/L)
VINYL CHLORIDE	2.17E+01	2.80E-02	1.77E+02	3.9E+03	2.0E+00	2.0E+00	1.8E+01
XYLENES	3.83E+02	6.60E-03	1.05E+02	2.6E+02	1.3E+01	2.0E+01	1.3E+01
ZINC					2.2E+01	2.2E+01	2.2E+01

Notes:

Soil leaching equation from Ontario MOEE guidance (see text).

Groundwater Category Drinking Water Resource - protective of groundwater that is a source of drinking water AND protective of discharge of groundwater to a surface water and subsequent impact on aquati

Groundwater Category NON-Drinking Water Resource - protective of discharge of impacted groundwater to surface water and subsequent impact on aquatic life.

#: Leaching model used considered to be excessively conservative for highly sorptive chemicals. For chemicals with koc values greater than 5,000 cm3/g, theoretical soil saturation level ("sat") used in place c saturation levels calculated using equation presented in USEPA Regional Screening Levels guidance (USEPA 2016, see Appendix 2).

Physio-Chemical constants for chemicals from USEPA RSLs guidance (USEPA 2016) or Ontario MOEE (MOEE 1996) when not available unless otherwise noted (see also Table H).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories. TPH action levels presented in 1996 HIDOH RBCA document applied to NDW, >150m from surface water groundwa that leaching of residual contamination from soil is not significant hazard.

Physio-Chemical constants for TPH (gasolines and middle distillates) based on constants developed for C11 to C22 aromatic carbon range fraction by Massachusetts DEP

and used to develop action levels for leaching of TPH in general from soil (MADEP 1997, refer to Table H). Soil leaching level rounded to nearest hundred.

Ethanol Dilution/Attenuation Factor (DAF) modified by a factor of ten to take into account anticipated high biodegradation rate in nature (refer to Chapter 5 of Appendix 1).

Action levels for TPH categories rounded to nearest 100 mg/kg.

TPH (residual fuels) soil action level for leaching from California Regional Water Board, Region 4 - drinking water protection, C23-C32 carbon range (RWQCBLA 1996).

Action levels for perchlorate calculated using leaching equation in USEPA Soil Screening Guidance and assumed Dilution/Attenuation Factor of 20 (see text).

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2.0E+02	1.2E+02	1.2E+02	1.2E+02	1.7E+02
3.0E+02	5.5E+00	1.0E+02	5.5E+00	1.3E+02
1.5E+04	9.2E-01	8.7E+00	9.2E-01	9.2E+00
1.3E+00	8.4E+00	8.4E+00	8.4E+00	1.8E+01
1.8E+03	1.3E+01	1.3E+01	5.0E+01	1.3E+02
1.6E+02	8.5E-01	1.9E+00	8.5E-01	7.5E+00
9.8E+01	5.2E-01	1.9E+00	5.2E-01	4.6E+00
1.8E-01	4.2E+00	4.2E+00	4.2E+00	4.2E+00
1.8E+02	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
6.9E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
3.3E+02	1.1E-01	1.1E-01	4.5E-01	1.2E+01
2.0E+03	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
2.8E+00	7.8E-03	1.6E-01	7.8E-03	1.6E-01
1.7E+03	3.0E-01	3.0E-01	4.3E+00	1.0E+02
4.7E+00	1.0E+01	1.0E+01	1.0E+01	1.4E+02
8.0E-01	5.9E+00	2.0E+01	5.9E+00	7.8E+01
7.5E-01	5.4E+00	5.4E+00	6.8E+01	7.5E+01
1.3E-01	3.5E+01	3.5E+01	3.5E+01	3.5E+01
4.0E-01	2.9E+01	2.9E+01	3.9E+01	3.9E+01
3.5E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
5.0E+00	2.3E+02	2.3E+02	2.3E+02	2.3E+02
1.8E+02	7.5E-05	7.5E-05	9.6E-01	9.6E-01
3.7E-01	4.0E-03	4.0E-03	4.0E-03	4.0E-03
2.7E+01	1.9E+02	1.9E+02	1.9E+02	5.4E+02
3.4E+04	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.1E+02	2.5E-03	2.5E-03	2.1E+00	2.1E+00
1.1E+03	6.9E-01	6.9E-01	2.0E+00	9.5E+00
3.8E+01	3.6E-01	3.6E-01	7.6E-01	1.8E+00
3.0E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.1E+02	9.1E-01	9.1E-01	1.8E+00	2.0E+01

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
9.0E-02	2.3E+01	2.3E+01	2.3E+01	2.3E+01
4.6E+02	7.3E-03	7.3E-03	3.6E-01	8.6E+00
2.2E+02	1.5E+00	2.9E+00	1.5E+00	1.3E+01
1.6E+02	1.2E+00	1.2E+00	1.2E+01	1.2E+01
1.1E+02	7.9E-01	2.0E+00	7.9E-01	3.1E+00
1.9E+02	1.1E+01	1.1E+01	1.1E+01	1.1E+01
1.8E+00	1.2E-02	1.2E-02	1.2E-01	1.2E-01
1.6E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
5.7E+02	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.6E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.0E+00	3.0E+01	3.0E+01	3.0E+01	3.0E+01
1.2E+02	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
2.9E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.0E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
5.2E+02	1.0E-02	1.0E-02	1.2E+00	7.7E+00
3.0E+03	1.1E-01	1.1E-01	1.6E-01	1.6E+00
1.3E+00	2.9E+01	2.9E+01	2.5E+02	4.0E+02
4.0E-02	8.1E-04	8.1E-04	8.1E-04	8.1E-04
4.5E+02	2.1E-03	2.1E-03	3.4E-01	4.6E+00
1.9E+01	4.2E-04	4.2E-04	2.0E-01	2.0E-01
1.0E+02	7.5E-01	7.5E-01	1.1E+00	7.5E+00
3.7E+02	5.7E-01	5.7E-01	2.5E+00	4.2E+01
1.1E+02	3.9E-01	3.9E-01	7.3E-01	8.5E+00
4.1E+01	9.2E-02	9.2E-02	2.4E+00	2.2E+01
1.9E-01	6.3E+01	6.3E+01	6.3E+01	6.3E+01
7.0E+00	2.8E+01	2.8E+01	2.8E+01	1.4E+02
1.3E-02	5.6E+00	5.6E+00	5.6E+00	5.6E+00
8.3E+02	1.1E-01	1.1E-01	1.9E+00	3.3E+01
1.8E+02	7.0E-02	7.0E-02	2.6E+00	2.6E+00
3.9E+03	1.2E+00	1.2E+00	4.2E+00	6.5E+02

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
1.3E+03	2.2E+00	2.2E+00	2.0E+01	4.1E+01
2.6E+03	6.5E+00	6.5E+00	3.6E+01	1.7E+02
3.0E+00	7.3E-03	7.3E-03	7.3E-02	7.3E-02
1.3E+02	3.4E-01	3.4E-01	3.4E-01	6.4E-01
1.0E+02	1.4E-01	1.4E-01	2.7E+00	2.7E+00
2.6E+02	2.1E-03	1.7E-02	2.1E-03	8.9E+00
7.1E-01	2.4E+01	2.4E+01	2.4E+01	2.4E+01
9.8E+02	3.7E+00	1.7E+01	3.7E+00	1.7E+01
7.0E+02	9.8E+00	3.3E+01	9.8E+00	5.7E+01
3.2E+03	2.6E+01	7.4E+01	2.6E+01	7.4E+01
1.0E+02	1.2E-01	1.2E-01	5.8E-01	5.8E+00
3.8E+02	1.1E+00	3.1E+00	1.1E+00	2.9E+01
1.1E+02	2.4E-02	2.4E-02	8.7E-01	1.1E+01
1.1E+02	5.1E-03	5.1E-03	7.9E+00	1.1E+01
5.0E+04	2.1E-04	2.1E-04	2.3E+01	2.3E+01
3.0E-03	3.0E-01	3.0E-01	3.0E-01	3.0E-01
2.0E+02	7.3E-01	7.3E-01	1.1E+00	3.6E+00
3.4E-02	1.3E+01	1.3E+01	1.3E+01	1.3E+01
3.7E-02	3.0E+01	3.0E+01	3.0E+01	3.0E+01
5.0E+04	4.5E+00	4.5E+00	4.5E+00	4.5E+00
1.4E+02	9.0E-01	3.7E+00	9.0E-01	1.7E+01
1.3E+01	8.7E+01	1.2E+02	8.7E+01	1.2E+02
3.0E+02	9.3E+01	3.6E+02	9.3E+01	4.6E+02
2.2E+04	2.4E+02	2.4E+02	6.3E+02	7.5E+03
5.3E-02	4.5E+01	4.5E+01	4.5E+01	4.5E+01
5.3E-02	1.2E+01	1.2E+01	1.2E+01	1.2E+01
3.0E-04	2.3E-01	2.3E-01	2.3E-01	2.3E-01
1.1E+01	4.1E-02	4.1E-02	6.1E-02	2.2E+00
1.6E-01	2.9E-02	7.5E-02	2.9E-02	7.5E-02
1.0E+02	2.3E-02	2.3E-02	6.8E-01	5.7E+00

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
5.0E+04	1.4E+01	1.4E+01	3.7E+02	1.1E+03
9.5E-02	9.6E+00	9.6E+00	3.1E+01	3.1E+01
4.3E+03	8.9E-01	8.9E-01	1.0E+01	4.7E+01
2.9E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
2.1E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
7.0E-01	1.6E+01	1.6E+01	1.6E+01	1.6E+01
5.0E+04	6.2E+00	6.2E+00	1.5E+01	5.5E+01
2.2E+03	5.0E-01	3.8E+00	5.0E-01	6.5E+00
9.9E-02	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
1.8E+03	2.8E-02	2.8E-02	4.1E+00	1.0E+01
8.5E+03	1.2E-01	1.2E-01	3.6E+01	2.0E+02
3.7E+01	8.9E-01	2.5E+00	8.9E-01	1.6E+01
4.2E+01	1.9E+00	4.1E+00	1.9E+00	1.7E+01
7.2E+03	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
2.1E+02	3.1E+00	4.4E+00	3.1E+00	5.4E+01
5.0E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
2.0E+03	5.3E-03	5.3E-03	1.4E+01	7.5E+01
1.6E+02	3.9E-02	3.9E-02	3.5E-01	3.1E+00
6.4E+02	4.9E-03	4.9E-03	4.4E+00	3.9E+01
3.8E+02	1.2E-01	1.2E-01	2.5E+00	2.3E+01
4.1E+02	2.9E-01	2.9E-01	2.8E+00	2.5E+01
1.3E+01	9.8E-02	9.8E-02	7.8E-01	1.3E+00
2.2E+04	2.1E+00	2.1E+00	2.3E+03	2.3E+03
5.0E+03	7.0E-03	7.0E-03	1.2E+00	1.2E+00
3.0E+02	6.9E+01	5.5E+02	6.9E+01	7.0E+02
3.0E+02	1.8E+00	9.3E+00	1.8E+00	9.3E+00
2.0E+00	3.4E+01	3.4E+01	3.4E+01	4.3E+01
4.3E+02	2.5E+01	6.7E+01	2.5E+01	1.1E+02
6.8E+01	4.4E+01	6.1E+02	4.4E+01	6.1E+02
2.0E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
1.0E+00	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
8.0E+01	9.7E-02	9.7E-02	2.2E-01	1.9E+00
1.1E+02	9.1E-01	9.1E-01	2.9E+00	1.0E+01
2.6E+02	2.2E+00	2.2E+00	2.2E+00	2.2E+00
5.0E+04	3.6E-02	3.6E-02	1.1E+02	3.1E+02
7.7E+02	1.8E-02	1.8E-02	3.2E-01	2.3E+01
2.4E+02	1.4E-03	1.4E-03	3.6E+00	4.3E+00
1.9E+02	6.4E-01	6.4E-01	6.8E+00	2.5E+01
1.1E+01	5.6E-02	5.1E-01	5.6E-02	5.1E-01
1.2E+03	1.9E+01	8.8E+01	1.9E+01	1.1E+02
4.7E+02	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)
4.0E+02	7.8E-01	3.2E+00	7.8E-01	3.2E+01
2.1E-01	2.5E+02	2.5E+02	2.5E+02	2.5E+02
5.0E+03	1.0E+02	1.0E+02	4.0E+02	2.0E+03
2.5E+03	1.0E+02	1.0E+02	5.0E+02	5.0E+03
2.5E+03	1.0E+03	1.0E+03	1.0E+03	5.0E+03
4.2E+02	1.6E+01	1.6E+01	2.6E+01	9.8E+01
6.0E+03	1.2E+00	2.3E+01	1.2E+00	6.8E+02
1.1E+02	7.6E-02	7.6E-02	1.6E+00	1.6E+00
2.1E+02	3.6E-01	3.6E-01	3.4E+00	1.5E+01
1.7E+01	5.0E-01	4.5E+00	5.0E-01	4.5E+00
3.9E+01	3.1E-01	4.5E-01	3.1E-01	2.5E+00
6.9E+02	3.6E+00	3.6E+00	1.2E+01	1.2E+01
2.7E+02	8.7E-01	1.5E+00	8.7E-01	7.9E+00
1.4E+02	1.3E-02	1.3E-02	3.0E-01	3.0E+00
6.2E-01	8.1E-02	8.1E-02	8.1E-02	8.1E-02
2.1E+01	1.8E+01	2.8E+01	1.8E+01	5.6E+01
2.7E+01	2.8E+00	7.5E+00	2.8E+00	7.5E+00
4.0E+01	3.1E+01	3.1E+01	3.1E+01	3.1E+01
2.1E+02	1.2E+00	1.2E+00	6.1E+00	9.8E+01

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
9.0E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)

	Soil Leaching Action Levels			
NOT Threatened	Drinking Water IS Threatened		Drinking Water NOT Threatened	
Target Groundwater Concentration (Surface Water NOT Within 150m; Table D-1d)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)	Soil Leaching Action Level (Surface Water Within 150m)	Soil Leaching Action Level (Surface Water NOT Within 150m)
(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
1.8E+01	3.5E-01	3.5E-01	3.3E+00	3.3E+00
2.3E+02	1.4E+00	2.1E+00	1.4E+00	2.4E+01
2.2E+01	(Use batch test)	(Use batch test)	(Use batch test)	(Use batch test)

c life.

of leaching model action level if higher (see text). Soil

ater category. May be applicable to other areas on a site-by-site basis if groundwater monitoring indicates

TABLE F-1. CRITERIA FOR ASSIGNMENT OF SOIL GROSS CONTAMINATION ACTION LEVELS

Soil Category	Criteria	Gross Contamination Action Level (mg/kg)
Surface Soils		
Unrestricted Land Use (includes Residential, Schools, Parkland, etc.)	Odor Index ≥ 100 OR no Odor Index and Vapor Pressure ≥ 1 Torr OR no data	100
	0.1 ≤ Odor Index < 100 OR no Odor Index and Vapor Pressure < 1 Torr	500
	Odor Index < 0.1 OR non-odorous chemical	1000
Industrial/Commercial Land Use Only	Odor Index ≥ 100 OR no Odor Index and Vapor Pressure ≥ 1 Torr OR no data	500
	0.1 ≤ Odor Index < 100 OR no Odor Index and Vapor Pressure < 1 Torr	1000
	Odor Index < 0.1 OR non-odorous chemical	2500
Subsurface Soils		
Unrestricted Land Use (includes Residential, Schools, Parkland, etc.)	Odor Index ≥ 100 OR no Odor Index and Vapor Pressure ≥ 1 Torr OR no data	500
	0.1 ≤ Odor Index < 100 OR no Odor Index and Vapor Pressure < 1 Torr	1000
	Odor Index < 0.1 OR non-odorous chemical	2500
Industrial/Commercial Land Use Only	Odor Index ≥ 100 OR no Odor Index and Vapor Pressure ≥ 1 Torr OR no data	1000
	0.1 ≤ Odor Index < 100 OR no Odor Index and Vapor Pressure < 1 Torr	2500
	Odor Index < 0.1 OR non-odorous chemical	5000

Modified from Ontario Ministry of Environment and Energy (MOEE 1996) and Massachusetts Department of Environmental Protection (MADEP 1994).

TABLE F-2. GROSS CONTAMINATION ACTION LEVELS FOR [1]EXPOSED OR POTENTIALLY EXPOSED SOIL (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
ACENAPHTHENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.5E-03	5.13E+02	8.00E-02	5.63E-02
ACENAPHTHYLENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.9E-02	-	-	-
ACETONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.1E+05	2.70E+02	3.09E+04	1.30E+01	2.08E+01
ALDRIN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.3E-05	2.63E+02	1.70E-02	1.35E-03
AMETRYN	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.74E-06	-	-	-
AMINO,2- DINITROTOLUENE,4,6-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.07E-04	-	-	-
AMINO,4- DINITROTOLUENE,2,6-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.07E-04	-	-	-
ANTHRACENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.7E-05	-	-	-
ANTIMONY	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
ARSENIC	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
ATRAZINE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.89E-07	-	-	-
BARIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
BENOMYL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
BENZENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.9E+03	9.50E+01	4.89E+03	1.50E+00	6.33E+01
BENZO(a)ANTHRACENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.2E-08	-	-	-
BENZO(a)PYRENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.6E-09	-	-	-
BENZO(b)FLUORANTHENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.0E-07	-	-	-
BENZO(g,h,i)PERYLENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.1E-10	-	-	-
BENZO(k)FLUORANTHENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.6E-11	-	-	-
BERYLLIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
BIPHENYL, 1,1-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.00E-03	6.00E+01	9.50E-03	5.26E-01
BIS(2-CHLOROETHYL)ETHER	5.0E+02	1.0E+03	5.0E+02	1.0E+03	5.0E+03	7.1E-01	2.87E+02	4.9E-02	1.45E+01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	5.0E+02	7.9E+02	5.0E+02	1.0E+03	7.9E+02	8.5E-01	2.24E+03	3.20E-01	2.66E+00
BIS(2-ETHYLHEXYL)PHTHALATE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.2E-08	-	-	-
BORON	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
BROMODICHLOROMETHANE	9.3E+02	9.3E+02	1.0E+03	2.5E+03	9.3E+02	5.00E+01	1.10E+07	1.68E+03	2.98E-02
BROMOFORM	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.60E+00	1.35E+04	1.30E+00	4.31E+00
BROMOMETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.6E+03	1.42E+03	8.00E+04	2.00E+01	7.10E+01
CADMIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
CARBON TETRACHLORIDE	4.5E+02	4.5E+02	5.0E+02	1.0E+03	4.5E+02	1.13E+02	6.30E+04	1.00E+01	1.13E+01
CHLORDANE (TECHNICAL)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.0E-05	8.40E+00	4.92E-04	2.03E-02
CHLOROANILINE, p-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.0E-05	-	-	-
CHLOROBENZENE	5.0E+02	7.6E+02	5.0E+02	1.0E+03	7.6E+02	1.18E+01	1.00E+03	2.20E-01	5.36E+01
CHLOROETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.1E+03	1.01E+03	3.80E+05	1.40E+02	7.20E+00
CHLOROFORM	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.5E+03	1.60E+02	4.22E+05	8.50E+01	1.88E+00
CHLOROMETHANE	1.0E+02	5.0E+02	1.0E+02	5.0E+02	1.3E+03	4.30E+03	-	-	-
CHLOROPHENOL, 2-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	2.7E+04	1.42E+00	1.90E+01	3.60E-03	3.94E+02
CHROMIUM (Total)	-	-	-	-	-	-	-	-	-
CHROMIUM III	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
CHROMIUM VI	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
CHRYSENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.3E-07	-	-	-
COBALT	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
COPPER	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
CYANIDE (Free)	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	6.20E+02	6.52E+02	5.80E-01	1.07E+03

TABLE F-2. GROSS CONTAMINATION ACTION LEVELS FOR [1]EXPOSED OR POTENTIALLY EXPOSED SOIL (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.10E-09	-	-	-
DALAPON	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.70E-01	-	-	-
DIBENZO(a,h)ANTHTRACENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.0E-10	-	-	-
DIBROMO-3-CHLOROPROPANE, 1,2-	5.0E+02	9.8E+02	5.0E+02	1.0E+03	9.8E+02	8.00E-01	-	-	-
DIBROMOCHLOROMETHANE	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	7.60E+01	-	-	-
DIBROMOETHANE, 1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.20E+01	2.00E+05	2.60E+01	4.62E-01
DICHLOROBENZENE, 1,2-	3.8E+02	3.8E+02	1.0E+03	2.5E+03	3.8E+02	1.50E+00	3.05E+05	5.00E+01	3.00E-02
DICHLOROBENZENE, 1,3-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	6.0E+02	2.30E+00	-	-	-
DICHLOROBENZENE, 1,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.80E+00	1.10E+03	1.80E-01	1.00E+01
DICHLOROBENZIDINE, 3,3-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.5E-09	-	-	-
DICHLORODIPHENYLDICHLOROETHANE (DDD)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.0E-06	-	-	-
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.5E-06	-	-	-
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.5E-06	-	-	-
DICHLOROETHANE, 1,1-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.7E+03	2.34E+02	1.25E+05	3.00E+01	7.80E+00
DICHLOROETHANE, 1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.0E+03	7.90E+01	2.42E+03	5.90E-01	1.34E+02
DICHLOROETHYLENE, 1,1-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.2E+03	5.91E+02	2.00E+06	5.00E+02	1.18E+00
DICHLOROETHYLENE, Cis 1,2-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	2.4E+03	2.15E+02	-	-	-
DICHLOROETHYLENE, Trans 1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.9E+03	3.31E+02	6.73E+04	1.70E+01	1.95E+01
DICHLOROPHENOL, 2,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.7E-02	1.40E+03	2.10E-01	3.19E-01
DICHLOROPHENOXYACETIC ACID (2,4-D)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	8.25E-05	-	-	-
DICHLOROPROPANE, 1,2-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	1.4E+03	4.20E+01	1.19E+03	2.50E-01	1.68E+02
DICHLOROPROPENE, 1,3-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.6E+03	4.30E+01	4.16E+03	1.00E+00	4.30E+01
DIELDRIN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.8E-08	-	-	-
DIETHYLPHTHALATE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	3.5E-04	-	-	-
DIMETHYLPHENOL, 2,4-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	9.8E-02	1.00E+00	1.97E-04	4.97E+02
DIMETHYLPHTHALATE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.7E-03	-	-	-
DINITROBENZENE, 1,3-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.00E-04	-	-	-
DINITROPHENOL, 2,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.5E-05	-	-	-
DINITROTOLUENE, 2,4- (2,4-DNT)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.47E-04	-	-	-
DINITROTOLUENE, 2,6- (2,6-DNT)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.67E-04	-	-	-
DIOXANE, 1,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.2E+05	3.70E+01	6.12E+05	1.70E+02	2.18E-01
DIOXINS (TEQ)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.50E-09	-	-	-
DIURON	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.90E-08	-	-	-
ENDOSULFAN	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.0E-05	-	-	-
ENDRIN	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.0E-07	-	-	-
ETHANOL	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.0E+05	5.65E+01	1.92E+04	1.00E+01	5.65E+00
ETHYLBENZENE	4.8E+02	4.8E+02	5.0E+02	1.0E+03	4.8E+02	1.00E+01	2.00E+03	4.50E-01	2.22E+01
FLUORANTHENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	5.0E-06	-	-	-
FLUORENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	3.2E-04	-	-	-
GLYPHOSATE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.30E-10	-	-	-
HEPTACHLOR	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.0E-04	3.00E+02	2.00E-02	1.50E-02
HEPTACHLOR EPOXIDE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.6E-06	3.00E+02	1.90E-02	1.37E-04
HEXACHLOROBENZENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.1E-05	-	-	-
HEXACHLOROBUTADIENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.50E-01	1.20E+04	1.10E+00	1.36E-01

TABLE F-2. GROSS CONTAMINATION ACTION LEVELS FOR [1]EXPOSED OR POTENTIALLY EXPOSED SOIL (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.4E-06	-	-	-
HEXACHLOROETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.1E-01	-	-	-
HEXAZINONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.25E-07	-	-	-
INDENO(1,2,3-cd)PYRENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.0E-06	-	-	-
ISOPHORONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.38E-01	-	-	-
LEAD	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
MERCURY	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.0E-03	-	-	-
METHOXYCHLOR	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.4E-06	-	-	-
METHYL ETHYL KETONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.8E+04	1.00E+02	3.20E+04	1.10E+01	9.09E+00
METHYL ISOBUTYL KETONE	1.0E+02	5.0E+02	1.0E+02	5.0E+02	3.4E+03	1.00E+01	4.20E+02	1.00E-01	1.00E+02
METHYL MERCURY	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	-	-	-	-
METHYL TERT BUTYL ETHER	1.0E+02	5.0E+02	1.0E+02	5.0E+02	8.9E+03	2.45E+02	5.30E+02	1.30E-01	1.88E+03
METHYLENE CHLORIDE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.3E+03	4.29E+02	5.60E+05	1.60E+02	2.68E+00
METHYLNAPHTHALENE, 1-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.8E-02	6.80E+01	1.15E-02	5.91E+00
METHYLNAPHTHALENE, 2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.8E-02	6.80E+01	1.15E-02	5.91E+00
MOLYBDENUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
NAPHTHALENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	8.2E-02	4.40E+02	8.40E-02	9.76E-01
NICKEL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
NITROBENZENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.0E+03	2.45E-01	-	-	-
NITROGLYCERIN	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.00E-02	-	-	-
NITROTOLUENE, 2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.09E-01	-	-	-
NITROTOLUENE, 3-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.04E-01	-	-	-
NITROTOLUENE, 4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.90E-03	-	-	-
PENTACHLOROPHENOL	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.1E-04	-	-	-
PENTAERYTHRITOLTETRANITRATE (PETN)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	8.38E-04	-	-	-
PERCHLORATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
PHENANTHRENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.6E-04	5.50E+01	7.42E-03	1.29E-01
PHENOL	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	3.50E-01	1.56E+02	4.00E-02	8.75E+00
POLYCHLORINATED BIPHENYLS (PCBs)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.9E-04 to 6.7E-03	-	-	-
PROPICONAZOLE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.00E-06	-	-	-
PYRENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.5E-06	-	-	-
SELENIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
SILVER	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
SIMAZINE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.21E-08	-	-	-
STYRENE	5.0E+02	8.7E+02	5.0E+02	1.0E+03	8.7E+02	5.00E+00	1.36E+03	3.00E-01	1.67E+01
TERBACIL	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.76E-07	-	-	-
tert-BUTYL ALCOHOL	1.0E+02	5.0E+02	1.0E+02	5.0E+02	3.2E+05	4.20E+01	-	-	-
TETRACHLOROETHANE, 1,1,1,2-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	6.8E+02	1.20E+01	-	-	-
TETRACHLOROETHANE, 1,1,2,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.9E+03	4.00E+00	1.05E+04	1.50E+00	2.67E+00
TETRACHLOROETHYLENE	1.7E+02	1.7E+02	5.0E+02	1.0E+03	1.7E+02	1.90E+01	3.17E+04	4.68E+00	4.06E+00
TETRACHLOROPHENOL, 2,3,4,6-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.66E-04	-	-	-
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.41E-08	-	-	-
THALLIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
TOLUENE	5.0E+02	8.2E+02	5.0E+02	1.0E+03	8.2E+02	2.80E+01	3.00E+04	8.00E+00	3.50E+00

TABLE F-2. GROSS CONTAMINATION ACTION LEVELS FOR [1]EXPOSED OR POTENTIALLY EXPOSED SOIL (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
TOXAPHENE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	4.00E-01	-	-	-
TPH (gasolines)	1.0E+02	5.0E+02	1.0E+02	5.0E+02	5.4E+03	3.00E+02	1.10E+03	2.50E-01	1.20E+03
TPH (middle distillates)	5.0E+02	5.0E+02	5.0E+02	1.0E+03	5.0E+02	1.00E+00	5.00E+03	7.00E-01	1.43E+00
TPH (residual fuels)	5.0E+02	2.5E+03	5.0E+02	2.5E+03	NA	-	-	-	-
TRICHLOROBENZENE, 1,2,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.9E-01	2.20E+04	2.96E+00	9.80E-02
TRICHLOROETHANE, 1,1,1-	5.0E+02	6.4E+02	5.0E+02	1.0E+03	6.4E+02	1.00E+02	6.51E+04	1.20E+01	8.33E+00
TRICHLOROETHANE, 1,1,2-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	2.2E+03	2.25E+01	-	-	-
TRICHLOROETHYLENE	5.0E+02	6.9E+02	5.0E+02	2.5E+03	6.9E+02	7.70E+01	1.36E+06	2.49E+02	3.09E-01
TRICHLOROPHENOL, 2,4,5-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	-	-	-	-
TRICHLOROPHENOL, 2,4,6-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.2E-02	3.00E-01	3.60E-05	3.33E+02
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.75E-05	-	-	-
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	2.58E-06	-	-	-
TRICHLOROPROPANE, 1,2,3-	1.0E+02	5.0E+02	1.0E+02	5.0E+02	1.4E+03	3.69E+00	-	-	-
TRICHLOROPROPENE, 1,2,3-	1.0E+02	3.1E+02	1.0E+02	5.0E+02	3.1E+02	4.40E+00	-	-	-
TRIFLURALIN	1.0E+02	5.0E+02	1.0E+02	5.0E+02	NA	4.58E-05	-	-	-
TRINITROBENZENE, 1,3,5-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.40E-06	-	-	-
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	1.17E-07	-	-	-
TRINITROTOLUENE, 2,4,6- (TNT)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	8.02E-06	-	-	-
VANADIUM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-
VINYL CHLORIDE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.9E+03	2.58E+03	7.71E+05	2.94E+02	8.78E+00
XYLENES	2.6E+02	2.6E+02	5.0E+02	1.0E+03	2.6E+02	6.00E+00	4.41E+02	1.00E-01	6.00E+01
ZINC	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	-	-	-	-

Notes:

1. Default 0-3m below ground surface for residential settings and 0-1m below ground surface for commercial/industrial settings.
2. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers and other sensitive uses.
3. Referred to as "ceiling levels" in original MADEP guidance (MADEP 1994).

Odor Index = VP/ORT in ppm-v

Physio-chemical constants Ontario MOEE (MOEE 1996) except as noted.

Physio-chemical constants for chloroethane and chloromethane from ATSDR Toxicological Profiles (ATSDR 2001).

Odor Recognition Threshold in parts per million - volume (ppm-v = (concentration in mg/m3) x (24/molecular weight)).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Ceiling Level: Based on comparison of vapor pressure and odor index to Table F-1 or saturation limit, if lower.

Saturation limits calculated using equation in USEPA RSL guidance (USEPA 2011) for chemicals that are liquid at ambient temperatures and pressures (refer to Appendix 2).

50% ORT of 0.13 ppm-v for MTBE from information in CaEPA Public Health Goal for MTBE (CalEPA 1999).

TPH VP values and ORTs from New Jersey Dept of Health (NJDPH 2008, 2010); ORTs for TPHg (0.25ppm) and TPHmd (0.7ppm) adjusted to ug/m3 based assumed MWs noted for TPHg and TPHd in Table H.

References for vapor pressure and odor threshold data (in order of use, see USEPA (1992) for additiona ORT values):

1. Ontario Ministry of Environment and Energy (MOEE 1996).
2. Massachusetts Department of Environmental Protection (MADEP 1994).
3. Agency for Toxic Substances and Disease Registry (ATSDR 2001).
4. Vapor Pressure for 1,4 Dioxane from "Solvent Stabilizers - White Paper" (Mohr 2001). Odor Threshold from US Department of Health and Human Services, National Toxicology Program (USDHHS, 2001).
5. Military range Database (ARAMS), U.S. Army Corps of Engineers, Engineer Research and Development Center, http://el.erdc.usace.army.mil/arams/databases.html (used for explosive-related contaminants).

TABLE F-3. GROSS CONTAMINATION ACTION LEVELS FOR [1]DEEP OR OTHERWISE ISOLATED SOILS
(mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
ACENAPHTHENE	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	4.50E-03	5.13E+02	8.00E-02	5.63E-02
ACENAPHTHYLENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.90E-02	-	-	-
ACETONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	1.1E+05	2.70E+02	3.09E+04	1.30E+01	2.08E+01
ALDRIN	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	2.30E-05	2.63E+02	1.70E-02	1.35E-03
AMETRYN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.74E-06	-	-	-
AMINO,2- DINITROTOLUENE,4,6-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.07E-04	-	-	-
AMINO,4- DINITROTOLUENE,2,6-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.07E-04	-	-	-
ANTHRACENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.70E-05	-	-	-
ANTIMONY	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
ARSENIC	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
ATRAZINE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.89E-07	-	-	-
BARIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
BENOMYL	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
BENZENE	1.0E+03	1.9E+03	1.0E+03	2.5E+03	1.9E+03	9.50E+01	4.89E+03	1.50E+00	6.33E+01
BENZO(a)ANTHRACENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.20E-08	-	-	-
BENZO(a)PYRENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.60E-09	-	-	-
BENZO(b)FLUORANTHENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.00E-07	-	-	-
BENZO(g,h,i)PERYLENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.10E-10	-	-	-
BENZO(k)FLUORANTHENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	9.60E-11	-	-	-
BERYLLIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
BIPHENYL, 1,1-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.00E-03	6.00E+01	9.50E-03	5.26E-01
BIS(2-CHLOROETHYL)ETHER	1.0E+03	2.5E+03	1.0E+03	2.5E+03	5.0E+03	7.10E-01	2.87E+02	4.9E-02	1.45E+01
BIS(2-CHLORO-1-METHYLETHYL)ETHER	7.9E+02	7.9E+02	1.0E+03	2.5E+03	7.9E+02	8.50E-01	2.24E+03	3.20E-01	2.66E+00
BIS(2-ETHYLHEXYL)PHTHALATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.20E-08	-	-	-
BORON	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
BROMODICHLOROMETHANE	9.3E+02	9.3E+02	2.5E+03	5.0E+03	9.3E+02	5.00E+01	1.10E+07	1.68E+03	2.98E-02
BROMOFORM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.60E+00	1.35E+04	1.30E+00	4.31E+00
BROMOMETHANE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.6E+03	1.42E+03	8.00E+04	2.00E+01	7.10E+01
CADMIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
CARBON TETRACHLORIDE	4.5E+02	4.5E+02	1.0E+03	2.5E+03	4.5E+02	1.13E+02	6.30E+04	1.00E+01	1.13E+01
CHLORDANE (TECHNICAL)	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	1.00E-05	8.40E+00	4.92E-04	2.03E-02
CHLOROANILINE, p-	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	1.00E-05	-	-	-
CHLOROBENZENE	7.6E+02	7.6E+02	1.0E+03	2.5E+03	7.6E+02	1.18E+01	1.00E+03	2.20E-01	5.36E+01
CHLOROETHANE	1.0E+03	2.1E+03	1.0E+03	2.5E+03	2.1E+03	1.01E+03	3.80E+05	1.40E+02	7.20E+00
CHLOROFORM	1.0E+03	2.5E+03	1.0E+03	2.5E+03	2.5E+03	1.60E+02	4.22E+05	8.50E+01	1.88E+00
CHLOROMETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.3E+03	4.30E+03	-	-	-
CHLOROPHENOL, 2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.7E+04	1.42E+00	1.90E+01	3.60E-03	3.94E+02
CHROMIUM (Total)	-	-	-	-	-	-	-	-	-
CHROMIUM III	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
CHROMIUM VI	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
CHRYSENE	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	6.30E-07	-	-	-
COBALT	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
COPPER	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
CYANIDE (Free)	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	6.20E+02	6.52E+02	5.80E-01	1.07E+03
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.10E-09	-	-	-

TABLE F-3. GROSS CONTAMINATION ACTION LEVELS FOR [1]DEEP OR OTHERWISE ISOLATED SOILS (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m³)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
DALAPON	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.70E-01	-	-	-
DIBENZO(a,h)ANTHTRACENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-10	-	-	-
DIBROMO-3-CHLOROPROPANE, 1,2-	9.8E+02	9.8E+02	1.0E+03	2.5E+03	9.8E+02	8.00E-01	-	-	-
DIBROMOCHLOROMETHANE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	7.60E+01	-	-	-
DIBROMOETHANE, 1,2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.20E+01	2.00E+05	2.60E+01	4.62E-01
DICHLOROBENZENE, 1,2-	3.8E+02	3.8E+02	2.5E+03	5.0E+03	3.8E+02	1.50E+00	3.05E+05	5.00E+01	3.00E-02
DICHLOROBENZENE, 1,3-	5.0E+02	6.0E+02	5.0E+02	1.0E+03	6.0E+02	2.30E+00	-	-	-
DICHLOROBENZENE, 1,4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.80E+00	1.10E+03	1.80E-01	1.00E+01
DICHLOROBENZIDINE, 3,3-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.50E-09	-	-	-
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-06	-	-	-
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.50E-06	-	-	-
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	5.50E-06	-	-	-
DICHLOROETHANE, 1,1-	1.0E+03	1.7E+03	1.0E+03	2.5E+03	1.7E+03	2.34E+02	1.25E+05	3.00E+01	7.80E+00
DICHLOROETHANE, 1,2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.0E+03	7.90E+01	2.42E+03	5.90E-01	1.34E+02
DICHLOROETHYLENE, 1,1-	1.0E+03	1.2E+03	1.0E+03	2.5E+03	1.2E+03	5.91E+02	2.00E+06	5.00E+02	1.18E+00
DICHLOROETHYLENE, Cis 1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.4E+03	2.15E+02	-	-	-
DICHLOROETHYLENE, Trans 1,2-	1.0E+03	1.9E+03	1.0E+03	2.5E+03	1.9E+03	3.31E+02	6.73E+04	1.70E+01	1.95E+01
DICHLOROPHENOL, 2,4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.70E-02	1.40E+03	2.10E-01	3.19E-01
DICHLOROPHENOXYACETIC ACID (2,4-D)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	8.25E-05	-	-	-
DICHLOROPROPANE, 1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.4E+03	4.20E+01	1.19E+03	2.50E-01	1.68E+02
DICHLOROPROPENE, 1,3-	1.0E+03	1.6E+03	1.0E+03	2.5E+03	1.6E+03	4.30E+01	4.16E+03	1.00E+00	4.30E+01
DIELDRIN	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	1.80E-08	-	-	-
DIETHYLPHTHALATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.50E-04	-	-	-
DIMETHYLPHENOL, 2,4-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	9.80E-02	1.00E+00	1.97E-04	4.97E+02
DIMETHYLPHTHALATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.70E-03	-	-	-
DINITROBENZENE, 1,3-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	9.00E-04	-	-	-
DINITROPHENOL, 2,4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.50E-05	-	-	-
DINITROTOLUENE, 2,4- (2,4-DNT)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.47E-04	-	-	-
DINITROTOLUENE, 2,6- (2,6-DNT)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.67E-04	-	-	-
DIOXANE, 1,4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	1.2E+05	3.70E+01	6.12E+05	1.70E+02	2.18E-01
DIOXINS (TEQ)	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	1.50E-09	-	-	-
DIURON	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.90E-08	-	-	-
ENDOSULFAN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-05	-	-	-
ENDRIN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.00E-07	-	-	-
ETHANOL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	1.0E+05	5.65E+01	1.92E+04	1.00E+01	5.65E+00
ETHYLBENZENE	4.8E+02	4.8E+02	1.0E+03	2.5E+03	4.8E+02	1.00E+01	2.00E+03	4.50E-01	2.22E+01
FLUORANTHENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	5.00E-06	-	-	-
FLUORENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.20E-04	-	-	-
GLYPHOSATE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.30E-10	-	-	-
HEPTACHLOR	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	3.00E-04	3.00E+02	2.00E-02	1.50E-02
HEPTACHLOR EPOXIDE	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	2.60E-06	3.00E+02	1.90E-02	1.37E-04
HEXACHLOROBENZENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.10E-05	-	-	-
HEXACHLOROBUTADIENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.50E-01	1.20E+04	1.10E+00	1.36E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	9.40E-06	-	-	-
HEXACHLOROETHANE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.10E-01	-	-	-

TABLE F-3. GROSS CONTAMINATION ACTION LEVELS FOR [1]DEEP OR OTHERWISE ISOLATED SOILS
(mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
HEXAZINONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.25E-07	-	-	-
INDENO(1,2,3-cd)PYRENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-06	-	-	-
ISOPHORONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.38E-01	-	-	-
LEAD	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
MERCURY	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.00E-03	-	-	-
METHOXYCHLOR	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.40E-06	-	-	-
METHYL ETHYL KETONE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	2.8E+04	1.00E+02	3.20E+04	1.10E+01	9.09E+00
METHYL ISOBUTYL KETONE	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.4E+03	1.00E+01	4.20E+02	1.00E-01	1.00E+02
METHYL MERCURY	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	-	-	-	-
METHYL TERT BUTYL ETHER	5.0E+02	1.0E+03	5.0E+02	1.0E+03	8.9E+03	2.45E+02	5.30E+02	1.30E-01	1.88E+03
METHYLENE CHLORIDE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.3E+03	4.29E+02	5.60E+05	1.60E+02	2.68E+00
METHYLNAPHTHALENE, 1-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.80E-02	6.80E+01	1.15E-02	5.91E+00
METHYLNAPHTHALENE, 2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.80E-02	6.80E+01	1.15E-02	5.91E+00
MOLYBDENUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
NAPHTHALENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	8.20E-02	4.40E+02	8.40E-02	9.76E-01
NICKEL	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
NITROBENZENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.0E+03	2.45E-01	-	-	-
NITROGLYCERIN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.00E-02	-	-	-
NITROTOLUENE, 2-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.09E-01	-	-	-
NITROTOLUENE, 3-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.04E-01	-	-	-
NITROTOLUENE, 4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.90E-03	-	-	-
PENTACHLOROPHENOL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.10E-04	-	-	-
PENTAERYTHRITOLTETRANITRATE (PETN)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	8.38E-04	-	-	-
PERCHLORATE	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
PHENANTHRENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	9.60E-04	5.50E+01	7.42E-03	1.29E-01
PHENOL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	3.50E-01	1.56E+02	4.00E-02	8.75E+00
POLYCHLORINATED BIPHENYLS (PCBs)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.70E-03	-	-	-
PROPICONAZOLE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.00E-06	-	-	-
PYRENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.50E-06	-	-	-
SELENIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
SILVER	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
SIMAZINE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.21E-08	-	-	-
STYRENE	8.7E+02	8.7E+02	1.0E+03	2.5E+03	8.7E+02	5.00E+00	1.36E+03	3.00E-01	1.67E+01
TERBACIL	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.76E-07	-	-	-
tert-BUTYL ALCOHOL	5.0E+02	1.0E+03	5.0E+02	1.0E+03	3.2E+05	4.20E+01	-	-	-
TETRACHLOROETHANE, 1,1,1,2-	5.0E+02	6.8E+02	5.0E+02	1.0E+03	6.8E+02	1.20E+01	-	-	-
TETRACHLOROETHANE, 1,1,2,2-	1.0E+03	1.9E+03	1.0E+03	2.5E+03	1.9E+03	4.00E+00	1.05E+04	1.50E+00	2.67E+00
TETRACHLOROETHYLENE	1.7E+02	1.7E+02	1.0E+03	2.5E+03	1.7E+02	1.90E+01	3.17E+04	4.68E+00	4.06E+00
TETRACHLOROPHENOL, 2,3,4,6-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.66E-04	-	-	-
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.41E-08	-	-	-
THALLIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
TOLUENE	8.2E+02	8.2E+02	1.0E+03	2.5E+03	8.2E+02	2.80E+01	3.00E+04	8.00E+00	3.50E+00
TOXAPHENE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.00E-01	-	-	-
TPH (gasolines)	5.0E+03	5.0E+03	5.0E+03	5.0E+03	5.4E+03	3.00E+02	1.00E+03	2.50E-01	1.20E+03
TPH (middle distillates)	5.0E+03	5.0E+03	5.0E+03	5.0E+03	NA	5.00E+00	1.00E+03	7.00E-01	7.14E+00

TABLE F-3. GROSS CONTAMINATION ACTION LEVELS FOR [1]DEEP OR OTHERWISE ISOLATED SOILS (mg/kg)

CONTAMINANT	[2]Final Unrestricted Land Use Action Level	Final Industrial/ Commercial Land Use Action Level	[2]Raw Unrestricted Action Level	Raw Industrial/ Commercial Action Level	Soil Saturation Limit (mg/kg)	Vapor Pressure (VP) (Torr @ 20-30 °C)	50 Percentile Odor Recognition Threshold (ORT) (ug/m^3)	50 Percentile Odor Recognition Threshold (ORT) (ppm-v)	Odor Index
TPH (residual fuels)	5.0E+03	5.0E+03	5.0E+03	5.0E+03	NA	-	-	-	-
TRICHLOROBENZENE, 1,2,4-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.90E-01	2.20E+04	2.96E+00	9.80E-02
TRICHLOROETHANE, 1,1,1-	6.4E+02	6.4E+02	1.0E+03	2.5E+03	6.4E+02	1.00E+02	6.51E+04	1.20E+01	8.33E+00
TRICHLOROETHANE, 1,1,2-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	2.2E+03	2.25E+01	-	-	-
TRICHLOROETHYLENE	6.9E+02	6.9E+02	2.5E+03	5.0E+03	6.9E+02	7.70E+01	1.36E+06	2.49E+02	3.09E-01
TRICHLOROPHENOL, 2,4,5-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	NA	-	-	-	-
TRICHLOROPHENOL, 2,4,6-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.20E-02	3.00E-01	3.60E-05	3.33E+02
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	3.75E-05	-	-	-
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	2.58E-06	-	-	-
TRICHLOROPROPANE, 1,2,3-	5.0E+02	1.0E+03	5.0E+02	1.0E+03	1.4E+03	3.69E+00	-	-	-
TRICHLOROPROPENE, 1,2,3-	3.1E+02	3.1E+02	5.0E+02	1.0E+03	3.1E+02	4.40E+00	-	-	-
TRIFLURALIN	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	4.58E-05	-	-	-
TRINITROBENZENE, 1,3,5-	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	6.40E-06	-	-	-
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	1.17E-07	-	-	-
TRINITROTOLUENE, 2,4,6- (TNT)	1.0E+03	2.5E+03	1.0E+03	2.5E+03	NA	8.02E-06	-	-	-
VANADIUM	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-
VINYL CHLORIDE	1.0E+03	2.5E+03	1.0E+03	2.5E+03	3.9E+03	2.58E+03	7.71E+05	2.94E+02	8.78E+00
XYLENES	2.6E+02	2.6E+02	1.0E+03	2.5E+03	2.6E+02	6.00E+00	4.41E+02	1.00E-01	6.00E+01
ZINC	2.5E+03	5.0E+03	2.5E+03	5.0E+03	NA	-	-	-	-

Notes:

1. Default >3m below ground surface for residential settings and >1m below unpaved ground surface for commercial/industrial settings.
2. Based on unrestricted current or future land use. Considered adequate for residential housing, schools, medical facilities, day-care centers and other sensitive uses.
3. Referred to as "ceiling levels" in original MADEP guidance (MADEP 1994).

Odor Index = VP/ORT in ppm-v

Physio-chemical constants Ontario MOEE (MOEE 1996) except as noted.

Physio-chemical constants for chloroethane and chloromethane from ATSDR Toxicological Profiles (ATSDR 2001).

Odor Recognition Threshold in parts per million - volume (ppm-v = (concentration in mg/m3) x (24/molecular weight)).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

Ceiling Level: Based on comparison of vapor pressure and odor index to Table F-1 or saturation limit, if lower.

Saturation limits calculated using equation in USEPA Region IX PRG guidance (for chemicals that are liquid at ambient temperatures and pressures; refer to Appendix 2).

Ceiling Levels for TPH after guidance from Massachusetts Department of Environmental Protection (MADEP 1997a).

50% ORT of 0.13 ppm-v for MTBE from information in CaEPA Public Health Goal for MTBE (CalEPA 1999).

TPH VP values from NIOSH (2002); TPHd ORT value from ATSDR (2001a). TPHg ORT based on threshold of 0.2ppm (AHC 2004; worst-case gasoline with TAME) and assumed MW of 108 (refer to Table H); ORT in ug/m^3 = 200 ppbv x (104/24)= 900; rounded to 1,000 ug/m^3.

TPH(middle distillate fuels) gross contamination action level for isolated soils at commercial/industrial sites set at 5,000 mg/kg, based on profession judgement.

References for vapor pressure and odor threshold data (in order of use):

1. Ontario Ministry of Environment and Energy (MOEE 1996).
2. Massachusetts Department of Environmental Protection (MADEP 1994).
3. Agency for Toxic Substances and Disease Registry (ATSDR 2001).
4. National Library of Medicine, Hazardous Substances Data Bank (NLM 2000).
5. U.S. Department of Health and Human Services (NIOSH 2000).

TABLE G-1. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
ACENAPHTHENE	2.0E+01	Taste & Odors	2.0E+03	2.0E+01	Ontario MOEE	5.0E+04
ACENAPHTHYLENE	2.0E+03	Solubility	2.0E+03	-	-	5.0E+04
ACETONE	2.0E+04	Taste & Odors	5.0E+08	2.0E+04	Amoore & Hautala	5.0E+04
ALDRIN	8.5E+00	Solubility	8.5E+00	1.7E+01	Ontario MOEE	5.0E+04
AMETRYN	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
AMINO,2- DINITROTOLUENE,4,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
AMINO,4- DINITROTOLUENE,2,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
ANTHRACENE	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
ANTIMONY	5.0E+04	Upper Limit		-	-	5.0E+04
ARSENIC	5.0E+04	Upper Limit		-	-	5.0E+04
ATRAZINE	2.0E+01	Taste & Odors	1.8E+04	2.0E+01	Young et al	5.0E+04
BARIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BENOMYL	1.9E+03	Solubility	1.9E+03	-	-	5.0E+04
BENZENE	1.7E+02	Taste & Odors	9.0E+05	1.7E+02	Amoore & Hautala	5.0E+04
BENZO(a)ANTHRACENE	4.7E+00	Solubility	4.7E+00	-	-	5.0E+04
BENZO(a)PYRENE	8.0E-01	Solubility	8.0E-01	-	-	5.0E+04
BENZO(b)FLUORANTHENE	7.5E-01	Solubility	7.5E-01	-	-	5.0E+04
BENZO(g,h,i)PERYLENE	1.3E-01	Solubility	1.3E-01	-	-	5.0E+04
BENZO(k)FLUORANTHENE	4.0E-01	Solubility	4.0E-01	-	-	5.0E+04
BERYLLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BIPHENYL, 1,1-	5.0E-01	Taste & Odors	3.7E+03	5.0E-01	Amoore & Hautala	5.0E+04
BIS(2-CHLOROETHYL)ETHER	3.6E+02	Taste & Odors	8.6E+06	3.6E+02	Amoore & Hautala	5.0E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.2E+02	Taste & Odors	8.5E+05	3.2E+02	Ontario MOEE	5.0E+04
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E+02	Solubility	1.4E+02	-	-	5.0E+04
BORON	5.0E+04	Upper Limit		-	-	5.0E+04
BROMODICHLOROMETHANE	5.0E+04	Upper Limit	1.5E+06	-	-	5.0E+04
BROMOFORM	5.1E+02	Taste & Odors	1.6E+06	5.1E+02	Amoore & Hautala	5.0E+04
BROMOMETHANE	5.0E+04	Upper Limit	7.6E+06	-	-	5.0E+04
CADMIUM	5.0E+04	Upper Limit		-	-	5.0E+04
CARBON TETRACHLORIDE	5.2E+02	Taste & Odors	4.0E+05	5.2E+02	Amoore & Hautala	5.0E+04
CHLORDANE (TECHNICAL)	2.5E+00	Taste & Odors	2.8E+01	2.5E+00	Ontario MOEE	5.0E+04
CHLOROANILINE, p-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
CHLOROBENZENE	5.0E+01	Taste & Odors	2.5E+05	5.0E+01	Amoore & Hautala	5.0E+04
CHLOROETHANE	1.6E+01	Taste & Odors	3.4E+06	1.6E+01	Amoore & Hautala	5.0E+04
CHLOROFORM	2.4E+03	Taste & Odors	4.0E+06	2.4E+03	Amoore & Hautala	5.0E+04
CHLOROMETHANE	5.0E+04	Upper Limit	2.7E+06		-	5.0E+04
CHLOROPHENOL, 2-	1.8E-01	Taste & Odors	5.7E+06	1.8E-01	Ontario MOEE	5.0E+04
CHROMIUM (Total)	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM III	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM VI	5.0E+04	Upper Limit	8.5E+08	-	-	5.0E+04
CHRYSENE	1.0E+00	Solubility	1.0E+00	-	-	5.0E+04
COBALT	5.0E+04	Upper Limit		-	-	5.0E+04

TABLE G-1. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
COPPER	1.0E+03	Taste & Odors		1.0E+03	CalDHS 2nd MCL	5.0E+04
CYANIDE (Free)	1.7E+02	Taste & Odors	4.8E+07	1.7E+02	Amoore & Hautala	5.0E+04
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	3.0E+04	Solubility	3.0E+04	-	-	5.0E+04
DALAPON	5.0E+04	Upper Limit	2.5E+08	-	-	5.0E+04
DIBENZO(a,h)ANTHTRACENE	1.3E+00	Solubility	1.3E+00	-	-	5.0E+04
DIBROMO,1,2- CHLOROPROPANE,3-	1.0E+01	Taste & Odors	6.2E+05	1.0E+01	Amoore & Hautala	5.0E+04
DIBROMOCHLOROMETHANE	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIBROMOETHANE, 1,2-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
DICHLOROBENZENE, 1,2-	1.0E+01	Taste & Odors	7.8E+04	1.0E+01	USEPA 2nd MCL	5.0E+04
DICHLOROBENZENE, 1,3-	5.0E+00	Taste & Odors	7.8E+04	5.0E+00	1,4 DCB	5.0E+04
DICHLOROBENZENE, 1,4-	5.0E+00	Taste & Odors	4.1E+04	5.0E+00	USEPA 2nd MCL	5.0E+04
DICHLOROBENZIDINE, 3,3-	1.6E+03	Solubility	1.6E+03	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHANE (DDD)	4.5E+01	Solubility	4.5E+01	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+01	Solubility	2.0E+01	-	-	5.0E+04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.8E+00	Solubility	2.8E+00	3.5E+02	Ontario MOEE	5.0E+04
DICHLOROETHANE, 1,1-	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DICHLOROETHANE, 1,2-	7.0E+03	Taste & Odors	4.3E+06	7.0E+03	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, 1,1-	1.5E+03	Taste & Odors	1.2E+06	1.5E+03	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, Cis 1,2-	5.0E+04	Upper Limit	3.2E+06	-	-	5.0E+04
DICHLOROETHYLENE, Trans 1,2-	2.6E+02	Taste & Odors	2.3E+06	2.6E+02	Amoore & Hautala	5.0E+04
DICHLOROPHENOL, 2,4-	3.0E-01	Taste & Odors	2.8E+06	3.0E-01	Ontario MOEE	5.0E+04
DICHLOROPHENOXYACETIC ACID (2,4-D)	5.0E+04	Upper Limit	3.4E+05	-	-	5.0E+04
DICHLOROPROPANE, 1,2-	1.0E+01	Taste & Odors	1.4E+06	1.0E+01	Ontario MOEE	5.0E+04
DICHLOROPROPENE, 1,3-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIELDRIN	4.1E+01	Taste & Odors	9.8E+01	4.1E+01	Ontario MOEE	5.0E+04
DIETHYLPHTHALATE	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04
DIMETHYLPHENOL, 2,4-	4.0E+02	Taste & Odors	3.9E+06	4.0E+02	Cal DHS AL	5.0E+04
DIMETHYLPHTHALATE	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DINITROBENZENE, 1,3-	5.0E+04	Upper Limit	2.7E+05	-	-	5.0E+04
DINITROPHENOL, 2,4-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DINITROTOLUENE, 2,4- (2,4-DNT)	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
DINITROTOLUENE, 2,6- (2,6-DNT)	5.0E+04	Upper Limit	9.1E+04	-	-	5.0E+04
DIOXANE, 1,4-	5.0E+04	Upper Limit	5.0E+08	2.3E+05	Amoore & Hautala	5.0E+04
DIOXINS (TEQ)	1.0E-01	Solubility	1.0E-01	-	-	5.0E+04
DIURON	2.1E+04	Solubility	2.1E+04	-	-	5.0E+04
ENDOSULFAN	1.6E+02	Solubility	1.6E+02	-	-	5.0E+04
ENDRIN	4.1E+01	Taste & Odors	1.3E+02	4.1E+01	Ontario MOEE	5.0E+04
ETHANOL	5.0E+04	Upper Limit	5.0E+08	7.6E+05	Amoore & Hautala	5.0E+04
ETHYLBENZENE	3.0E+01	Taste & Odors	8.5E+04	3.0E+01	USEPA 2nd MCL	5.0E+04
FLUORANTHENE	1.3E+02	Solubility	1.3E+02	-	-	5.0E+04
FLUORENE	8.5E+02	Solubility	8.5E+02	-	-	5.0E+04
GLYPHOSATE	5.0E+04	Upper Limit	5.3E+06	-	-	5.0E+04

TABLE G-1. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
HEPTACHLOR	2.0E+01	Taste & Odors	9.0E+01	2.0E+01	Ontario MOEE	5.0E+04
HEPTACHLOR EPOXIDE	1.0E+02	Solubility	1.0E+02	-	-	5.0E+04
HEXACHLOROBENZENE	3.1E+00	Solubility	3.1E+00	3.0E+03	Ontario MOEE	5.0E+04
HEXACHLOROBUTADIENE	6.0E+00	Taste & Odors	1.6E+03	6.0E+00	Ontario MOEE	5.0E+04
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	3.7E+03	Solubility	3.7E+03	1.2E+04	Ontario MOEE	5.0E+04
HEXACHLOROETHANE	1.0E+01	Taste & Odors	2.5E+04	1.0E+01	Amoore & Hautala	5.0E+04
HEXAZINONE	5.0E+04	Upper Limit	1.7E+07	-	-	5.0E+04
INDENO(1,2,3-cd)PYRENE	9.5E-02	Solubility	9.5E-02	-	-	5.0E+04
ISOPHORONE	5.0E+04	Upper Limit	6.0E+06	-	-	5.0E+04
LEAD	5.0E+04	Upper Limit		-	-	5.0E+04
MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHOXYCHLOR	5.0E+01	Solubility	5.0E+01	4.7E+03	Amoore & Hautala	5.0E+04
METHYL ETHYL KETONE	8.4E+03	Taste & Odors	1.1E+08	8.4E+03	Amoore & Hautala	5.0E+04
METHYL ISOBUTYL KETONE	1.3E+03	Taste & Odors	9.5E+06	1.3E+03	Amoore & Hautala	5.0E+04
METHYL MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHYL TERT BUTYL ETHER	5.0E+00	Taste & Odors	2.6E+07	5.0E+00	Cal DHS 2nd MCL	5.0E+04
METHYLENE CHLORIDE	9.1E+03	Taste & Odors	6.5E+06	9.1E+03	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 1-	1.0E+01	Taste & Odors	1.3E+04	1.0E+01	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 2-	1.0E+01	Taste & Odors	1.2E+04	1.0E+01	Ontario MOEE	5.0E+04
MOLYBDENUM	5.0E+04	Upper Limit		-	-	5.0E+04
NAPHTHALENE	2.1E+01	Taste & Odors	1.6E+04	2.1E+01	Amoore & Hautala	5.0E+04
NICKEL	5.0E+04	Upper Limit		-	-	5.0E+04
NITROBENZENE	5.0E+04	Upper Limit	1.0E+06	-	-	5.0E+04
NITROGLYCERIN	5.0E+04	Upper Limit	6.9E+05	-	-	5.0E+04
NITROTOLUENE, 2-	5.0E+04	Upper Limit	3.3E+05	-	-	5.0E+04
NITROTOLUENE, 3-	5.0E+04	Upper Limit	2.5E+05	-	-	5.0E+04
NITROTOLUENE, 4-	5.0E+04	Upper Limit	2.2E+05	-	-	5.0E+04
PENTACHLOROPHENOL	3.0E+01	Taste & Odors	7.0E+03	3.0E+01	Amoore & Hautala	5.0E+04
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Solubility	2.2E+04	-	-	5.0E+04
PERCHLORATE	5.0E+04	Upper Limit	1.2E+08	-	-	5.0E+04
PHENANTHRENE	4.1E+02	Solubility	4.1E+02	1.0E+03	Ontario MOEE	5.0E+04
PHENOL	7.9E+03	Taste & Odors	4.1E+07	7.9E+03	Amoore & Hautala	5.0E+04
POLYCHLORINATED BIPHENYLS (PCBs)	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
PROPICONAZOLE	5.0E+04	Upper Limit	5.5E+04	-	-	5.0E+04
PYRENE	6.8E+01	Solubility	6.8E+01	-	-	5.0E+04
SELENIUM	5.0E+04	Upper Limit		-	-	5.0E+04
SILVER	1.0E+02	Taste & Odors		1.0E+02	Cal DHS 2nd MCL	5.0E+04
SIMAZINE	3.1E+03	Solubility	3.1E+03	-	-	5.0E+04
STYRENE	1.0E+01	Taste & Odors	1.6E+05	1.0E+01	USEPA 2nd MCL	5.0E+04
TERBACIL	5.0E+04	Upper Limit	3.6E+05	-	-	5.0E+04
tert-BUTYL ALCOHOL	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
TETRACHLOROETHANE, 1,1,1,2-	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04

TABLE G-1. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
TETRACHLOROETHANE, 1,1,2,2-	5.0E+02	Taste & Odors	1.4E+06	5.0E+02	Amoore & Hautala	5.0E+04
TETRACHLOROETHYLENE	1.7E+02	Taste & Odors	1.0E+05	1.7E+02	Amoore & Hautala	5.0E+04
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+04	Solubility	1.2E+04	-	-	5.0E+04
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.5E+03	Solubility	2.5E+03	-	-	5.0E+04
THALLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
TOLUENE	4.0E+01	Taste & Odors	2.6E+05	4.0E+01	USEPA 2nd MCL	5.0E+04
TOXAPHENE	1.4E+02	Taste & Odors	2.8E+02	1.4E+02	USEPA 2nd MCL	5.0E+04
TPH (gasolines)	1.0E+02	Taste & Odors	7.5E+04	1.0E+02	USEPA SNARL	5.0E+04
TPH (middle distillates)	1.0E+02	Taste & Odors	2.5E+03	1.0E+02	USEPA SNARL	5.0E+04
TPH (residual fuels)	1.0E+02	Taste & Odors	2.5E+03	1.0E+02	USEPA SNARL	5.0E+04
TRICHLOROBENZENE, 1,2,4-	3.0E+03	Taste & Odors	2.5E+04	3.0E+03	USEPA (1995)	5.0E+04
TRICHLOROETHANE, 1,1,1-	9.7E+02	Taste & Odors	6.5E+05	9.7E+02	Amoore & Hautala	5.0E+04
TRICHLOROETHANE, 1,1,2-	5.0E+04	Upper Limit	2.3E+06	-	-	5.0E+04
TRICHLOROETHYLENE	3.1E+02	Taste & Odors	6.4E+05	3.1E+02	Amoore & Hautala	5.0E+04
TRICHLOROPHENOL, 2,4,5-	2.0E+02	Taste & Odors	6.0E+05	2.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,6-	1.0E+02	Taste & Odors	4.0E+05	1.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.6E+04	Solubility	3.6E+04	-	-	5.0E+04
TRICHLOROPROPANE, 1,2,3-	5.0E+04	Upper Limit	8.8E+05	-	-	5.0E+04
TRICHLOROPROPENE, 1,2,3-	5.0E+04	Upper Limit	1.7E+05	-	-	5.0E+04
TRIFLURALIN	9.0E+01	Solubility	9.0E+01	-	-	5.0E+04
TRINITROBENZENE, 1,3,5-	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.7E+04	Solubility	3.7E+04	-	-	5.0E+04
TRINITROTOLUENE, 2,4,6- (TNT)	5.0E+04	Upper Limit	5.8E+04	-	-	5.0E+04
VANADIUM	5.0E+04	Upper Limit		-	-	5.0E+04
VINYL CHLORIDE	3.4E+03	Taste & Odors	4.4E+06	3.4E+03	Amoore & Hautala	5.0E+04
XYLENES	2.0E+01	Taste & Odors	5.3E+04	2.0E+01	USEPA 2nd MCL	5.0E+04
ZINC	5.0E+03	Taste & Odors		5.0E+03	Cal DHS 2nd MCL	5.0E+04

References:

Amoore & Hautala (1983) and USEPA and California Dept of Health Services drinking water taste and odor threshold ("secondary MCLs") as presented in *A Compilation of Water Quality Goals* (RWQCBCV 2007).

Other references (see Appendix 1 text): Ontario Ministry of Energy and Environment (MOEE 1996); Young et al (1996).

Upper limit of 50000 ug/L intended to limit general groundwater resource degradation (MOEE 1996).

1/2 solubility based on solubility constants in USEPA RSL guidance (USEPA 2008a) or Ontario MOEE (MOEE 1996) if not available.

Notes:

Ceiling Level: lowest of 1/2 solubility, taste and odor threshold and 50000 ug/L maximum level

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TPH ceiling levels after Massachusetts DEP (MADEP 1997a).

TPH Taste and Odor Thresholds based on USEPA Suggested-No-Adverse-reaction (SNARL) level for TPH diesel.

TABLE G-2. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
ACENAPHTHENE	2.0E+02	Nuisance Odors	2.0E+03	2.0E+02	Ontario MOEE	5.0E+04
ACENAPHTHYLENE	2.0E+03	Solubility	2.0E+03	-	-	5.0E+04
ACETONE	5.0E+04	Upper Limit	5.0E+08	200000	Ontario MOEE	5.0E+04
ALDRIN	8.5E+00	Solubility	8.5E+00	170	Ontario MOEE	5.0E+04
AMETRYN	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
AMINO,2- DINITROTOLUENE,4,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
AMINO,4- DINITROTOLUENE,2,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
ANTHRACENE	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
ANTIMONY	5.0E+04	Upper Limit			-	5.0E+04
ARSENIC	5.0E+04	Upper Limit		-	-	5.0E+04
ATRAZINE	1.8E+04	Solubility	1.8E+04	-	-	5.0E+04
BARIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BENOMYL	1.9E+03	Solubility	1.9E+03	-	-	5.0E+04
BENZENE	2.0E+04	Nuisance Odors	9.0E+05	2.0E+04	Ontario MOEE	5.0E+04
BENZO(a)ANTHRACENE	4.7E+00	Solubility	4.7E+00	-	-	5.0E+04
BENZO(a)PYRENE	8.0E-01	Solubility	8.0E-01	-	-	5.0E+04
BENZO(b)FLUORANTHENE	7.5E-01	Solubility	7.5E-01	-	-	5.0E+04
BENZO(g,h,i)PERYLENE	1.3E-01	Solubility	1.3E-01	-	-	5.0E+04
BENZO(k)FLUORANTHENE	4.0E-01	Solubility	4.0E-01	-	-	5.0E+04
BERYLLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BIPHENYL, 1,1-	5.0E+00	Nuisance Odors	3.7E+03	5.0E+00	Amoore & Hautala	5.0E+04
BIS(2-CHLOROETHYL)ETHER	3.6E+03	Nuisance Odors	8.6E+06	3.6E+03	Amoore & Hautala	5.0E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.2E+03	Nuisance Odors	8.5E+05	3.2E+03	Ontario MOEE	5.0E+04
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E+02	Solubility	1.4E+02	-	-	5.0E+04
BORON	5.0E+04	Upper Limit		-	-	5.0E+04
BROMODICHLOROMETHANE	5.0E+04	Upper Limit	1.5E+06	-	-	5.0E+04
BROMOFORM	5.1E+03	Nuisance Odors	1.6E+06	5.1E+03	Ontario MOEE	5.0E+04
BROMOMETHANE	5.0E+04	Upper Limit	7.6E+06	-	-	5.0E+04
CADMIUM	5.0E+04	Upper Limit		-	-	5.0E+04
CARBON TETRACHLORIDE	5.2E+03	Nuisance Odors	4.0E+05	5.2E+03	Ontario MOEE	5.0E+04
CHLORDANE (TECHNICAL)	2.5E+01	Nuisance Odors	2.8E+01	2.5E+01	Ontario MOEE	5.0E+04
CHLOROANILINE, p-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
CHLOROBENZENE	5.0E+02	Nuisance Odors	2.5E+05	5.0E+02	Ontario MOEE	5.0E+04
CHLOROETHANE	1.6E+02	Nuisance Odors	3.4E+06	1.6E+02	Amoore & Hautala	5.0E+04
CHLOROFORM	2.4E+04	Nuisance Odors	4.0E+06	2.4E+04	Ontario MOEE	5.0E+04
CHLOROMETHANE	5.0E+04	Upper Limit	2.7E+06	-	-	5.0E+04
CHLOROPHENOL, 2-	1.8E+00	Nuisance Odors	5.7E+06	1.8E+00	Ontario MOEE	5.0E+04
CHROMIUM (Total)	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM III	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM VI	5.0E+04	Upper Limit	8.5E+08	-	-	5.0E+04
CHRYSENE	1.0E+00	Solubility	1.0E+00	-	-	5.0E+04
COBALT	5.0E+04	Upper Limit		-	-	5.0E+04

TABLE G-2. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
COPPER	5.0E+04	Upper Limit		-	-	5.0E+04
CYANIDE (Free)	1.7E+03	Nuisance Odors	4.8E+07	1.7E+03	Ontario MOEE	5.0E+04
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	3.0E+04	Solubility	3.0E+04	-	-	5.0E+04
DALAPON	5.0E+04	Upper Limit	2.5E+08	-	-	5.0E+04
DIBENZO(a,h)ANTHTRACENE	1.3E+00	Solubility	1.3E+00	-	-	5.0E+04
DIBROMO,1,2- CHLOROPROPANE,3-	1.0E+02	Nuisance Odors	6.2E+05	1.0E+02	Amoore & Hautala	5.0E+04
DIBROMOCHLOROMETHANE	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIBROMOETHANE, 1,2-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
DICHLOROBENZENE, 1,2-	1.0E+02	Nuisance Odors	7.8E+04	1.0E+02	Ontario MOEE	5.0E+04
DICHLOROBENZENE, 1,3-	5.0E+04	Upper Limit	7.8E+04	-	-	5.0E+04
DICHLOROBENZENE, 1,4-	1.1E+02	Nuisance Odors	4.1E+04	1.1E+02	Ontario MOEE	5.0E+04
DICHLOROBENZIDINE, 3,3-	1.6E+03	Solubility	1.6E+03	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHANE (DDD)	4.5E+01	Solubility	4.5E+01	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+01	Solubility	2.0E+01	-	-	5.0E+04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.8E+00	Solubility	2.8E+00	3.5E+03	Ontario MOEE	5.0E+04
DICHLOROETHANE, 1,1-	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DICHLOROETHANE, 1,2-	5.0E+04	Upper Limit	4.3E+06	2.0E+05	Ontario MOEE	5.0E+04
DICHLOROETHYLENE, 1,1-	1.5E+04	Nuisance Odors	1.2E+06	1.5E+04	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, Cis 1,2-	5.0E+04	Upper Limit	3.2E+06	-	-	5.0E+04
DICHLOROETHYLENE, Trans 1,2-	2.6E+03	Nuisance Odors	2.3E+06	2.6E+03	Ontario MOEE	5.0E+04
DICHLOROPHENOL, 2,4-	3.0E+00	Nuisance Odors	2.8E+06	3.0E+00	Ontario MOEE	5.0E+04
DICHLOROPHENOXYACETIC ACID (2,4-D)	5.0E+04	Upper Limit	3.4E+05	-	-	5.0E+04
DICHLOROPROPANE, 1,2-	1.0E+02	Nuisance Odors	1.4E+06	1.0E+02	Ontario MOEE	5.0E+04
DICHLOROPROPENE, 1,3-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIELDRIN	9.8E+01	Solubility	9.8E+01	4.1E+02	Ontario MOEE	5.0E+04
DIETHYLPHTHALATE	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04
DIMETHYLPHENOL, 2,4-	4.0E+03	Nuisance Odors	3.9E+06	4.0E+03	Ontario MOEE	5.0E+04
DIMETHYLPHTHALATE	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DINITROBENZENE, 1,3-	5.0E+04	Upper Limit	2.7E+05	-	-	5.0E+04
DINITROPHENOL, 2,4-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DINITROTOLUENE, 2,4- (2,4-DNT)	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
DINITROTOLUENE, 2,6- (2,6-DNT)	5.0E+04	Upper Limit	9.1E+04	-	-	5.0E+04
DIOXANE, 1,4-	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
DIOXINS (TEQ)	1.0E-01	Solubility	1.0E-01	-	-	5.0E+04
DIURON	2.1E+04	Solubility	2.1E+04	-	-	5.0E+04
ENDOSULFAN	1.6E+02	Solubility	1.6E+02	-	-	5.0E+04
ENDRIN	1.3E+02	Solubility	1.3E+02	4.1E+02	Ontario MOEE	5.0E+04
ETHANOL	5.0E+04	Upper Limit	5.0E+08	7.6E+05	Amoore & Hautala	5.0E+04
ETHYLBENZENE	3.0E+02	Nuisance Odors	8.5E+04	3.0E+02	USEPA 2nd MCL	5.0E+04
FLUORANTHENE	1.3E+02	Solubility	1.3E+02	-	-	5.0E+04
FLUORENE	8.5E+02	Solubility	8.5E+02	-	-	5.0E+04
GLYPHOSATE	5.0E+04	Upper Limit	5.3E+06	-	-	5.0E+04

TABLE G-2. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
HEPTACHLOR	9.0E+01	Solubility	9.0E+01	2.0E+02	Ontario MOEE	5.0E+04
HEPTACHLOR EPOXIDE	1.0E+02	Solubility	1.0E+02	-	-	5.0E+04
HEXACHLOROBENZENE	3.1E+00	Solubility	3.1E+00	3.0E+04	Ontario MOEE	5.0E+04
HEXACHLOROBUTADIENE	6.0E+01	Nuisance Odors	1.6E+03	6.0E+01	Ontario MOEE	5.0E+04
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	3.7E+03	Solubility	3.7E+03	1.2E+05	Ontario MOEE	5.0E+04
HEXACHLOROETHANE	1.0E+02	Nuisance Odors	2.5E+04	1.0E+02	Ontario MOEE	5.0E+04
HEXAZINONE	5.0E+04	Upper Limit	1.7E+07	-	-	5.0E+04
INDENO(1,2,3-cd)PYRENE	9.5E-02	Solubility	9.5E-02	-	-	5.0E+04
ISOPHORONE	5.0E+04	Upper Limit	6.0E+06	-	-	5.0E+04
LEAD	5.0E+04	Upper Limit		-	-	5.0E+04
MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHOXYCHLOR	5.0E+01	Solubility	5.0E+01	4.7E+04	Ontario MOEE	5.0E+04
METHYL ETHYL KETONE	5.0E+04	Upper Limit	1.1E+08	8.4E+04	Amoore & Hautala	5.0E+04
METHYL ISOBUTYL KETONE	1.3E+04	Nuisance Odors	9.5E+06	1.3E+04	Amoore & Hautala	5.0E+04
METHYL MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHYL TERT BUTYL ETHER	1.8E+03	Nuisance Odors	2.6E+07	1.8E+03	CalDHS	5.0E+04
METHYLENE CHLORIDE	5.0E+04	Upper Limit	6.5E+06	9.1E+04	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 1-	1.0E+02	Nuisance Odors	1.3E+04	1.0E+02	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 2-	1.0E+02	Nuisance Odors	1.2E+04	1.0E+02	Ontario MOEE	5.0E+04
MOLYBDENUM	5.0E+04	Upper Limit		-	-	5.0E+04
NAPHTHALENE	2.1E+02	Nuisance Odors	1.6E+04	2.1E+02	Ontario MOEE	5.0E+04
NICKEL	5.0E+04	Upper Limit		-	-	5.0E+04
NITROBENZENE	5.0E+04	Upper Limit	1.0E+06	-	-	5.0E+04
NITROGLYCERIN	5.0E+04	Upper Limit	6.9E+05	-	-	5.0E+04
NITROTOLUENE, 2-	5.0E+04	Upper Limit	3.3E+05	-	-	5.0E+04
NITROTOLUENE, 3-	5.0E+04	Upper Limit	2.5E+05	-	-	5.0E+04
NITROTOLUENE, 4-	5.0E+04	Upper Limit	2.2E+05	-	-	5.0E+04
PENTACHLOROPHENOL	5.9E+03	Nuisance Odors	7.0E+03	5.9E+03	Ontario MOEE	5.0E+04
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Solubility	2.2E+04	-	-	5.0E+04
PERCHLORATE	5.0E+04	Upper Limit	1.2E+08	-	-	5.0E+04
PHENANTHRENE	4.1E+02	Solubility	4.1E+02	1.0E+04	Ontario MOEE	5.0E+04
PHENOL	5.0E+04	Upper Limit	4.1E+07	7.9E+04	Amoore & Hautala	5.0E+04
POLYCHLORINATED BIPHENYLS (PCBs)	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
PROPICONAZOLE	5.0E+04	Upper Limit	5.5E+04	-	-	5.0E+04
PYRENE	6.8E+01	Solubility	6.8E+01	-	-	5.0E+04
SELENIUM	5.0E+04	Upper Limit		-	-	5.0E+04
SILVER	5.0E+04	Upper Limit		-	-	5.0E+04
SIMAZINE	3.1E+03	Solubility	3.1E+03	-	-	5.0E+04
STYRENE	1.1E+02	Nuisance Odors	1.6E+05	1.1E+02	Ontario MOEE	5.0E+04
TERBACIL	5.0E+04	Upper Limit	3.6E+05	-	-	5.0E+04
tert-BUTYL ALCOHOL	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
TETRACHLOROETHANE, 1,1,1,2-	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04

TABLE G-2. GROUNDWATER GROSS CONTAMINATION ACTION LEVELS
(groundwater IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
TETRACHLOROETHANE, 1,1,2,2-	5.0E+03	Nuisance Odors	1.4E+06	5.0E+03	Ontario MOEE	5.0E+04
TETRACHLOROETHYLENE	3.0E+03	Nuisance Odors	1.0E+05	3.0E+03	Ontario MOEE	5.0E+04
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+04	Solubility	1.2E+04	-	-	5.0E+04
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.5E+03	Solubility	2.5E+03	-	-	5.0E+04
THALLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
TOLUENE	4.0E+02	Nuisance Odors	2.6E+05	4.0E+02	Ontario MOEE	5.0E+04
TOXAPHENE	1.4E+02	Nuisance Odors	2.8E+02	1.4E+02	USEPA 2nd MCL	5.0E+04
TPH (gasolines)	5.0E+03	Nuisance Odors	7.5E+04	5.0E+03	MADEP	5.0E+04
TPH (middle distillates)	2.5E+03	Solubility	2.5E+03	5.0E+03	MADEP	5.0E+04
TPH (residual fuels)	2.5E+03	Solubility	2.5E+03	5.0E+03	MADEP	5.0E+04
TRICHLOROBENZENE, 1,2,4-	2.5E+04	Solubility	2.5E+04	3.0E+04	USEPA (1995)	5.0E+04
TRICHLOROETHANE, 1,1,1-	5.0E+04	Upper Limit	6.5E+05	5.0E+05	Ontario MOEE	5.0E+04
TRICHLOROETHANE, 1,1,2-	5.0E+04	Upper Limit	2.3E+06	-	-	5.0E+04
TRICHLOROETHYLENE	5.0E+04	Upper Limit	6.4E+05	1.0E+05	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,5-	2.0E+03	Nuisance Odors	6.0E+05	2.0E+03	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,6-	1.0E+03	Nuisance Odors	4.0E+05	1.0E+03	Ontario MOEE	5.0E+04
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.6E+04	Solubility	3.6E+04	-	-	5.0E+04
TRICHLOROPROPANE, 1,2,3-	5.0E+04	Upper Limit	8.8E+05	-	-	5.0E+04
TRICHLOROPROPENE, 1,2,3-	5.0E+04	Upper Limit	1.7E+05	-	-	5.0E+04
TRIFLURALIN	9.0E+01	Solubility	9.0E+01	-	-	5.0E+04
TRINITROBENZENE, 1,3,5-	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.7E+04	Solubility	3.7E+04	-	-	5.0E+04
TRINITROTOLUENE, 2,4,6- (TNT)	5.0E+04	Upper Limit	5.8E+04	-	-	5.0E+04
VANADIUM	5.0E+04	Upper Limit		-	-	5.0E+04
VINYL CHLORIDE	3.4E+04	Nuisance Odors	4.4E+06	3.4E+04	Ontario MOEE	5.0E+04
XYLENES	5.3E+03	Nuisance Odors	5.3E+04	5.3E+03	Ontario MOEE	5.0E+04
ZINC	5.0E+04	Upper Limit		-	-	5.0E+04

References:

Unless otherwise noted, criteria for nuisance odor threshold from Ontario MOEE (MOEE 1996) OR data from Amoore and Hautala (1983) as presented in *A Compilation of Water Quality Goals* if not available *(RWQCBCV 2007).*

Upper limit of 50000 ug/L intended to limit general groundwater resource degradation (MOEE 1996).

1/2 solubility based on solubility constants in USEPA RSL guidance (USEPA 2008a) or Ontario MOEE (MOEE 1996) if not available.

Odor threshold for MTBE based on average, upper range at which most subjects could smell MTBE in water (CalEPA 1999).

Vapor Pressure for ethanol from *Fate and Transport of Ethanol-Blended Gasoline in the Environment* (Ulrich 1999). Odor threshold from

Notes:

Nuisance Odor Thresholds assume ten-fold attenuation/dilution of chemical in groundwater upon discharge to surface water.

Ceiling Level: lowest of 1/2 solubility, odor/taste threshold and 50000 ug/L maximum level (intended to limit general groundwater resource degradation).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TPH ceiling level after Massachusetts DEP (MADEP 1997a).

TABLE G-3. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
ACENAPHTHENE	2.0E+01	Taste & Odors	2.0E+03	2.0E+01	Ontario MOEE	5.0E+04
ACENAPHTHYLENE	2.0E+03	Solubility	2.0E+03	-	-	5.0E+04
ACETONE	2.0E+04	Taste & Odors	5.0E+08	2.0E+04	Amoore & Hautala	5.0E+04
ALDRIN	8.5E+00	Solubility	8.5E+00	1.7E+01	Ontario MOEE	5.0E+04
AMETRYN	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
AMINO,2- DINITROTOLUENE,4,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
AMINO,4- DINITROTOLUENE,2,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
ANTHRACENE	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
ANTIMONY	5.0E+04	Upper Limit		-	-	5.0E+04
ARSENIC	5.0E+04	Upper Limit		-	-	5.0E+04
ATRAZINE	2.0E+01	Taste & Odors	1.8E+04	2.0E+01	Young et al	5.0E+04
BARIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BENOMYL	1.9E+03	Solubility	1.9E+03	-	-	5.0E+04
BENZENE	1.7E+02	Taste & Odors	9.0E+05	1.7E+02	Amoore & Hautala	5.0E+04
BENZO(a)ANTHRACENE	4.7E+00	Solubility	4.7E+00	-	-	5.0E+04
BENZO(a)PYRENE	8.0E-01	Solubility	8.0E-01	-	-	5.0E+04
BENZO(b)FLUORANTHENE	7.5E-01	Solubility	7.5E-01	-	-	5.0E+04
BENZO(g,h,i)PERYLENE	1.3E-01	Solubility	1.3E-01	-	-	5.0E+04
BENZO(k)FLUORANTHENE	4.0E-01	Solubility	4.0E-01	-	-	5.0E+04
BERYLLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BIPHENYL, 1,1-	5.0E-01	Taste & Odors	3.7E+03	5.0E-01	Amoore & Hautala	5.0E+04
BIS(2-CHLOROETHYL)ETHER	3.6E+02	Taste & Odors	8.6E+06	3.6E+02	Amoore & Hautala	5.0E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.2E+02	Taste & Odors	8.5E+05	3.2E+02	Ontario MOEE	5.0E+04
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E+02	Solubility	1.4E+02	-	-	5.0E+04
BORON	5.0E+04	Upper Limit		-	-	5.0E+04
BROMODICHLOROMETHANE	5.0E+04	Upper Limit	1.5E+06	-	-	5.0E+04
BROMOFORM	5.1E+02	Taste & Odors	1.6E+06	5.1E+02	Amoore & Hautala	5.0E+04
BROMOMETHANE	5.0E+04	Upper Limit	7.6E+06	-	-	5.0E+04
CADMIUM	5.0E+04	Upper Limit		-	-	5.0E+04
CARBON TETRACHLORIDE	5.2E+02	Taste & Odors	4.0E+05	5.2E+02	Amoore & Hautala	5.0E+04
CHLORDANE (TECHNICAL)	2.5E+00	Taste & Odors	2.8E+01	2.5E+00	Ontario MOEE	5.0E+04
CHLOROANILINE, p-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
CHLOROBENZENE	5.0E+01	Taste & Odors	2.5E+05	5.0E+01	Amoore & Hautala	5.0E+04
CHLOROETHANE	1.6E+01	Taste & Odors	3.4E+06	1.6E+01	Amoore & Hautala	5.0E+04
CHLOROFORM	2.4E+03	Taste & Odors	4.0E+06	2.4E+03	Amoore & Hautala	5.0E+04
CHLOROMETHANE	5.0E+04	Upper Limit	2.7E+06		-	5.0E+04
CHLOROPHENOL, 2-	1.8E-01	Taste & Odors	5.7E+06	1.8E-01	Ontario MOEE	5.0E+04
CHROMIUM (Total)	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM III	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM VI	5.0E+04	Upper Limit	8.5E+08	-	-	5.0E+04
CHRYSENE	1.0E+00	Solubility	1.0E+00	-	-	5.0E+04
COBALT	5.0E+04	Upper Limit		-	-	5.0E+04

TABLE G-3. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
COPPER	1.0E+03	Taste & Odors		1.0E+03	CalDHS 2nd MCL	5.0E+04
CYANIDE (Free)	1.7E+02	Taste & Odors	4.8E+07	1.7E+02	Amoore & Hautala	5.0E+04
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	3.0E+04	Solubility	3.0E+04	-	-	5.0E+04
DALAPON	5.0E+04	Upper Limit	2.5E+08	-	-	5.0E+04
DIBENZO(a,h)ANTHTRACENE	1.3E+00	Solubility	1.3E+00	-	-	5.0E+04
DIBROMO,1,2- CHLOROPROPANE,3-	1.0E+01	Taste & Odors	6.2E+05	1.0E+01	Amoore & Hautala	5.0E+04
DIBROMOCHLOROMETHANE	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIBROMOETHANE, 1,2-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
DICHLOROBENZENE, 1,2-	1.0E+01	Taste & Odors	7.8E+04	1.0E+01	USEPA 2nd MCL	5.0E+04
DICHLOROBENZENE, 1,3-	5.0E+04	Upper Limit	7.8E+04	-	-	5.0E+04
DICHLOROBENZENE, 1,4-	5.0E+00	Taste & Odors	4.1E+04	5.0E+00	USEPA 2nd MCL	5.0E+04
DICHLOROBENZIDINE, 3,3-	1.6E+03	Solubility	1.6E+03	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHANE (DDD)	4.5E+01	Solubility	4.5E+01	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+01	Solubility	2.0E+01	-	-	5.0E+04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.8E+00	Solubility	2.8E+00	3.5E+02	Ontario MOEE	5.0E+04
DICHLOROETHANE, 1,1-	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DICHLOROETHANE, 1,2-	7.0E+03	Taste & Odors	4.3E+06	7.0E+03	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, 1,1-	1.5E+03	Taste & Odors	1.2E+06	1.5E+03	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, Cis 1,2-	5.0E+04	Upper Limit	3.2E+06	-	-	5.0E+04
DICHLOROETHYLENE, Trans 1,2-	2.6E+02	Taste & Odors	2.3E+06	2.6E+02	Amoore & Hautala	5.0E+04
DICHLOROPHENOL, 2,4-	3.0E-01	Taste & Odors	2.8E+06	3.0E-01	Ontario MOEE	5.0E+04
DICHLOROPHENOXYACETIC ACID (2,4-D)	5.0E+04	Upper Limit	3.4E+05	-	-	5.0E+04
DICHLOROPROPANE, 1,2-	1.0E+01	Taste & Odors	1.4E+06	1.0E+01	Ontario MOEE	5.0E+04
DICHLOROPROPENE, 1,3-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIELDRIN	4.1E+01	Taste & Odors	9.8E+01	4.1E+01	Ontario MOEE	5.0E+04
DIETHYLPHTHALATE	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04
DIMETHYLPHENOL, 2,4-	4.0E+02	Taste & Odors	3.9E+06	4.0E+02	Cal DHS AL	5.0E+04
DIMETHYLPHTHALATE	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DINITROBENZENE, 1,3-	5.0E+04	Upper Limit	2.7E+05	-	-	5.0E+04
DINITROPHENOL, 2,4-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DINITROTOLUENE, 2,4- (2,4-DNT)	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
DINITROTOLUENE, 2,6- (2,6-DNT)	5.0E+04	Upper Limit	9.1E+04	-	-	5.0E+04
DIOXANE, 1,4-	5.0E+04	Upper Limit	5.0E+08	2.3E+05	Amoore & Hautala	5.0E+04
DIOXINS (TEQ)	1.0E-01	Solubility	1.0E-01	-	-	5.0E+04
DIURON	2.1E+04	Solubility	2.1E+04	-	-	5.0E+04
ENDOSULFAN	1.6E+02	Solubility	1.6E+02	-	-	5.0E+04
ENDRIN	4.1E+01	Taste & Odors	1.3E+02	4.1E+01	Ontario MOEE	5.0E+04
ETHANOL	5.0E+04	Upper Limit	5.0E+08	7.6E+05	Amoore & Hautala	5.0E+04
ETHYLBENZENE	3.0E+01	Taste & Odors	8.5E+04	3.0E+01	USEPA 2nd MCL	5.0E+04
FLUORANTHENE	1.3E+02	Solubility	1.3E+02	-	-	5.0E+04
FLUORENE	8.5E+02	Solubility	8.5E+02	-	-	5.0E+04
GLYPHOSATE	5.0E+04	Upper Limit	5.3E+06	-	-	5.0E+04

TABLE G-3. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
HEPTACHLOR	2.0E+01	Taste & Odors	9.0E+01	2.0E+01	Ontario MOEE	5.0E+04
HEPTACHLOR EPOXIDE	1.0E+02	Solubility	1.0E+02	-	-	5.0E+04
HEXACHLOROBENZENE	3.1E+00	Solubility	3.1E+00	3.0E+03	Ontario MOEE	5.0E+04
HEXACHLOROBUTADIENE	6.0E+00	Taste & Odors	1.6E+03	6.0E+00	Ontario MOEE	5.0E+04
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	3.7E+03	Solubility	3.7E+03	1.2E+04	Ontario MOEE	5.0E+04
HEXACHLOROETHANE	1.0E+01	Taste & Odors	2.5E+04	1.0E+01	Amoore & Hautala	5.0E+04
HEXAZINONE	5.0E+04	Upper Limit	1.7E+07	-	-	5.0E+04
INDENO(1,2,3-cd)PYRENE	9.5E-02	Solubility	9.5E-02	-	-	5.0E+04
ISOPHORONE	5.0E+04	Upper Limit	6.0E+06	-	-	5.0E+04
LEAD	5.0E+04	Upper Limit		-	-	5.0E+04
MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHOXYCHLOR	5.0E+01	Solubility	5.0E+01	4.7E+03	Amoore & Hautala	5.0E+04
METHYL ETHYL KETONE	8.4E+03	Taste & Odors	1.1E+08	8.4E+03	Amoore & Hautala	5.0E+04
METHYL ISOBUTYL KETONE	1.3E+03	Taste & Odors	9.5E+06	1.3E+03	Amoore & Hautala	5.0E+04
METHYL MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHYL TERT BUTYL ETHER	5.0E+00	Taste & Odors	2.6E+07	5.0E+00	Cal DHS 2nd MCL	5.0E+04
METHYLENE CHLORIDE	9.1E+03	Taste & Odors	6.5E+06	9.1E+03	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 1-	1.0E+01	Taste & Odors	1.3E+04	1.0E+01	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 2-	1.0E+01	Taste & Odors	1.2E+04	1.0E+01	Ontario MOEE	5.0E+04
MOLYBDENUM	5.0E+04	Upper Limit		-	-	5.0E+04
NAPHTHALENE	2.1E+01	Taste & Odors	1.6E+04	2.1E+01	Amoore & Hautala	5.0E+04
NICKEL	5.0E+04	Upper Limit		-	-	5.0E+04
NITROBENZENE	5.0E+04	Upper Limit	1.0E+06	-	-	5.0E+04
NITROGLYCERIN	5.0E+04	Upper Limit	6.9E+05	-	-	5.0E+04
NITROTOLUENE, 2-	5.0E+04	Upper Limit	3.3E+05	-	-	5.0E+04
NITROTOLUENE, 3-	5.0E+04	Upper Limit	2.5E+05	-	-	5.0E+04
NITROTOLUENE, 4-	5.0E+04	Upper Limit	2.2E+05	-	-	5.0E+04
PENTACHLOROPHENOL	3.0E+01	Taste & Odors	7.0E+03	3.0E+01	Amoore & Hautala	5.0E+04
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Solubility	2.2E+04	-	-	5.0E+04
PERCHLORATE	5.0E+04	Upper Limit	1.2E+08	-	-	5.0E+04
PHENANTHRENE	4.1E+02	Solubility	4.1E+02	1.0E+03	Ontario MOEE	5.0E+04
PHENOL	7.9E+03	Taste & Odors	4.1E+07	7.9E+03	Amoore & Hautala	5.0E+04
POLYCHLORINATED BIPHENYLS (PCBs)	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
PROPICONAZOLE	5.0E+04	Upper Limit	5.5E+04	-	-	5.0E+04
PYRENE	6.8E+01	Solubility	6.8E+01	-	-	5.0E+04
SELENIUM	5.0E+04	Upper Limit		-	-	5.0E+04
SILVER	1.0E+02	Taste & Odors		1.0E+02	Cal DHS 2nd MCL	5.0E+04
SIMAZINE	3.1E+03	Solubility	3.1E+03	-	-	5.0E+04
STYRENE	1.0E+01	Taste & Odors	1.6E+05	1.0E+01	USEPA 2nd MCL	5.0E+04
TERBACIL	5.0E+04	Upper Limit	3.6E+05	-	-	5.0E+04
tert-BUTYL ALCOHOL	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
TETRACHLOROETHANE, 1,1,1,2-	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04

TABLE G-3. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Taste And Odor Threshold	Basis	Upper Limit
TETRACHLOROETHANE, 1,1,2,2-	5.0E+02	Taste & Odors	1.4E+06	5.0E+02	Amoore & Hautala	5.0E+04
TETRACHLOROETHYLENE	1.7E+02	Taste & Odors	1.0E+05	1.7E+02	Amoore & Hautala	5.0E+04
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+04	Solubility	1.2E+04	-	-	5.0E+04
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.5E+03	Solubility	2.5E+03	-	-	5.0E+04
THALLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
TOLUENE	4.0E+01	Taste & Odors	2.6E+05	4.0E+01	USEPA 2nd MCL	5.0E+04
TOXAPHENE	1.4E+02	Taste & Odors	2.8E+02	1.4E+02	USEPA 2nd MCL	5.0E+04
TPH (gasolines)	1.0E+02	Taste & Odors	7.5E+04	1.0E+02	USEPA SNARL	5.0E+04
TPH (middle distillates)	1.0E+02	Taste & Odors	2.5E+03	1.0E+02	USEPA SNARL	5.0E+04
TPH (residual fuels)	1.0E+02	Taste & Odors	2.5E+03	1.0E+02	USEPA SNARL	5.0E+04
TRICHLOROBENZENE, 1,2,4-	3.0E+03	Taste & Odors	2.5E+04	3.0E+03	USEPA (1995)	5.0E+04
TRICHLOROETHANE, 1,1,1-	9.7E+02	Taste & Odors	6.5E+05	9.7E+02	Amoore & Hautala	5.0E+04
TRICHLOROETHANE, 1,1,2-	5.0E+04	Upper Limit	2.3E+06	-	-	5.0E+04
TRICHLOROETHYLENE	3.1E+02	Taste & Odors	6.4E+05	3.1E+02	Amoore & Hautala	5.0E+04
TRICHLOROPHENOL, 2,4,5-	2.0E+02	Taste & Odors	6.0E+05	2.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,6-	1.0E+02	Taste & Odors	4.0E+05	1.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.6E+04	Solubility	3.6E+04	-	-	5.0E+04
TRICHLOROPROPANE, 1,2,3-	5.0E+04	Upper Limit	8.8E+05	-	-	5.0E+04
TRICHLOROPROPENE, 1,2,3-	5.0E+04	Upper Limit	1.7E+05	-	-	5.0E+04
TRIFLURALIN	9.0E+01	Solubility	9.0E+01	-	-	5.0E+04
TRINITROBENZENE, 1,3,5-	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.7E+04	Solubility	3.7E+04	-	-	5.0E+04
TRINITROTOLUENE, 2,4,6- (TNT)	5.0E+04	Upper Limit	5.8E+04	-	-	5.0E+04
VANADIUM	5.0E+04	Upper Limit		-	-	5.0E+04
VINYL CHLORIDE	3.4E+03	Taste & Odors	4.4E+06	3.4E+03	Amoore & Hautala	5.0E+04
XYLENES	2.0E+01	Taste & Odors	5.3E+04	2.0E+01	USEPA 2nd MCL	5.0E+04
ZINC	5.0E+03	Taste & Odors		5.0E+03	Cal DHS 2nd MCL	5.0E+04

References:

Unless otherwise noted, criteria for drinking water taste and odor threshold from summary in *A Compilation of Water Quality Goals* (RWQCBCV 2007) or Ontario MOEE if not available (MOEE 1996).

Upper limit of 50000 ug/L intended to limit general groundwater resource degradation (MOEE 1996).

1/2 solubility based on solubility constants in USEPA RSL guidance (USEPA 2008a) or Ontario MOEE (MOEE 1996) if not available.

Notes:

Ceiling Level: lowest of 1/2 solubility, taste and odor threshold and 50000 ug/L maximum level

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TPH ceiling levels after Massachusetts DEP (MADEP 1997a).

TPH Taste and Odor Thresholds based on USEPA Suggested-No-Adverse-reaction (SNARL) level for TPH diesel.

TABLE G-4. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
ACENAPHTHENE	2.0E+01	Nuisance Odors	2.0E+03	2.0E+01	Ontario MOEE	5.0E+04
ACENAPHTHYLENE	2.0E+03	Solubility	2.0E+03	-	-	5.0E+04
ACETONE	2.0E+04	Nuisance Odors	5.0E+08	2.0E+04	Ontario MOEE	5.0E+04
ALDRIN	8.5E+00	Solubility	8.5E+00	1.7E+01	Ontario MOEE	5.0E+04
AMETRYN	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
AMINO,2- DINITROTOLUENE,4,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
AMINO,4- DINITROTOLUENE,2,6-	5.0E+04	Upper Limit	6.1E+05	-	-	5.0E+04
ANTHRACENE	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
ANTIMONY	5.0E+04	Upper Limit		-	-	5.0E+04
ARSENIC	5.0E+04	Upper Limit		-	-	5.0E+04
ATRAZINE	1.8E+04	Solubility	1.8E+04	-	-	5.0E+04
BARIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BENOMYL	1.9E+03	Solubility	1.9E+03	-	-	5.0E+04
BENZENE	2.0E+03	Nuisance Odors	9.0E+05	2.0E+03	Ontario MOEE	5.0E+04
BENZO(a)ANTHRACENE	4.7E+00	Solubility	4.7E+00	-	-	5.0E+04
BENZO(a)PYRENE	8.0E-01	Solubility	8.0E-01	-	-	5.0E+04
BENZO(b)FLUORANTHENE	7.5E-01	Solubility	7.5E-01	-	-	5.0E+04
BENZO(g,h,i)PERYLENE	1.3E-01	Solubility	1.3E-01	-	-	5.0E+04
BENZO(k)FLUORANTHENE	4.0E-01	Solubility	4.0E-01	-	-	5.0E+04
BERYLLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
BIPHENYL, 1,1-	5.0E-01	Nuisance Odors	3.7E+03	5.0E-01	Amoore & Hautala	5.0E+04
BIS(2-CHLOROETHYL)ETHER	3.6E+02	Nuisance Odors	8.6E+06	3.6E+02	Amoore & Hautala	5.0E+04
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.2E+02	Nuisance Odors	8.5E+05	3.2E+02	Ontario MOEE	5.0E+04
BIS(2-ETHYLHEXYL)PHTHALATE	1.4E+02	Solubility	1.4E+02	-	-	5.0E+04
BORON	5.0E+04	Upper Limit		-	-	5.0E+04
BROMODICHLOROMETHANE	5.0E+04	Upper Limit	1.5E+06	-	-	5.0E+04
BROMOFORM	5.1E+02	Nuisance Odors	1.6E+06	5.1E+02	Ontario MOEE	5.0E+04
BROMOMETHANE	5.0E+04	Upper Limit	7.6E+06	-	-	5.0E+04
CADMIUM	5.0E+04	Upper Limit		-	-	5.0E+04
CARBON TETRACHLORIDE	5.2E+02	Nuisance Odors	4.0E+05	5.2E+02	Ontario MOEE	5.0E+04
CHLORDANE (TECHNICAL)	2.5E+00	Nuisance Odors	2.8E+01	2.5E+00	Ontario MOEE	5.0E+04
CHLOROANILINE, p-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
CHLOROBENZENE	5.0E+01	Nuisance Odors	2.5E+05	5.0E+01	Ontario MOEE	5.0E+04
CHLOROETHANE	1.6E+01	Nuisance Odors	3.4E+06	1.6E+01	Amoore & Hautala	5.0E+04
CHLOROFORM	2.4E+03	Nuisance Odors	4.0E+06	2.4E+03	Ontario MOEE	5.0E+04
CHLOROMETHANE	5.0E+04	Upper Limit	2.7E+06	-	-	5.0E+04
CHLOROPHENOL, 2-	1.8E-01	Nuisance Odors	5.7E+06	1.8E-01	Ontario MOEE	5.0E+04
CHROMIUM (Total)	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM III	5.0E+04	Upper Limit		-	-	5.0E+04
CHROMIUM VI	5.0E+04	Upper Limit	8.5E+08	-	-	5.0E+04
CHRYSENE	1.0E+00	Solubility	1.0E+00	-	-	5.0E+04
COBALT	5.0E+04	Upper Limit		-	-	5.0E+04

TABLE G-4. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
COPPER	5.0E+04	Upper Limit		-	-	5.0E+04
CYANIDE (Free)	1.7E+02	Nuisance Odors	4.8E+07	1.7E+02	Ontario MOEE	5.0E+04
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	3.0E+04	Solubility	3.0E+04	-	-	5.0E+04
DALAPON	5.0E+04	Upper Limit	2.5E+08	-	-	5.0E+04
DIBENZO(a,h)ANTHTRACENE	1.3E+00	Solubility	1.3E+00	-	-	5.0E+04
DIBROMO,1,2- CHLOROPROPANE,3-	1.0E+01	Nuisance Odors	6.2E+05	1.0E+01	Amoore & Hautala	5.0E+04
DIBROMOCHLOROMETHANE	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIBROMOETHANE, 1,2-	5.0E+04	Upper Limit	2.0E+06	-	-	5.0E+04
DICHLOROBENZENE, 1,2-	1.0E+01	Nuisance Odors	7.8E+04	1.0E+01	Ontario MOEE	5.0E+04
DICHLOROBENZENE, 1,3-	5.0E+04	Upper Limit	7.8E+04	-	-	5.0E+04
DICHLOROBENZENE, 1,4-	1.1E+01	Nuisance Odors	4.1E+04	1.1E+01	Ontario MOEE	5.0E+04
DICHLOROBENZIDINE, 3,3-	1.6E+03	Solubility	1.6E+03	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHANE (DDD)	4.5E+01	Solubility	4.5E+01	-	-	5.0E+04
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+01	Solubility	2.0E+01	-	-	5.0E+04
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.8E+00	Solubility	2.8E+00	3.5E+02	Ontario MOEE	5.0E+04
DICHLOROETHANE, 1,1-	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DICHLOROETHANE, 1,2-	2.0E+04	Nuisance Odors	4.3E+06	2.0E+04	Ontario MOEE	5.0E+04
DICHLOROETHYLENE, 1,1-	1.5E+03	Nuisance Odors	1.2E+06	1.5E+03	Amoore & Hautala	5.0E+04
DICHLOROETHYLENE, Cis 1,2-	5.0E+04	Upper Limit	3.2E+06	-	-	5.0E+04
DICHLOROETHYLENE, Trans 1,2-	2.6E+02	Nuisance Odors	2.3E+06	2.6E+02	Ontario MOEE	5.0E+04
DICHLOROPHENOL, 2,4-	3.0E-01	Nuisance Odors	2.8E+06	3.0E-01	Ontario MOEE	5.0E+04
DICHLOROPHENOXYACETIC ACID (2,4-D)	5.0E+04	Upper Limit	3.4E+05	-	-	5.0E+04
DICHLOROPROPANE, 1,2-	1.0E+01	Nuisance Odors	1.4E+06	1.0E+01	Ontario MOEE	5.0E+04
DICHLOROPROPENE, 1,3-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DIELDRIN	4.1E+01	Nuisance Odors	9.8E+01	4.1E+01	Ontario MOEE	5.0E+04
DIETHYLPHTHALATE	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04
DIMETHYLPHENOL, 2,4-	4.0E+02	Nuisance Odors	3.9E+06	4.0E+02	Ontario MOEE	5.0E+04
DIMETHYLPHTHALATE	5.0E+04	Upper Limit	2.5E+06	-	-	5.0E+04
DINITROBENZENE, 1,3-	5.0E+04	Upper Limit	2.7E+05	-	-	5.0E+04
DINITROPHENOL, 2,4-	5.0E+04	Upper Limit	1.4E+06	-	-	5.0E+04
DINITROTOLUENE, 2,4- (2,4-DNT)	5.0E+04	Upper Limit	1.0E+05	-	-	5.0E+04
DINITROTOLUENE, 2,6- (2,6-DNT)	5.0E+04	Upper Limit	9.1E+04	-	-	5.0E+04
DIOXANE, 1,4-	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
DIOXINS (TEQ)	1.0E-01	Solubility	1.0E-01	-	-	5.0E+04
DIURON	2.1E+04	Solubility	2.1E+04	-	-	5.0E+04
ENDOSULFAN	1.6E+02	Solubility	1.6E+02	-	-	5.0E+04
ENDRIN	4.1E+01	Nuisance Odors	1.3E+02	4.1E+01	Ontario MOEE	5.0E+04
ETHANOL	5.0E+04	Upper Limit	5.0E+08	7.6E+05	Amoore & Hautala	5.0E+04
ETHYLBENZENE	3.0E+01	Nuisance Odors	8.5E+04	3.0E+01	USEPA 2nd MCL	5.0E+04
FLUORANTHENE	1.3E+02	Solubility	1.3E+02	-	-	5.0E+04
FLUORENE	8.5E+02	Solubility	8.5E+02	-	-	5.0E+04
GLYPHOSATE	5.0E+04	Upper Limit	5.3E+06	-	-	5.0E+04

TABLE G-4. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
HEPTACHLOR	2.0E+01	Nuisance Odors	9.0E+01	2.0E+01	Ontario MOEE	5.0E+04
HEPTACHLOR EPOXIDE	1.0E+02	Solubility	1.0E+02	-	-	5.0E+04
HEXACHLOROBENZENE	3.1E+00	Solubility	3.1E+00	3.0E+03	Ontario MOEE	5.0E+04
HEXACHLOROBUTADIENE	6.0E+00	Nuisance Odors	1.6E+03	6.0E+00	Ontario MOEE	5.0E+04
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	3.7E+03	Solubility	3.7E+03	1.2E+04	Ontario MOEE	5.0E+04
HEXACHLOROETHANE	1.0E+01	Nuisance Odors	2.5E+04	1.0E+01	Ontario MOEE	5.0E+04
HEXAZINONE	5.0E+04	Upper Limit	1.7E+07	-	-	5.0E+04
INDENO(1,2,3-cd)PYRENE	9.5E-02	Solubility	9.5E-02	-	-	5.0E+04
ISOPHORONE	5.0E+04	Upper Limit	6.0E+06	-	-	5.0E+04
LEAD	5.0E+04	Upper Limit		-	-	5.0E+04
MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHOXYCHLOR	5.0E+01	Solubility	5.0E+01	4.7E+03	Ontario MOEE	5.0E+04
METHYL ETHYL KETONE	8.4E+03	Nuisance Odors	1.1E+08	8.4E+03	Amoore & Hautala	5.0E+04
METHYL ISOBUTYL KETONE	1.3E+03	Nuisance Odors	9.5E+06	1.3E+03	Amoore & Hautala	5.0E+04
METHYL MERCURY	5.0E+04	Upper Limit		-	-	5.0E+04
METHYL TERT BUTYL ETHER	1.8E+02	Nuisance Odors	2.6E+07	1.8E+02	CalDHS	5.0E+04
METHYLENE CHLORIDE	9.1E+03	Nuisance Odors	6.5E+06	9.1E+03	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 1-	1.0E+01	Nuisance Odors	1.3E+04	1.0E+01	Ontario MOEE	5.0E+04
METHYLNAPHTHALENE, 2-	1.0E+01	Nuisance Odors	1.2E+04	1.0E+01	Ontario MOEE	5.0E+04
MOLYBDENUM	5.0E+04	Upper Limit		-	-	5.0E+04
NAPHTHALENE	2.1E+01	Nuisance Odors	1.6E+04	2.1E+01	Ontario MOEE	5.0E+04
NICKEL	5.0E+04	Upper Limit		-	-	5.0E+04
NITROBENZENE	5.0E+04	Upper Limit	1.0E+06	-	-	5.0E+04
NITROGLYCERIN	5.0E+04	Upper Limit	6.9E+05	-	-	5.0E+04
NITROTOLUENE, 2-	5.0E+04	Upper Limit	3.3E+05	-	-	5.0E+04
NITROTOLUENE, 3-	5.0E+04	Upper Limit	2.5E+05	-	-	5.0E+04
NITROTOLUENE, 4-	5.0E+04	Upper Limit	2.2E+05	-	-	5.0E+04
PENTACHLOROPHENOL	5.9E+02	Nuisance Odors	7.0E+03	5.9E+02	Ontario MOEE	5.0E+04
PENTAERYTHRITOLTETRANITRATE (PETN)	2.2E+04	Solubility	2.2E+04	-	-	5.0E+04
PERCHLORATE	5.0E+04	Upper Limit	1.2E+08	-	-	5.0E+04
PHENANTHRENE	4.1E+02	Solubility	4.1E+02	1.0E+03	Ontario MOEE	5.0E+04
PHENOL	7.9E+03	Nuisance Odors	4.1E+07	7.9E+03	Amoore & Hautala	5.0E+04
POLYCHLORINATED BIPHENYLS (PCBs)	2.2E+01	Solubility	2.2E+01	-	-	5.0E+04
PROPICONAZOLE	5.0E+04	Upper Limit	5.5E+04	-	-	5.0E+04
PYRENE	6.8E+01	Solubility	6.8E+01	-	-	5.0E+04
SELENIUM	5.0E+04	Upper Limit		-	-	5.0E+04
SILVER	5.0E+04	Upper Limit		-	-	5.0E+04
SIMAZINE	3.1E+03	Solubility	3.1E+03	-	-	5.0E+04
STYRENE	1.1E+01	Nuisance Odors	1.6E+05	1.1E+01	Ontario MOEE	5.0E+04
TERBACIL	5.0E+04	Upper Limit	3.6E+05	-	-	5.0E+04
tert-BUTYL ALCOHOL	5.0E+04	Upper Limit	5.0E+08	-	-	5.0E+04
TETRACHLOROETHANE, 1,1,1,2-	5.0E+04	Upper Limit	5.4E+05	-	-	5.0E+04

TABLE G-4. SURFACE WATER GROSS CONTAMINATION ACTION LEVELS
(surface water IS NOT a current or potential source of drinking water)
(ug/L)

CHEMICAL PARAMETER	Final Action Level	Basis	Solubility (1/2)	Nuisance Odor Threshold	Basis	Upper Limit
TETRACHLOROETHANE, 1,1,2,2-	5.0E+02	Nuisance Odors	1.4E+06	5.0E+02	Ontario MOEE	5.0E+04
TETRACHLOROETHYLENE	3.0E+02	Nuisance Odors	1.0E+05	3.0E+02	Ontario MOEE	5.0E+04
TETRACHLOROPHENOL, 2,3,4,6-	1.2E+04	Solubility	1.2E+04	-	-	5.0E+04
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.5E+03	Solubility	2.5E+03	-	-	5.0E+04
THALLIUM	5.0E+04	Upper Limit		-	-	5.0E+04
TOLUENE	4.0E+01	Nuisance Odors	2.6E+05	4.0E+01	Ontario MOEE	5.0E+04
TOXAPHENE	1.4E+02	Nuisance Odors	2.8E+02	1.4E+02	USEPA 2nd MCL	5.0E+04
TPH (gasolines)	5.0E+03	Nuisance Odors	7.5E+04	5.0E+03	MADEP	5.0E+04
TPH (middle distillates)	2.5E+03	Solubility	2.5E+03	5.0E+03	MADEP	5.0E+04
TPH (residual fuels)	2.5E+03	Solubility	2.5E+03	5.0E+03	MADEP	5.0E+04
TRICHLOROBENZENE, 1,2,4-	3.0E+03	Nuisance Odors	2.5E+04	3.0E+03	USEPA (1995)	5.0E+04
TRICHLOROETHANE, 1,1,1-	5.0E+04	Nuisance Odors	6.5E+05	5.0E+04	Ontario MOEE	5.0E+04
TRICHLOROETHANE, 1,1,2-	5.0E+04	Upper Limit	2.3E+06	-	-	5.0E+04
TRICHLOROETHYLENE	1.0E+04	Nuisance Odors	6.4E+05	1.0E+04	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,5-	2.0E+02	Nuisance Odors	6.0E+05	2.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOL, 2,4,6-	1.0E+02	Nuisance Odors	4.0E+05	1.0E+02	Ontario MOEE	5.0E+04
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	3.6E+04	Solubility	3.6E+04	-	-	5.0E+04
TRICHLOROPROPANE, 1,2,3-	5.0E+04	Upper Limit	8.8E+05	-	-	5.0E+04
TRICHLOROPROPENE, 1,2,3-	5.0E+04	Upper Limit	1.7E+05	-	-	5.0E+04
TRIFLURALIN	9.0E+01	Solubility	9.0E+01	-	-	5.0E+04
TRINITROBENZENE, 1,3,5-	5.0E+04	Upper Limit	1.4E+05	-	-	5.0E+04
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.7E+04	Solubility	3.7E+04	-	-	5.0E+04
TRINITROTOLUENE, 2,4,6- (TNT)	2.0E+01	Nuisance Odors	5.8E+04	2.0E+01	Ontario MOEE	5.0E+04
VANADIUM	5.0E+04	Upper Limit		-	-	5.0E+04
VINYL CHLORIDE	3.4E+03	Nuisance Odors	4.4E+06	3.4E+03	Ontario MOEE	5.0E+04
XYLENES	5.3E+02	Nuisance Odors	5.3E+04	5.3E+02	Ontario MOEE	5.0E+04
ZINC	5.0E+04	Upper Limit		-	-	5.0E+04

References:

Unless otherwise noted, criteria for nuisance odor threshold from Ontario MOEE (MOEE 1996, minus groundwater-to-surface water dilution factor) OR data from Amoore and Hautala (1983) as presented in *A Compilation of Water Quality Goals* if not available (RWQCBCV 2007).

Upper limit of 50000 ug/L intended to limit general groundwater resource degradation (MOEE 1996).

1/2 solubility based on solubility constants in USEPA RSL guidance (USEPA 2008a) or Ontario MOEE (MOEE 1996) if not available.

Odor threshold for MTBE based on average, upper range at which most subjects could smell MTBE in water (CalEPA 1999).

Notes:

Nuisance Odor Thresholds assume no attenuation/dilution of chemical in surface water.

Ceiling Level: lowest of 1/2 solubility, odor/taste threshold and 50000 ug/L maximum level (intended to limit general groundwater resource degradation).

TPH -Total Petroleum Hydrocarbons. See text for discussion of different TPH categories.

TPH ceiling level after Massachusetts DEP (MADEP 1997a).

TABLE H. PHYSIO-CHEMICAL AND TOXICITY CONSTANTS USED IN MODEI

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
ACENAPHTHENE	V	S	154	5.03E+03	5.10E-02	8.30E-06	3.90E+00	2.20E-03	1.80E-04	7.50E-03	1.0
ACENAPHTHYLENE	V	S	152	2.50E+03	6.08E-02	7.88E-06	3.93E+00	9.12E-04	1.45E-03	5.95E-02	1.0
ACETONE	V	L	58	2.40E+00	1.10E-01	1.20E-05	1.00E+06	2.32E+02	3.50E-05	1.40E-03	1.0
ALDRIN	SV	S	365	8.20E+04	2.30E-02	5.80E-06	1.70E-02	1.20E-04	4.40E-05	1.80E-03	1.0
AMETRYN	NV	S	227	4.28E+02	5.10E-02	6.00E-06	2.09E+02	2.70E-06	2.40E-09	9.90E-08	1.0
AMINO,2- DINITROTOLUENE,4,6-	NV	S	197	2.83E+02	5.60E-02	6.60E-06	1.22E+03	1.10E-05	3.30E-11	1.30E-09	1.0
AMINO,4- DINITROTOLUENE,2,6-	NV	S	197	2.83E+02	5.60E-02	6.60E-06	1.22E+03	1.10E-05	3.30E-11	1.30E-09	1.0
ANTHRACENE	V	S	178	1.64E+04	3.90E-02	7.90E-06	4.30E-02	6.50E-06	5.60E-05	2.30E-03	1.0
ANTIMONY	NV	S	122								0.15
ARSENIC	NV	S	75								1.0
ATRAZINE	NV	S	216	2.25E+02	2.60E-02	6.80E-06	3.50E+01	2.90E-07	2.40E-09	9.60E-08	1.0
BARIUM	NV	S	137								0.07
BENOMYL	NV	S	230	3.36E+02	4.33E-02	5.06E-06	3.80E+00	3.70E-09	4.93E-12	2.16E-10	1
BENZENE	V	L	78	1.50E+02	9.00E-02	1.00E-05	1.79E+03	9.48E+01	5.60E-03	2.30E-01	1.0
BENZO(a)ANTHRACENE	SV	S	228	1.77E+05	2.60E-02	6.70E-06	9.40E-03	2.10E-07	1.20E-05	4.90E-04	1.0
BENZO(a)PYRENE	NV	S	252	5.87E+05	4.80E-02	5.60E-06	1.60E-03	5.50E-09	4.60E-07	1.90E-05	1.0
BENZO(b)FLUORANTHENE	NV	S	252	5.99E+05	4.80E-02	5.60E-06	1.50E-03	5.00E-07	6.60E-07	2.70E-05	1.0
BENZO(g,h,i)PERYLENE	NV	S	276	1.60E+06	4.80E-02	5.60E-06	2.60E-04	1.00E-10	1.44E-07	5.90E-06	1.0
BENZO(k)FLUORANTHENE	NV	S	252	5.87E+05	4.80E-02	5.60E-06	8.00E-04	9.70E-10	5.80E-07	2.40E-05	1.0
BERYLLIUM	NV	S	9								0.007
BIPHENYL, 1,1-	V	S	154	5.13E+03	4.70E-02	7.60E-06	7.48E+00	8.90E-03	3.10E-04	1.30E-02	1.0
BIS(2-CHLOROETHYL)ETHER	V	L	143	3.22E+01	5.70E-02	8.70E-06	1.72E+04	1.55E+00	1.70E-05	7.00E-04	1.0
BIS(2-CHLORO-1-METHYLETHYL)ETHER	V	L	171	6.10E+01	6.31E-02	6.40E-06	1.70E+03	5.30E-01	1.13E-04	4.63E-03	1.0
BIS(2-ETHYLHEXYL)PHTHALATE	NV	S	391	1.20E+05	1.70E-02	4.20E-06	2.70E-01	1.40E-07	2.70E-07	1.10E-05	1.0
BORON	NV	S	14								1.0
BROMODICHLOROMETHANE	V	L	164	3.18E+01	5.60E-02	1.10E-05	3.03E+03	5.00E+01	2.10E-03	8.70E-02	1.0
BROMOFORM	SV	S	253	3.18E+01	3.60E-02	1.00E-05	3.10E+03	5.40E+00	5.40E-04	2.20E-02	1.0
BROMOMETHANE	V	G	95	1.32E+01	1.00E-01	1.40E-05	1.52E+04	1.62E+03	7.30E-03	3.00E-01	1.0
CADMIUM	NV	S	112								0.025
CARBON TETRACHLORIDE	V	L	154	4.39E+01	5.70E-02	9.80E-06	7.93E+02	1.15E+02	2.80E-02	1.10E+00	1.0
CHLORDANE (TECHNICAL)	SV	S	410	6.75E+04	2.10E-02	5.40E-06	5.60E-02	1.00E-05	4.90E-05	2.00E-03	1.0
CHLOROANILINE, p-	NV	S	128	1.13E+02	7.00E-02	1.00E-05	3.90E+03	2.70E-02	1.20E-06	4.70E-05	1.0
CHLOROBENZENE	V	L	113	2.34E+02	7.20E-02	9.50E-06	4.98E+02	1.20E+01	3.10E-03	1.30E-01	1.0

TABLE H. PHYSIO-CHEMICAL AND TOXICITY CONSTANTS USED IN MODEI

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
CHLOROETHANE	V	G	65	2.17E+01	1.00E-01	1.20E-05	6.71E+03	1.01E+03	1.10E-02	4.50E-01	1.0
CHLOROFORM	V	L	119	3.18E+01	7.70E-02	1.10E-05	7.95E+03	1.97E+02	3.70E-03	1.50E-01	1.0
CHLOROMETHANE	V	G	50	1.32E+01	1.20E-01	1.40E-05	5.32E+03	4.30E+03	8.80E-03	3.60E-01	1.0
CHLOROPHENOL, 2-	V	L	129	3.88E+02	6.60E-02	9.50E-06	1.13E+04	2.50E+00	1.10E-05	4.60E-04	1.0
CHROMIUM (Total)	NV	S	52								0.0
CHROMIUM III	NV	S	52								0.013
CHROMIUM VI	NV	S	52				1.69E+06				0.025
CHRYSENE	NV	S	228	1.81E+05	2.60E-02	6.70E-06	2.00E-03	6.20E-09	5.20E-06	2.10E-04	1.0
COBALT	NV	S	59								1.0
COPPER	NV	S	64								1.0
CYANIDE (Free)	V	S	27		2.11E-01	2.46E-05	9.54E+04	3.08E+02	1.01E-04	4.15E-03	1.0
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	NV	S	222	8.91E+01	3.10E-02	8.50E-06	5.97E+01	4.10E-09	2.00E-11	8.20E-10	1.0
DALAPON	NV	L	143	3.20E+00	6.00E-02	9.40E-06	5.02E+05	1.50E-01	5.70E-08	2.30E-06	1.0
DIBENZO(a,h)ANTHTRACENE	NV	S	278	1.91E+06	4.50E-02	5.20E-06	2.50E-03	9.60E-10	1.40E-07	5.80E-06	1.0
DIBROMO,1,2- CHLOROPROPANE,3-	V	L	236	1.16E+02	3.20E-02	8.90E-06	1.23E+03	5.80E-01	1.50E-04	6.00E-03	1.0
DIBROMOCHLOROMETHANE	V	S	208	3.18E+01	3.70E-02	1.10E-05	2.70E+03	5.54E+00	7.80E-04	3.20E-02	1.0
DIBROMOETHANE, 1,2-	V	S	188	3.96E+01	4.30E-02	1.00E-05	3.91E+03	1.12E+01	6.50E-04	2.70E-02	1.0
DICHLOROBENZENE, 1,2-	V	L	147	3.83E+02	5.60E-02	8.90E-06	1.56E+02	1.36E+00	1.90E-03	7.80E-02	1.0
DICHLOROBENZENE, 1,3-	V	L	147	6.17E+02	6.90E-02	7.90E-06	1.56E+02	2.15E+00	1.90E-03	7.79E-02	1.0
DICHLOROBENZENE, 1,4-	V	S	147	3.75E+02	5.50E-02	8.70E-06	8.13E+01	1.74E+00	2.40E-03	9.90E-02	1.0
DICHLOROBENZIDINE, 3,3-	NV	S	253	3.19E+03	4.70E-02	5.50E-06	3.10E+00	2.60E-07	2.80E-11	1.20E-09	1.0
DICHLORODIPHENYLDICHLOROETHANE (DDD)	NV	S	320	1.18E+05	4.10E-02	4.70E-06	9.00E-02	1.40E-06	6.60E-06	2.70E-04	1.0
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	SV	S	318	1.18E+05	2.30E-02	5.90E-06	4.00E-02	6.00E-06	4.20E-05	1.70E-03	1.0
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	NV	S	354	1.69E+05	3.80E-02	4.40E-06	5.50E-03	1.60E-07	8.30E-06	3.40E-04	1.0
DICHLOROETHANE, 1,1-	V	L	99	3.18E+01	8.40E-02	1.10E-05	5.04E+03	2.27E+02	5.60E-03	2.30E-01	1.0
DICHLOROETHANE, 1,2-	V	L	99	3.96E+01	8.60E-02	1.10E-05	8.60E+03	7.90E+01	1.20E-03	4.80E-02	1.0
DICHLOROETHYLENE, 1,1-	V	L	97	3.18E+01	8.60E-02	1.10E-05	2.42E+03	6.00E+02	2.60E-02	1.10E+00	1.0
DICHLOROETHYLENE, Cis 1,2-	V	L	97	3.96E+01	8.80E-02	1.10E-05	6.41E+03	2.00E+02	4.10E-03	1.70E-01	1.0
DICHLOROETHYLENE, Trans 1,2-	V	L	97	3.96E+01	8.80E-02	1.10E-05	4.52E+03	3.31E+02	9.40E-03	3.80E-01	1.0
DICHLOROPHENOL, 2,4-	NV	S	163	1.47E+02	4.90E-02	8.70E-06	5.55E+03	9.00E-02	4.30E-06	1.80E-04	1.0
DICHLOROPHENOXYACETIC ACID (2,4-D)	NV	S	221	2.96E+01	2.80E-02	7.30E-06	6.77E+02	8.30E-05	3.50E-08	1.40E-06	1.0
DICHLOROPROPANE, 1,2-	V	L	113	6.07E+01	7.30E-02	9.70E-06	2.80E+03	5.33E+01	2.80E-03	1.20E-01	1.0
DICHLOROPROPENE, 1,3-	V	L	111	7.22E+01	7.60E-02	1.00E-05	2.80E+03	3.40E+01	3.60E-03	1.50E-01	1.0
DIELDRIN	NV	S	381	2.01E+04	2.30E-02	6.00E-06	1.95E-01	5.90E-06	1.00E-05	4.10E-04	1.0

TABLE H. PHYSIO-CHEMICAL AND TOXICITY CONSTANTS USED IN MODEI

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
DIETHYLPHTHALATE	NV	S	222	1.05E+02	2.60E-02	6.70E-06	1.08E+03	2.10E-03	6.10E-07	2.50E-05	1.0
DIMETHYLPHENOL, 2,4-	NV	S	122	4.92E+02	6.20E-02	8.30E-06	7.87E+03	1.00E-01	9.50E-07	3.90E-05	1.0
DIMETHYLPHTHALATE	NV	S	194	1.40E+02			5.00E+03	3.08E-01	1.05E-07	4.31E-06	1.0
DINITROBENZENE, 1,3-	NV	S	168	3.52E+02	4.80E-02	9.20E-06	5.33E+02	9.00E-04	4.90E-08	2.00E-06	1.0
DINITROPHENOL, 2,4-	NV	S	184	4.61E+02	4.10E-02	9.10E-06	2.79E+03	3.90E-04	8.60E-08	3.50E-06	1.0
DINITROTOLUENE, 2,4- (2,4-DNT)	NV	S	182	5.76E+02	3.80E-02	7.90E-06	2.00E+02	1.50E-04	5.40E-08	2.20E-06	1.0
DINITROTOLUENE, 2,6- (2,6-DNT)	NV	S	182	5.87E+02	3.70E-02	7.80E-06	1.82E+02	5.70E-04	7.50E-07	3.10E-05	1.0
DIOXANE, 1,4-	V	L	88	2.60E+00	8.70E-02	1.10E-05	1.00E+06	3.80E+01	4.80E-06	2.00E-04	1.0
DIOXINS (TEQ)	SV	S	356	2.49E+05	4.70E-02	6.80E-06	2.00E-04	1.50E-09	5.00E-05	2.00E-03	1.0
DIURON	NV	S	233	1.09E+02	5.00E-02	5.90E-06	4.20E+01	6.90E-08	5.00E-10	2.10E-08	1.0
ENDOSULFAN	SV	S	407	6.76E+03	2.20E-02	5.80E-06	3.25E-01	1.70E-07	6.50E-05	2.70E-03	1.0
ENDRIN	NV	S	381	2.01E+04	3.60E-02	4.20E-06	2.50E-01	3.00E-06	6.40E-06	2.60E-04	1.0
ETHANOL	V	L	46	3.09E-01			1.00E+06	5.30E+01	6.29E-06	2.58E-04	1.0
ETHYLBENZENE	V	L	106	4.46E+02	6.80E-02	8.50E-06	1.69E+02	9.60E+00	7.90E-03	3.20E-01	1.0
FLUORANTHENE	NV	S	202	5.55E+04	2.80E-02	7.20E-06	2.60E-01	9.20E-06	8.90E-06	3.60E-04	1.0
FLUORENE	V	S	166	9.16E+03	4.40E-02	7.90E-06	1.69E+00	6.00E-04	9.60E-05	3.90E-03	1.0
GLYPHOSATE	NV	S	169	2.10E+03	6.20E-02	7.30E-06	1.05E+04	9.80E-08	2.10E-12	8.60E-11	1.0
HEPTACHLOR	SV	S	373	4.13E+04	2.20E-02	5.70E-06	1.80E-01	4.00E-04	2.90E-04	1.20E-02	1.0
HEPTACHLOR EPOXIDE	SV	S	389	1.01E+04	2.40E-02	6.20E-06	2.00E-01	2.00E-05	2.10E-05	8.60E-04	1.0
HEXACHLOROBENZENE	SV	S	285	6.20E+03	2.90E-02	7.80E-06	6.20E-03	1.80E-05	1.70E-03	7.00E-02	1.0
HEXACHLOROBUTADIENE	SV	S	261	8.45E+02	2.70E-02	7.00E-06	3.20E+00	2.20E-01	1.00E-02	4.20E-01	1.0
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	NV	S	291	2.81E+03	4.30E-02	5.10E-06	7.30E+00	4.20E-05	5.10E-06	2.10E-04	1.0
HEXACHLOROETHANE	SV	S	237	1.97E+02	3.20E-02	8.90E-06	5.00E+01	2.10E-01	3.90E-03	1.60E-01	1.0
HEXAZINONE	NV	S	252	1.29E+02	2.50E-02	6.30E-06	3.30E+04	2.30E-07	2.30E-12	9.20E-11	1.0
INDENO(1,2,3-cd)PYRENE	NV	S	276	1.95E+06	4.50E-02	5.20E-06	1.90E-04	1.30E-10	3.50E-07	1.40E-05	1.0
ISOPHORONE	NV	L	138	6.50E+01	5.30E-02	7.50E-06	1.20E+04	4.40E-01	6.60E-06	2.70E-04	1.0
LEAD	NV	S	207								1.0
MERCURY	NV	S	201								1.0
METHOXYCHLOR	NV	S	346	2.69E+04	2.20E-02	5.60E-06	1.00E-01	2.60E-06	2.00E-07	8.30E-06	1.0
METHYL ETHYL KETONE	V	L	72	4.51E+00	9.10E-02	1.00E-05	2.23E+05	9.06E+01	5.70E-05	2.30E-03	1.0
METHYL ISOBUTYL KETONE	V	L	100	1.26E+01	7.00E-02	8.30E-06	1.90E+04	1.99E+01	1.40E-04	5.60E-03	1.0
METHYL MERCURY	NV	S	216								1.0
METHYL TERT BUTYL ETHER	V	L	88	1.16E+01	7.50E-02	8.60E-06	5.10E+04	2.50E+02	5.90E-04	2.40E-02	1.0
METHYLENE CHLORIDE	V	L	85	2.17E+01	1.00E-01	1.30E-05	1.30E+04	4.35E+02	3.30E-03	1.30E-01	1.0

TABLE H. PHYSIO-CHEMICAL AND TOXICITY CONSTANTS USED IN MODEI

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
METHYLNAPHTHALENE, 1-	V	S	142	2.53E+03	5.30E-02	7.80E-06	2.58E+01	6.70E-02	5.10E-04	2.10E-02	1.0
METHYLNAPHTHALENE, 2-	V	S	142	2.48E+03	5.20E-02	7.80E-06	2.46E+01	5.50E-02	5.20E-04	2.10E-02	1.0
MOLYBDENUM	NV	S	96								1.0
NAPHTHALENE	V	S	128	1.54E+03	6.00E-02	8.40E-06	3.10E+01	8.50E-02	4.40E-04	1.80E-02	1.0
NICKEL	NV	S	59								0.04
NITROBENZENE	V	L	123	2.26E+02	6.80E-02	9.40E-06	2.09E+03	2.45E-01	2.40E-05	9.80E-04	1.0
NITROGLYCERIN	NV	L	227	1.16E+02	2.90E-02	7.70E-06	1.38E+03	4.00E-04	8.70E-08	3.50E-06	1.0
NITROTOLUENE, 2-	V	S	137	3.71E+02	5.90E-02	8.70E-06	6.50E+02	1.90E-01	1.30E-05	5.10E-04	1.0
NITROTOLUENE, 3-	NV	S	137	3.63E+02	5.90E-02	8.70E-06	5.00E+02	2.05E-01	9.30E-06	3.80E-04	1.0
NITROTOLUENE, 4-	NV	S	137	3.63E+02	5.70E-02	8.40E-06	4.42E+02	1.60E-02	5.60E-06	2.30E-04	1.0
PENTACHLOROPHENOL	NV	S	266	5.92E+02	3.00E-02	8.00E-06	1.40E+01	1.10E-04	2.50E-08	1.00E-06	1.0
PENTAERYTHRITOLTETRANITRATE (PETN)	NV	S	316	6.48E+02	2.60E-02	6.80E-06	4.30E+01	5.50E-09	1.30E-09	5.40E-08	1.0
PERCHLORATE	NV	S	117				2.45E+05				1.0
PHENANTHRENE	V	S	178	1.40E+04	6.08E-02	7.88E-06	8.16E-01		3.93E-05	1.61E-03	1.0
PHENOL	NV	S	94	1.87E+02	8.30E-02	1.00E-05	8.28E+04	3.50E-01	3.30E-07	1.40E-05	1.0
POLYCHLORINATED BIPHENYLS (PCBs)	SV	S	326	1.31E+05	2.37E-02	6.10E-06	4.30E-02	7.70E-05	2.83E-04	1.16E-02	1.0
PROPICONAZOLE	NV	L	342	1.56E+03	2.10E-02	5.30E-06	1.10E+02	4.20E-07	1.70E-09	7.00E-08	1.0
PYRENE	V	S	202	5.43E+04	2.80E-02	7.20E-06	1.35E-01	4.50E-06	1.20E-05	4.90E-04	1.0
SELENIUM	NV	S	81					1.40E-10			1.0
SILVER	NV	S	108								0.04
SIMAZINE	NV	S	202	1.47E+02	2.80E-02	7.40E-06	6.20E+00	2.20E-08	9.40E-10	3.90E-08	1.0
STYRENE	V	L	104	4.46E+02	7.10E-02	8.80E-06	3.10E+02	6.40E+00	2.80E-03	1.10E-01	1.0
TERBACIL	NV	S	217	5.01E+01	2.70E-02	7.20E-06	7.10E+02	4.70E-07	1.20E-10	4.90E-09	1.0
tert-BUTYL ALCOHOL	V	L	74	3.70E+01	9.00E-02	9.10E-06	1.00E+06	4.07E+01	1.17E-05	4.80E-04	1.0
TETRACHLOROETHANE, 1,1,1,2-	V	L	168	8.60E+01	4.80E-02	9.10E-06	1.07E+03	1.20E+01	2.50E-03	1.00E-01	1.0
TETRACHLOROETHANE, 1,1,2,2-	V	L	168	9.49E+01	4.90E-02	9.30E-06	2.83E+03	4.62E+00	3.70E-04	1.50E-02	1.0
TETRACHLOROETHYLENE	V	L	166	9.49E+01	5.00E-02	9.50E-06	2.06E+02	1.85E+01	1.80E-02	7.20E-01	1.0
TETRACHLOROPHENOL, 2,3,4,6-	NV	S	232	2.80E+02	5.00E-02	5.90E-06	2.30E+01	6.70E-04	8.80E-06	3.60E-04	1.0
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	NV	S	296	5.32E+02	4.30E-02	5.00E-06	5.00E+00	3.30E-14	8.70E-10	3.50E-08	1.0
THALLIUM	NV	S	204								1.0
TOLUENE	V	L	92	2.34E+02	7.80E-02	9.20E-06	5.26E+02	2.84E+01	6.60E-03	2.70E-01	1.0
TOXAPHENE	NV	S	414	7.72E+04	3.20E-02	3.80E-06	5.50E-01	6.70E-06	6.00E-06	2.50E-04	1.0
TPH (gasolines)	V	L	119	5.00E+03	7.00E-02	1.00E-05	1.50E+02	3.00E+02	7.86E-01	3.22E+01	1.0
TPH (middle distillates)	V	L	201	5.00E+03	7.00E-02	1.00E-05	5.00E+00	1.00E+00	5.65E-01	2.32E+01	1.0

TABLE H. PHYSIO-CHEMICAL AND TOXICITY CONSTANTS USED IN MODEI

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
TPH (residual fuels)	NV	L	236				5.00E+00				1.0
TRICHLOROBENZENE, 1,2,4-	V	S	181	1.36E+03	4.00E-02	8.40E-06	4.90E+01	4.60E-01	1.40E-03	5.80E-02	1.0
TRICHLOROETHANE, 1,1,1-	V	L	133	4.39E+01	6.50E-02	9.60E-06	1.29E+03	1.24E+02	1.70E-02	7.00E-01	1.0
TRICHLOROETHANE, 1,1,2-	V	L	133	6.07E+01	6.70E-02	1.00E-05	4.59E+03	2.30E+01	8.20E-04	3.40E-02	1.0
TRICHLOROETHYLENE	V	L	131	6.07E+01	6.90E-02	1.00E-05	1.28E+03	6.90E+01	9.90E-03	4.00E-01	1.0
TRICHLOROPHENOL, 2,4,5-	NV	S	198	1.60E+03	3.10E-02	8.10E-06	1.20E+03	7.50E-03	1.60E-06	6.60E-05	1.0
TRICHLOROPHENOL, 2,4,6-	NV	S	198	3.81E+02	3.10E-02	8.10E-06	8.00E+02	8.00E-03	2.60E-06	1.10E-04	1.0
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	NV	S	255	1.07E+02	2.90E-02	7.80E-06	2.78E+02	3.80E-05	8.70E-09	3.50E-07	1.0
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	NV	S	270	1.75E+02	2.30E-02	5.90E-06	7.10E+01	1.00E-05	9.10E-09	3.70E-07	1.0
TRICHLOROPROPANE, 1,2,3-	V	L	147	1.16E+02	5.70E-02	9.20E-06	1.75E+03	3.69E+00	3.40E-04	1.40E-02	1.0
TRICHLOROPROPENE, 1,2,3-	V	L	145	1.16E+02	5.90E-02	9.40E-06	3.34E+02	4.40E+00	1.80E-02	7.20E-01	1.0
TRIFLURALIN	SV	S	335	1.64E+04	2.20E-02	5.60E-06	1.80E-01	4.60E-05	1.00E-04	4.20E-03	1.0
TRINITROBENZENE, 1,3,5-	NV	S	213	1.68E+03	2.90E-02	7.70E-06	2.78E+02	6.40E-06	6.50E-09	2.70E-07	1.0
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	NV	S	287	4.61E+03	2.60E-02	6.70E-06	7.40E+01	5.70E-08	2.70E-09	1.10E-07	1.0
TRINITROTOLUENE, 2,4,6- (TNT)	NV	S	227	2.81E+03	3.00E-02	7.90E-06	1.15E+02	8.00E-06	2.10E-08	8.50E-07	1.0
VANADIUM	NV	S	51								0.026

CHEMICAL PARAMETER	Physical State		Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
				(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm-m^3/mol$)	(unitless)	(unitless)
VINYL CHLORIDE	V	G	63	2.17E+01	1.10E-01	1.20E-05	8.80E+03	2.98E+03	2.80E-02	1.10E+00	1.0
XYLENES	V	L	106	3.83E+02	6.90E-02	8.50E-06	1.06E+02	8.00E+00	6.60E-03	2.70E-01	1.0
ZINC	NV	S	67								1.0

General Notes:

Updates: Updates since March 2009 edition noted in red on color version of this table. Refer to "Updates" worksheet at front of EAL Surfer for key revisions and Appendix 9.

Physical state of chemical at ambient conditions (V - volatile, SV-semivolatile, NV - nonvolatile, S - solid, L - liquid, G - gas).

Chemical considered to be "volatile" if Henry's number (atm m3/mole) >0.00001 or VP >1 mm Hg and molecular weight <200, and "semi-volatile" if molecular weight >200.

Physio-chemical constants and toxicity factors primarily from USEPA RSL guidance (USEPA 2016). Other references include: National Library of Medicine Toxnet database (NLM 2008a), NLM ChemID Plus (NL (USDOE 2006), in that order or preference, unless otherwise noted. Nonvolatile pesticides Koc and Diffusivity constants primarily from ORNL RAIS database (ORNL 2006).

Inhalation Unit Risk (IUR) factor volatile carcinogens calculated based on oral slope factor if not provided in USEPA RSL guidance (IUR=CSFo x 20m3/day x (1/80kg) x (1mg/1,000ug). Resulting action levels may diff dibromochloromethane; 1-methylnaphthalene, 2-nitrotoluene, tert-butyl alcohol, 1,2,4-trichlorobenzene, 1,2,3-trichloropropane.

Reference Concentration (RfC) for volatile noncarcinogens calculated based on oral reference dose if not available in USEPA RSL guidance (USEPA 2004, RfC = RfD x 80kg x (1/20m3-d). Resulting action levels ma acenaphthalene, acenaphthylene, anthracene, 2-chlorophenol, bromodichloromethane, dibromochloromethane, dibromomethane, 1,3 dichlorobenzene, 1,1 dichloroethane, cis 1,2-dichloroethylene, trans 1,2-dichloroeth 3-nitrotoluene, phenanthrene, pyrene, 1,1,1,2-tetrachloroethane, 1,1,2-trichloroethane, 2,4,5-trichlorophenol.

TPH (gasoline and middle distillates). Reference Doses and Reference Concentrations based on assumed carbon range makeup of fuels and fuel vapors (see Appendix 1, Section 6).

Dioxins: Reference dose based on WHO Permissible Tolerable Intake factor (refer to: Update to Soil Action Levels for TEQ Dioxins and Recommended Soil Management Practices, HEER office Technical Memorandu

Notes on Individual Chemicals

Amino,2- dinitrotoluene,3,6- constants and toxicity factors based on Amino,2- dinitrotoluene,3,6-.

Antimony toxicity factors based on metallic forms.

Dibromochloromethane, dibromochloropropane and pyrene considered volatile for purposes of modeling (USEPA 2004). (Molecular weight adjusted to 199 in column E (hidden) to permit generation of volatilization fact

2,4 dimethylphenol Henry's constant and koc values and solubilities for nitrotoluenes from Syracuse Research Corporation (SRC 2005).

1,3 dichlorobenzene constants and toxicity factors after 2004 USEPA IX PRGs (USEPA 2004).

1,4 Dioxane physio-chemical constants from "Solvent Stabilizers - White Paper" (Mohr 2001).

Dioxin, polychlorinated biphenyls and toxaphene physio-chemical constants from ATSDR 2001a.

Ethanol toxicity factors not available (refer to Section 6 in Appendix 1).

Mercury toxicity factors based on elemental mercury.

Nickel toxicity factors based on soluble salts.

Nitrotoluenes, nitrobenzenes and other nonvolatile, explosives-related chemicals physiochemical constants from US Army Corps of Engineers *Military Range Chemical Database* (Zakikhani et al., 2002; primarily data fr

PCB constants and toxicity factors based on Arochlor 1254. PCB solubility based on value presented in 2004 USEPA IX PRGs (USEPA 2004).

CHEMICAL PARAMETER	Physical State	Molecular Weight	Organic carbon partition coefficient, K_{oc}	Diffusivity in air, D_a	Diffusivity in water, D_w	Pure component water solubility, S	Vapor Pressure	Henry's Law constant H	Henry's Law constant H'	GI Absorption Factor GIABS
			(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(mm Hg)	($atm\text{-}m^3/mol$)	(unitless)	(unitless)
PETN physiochemical constants from National Library of Medicine ChemID Plus database (NLM 2008b). Koc estimated from Kow based on equation for miscellaneous organics in Fetter 1993. Toxicity factors not availa UTDEQ 2008).										
Technical chlordane koc of 86,650 cm3/gm referenced in 2008 edition of USEPA RSLs retained based on comparison to field SPLP batch test data which indicates very low mobility.										
CalEPA 2016; noncancer toxicity factors from USEPA 2016.										
Thallium toxicity factors based on soluble salts.										
TBA physio-chemical constants from *Assessment and Management of MtBE Impacted Sites* (RWQCB 2001). Oral cancer slope factor from California EPA (CalEPA 1999b). URF for TBA based on conversion of oral C										
TPH -Total Petroleum Hydrocarbons. Molecular weights form ATSDR (gasolines) and NIOSH (middle distillates). TPHg and TPHmd solubilities from USACE 1998. See Section 6 of Appendix 1 for discussion of differe										
1,2,3 Trichloropropene diffusivity coefficients not available. Constants noted based on 1,2,3 Trichloropropane.										
Xylenes physio-chemical and toxicity constants based on m-xylene.										
Explosives-related compounds physio-chemical constants primarily from USACE ARAMS database (Zakikhani et al, 2002); National Library of Medicine ChemIDplus Advanced database (NLM 2008b) and DOE RAIS d										
PAHs acenaphthylene and phenanthrene RfDs based on fluorene; RfDs for benzo(g,h,i)perylene based on fluoranthene (after MADEP 1994). Diffusivities for acenaphthylene, and phenanthrene based on fluorene.										
Vanadium toxicity factors based on metallic forms.										
Zinc toxicity factors based on metallic forms.										

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo $(mg/kg\text{-}d)^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR $(ug/m^3)^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
0.13			6.0E-02	2.4E-01
0.13			4.0E-02	1.6E-01
			9.0E-01	3.1E+01
	3.4E+00	8.5E-04	1.0E-04	4.0E-04
0.1			9.0E-03	
0.006			2.0E-03	
0.009			2.0E-03	
0.13			3.0E-01	1.2E+00
			4.0E-04	
0.03	1.5E+00	4.3E-03	3.0E-04	1.5E-05
0.1	2.3E-01		3.5E-02	
			2.0E-01	5.0E-04
0.1			5.0E-02	
	5.5E-02	7.8E-06	4.0E-03	3.0E-02
0.13	7.3E-01	1.1E-04		
0.13	7.3E+00	1.1E-03		
0.13	7.3E-01	1.1E-04		
0.13			4.0E-02	
0.13	7.3E-02	1.1E-04		
		2.4E-03	2.0E-03	2.0E-05
	8.0E-03	2.0E-06	5.0E-01	4.0E-04
	1.1E+00	3.3E-04		
	7.0E-02	1.0E-05	4.00E-02	1.40E-01
0.1	1.4E-02	2.4E-06	2.0E-02	
			2.0E-01	2.0E-02
	6.2E-02	3.7E-05	2.0E-02	8.0E-02
	7.9E-03	1.1E-06	2.0E-02	
			1.4E-03	5.0E-03
0.001		1.8E-03	1.0E-03	1.0E-05
	7.0E-02	6.0E-06	4.0E-03	1.0E-01
0.04	3.5E-01	1.0E-04	5.0E-04	7.0E-04
0.1	2.0E-01		4.0E-03	
			2.0E-02	5.0E-02

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo $(mg/kg\text{-}d)^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR $(ug/m^3)^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
				1.0E+01
	3.1E-02	2.3E-05	1.0E-02	9.8E-02
				9.0E-02
			5.0E-03	2.0E-02
			1.5E+00	
	5.0E-01	8.4E-02	3.0E-03	1.0E-04
0.13	7.3E-03	1.1E-05		
		9.0E-03	3.00E-04	6.00E-06
			4.0E-02	
			6.0E-04	8.00E-04
0.015	1.1E-01		3.0E-03	
0.1			3.0E-02	
0.13	7.3E+00	1.2E-03		
	8.0E-01	6.0E-03	2.0E-04	2.0E-04
	8.4E-02	2.1E-05	2.0E-02	8.0E-02
	2.0E+00	6.0E-04	9.0E-03	9.0E-03
			9.0E-02	2.0E-01
			3.00E-02	1.2E-01
	5.4E-03	1.1E-05	7.0E-02	8.0E-01
0.1	4.5E-01	3.4E-04		
0.1	2.4E-01	6.9E-05		
	3.4E-01	9.7E-05		
0.03	3.4E-01	9.7E-05	5.0E-04	
	5.7E-03	1.6E-06	2.0E-01	8.0E-01
	9.1E-02	2.6E-05	6.0E-03	7.0E-03
			5.0E-02	2.0E-01
			2.0E-03	8.0E-03
			2.0E-02	8.0E-02
0.1			3.0E-03	
0.05			1.0E-02	
	3.6E-02	1.0E-05	9.0E-02	4.0E-03
	1.0E-01	4.0E-06	3.0E-02	2.0E-02
0.1	7.0E+00	1.8E-03	8.0E-05	3.2E-04

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo $(mg/kg\text{-}d)^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR $(ug/m^3)^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
0.1			8.0E-01	
0.1			2.0E-02	8.0E-02
0.10			1.00E+01	
0.1			1.0E-04	
0.1			2.0E-03	
0.102	3.1E-01	8.9E-05	2.0E-03	
0.099	1.5E+00		3.0E-04	
	1.0E-01	5.0E-06	3.0E-02	3.0E-02
0.03	1.3E+05	3.8E+01	3.3E-09	1.3E-08
0.1			2.0E-03	
			6.0E-03	
0.1			3.0E-04	
	1.1E-02	2.5E-06	1.0E-01	1.0E+00
0.13			4.0E-02	
0.13			4.0E-02	1.6E-01
0.1			1.0E-01	
	4.5E+00	1.3E-03	5.0E-04	
	9.1E+00	2.6E-03	1.3E-05	
	1.6E+00	4.6E-04	8.0E-04	
	7.8E-02	2.2E-05	1.0E-03	
0.04	1.1E+00	3.1E-04	3.0E-04	
	4.0E-02	1.1E-05	7.0E-04	3.0E-02
0.1			3.3E-02	
0.13	7.3E-01	1.1E-04		
0.1	9.5E-04		2.0E-01	2.0E+00
			3.0E-04	3.0E-04
0.1			5.0E-03	
			6.0E-01	5.0E+00
				3.0E+00
			1.0E-04	
	1.8E-03	2.6E-07		3.0E+00
	2.0E-03	1.0E-08	6.0E-03	6.0E-01

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo (mg/kg-d)$^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR (ug/m^3)$^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
0.13	2.9E-02	7.3E-06	7.0E-02	2.8E-01
0.13			4.0E-03	1.6E-02
			5.0E-03	
0.13		3.4E-05	2.0E-02	3.0E-03
			2.0E-02	9.0E-05
		4.0E-05	2.0E-03	9.0E-03
0.1	1.7E-02		1.0E-04	
	2.2E-01	5.5E-05	9.0E-04	3.6E-03
0.10			1.00E-04	4.0E-04
0.1	1.6E-02		4.0E-03	
0.25	4.0E-01	5.1E-06	5.0E-03	
0.1	4.0E-03		2.0E-03	
			7.0E-04	
0.13			4.0E-02	1.6E-01
0.1			3.0E-01	2.0E-01
0.14	2.0E+00	5.7E-04	2.0E-05	
0.1			1.3E-02	
0.13			3.0E-02	1.2E-01
			5.0E-03	2.0E-02
			5.0E-03	
0.1	1.2E-01		5.0E-03	
			2.0E-01	1.0E+00
0.1			1.3E-02	
	3.0E-03	7.5E-07		
	2.6E-02	7.4E-06	3.0E-02	1.2E-01
	2.0E-01	5.8E-05	2.0E-02	
	2.1E-02	6.1E-06	6.0E-03	4.0E-02
0.1			3.0E-02	
0.006			5.0E-02	
			1.0E-05	
			8.0E-02	5.0E+00
0.1	1.1E+00	3.2E-04		
0.10			3.00E-02	2.81E-01
0.10			2.00E-02	1.26E-01

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo (mg/kg-d)$^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR (ug/m^3)$^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
			1.20E-01	
	2.9E-02	7.3E-06	1.0E-02	2.0E-03
			2.0E+00	5.0E+00
	5.7E-02	1.6E-05	4.0E-03	2.0E-04
	4.6E-02	4.1E-06	5.0E-04	2.0E-03
0.1			1.0E-01	4.0E-01
0.1	1.1E-02	3.1E-06	1.0E-03	
0.1			1.0E-02	
0.1			8.0E-03	
	3.0E+01	7.5E-03	4.0E-03	3.0E-04
			3.00E-03	3.0E-04
	7.7E-03		7.5E-03	
0.019			3.0E-02	
0.00065			2.0E-03	
0.032	3.0E-02		5.0E-04	
			5.0E-03	1.0E-04

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Skin Absorption Factor ABS (unitless)	Cancer Slope Factor Oral CSFo (mg/kg-d)$^{-1}$	Cancer Unit Risk Factor (Inhalation) IUR (ug/m^3)$^{-1}$	Reference Dose Oral RfDo (mg/kg-d)	Reference Concentration (Inhalation) RfC (mg/m^3)
	7.2E-01	4.4E-06	3.0E-03	1.0E-01
			2.0E-01	1.0E-01
			3.0E-01	

.M 2008b), ATSDR Toxprofiles (ATSDR 2006) and USDOE RAIS database

er from those presented in the USEPA RSL guidance. Includes: 1,1 biphenyl,

y differ from those presented in the USEPA RSL guidance. Includes:
ıylene, 2,4-dimethylphenol, fluorene, 1 & 2-methylnaphthalene, 2-nitrotoluene,

ım, June 2010).

or in soil direct-exposure models.)

rom FRAMES database).

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Skin Absorption Factor	Cancer Slope Factor Oral	Cancer Unit Risk Factor (Inhalation)	Reference Dose Oral	Reference Concentration (Inhalation)
ABS	CSFo	IUR	RfDo	RfC
(unitless)	$(mg/kg\text{-}d)^{-1}$	$(ug/m^3)^{-1}$	(mg/kg-d)	(mg/m^3)

able; RDX used as surrogate based on similar chemical structure (after

SF (URF = CSF x (70kg/20m3-day)).
nt TPH categories.

latabase (DOE 2006).

TABLE I-1. DIRECT-EXPOSURE ACTION LEVELS
[1]UNRESTRICTED LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[2]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Mutagens (Risk = 10^{-6}) (mg/kg)	[3]Noncarcinogens (Final) (mg/kg)	[3]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
ACENAPHTHENE	6.6E+02	noncarcinogenic effects			6.6E+02	3.3E+03	NA
ACENAPHTHYLENE	3.4E+02	noncarcinogenic effects			3.4E+02	1.7E+03	NA
ACETONE	1.2E+04	noncarcinogenic effects			1.2E+04	6.1E+04	1.1E+05
ALDRIN	3.9E+00	noncarcinogenic effects	2.0E+01		3.9E+00	7.7E+00	NA
AMETRYN	1.1E+02	noncarcinogenic effects			1.1E+02	5.7E+02	NA
AMINO,2- DINITROTOLUENE,4,6-	3.1E+01	noncarcinogenic effects			3.1E+01	1.5E+02	NA
AMINO,4- DINITROTOLUENE,2,6-	3.1E+01	noncarcinogenic effects			3.1E+01	1.5E+02	NA
ANTHRACENE	3.5E+03	noncarcinogenic effects			3.5E+03	1.7E+04	NA
ANTIMONY	6.3E+00	noncarcinogenic effects			6.3E+00	3.1E+01	NA
ARSENIC	2.3E+01	HDOH 2010	2.3E+01		2.2E+01	2.2E+01	NA
ATRAZINE	2.4E+00	carcinogenic effects	2.4E+00		4.4E+02	2.2E+03	NA
BARIUM	3.1E+03	noncarcinogenic effects			3.1E+03	1.5E+04	NA
BENOMYL	6.3E+02	noncarcinogenic effects			6.3E+02	3.2E+03	NA
BENZENE	1.2E+00	carcinogenic effects	1.2E+00		1.7E+01	8.7E+01	1.9E+03
BENZO(a)ANTHRACENE	1.6E+01	mutagenic effects	6.9E+01	1.6E+01			NA
BENZO(a)PYRENE	1.6E+00	mutagenic effects	7.0E+00	1.6E+00			NA
BENZO(b)FLUORANTHENE	1.6E+01	mutagenic effects	7.0E+01	1.6E+01			NA
BENZO(g,h,i)PERYLENE	4.8E+02	noncarcinogenic effects			4.8E+02	2.4E+03	NA
BENZO(k)FLUORANTHENE	1.6E+02	mutagenic effects	7.0E+02	1.6E+02			NA
BERYLLIUM	3.1E+01	noncarcinogenic effects	1.6E+03		3.1E+01	1.6E+02	NA
BIPHENYL, 1,1-	1.0E+01	noncarcinogenic effects	5.8E+01		1.0E+01	5.1E+01	NA
BIS(2-CHLOROETHYL)ETHER	2.4E-01	carcinogenic effects	2.4E-01				5.0E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	3.8E+00	carcinogenic effects	3.8E+00		3.1E+02	1.6E+03	7.9E+02
BIS(2-ETHYLHEXYL)PHTHALATE	3.9E+01	carcinogenic effects	3.9E+01		2.5E+02	1.3E+03	NA
BORON	3.1E+03	noncarcinogenic effects			3.1E+03	1.6E+04	NA
BROMODICHLOROMETHANE	3.2E-01	carcinogenic effects	3.2E-01		5.8E+01	2.9E+02	9.3E+02
BROMOFORM	2.0E+01	carcinogenic effects	2.0E+01		3.1E+02	1.6E+03	NA
BROMOMETHANE	1.5E+00	noncarcinogenic effects			1.5E+00	7.4E+00	3.6E+03
CADMIUM	1.4E+01	noncarcinogenic effects	2.1E+03		1.4E+01	7.1E+01	NA
CARBON TETRACHLORIDE	7.1E-01	carcinogenic effects	7.1E-01		2.2E+01	1.1E+02	4.5E+02
CHLORDANE (TECHNICAL)	1.7E+01	carcinogenic effects	1.7E+01		3.5E+01	3.5E+01	NA
CHLOROANILINE, p-	2.7E+00	carcinogenic effects	2.7E+00		5.1E+01	2.5E+02	NA
CHLOROBENZENE	5.9E+01	noncarcinogenic effects			5.9E+01	2.9E+02	7.6E+02
CHLOROETHANE	2.1E+03	saturation limit			3.0E+03	1.5E+04	2.1E+03
CHLOROFORM	3.4E-01	carcinogenic effects	3.4E-01		4.2E+01	2.1E+02	2.5E+03
CHLOROMETHANE	2.4E+01	noncarcinogenic effects			2.4E+01	1.2E+02	1.3E+03
CHLOROPHENOL, 2-	7.0E+01	noncarcinogenic effects			7.0E+01	3.5E+02	2.7E+04
CHROMIUM (Total)		not available					
CHROMIUM III	2.3E+04	noncarcinogenic effects			2.3E+04	1.2E+05	NA
CHROMIUM VI	3.0E+01	mutagenic effects	1.3E+02	3.0E+01	4.7E+01	2.3E+02	NA
CHRYSENE	1.6E+03	mutagenic effects	7.0E+03	1.6E+03			NA
COBALT	4.7E+00	noncarcinogenic effects	4.2E+02		4.7E+00	2.3E+01	NA
COPPER	6.3E+02	noncarcinogenic effects			6.3E+02	3.1E+03	NA
CYANIDE (Free)	4.8E+00	noncarcinogenic effects			4.8E+00	2.4E+01	NA
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	6.1E+00	carcinogenic effects	6.1E+00		4.5E+01	2.3E+02	NA

TABLE I-1. DIRECT-EXPOSURE ACTION LEVELS
[1]UNRESTRICTED LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[2]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Mutagens (Risk = 10^{-6}) (mg/kg)	[3]Noncarcinogens (Final) (mg/kg)	[3]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
DALAPON	3.8E+02	noncarcinogenic effects			3.8E+02	1.9E+03	NA
DIBENZO(a,h)ANTHTRACENE	1.6E+00	mutagenic effects	7.0E+00	1.6E+00			NA
DIBROMO,1,2- CHLOROPROPANE,3-	5.7E-03	mutagenic effects	1.6E-02	5.7E-03	9.9E-01	5.0E+00	9.8E+02
DIBROMOCHLOROMETHANE	1.0E+00	carcinogenic effects	1.0E+00		9.8E+01	4.9E+02	NA
DIBROMOETHANE, 1,2-	3.9E-02	carcinogenic effects	3.9E-02		1.6E+01	7.8E+01	NA
DICHLOROBENZENE, 1,2-	3.8E+02	saturation limit			3.9E+02	1.9E+03	3.8E+02
DICHLOROBENZENE, 1,3-	2.0E+02	noncarcinogenic effects			2.0E+02	1.0E+03	6.0E+02
DICHLOROBENZENE, 1,4-	2.8E+00	carcinogenic effects	2.8E+00		6.9E+02	3.5E+03	NA
DICHLOROBENZIDINE, 3,3-	1.2E+00	carcinogenic effects	1.2E+00				NA
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	carcinogenic effects	2.3E+00				NA
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	2.0E+00	carcinogenic effects	2.0E+00				NA
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.9E+00	carcinogenic effects	1.9E+00		7.3E+00	3.7E+01	NA
DICHLOROETHANE, 1,1-	3.8E+00	carcinogenic effects	3.8E+00		3.4E+02	1.7E+03	1.7E+03
DICHLOROETHANE, 1,2-	5.0E-01	carcinogenic effects	5.0E-01		6.7E+00	3.4E+01	3.0E+03
DICHLOROETHYLENE, 1,1-	4.9E+01	noncarcinogenic effects			4.9E+01	2.4E+02	1.2E+03
DICHLOROETHYLENE, Cis 1,2-	3.9E+00	noncarcinogenic effects			3.9E+00	2.0E+01	2.4E+03
DICHLOROETHYLENE, Trans 1,2-	2.9E+01	noncarcinogenic effects			2.9E+01	1.4E+02	1.9E+03
DICHLOROPHENOL, 2,4-	3.8E+01	noncarcinogenic effects			3.8E+01	1.9E+02	NA
DICHLOROPHENOXYACETIC ACID (2,4-D)	1.4E+02	noncarcinogenic effects			1.4E+02	7.0E+02	NA
DICHLOROPROPANE, 1,2-	1.1E+00	carcinogenic effects	1.1E+00		3.4E+00	1.7E+01	1.4E+03
DICHLOROPROPENE, 1,3-	1.9E+00	carcinogenic effects	1.9E+00		1.5E+01	7.7E+01	1.6E+03
DIELDRIN	2.5E+00	noncarcinogenic effects	7.8E+00		2.5E+00	5.1E+00	NA
DIETHYLPHTHALATE	1.0E+04	noncarcinogenic effects			1.0E+04	5.1E+04	NA
DIMETHYLPHENOL, 2,4-	2.5E+02	noncarcinogenic effects			2.5E+02	1.3E+03	NA
DIMETHYLPHTHALATE	1.3E+05	noncarcinogenic effects			1.3E+05	6.3E+05	NA
DINITROBENZENE, 1,3-	1.3E+00	noncarcinogenic effects			1.3E+00	6.3E+00	NA
DINITROPHENOL, 2,4-	2.5E+01	noncarcinogenic effects			2.5E+01	1.3E+02	NA
DINITROTOLUENE, 2,4- (2,4-DNT)	1.7E+00	carcinogenic effects	1.7E+00		2.5E+01	1.3E+02	NA
DINITROTOLUENE, 2,6- (2,6-DNT)	3.6E-01	carcinogenic effects	3.6E-01		3.8E+00	1.9E+01	NA
DIOXANE, 1,4-	5.4E+00	carcinogenic effects	5.4E+00		1.7E+02	8.5E+02	1.2E+05
DIOXINS (TEQ)	2.4E-04	HDOH 2010a					
DIURON	2.5E+01	noncarcinogenic effects			2.5E+01	1.3E+02	NA
ENDOSULFAN	9.4E+01	noncarcinogenic effects			9.4E+01	4.7E+02	NA
ENDRIN	3.8E+00	noncarcinogenic effects			3.8E+00	1.9E+01	NA
ETHANOL		not available					
ETHYLBENZENE	6.3E+01	carcinogenic effects	6.3E+01		7.1E+02	3.5E+03	4.8E+02
FLUORANTHENE	4.8E+02	noncarcinogenic effects			4.8E+02	2.4E+03	NA
FLUORENE	4.6E+02	noncarcinogenic effects			4.6E+02	2.3E+03	NA
GLYPHOSATE	1.3E+03	noncarcinogenic effects			1.3E+03	6.3E+03	NA
HEPTACHLOR	1.4E-01	carcinogenic effects	1.4E-01		7.8E+00	3.9E+01	NA
HEPTACHLOR EPOXIDE	7.1E-02	carcinogenic effects	7.1E-02		2.0E-01	1.0E+00	NA
HEXACHLOROBENZENE	2.2E-01	carcinogenic effects	2.2E-01		1.3E+01	6.3E+01	NA
HEXACHLOROBUTADIENE	1.3E+00	carcinogenic effects	1.3E+00		1.6E+01	7.8E+01	NA
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	5.7E-01	carcinogenic effects	5.7E-01		4.3E+00	2.1E+01	NA
HEXACHLOROETHANE	2.0E+00	carcinogenic effects	2.0E+00		9.1E+00	4.6E+01	NA

TABLE I-1. DIRECT-EXPOSURE ACTION LEVELS
[1]UNRESTRICTED LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[2]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Mutagens (Risk = 10^{-6}) (mg/kg)	[3]Noncarcinogens (Final) (mg/kg)	[3]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
HEXAZINONE	4.2E+02	noncarcinogenic effects			4.2E+02	2.1E+03	NA
INDENO(1,2,3-cd)PYRENE	1.6E+01	mutagenic effects	7.0E+01	1.6E+01			NA
ISOPHORONE	5.7E+02	carcinogenic effects	5.7E+02		2.5E+03	1.3E+04	NA
LEAD	2.0E+02	noncarcinogenic effects			2.0E+02		NA
MERCURY	4.7E+00	noncarcinogenic effects			4.7E+00	2.3E+01	NA
METHOXYCHLOR	6.3E+01	noncarcinogenic effects			6.3E+01	3.2E+02	NA
METHYL ETHYL KETONE	5.6E+03	noncarcinogenic effects			5.6E+03	2.8E+04	2.8E+04
METHYL ISOBUTYL KETONE	3.4E+03	saturation limit			7.2E+03	3.6E+04	3.4E+03
METHYL MERCURY	1.6E+00	noncarcinogenic effects			1.6E+00	7.8E+00	NA
METHYL TERT BUTYL ETHER	5.0E+01	carcinogenic effects	5.0E+01		3.3E+03	1.7E+04	8.9E+03
METHYLENE CHLORIDE	5.8E+01	mutagenic effects	2.3E+02	5.8E+01	7.2E+01	3.6E+02	3.3E+03
METHYLNAPHTHALENE, 1-	1.0E+02	carcinogenic effects	1.0E+02		6.8E+02	3.4E+03	NA
METHYLNAPHTHALENE, 2-	3.9E+01	noncarcinogenic effects			3.9E+01	2.0E+02	NA
MOLYBDENUM	7.8E+01	noncarcinogenic effects			7.8E+01	3.9E+02	NA
NAPHTHALENE	2.8E+01	noncarcinogenic effects	4.2E+01		2.8E+01	1.4E+02	NA
NICKEL	3.1E+02	noncarcinogenic effects			3.1E+02	1.5E+03	NA
NITROBENZENE	5.6E+00	carcinogenic effects	5.6E+00		2.6E+01	1.3E+02	3.0E+03
NITROGLYCERIN	1.3E+00	noncarcinogenic effects	3.2E+01		1.3E+00	6.3E+00	NA
NITROTOLUENE, 2-	2.2E+00	carcinogenic effects	2.2E+00		1.2E+01	6.2E+01	NA
NITROTOLUENE, 3-	1.3E+00	noncarcinogenic effects			1.3E+00	6.3E+00	NA
NITROTOLUENE, 4-	3.4E+01	carcinogenic effects	3.4E+01		5.1E+01	2.5E+02	NA
PENTACHLOROPHENOL	1.0E+00	carcinogenic effects	1.0E+00		4.9E+01	2.5E+02	NA
PENTAERYTHRITOLTETRANITRATE (PETN)	2.5E+01	noncarcinogenic effects	1.4E+02		2.5E+01	1.3E+02	NA
PERCHLORATE	1.1E+01	noncarcinogenic effects			1.1E+01	5.5E+01	NA
PHENANTHRENE	4.6E+02	noncarcinogenic effects			4.6E+02	2.3E+03	NA
PHENOL	3.8E+03	noncarcinogenic effects			3.8E+03	1.9E+04	NA
POLYCHLORINATED BIPHENYLS (PCBs)	1.2E+00	noncarcinogenic effects	2.4E+00		1.2E+00	1.2E+00	NA
PROPICONAZOLE	1.6E+02	noncarcinogenic effects			1.6E+02	8.2E+02	NA
PYRENE	3.6E+02	noncarcinogenic effects			3.6E+02	1.8E+03	NA
SELENIUM	7.8E+01	noncarcinogenic effects			7.8E+01	3.9E+02	NA
SILVER	7.8E+01	noncarcinogenic effects			7.8E+01	3.9E+02	NA
SIMAZINE	4.5E+00	carcinogenic effects	4.5E+00		6.3E+01	3.2E+02	NA
STYRENE	8.7E+02	saturation limit			1.3E+03	6.4E+03	8.7E+02
TERBACIL	1.6E+02	noncarcinogenic effects			1.6E+02	8.2E+02	NA
tert-BUTYL ALCOHOL	9.9E+01	carcinogenic effects	9.9E+01				3.2E+05
TETRACHLOROETHANE, 1,1,1,2-	2.2E+00	carcinogenic effects	2.2E+00		1.2E+02	5.9E+02	6.8E+02
TETRACHLOROETHANE, 1,1,2,2-	6.5E-01	carcinogenic effects	6.5E-01		3.1E+02	1.6E+03	1.9E+03
TETRACHLOROETHYLENE	1.1E+00	carcinogenic effects	1.1E+00		1.7E+01	8.7E+01	1.7E+02
TETRACHLOROPHENOL, 2,3,4,6-	3.8E+02	noncarcinogenic effects			3.8E+02	1.9E+03	NA
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	7.7E+02	noncarcinogenic effects			7.7E+02	3.9E+03	NA
THALLIUM	7.8E-01	noncarcinogenic effects			7.8E-01	7.8E-01	NA
TOLUENE	8.2E+02	saturation limit			1.0E+03	5.0E+03	8.2E+02
TOXAPHENE	4.9E-01	carcinogenic effects	4.9E-01				NA
TPH (gasolines)	4.8E+02	noncarcinogenic effects			4.8E+02	4.8E+02	5.4E+03
TPH (middle distillates)	2.6E+02	noncarcinogenic effects			2.6E+02	2.6E+02	5.0E+02

TABLE I-1. DIRECT-EXPOSURE ACTION LEVELS
[1]UNRESTRICTED LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[2]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Mutagens (Risk = 10^{-6}) (mg/kg)	[3]Noncarcinogens (Final) (mg/kg)	[3]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
TPH (residual fuels)	9.4E+03	noncarcinogenic effects			9.4E+03	9.4E+03	NA
TRICHLOROBENZENE, 1,2,4-	8.2E+00	carcinogenic effects	8.2E+00		1.2E+01	6.2E+01	NA
TRICHLOROETHANE, 1,1,1-	6.4E+02	saturation limit			1.8E+03	8.8E+03	6.4E+02
TRICHLOROETHANE, 1,1,2-	3.2E-01	noncarcinogenic effects	1.2E+00		3.2E-01	1.6E+00	2.2E+03
TRICHLOROETHYLENE	8.9E-01	noncarcinogenic effects	-	9.4E-01	8.9E-01	4.4E+00	6.9E+02
TRICHLOROPHENOL, 2,4,5-	1.3E+03	noncarcinogenic effects			1.3E+03	6.3E+03	NA
TRICHLOROPHENOL, 2,4,6-	1.3E+01	noncarcinogenic effects	4.9E+01		1.3E+01	6.3E+01	NA
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.3E+02	noncarcinogenic effects			1.3E+02	6.3E+02	NA
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.0E+02	noncarcinogenic effects			1.0E+02	5.1E+02	NA
TRICHLOROPROPANE, 1,2,3-	1.6E-03	mutagenic effects	5.0E-03	1.6E-03	1.1E+00	5.3E+00	1.4E+03
TRICHLOROPROPENE, 1,2,3-	1.6E-01	noncarcinogenic effects			1.6E-01	7.9E-01	3.1E+02
TRIFLURALIN	9.0E+01	carcinogenic effects	9.0E+01		1.2E+02	5.9E+02	NA
TRINITROBENZENE, 1,3,5-	4.5E+02	noncarcinogenic effects			4.5E+02	2.2E+03	NA
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	3.1E+01	noncarcinogenic effects			3.1E+01	1.6E+02	NA
TRINITROTOLUENE, 2,4,6- (TNT)	7.3E+00	noncarcinogenic effects	2.1E+01		7.3E+00	3.6E+01	NA
VANADIUM	7.8E+01	noncarcinogenic effects			7.8E+01	3.9E+02	NA
VINYL CHLORIDE	5.9E-02	mutagenic effects	-	5.9E-02	1.5E+01	7.4E+01	3.9E+03
XYLENES	1.2E+02	noncarcinogenic effects			1.2E+02	6.2E+02	2.6E+02
ZINC	4.7E+03	noncarcinogenic effects			4.7E+03	2.3E+04	NA

Primary source: USEPA Regional Screening Levels (USEPA 2016), modified as noted below and described in Appendix 1, Section 3.2.

Notes:

1. Based on assumed residential exposure scenario. Considered adequate for residential housing, schools, medical facilities, day-care centers, parks and other sensitive uses.

2. Carcinogens: Default target excess cancer risk = 10^{-6} unless otherwise noted (see Section 3). Target ECR of 10^{-5} used for Technical Chlordane and PCBs. Target risk of 10^{-4} applied to aldrin, dieldrin, TEQ dioxins, hexavalent chromium and nonvolatile, carcinogenic PAHs action levels to reflect on higher confidence in noncancer toxicity factors and/or background and other factors.

3. Noncarcinogens: Final action level based on default target hazard quotient = 0.2 unless otherwise noted. TPH action levels based on HQ of 1.0 (see below footnote and Sections 3.2 and 6.0 in text). Action levels for Technical Chlordane based on HQ of 1.0. Action levels for aldrin and dieldrin (breakdown product of aldrin) based on HQ of 0.5. All chemicals - Action levels based on hazard quotient of 1.0 provided for reference.

4. Arsenic direct exposure soil action levels: refer to Update to Soil Action Levels for Inorganic Arsenic and Recommended Soil Management Practices, HEER office Technical Memorandum, October 2010 (HDOH 2010a).

5. TEQ dioxin action levels: Refer to *Update to Soil Action Levels for TEQ Dioxins and Recommended Soil Management Practices*, HEER office Technical Memorandum, June 2010 (HDOH 2010b).

See text for equations and assumptions used in models.

Final action level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects or action level for construction/trench workers if lower (see Table I-3). Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table H).

TPH:Total Petroleum Hydrocarbons. See Chapter 6 of Appendix 1for discussion of different TPH categories and development of action levels.

TPHmd saturation level set to 500 mg/kg vs model-derived 150 mg/kg to address low confidence in direct exposure, vapor emission model (see Chapter 6). Direct-exposure action levels for both TPHg and TPHmd set at 500 mg/kg to consider biodegradation.

Ethanol: Human health toxicity data not available. Environmental concerns driven by gross contamination/nuisance concerns.

Direct-exposure screening level for lead based on 50% of 2011 USEPA RSL of 400 mg/kg (see text, assumes target blood level of 5 ug/dl).

TABLE I-2. DIRECT-EXPOSURE ACTION LEVELS
COMMERCIAL/INDUSTRIAL LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
ACENAPHTHENE	7.1E+03	noncarcinogenic effects		7.1E+03	3.5E+04	NA
ACENAPHTHYLENE	2.7E+03	noncarcinogenic effects		2.7E+03	1.4E+04	NA
ACETONE	1.1E+05	saturation limit		1.4E+05	6.9E+05	1.1E+05
ALDRIN	5.6E+01	noncarcinogenic effects	9.3E+01	5.6E+01	1.1E+02	NA
AMETRYN	1.5E+03	noncarcinogenic effects		1.5E+03	7.4E+03	NA
AMINO,2- DINITROTOLUENE,4,6-	4.6E+02	noncarcinogenic effects		4.6E+02	2.3E+03	NA
AMINO,4- DINITROTOLUENE,2,6-	4.5E+02	noncarcinogenic effects		4.5E+02	2.3E+03	NA
ANTHRACENE	4.2E+04	noncarcinogenic effects		4.2E+04	2.1E+05	NA
ANTIMONY	9.3E+01	noncarcinogenic effects		9.3E+01	4.7E+02	NA
ARSENIC	9.5E+01	HDOH 2010	1.1E+02	3.1E+02	3.1E+02	NA
ATRAZINE	1.0E+01	carcinogenic effects	1.0E+01	5.7E+03	2.9E+04	NA
BARIUM	4.3E+03	trench/construction worker		4.3E+04	2.2E+05	NA
BENOMYL	8.2E+03	noncarcinogenic effects		8.2E+03	4.1E+04	NA
BENZENE	5.5E+00	carcinogenic effects	5.5E+00	9.1E+01	4.6E+02	1.9E+03
BENZO(a)ANTHRACENE	2.9E+01	carcinogenic effects	2.9E+01			NA
BENZO(a)PYRENE	2.9E+00	carcinogenic effects	2.9E+00			NA
BENZO(b)FLUORANTHENE	2.9E+01	carcinogenic effects	2.9E+01			NA
BENZO(g,h,i)PERYLENE	6.0E+03	noncarcinogenic effects		6.0E+03	3.0E+04	NA
BENZO(k)FLUORANTHENE	2.9E+02	carcinogenic effects	2.9E+02			NA
BERYLLIUM	1.5E+02	trench/construction worker	6.9E+03	4.6E+02	2.3E+03	NA
BIPHENYL, 1,1-	4.3E+01	noncarcinogenic effects	2.6E+02	4.3E+01	2.1E+02	NA
BIS(2-CHLOROETHYL)ETHER	1.1E+00	carcinogenic effects	1.1E+00			5.0E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	1.7E+01	carcinogenic effects	1.7E+01	2.1E+03	1.0E+04	7.9E+02
BIS(2-ETHYLHEXYL)PHTHALATE	1.6E+02	carcinogenic effects	1.6E+02	3.3E+03	1.6E+04	NA
BORON	4.7E+04	noncarcinogenic effects		4.7E+04	2.3E+05	NA
BROMODICHLOROMETHANE	1.4E+00	carcinogenic effects	1.4E+00	2.8E+02	1.4E+03	9.3E+02
BROMOFORM	9.1E+01	carcinogenic effects	9.1E+01	4.7E+03	2.3E+04	NA
BROMOMETHANE	6.5E+00	noncarcinogenic effects		6.5E+00	3.3E+01	3.6E+03
CADMIUM	7.4E+01	trench/construction worker	9.3E+03	2.0E+02	9.8E+02	NA
CARBON TETRACHLORIDE	3.1E+00	carcinogenic effects	3.1E+00	1.2E+02	6.2E+02	4.5E+02
CHLORDANE (TECHNICAL)	7.7E+01	carcinogenic effects	7.7E+01		4.6E+02	NA
CHLOROANILINE, p-	1.1E+01	carcinogenic effects	1.1E+01	6.6E+02	3.3E+03	NA
CHLOROBENZENE	2.9E+02	noncarcinogenic effects		2.9E+02	1.4E+03	7.6E+02
CHLOROETHANE	2.1E+03	saturation limit		1.3E+04	6.3E+04	2.1E+03
CHLOROFORM	1.5E+00	carcinogenic effects	1.5E+00	2.2E+02	1.1E+03	2.5E+03
CHLOROMETHANE	1.0E+02	noncarcinogenic effects		1.0E+02	5.1E+02	1.3E+03
CHLOROPHENOL, 2-	8.1E+02	noncarcinogenic effects		8.1E+02	4.0E+03	2.7E+04
CHROMIUM (Total)		not available				
CHROMIUM III	3.5E+05	noncarcinogenic effects		3.5E+05	1.8E+06	NA
CHROMIUM VI	4.8E+02	trench/construction worker	6.3E+02	7.0E+02	3.5E+03	NA
CHRYSENE	2.9E+03	carcinogenic effects	2.9E+03			NA
COBALT	4.0E+01	trench/construction worker	1.9E+03	6.9E+01	3.5E+02	NA
COPPER	9.3E+03	noncarcinogenic effects		9.3E+03	4.7E+04	NA
CYANIDE (Free)	3.1E+01	noncarcinogenic effects		3.1E+01	1.6E+02	NA

TABLE I-2. DIRECT-EXPOSURE ACTION LEVELS
COMMERCIAL/INDUSTRIAL LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	2.8E+01	carcinogenic effects	2.8E+01	6.6E+02	3.3E+03	NA
DALAPON	4.9E+03	noncarcinogenic effects		4.9E+03	2.5E+04	NA
DIBENZO(a,h)ANTHTRACENE	2.9E+00	carcinogenic effects	2.9E+00			NA
DIBROMO,1,2- CHLOROPROPANE,3-	7.0E-02	carcinogenic effects	7.0E-02	5.4E+00	2.7E+01	9.8E+02
DIBROMOCHLOROMETHANE	4.4E+00	carcinogenic effects	4.4E+00	5.3E+02	2.7E+03	NA
DIBROMOETHANE, 1,2-	1.7E-01	carcinogenic effects	1.7E-01	7.1E+01	3.5E+02	NA
DICHLOROBENZENE, 1,2-	3.8E+02	saturation limit		2.0E+03	1.0E+04	3.8E+02
DICHLOROBENZENE, 1,3-	6.0E+02	saturation limit		1.2E+03	6.2E+03	6.0E+02
DICHLOROBENZENE, 1,4-	1.2E+01	carcinogenic effects	1.2E+01	5.3E+03	2.7E+04	NA
DICHLOROBENZIDINE, 3,3-	5.1E+00	carcinogenic effects	5.1E+00			NA
DICHLORODIPHENYLDICHLOROETHANE (DDD)	9.6E+00	carcinogenic effects	9.6E+00			NA
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	9.3E+00	carcinogenic effects	9.3E+00			NA
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	8.5E+00	carcinogenic effects	8.5E+00	1.0E+02	5.2E+02	NA
DICHLOROETHANE, 1,1-	1.7E+01	carcinogenic effects	1.7E+01	1.5E+03	7.7E+03	1.7E+03
DICHLOROETHANE, 1,2-	2.2E+00	carcinogenic effects	2.2E+00	3.0E+01	1.5E+02	3.0E+03
DICHLOROETHYLENE, 1,1-	2.1E+02	noncarcinogenic effects		2.1E+02	1.1E+03	1.2E+03
DICHLOROETHYLENE, Cis 1,2-	1.8E+01	noncarcinogenic effects		1.8E+01	9.1E+01	2.4E+03
DICHLOROETHYLENE, Trans 1,2-	1.3E+02	noncarcinogenic effects		1.3E+02	6.5E+02	1.9E+03
DICHLOROPHENOL, 2,4-	4.9E+02	noncarcinogenic effects		4.9E+02	2.5E+03	NA
DICHLOROPHENOXYACETIC ACID (2,4-D)	1.9E+03	noncarcinogenic effects		1.9E+03	9.6E+03	NA
DICHLOROPROPANE, 1,2-	4.7E+00	carcinogenic effects	4.7E+00	1.4E+01	7.1E+01	1.4E+03
DICHLOROPROPENE, 1,3-	8.6E+00	carcinogenic effects	8.6E+00	6.6E+01	3.3E+02	1.6E+03
DIELDRIN	3.3E+01	carcinogenic effects	3.3E+01	3.3E+01	6.6E+01	NA
DIETHYLPHTHALATE	1.3E+05	noncarcinogenic effects		1.3E+05	6.6E+05	NA
DIMETHYLPHENOL, 2,4-	3.3E+03	noncarcinogenic effects		3.3E+03	1.6E+04	NA
DIMETHYLPHTHALATE	1.0E+06	maximum		1.6E+06	8.2E+06	NA
DINITROBENZENE, 1,3-	1.6E+01	noncarcinogenic effects		1.6E+01	8.2E+01	NA
DINITROPHENOL, 2,4-	3.3E+02	noncarcinogenic effects		3.3E+02	1.6E+03	NA
DINITROTOLUENE, 2,4- (2,4-DNT)	7.4E+00	carcinogenic effects	7.4E+00	3.3E+02	1.6E+03	NA
DINITROTOLUENE, 2,6- (2,6-DNT)	1.5E+00	carcinogenic effects	1.5E+00	4.9E+01	2.5E+02	NA
DIOXANE, 1,4-	2.5E+01	carcinogenic effects	2.5E+01	9.7E+02	4.8E+03	1.2E+05
DIOXINS (TEQ)	1.5E-03	HDOH 2010a				
DIURON	3.3E+02	noncarcinogenic effects		3.3E+02	1.6E+03	NA
ENDOSULFAN	1.4E+03	noncarcinogenic effects		1.4E+03	7.0E+03	NA
ENDRIN	4.9E+01	noncarcinogenic effects		4.9E+01	2.5E+02	NA
ETHANOL		not available				
ETHYLBENZENE	1.5E+02	trench/construction worker	2.8E+02	4.4E+03	2.2E+04	4.8E+02
FLUORANTHENE	6.0E+03	noncarcinogenic effects		6.0E+03	3.0E+04	NA
FLUORENE	5.3E+03	noncarcinogenic effects		5.3E+03	2.6E+04	NA
GLYPHOSATE	1.6E+04	noncarcinogenic effects		1.6E+04	8.2E+04	NA
HEPTACHLOR	6.3E-01	carcinogenic effects	6.3E-01	1.2E+02	5.8E+02	NA
HEPTACHLOR EPOXIDE	3.3E-01	carcinogenic effects	3.3E-01	3.0E+00	1.5E+01	NA
HEXACHLOROBENZENE	1.0E+00	carcinogenic effects	1.0E+00	1.9E+02	9.3E+02	NA
HEXACHLOROBUTADIENE	5.6E+00	carcinogenic effects	5.6E+00	2.3E+02	1.2E+03	NA

TABLE I-2. DIRECT-EXPOSURE ACTION LEVELS
COMMERCIAL/INDUSTRIAL LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	2.5E+00	carcinogenic effects	2.5E+00	6.0E+01	3.0E+02	NA
HEXACHLOROETHANE	8.7E+00	carcinogenic effects	8.7E+00	9.5E+01	4.8E+02	NA
HEXAZINONE	5.4E+03	noncarcinogenic effects		5.4E+03	2.7E+04	NA
INDENO(1,2,3-cd)PYRENE	2.9E+01	carcinogenic effects	2.9E+01			NA
ISOPHORONE	2.4E+03	carcinogenic effects	2.4E+03	3.3E+04	1.6E+05	NA
LEAD	8.0E+02	commercial/industrial exposure		8.0E+02		NA
MERCURY	7.0E+01	noncarcinogenic effects		7.0E+01	3.5E+02	NA
METHOXYCHLOR	8.2E+02	noncarcinogenic effects		8.2E+02	4.1E+03	NA
METHYL ETHYL KETONE	2.8E+04	saturation limit		4.1E+04	2.1E+05	2.8E+04
METHYL ISOBUTYL KETONE	3.4E+03	saturation limit		3.0E+04	1.5E+05	3.4E+03
METHYL MERCURY	2.3E+01	noncarcinogenic effects		2.3E+01	1.2E+02	NA
METHYL TERT BUTYL ETHER	2.2E+02	carcinogenic effects	2.2E+02	1.4E+04	7.0E+04	8.9E+03
METHYLENE CHLORIDE	6.6E+02	noncarcinogenic effects	1.1E+03	6.6E+02	3.3E+03	3.3E+03
METHYLNAPHTHALENE, 1-	2.7E+02	trench/construction worker	4.3E+02	6.3E+03	3.1E+04	NA
METHYLNAPHTHALENE, 2-	3.6E+02	noncarcinogenic effects		3.6E+02	1.8E+03	NA
MOLYBDENUM	1.2E+03	noncarcinogenic effects		1.2E+03	5.8E+03	NA
NAPHTHALENE	9.6E+01	trench/construction worker	1.8E+02	1.3E+02	6.4E+02	NA
NICKEL	7.5E+02	trench/construction worker		4.5E+03	2.2E+04	NA
NITROBENZENE	2.4E+01	carcinogenic effects	2.4E+01	2.7E+02	1.3E+03	3.0E+03
NITROGLYCERIN	1.6E+01	noncarcinogenic effects	1.4E+02	1.6E+01	8.2E+01	NA
NITROTOLUENE, 2-	1.0E+01	carcinogenic effects	1.0E+01	1.5E+02	7.3E+02	NA
NITROTOLUENE, 3-	1.6E+01	noncarcinogenic effects		1.6E+01	8.2E+01	NA
NITROTOLUENE, 4-	1.4E+02	carcinogenic effects	1.4E+02	6.6E+02	3.3E+03	NA
PENTACHLOROPHENOL	4.0E+00	carcinogenic effects	4.0E+00	5.7E+02	2.8E+03	NA
PENTAERYTHRITOLTETRANITRATE (PETN)	3.3E+02	noncarcinogenic effects	5.7E+02	3.3E+02	1.6E+03	NA
PERCHLORATE	1.6E+02	noncarcinogenic effects		1.6E+02	8.2E+02	NA
PHENANTHRENE	5.6E+03	noncarcinogenic effects		5.6E+03	2.8E+04	NA
PHENOL	4.9E+04	noncarcinogenic effects		4.9E+04	2.5E+05	NA
POLYCHLORINATED BIPHENYLS (PCBs)	9.8E+00	carcinogenic effects	9.8E+00	1.5E+01	1.5E+01	NA
PROPICONAZOLE	2.1E+03	noncarcinogenic effects		2.1E+03	1.1E+04	NA
PYRENE	4.4E+03	noncarcinogenic effects		4.4E+03	2.2E+04	NA
SELENIUM	1.2E+03	noncarcinogenic effects		1.2E+03	5.8E+03	NA
SILVER	1.2E+03	noncarcinogenic effects		1.2E+03	5.8E+03	NA
SIMAZINE	1.9E+01	carcinogenic effects	1.9E+01	8.2E+02	4.1E+03	NA
STYRENE	8.7E+02	saturation limit		7.5E+03	3.8E+04	8.7E+02
TERBACIL	2.1E+03	noncarcinogenic effects		2.1E+03	1.1E+04	NA
tert-BUTYL ALCOHOL	4.5E+02	carcinogenic effects	4.5E+02			3.2E+05
TETRACHLOROETHANE, 1,1,1,2-	9.6E+00	carcinogenic effects	9.6E+00	6.0E+02	3.0E+03	6.8E+02
TETRACHLOROETHANE, 1,1,2,2-	2.9E+00	carcinogenic effects	2.9E+00	4.7E+03	2.3E+04	1.9E+03
TETRACHLOROETHYLENE	5.0E+00	carcinogenic effects	5.0E+00	8.5E+01	4.2E+02	1.7E+02
TETRACHLOROPHENOL, 2,3,4,6-	4.9E+03	noncarcinogenic effects		4.9E+03	2.5E+04	NA
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	1.1E+04	noncarcinogenic effects		1.1E+04	5.7E+04	NA
THALLIUM	1.2E+01	noncarcinogenic effects		1.2E+01	1.2E+01	NA
TOLUENE	8.2E+02	saturation limit		9.8E+03	4.9E+04	8.2E+02

TABLE I-2. DIRECT-EXPOSURE ACTION LEVELS
COMMERCIAL/INDUSTRIAL LAND USE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-6}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
TOXAPHENE	2.1E+00	carcinogenic effects	2.1E+00			NA
TPH (gasolines)	2.4E+03	noncarcinogenic effects		2.4E+03	2.4E+03	5.4E+03
TPH (middle distillates)	5.0E+02	saturation limit		1.3E+03	1.3E+03	5.0E+02
TPH (residual fuels)	1.4E+05	noncarcinogenic effects		1.4E+05	1.4E+05	NA
TRICHLOROBENZENE, 1,2,4-	3.7E+01	carcinogenic effects	3.7E+01	5.5E+01	2.8E+02	NA
TRICHLOROETHANE, 1,1,1-	6.4E+02	saturation limit		7.7E+03	3.9E+04	6.4E+02
TRICHLOROETHANE, 1,1,2-	1.4E+00	noncarcinogenic effects	5.4E+00	1.4E+00	6.8E+00	2.2E+03
TRICHLOROETHYLENE	4.1E+00	noncarcinogenic effects	6.5E+00	4.1E+00	2.0E+01	6.9E+02
TRICHLOROPHENOL, 2,4,5-	1.6E+04	noncarcinogenic effects		1.6E+04	8.2E+04	NA
TRICHLOROPHENOL, 2,4,6-	1.6E+02	noncarcinogenic effects	2.1E+02	1.6E+02	8.2E+02	NA
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	1.6E+03	noncarcinogenic effects		1.6E+03	8.2E+03	NA
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	1.3E+03	noncarcinogenic effects		1.3E+03	6.6E+03	NA
TRICHLOROPROPANE, 1,2,3-	2.2E-02	carcinogenic effects	2.2E-02	4.5E+00	2.2E+01	1.4E+03
TRICHLOROPROPENE, 1,2,3-	6.7E-01	noncarcinogenic effects		6.7E-01	3.3E+00	3.1E+02
TRIFLURALIN	4.2E+02	carcinogenic effects	4.2E+02	1.8E+03	8.8E+03	NA
TRINITROBENZENE, 1,3,5-	6.5E+03	noncarcinogenic effects		6.5E+03	3.2E+04	NA
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	4.7E+02	noncarcinogenic effects		4.7E+02	2.3E+03	NA
TRINITROTOLUENE, 2,4,6- (TNT)	9.6E+01	carcinogenic effects	9.6E+01	1.0E+02	5.1E+02	NA
VANADIUM	6.6E+02	trench/construction worker		1.2E+03	5.8E+03	NA
VINYL CHLORIDE	1.8E+00	carcinogenic effects	1.8E+00	8.0E+01	4.0E+02	3.9E+03
XYLENES	2.6E+02	saturation limit		5.4E+02	2.7E+03	2.6E+02
ZINC	7.0E+04	noncarcinogenic effects		7.0E+04	3.5E+05	NA

Primary source: USEPA Regional Screening Levels (USEPA 2016), modified as noted below and described in Appendix 1, Section 3.2.

Notes:

1. Carcinogens: Default target excess cancer risk = 10^{-6} unless otherwise noted (see Section 3). Target ECR of 10^{-5} used for Technical Chlordane, PCBs and carcinogenic PAHs (see Section 3). Target risk of 10^{-4} applied to aldrin, dieldrin, TEQ dioxins and hexavalent chromium action levels to reflect on higher confidence in noncancer toxicity factors and/or background and other factors.

2. Noncarcinogens: Final action level based on default target hazard quotient = 0.2 unless noted. TPH action levels based on HQ of 1.0 (see Section 3.2 in text). Action levels for Technical Chlordane based on HQ of 1.0. Action levels for aldrin and dieldrin (breakdown product of aldrin) based on HQ of 0.5. Screening levels based on hazard quotient of 1.0 provided for reference.

3. Arsenic direct exposure soil action levels: refer to Update to Soil Action Levels for Inorganic Arsenic and Recommended Soil Management Practices, HEER office Technical Memorandum, October 2010 (HDOH 2010a).

4. TEQ dioxin action levels: Refer to Update to Soil Action Levels for TEQ Dioxins and Recommended Soil Management Practices, HEER office Technical Memorandum, June 2010 (HDOH 2010b).

See text for equations and assumptions used in models.

Final action level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects or action level for construction/trench workers if lower (see Table I-3). Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table H).

TPH:Total Petroleum Hydrocarbons. See Chapter 6 of Appendix 1for discussion of different TPH categories and development of action levels.

TPHmd saturation level set to 500 mg/kg vs model-derived 150 mg/kg to address low confidence in direct exposure, vapor emission model (see Chapter 6)

Ethanol: Human health toxicity data not available. Environmental concerns driven by gross contamination/nuisance concerns.

Direct-exposure screening level for lead from USEPA Regional Screening Levels (USEPA 2011).

TABLE I-3. DIRECT-EXPOSURE ACTION LEVELS
CONSTRUCTION/TRENCH WORKER EXPOSURE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-5}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
ACENAPHTHENE	1.3E+04	noncarcinogenic effects		1.3E+04	6.5E+04	NA
ACENAPHTHYLENE	4.5E+03	noncarcinogenic effects		4.5E+03	2.3E+04	NA
ACETONE	1.1E+05	saturation limit		2.6E+05	1.3E+06	1.1E+05
ALDRIN	1.2E+02	noncarcinogenic effects	7.0E+02	1.2E+02	2.4E+02	NA
AMETRYN	3.0E+03	noncarcinogenic effects		3.0E+03	1.5E+04	NA
AMINO,2- DINITROTOLUENE,4,6-	9.8E+02	noncarcinogenic effects		9.8E+02	4.9E+03	NA
AMINO,4- DINITROTOLUENE,2,6-	9.7E+02	noncarcinogenic effects		9.7E+02	4.8E+03	NA
ANTHRACENE	8.1E+04	noncarcinogenic effects		8.1E+04	4.1E+05	NA
ANTIMONY	2.0E+02	noncarcinogenic effects		2.0E+02	1.0E+03	NA
ARSENIC	1.3E+02	carcinogenic effects	1.3E+02	3.3E+02	3.3E+02	NA
ATRAZINE	7.2E+02	carcinogenic effects	7.2E+02	1.2E+04	5.8E+04	NA
BARIUM	4.3E+03	noncarcinogenic effects		4.3E+03	2.2E+04	NA
BENOMYL	1.7E+04	noncarcinogenic effects		1.7E+04	8.3E+04	NA
BENZENE	3.0E+01	carcinogenic effects	3.0E+01	1.4E+02	7.0E+02	1.9E+03
BENZO(a)ANTHRACENE	2.0E+02	carcinogenic effects	2.0E+02			NA
BENZO(a)PYRENE	2.0E+01	carcinogenic effects	2.0E+01			NA
BENZO(b)FLUORANTHENE	2.0E+02	carcinogenic effects	2.0E+02			NA
BENZO(g,h,i)PERYLENE	1.2E+04	noncarcinogenic effects		1.2E+04	6.0E+04	NA
BENZO(k)FLUORANTHENE	2.0E+03	carcinogenic effects	2.0E+03			NA
BERYLLIUM	1.5E+02	noncarcinogenic effects	1.9E+03	1.5E+02	7.6E+02	NA
BIPHENYL, 1,1-	6.2E+01	noncarcinogenic effects	1.7E+03	6.2E+01	3.1E+02	NA
BIS(2-CHLOROETHYL)ETHER	6.5E+00	carcinogenic effects	6.5E+00			5.0E+03
BIS(2-CHLORO-1-METHYLETHYL)ETHER	1.0E+02	carcinogenic effects	1.0E+02	3.3E+03	1.6E+04	7.9E+02
BIS(2-ETHYLHEXYL)PHTHALATE	6.6E+03	noncarcinogenic effects	1.2E+04	6.6E+03	3.3E+04	NA
BORON	6.5E+04	noncarcinogenic effects		6.5E+04	3.2E+05	NA
BROMODICHLOROMETHANE	7.4E+00	carcinogenic effects	7.4E+00	4.3E+02	2.1E+03	9.3E+02
BROMOFORM	5.2E+03	carcinogenic effects	5.2E+03	1.0E+04	5.1E+04	NA
BROMOMETHANE	9.8E+00	noncarcinogenic effects		9.8E+00	4.9E+01	3.6E+03
CADMIUM	7.4E+01	noncarcinogenic effects	2.5E+03	7.4E+01	3.7E+02	NA
CARBON TETRACHLORIDE	1.7E+01	carcinogenic effects	1.7E+01	1.9E+02	9.6E+02	4.5E+02
CHLORDANE (TECHNICAL)	5.6E+02	carcinogenic effects	5.6E+02	8.9E+02	8.9E+02	NA
CHLOROANILINE, p-	8.3E+02	carcinogenic effects	8.3E+02	1.3E+03	6.6E+03	NA
CHLOROBENZENE	4.3E+02	noncarcinogenic effects		4.3E+02	2.2E+03	7.6E+02
CHLOROETHANE	2.1E+03	saturation limit		1.9E+04	9.3E+04	2.1E+03
CHLOROFORM	8.0E+00	carcinogenic effects	8.0E+00	3.4E+02	1.7E+03	2.5E+03
CHLOROMETHANE	1.5E+02	noncarcinogenic effects		1.5E+02	7.6E+02	1.3E+03
CHLOROPHENOL, 2-	1.5E+03	noncarcinogenic effects		1.5E+03	7.6E+03	2.7E+04
CHROMIUM (Total)		not available				
CHROMIUM III	7.6E+05	noncarcinogenic effects		7.6E+05	3.8E+06	NA
CHROMIUM VI	4.8E+02	carcinogenic effects	4.8E+02	5.7E+02	2.8E+03	NA
CHRYSENE	2.0E+04	carcinogenic effects	2.0E+04			NA
COBALT	4.0E+01	noncarcinogenic effects	5.0E+02	4.0E+01	2.0E+02	NA
COPPER	2.0E+04	noncarcinogenic effects		2.0E+04	1.0E+05	NA
CYANIDE (Free)	5.0E+01	noncarcinogenic effects		5.0E+01	2.5E+02	NA
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	1.4E+03	noncarcinogenic effects	2.1E+03	1.4E+03	7.0E+03	NA

TABLE I-3. DIRECT-EXPOSURE ACTION LEVELS
CONSTRUCTION/TRENCH WORKER EXPOSURE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-5}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
DALAPON	9.9E+03	noncarcinogenic effects		9.9E+03	5.0E+04	NA
DIBENZO(a,h)ANTHTRACENE	2.0E+01	carcinogenic effects	2.0E+01			NA
DIBROMO,1,2- CHLOROPROPANE,3-	3.7E-01	carcinogenic effects	3.7E-01	8.3E+00	4.1E+01	9.8E+02
DIBROMOCHLOROMETHANE	2.4E+01	carcinogenic effects	2.4E+01	8.2E+02	4.1E+03	NA
DIBROMOETHANE, 1,2-	9.3E-01	carcinogenic effects	9.3E-01	1.1E+02	5.3E+02	NA
DICHLOROBENZENE, 1,2-	3.8E+02	saturation limit		3.1E+03	1.5E+04	3.8E+02
DICHLOROBENZENE, 1,3-	6.0E+02	saturation limit		2.0E+03	9.8E+03	6.0E+02
DICHLOROBENZENE, 1,4-	6.6E+01	carcinogenic effects	6.6E+01	8.8E+03	4.4E+04	NA
DICHLOROBENZIDINE, 3,3-	3.6E+02	carcinogenic effects	3.6E+02			NA
DICHLORODIPHENYLDICHLOROETHANE (DDD)	6.8E+02	carcinogenic effects	6.8E+02			NA
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	7.0E+02	carcinogenic effects	7.0E+02			NA
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	2.2E+02	noncarcinogenic effects	6.3E+02	2.2E+02	1.1E+03	NA
DICHLOROETHANE, 1,1-	9.0E+01	carcinogenic effects	9.0E+01	2.3E+03	1.1E+04	1.7E+03
DICHLOROETHANE, 1,2-	1.2E+01	carcinogenic effects	1.2E+01	4.5E+01	2.2E+02	3.0E+03
DICHLOROETHYLENE, 1,1-	3.2E+02	noncarcinogenic effects		3.2E+02	1.6E+03	1.2E+03
DICHLOROETHYLENE, Cis 1,2-	2.7E+01	noncarcinogenic effects		2.7E+01	1.4E+02	2.4E+03
DICHLOROETHYLENE, Trans 1,2-	1.9E+02	noncarcinogenic effects		1.9E+02	9.7E+02	1.9E+03
DICHLOROPHENOL, 2,4-	9.9E+02	noncarcinogenic effects		9.9E+02	5.0E+03	NA
DICHLOROPHENOXYACETIC ACID (2,4-D)	4.0E+03	noncarcinogenic effects		4.0E+03	2.0E+04	NA
DICHLOROPROPANE, 1,2-	2.1E+01	noncarcinogenic effects	2.5E+01	2.1E+01	1.1E+02	1.4E+03
DICHLOROPROPENE, 1,3-	5.0E+01	carcinogenic effects	5.0E+01	9.8E+01	4.9E+02	1.6E+03
DIELDRIN	6.6E+01	noncarcinogenic effects	2.3E+02	6.6E+01	1.3E+02	NA
DIETHYLPHTHALATE	2.6E+05	noncarcinogenic effects		2.6E+05	1.3E+06	NA
DIMETHYLPHENOL, 2,4-	6.6E+03	noncarcinogenic effects		6.6E+03	3.3E+04	NA
DIMETHYLPHTHALATE	1.0E+06	maximum		3.3E+06	1.7E+07	NA
DINITROBENZENE, 1,3-	3.3E+01	noncarcinogenic effects		3.3E+01	1.7E+02	NA
DINITROPHENOL, 2,4-	6.6E+02	noncarcinogenic effects		6.6E+02	3.3E+03	NA
DINITROTOLUENE, 2,4- (2,4-DNT)	5.2E+02	carcinogenic effects	5.2E+02	6.6E+02	3.3E+03	NA
DINITROTOLUENE, 2,6- (2,6-DNT)	1.0E+02	noncarcinogenic effects	1.1E+02	1.0E+02	5.0E+02	NA
DIOXANE, 1,4-	1.5E+03	noncarcinogenic effects	1.7E+03	1.5E+03	7.5E+03	1.2E+05
DIOXINS (TEQ)	1.5E-03	HDOH 2010a	1.6E-02			
DIURON	6.6E+02	noncarcinogenic effects		6.6E+02	3.3E+03	NA
ENDOSULFAN	3.0E+03	noncarcinogenic effects		3.0E+03	1.5E+04	NA
ENDRIN	9.9E+01	noncarcinogenic effects		9.9E+01	5.0E+02	NA
ETHANOL	1.5E-03	commercial/industrial exposure				
ETHYLBENZENE	1.5E+02	carcinogenic effects	1.5E+02	6.9E+03	3.5E+04	4.8E+02
FLUORANTHENE	1.2E+04	noncarcinogenic effects		1.2E+04	6.0E+04	NA
FLUORENE	1.0E+04	noncarcinogenic effects		1.0E+04	5.0E+04	NA
GLYPHOSATE	3.3E+04	noncarcinogenic effects		3.3E+04	1.7E+05	NA
HEPTACHLOR	4.6E+01	carcinogenic effects	4.6E+01	2.5E+02	1.3E+03	NA
HEPTACHLOR EPOXIDE	6.6E+00	noncarcinogenic effects	2.4E+01	6.6E+00	3.3E+01	NA
HEXACHLOROBENZENE	6.2E+01	carcinogenic effects	6.2E+01	4.0E+02	2.0E+03	NA
HEXACHLOROBUTADIENE	3.1E+02	carcinogenic effects	3.1E+02	5.1E+02	2.5E+03	NA
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	1.3E+02	noncarcinogenic effects	1.9E+02	1.3E+02	6.3E+02	NA
HEXACHLOROETHANE	1.7E+02	noncarcinogenic effects	4.7E+02	1.7E+02	8.7E+02	NA

TABLE I-3. DIRECT-EXPOSURE ACTION LEVELS
CONSTRUCTION/TRENCH WORKER EXPOSURE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-5}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
HEXAZINONE	1.1E+04	noncarcinogenic effects		1.1E+04	5.5E+04	NA
INDENO(1,2,3-cd)PYRENE	2.0E+02	carcinogenic effects	2.0E+02			NA
ISOPHORONE	6.6E+04	noncarcinogenic effects	1.7E+05	6.6E+04	3.3E+05	NA
LEAD	8.0E+02	commercial/industrial exposure				
MERCURY	1.4E+02	noncarcinogenic effects		1.4E+02	7.2E+02	NA
METHOXYCHLOR	1.7E+03	noncarcinogenic effects		1.7E+03	8.3E+03	NA
METHYL ETHYL KETONE	2.8E+04	saturation limit		6.7E+04	3.4E+05	2.8E+04
METHYL ISOBUTYL KETONE	3.4E+03	saturation limit		4.5E+04	2.2E+05	3.4E+03
METHYL MERCURY	5.1E+01	noncarcinogenic effects		5.1E+01	2.5E+02	NA
METHYL TERT BUTYL ETHER	1.2E+03	carcinogenic effects	1.2E+03	2.1E+04	1.0E+05	8.9E+03
METHYLENE CHLORIDE	1.2E+03	noncarcinogenic effects	7.0E+03	1.2E+03	5.8E+03	3.3E+03
METHYLNAPHTHALENE, 1-	2.7E+02	carcinogenic effects	2.7E+02	1.1E+04	5.5E+04	NA
METHYLNAPHTHALENE, 2-	6.3E+02	noncarcinogenic effects		6.3E+02	3.1E+03	NA
MOLYBDENUM	2.5E+03	noncarcinogenic effects		2.5E+03	1.3E+04	NA
NAPHTHALENE	9.6E+01	carcinogenic effects	9.6E+01	1.9E+02	9.5E+02	NA
NICKEL	7.5E+02	noncarcinogenic effects		7.5E+02	3.8E+03	NA
NITROBENZENE	1.3E+02	carcinogenic effects	1.3E+02	4.8E+02	2.4E+03	3.0E+03
NITROGLYCERIN	3.3E+01	noncarcinogenic effects	9.7E+03	3.3E+01	1.7E+02	NA
NITROTOLUENE, 2-	6.9E+01	carcinogenic effects	6.9E+01	2.7E+02	1.4E+03	NA
NITROTOLUENE, 3-	3.3E+01	noncarcinogenic effects		3.3E+01	1.6E+02	NA
NITROTOLUENE, 4-	1.3E+03	noncarcinogenic effects	1.0E+04	1.3E+03	6.6E+03	NA
PENTACHLOROPHENOL	2.7E+02	carcinogenic effects	2.7E+02	1.1E+03	5.5E+03	NA
PENTAERYTHRITOLTETRANITRATE (PETN)	6.6E+02	noncarcinogenic effects	4.1E+04	6.6E+02	3.3E+03	NA
PERCHLORATE	3.5E+02	noncarcinogenic effects		3.5E+02	1.8E+03	NA
PHENANTHRENE	1.1E+04	noncarcinogenic effects		1.1E+04	5.3E+04	NA
PHENOL	9.4E+04	noncarcinogenic effects		9.4E+04	4.7E+05	NA
POLYCHLORINATED BIPHENYLS (PCBs)	2.9E+01	noncarcinogenic effects	6.7E+01	2.9E+01	2.9E+01	NA
PROPICONAZOLE	4.3E+03	noncarcinogenic effects		4.3E+03	2.2E+04	NA
PYRENE	8.7E+03	noncarcinogenic effects		8.7E+03	4.4E+04	NA
SELENIUM	2.5E+03	noncarcinogenic effects		2.5E+03	1.2E+04	NA
SILVER	2.5E+03	noncarcinogenic effects		2.5E+03	1.3E+04	NA
SIMAZINE	1.4E+03	carcinogenic effects	1.4E+03	1.7E+03	8.3E+03	NA
STYRENE	8.7E+02	saturation limit		1.2E+04	5.9E+04	8.7E+02
TERBACIL	4.3E+03	noncarcinogenic effects		4.3E+03	2.2E+04	NA
tert-BUTYL ALCOHOL	2.7E+03	carcinogenic effects	2.7E+03			3.2E+05
TETRACHLOROETHANE, 1,1,1,2-	5.2E+01	carcinogenic effects	5.2E+01	9.2E+02	4.6E+03	6.8E+02
TETRACHLOROETHANE, 1,1,2,2-	1.6E+01	carcinogenic effects	1.6E+01	1.0E+04	5.1E+04	1.9E+03
TETRACHLOROETHYLENE	2.7E+01	carcinogenic effects	2.7E+01	1.3E+02	6.4E+02	1.7E+02
TETRACHLOROPHENOL, 2,3,4,6-	9.9E+03	noncarcinogenic effects		9.9E+03	5.0E+04	NA
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	2.5E+04	noncarcinogenic effects		2.5E+04	1.2E+05	NA
THALLIUM	2.5E+01	noncarcinogenic effects		2.5E+01	2.5E+01	NA
TOLUENE	8.2E+02	saturation limit		1.7E+04	8.7E+04	8.2E+02
TOXAPHENE	1.5E+02	carcinogenic effects	1.5E+02			NA
TPH (gasolines)	3.7E+03	noncarcinogenic effects		3.7E+03	3.7E+03	5.4E+03
TPH (middle distillates)	5.0E+02	saturation limit		1.9E+03	1.9E+03	5.0E+02

TABLE I-3. DIRECT-EXPOSURE ACTION LEVELS
CONSTRUCTION/TRENCH WORKER EXPOSURE SCENARIO

CHEMICAL	Final Action Level (mg/kg)	Basis	[1]Carcinogens (Risk = 10^{-5}) (mg/kg)	[2]Noncarcinogens (Final) (mg/kg)	[2]Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
TPH (residual fuels)	3.0E+05	noncarcinogenic effects		3.0E+05	3.0E+05	NA
TRICHLOROBENZENE, 1,2,4-	8.2E+01	noncarcinogenic effects	2.2E+02	8.2E+01	4.1E+02	NA
TRICHLOROETHANE, 1,1,1-	6.4E+02	saturation limit		1.2E+04	5.8E+04	6.4E+02
TRICHLOROETHANE, 1,1,2-	2.0E+00	noncarcinogenic effects	3.0E+01	2.0E+00	1.0E+01	2.2E+03
TRICHLOROETHYLENE	6.1E+00	noncarcinogenic effects	3.6E+01	6.1E+00	3.0E+01	6.9E+02
TRICHLOROPHENOL, 2,4,5-	3.3E+04	noncarcinogenic effects		3.3E+04	1.6E+05	NA
TRICHLOROPHENOL, 2,4,6-	3.3E+02	noncarcinogenic effects	1.5E+04	3.3E+02	1.7E+03	NA
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	3.3E+03	noncarcinogenic effects		3.3E+03	1.7E+04	NA
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	2.6E+03	noncarcinogenic effects		2.6E+03	1.3E+04	NA
TRICHLOROPROPANE, 1,2,3-	1.3E-01	carcinogenic effects	1.3E-01	6.7E+00	3.3E+01	1.4E+03
TRICHLOROPROPENE, 1,2,3-	9.9E-01	noncarcinogenic effects		9.9E-01	5.0E+00	3.1E+02
TRIFLURALIN	3.8E+03	noncarcinogenic effects	3.3E+04	3.8E+03	1.9E+04	NA
TRINITROBENZENE, 1,3,5-	1.4E+04	noncarcinogenic effects		1.4E+04	6.9E+04	NA
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	1.0E+03	noncarcinogenic effects		1.0E+03	5.0E+03	NA
TRINITROTOLUENE, 2,4,6- (TNT)	2.2E+02	noncarcinogenic effects	7.2E+03	2.2E+02	1.1E+03	NA
VANADIUM	6.6E+02	noncarcinogenic effects		6.6E+02	3.3E+03	NA
VINYL CHLORIDE	1.1E+01	carcinogenic effects	1.1E+01	1.2E+02	6.2E+02	3.9E+03
XYLENES	2.6E+02	saturation limit		8.0E+02	4.0E+03	2.6E+02
ZINC	1.5E+05	noncarcinogenic effects		1.5E+05	7.6E+05	NA

Primary source: USEPA Regional Screening Levels (USEPA 2016), modified as noted below and described in Appendix 1, Section 3.2.

1. Carcinogens: Default t+A6arget excess cancer risk = 10^{-5}. Target excess cancer risk of 10^{-6} used for volatile contaminants that are carcinogens. Target risk of 10^{-4} applied to aldrin, dieldrin, TEQ dioxins and hexavalent chromium action levels to reflect on higher confidence in noncancer toxicity factors and/or background and other factors.

2. Noncarcinogens: Final action level based on default target hazard quotient = 0.2 unless noted. TPH action levels based on HQ of 1.0 (see Section 3.2 in text). Action levels for Technical Chlordane based on HQ of 1.0. Action levels for aldrin and dieldrin (breakdown product of aldrin) based on HQ of 0.5. Screening levels based on hazard quotient of 1.0 provided for reference.

3. Arsenic direct exposure soil action levels: refer to Update to Soil Action Levels for Inorganic Arsenic and Recommended Soil Management Practices, HEER office Technical Memorandum, October 2010 (HDOH 2010a).

Notes:

See text for equations and assumptions used in models.

Final action level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects. Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Action levels for volatile chemicals may not fully consider increased vapor emissions during excavation of contaminated soil or work in trenches with poor air flow. Include actions to minimize worker exposure to VOCs and other contaminants that exceed action levels for commercial/industrial workers in Table I-2 in a worker Health and Safety Plan (e.g., PPE, good hygene, etc.).

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table H).

TPH:Total Petroleum Hydrocarbons. See Chapter 6 of Appendix 1for discussion of different TPH categories and development of action levels.

TPHmd saturation level set to 500 mg/kg vs model-derived 150 mg/kg to address low confidence in direct exposure, vapor emission model (see Chapter 6)

Ethanol: Human health toxicity data not available. Environmental concerns driven by gross contamination/nuisance concerns.

Direct-exposure screening level for lead based on USEPA Regional Screening Levels for commercial/industrial exposure scenarios (USEPA 2011).

TABLE J. TARGET ORGANS AND CHRONIC HEALTH EFFECTS

(For general reference only. May not be adequately comprehensive for some chemicals. Some noted effects may be insignificant. Refer to original documents for additional information.)

CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
ACENAPHTHENE	D		4,5						3					3
ACENAPHTHYLENE	D							4,5	3					3
ACETONE	D		4,5					2		4,5				
ALDRIN	B2		5								2			
AMETRYN	D		5											
AMINO,2- DINITROTOLUENE,4,6-	D		2,6				2,3	2,6				6		2,3
AMINO,4- DINITROTOLUENE,2,6-	D		2,6				2,3	2,6				6		2,3
ANTHRACENE	D								3					3
ANTIMONY	D			3			2,3	4,6				3	1,2,3	
ARSENIC	A		2,3,5	1,3	1,2,3			2,3,5			1,2,3			1,2,3,5
ATRAZINE	C		2	5,7	3,4,5					2		7		2
BARIUM	D			3				4		5		4		
BENOMYL	C				5									
BENZENE	A		2		1,3			1,2,3	2		1			
BENZO(a)ANTHRACENE	B2	M							3					3
BENZO(a)PYRENE	B2	M							3			2		3
BENZO(b)FLUORANTHENE	B2	M							3					3
BENZO(g,h,i)PERYLENE	D		4,5					4,5	3	4,5				3
BENZO(k)FLUORANTHENE	B2	M							3					3
BERYLLIUM	B1		1,5						1				1,2,3,5	2
BIPHENYL, 1,1-	D		2							5	2			
BIS(2-CHLOROETHYL)ETHER	B2										3	3		
BIS(2-CHLORO-1-METHYLETHYL)ETHER	B2							5						
BIS(2-ETHYLHEXYL)PHTHALATE	?		6,7									7		
BORON	D											3,5	4	
BROMODICHLOROMETHANE	B2		3							3,5				
BROMOFORM	B2		2,3,5							3	2,3			
BROMOMETHANE	D		1,2,4,5	2			1			1,2,3	2,3		2,3,4,5	
CADMIUM	B1/D									1,2,3,4,5			1,2,3	
CARBON TETRACHLORIDE	B2		1,3,5		1					3	1			
CHLORDANE (TECHNICAL)	B2		2,3,5						2,4		3			
CHLOROANILINE, p-	?		2,5						4	2				2
CHLOROBENZENE	D		1,2,4,5					2		1,2,3,4	2	1		

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CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
CHLOROETHANE	B		1		1,3									
CHLOROFORM	B2		1,2,3,5		1					1,2,3				
CHLOROMETHANE	C/D				3						2	2,3		
CHLOROPHENOL, 2-	D		1,3		1							1,4,5		
CHROMIUM (Total)	-													
CHROMIUM III	D							1					1	2
CHROMIUM VI	A	M						1				1	1,5	
CHRYSENE	B2	M							3					3
COBALT	?			2									2	2
COPPER	D		7										1,3	2
CYANIDE (Free)	D			1,3		1,3,5		3			1,4,5		3	
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	C		3		3					3				
DALAPON	D									2,5,7				
DIBENZO(a,h)ANTHTRACENE	B2	M							3					2,3
DIBROMO-3-CHLOROPROPANE, 1,2-	B2	M	1		1					2		1,2,3,4,5	1	
DIBROMOCHLOROMETHANE	C		5											
DIBROMOETHANE, 1,2-	B2				3							3	1,2	
DICHLOROBENZENE, 1,2-	D		2							2				2
DICHLOROBENZENE, 1,3-	D		2							2				
DICHLOROBENZENE, 1,4-	C		1,2,5					2		1,2	1,	5	1	
DICHLOROBENZIDINE, 3,3-	B2		2											
DICHLORODIPHENYLDICHLOROETHANE (DDD)	B2													
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	B2													
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	B2		2,3,5								2	2		
DICHLOROETHANE, 1,1-	C		2							2,3,4,6				
DICHLOROETHANE, 1,2-	B2		1,											
DICHLOROETHYLENE, 1,1-	C/D		1,2,3,4,5							2	3		3	
DICHLOROETHYLENE, Cis 1,2-	D		3					3,4,6						
DICHLOROETHYLENE, Trans 1,2-	D		3					4,5					3	
DICHLOROPHENOL, 2,4-	E								4					
DICHLOROPHENOXYACETIC ACID (2,4-D)	D		5,7			7		5		5,7				
DICHLOROPROPANE, 1,2-	B2		2					2					4	
DICHLOROPROPENE, 1,3-	B2		5										3	

TABLE J. TARGET ORGANS AND CHRONIC HEALTH EFFECTS

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CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
DIELDRIN	B2		5								2			
DIETHYLPHTHALATE	D				5							3		
DIMETHYLPHENOL, 2,4-	?							4,5			4,5			
DIMETHYLPHTHALATE	D													
DINITROBENZENE, 1,3-	D		2		2		2	2	5		2	2		
DINITROPHENOL, 2,4-	?						2,5				2			
DINITROTOLUENE, 2,4- (2,4-DNT)	D		5,6	3				2,3,5,6			3,5,6	4,6		
DINITROTOLUENE, 2,6- (2,6-DNT)	D		6	3	2			2,3,6			3	2,6		
DIOXANE, 1,4-	B2		1	1						1				
DIOXIN (2,3,7,8-TCDD)	B1?		1,3		1,3	1,3		1	3			1,3	1,3	3
DIURON	D							5						
ENDOSULFAN	?		3		3,5			5	3	3,4,5	3,5	3		
ENDRIN	D		4,5		3					5	4			
ETHANOL	D													
ETHYLBENZENE	D		1,4,5		1,3,5	1				1,4,5	2	2		2
FLUORANTHENE	D		4,5					4,5	3	4,5				3
FLUORENE	D							4,5	3					3
GLYPHOSATE	D									5,7		7		
HEPTACHLOR	B2		5								6			
HEPTACHLOR EPOXIDE	B2		5								6			
HEXACHLOROBENZENE	B2		1,2,3,5			3		3	3	3	2,3	2		
HEXACHLOROBUTADIENE	C		3							3				2
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	B2		1							1,2,5				
HEXACHLOROETHANE	C		2,3							2,3,5				
HEXAZINONE	D				5									
INDENO(1,2,3-cd)PYRENE	B2	M							3					3
ISOPHORONE	C		1		1									
LEAD	B2		2,6	6	2,6			2,6	2,6	2,6	2,6	6		
MERCURY	D				3				1	1,2	1,2,4,5			
METHOXYCHLOR	D		2		5					2	2	2,4,5		
METHYL ETHYL KETONE	D				5							1,2		
METHYL ISOBUTYL KETONE	D										6			
METHYL MERCURY	C				5						1,5			

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CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
METHYL TERT BUTYL ETHER	?		1,5				1			1,5				
METHYLENE CHLORIDE	B2	M	2,5	1						2	1			
METHYLNAPHTHALENE, 1-	C							4,5	3					3
METHYLNAPHTHALENE, 2-	D							4,5	3					3
MOLYBDENUM	D							5						
NAPHTHALENE	C						2	2	3				1,5	3
NICKEL	A/D		1,5					1		5			1,2	2
NITROBENZENE	D		1,2,3,4,5,6		2	4,5,6		2,3,4,5,6		4,5,6	1,6		2	6
NITROGLYCERIN	?													
NITROTOLUENE, 2-	?		2					2				2		
NITROTOLUENE, 3-	D							2						
NITROTOLUENE, 4-	?		2					2				2		
PENTACHLOROPHENOL	B2		1,2,3,5		1,3			3	3	2,5	2,3	1	2,3	
PENTAERYTHRITOLTETRANITRATE (PETN)	?													
PERCHLORATE	D					7		2						
PHENANTHRENE	D							4,5	3					3
PHENOL	D		1,2		3,5			1		1,2	1	4	1	
POLYCHLORINATED BIPHENYLS (PCBs)	B2		1,2,3		1,3	3	5	3	1,3,5			1,2,3		3
PROPICONAZOLE	D		5											
PYRENE	D								3	4,5				
SELENIUM	D		1,2,5	1				5			1		1,2	2,3,5
SILVER	D													2,3,5
SIMAZINE	?				4,5			5,7						2
STYRENE	C		3,4,5					4,5			1,2,4,5		2	2
TERBACIL	D		5			5								
tert-BUTYL ALCOHOL	?													
TETRACHLOROETHANE, 1,1,1,2-	C		5							5				
TETRACHLOROETHANE, 1,1,2,2-	C		2,3								2,3			
TETRACHLOROETHYLENE	C		1,2,5							1,2				
TETRACHLOROPHENOL, 2,3,4,6-	D		1		1							1		
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	D													
THALLIUM	D		2	2			2	5			2,3	2,3		2
TOLUENE	D		4,5		1,3					4,5	1,2,5	2	1,5	

TABLE J. TARGET ORGANS AND CHRONIC HEALTH EFFECTS

(For general reference only. May not be adequately comprehensive for some chemicals. Some noted effects may be insignificant. Refer to original documents for additional information.)

CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
TOXAPHENE	B2		3			3			3	3				
TPH (gasolines)	D		8					8		8	8			
TPH (middle distillates)	D		8					8		8	8			
TPH (residual fuels)	D		8					8		8	8			
TRICHLOROBENZENE, 1,2,4-	D					4,5								
TRICHLOROETHANE, 1,1,1-	D		2,6	7							1			
TRICHLOROETHANE, 1,1,2-	C		5					6	7					2
TRICHLOROETHYLENE	B2	M	2,3,6		3,6		1	3	6	2,3,6	1,2,3			
TRICHLOROPHENOL, 2,4,5-	D		1,2,4,5		1					2,4,5		1		
TRICHLOROPHENOL, 2,4,6-	B2		2											
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	D				2					5		2,5		
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	D		4,5,7											
TRICHLOROPROPANE, 1,2,3-	A2	M	3					3,5		3			3	
TRICHLOROPROPENE, 1,2,3-	D													
TRIFLURALIN	C		5					5						2
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	D		2					2		2			2	2
TRINITROTOLUENE, 1,3,5-	?													
TRINITROTOLUENE, 2,4,6- (TNT)	C		2,5,6				2,3	2,6				6		2,3

TABLE J. TARGET ORGANS AND CHRONIC HEALTH EFFECTS
(For general reference only. May not be adequately comprehensive for some chemicals. Some noted effects may be insignificant. Refer to original documents for additional information.)

CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
VANADIUM	D		3							3			2,3	
VINYL CHLORIDE	A	M	1,2,3,5		1,3			2,3	3		3	1,3		2
XYLENES	D										1,2,3,4,5		1	
ZINC	D			1		3		1,3,4,5					1	

Notes:

a. Carcinogen type from RWQCBCV 2007; ORNL 2001 (see classification below).

b. Chemicals classified as mutagenic (M) in USEPA Regional Screening Levels guidance (USEPA 2011).

c. Includes gastro-intestinal tract, liver, spleen, gall bladder, etc.

d. Includes skin sensitization but not general dermatitis or defatting of skin.

Carcinogen Classification

A: Human carcinogen

B: Probable human carcinogen (B1: limited human evidence; B2 Sufficient evidence in animals and inadequate or no evidence in humans)

C: Possible human carcinogen

D: Not classifiable as to human carcinogenicity

E: Evidence of noncarcinogenicity for humans

NA: Carcinogen classification information not available

References:

1. CalEPA, 2005, Consolidated Table of Chronic Reference Exposure Levels: California Environmental Protection Agency, Office of Environmental Health Hazard Assessment/Air Resources Board, April http://www.arb.ca.gov/toxics/healthval/healthval.htm

2. CDC, 2007, International Chemical Safety Cards: International Programme on Chemical Safety: United Nations Environment Program, International Labour Office and World Health Organization (accessed December 2007); published through US Department of Health and Human Services, Centers for Disease Control and Prevention, http://www.cdc.gov/niosh/ipcs/icstart.html

3. ATSDR, 2007, ToxFAQs™: Agency for Toxic Substances and Disease Registry (accessed December 2007), http://www.atsdr.cdc.gov/toxfaq.html

4. Illinois, 2001, Tiered Approach to Corrective Action Objectives (TACO): Illinois Environmental Protection Agency, Title 35, Subtitle G, Chapter I, Subchapter f, Part 742, Appendix A, Table E, Similar-A Chemicals (accessed December 2007), http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp

5. USEPA, 2007, IRIS: U.S. Environmental Protection Agency, IRIS Database (accessed December 2007); (Critical effect used for derivation of USEPA RfD as presented in IRIS database; may not be in of all potentially significant health effects), http://www.epa.gov/iris/subst/index.html

6. ORNL, 2007, Risk Assessment Information System (RAIS), Toxicity Profiles: Oak Ridge National Laboratory/U.S. Department of Energy (accessed December 2007), RAGs A Format, especially Critic Effect used for derivation of RfDs, http://risk.lsd.ornl.gov/tox/rap_toxp.shtml

7. USEPA National Primary Drinking Water Standards (March 2001): U.S. Environmental Protection Agency, Office of Water, EPA 816-F-01-007, http://www.epa.gov/safewater/consumer/pdf/mcl.pdf (se

TABLE J. TARGET ORGANS AND CHRONIC HEALTH EFFECTS
(For general reference only. May not be adequately comprehensive for some chemicals. Some noted effects may be insignificant. Refer to original documents for additional information.)

CHEMICAL PARAMETER	Target Organs And Health Effects													
	[a]Carcinogen	[b]Mutagen	[c]Alimentary Tract	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	[d]Skin
8. TPH whole product toxicity based review of TPH Working Group petroleum carbon fraction guidance (TPHWG 1998, Volume 4) and Massachusetts DEP VPH/EPH guidance (MADEP 2002a). For additional online references, see also: Hazardous Substances (On-line) Database: U.S. National Library of Medicine, Toxicology Data Network, http://toxnet.nlm.nih.gov.														

Other
= Fluorene
No data, TNT data shown
No data, TNT data shown
No chronic toxicity factors.
No chronic toxicity factors.
No chronic toxicity factors.
= Fluoranthene
No chronic toxicity factors.
No chronic toxicity factors.
No chronic toxicity factors.
bone loss (1,3)

Other
No chronic toxicity factors.
hearing (2)
No chronic toxicity factors.
No chronic toxicity factors.
No chronic toxicity factors.

Other
Information not available
No chronic toxicity factors.
bones (3)
No chronic toxicity factors.

Other
= Fluorene
= Fluorene
Information not available
Information not available
= Fluorene
Selenosis (3,5)
No chronic toxicity factors.

Other
Decreased body weight
Decreased body weight
Decreased body weight
Information not available
Information not available

Other
No chronic toxicity factors.

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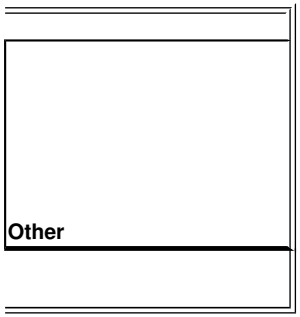
Other

TABLE K. [1]NATURAL BACKGROUND CONCENTRATIONS OF METALS IN SOIL

CHEMICAL PARAMETER	Range (mg/kg)	[2]Upper Bound (mg/kg)	[3]Background Threshold Value (mg/kg)	[4]Selected Action Level (mg/kg)
ACENAPHTHENE				
ACENAPHTHYLENE				
ACETONE				
ALDRIN				
AMETRYN				
AMINO,2- DINITROTOLUENE,4,6-				
AMINO,4- DINITROTOLUENE,2,6-				
ANTHRACENE				
ANTIMONY	0.004-2.4	2.4E+00	2.4E+00	2.4E+00
ARSENIC	0.3-50	2.4E+01	5.0E+01	2.4E+01
ATRAZINE				
BARIUM	4.5-926	6.9E+02	9.3E+02	6.9E+02
BENOMYL				
BENZENE				
BENZO(a)ANTHRACENE				
BENZO(a)PYRENE				
BENZO(b)FLUORANTHENE				
BENZO(g,h,i)PERYLENE				
BENZO(k)FLUORANTHENE				
BERYLLIUM	0.05-3.8	3.0E+00	3.8E+00	3.0E+00
BIPHENYL, 1,1-				
BIS(2-CHLOROETHYL)ETHER				
BIS(2-CHLORO-1-METHYLETHYL)ETHER				
BIS(2-ETHYLHEXYL)PHTHALATE				
BORON				
BROMODICHLOROMETHANE				
BROMOFORM				
BROMOMETHANE				
CADMIUM	0.02-17	2.3E+00	1.7E+01	2.3E+00
CARBON TETRACHLORIDE				
CHLORDANE (TECHNICAL)				
CHLOROANILINE, p-				
CHLOROBENZENE				
CHLOROETHANE				
CHLOROFORM				
CHLOROMETHANE				
CHLOROPHENOL, 2-				
CHROMIUM (Total)	8.52-3,180	1.1E+03	3.2E+03	1.1E+03
CHROMIUM III				
CHROMIUM VI				
CHRYSENE				

TABLE K. [1]NATURAL BACKGROUND CONCENTRATIONS OF METALS IN SOIL

CHEMICAL PARAMETER	Range (mg/kg)	[2]Upper Bound (mg/kg)	[3]Background Threshold Value (mg/kg)	[4]Selected Action Level (mg/kg)
COBALT	0.69-113	8.0E+01	1.1E+02	8.0E+01
COPPER	2.4-450	2.5E+02	4.5E+02	2.5E+02
CYANIDE (Free)				
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)				
DALAPON				
DIBENZO(a,h)ANTHTRACENE				
DIBROMO,1,2- CHLOROPROPANE,3-				
DIBROMOCHLOROMETHANE				
DIBROMOETHANE, 1,2-				
DICHLOROBENZENE, 1,2-				
DICHLOROBENZENE, 1,3-				
DICHLOROBENZENE, 1,4-				
DICHLOROBENZIDINE, 3,3-				
DICHLORODIPHENYLDICHLOROETHANE (DDD)				
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)				
DICHLORODIPHENYLTRICHLOROETHANE (DDT)				
DICHLOROETHANE, 1,1-				
DICHLOROETHANE, 1,2-				
DICHLOROETHYLENE, 1,1-				
DICHLOROETHYLENE, Cis 1,2-				
DICHLOROETHYLENE, Trans 1,2-				
DICHLOROPHENOL, 2,4-				
DICHLOROPHENOXYACETIC ACID (2,4-D)				
DICHLOROPROPANE, 1,2-				
DICHLOROPROPENE, 1,3-				
DIELDRIN				
DIETHYLPHTHALATE				
DIMETHYLPHENOL, 2,4-				
DIMETHYLPHTHALATE				
DINITROBENZENE, 1,3-				
DINITROPHENOL, 2,4-				
DINITROTOLUENE, 2,4- (2,4-DNT)				
DINITROTOLUENE, 2,6- (2,6-DNT)				
DIOXANE, 1,4-				
DIOXINS (TEQ)				2.0E-05
DIURON				
ENDOSULFAN				
ENDRIN				
ETHANOL				
ETHYLBENZENE				
FLUORANTHENE				
FLUORENE				
GLYPHOSATE				

TABLE K. [1]NATURAL BACKGROUND CONCENTRATIONS OF METALS IN SOIL

CHEMICAL PARAMETER	Range (mg/kg)	[2]Upper Bound (mg/kg)	[3]Background Threshold Value (mg/kg)	[4]Selected Action Level (mg/kg)
HEPTACHLOR				
HEPTACHLOR EPOXIDE				
HEXACHLOROBENZENE				
HEXACHLOROBUTADIENE				
HEXACHLOROCYCLOHEXANE (gamma) LINDANE				
HEXACHLOROETHANE				
HEXAZINONE				
INDENO(1,2,3-cd)PYRENE				
ISOPHORONE				
LEAD	0.76-73	7.3E+01	7.3E+01	7.3E+01
MERCURY	<0.017-1.4	7.2E-01	1.4E+00	7.2E-01
METHOXYCHLOR				
METHYL ETHYL KETONE				
METHYL ISOBUTYL KETONE				
METHYL MERCURY				
METHYL TERT BUTYL ETHER				
METHYLENE CHLORIDE				
METHYLNAPHTHALENE, 1-				
METHYLNAPHTHALENE, 2-				
MOLYBDENUM	0.06-4.0	4.0E+00	4.0E+00	4.0E+00
NAPHTHALENE				
NICKEL	2.1-767	4.1E+02	7.7E+02	4.1E+02
NITROBENZENE				
NITROGLYCERIN				
NITROTOLUENE, 2-				
NITROTOLUENE, 3-				
NITROTOLUENE, 4-				
PENTACHLOROPHENOL				
PENTAERYTHRITOLTETRANITRATE (PETN)				
PERCHLORATE				
PHENANTHRENE				
PHENOL				
POLYCHLORINATED BIPHENYLS (PCBs)				
PROPICONAZOLE				
PYRENE				
SELENIUM	0.24-12	7.1E+00	1.2E+01	7.1E+00
SILVER	0.02-1.5	1.5E+00	1.5E+00	1.5E+00
SIMAZINE				
STYRENE				
TERBACIL				
tert-BUTYL ALCOHOL				
TETRACHLOROETHANE, 1,1,1,2-				
TETRACHLOROETHANE, 1,1,2,2-				

TABLE K. [1]NATURAL BACKGROUND CONCENTRATIONS OF METALS IN SOIL

CHEMICAL PARAMETER	Range (mg/kg)	[2]Upper Bound (mg/kg)	[3]Background Threshold Value (mg/kg)	[4]Selected Action Level (mg/kg)
TETRACHLOROETHYLENE				
TETRACHLOROPHENOL, 2,3,4,6-				
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)				
THALLIUM	<0.25-15	2.5E-01	1.5E+01	2.5E-01
TOLUENE				
TOXAPHENE				
TPH (gasolines)				
TPH (middle distillates)				
TPH (residual fuels)				
TRICHLOROBENZENE, 1,2,4-				
TRICHLOROETHANE, 1,1,1-				
TRICHLOROETHANE, 1,1,2-				
TRICHLOROETHYLENE				
TRICHLOROPHENOL, 2,4,5-				
TRICHLOROPHENOL, 2,4,6-				
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)				
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)				
TRICHLOROPROPANE, 1,2,3-				
TRICHLOROPROPENE, 1,2,3-				
TRIFLURALIN				
TRINITROBENZENE, 1,3,5-				
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)				
TRINITROTOLUENE, 2,4,6- (TNT)				
VANADIUM	0.25-1,090	7.7E+02	1.1E+03	7.7E+02
VINYL CHLORIDE				
XYLENES				
ZINC	3.6-1,200	3.5E+02	1.2E+03	3.5E+02
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)				
Sodium Adsorption Ratio				

Primary Reference: Evaluation of Background Metal Concentrations in Soils of the Hawaiian Islands (HDOH 2011a). Refer to Appendix 1, Section 6.1.

Notes:

1. Excludes samples with known or suspected anthropogenic contamination (see primary reference).
2. Upper Bound concentration selected based on evaluation of univariate sample data plots.
3. Background Threshold Value set to maximum-reported concentration, excluding samples with suspected anthropogenic contamination.
4. Selected action level based on Upper Bound concentration unless otherwise noted.
5. BTV for arsenic based on profession judgment (widespread use as herbicide; clear break from anticipated, natural background not apparent on univariate graphs).
6. BTV for lead set equal to selected, Upper Bound concentration (common contamination of soil with leaded paint or auto exhaust from leaded gasoline; clear break from anticipated, natural background not apparent on univariate graphs).

TABLE L. SOIL ECOTOXICITY ACTION LEVELS

(Discontinued as of Fall 2011 due to low confidence in use of published action levels in Hawai'i. See text Section 3.5.)

	Urban Area Ecotoxicity Criteria (mg/kg)	
CHEMICAL PARAMETER	Residential Areas	Commercial/ Industrial areas
ACENAPHTHENE	site-specific	site-specific
ACENAPHTHYLENE	site-specific	site-specific
ACETONE	site-specific	site-specific
ALDRIN	site-specific	site-specific
AMETRYN	site-specific	site-specific
AMINO,2- DINITROTOLUENE,4,6-	site-specific	site-specific
AMINO,4- DINITROTOLUENE,2,6-	site-specific	site-specific
ANTHRACENE	site-specific	site-specific
ANTIMONY	site-specific	site-specific
ARSENIC	site-specific	site-specific
ATRAZINE	site-specific	site-specific
BARIUM	site-specific	site-specific
BENOMYL	site-specific	site-specific
BENZENE	site-specific	site-specific
BENZO(a)ANTHRACENE	site-specific	site-specific
BENZO(a)PYRENE	site-specific	site-specific
BENZO(b)FLUORANTHENE	site-specific	site-specific
BENZO(g,h,i)PERYLENE	site-specific	site-specific
BENZO(k)FLUORANTHENE	site-specific	site-specific
BERYLLIUM	site-specific	site-specific
BIPHENYL, 1,1-	site-specific	site-specific
BIS(2-CHLOROETHYL)ETHER	site-specific	site-specific
BIS(2-CHLORO-1-METHYLETHYL)ETHER	site-specific	site-specific
BIS(2-ETHYLHEXYL)PHTHALATE	site-specific	site-specific
BORON	site-specific	site-specific
BROMODICHLOROMETHANE	site-specific	site-specific
BROMOFORM	site-specific	site-specific
BROMOMETHANE	site-specific	site-specific
CADMIUM	site-specific	site-specific
CARBON TETRACHLORIDE	site-specific	site-specific
CHLORDANE (TECHNICAL)	site-specific	site-specific
CHLOROANILINE, p-	site-specific	site-specific
CHLOROBENZENE	site-specific	site-specific
CHLOROETHANE	site-specific	site-specific
CHLOROFORM	site-specific	site-specific
CHLOROMETHANE	site-specific	site-specific
CHLOROPHENOL, 2-	site-specific	site-specific
CHROMIUM (Total)	site-specific	site-specific
CHROMIUM III	site-specific	site-specific
CHROMIUM VI	site-specific	site-specific
CHRYSENE	site-specific	site-specific
COBALT	site-specific	site-specific
COPPER	site-specific	site-specific
CYANIDE (Free)	site-specific	site-specific
CYCLO-1,3,5-TRIMETHYLENE-2,4,6-TRINITRAMINE (RDX)	site-specific	site-specific
DALAPON	site-specific	site-specific
DIBENZO(a,h)ANTHTRACENE	site-specific	site-specific
DIBROMO,1,2- CHLOROPROPANE,3-	site-specific	site-specific

TABLE L. SOIL ECOTOXICITY ACTION LEVELS

(Discontinued as of Fall 2011 due to low confidence in use of published action levels in Hawai'i. See text Section 3.5.)

	Urban Area Ecotoxicity Criteria (mg/kg)	
CHEMICAL PARAMETER	Residential Areas	Commercial/ Industrial areas
DIBROMOCHLOROMETHANE	site-specific	site-specific
DIBROMOETHANE, 1,2-	site-specific	site-specific
DICHLOROBENZENE, 1,2-	site-specific	site-specific
DICHLOROBENZENE, 1,3-	site-specific	site-specific
DICHLOROBENZENE, 1,4-	site-specific	site-specific
DICHLOROBENZIDINE, 3,3-	site-specific	site-specific
DICHLORODIPHENYLDICHLOROETHANE (DDD)	site-specific	site-specific
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	site-specific	site-specific
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	site-specific	site-specific
DICHLOROETHANE, 1,1-	site-specific	site-specific
DICHLOROETHANE, 1,2-	site-specific	site-specific
DICHLOROETHYLENE, 1,1-	site-specific	site-specific
DICHLOROETHYLENE, Cis 1,2-	site-specific	site-specific
DICHLOROETHYLENE, Trans 1,2-	site-specific	site-specific
DICHLOROPHENOL, 2,4-	site-specific	site-specific
DICHLOROPHENOXYACETIC ACID (2,4-D)	site-specific	site-specific
DICHLOROPROPANE, 1,2-	site-specific	site-specific
DICHLOROPROPENE, 1,3-	site-specific	site-specific
DIELDRIN	site-specific	site-specific
DIETHYLPHTHALATE	site-specific	site-specific
DIMETHYLPHENOL, 2,4-	site-specific	site-specific
DIMETHYLPHTHALATE	site-specific	site-specific
DINITROBENZENE, 1,3-	site-specific	site-specific
DINITROPHENOL, 2,4-	site-specific	site-specific
DINITROTOLUENE, 2,4- (2,4-DNT)	site-specific	site-specific
DINITROTOLUENE, 2,6- (2,6-DNT)	site-specific	site-specific
DIOXANE, 1,4-	site-specific	site-specific
DIOXINS (TEQ)	site-specific	site-specific
DIURON	site-specific	site-specific
ENDOSULFAN	site-specific	site-specific
ENDRIN	site-specific	site-specific
ETHANOL	site-specific	site-specific
ETHYLBENZENE	site-specific	site-specific
FLUORANTHENE	site-specific	site-specific
FLUORENE	site-specific	site-specific
GLYPHOSATE	site-specific	site-specific
HEPTACHLOR	site-specific	site-specific
HEPTACHLOR EPOXIDE	site-specific	site-specific
HEXACHLOROBENZENE	site-specific	site-specific
HEXACHLOROBUTADIENE	site-specific	site-specific
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	site-specific	site-specific
HEXACHLOROETHANE	site-specific	site-specific
HEXAZINONE	site-specific	site-specific
INDENO(1,2,3-cd)PYRENE	site-specific	site-specific
ISOPHORONE	site-specific	site-specific
LEAD	site-specific	site-specific
MERCURY	site-specific	site-specific
METHOXYCHLOR	site-specific	site-specific
METHYL ETHYL KETONE	site-specific	site-specific
METHYL ISOBUTYL KETONE	site-specific	site-specific

TABLE L. SOIL ECOTOXICITY ACTION LEVELS

(Discontinued as of Fall 2011 due to low confidence in use of published action levels in Hawai'i. See text Section 3.5.)

	Urban Area Ecotoxicity Criteria (mg/kg)	
CHEMICAL PARAMETER	Residential Areas	Commercial/ Industrial areas
METHYL MERCURY	site-specific	site-specific
METHYL TERT BUTYL ETHER	site-specific	site-specific
METHYLENE CHLORIDE	site-specific	site-specific
METHYLNAPHTHALENE, 1-	site-specific	site-specific
METHYLNAPHTHALENE, 2-	site-specific	site-specific
MOLYBDENUM	site-specific	site-specific
NAPHTHALENE	site-specific	site-specific
NICKEL	site-specific	site-specific
NITROBENZENE	site-specific	site-specific
NITROGLYCERIN	site-specific	site-specific
NITROTOLUENE, 2-	site-specific	site-specific
NITROTOLUENE, 3-	site-specific	site-specific
NITROTOLUENE, 4-	site-specific	site-specific
PENTACHLOROPHENOL	site-specific	site-specific
PENTAERYTHRITOLTETRANITRATE (PETN)	site-specific	site-specific
PERCHLORATE	site-specific	site-specific
PHENANTHRENE	site-specific	site-specific
PHENOL	site-specific	site-specific
POLYCHLORINATED BIPHENYLS (PCBs)	site-specific	site-specific
PROPICONAZOLE	site-specific	site-specific
PYRENE	site-specific	site-specific
SELENIUM	site-specific	site-specific
SILVER	site-specific	site-specific
SIMAZINE	site-specific	site-specific
STYRENE	site-specific	site-specific
TERBACIL	site-specific	site-specific
tert-BUTYL ALCOHOL	site-specific	site-specific
TETRACHLOROETHANE, 1,1,1,2-	site-specific	site-specific
TETRACHLOROETHANE, 1,1,2,2-	site-specific	site-specific
TETRACHLOROETHYLENE	site-specific	site-specific
TETRACHLOROPHENOL, 2,3,4,6-	site-specific	site-specific
TETRANITRO-1,3,5,7-TETRAAZOCYCLOOCTANE (HMX)	site-specific	site-specific
THALLIUM	site-specific	site-specific
TOLUENE	site-specific	site-specific
TOXAPHENE	site-specific	site-specific
TPH (gasolines)	site-specific	site-specific
TPH (middle distillates)	site-specific	site-specific
TPH (residual fuels)	site-specific	site-specific
TRICHLOROBENZENE, 1,2,4-	site-specific	site-specific
TRICHLOROETHANE, 1,1,1-	site-specific	site-specific
TRICHLOROETHANE, 1,1,2-	site-specific	site-specific
TRICHLOROETHYLENE	site-specific	site-specific
TRICHLOROPHENOL, 2,4,5-	site-specific	site-specific
TRICHLOROPHENOL, 2,4,6-	site-specific	site-specific
TRICHLOROPHENOXYACETIC ACID, 2,4,5- (2,4,5-T)	site-specific	site-specific
TRICHLOROPHENOXYPROPIONIC ACID, 2,4,5- (2,4,5-TP)	site-specific	site-specific
TRICHLOROPROPANE, 1,2,3-	site-specific	site-specific
TRICHLOROPROPENE, 1,2,3-	site-specific	site-specific
TRIFLURALIN	site-specific	site-specific
TRINITROBENZENE, 1,3,5-	site-specific	site-specific

TABLE L. SOIL ECOTOXICITY ACTION LEVELS

(Discontinued as of Fall 2011 due to low confidence in use of published action levels in Hawai'i. See text Section 3.5.)

	Urban Area Ecotoxicity Criteria (mg/kg)	
CHEMICAL PARAMETER	Residential Areas	Commercial/ Industrial areas
TRINITROPHENYLMETHYLNITRAMINE, 2,4,6- (TETRYL)	site-specific	site-specific
TRINITROTOLUENE, 2,4,6- (TNT)	site-specific	site-specific
VANADIUM	site-specific	site-specific

TABLE L. SOIL ECOTOXICITY ACTION LEVELS

(Discontinued as of Fall 2011 due to low confidence in use of published action levels in Hawai'i. See text Section 3.5.)

	Urban Area Ecotoxicity Criteria (mg/kg)	
CHEMICAL PARAMETER	Residential Areas	Commercial/ Industrial areas
VINYL CHLORIDE	site-specific	site-specific
XYLENES	site-specific	site-specific
ZINC	site-specific	site-specific
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	-	-
Sodium Adsorption Ratio	-	-

Discontinued in Fall 2011. Site specific, ecological risk assessment recommended at sites where anthropogenic contamination identified and sensitive, terrestrial ecological habitats could be threatened.